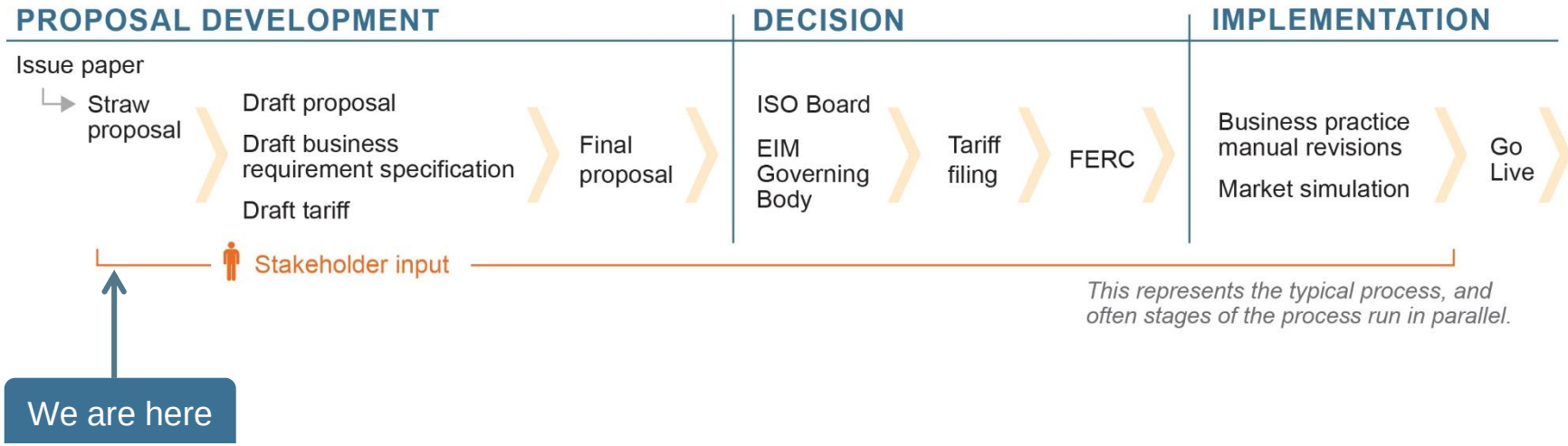
Market Enhancements for 2021 Summer Readiness

Straw Proposal
January 27, 2021

Agenda

Time	Topic	Presenter
1:00 – 1:05	Welcome and Introduction	Kristina Osborne
1:05 – 1:10	Background and Scope	James Friedrich
1:10 – 3:55	Policy Proposals	James Friedrich, Danny Johnson, Danielle Tavel, Perry Servedio, Gabe Murtaugh
3:55 – 4:00	Next Steps	Kristina Osborne

CAISO Policy Initiative Stakeholder Process



BACKGROUND AND SCOPE

This initiative's goal is to prepare the CAISO's operations and market ahead of this summer

- Initiative is part of several measures to better access available supply, protect grid reliability, and avoid rotating power outages during extreme heat waves

- In addition to reliability, the CAISO has the responsibility to ensure its markets are operated efficiently, including mitigating market power and ensuring rational price formation

Initiative is developing various measures to enhance summer 2021 readiness

1. Export and load priorities
2. EIM coordination and resource sufficiency test review
3. Import and export market incentives during tight system conditions
4. Real-time scarcity price enhancements
5. Reliability demand response dispatch and real-time price impacts
6. Management of storage resources during tight system conditions
7. System market power mitigation
8. Other items

EXPORT AND LOAD PRIORITIES

CAISO thoughts from the export and load scheduling priority workshops

- Generators contracted to support an export are not cut for capacity shortfalls in western BAAs but can be curtailed for congestion management
- CAISO market does not determine excess system capacity or allocate transmission prior to accepting an export or wheel transaction self-schedule
- CAISO looking to provide comparable “firm” and “non-firm” energy but timing and process is different than other BAAs in the west

Export Priorities – Definitions

- PT (price taker) exports – a self-scheduled export with a designated supporting resource with sufficient non-RA generation bid in the market
- LPT (lower price taker) exports – a self-scheduled export that does not designate a supporting resource with sufficient non-RA generation bid in the market
- Economic export – an export with economic bid
- RUC export – the physical energy schedule determined by the day-ahead market's residual unit commitment process

Current and proposed scheduling priorities

Post September 5

- Day-Ahead Market (RUC)
  1. PT Export & Load
  2. LPT Export
  3. Economic Bid Export
- Real-Time Market
  1. RUC Export
  2. PT Export & Load
  3. LPT Export
  4. Economic Bid Export

