



California ISO

External Load Forward Scheduling Rights Process Initiative

Issue Paper

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Table of Contents

1	Introduction	3
2	Initiative Background	4
	2.1 CAISO Markets and Role of Scheduling Priorities.....	5
	2.2 Scheduling Priorities Framework – Summer 2021.....	7
3	Guiding Principles – Establishing a Long-Term Framework	8
4	Phase 1: Near-Term Enhancements by Summer 2022	10
	4.1 Transparency Enhancements.....	11
	4.1.1 Consolidation of Terms and Business Practice Requirements.....	11
	4.1.2 Curtailment Data and Information Impacting PT Wheels and PT Exports..	12
	4.1.3 Data on Transactions at Tie Points – RA Imports and PT Wheels.....	13
	4.1.4 RUC Load Forecast Adjustments.....	14
	4.1.5 Miscellaneous	16
	4.2 PT Wheel and PT Export Scheduling Priority Enhancements	16
	4.2.1 PT Export Enhancements	16
	4.2.2 PT Wheel Process Enhancements	19
	4.3 Simplified Near-Term Forward Transmission Procurement Framework	20
5	Phase 2: Long-Term Framework for Establishing Scheduling Priorities - Scope	22
	5.1 Evaluating a Forward Transmission Reservation Framework	23
	5.2 Collaborative Stakeholder Working Group Structure	26
	5.3 Benchmarking of ISO/RTO Practices	28
6	EIM Decisional Classification	33
7	Stakeholder Engagement	34

1 Introduction

The purpose of this initiative is to explore development of a long-term, holistic, and durable, framework for establishing scheduling priorities in the CAISO market. The initiative will also explore near-term enhancements to the current scheduling priorities framework that the CAISO can implement by summer of 2022.

Earlier in the year, the CAISO undertook an expedited initiative – *Market Enhancements for Summer 2021 Readiness* – which evaluated market enhancements in preparation for the upcoming summer in expectation of stressed system conditions in summer 2021. Among other things, the CAISO established certain revised scheduling priorities for export, load, and wheel-through transactions in that initiative. Under that framework, which the CAISO implemented in early August 2021, wheel-through and export transactions must meet specific requirements to secure a scheduling priority equal to CAISO load. The wheeling through priorities the CAISO placed into effect are interim only and will sunset after May 31, 2022. Within the same initiative, the CAISO committed to undertaking a new initiative to develop a holistic long-term framework for establishing scheduling priorities in the CAISO markets.

This issue paper describes the range of stakeholder feedback on both near-term enhancements and a longer-term framework based on stakeholder presentations made during the initiative kickoff July 13th, 2021, stakeholder workshop and subsequent stakeholder written comments. Based on this feedback, the issue paper further identifies a common set of principles that will guide the development of a long-term framework.

This initiative will have two distinct, but simultaneously run, phases. Phase 1 will focus on near-term enhancements to the existing scheduling priorities framework that the CAISO can implement by summer 2022. Phase 2 will focus on developing a long-term holistic framework. The CAISO will conduct both phases concurrently with Phase 1 being presented to the CAISO Board of Governors in March 2021, and Phase 2 continuing beyond that.

Phase 1 of the initiative will be evaluating near-term enhancements that the CAISO can implement by next summer and proposes the following category of items within its scope based on stakeholder comments (discussed in more detail in section 4.2 of the paper):

- **Transparency enhancements** – considers provision of additional information, data, and analysis suggested by the stakeholders. Transparency items in scope include publication of resource adequacy (RA) import aggregate data at tie points, Priority Wheeling Through (PT wheel) aggregate registration amount at import/export points, and other stakeholder suggestions. Additional information on stakeholder comments and specific items in scope is discussed in section 4.2.1.

Issue Paper

- **PT wheel and PT export processes enhancements** – considers enhancements to processes associated with establishment of high priority wheeling through and high priority export status. The scope includes consideration of suggested enhancements to minimize over-curtailment and enhancements to allow for partial PT export status when sum of PT export self-schedules exceeds the non-RA capacity of the supporting resource. Additionally, the CAISO will consider approaches for mitigating risks posed by underproduction of resources supporting high priority export transactions. These items are further discussed in section 4.2.2.

Phase 2 of the initiative will focus on the development of a forward transmission reservation process under which parties can reserve transmission service in advance and secure a scheduling priority for wheeling through and export transactions equal to internal load. A forward transmission reservation process framework will include consideration of transmission capacity needed to reliably serve native load, as well as a process for studying requests for transmission service to identify potential transmission upgrades needed to support the service and higher scheduling priority. Stakeholder comments suggested the CAISO consider a forward transmission reservation process as a way to provide open, non-discriminatory, access to the transmission system, while also addressing seams issues with transmission providers operating under an the OATT paradigm in which parties secure transmission to get to the CAISO system. This framework would replace the current scheduling priorities framework and requirements for establishing PT wheel and PT export priorities.

To develop this holistic framework based on forward reservation of transmission service, the CAISO proposes a collaborative stakeholder working group structure to vet and inform various critical components. The structure and scope of the stakeholder working groups is further described in section 5.2 of this issue paper.

The CAISO will host a stakeholder meeting on September 9, 2021, to discuss the scope and concepts put forward in this issue paper, and officially begin formation of the different working groups that will help evaluate aspects of the long-term framework.

2 Initiative Background

Earlier in the year, the ISO conducted an expedited stakeholder initiative - *Market Enhancements for Summer 2021 Readiness* – which evaluated market enhancements in anticipation of challenging system conditions in summer 2021. This expedited initiative evaluated a number of topics, including enhancements to the scheduling priorities for load, export, and wheeling through transactions in the day-ahead and real-time market optimization

Issue Paper

processes and related market rules. FERC approved the proposed scheduling priorities in June.¹

As part of the same expedited initiative, the CAISO committed to undertaking a separate effort to develop a long-term, holistic, framework for establishing scheduling priorities in the market recognizing that it could not adequately vet a robust framework with stakeholders by the summer, nor could it implement such a framework in time. The CAISO recognizes this is a critical issue not only for CAISO load serving entities, but also for external load serving entities across the region that seek to use the CAISO system to wheel through or export power to serve their load, particularly in stressed system conditions.

Further compounding the need to move toward a more holistic and durable long-term framework for establishing scheduling priorities in CAISO's market are the evolving conditions across the western grid. Capacity deficit challenges in the CAISO and across the western interconnection² are contributing to the increasing dependence on import generation to serve load reliably. The CAISO and much of the western interconnection are increasingly facing stressed grid conditions, often simultaneously, driven by a number of different factors.

The purpose of this initiative is to engage with stakeholders collaboratively and constructively to develop a holistic, long term framework of scheduling rights and priorities that will allow CAISO and regional entities to serve load reliably in light of the common challenges we face.

2.1 CAISO Markets and Role of Scheduling Priorities

The CAISO operates a wholesale day-ahead and real-time energy market. Supply offered into these markets, whether economically bid or self-scheduled³, is awarded and dispatched by the market based on economics. The CAISO does not require or provide for forward reservation of transmission service to participate in the market. Rather, the market

¹ *California Independent System Operator Corporation*, 175 FERC ¶61,245 (2021).

² Western Electric Coordinating Council (WECC), *The Western Assessment of Resource Adequacy Report* (December 18, 2020).

<https://www.wecc.org/Administrative/Western%20Assessment%20of%20Resource%20Adequacy%20Report%2020201218.pdf>

³ A self-schedule is a market bid a scheduling coordinator submits to the CAISO that indicates a quantity in MWh but does not specify a price. This indicates the scheduling coordinator is a price-taker. Effectively, self-schedules are requests the market schedule the transaction irrespective of the market price.

Issue Paper

optimizes all physically available transmission. This contrasts with the Open Access Transmission Tariff (OATT) paradigm prevalent across the west where buyers/sellers bilaterally secure capacity/energy and separately reserve transmission service in advance of the transaction, to support delivery of the transaction from source to sink.

Scheduling priorities in CAISO's market become a factor when the market cannot find a feasible solution. This occurs when there is insufficient supply to meet overall demand on the CAISO grid, including exports, or there are binding transmission constraints in the CAISO balancing authority area such that economic bids alone cannot resolve. The market adjustment process, which utilizes penalty price parameters⁴, adjusts import schedules and wheeling through transactions to apportion transmission capacity when the system is constrained and the CAISO is at risk of not serving its load. This is particularly important when, for example, an intertie is constrained in the import direction based on the scheduling limits or internal path 26 is constrained in the north-south direction, in which case scheduling priorities dictate curtailment order of self-scheduled transactions for the market to solve.

Under the framework that existed prior to August 4, 2021, a self-scheduled export that is potentially supported by resource adequacy (RA) capacity scheduled in the day-ahead market had a higher priority than CAISO load in the real-time market. This created the possibility the market would use RA capacity intended to serve CAISO internal load to instead support the export transaction. Moreover, the tariff did not specify scheduling priorities for wheeling through transactions. However, the market software effectively provided wheeling through self-schedules that clear the day-ahead market a higher priority than CAISO load. In stressed conditions when there may be binding intertie constraints, wheeling through self-schedules could displace RA imports serving CAISO load based on the higher scheduling priority.

The CAISO replaced the scheduling priority framework described above with the scheduling priority framework that emerged out of the *Market Enhancements for Summer 2021 Readiness*⁵ initiative. The provisions the CAISO implemented in August are described further below.

⁴ The market software determines the priority order in which the various self-schedules are curtailed using market parameters known as "penalty prices." These penalty prices are set to specific values to (1) determine the conditions under which the market may relax a constraint or curtail a self-schedule, and (2) establish the market prices when these events happen.

