143 FERC ¶ 61,087
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;
Philip D. Moeller, John R. Norris,
Cheryl A. LaFleur, and Tony Clark.

California Independent System Operator Corporation — Docket No. ER11-4580-000

ORDER CONDITIONALLY ACCEPTING PROPOSED TARIFF REVISIONS

(Issued May 2, 2013)

1. On September 21, 2011, pursuant to section 205 of the Federal Power Act (FPA),[1] the California Independent System Operator Corporation (CAISO) proposed revisions to its Open Access Transmission Tariff (Tariff)[2] to eliminate convergence bidding at intertie scheduling points (intertie convergence bidding).[3] In an order issued on November 25, 2011,[4] the Commission found that CAISO had not demonstrated that its proposal was just and reasonable. Thus, the Commission accepted and suspended it, for a nominal period, effective November 28, 2011, as requested, and made its acceptance subject to the outcome of a technical conference and further Commission order.[5] The technical conference was convened by Commission staff on February 2, 2012.

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[1] 16 U.S.C. § 824e (2006).

[2] California Independent System Operator Corporation, FERC Electric Tariff, OATT, Fifth Replacement.

[3] CAISO September 21, 2011 Proposed Tariff Amendment Eliminating Convergence Bidding (CAISO September 21, 2011 Filing).

[4] *Cal. Indep. Sys. Operator Corp.*, 137 FERC ¶ 61,157 (2011) (November 25 Order).

[5] November 25 Order, 137 FERC ¶ 61,157 at P 38.

2. For the reasons discussed below and upon our further review of the record, as supplemented, we conditionally accept CAISO's proposal to suspend intertie convergence bidding, effective November 28, 2011, finding it to be just, reasonable, and not unduly discriminatory, subject to the conditions discussed herein.

I. Background

A. CAISO Markets

3. CAISO operates a financially binding day-ahead market,[6] an Hour-Ahead Scheduling Process (HASP), and a real-time market. In the day-ahead market, CAISO procures supply to meet its bid-in demand for the day. After CAISO receives and clears all bids submitted, CAISO establishes the final day-ahead schedules in the IFM process and sets a day-ahead locational marginal price (day-ahead price). If the amount of physical energy procured in the final day-ahead schedules is below CAISO's projected load forecast, CAISO procures additional resources to meet its load forecast in the RUC process on a least-cost basis. Resources procured in the RUC process are not included in the day-ahead optimization and their cost is therefore not reflected in the day-ahead price.

4. Subsequent to the day-ahead market, CAISO operates both a HASP and a real-time market, together referred to as the "dual real-time market structure."[7] The HASP procures energy based on forecasted demand and determines how much additional energy to import from and export to neighboring systems based on bids submitted for imports and exports at the intertie scheduling points. These bids clear in the HASP based on locational marginal prices established in the HASP (HASP price). In the real-time market, CAISO settles internal transactions based on actual demand at the five-minute real-time dispatch price (real-time price). Imbalance conditions can change after the HASP and before the real-time dispatch, for example due to changes in load forecasts, resource deviations, and actual energy delivery. Because the forecasted demand often differs from the

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[6] The day-ahead market includes an Integrated Forward Market (IFM) process and a Residual Unit Commitment (RUC) process.

[7] CAISO explains that these two separate real-time market clearing processes are unique to the CAISO market, where it must manage interconnections with non-CAISO regions that operate on hourly transmission schedules. CAISO September 21, 2011 Filing at 2, 13.

actual demand due to changes in imbalance conditions, the HASP price and the real-time price can differ.[8]

B. Intertie Convergence Bidding in CAISO[9]

5. Pursuant to Commission direction, on February 1, 2011, CAISO implemented convergence bidding on internal nodes and intertie scheduling points, subject to temporary position limits.[10] Convergence bidding is a market feature that involves the submission of bids to buy or sell electric energy in the day-ahead market, without any obligation to consume or provide electricity. Convergence bids that are submitted at internal nodes settle at the day-ahead price and are then automatically liquidated with the opposite buy or sell position at the real-time price. Convergence bids that are submitted at intertie scheduling points settle at the day-ahead price and are then automatically liquidated with the opposite buy or sell position at the HASP price.

6. The Commission has long recognized the benefits convergence bidding is capable of providing in CAISO's market. In particular, the Commission recognized that a properly designed convergence bidding system expands competition and improves market performance, thereby helping to prevent the exercise of market power. Additionally, by reducing the price differences between day-ahead and real-time markets, convergence bidding reduces the incentive for load serving entities to under-schedule in the day-ahead market at the expectation of better prices in the real-time market. Further, the Commission stated that market participants can avoid using physical schedules as a means to hedge financial expectations by submitting virtual supply and virtual demand bids. The Commission also found that convergence bidding would reduce implicit convergence bidding, whereby market participants take actions in the physical

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[8] Direct Testimony of Mark A. Rothleder, Attachment to CAISO September 21, 2011 Filing, at 5 (Rothleder Test.).

[9] For a more detailed description of the history of convergence bidding, please see *Cal. Indep. Sys. Operator Corp.*, 130 FERC ¶ 61,122, at PP 3-5 (2010).

[10] *Cal. Indep. Sys. Operator Corp.*, 107 FERC ¶ 61,274, at P 159, *order on reh'g*, 108 FERC ¶ 61,254 (2004) (*CAISO*); *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,039, at P 121 (2010), *order on reh'g*, 136 FERC ¶ 61,056 (2011) (establishing position limits that restrict the total megawatts of convergence bids that a scheduling coordinator can place on behalf of a single convergence bidding entity at any one internal node or intertie scheduling point).

market to arbitrage the price difference between the day-ahead and real-time markets. Implicit convergence bidding poses potential reliability concerns due to the expectation that energy will actually be delivered.[11] The Commission also emphasized that convergence bidding could improve day-ahead unit commitment thereby helping reduce the reliance on the RUC process and thereby reduce uplift.[12]

7. In order to facilitate intertie convergence bidding, CAISO enforced two software constraints for the purposes of scheduling and pricing (dual software constraints). These constraints ensure that net physical imports or exports do not exceed the scheduling limit at the intertie scheduling point, consistent with the applicable reliability standards of the North American Electric Reliability Corporation (NERC), and the Western Electricity Coordinating Council (WECC) and also establishes a shared congestion price for physical-plus-virtual bids at each intertie location and ensures that physical and virtual schedules are cleared together and codetermined based on their economic bid prices in the IFM.[13]

C. CAISO September 21, 2011 Filing

8. In the CAISO September 21, 2011 Filing, CAISO proposed to eliminate all intertie convergence bidding in order to address, and prevent, observed market inefficiencies related to an increase in price divergence between HASP and real-time prices and higher than expected real-time imbalance energy offset charges that are allocated to measured demand (i.e., metered load and exports),[14] as well as

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[11] *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,039, at P 134 (2010).