Summer 2021/DAME

- Day-Ahead Market (RUC)
  1. PT Export
  2. Load
  3. LPT Export
  4. Economic Bid Export
- Real-Time Market
  1. RUC Export w/ Gen
  2. PT Export
  3. Load
  4. RUC Export w/o Gen
  5. LPT Export
  6. Economic Bid Export

RUC exports can “firm up” their energy schedule by contracting with non-RA generation in the CAISO (1 of 2)

- All day-ahead export priorities can identify a designated resource in its real-time bid to receive PT status in real-time
- If real-time self-schedule submitted, but no designated resource in bid, the export will have lower priority than CAISO load, but higher priority than new LPT exports
- If no real-time bid is received, a self-schedule will be created with no designated resource identified. Will have lower priority than CAISO load, but higher priority than new LPT exports
  - Applies to all day-ahead export priorities

RUC exports can “firm” up their energy schedule by contracting with non-RA generation in the CAISO (2 of 2)

- Non-RA generation will consider changes in RA status and outages known prior to validation process
- Power contracts bulletin board on the market participant portal lists available and offered resource capacity
- To ensure that non-RA generation has been contracted, propose to add a notification to the designated resource SC that its resource is supporting a PT export
- Non-RA imports are not eligible to designate because they have not been awarded import capability prior to market

Proposing no changes to process to validate designated resource has available non-RA generation

- Prior to day-ahead and real-time market, validate the resource has sufficient non-RA generation bid into the market
- No requirement that the resource self-schedule equal the export self-schedule MW
- Resource does not need to be generating in order for the export to have PT status

Recap current and proposed scheduling priorities

Post September 5

- Day-Ahead Market (RUC)
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Propose to modify priority of wheel through schedules to ensure RA imports can sink in CAISO BAA

- Summer 2021 - wheel through schedules treated as LPT export
  - Treat wheel through scheduling priority similar to any other export
  - Continue to enforce constraint that wheel through must be balanced
  - ETC/TORs scheduling priorities are unchanged

- Policy catalog – develop process to allow wheel through schedules to be treated similar to a PT export
  - Need to be allocated import capability to be a PT export

EIM COORDINATION AND RESOURCE SUFFICIENCY TEST REVIEW

Review performance of resource sufficiency evaluation (RSE) and determine if modifications are appropriate

- Implement changes to address defects discussed in workshop
  - Account for resource de-rates in the capacity test
  - Eliminate double counting of mirror resources

- Proposed improvements to the RSE capacity test for summer 2021

- More comprehensive changes to the RSE are not feasible by summer 2021 and may require changes to current policy roadmap

Proposed improvements to the RSE capacity test for summer 2021

- Propose to add uncertainty requirements to the capacity test
  - Uncertainty requirement would be flexible ramping requirement for the BAA less the diversity benefit
  - Ancillary services are already accounted for at the resource level in the capacity counted towards the capacity test
- Propose to assess if modifications to resource capacity accounting are needed to better reflect actual availability
  - e.g., exclude offline resources whose startup time is greater than 1 hour
  - Would not consider adding intertemporal constraints because it would not be feasible by summer 2021

More comprehensive changes to the RSE would be a longer term process than this initiative

- Changes touch upon foundational elements of the EIM and should not be rushed
  - Definition of leaning
  - Repercussions of failure
  - Balance between leaning and EIM economic benefits
- RSE tests that can limit amount of EIM transfers are applied equally to all EIM participants
- Resource sufficiency evaluation is currently part of bucket 1 of the EDAM initiative
- Separate resource sufficiency evaluation initiative would require re-prioritizing existing initiatives

Address September 6 issues to improve coordination between balancing authority areas during tight system conditions

- Running out of advisory transfer due to running with contingency flag more than 30 minutes

- Mirror resource schedules getting cut without adjustment underlying interchange schedule
  - Update to ensure auto-mirroring is implemented on all mirrors. Mirrors are between the CAISO and EIM entities
  - Fix base intertie schedules and base ETSR for EIM entities such that they are not subject to economic adjustment by the EIM optimization. This applies to EIM entity import/exports with other EIM entities and non-EIM entities.

IMPORT AND EXPORT MARKET INCENTIVES DURING TIGHT SYSTEM CONDITIONS

CAISO evaluating two options to improve intertie incentives during tight system conditions

- Option 1: Modify settlement of real-time market imports and exports based on higher of HASP or FMM LMP during tight system conditions
  - Addresses both import and export incentives and would avoid potential anomalous outcomes
  - However, CAISO still evaluating feasibility for summer 2021 implementation

- Option 2: Provide for make-whole payment to bid price for real-time market hourly block economic imports during tight system conditions

Tight system conditions would be defined by specified criteria

- For hours in which:
  - The CAISO issues an alert in the day-ahead, or
  - The CAISO issues a warning or emergency in the real-time

Option 1: Modify settlement of real-time market imports and exports during tight system conditions