⁵ California Independent System Operator, *Market Enhancements for Summer 2021 Readiness* initiative. <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness>

2.2 Scheduling Priorities Framework – Summer 2021

Following the historic heat wave in mid-August 2020, which caused energy supply shortages across the CAISO and led to controlled rotating power outages on the system, the CAISO, California Public Utilities Commission (CPUC), and the California Energy Commission (CEC) issued a root cause analysis of the events⁶. Subsequently, the CAISO launched an expedited stakeholder initiative, titled *Market Enhancements for Summer 2021 Readiness*, to consider market enhancements necessary to prepare for potential extreme weather events and tight supply conditions in summer 2021. One of the initiative elements evaluated was enhancements to the load, export, and wheeling through scheduling priorities in the market. Scheduling priorities are effectuated by use of *penalty prices* in the CAISO market software. These penalty prices are set to specific values to (1) determine the conditions under which the market may relax a constraint or curtail a self-schedule and (2) establish the market prices when these events happen. A higher magnitude of penalty price indicates a higher scheduling priority. The CAISO and stakeholders put in painstaking effort during the discussion to address the complex, challenging and polarizing issue of scheduling priorities.

Through the initiative, the CAISO proposed substantive enhancements to the scheduling priorities framework, including:

- Exports supported by non-RA capacity, *i.e.*, high priority PT exports, will have equal priority to CAISO load, and a higher priority than exports supported by RA capacity, *i.e.*, LPT exports.
- LPT exports supported by RA capacity will have lower priority than CAISO load.
- Establishing explicit priorities for wheeling through transactions:
 - Non-Priority Wheeling Through (LPT wheels) transactions – have lower priority, equal to LPT exports.
 - Priority Wheeling Through (PT wheels) transaction – have a priority equal to CAISO load and PT exports, and higher priority than LPT wheels and LPT exports.

FERC approved⁷ the proposed enhancements on June 25, 2021 and CAISO implemented them on August 4.

Exports qualify for PT export status by sourcing generation from a supporting resource's designated non-RA capacity and confirming/attesting that a load serving entity external to the CAISO has rights to the capacity. Wheeling through transactions can qualify for PT wheel status if the scheduling coordinator notifies the CAISO at least 45 days before the month of the

⁶ California Independent System Operator, California Public Utilities Commission, California Energy Commission, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* (January 13, 2021).

<http://www.aiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>

⁷ *California Independent System Operator Corporation*, 175 FERC ¶61,245 (2021).

Issue Paper

quantity of the wheel supported by a power supply contract to serve an external LSE's load for the entire calendar month, and attesting that appropriate firm transmission has been secured to the CAISO border.

High priority transactions - PT exports, PT wheels and CAISO load - have equal scheduling priority. As part of the existing scheduling priorities framework, the CAISO also can conduct a post-HASP process to allocate available transmission capacity between supply needed to meet CAISO load and PT wheel transactions on a *pro rata*⁸ basis if an intertie scheduling point is constrained in the import direction or Path 26 is congested in the north-south direction and CAISO cannot meet forecast demand or fully accommodate a PT wheel transaction.

This initiative will focus on development of a long-term, holistic, framework for establishing scheduling priorities in the market.

3 Guiding Principles – Establishing a Long-Term Framework

During the initiative kickoff stakeholder workshop held on July 13, the CAISO sought stakeholder input on principles that should guide development of a long-term, holistic, framework for establishing scheduling priorities in the market. Stakeholders provided feedback and suggestions during the workshop, but also through subsequent written comments in early August.

The CAISO shared a number of suggested initial guiding principles during the stakeholder workshop on July 13th to foster discussion on this topic. These initial guiding principles from the workshop are identified below:

- Ensure CAISO ability to serve native load needs while providing non-discriminatory access to the transmission system consistent with open access principles;
- Ensure CAISO has the tools and processes necessary to manage the grid reliably;
- Maintain the efficiencies of the CAISO market in dispatching resources, on a least cost basis, to serve load and market needs.

The first principle recognizes that the framework should support reliable service to native loads, while recognizing that external load serving entities also depend on CAISO's transmission system to serve their load reliably and the framework should support open and non-discriminatory access to the system. The second principle posits that the long-term framework development, accompanied by system and process changes, should continue to

⁸ In determining *pro rata* allocations, the CAISO load share is the lower of each applicable RA resource's real-time energy bid quantity or its shown RA capacity. The PT wheel *pro rata* share for each self-schedule is based on the lowest of (1) 110 percent of the submitted day-ahead market self-schedule of the PT wheel transaction; (2) the submitted real-time market self-schedule of the PT wheel transaction; or (3) the PT wheel quantity requested 45-days in advance of the month.

Issue Paper

support CAISO's ability to manage the grid reliably. The third guiding principle captures the concept that the long-term framework for establishing scheduling priorities should be compatible with CAISO's organized market structure.

Several stakeholders commented on the initial principles shared by the CAISO suggesting edits, additional or different principles for consideration. Stakeholders providing comments on principles included the *Desert Southwest Energy Imbalance Market (DSW EIM) Entities*, *Public Generating Pool (PGP)*, *Bonneville Power Administration (BPA)*, and the *Joint California LSEs*, all which shared helpful insights. The themes from stakeholder-suggested principles identify key concepts through which to consider a long-term framework, including:

- Access to the transmission system consistent with open access principles;
- Providing ability to secure firm transmission across different timeframes;
- Minimizing seams issues between the CAISO organized market and OATT framework;
- Not deterring competitive trade across western markets;
- Ability to reliably serve native load;
- Support reliable load service in CAISO and across the west; and
- Increase access to the CAISO transmission system and consideration of external needs in transmission planning process.

The CAISO believes these themes, along with others, are appropriate to inform and guide development of a long-term framework for establishing scheduling priorities in the market. Informed by stakeholder comments, the CAISO proposes the following guiding principles for any long-term scheduling priority framework:

- Ensure CAISO's ability to reliably serve native load needs while, providing non-discriminatory access to the transmission system consistent with open access principles;
- Minimize seams issues between the CAISO organized market and the OATT framework prevalent across the west;
- Support reliable load service in the CAISO and across western balancing authority areas;
- Not deter or inhibit competitive trades;
- Ensure CAISO has the tools and processes necessary to manage the grid reliably; and
- Maintain the efficiencies of the CAISO markets in dispatching resources to serve load and meet market needs.

The identified guiding principles recognize the importance of ensuring open access to the CAISO transmission system not only to serve CAISO native load reliably, but also to enable

Issue Paper

reliable service to external loads that depend on the CAISO transmission system. The principles also recognize there are inherent differences between CAISO's organized market paradigm and the OATT paradigm that must be bridged to support competitive markets and provide increased dependability to transactions that rely on the CAISO transmission system. The CAISO believes that the long-term framework must recognize the organized market structure, be compatible with that market structure, and continue to optimize generation dispatch and transmission use to support transactions offered in the market. As the CAISO and stakeholders collaboratively consider developing a holistic framework for establishing scheduling priorities in the market, it will be important to periodically return and evaluate adherence of the framework and structure to these principles.

4 Phase 1: Near-Term Enhancements by Summer 2022

Through this issue paper, consistent with the discussions during the July 13 stakeholder workshop, the CAISO continues to propose that the initiative be conducted through two concurrently run phases. Phase 1 will focus on near-term enhancements to the interim scheduling priorities framework implemented earlier this summer that can be vetted and evaluated in time to support implementation by summer 2022. Phase 2 of the initiative, which will run concurrent with and continue after phase 1 conclusion, will focus on the development of the long-term, holistic, framework for establishing scheduling priorities in the market.

During the July 13 stakeholder workshop, a number of stakeholders presented suggested near-term enhancements to the interim scheduling priorities framework that they would like to see vetted and implemented by summer 2022. In the subsequent written comments submitted in early August, stakeholders identified additional near term enhancements for consideration. The near-term enhancements suggested by stakeholders can generally be grouped into two categories:

- *Transparency enhancements* – additional data and information, or consolidation of concepts across multiple documents that would help market participants evaluate and mitigate the risk of curtailment for wheeling through and export transactions, and provide additional information on curtailments and impacts on transactions.
- *Process enhancements for PT wheels and PT exports* – substantive process enhancements to the existing framework implemented earlier this summer.

The *Joint California LSEs* submitted comments suggesting moving away from the interim scheduling priorities framework implemented earlier this summer toward a simplified forward transmission reservation process for establishing scheduling priorities for implementation by summer 2022. After evaluation, the CAISO believes the suggested framework cannot be adequately vetted in a compressed timeframe, and is not implementable by next summer. This is discussed further in section 4.3 of the paper.

The subsections below will further describe stakeholder comments and suggestions received regarding near-term enhancements, will describe the enhancements and identify those that will be in scope for phase 1 of the initiative. Some of these enhancements can and

Issue Paper

will be acted on ahead of next summer, particularly certain transparency enhancements that may not require further automation development.

4.1 Transparency Enhancements

Stakeholder comments on near-term enhancements focused extensively on transparency improvements that aim to provide additional data and information on transactions at tie points, adjustments to load forecasts in RUC, and impacts of curtailments on high priority transactions particularly Priority Wheeling Through (PT wheel) transactions and Priority Export (PT export) transactions. Additionally, some stakeholders suggested consolidation of business practice manual (BPM) information related to wheeling through and export processes into a single common document or area of BPM to facilitate contracting, among other benefits, along with review of terms across the tariff, BPM and system's guide documents to ensure consistency. These items, further described below, will be included in the scope of the initiative and may be performed across different timeframes, prior to next summer, since it is not expected that tariff changes will be needed to support these. To the extent a tariff change is needed, it will be identified through this initiative in subsequent proposals.