[12] *See CAISO*, 107 FERC ¶ 61,274 at P 158; *Cal. Indep. Sys. Operator Corp.*, 112 FERC ¶ 61,013, at P 175 (2005), *order on reh'g*, 112 FERC ¶ 61, 310 (2005); *Cal. Indep. Sys. Operator Corp.*, 116 FERC ¶ 61,274, at PP 447-452 (2006), *order on reh'g*, 119 FERC ¶ 61,076 (2007).

[13] CAISO September 21, 2011 Filing at 7-8.

[14] The real-time imbalance energy offset is a neutrality account. CAISO charges all load imbalances from the day-ahead based on real-time prices. To the extent that HASP and real-time prices are different, CAISO may not collect sufficient revenue from load to recover the total cost of supply (or it may collect surplus revenue) in the combination of the HASP and real-time dispatch. The real-time imbalance energy offset is used to reconcile the settlement dollar values for all real-time energy to ensure that after payments and charges for the real-time energy market have been calculated, there is no shortage or surplus in revenue.

(continued…)

price inconsistencies between the bid price and the market clearing locational marginal price at interties caused by the enforcement of the dual software constraints.[15]

9. As a result of predictable pricing trends and the dual real-time market structure, CAISO claimed that market participants were able to profit from submitting large volumes of virtual supply bids at intertie scheduling points and offsetting virtual demand bids at internal nodes (offsetting convergence bidding strategy). Under this strategy, CAISO explained that the virtual demand and virtual supply positions in the day-ahead settlement would offset each other and that a market participant would profit from the liquidation of those positions by paying a usually lower HASP price for the virtual import bid, and receiving a usually higher real-time price for the virtual demand bid.[16] CAISO explained that, when convergence bids on the interties are cleared against internal convergence bids and the HASP price is less than the real-time price, the real-time imbalance energy offset incurs a charge, which is allocated to scheduling coordinators with measured demand.[17]

10. CAISO noted that the observed inefficiencies, including uplift costs, would be permanently addressed through a change to the existing market design by modifying the dual real-time market structure. Accordingly, CAISO stated that it began another stakeholder process to consider far-reaching market design changes. CAISO argued that suspension of intertie convergence bidding is appropriate until such a time as the fundamental market design issues are resolved.[18]

Any shortages or surpluses are allocated to all scheduling coordinators based on a *pro rata* share of their measured demand (i.e., metered load and exports). CAISO September 21, 2011 Filing at 10; Rothleder Test. at 5-6.

[15] For a more detailed description CAISO's claims, please see the CAISO September 21, 2011 Filing and the November 25 Order.

[16] *See* CAISO September 21, 2011 Filing at 10-11; Rothleder Test. at 15-16.

[17] CAISO September 21, 2011 Filing at 10-11.

[18] *Id.* at 19.

D. November 25 Order

11. The November 25 Order accepted and suspended CAISO's proposed tariff revisions for a nominal period to become effective November 28, 2011, as requested, subject to the outcome of a technical conference and further order by the Commission. The Commission stated that CAISO had not demonstrated that its proposed suspension of convergence bidding at the interties was just and reasonable and that issues related to intertie convergence bidding would benefit from further examination by Commission staff and the parties to the proceeding.

12. The Commission stated that it was imperative to examine the costs, benefits, and potential solutions associated with intertie convergence bidding at greater length to determine whether they warranted its indefinite elimination.[19] Further, given the indefinite nature of CAISO's proposal, the Commission found it was critical to evaluate *when* CAISO would address the underlying dual real-time market structure, and the cause of the inefficiencies.[20]

II. Notice of Filing and Responsive Pleadings

13. Notice of the CAISO September 21, 2011 Filing was published in the *Federal Register*, 76 Fed. Reg. 60,012 (2011), with protests and interventions due on or before October 11, 2011. Numerous parties filed timely motions to intervene, comments, and protests.[21]

14. Notice of Technical Conference was issued on December 2, 2011, with a supplemental notice published on December 16, 2011. In the December 16, 2011 supplemental notice, the Commission's agenda included the following items for discussion: (1) the performance of convergence bidding at intertie scheduling points and internal nodes; (2) the dual real-time market structure; and (3) alternative proposals to indefinitely eliminating intertie convergence bidding. Regarding costs and benefits associated with intertie convergence bidding, the Commission specifically solicited quantifiable data about price divergence and uplift costs, as well as information on the less quantifiable hedging benefits and benefits for renewable resources.

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[19] November 25 Order, 137 FERC ¶ 61,157 at P 39.

[20] *Id.* P 42.

[21] *Id.* P 15.

15. The Commission held a technical conference on February 2, 2012, to discuss issues related to the suspension of intertie convergence bidding, at which CAISO and the CAISO Department of Market Monitoring (DMM) made presentations and Commission staff and stakeholders participated.

16. On February 8, 2012, notice was issued setting the initial post-technical conference comment and reply comment dates of February 23, 2012, and March 9, 2012, respectively. On February 28, 2012, the Commission extended the comment dates to March 16, 2012, and March 30, 2012, respectively.

17. On February 10, 2012, Monterey Enterprises, LLC, SESCO Enterprises LLC, XO Energy Companies, and West Oaks Energy, LLC (Financial Marketers) submitted a data request to CAISO in Docket No. ER11-4580-000. On March 1, 2012, CAISO responded to the requests for data posed at the technical conference, and on March 13, 2012, CAISO submitted further responses to requests for data.