- Pay (charge) hourly block imports (exports) the higher of HASP or FMM LMP
- Proposal applies to all hourly block import and export resources to provide symmetrical treatment
- Improves both import and export incentives during tight system conditions
- Avoids potential anomalous outcomes of make-whole payment
- Proposal would not apply to PT exports
- CAISO still assessing implementation feasibility of these changes by summer 2021

Option 2: Provide for make-whole payment to bid price for real-time market hourly block economic imports during tight system conditions

- Modifies only hourly block economic import pricing during tight system conditions
- Provides for hourly make-whole payment only during tight supply conditions
- Potentially introduces issue of having overlapping export dispatch with uplift payment for import leg
  - This could result in net zero deliveries accompanied by make-whole payment
  - Significant real-time market exports unlikely during conditions when this rule would be triggered

REAL-TIME SCARCITY PRICE ENHANCEMENTS

Propose two enhancements to improve market incentives during tight supply conditions

- First proposed enhancement improves day-ahead market scheduling incentives and incentives for resources to be available in real time

- Second proposed enhancement improves real-time market incentives when grid operators arm load to meet contingency reserves

Address bidding incentives by increasing real-time market's scarcity price under certain conditions

- Proposed solution is to scale real-time market's penalty prices relative to $2,000/MWh power balance constraint penalty price when:
  - Day-ahead market clears at $800/MWh or greater, or
  - The CAISO issues an alert in the day-ahead, or
  - The CAISO issues a warning or emergency in the real-time
- Considering whether additional provisions are needed when $2000/MWh power balance constraint penalty price is triggered in day-ahead market under CAISO's existing FERC Order 831 – Import Bidding and Market Parameters proposal
- Virtual demand will have higher profit potential, virtual supply will have higher loss risk, physical demand would face the risk of higher real-time market prices
- Higher power balance penalty prices in real-time market is consistent with other ISOs' real-time market pricing provisions

First enhancement improves day-ahead market scheduling incentives and incentives for resources to be available in real-time

- Summer conditions highlighted that less demand scheduled in day-ahead than required in real-time
- In these circumstances, expected to see more demand and less virtual supply
- However, there is limited upside profit potential for virtual demand, limited loss risk for physical demand, and limited loss risk for virtual supply when prices approach the $1,000/MWh in the day-ahead market
- Also, incentives to deliver or make additional supply available in real-time are muted when day-ahead market prices are near the $1,000/MWh bid cap

Address real-time market scarcity pricing under tight supply conditions

- When CAISO cannot meet its contingency reserve requirement with generation, it releases contingency reserves to meet load and arms load to meet its contingency reserve requirement
  - Using existing mechanisms may decrease prices in this situation while real-time prices should increase to reflect tight supply conditions
- Propose to release contingency reserves at the bid cap when arming load to meet contingency reserve requirement
  - This will set prices at the offer cap when there is insufficient generation to meet both energy and contingency reserve requirements

RELIABILITY DEMAND RESPONSE DISPATCH AND REAL-TIME PRICE IMPACTS

Reliability Demand Response Resources – Barriers to market dispatch

- RDRR is modeled as a resource and is reflected as less load via telemetry. Operations must manually account for dispatch with load biasing to avoid double counting of RDRR load reduction
  - ISO making changes to incorporate the RDRR dispatch into load forecast (would also apply to PDRs)

- RDRR observed performance often differs significantly from credited/dispatched amounts
  - ISO making changes to estimate expected performance in the load forecast adjustment

Reliability Demand Response Resources – Pricing

- The market currently only dispatches RDRRs in RTD. RTPD does not give them start-up instructions like other resources
  - Proposed solution is to include RDRRs in RTPD, and if scheduled in RTPD, hold RTPD schedules in RTD
  - Including RDRRs in RTPD will account for RDRR's start-up and minimum run times, ensuring they are more optimally dispatched
- Exploring modifications to allow RDRR's to set the market clearing price
  - RDRR tends to be dispatched in non-granular manner due to size and narrow range of bids
  - Contacting market participants to explore feasibility of spreading bids of RDRR portfolio between $950-$1000

MANAGEMENT OF STORAGE RESOURCES DURING TIGHT SYSTEM CONDITIONS

CAISO is planning several measures to ensure storage is available during peak hours in tight supply conditions

- Propose to accelerate implementation of changes developed in the RA Enhancements initiative that aim to ensure storage resources are charged during the peak hours in tight supply conditions
  - Real-time markets will observe requirements set at the resource level to ensure that day-ahead discharge schedules can be met
  - Real-time market will observe these requirements when non-storage supply is able to serve peak net load plus a reserve margin
  - These will only be observed for storage resources shown for RA
- Requirement designed so that the constraint is only imposed on days and hours when needs are most critical
- Final proposal will be discussed on Feb 23