4.1.1 Consolidation of Terms and Business Practice Requirements

The *Balancing Authority of Northern California (BANC)* submitted comments suggesting review and consolidation of terms across the tariff, BPMs and system guide documents to ensure consistent terminology when referring to PT wheels, PT export and related concepts relevant to the interim scheduling priorities framework. They point to the example that high priority status for wheels and export is referred to differently in the Scheduling Infrastructure Business Rules (SIBR) guide which is system through which offers are submitted into the market. Additionally, *BANC* suggests consolidating requirements applicable to exports in general, including PT exports, which currently may be part of different business practices, be consolidated into a singular document. The *DSW EIM entities* submitted comments along similar lines suggesting development of a step by step guide from start to end for registering a PT wheel transaction, listing definitions and equivalent terms among different documents regarding PT wheels and PT exports, providing links to relevant BPMs, SIBR guides, and other documents that contain relevant information for these types of transactions.

The CAISO will include these suggested improvements in the scope of Phase 1 of the initiative. The CAISO will review terminology across different documents for consistency and will update necessary documents, whether these be BPMs or user guides. Additionally, the CAISO will undertake a review of BPMs and consider consolidation of relevant concepts across multiple BPMs relating to PT wheels and PT exports into a single document, whether that be an addendum to a BPM or otherwise some form of a guide.

Issue Paper

On June 24, the CAISO held a training session on the implementation of the interim scheduling priorities that are currently in effect.⁹ This training, which was recorded and accompanied by presentation materials, provides an overview of the priorities, a step by step process for establishing these including registering PT wheels, SIBR changes that facilitate offering these transactions in the market, terminology and other aspects of the overall process. The training materials contain helpful information on the new process and are a good starting step-by-step guide for stakeholders to review.

4.1.2 Curtailment Data and Information Impacting PT Wheels and PT Exports

Stakeholders requested additional data and information regarding curtailment events affecting PT wheels and PT exports. The *BANC and DSW EIM entities* suggested that the CAISO should provide additional data and information about curtailments to understand the reasons for curtailment, impacts of those curtailments on PT wheels, PT exports, and other transactions, and overall have the ability to validate that the curtailments were conducted in accordance with the interim scheduling priorities where PT wheels and PT exports have equal priority to load. The *BANC*, for example, suggested consideration of an after-the-fact report with sufficient detail about curtailments to address the informational needs identified above.

The *DSW EIM entities* further suggested reporting of additional information on curtailments including (1) an OASIS report showing the percentage curtailment of PT wheels and PT exports, ISO load/transactions, by interval and location and reason for curtailment; (2) OASIS report showing location and total quantity of ISO load curtailment relative to scheduled load; and (3) OASIS report showing location and quantity of PT wheel and PT export transactions, by scheduling coordinator and resource ID, relative to scheduled quantities. The *DSW EIM entities* note that this information will allow stakeholders to verify the curtailments were conducted consistent with established scheduling priorities, and that the information should be made available as soon as curtailments are issued.

The CAISO will include the curtailment data and information enhancements in the scope of phase 1 of the initiative. Earlier this summer, starting with the month of June 2021, the CAISO began publishing the *Summer Market Performance Report*,¹⁰ which is intended to provide additional data and information on market performance and system conditions during the summer months when conditions are particularly constrained in California and the Western Interconnection. These reports include detailed information on curtailments of transactions in the CAISO markets, including additional information on the reason for those curtailments, metrics and data on curtailments of high priority and low priority wheeling through and export transactions, any CAISO load curtailments, and curtailments of other transactions. This

⁹ California Independent System Operator, *Market Enhancements for Summer 2021 Readiness: Training – Part 3 Load, Export, and Wheeling Through Priorities*, June 24, 2021. <http://www.caiso.com/Documents/Presentation-Summer-2021-Readiness-Training-Part-3-Jun-24-2021.pdf>

¹⁰ California Independent System Operator, *2021 Summer Market Performance Reports* <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=B115789A-7452-48D3-A223-3388BA943C6A>

Issue Paper

existing report will strive to provide the requested detailed after-the-fact transparency on curtailments, and the CAISO can consider different ways of providing this information outside of the summer months.

The CAISO will also explore other ways of making aggregate curtailment data available, consistent with confidentiality requirements, whether on OASIS or elsewhere, closer to the time that these occur. The CAISO is unable to provide the information suggested in item (3) from the *DSW EIM entities* comments as the information requested would reveal market sensitive information in identifying the individual quantity of curtailment, by scheduling coordinator and associated resource ID. Nevertheless, the CAISO will consider the other suggestions, subject to confidentiality requirements, and understands the desire for additional transparency on curtailments and their impacts across transactions with different scheduling priorities.

4.1.3 Data on Transactions at Tie Points – RA Imports and PT Wheels

Several stakeholders requested additional data on transactions at tie points into the CAISO as a way to help inform future PT wheel registrations and to evaluate as a factor in the potential risk of curtailment, whether high or low scheduling priority, and overall help improve contracting. To that end *Powerex*, the *Imperial Irrigation District (IID)*, and *Shell* suggested different types of data that can help inform their needs.

Powerex suggested the CAISO make available the aggregate MW of resource adequacy imports shown at different tie points based on the monthly resource adequacy plan submissions. Additionally, *Powerex* suggested publication of aggregate PT wheel registration data by identifying the aggregate MW and import/export points across which these are registered. *IID* requested similar information regarding PT wheel registrations and resource adequacy import showings, and commitments at the ties, to inform their assessment of potential curtailment risk for transactions. *Shell* also requested PT wheel data and resource adequacy import data at tie points by requesting the summation of MIC rights by tie, along with the summation of Transmission Ownership Rights (TOR) by tie point, and currently calculated amounts of Available Transfer Capability (ATC) at tie points.

The CAISO appreciates the comments and recognizes the reasons and the need for this information, and will include the provision of this information in scope of phase 1 of the initiative. Some of this requested information is already available and public on CAISO's webpage or OASIS, and other information will be provided in short-order. The CAISO will consider providing the following information subject to any confidentiality requirements:

- *Running total of registered PT wheels* – as PT wheels are registered, the CAISO will publish running totals of aggregate MWs of PT wheel registrations at different import and export points. The CAISO anticipates being able to provide this information in the very near future as we craft the report.
- *Resource adequacy imports by tie point* – the CAISO will publish a historical report of the aggregate MWs of shown generation at tie points, on a monthly basis, over the last 18-months. This information may be useful in helping wheeling through parties evaluate

Issue Paper

future transactions across CAISO system. The historical information will also be made available in the very near future as we craft the report. Publication of month-ahead (not historical) aggregate RA showings at tie points will become automated in the future based on the transparency improvements contemplated in the *MIC Enhancements* initiative. However, the CAISO will consider approaches for publishing this information in the interim until the automation becomes available.

- *Summation of Maximum Import Capability (MIC) allocations by tie point* – currently, this information is available on CAISO’s web page based on the annual MIC allocations by holder and branch group.¹¹ Based on the *MIC Enhancements* initiative that is currently under way, the CAISO hopes to publish in the future an updated list of MIC holders and branch groups throughout the year that reflects any transfers of MIC that may have occurred, along with additional information.
- *Summation of Transmission Ownership Rights (TOR) and Existing Transmission Contract (ETC)* – this information is currently available on CAISO’s web page and is published as part of step 6 of the 2022 MIC allocation process.¹² The information is provided through an excel spreadsheet and identifies the branch group, amount and holder along with other information.
- *Calculated ATC for imports/exports* – the CAISO calculates the market available transmission capacity (ATC) consistent with its ATC methodology document.¹³ The information for the different tie points (import/export) is currently available and can be found on CAISO’s OASIS under the *Transmission* tab and selecting *Market Available Transmission Capacity*. The functionality allows for searches based on the market, transmission interface, and direction (import/export).

As noted above, several informational items requested are currently available on CAISO’s webpage or OASIS. The CAISO will thus focus its efforts under this subsection on providing the greater transparency on resource adequacy import aggregate showings at tie points and aggregate data on PT wheel registrations in response to stakeholder requests.

4.1.4 RUC Load Forecast Adjustments

Several stakeholders requested additional transparency regarding CAISO operator adjustments to day-ahead load forecasts. Added transparency on day-ahead load forecast

¹¹ See CAISO’s *Reliability Requirements* web page which includes a document identifying the holders of MIC, and associated branch groups. This information is published under the *Import Allocations* section of the page - <http://www.caiso.com/planning/Pages/ReliabilityRequirements/Default.aspx>

¹² See CAISO’s *Reliability Requirements* web page, under the *Import Allocations* section for 2022, step 6 - <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=198DB44F-7348-4696-B9B9-BBEED345E922>

¹³ California Independent System Operator, *MOD-001-1a Available Transfer Capability Implementation Document*, October 2020. <https://www.caiso.com/Documents/AvailableTransferCapabilityImplementationDocument.pdf>

Issue Paper

adjustments could help parties with high priority or low priority wheeling through and export transactions evaluate the risk of curtailment stemming from those adjustments, especially in stressed system conditions. It could further inform the need for alternate arrangements to serve load reliably in case those transactions are curtailed on CAISO's system.

The *DSW EIM entities* suggested publication of day-ahead load forecast used in the RUC process and any associated operator adjustments to these forecasts. Additionally, they suggested that further information be provided on the criteria or factors considered in making the determination of need for operator adjustments to load forecast as well as weekly or monthly reports showing RUC adjustments. *Shell* also suggested publication of the RUC "high confidence" forecast as, in their view, it allows market participants to determine the potential impact on high priority and low priority wheeling through and export transactions.

The CAISO will include publication of operator adjustments to the day-ahead forecast, within the scope of phase 1 of the initiative as stakeholders find this information beneficial to inform curtailment risk and otherwise improve situational awareness which is key in stressed system conditions. This element will likely require systems enhancements that will be evaluated ahead of a future straw proposal with an eye toward making the information available as soon as possible.

The tariff currently provides guidance on factors that the CAISO operators will consider in making the decision of whether to adjust the day-ahead load forecast. These factors are described in section 31.5.3.1.1 of the tariff and include consideration forecast demand error, weather pattern changes, generator outages on the system, fire conditions threatening transmission structures, among other factors.¹⁴ Because factors guiding operator adjustments to the day-ahead load forecasts are already described in the tariff, the CAISO believes that this should address *DSW EIM entities* suggestion for further information on criteria or factors guiding adjustments.

Regarding the *DSW EIM entities* suggestion for a weekly or monthly report showing RUC adjustments, the CAISO believes that this gap in information can be filled by the new *Day-Ahead Summer Report*¹⁵ that the CAISO started publishing in early August 2021. This new report is published daily, after-the-fact, and includes load forecast information, amount of

¹⁴ Section 31.5.3.1.1 of the CAISO tariff describes a sample list of factors that operators can consider in determining whether to adjust a load forecast – "The CAISO Operator will consider factors such as: CAISO Forecast of CAISO Demand error; weather pattern that is expected to continue or change within the next Trading Day; generator outage resulting in different Supply availability than was bid into the Day-Ahead Market; fire that threatens transmission lines and/or corridors; the expectation that the amount of Generation committed in the IFM will not be sufficient to meet the anticipated Demand; and Reliability Coordinator next-day analysis of system conditions."

¹⁵ See market notice issued on August 11th, 2021 informing stakeholders of the new report and providing directions on how to access the report - <http://www.aiso.com/Documents/NewDay-AheadSummerReportPostedInformationalCall081121.html>

Issue Paper

RUC forecast adjustments (if any), RUC shortfall, and RUC PT export reductions (if any). The report was originally intended for publication in summer months, which tend to be the most constraining across the year, since the data is compiled manually but as part of this initiative the CAISO will evaluate enhancements to automate data gathering to support posting of the information year round and not only the summer months. Separately, the new monthly *Summer Market Performance Report*¹⁶ described in an earlier section of this paper and planned for publication in summer months, will also include further information and data on RUC adjustments, including load forecast adjustments, particularly during stressed system condition which can provide the additional transparency requested. Between the daily *Day-Ahead Summer Report* and the monthly *Summer Market Performance Report*, the CAISO expects to fulfill the after-the fact transparency requested by stakeholders at least during summer months. These reports can be further improved through stakeholder input.

4.1.5 Miscellaneous

Separately, *Silicon Valley Power (SVP)* submitted comments suggesting a definitional clarification in the tariff regarding the term “CAISO Load” which was included in the summer tariff filing as part of section 34.12.3 discussing proration of transmission capacity between “CAISO Load and Priority Wheel Through Transactions.” SVP notes that the tariff includes a definition of the term “CAISO Demand” but does not explicitly define the term “CAISO Load” which is capitalized in the context of the section noted above. SVP suggest defining the term as - “CAISO Load: Load internal to the CAISO Balancing Authority Area” – which would clarify that CAISO treats non-Participating Transmission Owner (PTO) load the same as PTO Load.

The CAISO will include this element for consideration within the scope of phase 1 and evaluate if any clarifications are needed regarding the use of the term “CAISO Load” whether those involve the tariff, BPM or other method.

4.2 PT Wheel and PT Export Scheduling Priority Enhancements

Stakeholders submitted a number of suggestions for enhancements to improve the existing framework of PT wheel and PT export scheduling priorities in the market. As will be discussed in further detail in the subsections below, those suggested enhancements will be included as part of the scope of phase 1 of the initiative.

4.2.1 PT Export Enhancements

A supporting resource with non-RA capacity can be designated to support multiple self-scheduled PT exports. In its comments, *BANC* raised the issue that under current SIBR

¹⁶ California Independent System Operator, *2021 Summer Market Performance Reports*
<http://www.aiso.com/Pages/documentsbygroup.aspx?GroupID=B115789A-7452-48D3-A223-3388BA943C6A>

Issue Paper

system design, self-scheduled PT export transactions can be reversed to low priority status (LPT export) to the extent the sum of PT export bids exceeds the total non-RA capacity of the resource. For example, if the non-RA capacity associated with the resource is 50 MW for the next hour, but the sum of PT export schedules designating that resource is greater than 50 MW, the SIBR software will revert all the PT exports schedules to LPT export schedules. The CAISO recognizes this is an important issue to address and will include this item within scope of phase 1 as further discussed in subsection 4.2.1.1.

BANC also suggested consideration of (1) permitting multiple generators to be “supporting resource(s)” for a single PT export self-schedule (from non-RA capacity) and (2) permitting submission of export schedules in non-whole values (i.e., permit schedules that have decimals such as 1.6 MW at the ties) asserting that CAISO rounds down fractional schedules. *BANC* states that parties with smaller resources whose nameplate capacity is a non-whole number do not maximize their full potential if they have to schedule exports in whole number values (i.e., a 1.2 MW resource scheduled as a 1 MW resource) and aggregating multiple resources to support an export could further help maximize the full capability of the resource when scheduling in whole numbers. Under the North American Energy Standards Board (NAESB) tagging standards, transactions have to be tagged in whole values which includes interchange transactions.¹⁷ The CAISO software (SIBR) does not round down export schedules, but rather requires submission in whole numbers for exports transactions. The scheduling coordinator submitting the schedule can decide whether to round up or down the submission to a whole number. Separately, aggregating multiple smaller resources spread across the system as designated “supporting resources” for a single export schedule is likely incompatible in a forward transmission reservation process since flows from multiple generators do not adequately account for the transmission use if there is only a single transmission reservation in place for the transaction. For these reasons, the CAISO does not believe this item should be included in phase 1 of the initiative. However, the CAISO and stakeholders can consider this scenario once the forward transmission reservation framework is further developed and evaluate compatibility.

The *Joint California LSEs* suggest that the CAISO consider enhancements that (1) a PT export is actually deliverable to the indicated export intertie, and (2) resources significantly deviating from their export schedules are curtailable. The *Joint California LSEs* acknowledge that these enhancements may not be implementable in the near-term timeframe, but nevertheless note that they should be explored in this initiative. The CAISO agrees there may be merit to evaluating both issues, however, item 1 (deliverability) should be considered in the context of a forward transmission reservation process in phase 2 and the associate structure of that process. Under a forward transmission reservation process, the determination of whether transmission service can be reserved to support a transaction will or should address deliverability. Otherwise evaluating each PT export for deliverability individually would be effectively implementing a transmission evaluation process by next summer, which is not sufficient time to evaluate and likely implement such a concept. As such, item 1 will be out of

¹⁷ North American Energy Standards Board, *Electronic Tagging Functional Specification* version 1.8.4, section 1.4.10 (February 19, 2020).

Issue Paper

scope for phase 1 and should be inherently addressed by the phase 2 framework. However, item 2 will be in scope of phase 1 and is further discussed in section 4.2.1.2 of this paper.

4.2.1.1 PT Export status when sum of exports bids exceeds non-RA capacity

In its comments, *BANC* raised the issue that under current SIBR system design, self-scheduled PT export transactions can be reversed to low priority status (LPT export) to the extent the sum of PT export bids exceeds the total non-RA capacity of the resource. The CAISO recognizes the impact that this can have on parties exporting generation from the CAISO system to serve load, particularly in stressed system conditions, and will thus further evaluate two potential enhancements:

1. *Creating awareness or additional visibility for the designated resource scheduling coordinator of the non-RA capacity associated with a resource.* Designated resource scheduling coordinators can calculate their resource's available non-RA capacity in CIRA, but having a dedicated field that automatically calculates non-RA capacity would provide designated resource scheduling coordinators more transparency and certainty of their non-RA capacity and can aid in collaborating PT export transactions with the exporting scheduling coordinator(s).
2. *Retaining PT export status for at least a portion of the self-schedule.* Instead of reverting all PT export schedules to LPT export status, the CAISO could explore retaining PT export status for at least a portion of the schedule, and reverting the remaining amount to LPT export status. In instances where a single entity is submitting a PT export self-schedule associated with the resource and exceeding the non-RA capacity, the software could decrease the PT export status to the non-RA capacity amount and LPT export status for anything above that amount. In instances where there are multiple PT export self-schedules, with multiple entities involved, and the sum of the PT export schedules exceeds the total non-RA capacity of the resource, the CAISO could consider a pro-rata decrease in PT export schedules among the parties. Alternatively, the CAISO could consider identifying a way for the resource scheduling coordinator to provide indication on how to allocate the non-RA capacity among the PT export self-schedules.

The CAISO recognizes the issue raised by stakeholders in this respect, and this item will be further evaluated in phase 1 of the initiative.

4.2.1.2 Underproduction of resources supporting PT exports

The *Joint California LSEs* suggested that the CAISO consider enhancements to ensure that resources deviating from their export schedules are curtailable if the resource is producing under its schedule. The CAISO proposes that this element be included in the scope of phase 1 of the initiative.

Issue Paper

Underproduction of resources supporting PT exports can adversely affect the CAISO's ability to manage the grid reliably. In stressed system conditions, to the extent the supporting resource is significantly underperforming compared to a PT export schedule, the CAISO needs to make up that capacity to support the export potentially exacerbating already delicate system conditions.

Although underproduction of resources supporting PT exports can occur with any type of resource regardless of technology type, perhaps this could be most pronounced with Variable Energy Resources (VER). Current PT export rules require that the scheduling coordinator of the resource attest that the resource is capable of producing to support the export schedule and this attestation is required "at the time of bid submission" which can be significant time in advance of the real-time operating hour. From the time the attestation is made and PT export schedule submitted, which can be prior to the operating day, to the time of the operating hour the VER forecast may have changed significantly leading to underproduction in that hour compared to the schedule. As noted earlier, this is not an issue unique to VERs but may be more pronounced in VERs.

The CAISO will evaluate potential measures that could be in place to mitigate the risk of underproduction compared to the PT schedule and/or reductions in PT export schedules in instances of underproduction. Potential considerations could include requiring attestation of production capability much closer to the real-time bid submission deadline or operating hour rather than at time of bid submission. Additionally, consideration of provisions that would permit reduction of PT export schedules supported by under-producing resources prior to curtailing CAISO load. There would need to be consideration of underproduction thresholds so as to not unreasonably reduce PT export schedules for small deviations.

4.2.2 PT Wheel Process Enhancements

Powerex and *Shell* submitted comments suggesting enhancements to minimize unnecessary over-curtailment of transactions and maximizing use of available transmission to support high priority transactions. These items will be considered in scope for phase 1 of the initiative and will be further described in subsection 4.2.2.1 below.

4.2.2.1 Curtailment Timing and Tagging Requirements of High Priority Transactions

Powerex suggested enhancements that minimize unnecessary over-curtailment and maximize use of physically available transmission. In particular, *Powerex* expressed concern that some resource adequacy imports serving CAISO load may be speculative or consist of "paper capacity" that ultimately may not flow when relied upon by the CAISO. To the extent that the CAISO curtails high priority transactions (PT wheels and RA imports) prior to RA imports submitting valid e-tags, PT wheel and/or PT export transactions may have been unnecessarily curtailed if the RA import is speculative and ultimately does not flow. To that end, *Powerex* suggested that the CAISO consider a requirement that all high priority transaction self-schedules (PT wheels and RA imports) submit a valid day ahead e-tag. A valid e-tag would contain the energy and transmission profile. A valid e-tag, with a transmission profile, not only includes the transmission service reserved across different

Issue Paper

segments to get to the CAISO system, but it also identifies the source and in that way provides greater assurance that the RA import is not speculative.

Shell shared similar concerns regarding the need to minimize over-curtailment and to curtail only the amount truly needed to resolve the reliability issue. However, *Shell* suggests that the CAISO issue curtailments only after all valid e-tags have been submitted, after the T-20 minutes final tagging deadline (20 minutes before the start of the hour of flow). By waiting until after the tagging deadline to issue curtailment of high priority transactions (PT wheels, RA imports), this would ensure that all valid e-tags are taken into consideration when issuing a curtailment, thus minimizing over-curtailment as compared to curtailments where not all e-tags are yet submitted. *Shell* disagreed with *Powerex*'s proposed solution of requiring all high priority transactions (PT wheels and RA imports) to be tagged in the day-ahead timeframe. *Shell* notes that while it may be a common practice to submit e-tags during the preschedule window, day-ahead tagging is not a NERC/WECC standard requirement. Further they note that a day-ahead tagging requirement may disadvantage scheduling coordinators that have to deliver generation across multiple balancing authority areas and that through the CAISO's recently implement intertie settlement deviation penalty, imports have an incentive to deliver or face stiff financial consequences, thus no need for a day-ahead tagging requirement.

The CAISO agrees with *Powerex* and *Shell* that the risk of over-curtailment should be minimized by considering only high priority transactions (PT wheels, RA imports) with valid e-tags and this item will be part of phase 1 scope. Requiring the submission of day-ahead e-tags for high priority transactions (PT wheels, RA imports) would have impacts beyond this initiative, particularly on the RA program and RA imports secured under that program. On the other end, waiting to issue curtailments until after the T-20 minutes tagging deadline would leave very little time for both the CAISO and impacted parties to make alternate arrangements which could be particularly problematic in stressed system conditions.

Aside from the approaches suggested by *Powerex* and *Shell*, there may be opportunities to evaluate potentially leveraging existing processes and requirements. For example, imports are required to submit an e-tag with a valid transmission profile by T-40 minutes, otherwise the awards will be withdrawn/cancelled and these will be subject to the intertie settlement deviation penalty. There also needs to be considerations of timing associated with the HASP and post-HASP processes. The CAISO will further evaluate the *Powerex* and *Shell* suggestions and potentially other approaches to minimize the risk of over-curtailment as described by stakeholders.

The CAISO will further evaluate this topic as part of phase 1 and consider a potential approach that integrates with the post-HASP process.

4.3 Simplified Near-Term Forward Transmission Procurement Framework

The *Joint California LSEs* suggest that, as part of phase 1 enhancements that could be implemented by summer 2022, the CAISO develop a simplified forward transmission reservation process under which wheeling through transactions and exports can secure high scheduling priority equal to load. The proposed process would consist of:

Issue Paper

- Simplified or expedited studies with assumptions on imports used by the Maximum Import Capability (MIC) process and current Transmission Planning Process (TPP) studies to estimate transmission available for wheel-through and export transactions;
- Release of the available transmission capacity for reservation in monthly and yearly increments (and establishing scheduling priority equal to load). Parties securing the transmission service would pay for the full reservation period regardless of use;
- Implementation of a commitment process after determining the capacity needed to serve native load, including calculation of a reasonable Capacity Benefit Margin (CBM);
- If all requests for the transmission establishing high scheduling priority are not feasible, allow for prioritization based on objective factors (e.g., the length of requested commitment; offer price; or historical usage).

The suggested framework from the *Joint California LSEs* is proposed as a phase-in toward the development of a long-term framework with a more robust and holistic forward transmission reservation process for establishing scheduling priorities in the market.

The CAISO evaluated the suggested framework to consider the impacts, interdependencies with other processes, and overall viability of completing the necessary policy development in time for presentation to the CAISO Board of Governors in March 2022 and implementation in summer 2022. Although the concept may appear simplistic, it requires the CAISO and stakeholders to address challenging issues with wide-ranging ramifications in a very compressed timeline. One critical item is determining the transmission capacity that needs to be reserved to serve native load so the CAISO can determine the amount of transmission capacity it can make available for reservation by other transactions. A “simplified or expedited” study to determine these values could undermine the entirety of the process and lead to contentious discussions and diverging perspectives that could not be adequately addressed in the short timeframe that phase 1 allows. Moreover, the proposed framework leaves a number of gaps or issues unaddressed that the policy discussion would need time to consider and develop. There are important interdependencies with the Maximum Import Capability (MIC) and Congestion Revenue Rights (CRR) timelines and processes. For example, it is of consideration whether parties reserving this transmission and high priority scheduling rights in yearly and monthly timeframes should also be eligible for allocations of CRRs and it is very likely that under an expedited or simplified process timelines to the CRR allocation process would need to be modified to permit the allocations. Moreover, for a process that considers reservation of transmission service in yearly increments to establish scheduling priorities there would need to be consideration of a process for study of requests that could not be accommodated in order to provide an opportunity to access the system and secure the high scheduling priority, including a process to support necessary upgrades to the system. These are important aspects that could not be adequately vetted by March 2022 and would have implementation challenges by next summer.

Issue Paper

Due to the challenges identified above, along with numerous other associated topics or issues that would need to be addressed but are not identified in this proposed approach, the CAISO does not believe that the identified framework can be adequately vetted in phase 1 of the initiative or implemented by next summer. Focusing phase 1 on near-term enhancements to the existing scheduling priorities framework will allow the CAISO and stakeholders to focus on the development of a robust, durable and holistic forward transmission reservation process for establishing scheduling priorities in the market as part of phase 2 of the initiative. The longer timeframe that phase 2 provides will allow for careful consideration of all the issues that are critical to the development of an equitable forward transmission reservation process that can integrate with CAISO's organized market structure.

5 Phase 2: Long-Term Framework for Establishing Scheduling Priorities - Scope

Summary of Phase 2 scope:

- Development of a forward transmission reservation process for establishing scheduling priorities in the market.
- Establishment of collaborative stakeholder working groups to evaluate different components of a forward transmission reservation process compatible with CAISO's market structure and consistent with established guiding principles.

Phase 2 of the initiative focuses on the development of a long-term, holistic, framework for establishing scheduling priorities in the market. This phase will be conducted concurrently with phase 1 of the initiative, which evaluates near-term enhancements to the interim scheduling priorities framework that can be in place by next summer. As phase 1 concludes in March 2022, phase 2 will become the sole focus of the initiative and the expectation is that at the end of phase 1 the CAISO and stakeholders will be a fair way along in defining the components of the long-term framework. The expectation is that by next summer, the CAISO and stakeholders can vet and establish robust framework and leave additional time for other issues that may have been identified throughout development of this framework, including consideration on the type of transmission process, if needed, to move to the new framework. Phase 2 is targeted for presentation to the CAISO Board of Governors in March 2023 and implementation by January 2024, but this timeline can be re-evaluated depending on the structure of the different components of the forward reservation process framework and it is plausible that the topic can be taken for decision earlier and implemented earlier. The schedule of phase 2 is further defined in section 7 of this paper.

Based on stakeholder comments, the CAISO proposes that the scope of phase 2 of this initiative focus on the development of a forward transmission reservation process for establishing scheduling priorities in the market. Stakeholders expressed support for the general concept of a forward transmission reservation process, and some stakeholders

Issue Paper

provided additional structural details for the transmission reservation process. A forward transmission reservation process provides for recognition of native load priority to transmission capacity, while making the remaining transmission capacity available for sale to support other transactions. The different components of the framework will need to be carefully vetted through a robust engagement process.

A forward transmission reservation process for establishing scheduling priorities can help address key seams issues between CAISO markets and the OATT framework:

- *Ability to reserve transmission service and secure high scheduling priority across different time horizons* – Under the OATT, parties can reserve transmission service (firm or non-firm) across different time horizons (long-term, down to daily and/or hourly) to support delivery of resources across multiple systems. A transmission reservation process in the CAISO market that provides the ability to reserve transmission across same or similar time horizons as the OATT can allow securing high scheduling priority commensurate with need to support transactions.
- *Ability to study requests for transmission service and identify potential need for transmission upgrades* – Under the OATT, parties unable to secure long-term service (1-year or longer) have the ability to request a study to identify whether an upgrade may be needed to accommodate service, and if an upgrade is needed, the parties can seek to proceed with the upgrade to secure service. A forward transmission reservation process would allow for a similar process for external requests to drive a study, and upgrades (if needed), to grant the transmission service and secure high priority scheduling rights in the market.

The CAISO proposes establishing stakeholder working groups to collaboratively evaluate different components of a forward transmission reservation process. The working groups would consist of external stakeholders, internal stakeholders and CAISO staff, focused on discrete topics of the framework. This collaborative approach will leverage the expertise of our regional partners who have operated under an OATT transmission reservation process for over twenty years, will further help build consensus, and will allow for robust collaboration in developing a framework that can meet the principles outlined earlier. The stakeholder working groups will be further discussed in subsection 5.2 of this paper.

In subsection 5.3 the CAISO shares an overview of the practices of other ISOs/RTOs across the country. The CAISO held discussions with five ISOs/RTOs to better understand their practices in allocating transmission, establishing scheduling priorities and associated processes. The CAISO will describe those practices and provide a general comparison of the approaches.

5.1 Evaluating a Forward Transmission Reservation Framework

Stakeholders suggested evaluation of a forward transmission reservation process for establishing scheduling priorities in the market. A forward transmission reservation process was generally seen as providing the ability to balance the needs of the CAISO to ensure reliable service to loads within its footprint by recognizing the ability to reserve transmission

Issue Paper

capacity for native load while also providing access to the transmission system, across different increments of time, consistent with open access principles and could address seams issues between the CAISO market and the OATT. Some stakeholder went further and identified structural components to that framework for consideration.

The *Joint California LSEs* proposed a framework whereby the CAISO determines the transmission capacity needed to serve native load, including calculation of a Capacity Benefit Margin (CBM), and remaining entities seeking long-term transmission service would submit requests into a transmission queue.¹⁸ If transmission service can be reserved, the reserving party would pay for transmission for the duration of the reservation (whether used or not) and if it cannot be awarded the request would be studied for potential upgrades. Furthermore, the CAISO would conduct studies to determine native load needs in shorter timeframes – monthly and weekly – and make remaining transmission capacity available for reservation on a monthly and weekly duration basis. Transactions supported by forward reserved transmission service would obtain the high “curtailment priority” in the market, equal to load. This approach contains a number of similarities with the OATT framework by providing the ability to reserve transmission service across long-term and shorter term timeframes, after accounting for native load needs, and providing for a planning framework if a request for long-term transmission service cannot be accommodated. However, the framework may not go far enough in its current form to bridge seams issues if transmission service cannot be reserved in increments less than weekly transmission service to secure the higher priority. Nevertheless this framework provides a good foundation or starting point to conceptualize the different components of a long-term framework and can further be vetted through stakeholder working groups.

Vistra Corp. comments noted the merits of the framework suggested by the *Joint California LSEs*, and further recognized it as providing a basis for a strong starting place for the long-term solution. It also noted that it could be built upon to develop a robust, non-discriminatory solution. *Vistra Corp.* further went on to identify and describe the *pro forma* OATT transmission reservation framework and effectively propose that same framework as a solution for establishing scheduling priorities in the CAISO market structure. Although CAISO recognizes the merits of the OATT structure, this process also must recognize the CAISO organized market structure with its unique characteristics. The ultimate approach may be OATT-like in many respects to bridge key seams issues, but ultimately may not exactly be the same as the *pro forma* OATT.

Shell also recognizes the merits of a forward reservation process and suggest a framework that builds upon the Maximum Import Capability (MIC) process in place today by creating a “priority reservation product” in the monthly and yearly time horizons for wheel and export transactions. Under this approach, after accounting for native load needs through the MIC allocation for import RA, parties seeking to wheel through or export from the CAISO would

¹⁸ Joint California LSEs (CalCCA, PG&E, SCE, SDG&E, and Six Cities), *External Load Forward Scheduling Rights Process Workshop* presentation, July 13, 2021.

<http://www.caiso.com/InitiativeDocuments/JointLSEPresentation-ExternalLoadForwardSchedulingRightsProcessWorkshop-Jul13-2021.pdf>

Issue Paper

submit requests for “priority service” at different tie points into a queue for evaluation as to whether there is sufficient import/export capability to accommodate the request. Although this framework is essentially based upon a forward transmission reservation process, one challenge is that it may not fully bridge the seams issues with the OATT paradigm if the service is not offered in increments lower than monthly service. Moreover, by limiting evaluations to availability of transmission capacity to tie points only, as appears to be suggested by *Shell*, it fails consider the impacts and availability of transmission across the internal CAISO system – effectively “the network.” The long-term framework will need to consider a process that can identify the transmission capacity available for reservation across tie points and the CAISO network.

Powerex further suggests the CAISO should consider the type of transmission arrangements secured on other transmission provider systems when determining the priority that should be provided to a transaction across the full path from source to sink and whether a transaction should ultimately be curtailed or allowed to flow. *Powerex* cites the example of an entity that may have secured firm rights on BPA’s transmission system but has a low priority transaction on CAISO’s system versus a transaction that secured non-firm rights on BPA’s system but high priority on CAISO system in raising the question of which transaction should flow. As is the case with transmission service under the OATT, the type of transmission arrangements and conditions on other transmission systems do not have a bearing on a transmission provider’s ability to curtail a transaction across its system. The OATT framework allows entities to reserve different types of transmission service products, with different firmness, duration, quality, and cost to support a transaction, and the entity securing those rights determines the best product to address its needs and level of risk across that particular system it is willing to accept. A transmission provider curtails transactions under the OATT based on the type of transmission service ultimately reserved under its OATT, not the type of transmission service a customer independently arranged on another system. The CAISO move toward a transmission reservation process for establishing priorities will bridge seams issues with the OATT framework and allow parties to secure higher scheduling priority in advance across different timeframes. The entities transacting across multiple independent systems and tariffs, including the CAISO, could determine the type of transmission service and priority they want to reserve, considering the qualities of the products, risks and costs to support a transaction across a full path. As the CAISO and stakeholders work on further developing a transmission reservation process, consideration can be given to additional seams issues that may be identified.

A forward transmission reservation process for establishing scheduling priorities in the CAISO market will need to consider several key elements that will be vetted with stakeholders and in stakeholder working groups. Some of the key elements include:

- *Calculating native load needs* and existing commitments – under open access principles and FERC guidance, transmission capacity needed to serve native load can be reserved as an Existing Transmission Commitment (ETC) within the ATC methodology. Calculating native load needs across tie points and the network is largely based upon assumptions as to how those loads will be served and, generally, studies are conducted that use of load forecast information, and generation assumptions, along with the ability to account for uncertainty.

Issue Paper

- *Calculating ATC* – the calculation of native load needs, and different margins such as the CBM, derives the ATC that is available across the system for other transactions to reserve across different time horizons.
- *Transmission products offered & timeframes* – consideration will need to be given to the type(s) of transmission products offered (i.e., firm, non-firm, point-to-point) and the time increments across which these are provided (i.e., long-term, monthly, weekly, daily, hourly). This will be a key element for consideration in bridging seams issues between CAISO's organized market and the OATT structure of western transmission providers.
- *Study process for requests that cannot be accommodated* – the framework needs to consider a process whereby requests for transmission service that cannot be accommodated can be studied to determine whether an upgrade is needed. If an upgrade is needed, the process also needs to identify associated financial or other requirements, and a process, to proceed with an upgrade. This process also needs to integrate with the CAISO's transmission planning and generation interconnection processes.
- *Rate structure* – depending upon the transmission product(s) offered, there will need to be discussion on the rate for the reserved transmission service to the extent it is different from the current transmission access charges.
- *Congestion revenue rights (CRR)* – consideration will need to be given to whether, aside from the higher scheduling priority, parties that reserve transmission service will be eligible for CRR allocations. This is likely dependent on the type(s) of transmission product and duration of service.
- *Transition to new framework* – as the structure of the forward transmission reservation process is developed, consideration will need to be given to a process for transitioning to the new framework. This may depend upon the structure of the different components of the reservation process and will need to be considered after the structure is further developed.

Ultimately, the CAISO envisions that a forward transmission reservation process will provide a pathway for external parties to secure high scheduling priority, equal to load, for transactions across different increments in time. The market would continue to re-optimize all physically available transmission capacity, as it does today, to ensure the most efficient and effective market solution. If the market cannot solve, those transactions with forward reserved transmission would have the benefit of establishing priority equal to load and obtaining the higher certainty. As the stakeholder process progresses, additional key issues are likely to be identified that we will need to work through collaboratively.

5.2 Collaborative Stakeholder Working Group Structure

The CAISO proposes a collaborative stakeholder working group structure to assist in further development of the forward transmission reservation process consistent with the identified guiding principles. The collaborative structure is intended to leverage the expertise of all stakeholders in administering a forward transmission reservation under the OATT.

Issue Paper

Additionally, the working group structure can help build consensus, and will likely help expedite evaluation of key concepts to inform future proposals.

The stakeholder working groups would be comprised of stakeholders external to the CAISO balancing authority area footprint, stakeholders within the CAISO footprint, and CAISO staff. Participation will be voluntary, but to the extent there is significant stakeholder interest in participation, the working groups may need to be limited in order to facilitate collaborative discussion and ensure timely progress. A likely manageable working group size is no more than 10 different participating organizations. For the working groups, it would be particularly beneficial for participating external load serving entities to include subject matter experts from their transmission provider functions as they have the expertise and experience with all aspects of a forward transmission reservation process to share with the working group and help inform potential approaches or options for consideration. Ultimately, the information developed through the working groups will inform the CAISO proposal and allow for vetting with the broader stakeholder community.

The CAISO proposes three working groups at this stage which are further described below. As the initiative progresses and the CAISO and stakeholders narrow in on the structure of the transmission reservation process, there may be opportunities for formation of additional stakeholder working groups on additional topics.