18. On March 16, 2012, the Commission received initial post-technical conference comments from: Brookfield Energy Marketing LP (Brookfield); California Department of Water Resources State Water Project (SWP); CAISO; The Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California (Six Cities); DC Energy California, LLC (DC Energy);[22] Gila River Power, LLC (Gila River); Financial Institutions Energy Group (FIEG); Northern California Power Agency (NCPA); NRG Power Marketing LLC, Cabrillo Power I LLC, Cabrillo Power II LLC, El Segundo Power, LLC, Long Beach Generation LLC, NRG Solar Blythe LLC, Avenal Solar Holdings LLC and NRG Solar Roadrunner (NRG); J.P. Morgan Ventures Energy Corporation and BE CA LLC (JP Morgan); Financial Marketers; Morgan Stanley Capital Group Inc. (Morgan Stanley); Pacific Gas & Electric Company (PG&E); Powerex Corporation (Powerex); San Diego Gas & Electric Company (SDG&E); Sacramento Municipal Utility District (SMUD); Southern California Edison Company (SoCal Edison);[23] and Western Power Trading Forum (WPTF).

19. On March 30, 2012, the Commission received post-technical conference reply comments from: Brookfield; CAISO; JP Morgan; Morgan Stanley; NCPA; NRG; PG&E; Powerex; Six Cities; SoCal Edison; SWP; and WPTF.

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[22] DC Energy supports, in general, WPTF's comments. DC Energy March 16, 2012 Initial Comments at 1.

[23] SoCal Edison filed two errata to its initial comments on March 19, 2012.

20. On August 29, 2012, WPTF submitted a motion to expedite consideration of CAISO's filing. CAISO, Financial Marketers, PG&E, Powerex, Six Cities, SoCal Edison, and SWP submitted answers to WPTF's motion.

III. Discussion

A. Comments

21. Although the comments received following the technical conference were varied, they fell broadly into four categories, including comments that: (1) emphasized the benefits of intertie convergence bidding, (2) emphasized the costs resulting from intertie convergence bidding, (3) debated redesigning the CAISO market, and (4) proposed alternative interim solutions. Below we summarize those comments and responses.

Benefits of Intertie Convergence Bidding

22. Brookfield Energy, FIEG, Financial Marketers, JP Morgan, Morgan Stanley and WPTF all strongly emphasize the benefits of convergence bidding on intertie scheduling points.[24] WPTF and Morgan Stanley argue that CAISO's data shows many months with increased convergence between the day-ahead price and the HASP price on interties and between the day-ahead price and the real-time price on internal nodes at certain times.[25] Brookfield Energy argues that in the hours in which day-ahead prices were higher than real-time prices, net virtual supply at the interties helped converge day-ahead and real-time prices.[26]

23. On the other hand, some parties argue that, under the dual real-time market structure, rational bidding behavior rarely results in price convergence, and prevents the benefits that were anticipated with the implementation of

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[24] *See e.g.*, Brookfield Energy March 30, 2012 Reply Comments at 5; FIEG March 16, 2012 Initial Comments at 3; Financial Marketers March 16, 2012 Initial Comments at 16, (citing *Cal. Indep. Sys. Operator Corp.*, 130 FERC ¶ 61,122, at P 30 (2010)); JP Morgan March 16, 2012 Initial Comments at 4-8; Morgan Stanley March 30, 2012 Reply Comments at 2-4; WPTF March 30, 2012 Reply Comments at 3-5.

[25] WPTF March 16, 2012 Initial Comments at 4-5; Morgan Stanley March 16, 2012 Initial Comments at 13-14.

[26] Brookfield Energy March 30, 2012 Reply Comments at 6.

convergence bidding from being realized.[27] CAISO states that it has improved operational practices in order to reduce price differentials between the HASP and real-time prices but notes that such efforts have not fully eliminated predictable price disparities.[28] CAISO states that since intertie convergence bidding was suspended, it has observed price convergence, noting that the submission of balanced virtual positions stopped.[29]

24. Brookfield Energy, FIEG, Financial Marketers Gila River, JP Morgan, Morgan Stanley, and WPTF argue that intertie convergence bidding also provides measurable hedging benefits.[30] Several parties argue that convergence bidding improves the capability to hedge intermittency of variable energy resources.[31] Parties also emphasize the importance of the hedging capability for renewable resources will only increase going forward.[32] Gila River and WPTF also state that market participants can use virtual supply bids at the interties to hedge day-ahead prices and then import energy in the HASP, where congestion is less likely.[33] Gila

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[27] CAISO March 16, 2012 Initial Comments at 4; SoCal Edison March 16, 2012 Initial Comments at 5-8; SWP March 30, 2012 Reply Comments at 4-7.

[28] CAISO March 30, 2012 Reply Comments at 5.

[29] CAISO March 16, 2012 Initial Comments at 8;

[30] Brookfield Energy March 16, 2012 Initial Comments at 7-8; Gila River March 16, 2012 Initial Comments at 1-2; FIEG March 16, 2012 Initial Comments at 4-8; Financial Marketers March 16, 2012 Initial Comments at 19-20; JP Morgan March 16, 2012 Initial Comments at 4-8; Morgan Stanley March 16, 2012 Initial Comments at 7; WPTF March 16, 2012 Initial Comments at 18.

[31] Under this hedging strategy, a supplier could submit a virtual supply bid for its expected output and wait for the HASP market to bid its physical resource into the market, thereby earning the day-ahead price for its resource. *See* Brookfield Energy March 16, 2012 Initial Comments at 7; Morgan Stanley March 16, 2012 Initial Comments at 7.

[32] Brookfield Energy March 16, 2012 Initial Comments at 11; FIEG March 16, 2012 Initial Comments at 3; Morgan Stanley March 16, 2012 Initial Comments at 7-8.

[33] Gila River March 16, 2012 Initial Comments at 1-2; WPTF March 16, 2012 Initial Comments at 18.

River notes that it has used convergence bidding to hedge day-ahead prices and import energy in the HASP. Gila River argues that, along with other external resources, it would likely import less energy if it does not have the ability to hedge imports with convergence bids.[34]

25. In response, CAISO states that although market participants could theoretically facilitate renewable resource delivery through virtual intertie bidding, and use convergence bidding to hedge delivery risk, the CAISO DMM has reviewed bidding data over the ten month period when intertie convergence bidding was permitted, and the data does not show evidence that the bidding strategy was used.[35] Six Cities also states that hedging activities using convergence bidding have been minimal.[36] SWP states the ability to hedge does not warrant CAISO sponsorship and ratepayer subsidization of a derivatives market for the sole purpose of providing a few power sellers a hedging device.[37]

26. Morgan Stanley and Brookfield Energy disagree with the CAISO DMM suggestion at the technical conference that a renewable resource can facilitate its imports through physical schedules only (i.e., without convergence bidding), expressing concern that scheduling in this manner may be construed as implicit convergence bidding and not simply hedging.[38] In particular, Brookfield Energy states that that the HASP reversal settlement rule requires procurement of transmission and e-tagging prior to the HASP or "claw back" of profits for those physical transactions that are not e-tagged resulting from differences in prices between the day-ahead and HASP price, if a day-ahead physical schedule is bought back in the HASP. Accordingly, Brookfield Energy and Morgan Stanley state that market participants relying on physical bids to hedge delivery must procure transmission prior to HASP, even if all of the transmission may not be needed. Brookfield Energy states that while intertie convergence bidding is superior, if the HASP reversal settlement rule is removed, it could agree that

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[34] Gila River March 16, 2012 Initial Comments at 1-2.

[35] CAISO March 16, 2012 Initial Comments at 11.

[36] Six Cities March 30, 2012 Reply Comments at 4.

[37] SWP March 30, 2012 Reply Comments at 3-4.

[38] Brookfield March 16, 2012 Initial Comments at 8-9; Morgan Stanley March 16, 2012 Initial Comments at 9-10.

physical scheduling mechanisms could become more interchangeable with intertie virtual bidding.[39]

27. In addition to the convergence benefits and hedging benefits, Brookfield Energy, Gila River, Morgan Stanley, and WPTF argue that intertie convergence bidding has reduced day-ahead prices.[40] Brookfield Energy states that the net supply position created by intertie convergence bids has had the effect of lowering the day-ahead price paid by load by more than $1.50/MWh, and Morgan Stanley cites that the day-ahead price has fallen by over $1.00/MWh.[41] However, several parties, including CAISO, argue that the price reduction in the day-ahead market is being driven by a market design issue and not by efficient bidding in response to accurate market signals, and therefore, it does not constitute a benefit.[42] CAISO argues that the purported savings in the cost of procurement in the day-ahead market may well be lost through payments made in another form. For instance, CAISO states that generators who face lower day-ahead prices may seek to make up those revenues through capacity contracts.[43]

28. Finally, Financial Marketers and Morgan Stanley state that another benefit of convergence bidding is that explicit convergence bidding reduces implicit convergence bidding, which can cause reliability impacts.[44] CAISO counters that it has not found evidence, subsequent to the elimination of intertie convergence

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[39] Brookfield Energy March 16, 2012 Initial Comments at 11; Morgan Stanley March 16, 2012 Initial Comments at 10.

[40] Brookfield Energy March 16, 2012 Initial Comments at 15; Gila River March 16, 2012 Initial Comments at 2; Morgan Stanley March 16, 2012 Initial Comments at 10-12; WPTF March 16, 2012 Initial Comments at 7-8.

[41] Brookfield Energy March 16, 2012 Initial Comments at 15.

[42] CAISO March 30, 2012 Reply Comments at 6-7; PG&E March 30, 2012 Reply Comments at 6; Six Cities March 30, 2012 Reply Comments at 5.

[43] CAISO March 30, 2012 Reply Comments at 7.

[44] Financial Marketers March 16, 2012 Initial Comments at 17-18; Morgan Stanley March 16, 2012 Initial Comments at 9-12.

bidding, that there has been implicit convergence bidding. CAISO argues that its existing measures to deter implicit convergence bidding are effective.[45]

Costs Resulting From Intertie Convergence Bidding

29. CAISO, PG&E, SDG&E, Six Cities, and SoCal Edison argue that intertie convergence bidding resulted in significant increased costs, and these costs support continued suspension of convergence bidding at the interties.[46]

30. CAISO states that the total uplift cost from convergence bidding over the ten month period when intertie convergence bidding was permitted was approximately $58.6 million. $36.7 million of the total uplift cost was caused by offsetting virtual bids that were made by the same scheduling coordinator, including instances where a virtual supply bid was submitted on an intertie scheduling point and a virtual demand bid was submitted on an internal node, thus allowing for the difference between the real-time price and HASP price to be arbitraged. $21.9 million of the total uplift cost was caused by offsetting bids that were independently submitted by different scheduling coordinators. CAISO also argues that, although the values fell over time due, in part, to software improvements, the uplift costs were still substantial, ranging from $1.1 million per month to $3.5 million per month over the last five months intertie convergence bidding was in effect.[47] Six Cities argue that, although the recent market design initiatives have moderated the differences between the HASP and real-time prices, increased volumes of convergence bidding transactions could significantly increase real-time imbalance energy offset amounts.[48]

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[45] CAISO March 16, 2012 Initial Comments at 12 (citing *Cal. Indep. Sys. Operator Inc.*, 133 FERC ¶ 61,039 at PP 130-134, *order on reh'g*, 134 FERC ¶ 61,070 (2011)).

[46] CAISO March 16, 2012 Initial Comments at 9-10; PG&E March 30, 2012 Reply Comments at 6-7; SDG&E March 16, 2012 Initial Comments at 1-2; Six Cities March 30, 2012 Reply Comments at 2-3; SoCal Edison March 16, 2012 Initial Comments at 11-13.

[47] CAISO March 16, 2012 Initial Comments at 9-10.

[48] Six Cities March 30, 2012 Reply Comments at 2-3.

31. Several parties argue that the existing convergence bidding design is problematic because the convergence bidding participants do not pay for the uplift associated with behavior and associated profits.[49] CAISO notes that the cost of maintaining convergence bidding may increase over time, and the load-serving entities are unable to protect themselves from the costs.[50] In response to WPTF claims that real-time imbalance energy offset costs only account for one percent of the total day-ahead and real-time energy costs,[51] PG&E states that these costs still amount to a significant cost, given that there are no demonstrable benefits to load to justify this cost.[52]

32. In response, several parties state that the high real-time imbalance energy offset costs are caused by the dual real-time market structure, specifically by the difference between the HASP and real-time prices, and were high prior to the implementation of convergence bidding, and are aggravated by operational issues and inaccurate load forecasts.[53] Brookfield Energy, DC Energy, Financial Marketers, JP Morgan and WPTF state that, as a result of improved load forecasting and real-time operations real-time imbalance energy offset costs fall.[54] Brookfield Energy argues that these values have fallen from $22 million in June 2010 to just $2 million in December of 2011.[55] WPTF and Gila River argue that

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[49] CAISO March 16, 2012 Initial Comments at 9-10; SDG&E March 16, 2012 Initial Comments at 1-2; SoCal Edison March 16, 2012 Initial Comments at 11-13; SWP March 30, 2012 Reply Comments at 7-8.

[50] CAISO March 30, 2012 Reply Comments at 3, 9.

[51] WPTF March 16, 2012 Initial Comments at 8-9.

[52] PG&E March 30, 2012 Reply Comments at 7.

[53] Brookfield Energy March 16, 2012 Initial Comments at 13; Morgan Stanley March 16, 2012 Initial Comments at 3; Financial Marketers March 16, 2012 Initial Comments at 6-7; WPTF March 16, 2012 Initial Comments at 10-12.

[54] Brookfield Energy March 16, 2012 Initial Comments at 5-6; JP Morgan March 16, 2012 Initial Comments at 4-8; JP Morgan March 30, 2012 Reply Comments at 5-6;Morgan Stanley March 16, 2012 Initial Comments at 3; Morgan Stanley March 30, 2012 Reply Comments at 1-2; WPTF March 16, 2012 Initial Comments at 10-12.

[55] Brookfield Energy March 16, 2012 Initial Comments at 6.

CAISO's cost estimates overstate the impact of convergence bidding on the real-time imbalance energy offset.[56]

33. In addition to the high real-time imbalance energy offset costs, parties argue that intertie convergence bidding was not driving efficient day-ahead unit commitment and did not reduce reliance on the RUC process or reduce costs from inefficient unit commitments.[57] CAISO states that since intertie convergence bidding was suspended, it observed efficient day-ahead unit commitment, noting that when the day-ahead price moves closer to the real-time price, physical suppliers do not have an incentive to withhold their resources from the day-ahead market.[58]

34. However, JP Morgan, NRG, and WPTF state that CAISO has not demonstrated that there are increased commitment costs. JP Morgan argues that any increased RUC costs have been *de minimis*.[59] WPTF notes that the technical conference materials indicate decreased IFM commitment costs and increased RUC costs but do not show that overall commitment costs have increased. WPTF states that total commitment costs have trended down with convergence bidding noting that an intertie convergence bid offset by an internal convergence bid has a null effect on unit commitment.[60]

35. SoCal Edison highlights that CAISO has imported 20-30 percent of power at times and warns that there is potential for market manipulation via exploitation of the dual software constraints if convergence bidding were to be reinstated.[61] Financial Marketers, JP Morgan, Morgan Stanley, and WPTF respond that the

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[56] WPTF March 16, 2012 Initial Comments at 10-12; Gila River March 16, 2012 Initial Comments at 2

[57] CAISO March 16, 2012 Initial Comments at 4; Six Cities March 30, 2012 Reply Comments at 2-5; PG&E March 16, 2012 Initial Comments at 2.

[58] CAISO March 16, 2012 Initial Comments at 8.

[59] JP Morgan March 16, 2012 Initial Comments at 8; NRG March 30, 2012 Reply Comments at 12-13; WPTF March 16, 2012 Initial Comments at 5.

[60] WPTF March 16, 2012 Initial Comments at 5; WPTF March 30, 2012 Reply Comments at 5-6.

[61] SoCal Edison March 16, 2012 Initial Comments at 9-10, 14.

dual software constraints issue does not justify keeping convergence bidding suspended at the interties.[62] Financial Marketers argue that the price inconsistency caused by convergence bidding is *de minimis* on a system-wide basis, reaching a high of just $1.4 million/month.[63] WPTF states that there is no evidence that the issue with the dual software constraints has resulted in gaming.[64]

Redesign the Market

36. All parties support CAISO's efforts to address the dual real-time market structure issues and believe that a permanent market redesign will resolve any market inefficiencies identified by CAISO that are associated with intertie convergence bidding.[65]

37. CAISO noted that it was engaged in an ongoing stakeholder proceeding where it was considering two options to reinstate convergence bidding and planned to seek approval from the CAISO Board of Governors for these options between May and September 2012.[66] CAISO requested that the Commission not act prior to the conclusion of its stakeholder process.[67] However, as noted by WPTF in its motion for expedited consideration discussed further below, on July 27, 2012, in a market notice to its stakeholders, CAISO concluded that it was discontinuing its efforts to develop a short-term solution to the observed market inefficiencies that would permit the near-term reinstatement of convergence

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[62] Financial Marketers March 16, 2012 Initial Comments at 2, 7-9; Morgan Stanley March 16, 2012 Initial Comments at 14-15; JP Morgan March 16, 2012 Initial Comments at 8; WPTF March 16, 2012 Initial Comments at 15-16.

[63] Financial Marketers March 16, 2012 Initial Comments at 2, 7-9.

[64] WPTF March 30, 2012 Reply Comments at 7-8.

[65] Financial Marketers March 16, 2012 Initial Comments at 10; PG&E March 16, 2012 Initial Comments at 1; WPTF March 30, 2012 Reply Comments at 11.

[66] CAISO March 16, 2012 Initial Comments at 20-21.

[67] *Id.* at 2, 21-24.

bidding at the interties.[68] CAISO noted that it planned to address these issues in the context of a new stakeholder initiative that would address compliance with Order No. 764.[69] CAISO stated that it intended to reintroduce convergence bidding at the interties following the development of broader market enhancements.

38. DC Energy, JP Morgan, Morgan Stanley, and SoCal Edison suggest that the Commission should direct CAISO to redesign its dual real-time market structure as a long-term or permanent solution, particularly within a time certain. DC Energy requests a one-year time frame, JP Morgan recommended a date no later than Summer 2013, and SoCal Edison suggested 18 months.[70]

39. Regarding the redesign of the market, several parties weighed in with suggestions and recommendations. JP Morgan supports development and implementation of a real-time market structure wherein both internal and external resources are treated comparably and priced on the same basis. [71] Brookfield Energy and Morgan Stanley support a full three-settlement market that includes a full hour-ahead market, which would eliminate forecasting errors.[72] Brookfield Energy believes that this design better accommodates renewable integration and

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[68] *See* CAISO, http://www.caiso.com/Documents/IntertiePricing_Settlementinitiative-StakeholderCall8712.htm(last visited March 7, 2013).

[69] *Integration of Variable Energy Resources*, Order No. 764, 139 FERC ¶ 61,246 (2012) (final rule requiring each public utility transmission provider to: (1) offer intra-hourly transmission scheduling at 15-minute intervals; and, (2) incorporate provisions into the *pro forma* Large Generator Interconnection Agreement requiring interconnection customers whose generating facilities are variable energy resources to provide meteorological and forced outage data to the public utility transmission provider for the purpose of power production forecasting).

[70] DC Energy March 16, 2012 Initial Comments at 3; JP Morgan March 16, 2012 Initial Comments at 5-6; Morgan Stanley March 16, 2012 Initial Comments at 6; SoCal Edison March 16, 2012 Initial Comments at 3.

[71] JP Morgan March 16, 2012 Initial Comments at 5-6.

[72] Brookfield Energy March 16, 2012 Initial Comments at 20; Morgan Stanley March 16, 2012 Initial Comments at 15-16.

can be designed to support future anticipated design changes such as 15-minute scheduling.[73]

40. NRG supports the elimination of the HASP settlement, settling the intertie transactions at real-time prices, thereby reducing the real-time imbalance energy offset.[74] PG&E supports the use of a mechanism similar to that used in NYISO,[75] as developed through the CAISO stakeholder process, for both virtual and physical intertie resources, stating that such a mechanism should minimize uplift costs and align the processes for settling bids.[76] Morgan Stanley states that it could also support a modified NYISO approach, but only if bid cost recovery is provided to both imports and exports.[77] Financial Marketers also supports a NYISO model for immediate implementation, at least on an interim basis until CAISO remedies its underlying HASP market deficiencies.[78]

41. SoCal Edison states that NRG's proposal to eliminate the HASP settlement does not maintain fungibility between physical and intertie bids, and does not address the problems of potential gaming and intertie market distortions of the dual-constraint.[79] PG&E strongly opposes the adoption of a fully-settled hour-ahead market, arguing that it would result in high costs and a long implementation period, and there is the possibility of future reforms from the Commission, such as

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[73] Brookfield Energy March 16, 2012 Initial Comments at 20.

[74] NRG March 16, 2012 Initial Comments at 7-8; NRG March 30, 2012 Reply Comments at 10-11.

[75] NYISO is a net importer and schedules imports and exports in the hour-ahead process, similar to CAISO's HASP. NYISO settles imports and exports at the time-weighted average of the real-time price at the relevant proxy bus, where there is no congestion, and at the HASP price, where there is congestion. Further, imports receive a bid production cost guarantee if the real-time price is lower than their offer price. *See* CAISO September 21, 2011 Filing at 18.

[76] PG&E March 16, 2012 Initial Comments at 7; PG&E March 30, 2012 Reply Comments at 5-6.

[77] Morgan Stanley March 16, 2012 Initial Comments at 17.

[78] Financial Marketers March 16, 2012 Initial Comments at 4, 10, 21-23.

[79] SoCal Edison March 30, 2012 Reply Comments at 11-13.

implementation of 15-minute scheduling on the interties, could affect the value of moving to a fully settled hour-ahead market.[80] Powerex also does not support a proposal to settle convergence bids against the real-time price, adjusted for HASP congestion and losses warning that such design changes present a high risk of unintended outcomes that undermine convergence and market efficiency.[81] Brookfield Energy and SMUD do not support the proposal to utilize the NYISO model, cautioning that there is a great risk in implementing market elements that may not be directly transferrable to CAISO markets.[82]

Comments Proposing Interim Solutions

42. Brookfield Energy, DC Energy, Financial Marketers, JP Morgan, Morgan Stanley, NRG, and WPTF argue that the Commission should direct CAISO to reinstate convergence bidding immediately or within the next couple months, while CAISO develops a market redesign, expressing doubt that the stakeholder process will reach a consensus.[83] As discussed in more detail below, some parties proposed interim solutions or safeguards, which would be implemented, allowing for the reinstatement of intertie convergence bidding while a market redesign is being developed, but protecting from the costs associated with convergence bidding at the interties. CAISO, NCPA, PG&E, Powerex, and SoCal Edison argue that intertie convergence bidding should not be reinstated, including in connection with an interim solution, until CAISO designs and implements structural changes, noting the potential for continued inefficiencies.[84] CAISO states that the

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[80] PG&E March 16, 2012 Initial Comments at 7.

[81] Powerex March 16, 2012 Initial Comments at 7.

[82] Brookfield Energy March 16, 2012 Initial Comments at 20-21; SMUD March 16, 2012 Initial Comments at 5-6.

[83] Brookfield Energy March 16, 2012 Comments at 16-18; DC Energy March 16, 2012 Initial Comments at 2; Financial Marketers March 16, 2012 Initial Comments at 20-22; JP Morgan March 16, 2012 Initial Comments at 10; Morgan Stanley March 16, 2012 Initial Comments at 5; NRG March 16, 2012 Initial Comments at 2;WPTF March 16, 2012 Initial Comments at 2-3.

[84] CAISO March 16, 2012 Initial Comments at 1, 15; NCPA March 30, 2012 Reply Comments at 1-2; PG&E March 16, 2012 Initial Comments at 1-2; Powerex March 16, 2012 Initial Comments at 5, 7-8; Powerex March 30, 2012 Reply Comments at 15-16. SoCal Edison March 16, 2012 Initial Comments at 5; SoCal Edison March 30, 2012 Reply Comments at 1-2.

identified options for a short-term solution would not improve overall efficiency and would introduce counterproductive complexity and operational risks.[85]

43. As an interim solution, Gila River supports the reinstatement of intertie convergence bidding with a rule that prohibits balanced virtual positions from profiting from the HASP and real-time price differential, thereby deterring the explicit submission of balanced convergence bidding minimizing the impact on the real-time imbalance energy offset, while enabling importers to hedge their external supply.[86]

44. CAISO, JP Morgan, Morgan Stanley, NRG, PG&E, and Powerex do not support a prohibition against offsetting internal and intertie virtual bids.[87] CAISO states that simply prohibiting scheduling coordinators from submitting offsetting internal and intertie virtual schedules would not prevent the independent submission of offsetting intertie and internal virtual schedules.[88] NRG states that a "claw-back" rule would stifle legitimate and desirable trading activity, noting that requiring scheduling coordinators to disgorge profits from overlapping internal and intertie bids presumes nefarious intent when there may be no such intent.[89] JP Morgan concurs, noting that they may take multiple and various positions in the CAISO markets due to commercial arrangement for different units.[90]

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[85] CAISO September 13, 2012 Answer to WPTF's Motion at 10 (citing WPTF August 29, 2012 Motion for Expedited Consideration and Other Relief, Attachment A (CAISO 2012 Market Notice in the Intertie Pricing and Settlement Initiative)).

[86] Gila River March 16, 2012 Initial Comments at 2-3.

[87] CAISO March 16, 2012 Initial Comments at 14; JP Morgan March 16, 2012 Initial Comments at 11; Morgan Stanley March 16, 2012 Initial Comments at 16-17; NRG March 16, 2012 Initial Comments at 11; PG&E March 16, 2012 Initial Comments at 1-2; Powerex March 16, 2012 Initial Comments at 6.

[88] CAISO March 16, 2012 Initial Comments at 14.

[89] NRG March 16, 2012 Initial Comments at 11.

[90] JP Morgan March 16, 2012 Initial Comments at 11.

45. Brookfield Energy, Morgan Stanley, NRG, and SMUD support ensuring that market participants receive price certainty for both imports and exports through bid cost recovery.[91] SMUD and Morgan Stanley support the concepts of "pay as-bid" or "pay as-bid or better"[92] as applied equally to imports and exports, and SMUD prefers these approaches to the NYISO model, which provides bid cost recovery to imports only.[93] SWP does not support these proposals stating that "make-whole" payments have themselves been a source of gaming on the CAISO system.[94] CAISO does not support bid cost recovery for exports.[95]

46. Powerex offers a proposal that it claims will address the root causes of the HASP and real-time price divergence and will improve the ability of convergence bidding at internal nodes to efficiently converge day-ahead and real-time prices. Powerex's three phased solution includes several measures, including a key algorithm change.[96] For instance, Powerex argues that the two aspects of its phase one will reduce the real-time imbalance energy offset by reducing import delivery failures and thereby reduce divergence between the HASP and the real-time prices. Powerex also offers three separate means of addressing the dual pricing constraint problem. Powerex believes that its proposal, which is compatible with

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[91] Brookfield Energy March 16, 2012 Initial Comments at 17-18; Morgan Stanley March 16, 2012 Initial Comments at 16; NRG March 16, 2012 Initial Comments at 13; SMUD March 16, 2012 Initial Comments at 4.

[92] Under the "pay as-bid" approach, intertie schedules produced in the HASP would be paid their submitted bid price, as opposed to the market-clearing HASP price. Under the "pay as-bid or better" approach, an import resource would receive the higher of its submitted bid price and the market-clearing HASP price, and an export resource would pay the lower of its submitted bid price and the market-clearing HASP price. In situations where a resource's bid is better than the market-clearing HASP price, CAISO would add an uplift payment to ensure the resource receives its bid cost. CAISO September 21, 2011 Filing at 18.

[93] SMUD March 16, 2012 Initial Comments at 4.

[94] SWP March 30, 2012 Reply Comments at 9.

[95] CAISO March 16, 2012 Initial Comments at 23-24.

[96] Powerex March 16, 2012 Initial Comments at 11; Powerex March 30, 2012 Reply Comments at 12. *See also* Powerex March 16, 2012 Initial Comments, Appendix A for additional details of Powerex's proposal.

other long-term approaches, can be implemented more quickly and will allow for a faster reinstatement of convergence bidding.[97]

47. Brookfield Energy and Morgan Stanley support certain aspects of Powerex's proposal.[98] WPTF does not support waiting until the additional changes are made in order to reinstate convergence bidding, but supports Powerex's design changes which would result in improved HASP to real-time price convergence, noting that if the market is redesigned such changes may be superfluous.[99] NRG and SoCal Edison do not support the Powerex proposal stating that it fails to address all of the inefficiencies related to convergence bidding at intertie scheduling points, and may result in other inefficiencies.[100]

48. SoCal Edison proposes using "Virtual Intertie Bids" or VIBs, which would serve as a modified form of intertie convergence bidding. Under the proposal, parties could submit demand or supply VIBs, at any intertie scheduling point. However, rather than interacting with physical bids and impacting the optimization results, a demand VIB would only clear against a willing supply VIB. CAISO would determine VIB clearing prices at all interties where there were willing VIB counterparties. SoCal Edison states that through VIBs, parties could hedge their intertie transactions if a willing counterparty took the opposite side of the transaction. Further, VIBs would fully "self-fund" and would allow some form of virtual bidding on the interties for hedging.[101]

49. SoCal Edison urges the Commission to consider whether any proposal (1) "self-funds" among willing counterparties and does not cause uplift; (2) allows intertie convergence bids to converge prices; (3) treats convergence and physical bids as fully fungible in the market optimization; and (4) requires no extra steps to

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[97] Powerex March 16, 2012 Initial Comments at 13, Appendix A at 9.

[98] Brookfield Energy March 16, 2012 Initial Comments at 22; Morgan Stanley March 30, 2012 Reply Comments at 5-6.

[99] WPTF March 16, 2012 Initial Comments at 23.

[100] NRG March 30, 2012 Reply Comments at 5; SoCal Edison March 30, 2012 Reply Comments at 10, 12-13.