CAISO is planning several other measures for storage preparedness for summer 2021

- AGC algorithm changes to ensure that regulation dispatch does not overly deplete storage resources

- New grid operator tools to manage storage resources
  - If necessary, CAISO will issue out-of-market reliability dispatches to storage through existing exceptional dispatch provisions
  - CAISO is developing new screens for the operators to have visibility into the entire storage fleet

SYSTEM MARKET POWER MITIGATION

System market power mitigation and proposed changes to enhance pricing signals

- CAISO proposes a balanced approach for market pricing that considers the potential for market power along with the need for scarcity pricing improvements

- CAISO proposes to implement both system market power mitigation and real-time scarcity pricing enhancements together in August 2021

OTHER ITEMS

Other items based on stakeholder comments that will be considered in this initiative

- New OASIS report showing gross exports and imports by intertie
- Independent study interconnection enhancements
- Changes to Resource Adequacy Availability Incentive Mechanism (RAAIM)

Independent Study Interconnection Enhancements

- Independent study process allows customers to interconnect faster than the cluster study process

- Two proposed enhancements:
  - Remove 100 MW/125% cap on behind-the-meter expansion requests
  - Enable the CAISO to award available deliverability temporarily to online projects until earlier-queued project comes online

- Enhancements will provide CAISO additional capacity for summer 2021 and allow LSEs to procure available RA capacity

CAISO still assessing implementation feasibility of changes proposed to Resource Adequacy Availability Incentive Mechanism (RAAIM)

- Potential changes include:
  - Change the availability assessment hours to include weekends and holidays
  - Increase the RAAIM penalty
  - Eliminate certain RAAIM exemptions (e.g., for resources < 1 MW)
  - Review outage substitution rules to allow for more flexibility (e.g., between imports and internal resources) or publish a list of resources that have available non-RA capacity to make it easier for SCs to find substitution
    - Planned outage substitution rules are also being addressed in RA enhancements
- CAISO is assessing the implementation feasibility of these changes
  - Soliciting stakeholder feedback on support for the potential changes and whether they would cause contractual issues if these changes were implemented in the middle of an RA operational year

Stakeholder feedback to Jan 6th scoping call (1 of 2)

Stakeholder Comment	CAISO Response
CAISO should clarify the permanent or temporary nature of proposed changes.	CAISO currently not proposing sunset dates because elements of this proposal that potentially could warrant temporary use will only be in effect under narrow circumstances. Other proposed changes could be superseded by more comprehensive initiatives (e.g., scarcity pricing).
Allow an LSE's unused Maximum Import Capability (MIC) to be used by another LSE.	Not feasible by summer 2021. Can be addressed in stakeholder initiative starting in February.
Provide OASIS report showing gross exports and gross imports by intertie.	Added to topic 7.
Modify Resource Adequacy Availability Incentive Mechanism (RAAIM) penalty hours and penalty prices.	Will be considered in topic 7.
Accelerate implementation to allow hybrid resources to provide ancillary services.	Not feasible by summer 2021 and would not add additional capacity to system.

Stakeholder feedback to Jan 6th scoping call (2 of 2)

Stakeholder Comment	CAISO Response
Include evaluation of CAISO emergency operating procedures.	Anticipate when export priorities are finalized that corresponding changes to operator emergency procedures will be made.
CAISO should move forward with immediate enhancements to Resource Sufficiency Evaluation (RSE) suggested in RSE workshop.	Improvements that are feasible by summer 2021 are proposed in topic 6. Will consider whether to add more comprehensive RSE review initiative to policy roadmap to reexamine core RSE principles.
Accelerate implementation of additional items from Resource Adequacy Enhancements (e.g., source identification and attestation, day-ahead tagging requirements).	Evaluating feasibility of accelerating these implementation timelines.

EIM Governing Body Role

Topic	Proposed EIM Classification
Resource sufficiency	Primary authority
Scarcity pricing	Advisory
Export and load priorities	No role
Import and export incentive	No role
Reliability demand response resources	No role
Storage	No role
Other topics	No role

NEXT STEPS

Schedule

Date	Milestones
Jan 26	Post straw proposal presentation
Jan 27	Stakeholder call
Feb 3	Comments due – straw proposal
Feb 12*	Post draft final proposal (board memo), business requirement specifications, and tariff language
Feb 17-18*	Stakeholder call
Feb 25*	Comments due – draft final proposal and draft tariff language
Mar 10	EIM Governing Body meeting
Mar 24-25	ISO Board of Governors meeting
TBD	Scarcity pricing and system market power mitigation ISO Board of Governors approval
Jun 1	Implementation
Aug 1	Implement scarcity pricing and system market power mitigation

*Tentative

Comments

- Submit comments on the straw proposal and stakeholder call discussion by Feb. 3 using the comment template available on the initiative webpage at https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness.