

April 21, 2017

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re: California Independent System Operator Corporation
Docket No. ER17-_____-000**

**Filing addressing outstanding Commission directives relating
to CAISO Market Redesign and Technology Upgrade**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this filing under Sections 205 and 206 of the Federal Power Act, requesting that the Federal Energy Regulatory Commission find that the CAISO tariff is just and reasonable, and that the CAISO does not need to implement certain outstanding directives in the Commission's order issued on September 21, 2006.¹ These directives pertain to the CAISO's Market Redesign and Technology Upgrade (MRTU) tariff amendment and requires that the CAISO do the following:

- Implement a two-tier allocation of real-time bid cost recovery uplift;
- Implement bid cost recovery changes to account for units running over multiple operating days;
- Implement multi-hour constraints in the residual unit commitment process;
- Assess whether and how to develop more flexibility for ancillary services substitution;
- Develop software functionality to support exports for ancillary services; and
- Undertake a stakeholder process to examine rebating the over-collection of transmission losses to renewable resources.²

¹ *Cal. Indep. Sys. Operator Corp.*, 116 FERC ¶ 61,274 (2006) (September 2006 order).

² See September 2006 order at PP 143, 301, 303, 355, 533, 539, 1373, 1402, and n. 570, *order on reh'g*, 119 FERC ¶ 61,076, at PP 55-56, 87, 309 (2007) (April 2007 order); *Cal. Indep.*

The directives in the September 2006 order are more than a decade old. The CAISO system has undergone numerous and substantial changes since then, and significant new challenges have arisen that the CAISO must address. As the Commission has recognized, a large number of variable energy resources have interconnected to the CAISO controlled grid in the past few years, and that number will continue to increase significantly over the next several years.³ The CAISO's operational and market needs today are far different than contemplated in the September 2006 order. Additional market modifications required to implement the six remaining MRTU directives will not help the CAISO address the challenges it faces today or in the near future. Some of these directives may exacerbate the challenges the CAISO faces and lead to inefficient market outcomes.

The CAISO requests that the Commission find that four of the outstanding directives are unnecessary because the CAISO's current market structure is just and reasonable and does not require implementation of the directives. The CAISO also requests that the Commission find that the CAISO has already adequately complied with the directive to develop software functionality to support exports for ancillary services and has completed stakeholder discussions to examine rebating the over-collection of transmission losses to renewable resources. In the alternative, the CAISO requests that the Commission find these directives are no longer necessary. In this filing, the CAISO explains why implementing these directives is unnecessary or problematic and provides analysis to support the relief sought.

I. Background

A. Procedural Background

On April 1, 2009, the CAISO commenced operating the nodal day-ahead and real-time markets the Commission approved in the September 2006 order and in subsequent orders.⁴ The CAISO developed the MRTU design under lengthy stakeholder and Commission processes. Some market participants requested additional market design elements that the CAISO could not accommodate at the start of the new market. The CAISO proposed, and the

Sys. Operator Corp., 139 FERC ¶ 61,206, at PP 26-28 (June 2012 order); *Cal. Indep. Sys. Operator Corp.*, 148 FERC ¶ 61,173, at PP 28-29 (2014) (September 2014 order).

³ See generally *Reactive Power Requirements for Non-Synchronous Generation*, Order No. 827, 81 Fed. Reg. 40,793 (June 23, 2016), FERC Stats. & Regs. ¶ 31,385, at P 4 (Order No. 827), *order on clarification and reh'g*, 157 FERC ¶ 61,003 (2016).

⁴ The September 2006 order conditionally accepted tariff provisions to implement the nodal market design that the CAISO filed on February 9, 2006 (February 2006 MRTU tariff amendment filing), and the April 2007 order granted in part requests for clarification and rehearing of the September 2006 order. The CAISO implemented its MRTU tariff on March 31, 2009 for an initial trade date of April 1, 2009.

Commission required, that the CAISO address specific market modifications after its initial implementation of the market. The CAISO has since designed and implemented the majority of these elements.⁵ In addition, in response to evolving market needs, the CAISO has developed and implemented numerous other significant market enhancements that have provided substantial improvements to the overall market design.⁶

On March 28, 2012, the CAISO filed a motion for an extension of time, until April 30, 2014, to address the six remaining directives from the September 2006 order and April 2007 order (March 2012 motion) addressed herein. The Commission granted the CAISO's March 2012 motion.⁷

The CAISO subsequently filed three other pleadings addressing these issues. First, on April 20, 2013, the CAISO filed a report and motion addressing the requirement to develop software functionality to support the export of ancillary services (April 2013 report/motion). In the April 2013 report/motion the CAISO requested that the Commission find that the CAISO had satisfied the September 2006 directive concerning developing software and market rules to support exports of ancillary services.⁸ To date, the Commission has not ruled on the CAISO's motion. If the Commission grants the relief requested in this filing, the CAISO's motion will be moot.

On September 27, 2013, the CAISO filed a report and motion regarding rebating over-collections of transmission losses (September 2013 report/motion). In the September 2013 report/motion, the CAISO explained that stakeholders no longer desired to explore whether the CAISO should rebate the over-collection of transmission losses to renewable resources.⁹ Out of an abundance of caution, the CAISO requested that the Commission find that the CAISO was no longer

⁵ See, e.g., *Cal. Indep. Sys. Operator Corp.*, 130 FERC ¶ 61,122 (2009) (conditionally accepting the CAISO's convergence bidding design developed in response to P 452 of the September 2006 order and P 117 of the April 2007 order); *Cal. Indep. Sys. Operator Corp.*, 131 FERC ¶ 61,280 (2010) (conditionally accepting the CAISO's scarcity reserve pricing mechanism proposal in response to a directive in PP 1078-79 of the September 2006 order); *Cal. Indep. Sys. Operator Corp.*, 132 FERC ¶ 61,087 (2010) (conditionally accepting the CAISO's multi-stage generating resource modeling proposal in response to a directive in P 573 of the September 2006 order).

⁶ See, e.g., *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204 (2014) accepting tariff revisions to align the CAISO's market structure with certain reforms mandated in the Commission's Order No. 764 and implement additional real-time market enhancements; see also e.g. *Cal. Indep. Sys. Operator Corp.*, 156 FERC ¶ 61,226 (2016) accepting tariff revisions to implement the CAISO's flexible ramping product.

⁷ June 2012 order at PP 26-28.

⁸ April 2013 report/motion at 2.

⁹ September 2013 report/motion at 2.

required to conduct additional stakeholder processes to address this proposal.¹⁰ To date, the Commission has not ruled on this motion. If the Commission grants the relief requested in this filing, the CAISO's motion will be moot.

Finally, on March 24, 2014, the CAISO filed a motion requesting that the Commission grant a "permanent waiver" of the other four directives addressed in this filing (March 2014 motion). In the March 2014 motion, the CAISO requested an extension of time to implement these directives.¹¹ On September 5, 2014, the Commission denied the CAISO's motion for waiver.¹² In the September 2014 order, the Commission stated in part:

[W]e find that a motion for 'permanent waiver' is not the appropriate vehicle to seek relief from directives in a Commission order In the future, any request to deviate or abstain from a directive in a Commission order . . . must be made, as appropriate, in a filing pursuant to section 205 or section 206 of the FPA.¹³

Additionally, the Commission stated that the CAISO had not explained how its current market structure obviates the need for the Commission-ordered directives, or how implementing these directives would be duplicative or unnecessary in light of the current market structure or based upon future market initiatives. The Commission also observed that the CAISO did not offer sufficient analysis for the Commission to assess the costs and benefits of implementing the Commission's directives.¹⁴ However, the Commission's order extended the time to address or implement these market enhancements until April 30, 2017.¹⁵

B. The CAISO System Has Changed Significantly and New Market Design Priorities Have Arisen Since the Commission Approved MRTU

The operational needs the CAISO faces today differ significantly from those the CAISO faced in 2006. The Commission and the CAISO should ensure that market design aligns with these current operational needs as opposed to pursuing enhancements that will yield little or no value to reliable grid operations under current conditions. As the Commission has recognized, a large number variable energy resources have interconnected to the CAISO controlled grid, and

¹⁰ September 2013 report/motion at n.2.

¹¹ March 2014 motion at 3-4.

¹² September 2014 order at PP 25-27.

¹³ September 2014 order at P 25.

¹⁴ September 2014 order at P 27.

¹⁵ September 2014 order at PP 28-29.

that number will continue to increase over the next several years.¹⁶ The CAISO's market design needs today are far different than they were in 2006 when the Commission issued its order on the February 2006 MRTU tariff amendment filing.

The change in the CAISO's fleet is already affecting CAISO controlled grid operations. Not only must the CAISO focus on meeting peak load, but now the CAISO must also ensure sufficient ramping capability, both upwards and downwards, is available over relatively short periods of time to meet both net load ramps and the sudden swings caused by variable energy resources.¹⁷ The large-scale addition of non-dispatchable, behind-the-meter resources (*e.g.*, roof-top solar) in the CAISO balancing authority area has also shifted loads adding to the challenges the CAISO must address to maintain the supply-demand balance and ensure reliable operation within control performance standards such as CPS1.¹⁸

Among other challenges, the CAISO requires resources that can ramp more frequently to address two net load ramps per day and respond to variable energy resources' variability. If the system lacks sufficient ramping capabilities, the CAISO will not be able to balance supply and demand effectively, and this may cause control performance standards to fall below acceptable levels for sustained periods. From time-to-time, the CAISO has had to commit resources at their minimum operating level (Pmin) and/or de-commit other resources prior to a ramp to address such needs. Resources that require commitment at Pmin or another minimum operating level to respond to dispatch instructions present a significant operational challenge, *i.e.*, a Pmin burden, when the CAISO is operating with low net load periods. During these operating conditions, the Pmin burden may exacerbate over-supply conditions, which are already occurring at a more frequent rate.¹⁹

The CAISO's challenges will only increase as California progresses toward a 50 percent Renewables Portfolio Standard requirement and beyond. To address these challenges, the CAISO has modified and continues to modify both its resource adequacy requirements and its market rules to incentivize investment in enhanced resource dispatch flexibility. The CAISO continues to strive to not incentivize inflexible resources or resources that, when dispatched,

¹⁶ See generally Order No. 827 at P 4.

¹⁷ Net load is CAISO load less solar and wind production.

¹⁸ CPS1 is a statistical measure of a balancing authority area's control error (ACE) variability in combination with the interconnection frequency error from scheduled frequency. CPS1 assigns each balancing authority a share of the responsibility for controlling the interconnection steady state frequency.

¹⁹ See CAISO Market Performance and Planning Forum presentation dated March 14, 2017 at 31-33. http://www.aiso.com/Documents/Agenda-Presentation-MarketPerformance-PlanningForum-Mar14_2017.pdf

contribute to the need for additional downward dispatch flexibility.²⁰

More work is needed, however, to address these issues given the forecasted increases in variable energy resources over the next several years. The CAISO therefore plans to focus its market changes and stakeholder initiative efforts over the next few years on items that will facilitate the transition to a low carbon grid and enable the CAISO to reliably manage the CAISO controlled grid during this transition. Attachment A describes the CAISO's policy development plan to address these issues. The CAISO asks the Commission to consider these planned initiatives to meet system needs as it considers whether the CAISO's market is just and reasonable without implementation of the outstanding MRTU directives.

The CAISO recognizes that it has not implemented each and every directive from the September 2006 order. However, the need to develop market rules to address changing system needs have outweighed the benefits the remaining directives from the September 2006 order might have had. As discussed further below, under the current and expected system needs, the remaining directives no longer add the anticipated value. Not only is the CAISO market just and reasonable without them, it would be unjust and unreasonable to require the CAISO and its stakeholders to devote the resources to implement these directives. Below the CAISO demonstrates why the directives from the September 2006 order are no longer necessary for the Commission to determine that the CAISO's market is just and reasonable and why implementing these directives may cause unjust and unreasonable outcomes because of the potential impact on efficient market operations.

III. Discussion of Outstanding MRTU Directives

A. Two-Tiered Allocation of Real-Time Bid Cost Recovery

1. Background

The CAISO allocates bid cost recovery costs incurred in the real-time market to all load-serving entities in a single-tier allocation based on their measured demand, which includes all metered demand plus exports.²¹ Bid cost

²⁰ In particular, the CAISO developed, and the Commission approved, the flexible ramping product, which the CAISO implemented on November 1, 2016. *Cal. Indep. Sys. Operator Corp.*, 156 FERC ¶ 61,226 (2016). The flexible ramping product functionality allows the CAISO to ensure its dispatches and price signals are better aligned with meeting the system flexibility requirements. In accepting the tariff modifications to implement the flexible ramping product, the Commission recognized the importance of encouraging flexible ramping capability in order to "account for forecasted net load movement and forecast uncertainty in all processes of the real-time market." *Id.* at P 36.

²¹ CAISO tariff section 11.8.6.6.

recovery costs derive from payments made to supply resources to guarantee they recover their bid-in costs (which includes energy bid costs, start-up costs, transition costs, and minimum load costs) to the extent such costs are not covered by market revenues in the CAISO market. Resources may have a revenue shortfall when the market dispatches a resource for energy at a locational marginal price inconsistent with the resource's energy bid,²² or a resource cannot recover its start-up and minimum load costs through market payments at the applicable locational marginal price.²³ In the first case, the market may commit a resource that bid at a level higher than the applicable locational marginal price. In the second case, a resource may incur variable costs to respond to a unit commitment that exceeds the market payments it receives from an energy locational marginal price. The CAISO nets a resource's market bid costs and revenues across the real-time market for the same trading day to determine whether it owed bid cost recovery payments.²⁴

In response to the February 2006 MRTU tariff amendment filing, the California Department of Water Resources State Water Project (SWP) argued that this allocation scheme could result in socializing real-time bid cost recovery costs even though such costs were attributable to load whose day-ahead cleared demand was less than actual demand.²⁵ SWP suggested allocating real-time bid cost recovery using a two-tiered allocation approach, similar to the allocation methodology used in the day-ahead bid cost recovery costs.²⁶

The CAISO allocates day-ahead bid cost recovery uplift costs first to virtual demand positions that result in the integrated forward market clearing more supply than necessary to serve actual real-time demand. The CAISO then allocates the remaining costs to metered demand and exports. SWP recommended a similar allocation scheme for real-time bid cost recovery costs, which would presumably allocate the first tier to demand not scheduled in the day-ahead market (*i.e.*, deviations from day-ahead schedules).

In the September 2006 order, the Commission found that SWP's recommendation to allocate real-time bid cost recovery costs using a two-tier method similar to the day-ahead allocation method was reasonable and directed the CAISO to modify its tariff accordingly.²⁷ In the April 2007 order, the Commission granted rehearing regarding the two-tier allocation of real-time bid cost recovery costs. The Commission agreed with the CAISO that allocating the

²² CAISO tariff section 11.8.

²³ CAISO tariff section 30.4.

²⁴ CAISO tariff section 11.8.

²⁵ See September 2006 order at P 537.

²⁶ CAISO tariff section 11.8.6.4.1.

²⁷ See September 2006 order at P 539.

first tier of real-time bid cost recovery costs based on day-ahead deviations was problematic due to disparities between the forecast and real-time demand, and that it could lead to costs that cannot accurately be attributed to a specific market participant. The Commission accepted the original tariff language the CAISO had filed to allocate real-time bid cost recovery costs. However, the Commission directed the CAISO to work with stakeholders to develop a two-tiered allocation of real-time bid cost recovery costs that can be include in a future market design release.²⁸

The CAISO first explored with stakeholders ways to implement a two-tier allocation approach in conjunction with implementing convergence bidding. However, after the CAISO and market participants gained additional experience with the new market structure, other bid cost recovery market design enhancements became a higher priority. A significant portion of bid cost recovery costs incurred in 2011 were due to problematic market participant behavior, which the CAISO addressed through two emergency filings that eliminated costs resulting from those practices.²⁹ The CAISO also implemented rules to net day-ahead market cost and revenues and real-time market cost and revenues separately across an operating day and other bid cost recovery mitigation measures.³⁰ While these rule changes did not target the cost allocation rules related to bid cost recovery, they were targeted at reducing the cost of bid cost recovery to ensure the uplift was limited to what was just and reasonable.

The CAISO subsequently sought an extension of time to implement a two-tiered allocation of real-time bid cost recovery in its March 2012 motion, which the Commission granted.³¹ The Commission also granted a further extension in its September 2014 order, allowing the CAISO to file tariff modifications by April 30, 2017.³²

²⁸ April 2007 order at P 309.

²⁹ The two tariff amendment filings were accepted in *Cal. Indep. Sys. Operator Corp.*, 135 FERC ¶ 61,110, *clarified*, 137 FERC ¶ 61,180 (2011), and *Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,118 (2011).

³⁰ *Cal. Indep. Sys. Operator Corp.*, 145 FERC ¶ 61,254 (2013).

³¹ June 2012 order at PP 26, ordering para. (A).

³² September 2014 order at PP 28, ordering para. (B).

2. The Commission should find that the CAISO's tariff is just and reasonable without a two-tier bid cost recovery allocation mechanism

The Commission's directive required the CAISO to work with stakeholders to develop a two-tiered approach to allocating the costs of real-time bid cost recovery. In the CAISO's stakeholder initiative catalog process, stakeholders have not actively advocated for this market design change, partly because they may have understood it to be a directive the CAISO had to address.³³ To comply with the Commission's directive, the CAISO conducted a stakeholder process in 2016 and 2017 to explore designing a two-tier allocation of real-time bid cost recovery payments based on cost causation.³⁴ The CAISO examined how structuring a first allocation tier based on the causes of real-time unit commitment and how it would align allocation with cost causation. As part of this effort, the CAISO assessed the effectiveness of either net negative uninstructed imbalance energy (which includes both under scheduled load and over scheduled generation) or net negative demand deviations (which is metered load above day-ahead scheduled load) to allocate real-time bid cost recovery uplift.³⁵ The CAISO's analysis identified no strong correlation between deviations and real-time bid cost recovery uplift.

Instead, the CAISO observed that real time unit commitment occurs primarily from differences in the inputs between real-time market runs that conduct unit commitment. The CAISO identified the following contributing factors for real-time unit commitment leading to bid cost recovery uplift costs:

- Changes in load forecast between real-time unit commitment market runs not reflected in the day-ahead market.
- Changes in variable energy resource forecasts between real-time unit commitment market runs not reflected in the day-ahead market.
- Outages of resources with a day-ahead schedules not reflected in the previous real-time unit commitment market run.

³³ March 2012 motion at 10-11. See also, comments submitted on 2017 stakeholder initiatives catalog process
<http://www.aiso.com/informed/Pages/StakeholderProcesses/StakeholderInitiativesCatalogProcess.aspx>

³⁴ More information on the CAISO's stakeholder initiative is available on the following website:
<http://www.aiso.com/informed/Pages/StakeholderProcesses/BidCostRecoveryEnhancements.aspx>

³⁵ See CAISO straw proposal dated June 3, 2016 at 10-12.

- Changes in net import positions between the two hour-ahead scheduling processes that were not reflected in the day-ahead market.
- Transmission outages/de-rates.
- Congestion management.
- Generation deviations.
- Resources available in the real-time market that were not available in the day-ahead market resulting in a lower overall real-time market solution that commits a different set of resources with a higher associated uplift costs.³⁶

Because numerous factors drive real-time uplift costs, it is difficult to decipher and “untangle” definitively what causes commitment costs in any market run. The reason driving each individual commitment is different, which makes developing an applicable second tier for allocating real-time bid cost recovery problematic. In real-time, the CAISO commits resources on a fifteen-minute basis, looking out up to four-and-a-half hours into the future. This makes identifying the proximate cause of a unit commitment and then allocating the cost of that commitment to an entity or entities causing the uplift very difficult. Accordingly, the CAISO believes that a two-tiered cost allocation approach would not advance cost causation principles.

The CAISO also notes that on January 19, 2017, the Commission issued a Notice of Proposed Rulemaking that proposes to require each RTO or ISO that allocates the costs of real-time uplift due to deviations to follow certain practices when allocating such costs.³⁷ The Uplift NOPR suggests that each RTO or ISO should allocate real-time uplift costs only to those market participants whose transactions are reasonably expected to have caused the real-time uplift costs.³⁸ The CAISO’s analyses discussed above show there is not a clear rationale for a two-tier allocation of real-time uplift costs based on cost-causation principles.

In the Uplift NOPR, the Commission also stated that it does not propose to require that RTOs and ISOs allocate real-time uplift costs to deviations.³⁹ The CAISO concurs that allocating real-time uplift to deviations from day-ahead schedules may create problems because there does not appear to be a correlation between these deviations and real-time unit commitment decisions.

³⁶ *Id.* at PP 12-13.

³⁷ *Uplift Cost Allocation and Transparency in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 158 FERC ¶ 61,047 (Uplift NOPR).

³⁸ *Id.* at P 106.

³⁹ *Id.* at P 106.

The CAISO has not identified typical types of transactions that are a proximate cause of real-time unit commitment. The Commission asks whether RTOs and ISOs should even implement two-tier allocation methodologies. Regardless, in the Uplift NOPR, the Commission is proposing that RTOs and ISOs “should allocate . . . real-time uplift costs to only those market participants whose transactions are reasonably expected to have caused the real-time uplift.”⁴⁰

In the CAISO market, market participants that deviate from day-ahead schedules are exposed to real-time market prices. This sufficiently incentivizes market participants not to deviate from day-ahead schedules to the extent possible when such deviations are not beneficial to the system, without having to quantify and allocate real-time uplift to market participants with such deviations. Although the CAISO could develop some presumptions about allocating all real-time bid cost recovery incurred over an operating day to a specific set of transactions, the CAISO’s stakeholder process did not result in any consensus or clear path to construct such an allocation.

The CAISO also believes that certain market design changes it has implemented since 2006 obviate the need for a two-tier allocation of real-time bid cost recovery costs. Over the past few years, the CAISO has focused its efforts and resources on developing market rules and products that reduce such costs or incentivize economic bids for upward and downward flexibility.

The first of these changes was introducing the fifteen-minute market in response to Commission Order No. 764.⁴¹ The fifteen-minute market reduces uplift because it more efficiently commits and positions dispatchable resources by having the same fifteen-minute market run commit internal generation, dispatch variable energy resources, and dispatch fifteen-minute dispatchable inerties. It also improves resource commitment and positioning by reducing the lead time and granularity of variable energy resource output forecasts used by the market.

The second important market change the CAISO made was no longer netting a resource’s bid costs and revenues in the day-ahead and real-time markets in a day when calculating a resource’s bid cost recovery payment. This change helped incentivize real-time market economic bids from dispatchable resources needed to balance variable energy resources’ variability.

⁴⁰ *Id.* at P 106.

⁴¹ *Integration of Variable Energy Resources*, Order No. 764, FERC Stats. & Regs. ¶ 31,331 (Order No. 764), *order on reh’g and clarification*, Order No. 764-A, 141 FERC ¶ 61,232 (2012), *order on clarification and reh’g*, Order No. 764-B, 144 FERC ¶ 61,222 (2013).

Last year, the CAISO implemented its flexible ramping product.⁴² The flexible ramping product functionality allows the CAISO to ensure its dispatches and price signals are better aligned with meeting the system flexibility requirements. In accepting the tariff modifications to implement the flexible ramping product, the Commission recognized the importance of encouraging flexible ramping capability in order to “account for forecasted net load movement and forecast uncertainty in all processes of the real-time market.”⁴³ This functionality will help mitigate the need for real-time out of market actions to address system flexibility requirements.

The CAISO is planning further enhancements to the real-time market that should decrease bid cost recovery uplift by moving resource commitment from the fifteen-minute market into the real-time market’s five-minute granularity market runs. Reduced uplift costs will result from reducing the inefficiencies caused by the difference in granularity between the real-time market’s existing fifteen-minute unit commitment run and the final resource dispatch, which occurs on a five-minute basis. The CAISO is planning to design this enhancement through a stakeholder process in 2017-2018 with anticipated implementation in the fall of 2019.

Given the market design changes that have mitigated real-time bid cost recovery and plans for future market enhancements that will reduce them even further, the CAISO requests that the Commission find that it is unnecessary for the CAISO to implement a two-tier allocation of real-time bid cost recovery uplift. The CAISO’s stakeholder process reflects that a two-tier allocation approach will not follow cost causation principles and the Commission itself is questioning whether RTOs/ISOs should even implement two-tier allocation methodologies for uplift costs. At this time, the CAISO’s markets are just and reasonable without a two-tier allocation methodology. The Commission should find it is unnecessary for the CAISO to implement this directive from the September 2016 order. The Commission should instead support the CAISO’s work to ensure its real-time market structure remains just and reasonable and the CAISO’s efforts to further reduce uplift costs.

⁴² *California Indep. Sys. Op. Corp.*, 156 FERC ¶ 61,226 (2016).

⁴³ *Id.* at P 36.

B. Bid Cost Recovery over Multiple Days

1. Background

The CAISO determines a resource's eligibility for bid cost recovery based on the resource's commitment during a day⁴⁴ because the day-ahead market commitment processes considers whether to commit a resource based on the resource's parameters as they apply for that single operating day. If a resource operates across different operating days, the day-ahead optimization considers no resource's minimum run time beyond the run hours of the first day. The CAISO's day-ahead market may commit the resource based only on its start-up costs recovered within the hours of the operating day the market optimized. For example, if the CAISO committed a unit for hour ending 23:00, which then ran into the subsequent day, the CAISO would only include in the bid cost recovery calculation to cover start-up and other commitment costs the revenue for hour ending 23:00 and 24:00 on the first operating day.

In response to the February 2006 MRTU tariff amendment filing, Southern California Edison (SCE) suggested that these tariff provisions were problematic because they do not fully consider units that have minimum run times that exceed a calendar day. SCE requested that the Commission direct the CAISO to divide the start-up costs (but not necessarily all bid cost recovery costs) by the total run time of the unit even if the run time exceeds the 24 hours of a calendar date.⁴⁵ The CAISO agreed to make the software enhancements to allow for this change in a future market release.⁴⁶ In the September 2006 order, the Commission directed the CAISO to develop and file with the Commission a plan to address bid cost recovery for units facing these types of constraints for implementation by "Release 2" of the current market design.⁴⁷

In its March 2012 motion, the CAISO requested an extension of time, until April 30, 2014, to implement this directive. The CAISO explained that its analysis showed that a CAISO resource commitment extended beyond a single day in only three percent of all day-ahead commitments for the period of 2009-2011. The low occurrence of such events demonstrated that implementing the market change was not urgent. Stakeholders confirmed this by assigning the issue a low priority in the CAISO's market initiatives process.⁴⁸ The CAISO also explained that redesigning the integrated forward market and residual unit

⁴⁴ CAISO tariff section 11.8.5.

⁴⁵ See September 2006 order at P 531.

⁴⁶ *Id.* at P 532.

⁴⁷ *Id.* at P 533. "Release 1" refers to the initial implementation of the MRTU market design, and "Release 2" refers to later enhancements to such market design.

⁴⁸ March 2012 motion at 14.

commitment would require significant changes to the rules for committing units and the corresponding bid cost recovery rules.⁴⁹ The Commission granted the CAISO's requests for extensions of time to implement bid cost recovery over multiple days in the June 2012 and September 2014 orders.⁵⁰

2. Changed circumstances since the September 2006 Order support finding this directive is no longer necessary

To comply with the September 2006 order, the CAISO conducted a stakeholder process to explore implementing bid cost recovery over multiple days. This process involved an evaluation of two years of data to assess the potential benefits from changing bid cost recovery payment calculations. The CAISO analyzed bid cost recovery payments made to resources operating over two days for the period May 2014 through April 2016.⁵¹ The CAISO determined that only \$2.93 million of bid cost recovery payments associated with start-up costs during this two-year period were made to resources operating across two trade dates.⁵² This \$2.93 million represented only 1.5 percent of the total integrated forward market and real-time market bid cost recovery payments over the two-year period.⁵³ The \$2.93 million represents the maximum potential benefit gained over this period had the CAISO modified its payment calculation to account for bid cost recovery over multiple days.⁵⁴

A small number of resources received most of this \$2.93 million. Only eight resources operating across two days collected more than \$100,000 in start-up costs. Seven of the eight resources accounted for approximately \$1.99 million (73 percent) of the total \$2.93 million.⁵⁵ These seven resources are scheduled to retire soon because they utilize once-through-cooling technology, and their retirement will comply with the California State Water Resource Control Board's approved once-through-cooling policy.⁵⁶ Implementing bid cost recovery over multiple operating days would have *de minimis* long-term financial benefit to

⁴⁹ *Id.* at 14-15.

⁵⁰ June 2012 order at P 26; September 2014 Order at P 29.

⁵¹ California ISO, Bid Cost Recovery Enhancements, Draft Final Proposal, p. 11, Feb. 3, 2017, <http://www.caiso.com/Documents/DraftFinalProposal-BidCostRecoveryEnhancements.pdf>.

⁵² *Id.* As the CAISO explains in this analysis, start-up costs are the only form of commitment costs that would be impacted by this initiative.

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.* at p. 12.

⁵⁶ *Id.* See also California Energy Commission – Tracking Progress, Once-Through Cooling Phase Out last updated March 8, 2017. http://www.energy.ca.gov/renewables/tracking_progress/documents/once_through_cooling.pdf.

the CAISO market. Therefore, the Commission should allow the CAISO to retain its current process for considering start-up costs in determining bid cost recovery payments.

The CAISO's market does not need, and should not further incentivize, resources with long run times. The CAISO requires flexible capacity now, and will require even more in the future. Annually, the CAISO identifies its flexible capacity must meet operational challenges based on the changing characteristics of the CAISO's system's net load ramps.⁵⁷ The CAISO is also exploring changes to flexible resource adequacy criteria to address generation oversupply and ramps in fewer than three hours.⁵⁸ As flexibility needs increase, resources with long run times will have diminished value as resource adequacy resources.⁵⁹ It is highly improbable that new resources added to the CAISO controlled grid will have long minimum run times. Existing resources may also retrofit to reduce their minimum run times to provide flexible capacity and remain viable as part of an evolving fleet of resources. Not only will bid cost recovery across multiple days provide the wrong incentives, it will become less necessary as the system moves away from resources with long run times.

⁵⁷ See e.g. Draft Flexible Capacity Needs Assessment for 2018, dated March 31, 2017. <http://www.caiso.com/Documents/2018DraftFlexibleCapacityNeedsAssessment.pdf>.

⁵⁸ More information about this CAISO stakeholder initiative is available at the following website: <http://www.caiso.com/informed/Pages/StakeholderProcesses/FlexibleResourceAdequacyCriteria-MustOfferObligations.aspx>.

⁵⁹ See, CAISO Supplemental Issue Paper: Expanding the Scope of the Initiative to address Flexible resource adequacy criteria and must offer obligations at 6-15. <http://www.caiso.com/Documents/SupplementalIssuePaper-FlexibleResourceAdequacyCriteria-MustOfferObligationPhase2.pdf>. In this paper, the CAISO has identified the following potential areas that require additional exploration in considering design enhancements to the existing flexible capacity product:

- Insufficient ramping speed.
- Cycle time for determining daily start requirements for base flexible capacity requires additional clarity.
- High minimum operating levels from both resource adequacy and flexible resource adequacy.
- Most significant net load ramps occur on weekends or holiday weekdays.
- Significant quantities of long start resources may limit the CAISO's ability to address real-time flexibility needs.
- There is currently no means in place for the CAISO to assess the likelihood that the flexible resource adequacy showings will adequately meet all ramping needs.

The CAISO therefore requests the Commission determine that it is unnecessary for the CAISO to implement bid cost recovery over multiple days. Because of the impending retirement of most resources incurring start-up costs associated with multi-day operations, implementing this directive would provide little financial benefit to the CAISO markets. It is just and reasonable for the CAISO to retain its existing methodology for recovering start-up costs over a single day and will be even more so given expected future conditions. It would not be just and reasonable to require the CAISO and stakeholders to devote significant time and resources to implementing an alternative multi-day bid cost recovery methodology significantly less relevant over time.

C. Multi-Hour Constraints in the Residual Unit Commitment Process

1. Background

The CAISO's residual commitment process ensures that sufficient resources are available to satisfy the CAISO's demand forecast while optimizing individual hourly constraints.⁶⁰ In response to the CAISO's February 2006 MRTU tariff amendment filing, SCE argued that the proposed tariff failed to honor all bid parameters of system resources because it only required the CAISO to consider system resources that are eligible to participate in the residual unit commitment on an hourly basis. SCE asserted that the residual unit commitment therefore could not consider other bid parameters such as multi-hour block inertia constraints submitted with energy bids to the day-ahead market by system resources. SCE contended this could cause the CAISO to commit a system resource in the residual unit commitment for a period inconsistent with the scheduling coordinator's offer for the resource.⁶¹

In the September 2006 order, the Commission directed the CAISO to examine whether it could revise its software by Release 1 to honor multi-hour block inertia constraints as a bidding parameter of system resources under the residual unit commitment. The Commission directed the CAISO to report whether it could revise its software by Release 1, and if not, to report when on the CAISO could implement the software provisions.⁶² The CAISO sought rehearing of these directives, reporting this modification would cost approximately \$500,000, including support for additional functional and integration testing, and would take up to 14 additional weeks to develop and test.⁶³

⁶⁰ See CAISO tariff section 31.5.1.1.

⁶¹ See September 2006 order at P 141.

⁶² *Id.* at P 143.

⁶³ See April 2007 order at P 56.

In its April 2007 order, the Commission found that the identified costs of implementing the market design change and potential delay outweighed the potential benefits of including this functionality at that time. The Commission granted the CAISO's request for rehearing and directed the CAISO to implement this bidding parameter in Release 2.⁶⁴

In its March 2012 motion, the CAISO requested postponing this market change until the CAISO settled on a new market design for the integrated forward market and residual unit commitment.⁶⁵ The CAISO also explained that since the start of the current market design, lacking this bidding parameter had caused no market efficiency or performance issues.⁶⁶

In the June 2012 order, the Commission granted the CAISO request for extension of time until April 30, 2014 to implement multi-hour constraints in the residual unit commitment process.⁶⁷ In the September 2014 order, the Commission granted the CAISO a further extension, until April 30, 2017, to implement this directive.⁶⁸

2. The CAISO's markets are just and reasonable without an explicit multi-hour block bidding parameter in the residual unit commitment process

The CAISO's integrated forward market recognizes multi-hour block constraints for system resources. If a system resource with a multi-hour block constraint clears the day ahead market, the residual unit commitment process will continue with respect to the multi-hour block constraint. These resources do not also need to submit bids into the residual unit commitment process. The CAISO has confirmed that subsequent to Release 1 it developed the technical capability to activate a biddable parameter in the residual unit commitment process to recognize multi-hour block intertie constraints. The CAISO, however, no longer believes there is a need to implement an explicit multi-hour block bidding parameter in the residual unit commitment process.

Figure 1 reflects the amount of resource adequacy capacity of block intertie resources. Only resource adequacy intertie resources can participate in the residual unit commitment process. Over the past two years, the monthly average of the resource adequacy capacity comprising block intertie resources has been relatively small – fewer than 400 MW in all months, except in August.

⁶⁴ *Id.* at PP 55-56.

⁶⁵ March 2012 motion at 17-18.

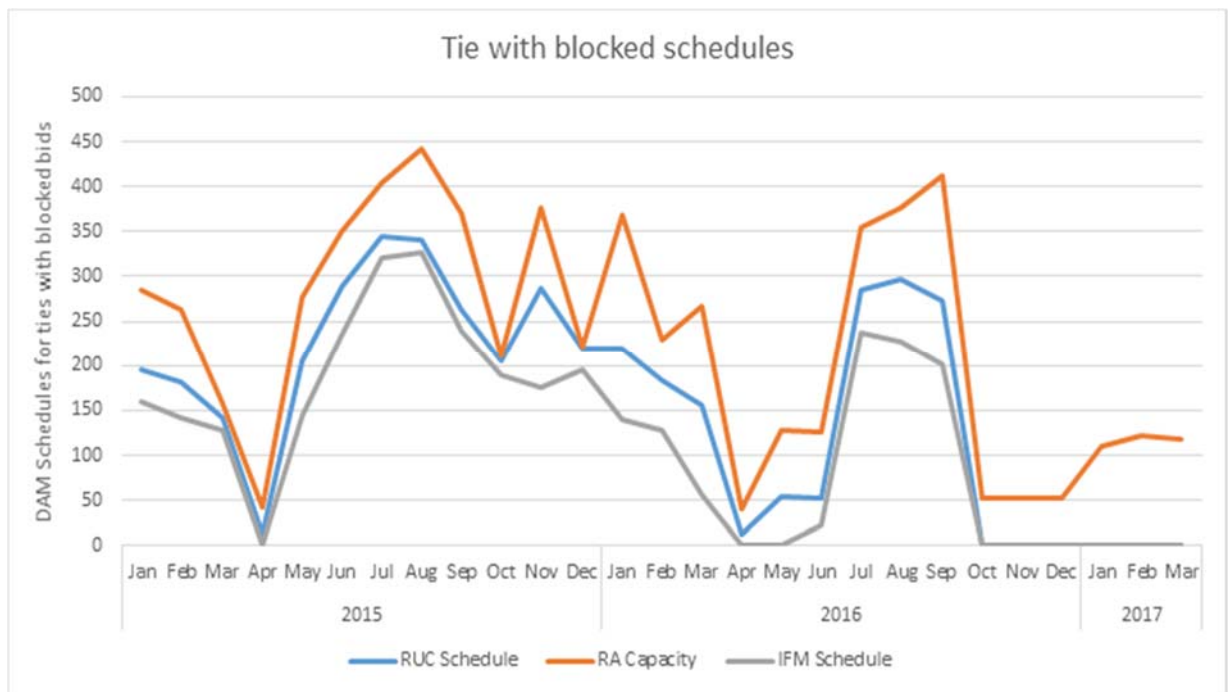
⁶⁶ *Id.* at 17.

⁶⁷ June 2012 order at P 26.

⁶⁸ September 2014 order at PP 28, ordering para. (B).

The majority of this resource adequacy capacity already clears the integrated forward market. When this occurs, the residual unit commitment process continues to recognize the resources' multi-hour block constraint. Figure 1 also reflects that the block intertie capacity that may be bid into the residual unit commitment process is small. The resource adequacy capacity from system resources with multi-hour operating constraints that does not clear the integrated forward market is only approximately 200 MW during summer months and is much less than in other months. This data demonstrates that the majority of existing resources need no biddable parameter in the residual unit commitment process to recognize their multi hour block constraints.

Figure 1: Resource Adequacy Capacity - Intertie Block Constraints (2015-2017)



Activating a biddable parameter to recognize a system resource's multi-hour block constraint in the residual unit commitment process would contravene the CAISO's current market design initiatives. Ramping capability in both the upward and downward directions is critical to support reliable operation on the CAISO controlled grid. Resources that have a static operating constraint level present an operational challenge, especially when the CAISO system is operating with low loads. These resources can exacerbate over-supply conditions over multiple operating hours. Under these circumstances, it is unjust and unreasonable to activate new bidding functionality that may facilitate additional commitments through the CAISO's residual unit commitment process. Stated differently, functionality to recognize multi-hour block constraints of

system resources as a biddable parameter in the residual unit commitment process runs counter to the flexibility the CAISO needs on its system, both now and in the future.

Activating a multi-block bidding parameter in the residual unit commitment process could cause more inflexible resource commitments. The better approach is to encourage system resources to submit bids in the day-ahead market and the residual unit commitment process that allow for more flexible dispatch, as opposed to bids in multi-hour blocks. Ideally, these bids would come from resources that the CAISO can ultimately dispatch in real-time at fifteen-minute granularity in its fifteen-minute market. Implementing new functionality to recognize multi-hour block constraints of system resources as a biddable parameter in the residual unit commitment process is no longer just and reasonable given the *de minimis* financial benefits it would provide and the CAISO's growing need for resources with greater dispatch flexibility. The CAISO, therefore, requests that the Commission eliminate the requirement to implement this feature.

D. Flexibility for Ancillary Services Substitution

1. Background

In 2006, several market participants argued that providing scheduling coordinators the ability to substitute an ancillary service for reasons other than an outage could improve the ancillary services procurement process and provide for a secondary ancillary services market.⁶⁹ In response, the CAISO noted it would explore providing scheduling coordinators with the ability to substitute ancillary services for reasons other than an outage to include in a subsequent market release.⁷⁰ Market participants wanted to explore this functionality to obtain greater flexibility to substitute resources providing ancillary services capacity for economic reasons.

In the September 2006 order, the Commission recognized the CAISO's commitment and directed the CAISO to address the flexibility of ancillary services procurement in future market releases.⁷¹ The Commission recognized that although the CAISO's proposal did not provide for suppliers' ability to buy back and/or trade ancillary services, however, the main component, "a Scheduling Coordinator's ability to substitute one generating unit for another in the event of

⁶⁹ See September 2006 order at PP 296, 299. Ancillary service substitution occurs in the hour-ahead scheduling process and is the substitution of a resource that was awarded ancillary services in the day-ahead market for another resource that will provide those awarded ancillary services. April 2007 order at P 85 n. 98.

⁷⁰ See September 2006 order at P 297.

⁷¹ *Id.* at PP 301, 303.

an outage . . . has been preserved.”⁷²

The Commission denied a request for rehearing filed by Williams Power Company, Inc. on this issue in its April 2007 order,⁷³ finding that modifying the software for flexibility for ancillary services substitution prior to Release 1 would be an inefficient use of the CAISO’s resources.⁷⁴ However, the Commission noted that the September 2006 order directed the CAISO to address the ancillary services flexibility issue in future MRTU releases.⁷⁵

In its March 2012 motion, the CAISO explained that since implementing its nodal market design, the CAISO had considered and implemented multiple market enhancements to make ancillary service procurement more efficient.⁷⁶ The CAISO also explained that, as part of its 2011 market design initiatives process, the CAISO solicited comments from stakeholders to assess the priority of various market design issues. For this effort, SCE submitted comments stating it expected the CAISO to include ancillary service substitution in phase 2 of the CAISO’s renewable integration market and product review initiative. The CAISO received no additional comments from stakeholders on this issue.⁷⁷

In the June 2012 order, the Commission granted the CAISO’s request for an extension of time, until April 30, 2014, to assess whether, and how, to develop more flexibility for ancillary services substitution.⁷⁸ In its September 2014 order, the Commission granted the CAISO an extension to implement this directive by April 30, 2017.⁷⁹

2. The CAISO market is just and reasonable without more flexibility for ancillary services substitution

The CAISO market is just and reasonable without allowing for ancillary services substitution for reasons other than an outage. Requiring the CAISO to develop and implement this functionality will not promote market efficiency or support challenges the CAISO faces today.

⁷² *Id.* at P 300.

⁷³ April 2007 order at P 87.

⁷⁴ April 2007 order at P 87.

⁷⁵ *Id.* at P 87.

⁷⁶ March 2012 motion at 18-19 (citing applicable Commission orders and materials provided in the CAISO stakeholder processes).

⁷⁷ *Id.* at 19.

⁷⁸ June 2012 order at PP 26, 28.

⁷⁹ September 2014 order at PP 28, ordering para. (B).

Allowing ancillary services substitution outside of situations involving an outage merely presents an arbitrage opportunity for ancillary service suppliers for which there is no need or any clear market efficiency or reliability benefit. After the fact shuffling of a fleet of resources supporting an ancillary service award or self-provision schedule may allow a scheduling coordinator to gain a profit by using a resource with lower fixed or variable costs. However, this does not make the CAISO's procurement of ancillary services any more efficient or provide a reduction in costs to ratepayers. The CAISO will still have minimum and maximum ancillary service procurement requirements within ancillary service regions. This procurement would limit which resources could feasibly substitute for other resources. Moreover, allowing resource substitutions in situations other than those involving outages would result in individual market participants making optimization decisions without the benefit of understanding system constraints.

Allowing ancillary services substitution in situations not involving an outage is also problematic given the evolution and development of the CAISO markets since MRTU implementation. There are times when the CAISO faces oversupply conditions, and dispatching more resources operating at minimum operating levels can exacerbate those conditions. Requiring greater flexibility in ancillary services substitution could increase the challenges that the CAISO already encounters because resources may need to come online and operate at minimum load to substitute as regulation resources or as spinning reserve capacity.

Market participants can already substitute resources supporting ancillary service capacity if an outage occurs. This functionality allows each market participant some ability to maintain its ancillary service award if an underlying resource experiences an outage. The CAISO requests the Commission find that the CAISO tariff is just and reasonable without allowing ancillary services substitution other than in situations involving an outage, and not require the CAISO to implement this functionality.

IV. The Commission should resolve pending motions filed by the CAISO regarding its compliance with MRTU directives to address exports of ancillary services and rebates of transmission losses to renewable resources

As referenced in Section I.A, the CAISO has submitted a report and motion relating to the directive for it to develop software functionality to support the export of ancillary services.⁸⁰ The CAISO requested that the Commission find that the CAISO had satisfied the September 2006 directive to develop software and market rules to support exports of ancillary services. The CAISO

⁸⁰ April 2013 report/motion.

also filed a report and motion with the Commission regarding conducting a stakeholder initiative to explore rebating over-collections of transmission losses.⁸¹ In the September 2013 report/motion, the CAISO explained that stakeholders no longer desired to explore whether the CAISO should rebate the over-collection of transmission losses to renewable resources. To date, the Commission has not ruled on the CAISO's motions. If the Commission grants the relief requested in this filing, the CAISO's motions will be moot.

A. Developing Software Functionality to Support Exports for Ancillary Services

1. Background

During the stakeholder process underlying development of the MRTU markets, some stakeholders argued that the CAISO should develop functionality to support exports for ancillary services.⁸² In the September 2006 order, the Commission directed the CAISO to develop software to support ancillary services exports through stakeholder processes and propose necessary tariff changes by Release 2.⁸³

In its March 2012 motion, the CAISO requested additional time to examine the benefits of developing this functionality, notwithstanding the newly developed dynamic transfer functionality, *i.e.*, the functionality to support ancillary services exports.⁸⁴ The CAISO committed to filing a report by April 2013 on the status of these efforts.⁸⁵ In its June 2012 order, the Commission accepted this commitment.⁸⁶ The Commission stated that if the CAISO found sufficient benefits from this functionality, it must initiate a stakeholder process to implement functionality in the spring of 2014.⁸⁷

On April 30, 2013, the CAISO filed a report and motion with the Commission addressing the requirement to develop software functionality to support ancillary services exports.⁸⁸ The April 2013 report/motion concluded that any benefits associated with allowing export bids for ancillary services would be difficult to quantify, and the CAISO could not justify costs associated with

⁸¹ September 2013 report/motion.

⁸² September 2006 order at PP 348-355.

⁸³ *Id.* at P 355.

⁸⁴ March 2012 motion at 21.

⁸⁵ *Id.* at 21.

⁸⁶ June 2012 order at P 28.

⁸⁷ *Id.* at P 28.

⁸⁸ April 2013 report/motion.

developing an alternative market mechanism to support exports of ancillary services.⁸⁹ The filing requested that the Commission eliminate any requirement relating to the CAISO developing a bid-based, auction market for ancillary service exports.⁹⁰ The April 2013 report/motion remains pending before the Commission.

2. The CAISO has implemented market rules and functionality permitting the export of ancillary services, and no further functionality is necessary or warranted

As requested in its pending April 2013 report/motion, the Commission should find that the CAISO has satisfied the obligation to develop software to support ancillary services exports. The CAISO has implemented market rules and functionality that allow for the export of ancillary services to external balancing authority areas. Tariff revisions the Commission approved in 2009 at the start of the CAISO's nodal market allows entities to export ancillary services prior to the hour-ahead scheduling process by entering commitments with other balancing authority areas. This process is known as on-demand obligations.⁹¹

As the result of tariff amendments approved in 2011, the CAISO's market now supports dynamic schedules of energy exports to other balancing authority areas. This functionality permits market participants to deliver firm energy outside the CAISO within the period required to support ancillary service obligations.⁹² Resources that have a contractual obligation to export ancillary services or market based rate authority to sell ancillary services can do so using the CAISO's dynamic transfer protocol. Resources can dynamically schedule all or a portion of the actual real-time output of a specific or aggregation of generators within the CAISO balancing authority area to another balancing authority area, provided the transaction meets CAISO tariff requirements. Under this approach, the CAISO treats the ancillary service as a firm energy schedule, and the CAISO can dispatch it on a five-minute basis to honor ancillary service export obligations.

To the extent the Commission contemplated that the CAISO would develop a bid-based auction market for ancillary service exports, the CAISO asks the Commission to find that that the CAISO need not adopt such functionality because its markets are just and reasonable without it. Further, adding such functionality would detract from the CAISO's and stakeholder efforts to address

⁸⁹ *Id.* at 1-2.

⁹⁰ *Id.* at 2.

⁹¹ See CAISO tariff section 8.3.7.

⁹² *Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,239 (2011). See also CAISO tariff, appendix N.

more pressing market design issues. Although allowing export bids for ancillary services may yield benefits, the benefits are difficult to quantify. In theory, developing software functionality and market rules to support bid-based exports of ancillary services could assist external balancing authority areas with managing variable energy resources. However, allowing export bids could also exacerbate the CAISO's Pmin burden because resources may need to operate at minimum load levels to provide spinning reserves to an external balancing authority, or come online to provide energy, if an external balancing authority must dispatch the resource. This outcome could lead to out-of-market actions (e.g., de-committing resources) that may increase uplift and market inefficiencies. The CAISO now believes that implementing software to allow export bids of ancillary services would be unjust and unreasonable.

Finally, other organized markets do not allow their market participants to submit export bids for ancillary services. The CAISO's discussions with representatives of other organized electricity markets in the United States also indicates that these entities do not intend to design market functionality to support export bids for ancillary services.

The Commission should find that the CAISO has already satisfied the directive to provide ancillary services export functionality. If, however, the Commission determines that the original directive required the CAISO to provide the ability for market participants to submit bids for the export of ancillary services, the Commission should find, that the CAISO is no longer required to implement that aspect of the functionality because it is both unnecessary and detrimental to the CAISO's markets.

B. Rebate of Over-Collected Transmission Losses to Renewable Resources

1. Background

During the stakeholder process leading up to the February 2006 MRTU tariff amendment filing, the California Energy Commission (CEC) proposed that the CAISO should rebate over-collected transmission losses to renewable resources.⁹³ This issue arose, in part, from the Commission's recognition that a marginal loss mechanism may place a burden on intermittent resources located near their fuel source but distant from load.⁹⁴

⁹³ September 2006 order at P 1373, n. 570.

⁹⁴ *Cal. Indep. Sys. Operator Corp.*, 107 FERC ¶ 61,274 (2004) at P 150.

In the September 2006 order, the Commission acknowledged that the CAISO would address the CEC's proposal as part of Release 2.⁹⁵ The Commission noted this requirement again in its April 2007 order.⁹⁶ In its March 2012 motion, the CAISO requested that the Commission give it until April 2014 to consider the CEC's proposal because the CAISO was examining other market changes related to the integration of variable energy resources.⁹⁷ In the June 2012 order, the Commission granted an extension of time for CAISO to consider this proposal.⁹⁸

On September 27, 2013, the CAISO filed a report and motion to find that the CAISO had complied with this directive. The CAISO stated in the September 2013 report/motion that it had determined that it was unnecessary to conduct a stakeholder process to examine this proposal because the CAISO had tried to promote renewable resource development.⁹⁹ Stakeholders, including the CEC, expressed no support to examine providing rebates of over-collected transmission losses.¹⁰⁰ Out of an abundance of caution, the CAISO requested that the Commission find the CAISO is no longer required to conduct additional stakeholder processes to address this proposal.¹⁰¹ The September 2013 motion/report remains pending before the Commission.

2. Market enhancements and other facts have made it unnecessary for the CAISO to further assess allocating transmission loss over-collections to renewable resources

As explained in the CAISO's pending September 2013 report/motion on this issue, the Commission should not require the CAISO to initiate a stakeholder process to assess rebating over-collected transmission losses to renewable resources. Intervening market enhancements and other market changes render the current market rules as just and reasonable without this modification, and no further action is necessary.

Since the Commission approved the CAISO's MRTU market structure in 2006, the CAISO has developed and implemented numerous enhancements to promote renewable resource development. These include integrating the

⁹⁵ September 2006 order at P 1373, n. 570.

⁹⁶ April 2007 order at P 662, n. 668.

⁹⁷ March 2012 motion at 22-24.

⁹⁸ June 2012 order at P 26.

⁹⁹ September 2013 report/motion at 1-2.

¹⁰⁰ *Id.* at 6.

¹⁰¹ *Id.* at 1.

transmission planning and interconnection processes to facilitate interconnecting renewable resources to the CAISO controlled grid and to approve ratepayer funded transmission projects to advance public policy goals.¹⁰² By undertaking these steps, the CAISO has reduced the burden on developing intermittent resources located near their fuel source but distant from load.

If adopted, the CEC's original proposal would change how the CAISO allocates over-collected transmission losses by shifting the allocation of these revenues from metered demand (load and exports) to a sub-set of resources interconnected to the CAISO controlled grid. This loss rebate would be a renewables subsidy. Renewables portfolio standards have become more robust since the September 2006 order. California has adopted a 50 percent renewable portfolio standard for load serving entities by 2030.¹⁰³ These increasing renewable portfolio standard requirements provide many opportunities for renewable resources to receive adequate compensation under long-term power purchase agreements with load serving entities. Providing a rebate to renewable resources would unduly discriminate against both conventional generators and renewable resources that participate in the CAISO's market but that interconnect closer to load. Also, the rebate would contravene the CAISO's nodal pricing design, which in part sends a price signal to resources based on the transmission losses incurred by the resource to serve load.

These rebates would conflict with other findings in the September 2006 order that locational marginal pricing (LMP) should be based on marginal losses, and not average losses.¹⁰⁴ Following this directive would base the LMP on average losses, defeating the purpose for increasing transparency through pricing. This would also undermine the market's ability to provide incentives for new generation. The LMP loss component is important for signaling the location of new generation. With renewables, this gains even more importance. Without the loss component, the LMP would not differentiate between a renewable generator near load with lower losses and a renewable generator far from load with high losses.

Finally, stakeholders and the CEC – the party that originally argued for this change – have indicated no desire to continue exploring this option. During recent stakeholder initiatives catalog processes, no stakeholder submitted comments supporting the proposal. Further, the CEC has since dropped its request, informing the CAISO that it no longer wishes to pursue this proposal.

¹⁰² *Cal. Indep. Sys. Operator Corp.*, 140 FERC ¶ 61,070 (2012); see also *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,224 (2010).

¹⁰³ See e.g. CASIO Document Flexible Resources Help Renewables Fast Facts (http://www.aiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf) available on the following website: <http://www.aiso.com/informed/Pages/CleanGrid/default.aspx>.

¹⁰⁴ See, e.g., September 2006 order at P 62.

Attachment B is a letter the CAISO sent to the CEC confirming that the CEC no longer wishes to pursue this initiative. The Commission should find that the CAISO has satisfied its directive and the CAISO need not pursue any further efforts regarding this issue.

V. Contents of Filing

In addition to this transmittal letter, this filing includes these attachments:

- Attachment A: Overview of CAISO Policy Initiative Roadmap
- Attachment B: Letter dated March 18, 2013 from the CAISO to the CEC

VII. Communications

Pursuant to Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,¹⁰⁵ correspondence and other communications regarding this filing should be directed to the following:

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VIII. Service

The CAISO has electronically served copies of this transmittal letter, and all attachments, to all participants on the service list referenced in the September 2006 order docket. In addition, the CAISO is posting this transmittal letter and all attachments on the CAISO website.

¹⁰⁵ 18 C.F.R. § 385.203(b)(3).

IX. Conclusion

The CAISO respectfully requests that the Commission find that the CAISO's current market structure is just and reasonable without implementation of the outstanding directives from the Commission's September 2006 order, and there is no need for the CAISO to implement these directives. The CAISO also asks that the Commission determine that the CAISO has adequately complied with the Commission's directives to develop software functionality to support exports of ancillary services and to hold a stakeholder process to examine rebating the over-collection of transmission losses to renewable resources.

Respectfully submitted

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Attachment A – Overview of CAISO Policy Initiative Roadmap

Market Redesign and Technology Upgrade Directives

California Independent System Operator Corporation

Overview of CAISO Policy Initiative Roadmap

The CAISO's policy development plan includes several important potential enhancements to the CAISO's real-time market's economic dispatch and unit commitment processes.¹ These enhancements will increase market efficiency by moving energy dispatch and unit commitment into the same market run. Among the potential benefits are shortening the CAISO's scheduling timeline, which stakeholders have identified as important to reducing the impact of the Western Energy Imbalance Market on bilateral transactions in the West. Another potential benefit is extending the real-time market's unit commitment look-ahead process. Because the CAISO system load now peaks twice per day because of the large amount of renewable generation, extending the look-ahead is critically important so the market can commit resources to manage these two peaks. Finally, the real-time market enhancements initiative will explore re-optimizing ancillary services in the real-time market, which among other benefits, addresses some of the issues underlying the desire for broader ancillary services substitution options that this filing addresses.²

The CAISO's 2017 policy development roadmap also reflects the CAISO currently working with stakeholders to develop various other market changes that will facilitate the ongoing transformation of the electric system and will enable the CAISO to reliably manage the CAISO controlled grid. The CAISO continues to develop market changes to integrate energy storage and distributed energy generation. The CAISO is also exploring a potential frequency response market product, which will gradually become more important with increased amounts of renewables and could also provide enhanced market incentives for resources with needed operational attributes.³ In addition, the CAISO continues to explore contingency modeling enhancements and is currently in the process of developing generator contingency and remedial action scheme modeling to enhance reliability and to foster market incentives for resources with needed operational attributes.

While the CAISO recently implemented its flexible ramping product so that the market could better manage the needed dispatch flexibility needed to integrate

¹ California ISO 2017 Policy Initiatives Roadmap.
http://www.aiso.com/Documents/Final_2017PolicyInitiativesRoadmap.pdf

² The Real-Time Market Enhancements is an initiative ranked highest in the CAISO's 2017 discretionary items. Its goals include: (1) improving market efficiency; (2) extending unit commitment time horizon; (3) better aligning ancillary services procurement with flexible ramping product and energy; and (4) improving fifteen-minute market and EIM base schedule submission timing. See CAISO 2017 Policy Initiatives Roadmap, p. 6, <https://www.aiso.com/Documents/Agenda-Presentation-2017PolicyInitiativesRoadmap.pdf>.

³ *California Indep. Sys. Op. Corp.*, 156 FERC ¶ 61,182 (2016) at P 50. See also, Informational Report for Frequency Response filed by the CAISO on March 15, 2017 in Docket ER16-1486: <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14521672>

Overview of CAISO Policy Initiative Roadmap

renewable resources into the CAISO controlled grid, the CAISO is presently developing modifications to its forward capacity planning provisions to ensure that its markets have access to sufficient flexible resources.⁴ The CAISO plans to work with stakeholders this year to enhance its resource adequacy provisions, including improvements to its criteria for flexible resources. The CAISO is also planning stakeholder initiatives to enhance the process to retain critical conventional generation that otherwise is planning on retirement and to refine the criteria for economic and maintenance outages. These issues are becoming critically important as conventional generation retires because of the market transformation to renewable generation.

The CAISO is also conducting a stakeholder process to explore changes to reference levels used in market power mitigation of resource commitment costs and energy bids and potential changes to the way the CAISO market mitigates market power in commitment costs.⁵ The potential benefits of these changes include allowing resources to better manage natural gas price variability and gas system operational constraints, including the current constraints at the Aliso Canyon natural gas storage facility. This initiative fulfills previous commitments to the Commission⁶ and will also develop the energy bid validation criteria and processes needed to comply with the Commission's Order 831 relating to energy offers caps.

The CAISO has initiated a stakeholder initiative to examine whether changes to its congestion revenue rights market are appropriate. This initiative is to address the relative large differences between the congestion revenue paid to congestion revenue rights and the amount they sell for in the CAISO's congestion revenue right auctions. As noted in the CAISO's Department of Market Monitoring's May 2016 annual report, CAISO's congestion revenue right auction revenues have only been about 45 percent of their value from 2012 through 2015, representing about a \$130 million shortfall.⁷

⁴ More information about the CAISO's stakeholder process is available at the following website: <http://www.caiso.com/informed/Pages/StakeholderProcesses/FlexibleResourceAdequacyCriteria-MustOfferObligations.aspx>

⁵ More information about the CAISO's stakeholder process is available at the following website: http://www.caiso.com/informed/Pages/StakeholderProcesses/CommitmentCosts_DefaultEnergyBidEnhancements.aspx

⁶ More information about the CAISO's stakeholder process is available at the following website: http://www.caiso.com/informed/Pages/StakeholderProcesses/CommitmentCosts_DefaultEnergyBidEnhancements.aspx

⁷ California ISO, 2015 Annual Report on Market Issues & Performance prepared by the Department of Market Monitoring, May 2016 at 14 and 182-188. <http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>

Overview of CAISO Policy Initiative Roadmap

The CAISO's policy development plan for 2017 also includes numerous further improvements to the Western Energy Imbalance Market, which provides economic benefits throughout the West in addition to helping to integrate renewable resources. Importantly, the CAISO continues to work with stakeholders, including the California Air Resources Board, to more accurately reflect the greenhouse gas emissions resulting from Energy Imbalance Market dispatches. The proposed solution will require the CAISO to expend substantial effort modifying its real-time market and testing the results as it will require the real-time market to make a second run for every dispatch interval. The CAISO also plans to develop several other improvements to the EIM this year in response to stakeholders' requests. These improvements include a mechanism to improve market participants' ability to manage exposure to congestion charges associated with schedule changes to bilateral transactions in Energy Imbalance Market areas, a potential transmission charge, and a mechanism for entities that are not EIM participants to make transmission available to the EIM.⁸

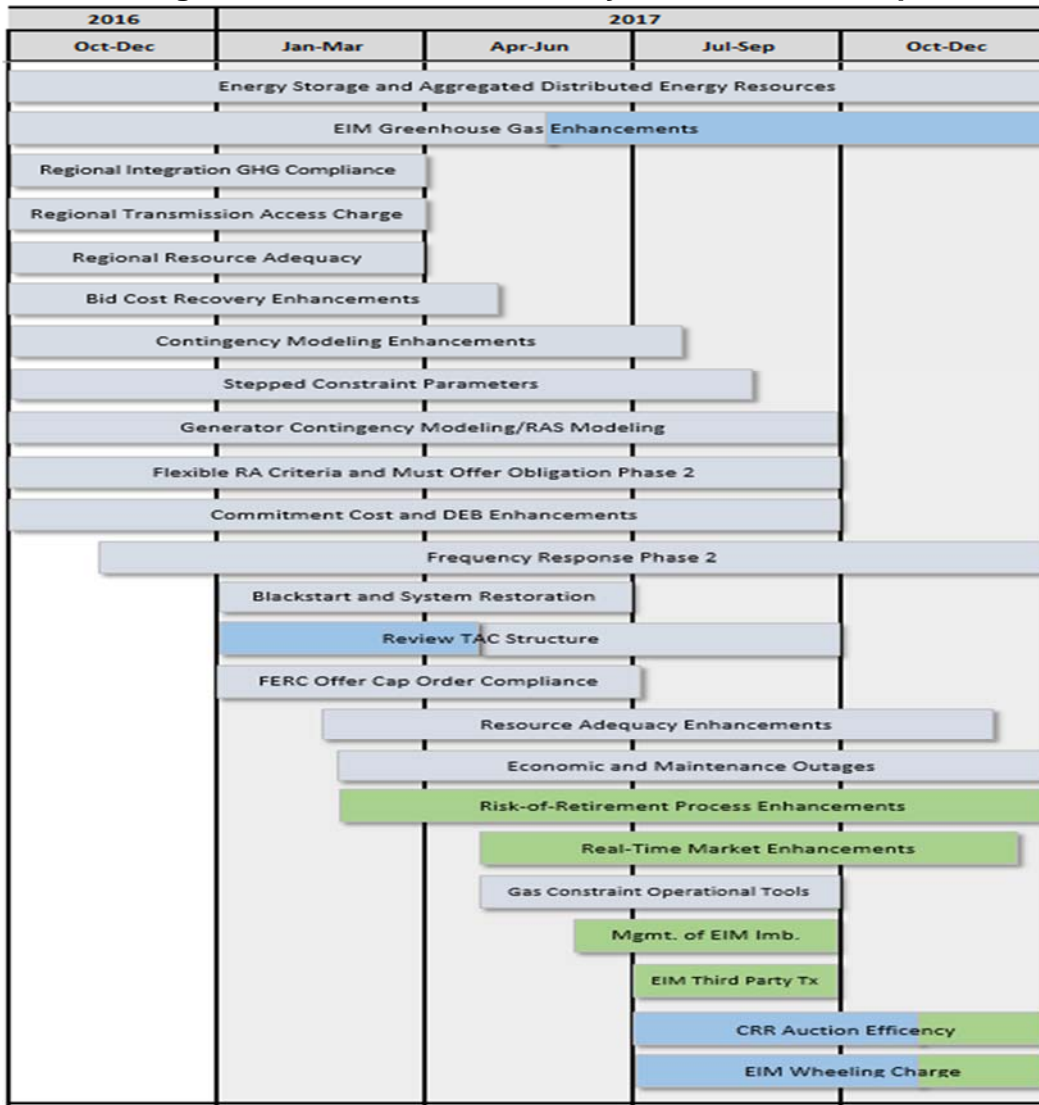
Figure A-1 depicts the timelines for the 2017 policy roadmap. Initiatives marked in grey are non-discretionary on-going initiatives.⁹ Initiatives marked in green are discretionary initiatives. Initiatives marked in blue are currently in the development phase.

⁸ See California ISO 2017 Policy Initiatives Roadmap at 5.
http://www.caiso.com/Documents/Final_2017PolicyInitiativesRoadmap.pdf

⁹ The CAISO has closed its initiative addressing stepped constraint parameters.
<http://www.caiso.com/Documents/SteppedConstraintParametersInitiativeClosed030817CallCancelled.html>
The Real-Time Market Enhancements initiative will include considering co-optimizing ancillary services and energy in the real-time market. This will provide an opportunity to consider if graduated penalty prices are appropriate when there are insufficient energy bids.

Overview of CAISO Policy Initiative Roadmap

Figure A-1 – CAISO 2017 Policy Initiative Roadmap



Attachment B – Letter Dated March 18, 2013 from the CAISO to the CEC

Market Redesign and Technology Upgrade Directives

California Independent System Operator Corporation

March 18, 2013

Via Electronic and U.S. Mail

Mr. Robert Oglesby
Executive Director
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Request for California ISO to consider transmission loss rebate for renewable resources

Dear Mr. Oglesby:

In 2005, the California Energy Commission advocated that the California Independent System Operator Corporation adopt a rebate payable to renewable resources for over-collected transmission losses as part of the ISO's efforts to implement nodal markets. In an order dated September 21, 2006, the Federal Energy Regulatory Commission directed the ISO to consider the addition of features such as the CEC's proposal in subsequent market design releases.¹ This letter confirms the CEC's position that it no longer wishes that the ISO pursue examination of a rebate for over-collected transmission losses to renewable resources. We plan to inform the Federal Energy Regulatory Commission of the CEC's position later this year.

Thank you for your attention to this matter. If you have any questions, please feel free to contact me at 202.239.3947.

Sincerely,

/s/ Andrew Ulmer

Andrew Ulmer
Director, Federal Regulatory Affairs

cc: Dick Ratliff – CEC
Arlene Ichien - CEC
Sylvia Bender - CEC
Delphine Hou - ISO

¹ *California Independent System Operator Corp* 116 FERC ¶ 61,274 (September 2006) at P1402.