Working Group 1 – Calculating Native Load Needs & Available Transfer Capability (ATC)

This working group will be focused on evaluating approaches, processes and inputs for calculating native load needs as an Existing Transmission Commitment (ETC) and the overall calculation of ATC. Scope includes:

- Calculation of ETC for native load – inputs and assumptions
- Calculation of margins, including CBM
- Accounting for uncertainties (generation, load, topology uncertainties)
- Calculation of ATC across different timeframes
- Transparency and data requirements
- Tools and system supporting the calculations and process

The working group would discuss and learn from current external party practices of how they calculate different components of the ATC methodology and develop an approach or approaches for consideration.

Working Group 2 – Transmission products and reserving transmission service

This working group will be focused on evaluating the different transmission products that could be offered in the context of CAISO's markets as well as evaluation of the process for reserving transmission service. Scope includes:

- Evaluation of types of transmission products
- Evaluation of transmission product time increments
- Evaluation of process for requesting transmission service

Issue Paper

- Process for evaluation of transmission service requests to determine if these can be awarded
- Transparency and data requirements regarding awarding of transmission service
- Tools and systems supporting the different aspects of processes

Ideally, there would be some limited overlap between participants in working groups 1 and 2 as the topics do build on each other.

Working Group 3 – Studying requests for long-term service and identifying upgrades

This working group will be focused on evaluating planning processes to for studying requests for long-term transmission service that cannot be accommodated to integrate with CAISO's current transmission planning processes. Scope includes:

- Process for requesting a study
- Study process to evaluate whether an upgrade may be needed to accommodate a request, including consideration of individual studies or clustered studies (multiple requests)
- Process and requirements (financial or otherwise) for proceeding with a transmission upgrade
- Identification of rights that individual entity secures if they move forward with an upgrade.

Stakeholders interested in participating in any of the working groups should send an email to isostakeholderaffairs@caiso.com indicating the company they represent and the working group they are interested in participating. To the extent that there is significant stakeholder interest in the working groups, the CAISO may need to limit participation in these to better manage engagement and constructive discussion. Nevertheless, the CAISO fully intends to provide progress reports from the working groups and any options or proposals that arise as a result of the discussions will be shared and vetted with the wider stakeholder community through the different steps of the initiative.

5.3 Benchmarking of ISO/RTO Practices

Over the last two months, CAISO staff met with representative and subject matter experts of other ISOs/RTOs across the country to benchmark their practices regarding establishment of scheduling priorities in the market, treatment of wheel-through and export transactions, calculating native load needs, and other related topics as we delved deeper into their processes. Discussions were primarily conducted over the phone/webex, but email as well to the extent the appropriate subject matter experts were not available for the phone discussion.

The CAISO benchmarked the practices of PJM, MISO, NYISO, ISONE, and SPP as part of the effort. Three of the entities – PJM, MISO, and SPP – have an OATT-like transmission

Issue Paper

reservation process in place under which a transmission reservation is required in order to participate and make offers in the market. These entities have similar transmission products and reservation processes, but with some nuances that are noted in the tables further below.

On the other hand, NYISO and ISONE do not have a forward reservation process but rather have a more simplistic prioritization approach based on nuanced differences in their market, and in part also due to the comparatively very low volume of wheel-through transactions in their market. For example, ISONE noted that they have less than a handful of wheel-through transactions within a calendar year in large part due to their geographical location. Similarly, NYISO has a relatively low wheel through volume also driven in large part by their geographical location and a memorandum of agreement between NYISO and ISONE provides for less than 300 MW of transmission capacity for wheels through NYISO to ISONE. The other ISOs – PJM, MISO, SPP – also noted that they do not have a significant volume of wheel-through transactions, thus not a sizeable amount of the transmission capacity is utilized to support these transactions. However, these entities recognized that in stressed system conditions, they may see a higher volume of wheels through their systems supported by different transmission service reservations.

With that background, the CAISO has included below two tables as a condensed comparison of the benchmarked practices between the ISOs/RTOs. The CAISO also includes, as figure 1, the map of the ISOs/RTOs around the country since this figure can help put in perspective some of the practices and low volume of wheeling through transactions across their systems.

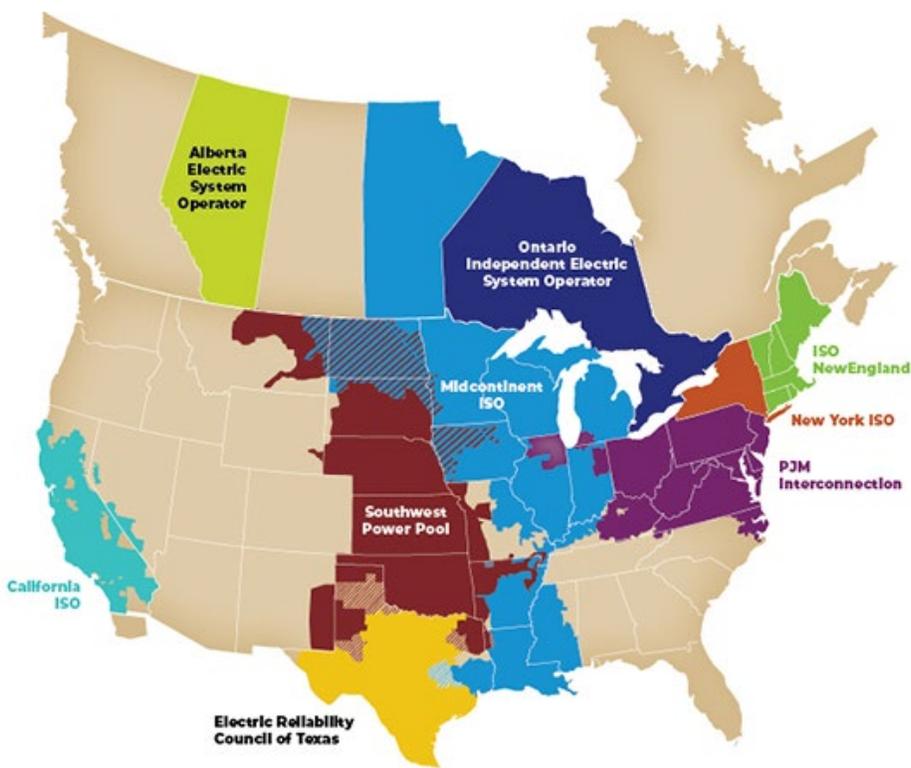


Figure 1 – Map of the United States and Canada ISOs/RTOs.

Table 1 focuses on the practices of PJM, MISO and SPP as they operate an organized market with a forward transmission reservation requirement. It is important to note that although they require forward reservation of transmission service, the market optimizes all physically available transmission regardless of the reservations to operate the market efficiently.

Table 1 – Comparison between PJM, MISO, and SPP practices.

	PJM	MISO	SPP
Transmission reservation required to offer into market?	Yes	Yes. However, can offer into RT market without transmission but subject to availability of non-firm transmission.	Yes
Transmission products	Point to Point (PTP) and Network Integration Transmission Service (NITS).	PTP and NITS	PTP and NITS
Types of transmission	Firm and Non-Firm	Firm and Non-Firm	Firm and Non-Firm
Transmission reservation increments	Firm – Monthly, Weekly, Daily. Non-Firm – Monthly, Weekly Daily, Hourly.	Firm – Yearly, Monthly, Weekly, Daily. Non-Firm – Monthly, Weekly Daily, Hourly.	Firm – Yearly, Monthly, Weekly, Daily. Non-Firm – Monthly, Weekly Daily, Hourly.
Long-term transmission service	Yes – but it is not evaluated for ATC, goes to a formal study immediately. ATC calculated only up to 18 months out.	Yes – evaluated for ATC, calculates ATC on long-term basis (1-10 years).	Yes – evaluated for ATC, calculates ATC on long-term basis (1-10 years).
Native load/network load priority	Yes – included as Existing Transmission Commitment (ETC)	Yes – included as ETC	Yes – included as ETC
Calculating native load ETC	Load forecast and generation assumptions utilized through powerflow analysis to derive ETC. Generation assumptions based on ranking of internal resources in “blocks” based on run time performance over last year. Imports may be considered closer to DA and RT when ETC is recalibrated based on resource “blocks” to include some imports/external resource assumptions.	Load forecast and generation assumptions utilized through specific tool/system to derive ETC. Individual members submit long-term and mid-term load forecasts. Generation assumptions based on “stacking” approach of internal generation based on number of factors, but particularly based on historical outage information. External generation/imports not generally used.	Load forecasts and generation assumptions utilized to information calculation of ETC. Generation assumptions based on a created “generation stack” based on a “participation factor algorithm.” Software utilizes historical actual generation values for individual units and weights value of resources with heavier weight given to more recent data points, while also considering outage data for unit. The “generation stack” is the starting point for the assumptions with potential

Issue Paper

			adjustments with each base case.
Curtailment priorities	Based on reserved transmission service. Firm has highest priority (last cut) regardless of duration, with non-firm transmission having lower priority that increase with duration (i.e., hourly non-firm has lowest priority, then daily non-firm, etc...).	Based on reserved transmission service. Firm has highest priority (last cut) regardless of duration, with non-firm transmission having lower priority that increase with duration (i.e., hourly non-firm has lowest priority, then daily non-firm, etc...).	Based on reserved transmission service. Firm has highest priority (last cut) regardless of duration, with non-firm transmission having lower priority that increase with duration (i.e., hourly non-firm has lowest priority, then daily non-firm, etc...).
Transmission studies and upgrades	Only study requests for service of 5-years duration or longer in duration. Studied in annual cluster process. Long term requests are also tested for load and generation deliverability impacts.	Study any request of 1-year or longer in duration. Can be studied in annual cluster process.	Study any request of 1-year or longer in duration. Can be studied in annual cluster process.
Wheel-through requirements	No special/unique requirements imposed.	No special/unique requirements imposed.	No special/unique requirements imposed.
Congestion revenue rights (CRR), or equivalent, allocation for wheels with transmission reservation	Yes – but only with long-term firm transmission service (not short term)	Yes – but only with long-term firm transmission service (not short term)	Yes – for long-term firm transmission service or monthly firm transmission service (not lower than monthly)
Capacity Benefit Margin (CBM)	Yes	Yes	No

Observations from PJM, MISO, SPP practices:

- Transmission service reservation is a pre-requisite to participate in the market. However, MISO permits offers into the real-time market without forward transmission reservation, but it is subject to availability of hourly non-firm transmission.
- They offer transmission service increments similar to the OATT, down to daily/hourly timeframes. This addresses seams issues between the ISOs as they are in close proximity to each other but also with transmission providers that offer service under the OATT surrounding those ISOs/RTOs.
- They set aside/reserve transmission capacity for native load/network load as ETC within the ATC methodology. Calculating native load needs is fairly similar among these entities from a load and generation assumption perspective.
- Curtailment order is determined by the type of transmission that has been reserved. To the extent there are transmission constraints and not all awarded market transactions can flow, those supported by higher transmission priority have effectively scheduling priority.

Issue Paper

- All three have a process for studying requests for long-term service of 1-year or longer, with PJM imposing a 5-year requirement on duration in order to study a request and consider upgrades.
- Wheel-through requests for transmission service do not have any additional requirements. There is no consideration of arrangements on other systems for reserving transmission service, nor do arrangements on other systems inform the ISOs/RTOs actions on their own systems.
- Transmission reservation process allows for accounting of the transmission capabilities of the system and not overselling “firm” uses. Nevertheless, the functionality between transmission reservations and operation of the market is largely separate since the market re-optimizes all physically available transmission regardless of the reservations.
- Finally, all three entities provide eligibility for CRR allocation (their equivalent concept) for firm transmission reservations of a year or longer, with SPP providing eligibility for monthly duration reservations of firm transmission service as well.

Regarding the NYISO and ISONE, it is important to note their geographical location as this will put their practices in perspective and the low volume of wheel through transactions. ISONE is located furthestmost on the East coast of the United States, bordered on one side by NYISO and Canada on the other, thus the very rare instances of wheel through transactions across their system. Similarly, NYISO is pancaked between PJM and ISONE, with the Ontario Independent System Operator above them with limited system interconnections. NYISO also has very limited wheel-through transactions, and primarily these are wheels from the Ontario ISO (Canada) to ISONE. Table 2, will generally describe their practices.

Table 2 – Comparison between NYISO and ISONE practices.

	NYISO	ISONE
Transmission reservation process	No	No
Unique market rules/requirements	All transactions are economically scheduled (DA and RT)	Wheel-throughs cannot offer into DA market, but only participate in RT. In RT, wheel-throughs must be self-scheduled (not economically offered).
Calculating native load needs	Have ATC methodology through which calculate day ahead and hour ahead values. In those timeframes, ETC consists of “transmission utilization” based on DA and RT unit commitments. While have ability to set aside ETC for native load exclusively, ETC is represented by the transmission utilization in DA and RT at tie points and internal system.	Does not calculate ATC across most of system, but only across certain paths that operate under the OATT (3 rd party owners).
Wheel-through requirements	No additional requirements to wheel through system.	Aside from limitation that wheels can only be offered in RT (not DA), no other specific requirements imposed.
Priorities	Wheel have lower priority to import serving load based on NYISO/ISONE memorandum of agreement for wheels	Day Ahead – pro-rata curtailments (wheels cannot be offered in DA).

Issue Paper

	through NYISO to ISONE. Additionally, transmission limit is approximately 300 MW (fluid amount) supporting wheels (while rest of interface capacity supports exports/imports to ISONE).	Real-Time: Priority given to transactions clearing DA (thus load transactions priority over wheels), over RT-only transactions.
Capacity Benefit Margin (CBM)	Yes (but set to zero)	No

Observations from NYISO and ISONE practices:

- As noted earlier, their geographic location and proximity to other ISOs/RTOs drive some of the differences compared to CAISO or other ISOs/RTOs. This is exemplified through the very limited wheeling through transaction volume across their systems.
- Their markets also have certain inherent nuanced differences as compared to CAISO or other ISOs/RTOs that have a forward transmission reservation process. NYISO only allows economic offers, not self-schedules. ISONE, on the other hand, only allows wheeling through transactions to participate in the real-time market, which may also contribute to the low volume of wheeling through transactions.
- Because some of the ISOs/RTOs border each other they are able to execute limited memorandums of agreement (approved by FERC) that provide for a more bilateral and tailored approach to imports, exports, and wheel through transactions across areas with relatively similar practices.

The CAISO may be uniquely situated in many respects compared to the other ISOs/RTOs in that it has a relatively high volume of wheel through transactions across its system, and these types of transactions are likely to increase driven in part by the dependence on imports across the western interconnection to reliably serve load. Additionally, the seams issues between the OATT paradigm and CAISO’s organized market structure are more pronounced as the CAISO is the only organized market in the western interconnection. Nevertheless, the benchmarking information, particularly practices of the ISOs/RTOs with a forward transmission reservation process, will be a helpful reference as we collaboratively work to craft a framework consistent with the guiding principles.

6 EIM Decisional Classification

This initiative will consider changes to the forward scheduling rights for schedules to export from or wheel through the CAISO balancing authority area. CAISO staff believes that, given the range of potential tariff changes contemplated at this early stage of the initiative, the EIM Governing Body would have an advisory role with respect to both Phase 1 and Phase 2.

The role of the EIM Governing Body with respect to policy initiatives is in the process of changing. On August 20, 2021, the Board of Governors and the EIM Governing Body jointly adopted the proposal of the Governance Review Committee, which would reformulate the authority over Section 205 filings that the Board of Governors shares with the EIM Governing

Issue Paper

Body. Although the new rules have not yet been implemented in the ISO's governance documents, the GRC's final proposal includes a clear statement of the scope:

Joint authority extends to all proposals to change or establish any CAISO tariff rule(s) applicable to the EIM Entity balancing authority areas, EIM Entities, or other market participants within the EIM Entity balancing authority areas, in their capacity as participants in EIM. This scope excludes from joint authority, without limitation, any proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid.

GRC Part II Draft Final Proposal, page 8.

Both Phase I and Phase II of this initiative would adjust the tariff rules that govern whether and to what extent schedules to wheel through or export from the CAISO balancing authority area would receive priority. None of the currently contemplated tariff would be "applicable to EIM Entity balancing authority areas, EIM Entities, or other market participants within EIM Entity balancing authority areas, in their capacity as participants in EIM." Instead, the proposed tariff rules would be applicable "only to the CAISO balancing authority area or o the CAISO-controlled grid." Accordingly, these proposals fall outside the scope of joint authority.

The GRC proposal as adopted provides that the EIM Governing Body has an advisory role over any proposal to change rules of the real-time market that fall outside the scope of joint authority. See GRC Part II Draft Final Proposal, page 12. This ensures that the EIM Governing Body "has an opportunity to provide formal input on all proposals to change real time market rules, including those rules that may significantly impact market participants in EIM balancing authority areas but that do not directly apply to them in their capacity as EIM participants." Id. at 13. Because the proposals contemplate changes to the rules of the real-time market, the EIM Governing Body would have an advisory role with respect to those changes.

This proposed classification reflects the current state of this initiative and may change as the stakeholder process moves ahead. Stakeholders are encouraged to submit a response to the EIM classification of this initiative as described above in their written comments, particularly if they have concerns or questions.

7 Stakeholder Engagement

The table below outlines the proposed schedule for both phases of the initiative. Phase 1 of the initiative is slated for presentation to the CAISO Board of Governors in March 2022 to allow time for a FERC filing and order in time for implementation of enhancements in June 2022. Phase 2 of the initiative will be conducted concurrently with Phase 1, with stakeholder working groups launching in October with an eye toward a December straw proposal. The CAISO is targeting development of the forward transmission reservation process structure by summer 2022, at which point the timelines will be re-evaluated and may be adjusted based on

Issue Paper

the nature of the framework developed, with focus shifting toward remaining issues and consideration of a transition process to the new framework.

Phase 1 Schedule

Date:	Activity:
Jul 13	Stakeholder workshop
Aug 31	Post issue paper
Sept 9	Stakeholder meeting
Sept 30	Comments deadline - issue paper
Oct 25	Post straw proposal
Nov 1	Stakeholder meeting
Dec 2	Comments deadline - straw proposal
Dec 22	Post draft final proposal
2022	
Jan 4	Stakeholder meeting
Jan 25	Comments deadline
Feb 10	Post final proposal
Feb 17	Stakeholder meeting
Mar 3	Comments deadline - final proposal
Mar 10	EIM GB meeting
Mar 23-24	ISO Board meeting
June 2022	Implementation

Phase 2 Schedule

Date:	Activity:
Dec 22, 2021	Post straw proposal
2022	
Jan 4	Stakeholder meeting
Jan 25	Comments deadline - straw proposal
Feb 24	Post revised straw proposal
March 3	Stakeholder meeting
March 25	Comments deadline
Late Apr	Post 2nd revised straw proposal
Early Mar	Stakeholder meeting
Late Mar	Comments deadline - 2nd revised straw proposal
Mid to late June	3 rd revised straw/re-evaluate timelines
2023	
March	EIM GB meeting
March	ISO Board meeting
2024	
Early 2024	Implementation

Regarding this particular issue paper, a stakeholder meeting is scheduled for September 9 to discuss the paper. Stakeholders should submit comments on the issue paper

Issue Paper

through the ISO's commenting tool using the link on the initiative webpage by close of business on September 30, 2021.