Day-Ahead Market Enhancements Alternative Proposal

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Disclaimer

Conceptual detailed proposal provided that leverages zonal (BAA or intra-BAA) requirements across the Day-Ahead Market Processes

Draft proposals provided to illustrate a workable place to start for a day-ahead market enhancement design pivot that is simpler and less computationally intensive that also improves the solution by minimizing error risks. The proposal will ensure deliverability risks are mitigated, procure products to provide grid services with some need, and balance costs to consumers as result of enhancements.

After February 27, 2023 meeting, Vistra incorporated stakeholder feedback and revised its proposal contained within.

Importance of day-ahead market enhancements

- Vistra desires a day-ahead market that procures services to meet expected energy and uncertainty needs and rationally prices those services to send rational signals for investment and performance
- A day-ahead flexibility product will need to provide compensation for resources commensurate with that provided by Flex RA or else it could undermine incentives to provide flexible capacity, which is not in the best interest of reliability given the variability of the evolving grid
- Locational marginal prices that are muddied through including counterfactual congestion scenarios based on a range of probability deployments will reduce transparency into the LMP and its fundamental drivers eroding confidence in LMP ability to incentive locational performance and as the daily LMP impacts forward markets also erode confidence in forward market investment signals

DAM needs to continue to send signals that can be understood, effectively incorporate into forward markets, and solves for grid needs efficiently.

Importance of day-ahead market enhancements

- In 2013, CA RA program set effective flexible capacity requirement for largest three-hour continuous ramp
  - D.13-06-024 - "Flexible capacity need" is quantity of economically dispatched resources needed by CAISO during greatest three-hour continuous ramp in each month.
- EDAM/WEIM will need to incentivize flexible resource attributes, especially for merchant generation that are on one-three year contracts
  - "The Commission will coordinate with CAISO on the future removal of the flexible RA requirements for the SOD framework." (Proposed Decision on Resource Adequacy Reform Track, Page 79)
  - IR and FRP will be main product(s) to value flexibility where a poorly designed product will harm our ability to bring flexible resources to EDAM/WEIM.

Imbalance Reserves and Flexible Ramping Product need to replace Flexible RA to ensure compensation is provided for flexible attributes to be built and maintained to meet evolving grid needs.

We asked ourselves: What is a workable design that achieves the goals laid out with minimal market disruption while leaving room for future enhancements?

A workable design to start under EDAM

1. Add new Integrated Forward Market product to procure expected uncertainty to meet imbalances for when real-time needs are expected to be greater than day-ahead forecasts
2. Mitigate market power concerns for imbalance reserves and residual unit commitment capacity using bid caps at $250/MWh plus must offer rules
3. Set IFM uncertainty requirements based on dynamic reserve requirements (probabilistic forecasts of upward uncertainty between IFM and RTM)
4. BAA operations should have flexibility to identify level of reserves locational granularity needed to mitigate deliverability risks
   ➔ design should allow each BAA to enforce BAA or intra-BAA zones
5. Co-optimize Energy and Ancillary Services to include Imbalance Reserves
6. Determine Imbalance Reserves marginal clearing price based on marginal resource's opportunity cost pricing and Imbalance Reserve capacity offer
7. Develop uplift rules for differences between IR zonal and FRP nodal
8. Develop uplift rules to incentivize minimizing imbalances, e.g. disqualify resources/load for uplifts or allocate uplifts when not following dispatch
9. Specify how the IFM and RUC will be performed in light of multiple EDAM BAAs and multiple RA programs

#1 Add new Integrated Forward Market product to procure expected uncertainty to meet imbalances for when real-time needs are expected to be greater than day-ahead forecasts

Day-Ahead Market Processes

- Performs BAA or intra-BAA zonal procurement for Imbalance Reserves and for RUC Capacity
- Co-optimize across EDAM Imbalance Reserves Up Uncertainty product to meet imbalances for when real-time needs are expected to be greater than the IFM cleared physical supply with energy & ancillary services, select details:
  - Perform EDAM-level run that limits transfers to Total Transfer Capability of ETSRs
  - Enforce BAA or intra-BAA requirements to ensure local needs met
- Perform a BAA-level RUC run that incorporates EDAM transfers and Imbalance Reserve awards into cleared awards, and applies appropriate treatment for WRAP or off-system sales, select details:
  - BAA-level RUC run that limits transfers between BAAs to zero
  - Include Imbalance Reserve awards in stack with Imbalance Reserve RUC adder
  - Include EDAM transfers along with intertie transactions (cleared interties for CISO EDAM BAA and modeled injections/withdrawals for non-CISO EDAM BAA)
  - Allow RUC "cut" process to cut Multi-Stage Generators cleared physical schedules down to "offline" state for purposes of relaxing cleared supply offers before hitting the overgeneration slack bus
    - Note, does not change RT binding configuration logic
- Assess Grid Management Charges on Imbalance Reserve bids, RUC availability bids, RUC unavailability bids (no RUC capacity from RA bids so no charge)

Residual Unit Commitment Notes

- EDAM RUC run results in issuing RUC awards for incremental capacity above that cleared in the Integrated Forward Market above the greater of Imbalance Reserve Awards, Day-Ahead Energy Awards, or Minimum Load that has not been previously arranged by the internal BAA or external BAA supporting off-system needs.
  - RUC award and payments: Eligible for resource's capacity in excess of RMR Capacity, California RA, or any supply supporting WRAP RA or off-system sale
  - RUC capacity: Eligible for Reliability Must Run, California RA obligation, energy associated with WRAP RA obligation, or unavailability bid to support off-system sale. ***Should not receive any RUC payments.***
  - **Binding commitment costs included in real-time bid cost recovery:** Minimum Load not considered RUC Capacity, not eligible for RUC compensation, in RTM BCR.
- EDAM RUC run results in issuing start-up instructions to Long-Start Units and Extremely Long-Start Resources if RUC>24 hours is run
  - Ensures resources under RMR, California RA, associated with WRAP RA, or supporting off-system sales are committed if needed
  - Resources with start up time and minimum up time greater than 240 minutes need to be started in advance of real time to meet Real-Time Demand.
  - For Extremely Long-Start Resources, advisory start-up instructions may be issued for start times up to the end of the time horizon.
  - For other units, the CAISO re-evaluates their commitment in STUC and RTUC.
  - RUC Schedule is made available to relevant SC even if a RUC Start-Up instruction is not issued in the DAM

#2 Mitigate market power concerns for imbalance reserves and residual unit commitment capacity using bid caps plus must offer rules

Market Power Mitigation – $250/MWh Bid Caps

- **No changes to existing Market Power Mitigation** engine, which performs the Dynamic Competitive Path Assessment, does not change under Imbalance Reserve Up Uncertainty Zonal Procurement
  - No flows on transmission constraints and no deployment scenarios leading to increased levels of uncompetitive constraints
- **No NEW Market Power Mitigation run needed for RUC**
  - Includes Imbalance Reserves in addition to cleared supply in the supply stack
  - Inserts all California RA at $0/MWh (no bids)
  - Exploring how WRAP interfaces with RUC, but conceptually since the payments for WRAP services are out of the market any integration in RUC would also be at $0/MWh cost
  - Continue to perform RUC to meet Power Balance and to enforce RUC zones
- **Market power mitigated in both IFM and RUC by limiting Imbalance Reserve Up Bids and RUC availability bids to no more than $250/MWh**

Day-Ahead Must Offer Obligations

Non-RA:

- Status Quo, no must offer obligations into DAM.
- Status Quo, excess supply from Non-RA shall not be included in RUC unless the Non-RA capacity is voluntarily offered through RUC availability bid

California RA:

- RUC bid insertion of RUC capacity at $0/MWh for any portion of its shown RA above the sum of its energy *and imbalance reserves*
- Status Quo, bid insertion for energy if not submitted at DEB – **No Imbalance Reserve MOO since not included in RA program**

Other Contracts:

- Resources contracted for any portion of their capacity to external BAAs required to submit unavailability bids to indicate the capacity has been pre-arranged for off-system sales and treated similar to CA RA at $0/MWh
- Any DAM energy MOO is contractual.

WRAP:

Not been discussed in DAME - need to discuss potential ways WRAP BAAs, and the resources within those BAAs, will potentially interface with EDAM. This needs its own full day workshop. DAME needs to support WRAP BAAs participation.

- Status Quo, may bid up to their Pmax but will be limited in their awards to no more than their Upper Economic Limit across all products
- Status Quo, RUC will ensure it does not award into AS awards by including in the Upper Economic Limit AS procurement from IFM (Pmax – Derates – Cleared IFM AS)

Real-Time Must Offer Obligations

- IFM AS Awards removed from Upper Economic Limit (Pmax-Derates-AS) fixed at penalty price
- Max(Imbalance Reserves Up Award, RUC Award) must submit economic bids
- IFM supply or intertie transactions can transfer as self-schedule or can submit economic bids

Non-RA:

- IFM physical supply or intertie transactions can either transfer as self-schedule or can submit economic bids

California RA:

- Generic RA: Status Quo, RA capacity above sum of energy/imports and Imbalance Reserves has a real-time must offer obligation of either self-schedules or economic bids
- Flex RA: Status Quo, Flex RA uncleared MW required to submit economic energy bids to avoid RAAIM
- Status Quo, energy bid insertion at DEB

Other Contracts:

- Any real-time MOO will be contractual.
  - IE no bid insertion

WRAP:

This topic has not been discussed in DAME. We need to discuss the potential ways that BAAs within WRAP, and the resources within those BAAs, will potentially interface with EDAM. This needs its own full day workshop. Any DAME needs to be able to support WRAP BAAs.

#3 Set IFM uncertainty requirements based on dynamic reserve requirements

Vistra proposed daily calculation of hourly uncertainty requirements

- **"Daily basis:** On daily basis calculate hourly dynamic reserve requirements for BAA and each pre-defined intra-BAA zone using probabilistic forecasts to estimate each EDAM BAA or pre-defined intra-EDAM BAA zones uncertainty forecasts"
- CAISO proposed to calculate the imbalance reserve requirement for each EDAM BAA separately using historical data specific to the BAA.
  - Generally same proposal, with variation for intra-BAA zones
- Once the quantile regression is performed, then the subregion, BAA, and intra-BAA zones could have their own calculated uncertainty and the BAA Operations should identify which requirements to enforce on a given day
- Quantile regression calculated uncertainty requirement would be included in a Imbalance Reserve constraint enforced in the IFM at a BAA or intra-BAA level
  - Detailed formulation of the constraint needed for a BAA or intra-BAA constraint

Establishing dynamic reserve requirements by BAA and potentially intra-BAA zones by hour

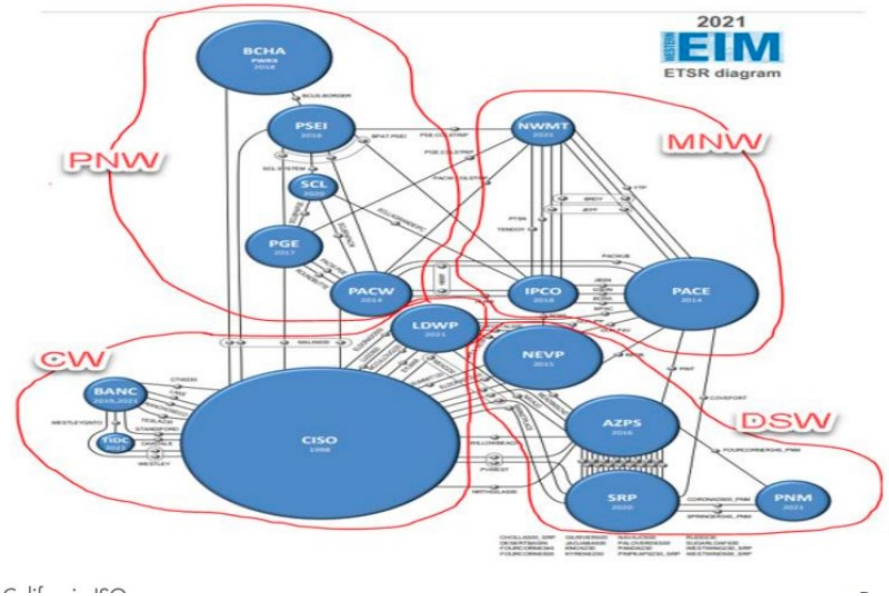
Prior to the day-ahead market, on a daily basis calculate the uncertainty requirements by:

- Use quantile regression to estimate for each BAA (and any specified sub-zones) parameters of load forecast, month, and hour on the 97.5 percentile of load imbalance
- Use quantile regression to estimate for each BAA (and any specified sub-zones) parameters of wind forecast, month, and hour on the 2.5 percentile of wind imbalance
- Use quantile regression to estimate for each BAA (and any specified sub-zones) parameters of solar forecast, month, and hour on the 2.5 percentile of solar imbalance
- Output values from the three quantile regressions are synthesized using a formula for the Net Load (Load – Wind – Solar) and go through an additional quantile regression to produce the final imbalance reserve up requirement polynomial for each BAA (and any specified sub-zones)

Regional diversity benefit results in BAA credit

- Diversity benefit should not credit for transfers expected in DAM not available in RTM
  - To mitigate this risk, regions that reliably operate as unit should be grouped
  - Incorporates risks to transfer capability materializing b/w DA and RT
- Calculate uncertainty requirement for each region so that we can identify the denominator for the Diversity Benefit calculation
- Allocate to each BAA's requirement by the share of the calculated BAA uncertainty requirement to the regional uncertainty

Existing transfer capabilities create regional areas



Flexible Ramp Product discussion, February 11, 2022, slide 8, http://www.caiso.com/Documents/FlexibleRampProduct-Presentation-Feb11_2022.pdf

#4 BAA operations should have flexibility to identify level of locational granularity needed to mitigate deliverability risks

Initial thoughts on process to establish BAA or intra-BAA dynamic zonal requirements

- **Forward basis:** Each EDAM BAA perform forward studies (e.g. seasonal) to identify deliverability risks to Ancillary Services where there are deliverability risks that could leave any AS or Imbalance reserves stranded
  - Ideally, pre-defined zones would be posted to OASIS under atlas ref.
- **Daily basis:** On daily basis calculate hourly dynamic reserve requirements for BAA and each pre-defined intra-BAA zone using probabilistic forecasts to estimate each EDAM BAA or pre-defined intra-EDAM BAA zones uncertainty forecasts
- **Pre-IFM Run:** EDAM BAA operations should have flexibility to identify whether each EDAM BAA or pre-defined intra-BAA zones are needed
  - Perform intra-day risk assessment to identify next day's expected risks and whether there are deliverability risks that could leave any reserves stranded
  - Determine whether BAA or intra-BAA zonal requirements for the pre-defined zones should be enforced using this assessment
- **IFM Run:** IFM would use applicable dynamic reserve requirement for the enforced "zone" either EDAM BAA or pre-defined intra-EDAM BAA zones
- **RTM Runs:** Flexible Ramping Product requirements will position "zonal" reserve requirements to most optimal location in real-time ➔ increasing benefits

Initial thoughts on expanding RUC zone process to non-CISO EDAM BAAs

- BAA operations should have flexibility to ensure they can enforce RUC zones intra-BAA, maintaining the zonal design
- RUC Zone is designated area representing collection of Cnodes e.g. IOU service area, UDC, MSS, Local Capacity Area.
  - EDAM operator may develop collections of nodes based on BAA operator direction as sufficient historical Demand and relevant weather data is available to perform Demand Forecast.
- RUC Zones defined to allow EDAM Operators to adjust Demand Forecast on local basis as input to RUC process, to ensure RUC process results in adequate local capacity procurement.
- Forecast for each RUC Zone is adjustable by BAA Operator direction on a RUC zone basis.
- CISO EDAM BAA uses 3 RUC zones associated with 3 TAC areas, and we will need the Non-CISO EDAM BAAs to identify and work to establish intra-BAA RUC zones depending on their particular need

#5/#6 Co-optimize Energy and Ancillary Services include new Imbalance Reserves product & Set Clearing Prices

Co-optimize Energy and Ancillary Services include new Imbalance Reserves product

- Co-optimize Energy and Ancillary Services including the new Imbalance Reserves product in the Integrated Forward Market
- Do not include Imbalance Reserve in cascading of BAL min AS requirements
- Set Imbalance Reserve Services Marginal Price (IRSMP) based on opportunity cost of not providing energy and marginal Imbalance Reserve resources' offer
- Imbalance Reserve would be procured based on a demand curve in the scheduling run to respect that there are varying levels of confidence in the uncertainty requirements across P10-P90
  - Percentiles and amounts established for each BAA and hour
- Pricing run penalty prices set a demand curve in a similar relative priority dependent on the level of bid cap ($1k, between 1-2k, 2k).
- Non-priced adjustment values would be consistent across EDAM.
- EDAM RSE should consider whether it would be more prudent to also recognize the varying levels of confidence in the penalties used for RSE
  - It does not make logical sense that lower certainty uncertainty amounts that will be protected at and willing to pay for at low values are penalized excessively in RSE

Imbalance Reserve Demand Curves Scheduling Run

- P10 uncertainty is highly certain so would be protected above energy SS (=minimum Imbalance Reserve requirement)
- P25 is high certainty but lower degree and should be price to establish downward sloping demand curve between $1,800/MWh and $1,500/MWh
- P50 is medium certainty at penalty price being used for “Ancillary Service Region Maximum Limit on Upward Services” at $1,500/MWh
- P75 is lower certainty but still reasonably expected and should be priced to establish downward sloping curve between $1,500/MWh and $1,050/MWh
- P90 is lowest level of uncertainty below that being used for “Self-scheduled exports not using identified non-RA capacity” at <$1,050/MWh
- Max Requirement should be set at $1,000/MWh

Imbalance Reserve Demand Curves Pricing Run (illustrative)

Assuming 1k bid cap and illustrating downward curves:

- P10 uncertainty is highly certain so would be price at $1,000/MWh
- P25 is high certainty but lower degree and should be price to establish downward sloping demand curve between $1,000/MWh and $900/MWh
- P50 is medium certainty so at $500/MWh
- P75 is lower certainty but still reasonably expected and should be priced to establish downward sloping curve between $500/MWh and $250/MWh
- P90 is lowest level of uncertainty at $150/MWh
- Max Requirement should be set at $50/MWh

EDAM considerations

- Market would optimize to ensure each BAA meets its individual requirement for the BAA and any intra-BAA zone if enforced
  - The requirement would include a diversity benefit for the region
- Market could allow transfers between the regions, and the BAAs within the regions, if the transfer capability is available between two neighboring BAAs to allow for deliveries
  - Transfers between neighboring BAAs would be limited based on its Total Transfer Capacity associated with the ETSRs
- Market will not award transfers of imbalance reserves between BAAs that do not have transfer paths directly connecting them

#7/#8 Develop uplift rules for differences between IR zonal and FRP nodal and to incentivize minimizing imbalances

Imbalance Reserve Settlements & Allocations

- Day Ahead Imbalance Reserve Settlement amount should be calculated for awarded Imbalance Reserve (up) capacity bids in the IFM market.
  - Settled on an hourly basis at the resource level
  - Imbalance Reserve (up) settlement should be based on IFM Imbalance Reserve Service Marginal Price (IRSMP) for the resource for the hour
  - Settlement amount for each hour is the product of Imbalance Reserve Capacity awards and the IRSMP for the resource for the hour
  - Settlement includes rescission amount for the minimum of the Total Imbalance Reserve Quantity and Positive Deviation Quantity (amount the FMM Upper Economic Limit does not cover the sum of IFM energy and IFM Imbalance Reserve awards)

Imbalance Reserve Settlements & Allocations

- Imbalance Reserve (Up) Uncertainty allocations shall apply at BAA level on a daily basis, potentially with monthly resettlement.
  - Allocation on daily basis
  - At the end of the month, the daily uncertainty award allocation could be reversed and re-allocated based on the BAA and month's net unavailable Imbalance Reserve uncertainty awards in FMM including due to Operational adjustments.
- Imbalance Reserve awards - ignoring rescission settlement amount - included as part of daily IFM bid cost recovery calculations to determine net surplus or net shortfall.
- Imbalance reserve unavailability no pay would be duplicative to the rescission amounts included in the IFM Imbalance Reserve Up Uncertainty settlements so no separate no pay approach. If alternatively, the CAISO is trying to separate the rescission amounts from the settlement then it will be necessary to clarify this detail to ensure no double penalty.

Residual Unit Commitment Settlements

- RUC capacity & RUC unavailability bids receive no RUC payments
  - If binding commitment, then commitment costs included in RTM BCR
- RA, RMR, energy associated with WRAP or other contracts do not receive RUC Awards for their previously arranged Capacity.
- RUC awards are product of RUC award and the RUC Price at its location
  - Note the RUC price has Energy, Loss, and Congestion components associated with it similar to LMPs produced in the IFM, however, RUC availability bids set prices and RUC Prices are not decomposed.
- Without any RUC down product there is no need to settle & allocate simplifying the settlement changes needed

Residual Unit Commitment Allocations

- RUC cost allocation uses two-tier Settlement approach and this approach would continue with the CAISO's proposed allocation for RUC Up
- Expecting no changes to RUC and RTM BCR needed
- RUC Capacity No Pay not proposed because it is expected to be duplicative to RAAIM penalties for CA RA capacity when unavailable, and similar penalties expected for contracts, including WRAP, for failure to meet obligations

Appendices

Integrated Forward Market Bids

Product	Purpose	Output	Eligibility	Ineligibility	Status
Ancillary Services (Regulation Up, Regulation Down, Spinning Reserves, and Non-Spinning Reserves)	Reserve awards to preserve either up or down capacity to meet ancillary service obligations either through 4-second AGC signals (Regulation) or through Real-Time Contingency Dispatch (RTCD) after a contingency event occurs.	Regulation Up, Regulation Down, Spinning Reserves, or Non-Spinning Reserve awards	Certified resources by AS type	Resources not certified for a specific service	Existing
Energy	Energy schedules cleared to meet bid-in demand	IFM cleared bid/export, supply/import, wheel throughs, virtuals	All resources	N/A	Existing
Imbalance Reserves Up	Incremental flexible capacity to meet net load uncertainty between the Day-Ahead and Fifteen Minute Markets	Imbalance Reserve Awards	15-minute dispatchable capacity	>15-min capable resources	Proposed

Integrated Forward Market Bids

Product	Purpose	Output	Eligibility	Ineligibility	Status
RUC Capacity	Ensure California RA resources not cleared in IFM for either energy or imbalance reserves that need to receive commitment instructions in IFM are committed if expected to be needed based on RUC forecast. Need to ensure EDAM transfers for WRAP agreements are reflected to not over procure capacity. CA RA or WRAP transactions at $0/MWh.	Binding Start Up Instructions sent to any binding start resources (start up+minimum up time>240 min) that received a RUC capacity schedule.	California RA resources shown on monthly RA plan up to their Net Qualifying Capacity; Need to confirm WRAP treatment.	Resource capacity submitted as "Unavailability Offer" for an external BAA are ineligible to participate in the internal BAAs RUC pass for that capacity	Existing with revisions to accommodate WRAP / idea of off-system RA sales
RUC Award	Ensure there are sufficient supply offers submitted into real-time market through a combination of IFM cleared supply, IFM imbalance reserve awards, cleared EDAM transfers modeled as imports and exports, incremental RUC capacity schedules, and finally any incremental RUC availability awards for non-RA resource capacity.	Binding Start Up Instructions sent to any binding start resources (start up+minimum up time>240 min) that received a RUC award and a real-time must offer obligation for the commitment cost and energy bid similar to a generic RA obligation.	Resource capacity above any shown for either California or Western RA purposes can submit availability bids for incremental RA backstop capacity	Resources shown on any RA plan or that submitted an Unavailability Bid are ineligible to receive RUC awards for that capacity	Existing with revisions to accommodate WRAP / idea of off-system RA sales
RUC Unavailability Bid	Ensure that the capacity is not accounted for or assigned to the internal BAA area because it has sold its capacity for off-system purposes. Include in the internal BAA RUC run to ensure the energy is accounted for in supporting exports for the off-system sale.	Binding Start Up Instructions sent to any binding start resources (start up+minimum up time>240 min) and real-time must offer for any incremental unavailable capacity above IFM cleared supply supporting off-system sales.	Resources that submit Unavailability Bid and are designated on an export bid. Non-RA resources designated to support PT exports would be required to bid RUC unavailability bid up to export SS.	Resources without Unavailability Bid and not designated on export bid.	Replaces availability bid for internal BAA RUC target with unavailability bid that allows it to be accounted for in RUC but explicitly categorized as supporting off-system sales.

Eligibility generally

- Proposal largely aligned with Appendix A for En, IRU, RCU/ie RUC awards

- Notable exceptions exist, including that offline resources are eligible to provide Imbalance Reserves for start-up times >15 minutes as long as the start up time and ramp time is feasible. For instance if a resource is offline with a 3 hour start up time that will take it 1 additional hour of ramping to meet the Imbalance Reserve award, then it will be eligible for award no sooner than 4 hours into the operating day

Appendix A: Eligibility Table

	EN	RUC Award	[redacted]	IRU	[redacted]
Non-Participating Load	Yes	Not Eligible		Not Eligible	
Virtual Supply	Yes	Not Eligible		Not Eligible	
Virtual Demand	Yes	Not Eligible		Not Eligible	
Hourly Block Import	Yes	Eligible		Not Eligible	
Hourly Block Export	Yes	Eligible		Not Eligible	
15-Min Import	Yes	Eligible		Eligible	
15-Min Export	Yes	Eligible		Eligible	
Dynamic Import	Yes	Eligible		Eligible	
Long-Start Generator	Yes	Eligible		Eligible	
Short-Start Generator	Yes	Eligible		Eligible	
Participating Load w/ 15-Min dispatch capability	Yes	Eligible		Eligible	
Participating Load w/ Hourly dispatch capability	Yes	Eligible		Not Eligible	
Variable Energy Resources (Wind/Solar)	Yes	Eligible		Eligible	
Non-Generator Resources (Storage)	Yes	Eligible		Eligible	
Hybrid Resource	Yes	Eligible		Eligible	
Energy Storage Resource	Yes	Eligible		Eligible	
60-Minute Proxy Demand Resource	Yes	Eligible		Not Eligible	
15-Minute Proxy Demand Resource	Yes	Eligible		Eligible	
5-Minute Proxy Demand Resource	Yes	Eligible		Eligible	
Reliability Demand Response Resource	Yes	Not Eligible		Not Eligible	

Bidding Rules

Section 3.3 "IR Bidding Rules"	Change to Proposal?
DAM Closes at 10AM PST, Energy & AS Bidding Remains Same	**None**
Separate bids for energy, ancillary services (regulation up, regulation down, regulation up/down mileage, spinning reserves, and non-spinning reserves), imbalance reserves up	**No Imbalance Reserve Down Bid**
Imbalance Reserve Capacity Bid is absolute value Capacity Offer with a single P*Q pair that can vary by hour	**None**
IR bid (MW) must be greater than zero and less than resource's maximum 15-minute ramp capability for that hour	**None**
imbalance reserve up bids will be capped at $250/MWh.	**- No Imbalance Reserve Down Bid** **- Align cap with all other Ancillary Services**
Resources with imbalance reserve awards that did not submit economic offers into RTM will be subject to bid insertion at its RTM DEB.	**None**

Section 3.5 "RUC Bidding Rules"	Change to Proposal?
Submit bids for RUC availability between $0/MWh and $250/MWh for Non-RA capacity (CA RA/WRAP RA/Other Contracts)	**- Keeps RUC availability bids for Non-RA capacity** **- No RUC Down Bid**
RUC availability bid for capacity (absolute value) with a single P*Q pair that varies by hour	**None**
Submit bids for RUC unavailability at $0/MWh for WRAP RA/Other Contracts (SIBR rule limit to $0/MWh).	**Off-system sales whether RA/REC can show energy has been pre-arranged for off-system sales**
Bid insertion for California RA capacity not cleared in IFM for either energy or Imbalance Reserves	**Keeps existing bid insertion lofor CA RA, adds IR to that "cleared" MW**
RUC availability and unavailability bids must be greater than zero and less than Upper Economic Limit, and does not have to overlap with energy bids	- **Use UEL w/ modeled RR instead of "cap to 60min ramp rate"** - **RUC availability or unavailability do not need to overlap with energy**
Resources with RUC Awards and RUC Unavailability Awards that did not submit economic offers subject to bid insertion at RTM DEB.	**None**

Imbalance Reserve Settlements & Allocations

Settlements	Purpose	Change to CAISO Proposal?
New Charge Code: Imbalance Reserve Up Uncertainty Capacity Settlement (similar to CC 7071)	For each Settlement Interval, calculate the Flexible Ramp Up Uncertainty Award Settlement, including the rescission amount. Sum total of the IFM Imbalance Reserve Up Uncertainty Capacity Settlement Amount and the Imbalance Reserve Up Uncertainty Capacity Rescission Amount. Settlement Amount is the product of the Imbalance Reserve Up Uncertainty capacity award and the Imbalance Reserve Services Marginal Price. Rescission amount is the minimum of the Total Imbalance Reserve Up Quantity and Positive Deviation Quantity. E.G., min(Imbalance Reserve Up Uncertainty capacity, day-ahead energy+IRU award-5-minute ramp-capable portion-FMM UEL). Rescission quantity times the max(IFM IR price, FMM FRP price, 5MM FRP price).	1) **Yes for the Settlement Amount - Difference is that the Settlement Amount is the product of a IRSMP at the enforced zonal level instead of IR LMP at resource's node.** 2) **Remaining elements are the same.** 3) **Need to clarify that the "Imbalance Reserve Unavailability No Pay" section on Page 34 is proposing the Rescission Amount in the IFM settlement Charge Code.**
New Charge Code: Daily Imbalance Reserve Up Uncertainty Award Allocation (similar to CC 7077)	For each Balancing Authority Area (BAA) and Trading Day, allocate the charges associated with the total Imbalance Reserve Up Uncertainty capacity award settlement amounts that are paid in association with charge code for Daily Imbalance Reserve Up Uncertainty Capacity Settlement to the BAA. Allocate in two tiers – tier 1 for uncertainty types and tier 2 for any remaining costs to metered demand.	**No changes to CAISO proposal as we believe the CAISO proposal intends to allocate at the BAA and Trading Day granularity in the daily charge code.**
Monthly Imbalance Reserve Up Uncertainty Award Allocation (similar to CC 7078)	Would be on a monthly basis and result in the resettlement of the daily charges already calculated with charge code CC Daily Imbalance Reserve Up Uncertainty Capacity Award Allocation), with separate monthly allocation amounts determined for the Peak Imbalance Reserve Hours and Off-Peak Imbalance Reserve Hours of the Trading Month.	**Need to discuss whether there is a need for monthly resettlement or not for the IFM Imbalance Reserve settlements.**
RETIRED: Imbalance Reserve Up Capacity No Pay Charge (similar to retired CC 7024)	**NOT PROPOSED:** Per resource per settlement interval, computed based on calculated Imbalance Reserve Up No Pay Capacity.	**No Pay proposed is the same as Rescission Amount in the Capacity Settlement charge code not this retired charge code – CAISO should confirm.**
IFM Bid Cost Recovery CC 6630 Changes	Eligible IFM SUC, MLC, TC, Bid Costs and IFM market revenues are netted across Trading Hours, and Settlement Intervals in a Trading Day for a single IFM Uplift Payment by resource or MSS entity.	**No changes – adds Imbalance Reserves to the Bid Costs and IFM Market Revenues calculations.**