[101] SoCal Edison March 16, 2012 Initial Comments at 22-23.

ensure physical feasibility or, if so, allocates these costs based on cost causation.[102]

50. PG&E argues that, to the extent CAISO wants to afford market participants at the interties with the potential to hedge through intertie convergence bidding, SoCal Edison's VIBs proposal would be a better solution than CAISO's short-term stakeholder approach.[103] Powerex does not support SoCal Edison's proposal as a long-term approach but does not oppose it as a short-term solution that would reinstate virtual bidding for hedging purposes, while a more robust solution is developed.[104] In contrast, NRG objects to SoCal Edison's proposal, arguing that CAISO could likely solve the underlying problem by eliminating the HASP settlement more expeditiously than it could if it were to create multiple new market products.[105]

51. FIEG, PG&E, Six Cities, and SWP all support modifying allocation of real-time imbalance energy offset costs, such that the cost allocation is consistent with cost causation.[106] FIEG and PG&E state that if the Commission does require CAISO to reinstitute intertie convergence bidding before the fundamental market design flaws are corrected, then it is imperative that CAISO allocate the uplift costs associated with convergence bidding to those virtual bidders who are causing the costs.[107] PG&E states that the existing allocation of the real-time imbalance energy offset to measured demand is not just and reasonable, as load cannot avoid these charges and sees little or no benefit from the activities leading to these uplift costs. PG&E states that one option would be to charge any deviations from day-ahead positions, including day-ahead virtual bids, that settle based on hour-ahead

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[102] *Id.* at 19-20.

[103] PG&E March 30, 2012 Reply Comments at 5, 7.

[104] Powerex March 16, 2012 Initial Comments at 10.

[105] NRG March 30, 2012 Reply Comments at 6.

[106] FIEG March 16, 2012 Initial Comments at 4-5; PG&E March 16, 2012 Initial Comments at 7-8; Six Cities March 30, 2012 Reply Comments at 6; SWP March 16, 2012 Initial Comments at 6; SWP March 30, 2012 Reply Comments at 10.

[107] FIEG March 16, 2012 Initial Comments at 4-5; PG&E March 16, 2012 Comments at 7-8.

prices and cause real-time imbalance energy offset to be allocated a *pro rata* share of the uplift.[108] Morgan Stanley states that CAISO reliably balances the system for the benefit of load, so it seems without basis to not continue to allocate real-time imbalance energy offset to load.[109] FIEG expresses doubt that, in light of the focus on convergence bidding, that resources would continue to submit offsetting bids.[110]

52. Powerex does not support commenters' proposal to modify the existing allocation of the real-time imbalance energy offset and states that there would be no need to modify the existing cost allocation methodology if the underlying causes of the market inefficiencies are addressed or remedied.[111]

53. As a safeguard against increases to the real-time imbalance energy offset potentially attributable to intertie convergence bidding, several parties support a $3.5 million per month "circuit breaker" mechanism, whereby intertie convergence bidding could contribute a limit of $3.5 million to the real-time imbalance energy offset before triggering a temporary suspension of intertie convergence bidding for not more than 30 days.[112] JP Morgan notes that it supports implementation of some form of "circuit breaker" that would either temporarily suspend intertie convergence bidding or allocate real-time imbalance energy offset costs to convergence bidders, but it would not support a mechanism that, once triggered, would indefinitely suspend intertie convergence bidding.[113] WPTF argues that a monthly reset would allow market participants to anticipate the occurrence of high convergence bidding volumes and manage the real-time imbalance energy offset impacts when the HASP and real-time prices diverge, and

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[108] PG&E March 16, 2012 Initial Comments at 7-8.

[109] Morgan Stanley March 16, 2012 Initial Comments at 18.

[110] FIEG March 16, 2012 Initial Comments at 4-5.

[111] Powerex March 16, 2012 Initial Comments at 7.

[112] NRG March 30, 2012 Reply Comments at 5; Morgan Stanley March 30, 2012 Reply Comments at 3-4;WPTF March 16, 2012 Initial Comments at 22.

[113] JP Morgan March 16, 2012 Initial Comments at 12.

thereby avoid real-time imbalance energy offset impacts that may trigger the circuit breaker.[114]

54. CAISO objects to reinstatement of convergence bidding with monetary thresholds for the real-time imbalance energy offset to protect against adverse market outcomes, arguing that the measures do not add protection against market inefficiencies but instead continue to contribute costs to the market.[115] SWP argues such a mechanism does not send meaningful price signals.[116]

B. WPTF's Motion for Expedited Consideration and Other Relief

55. WPTF submitted a motion to expedite consideration of CAISO's proposal to indefinitely suspend intertie convergence bidding. Noting that CAISO posted a market notice indicating that it was no longer pursuing the timely restoration of intertie convergence bidding in its stakeholder process and was deferring that effort to a new initiative related to complying with Order No. 764, WPTF argues that it is not likely that CAISO will complete its proposal until September 2013 and market modifications likely, will not be made until mid-or-late 2014 and more likely, in 2015.[117]

56. WPTF states that the only means of resolving the inefficiencies caused by convergence bidding would be to eliminate the HASP settlement or to implement a true three-settlement system through a full hour-ahead market. WPTF states that Order No. 764 does not require such an outcome. Instead, WPTF argues that Order No. 764 only requires CAISO to *offer* 15-minute intertie transmission scheduling. Further, until all other Balancing Authority Operators that interchange with CAISO also adopt 15-minute scheduling, CAISO will need to continue to support block-hour scheduling for post day-ahead intertie schedules and will not be able to adjust some intertie volumes within the hour. Thus, WPTF argues that Order No. 764's compliance process will not structurally solve all of the problems associated with intertie convergence bidding. WPTF states that, over the past ten months, the CAISO and market participants have worked to develop alternatives

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[114] WPTF March 16, 2012 Initial Comments at 22.

[115] CAISO March 30, 2012 Reply Comments at 11.

[116] SWP March 30, 2012 Reply Comments at 11.

[117] WPTF August 29, 2012 Motion for Expedited Consideration and Other Relief Motion at 4 (WPTF August 29, 2012 Motion).

and it is not reasonable to abandon that progress in order to comply with Order No. 764.[118]

57. If the Commission should find that the record is incomplete and therefore cannot require reinstatement of convergence bidding with protections proposed by parties, WPTF requests that the Commission require CAISO to file by November 1, 2012, the elements of such design for comment and Commission action based on the design proposal predominately arising from the stakeholder work. WPTF argues that lack of stakeholder consensus on the intertie pricing stakeholder process does not warrant further delay, and notes that the HASP has long been identified as a misguided design.[119]

58. CAISO, SoCal Edison, SWP, and PG&E disagree with WPTF and argue that the Commission should not order CAISO to submit a proposal by November 1, 2012.[120] Additionally, CAISO, SoCal Edison, and PG&E state that CAISO did not unilaterally suspend its stakeholder process, arguing that, despite efforts to work with all stakeholders to find a short-term solution that would permit intertie convergence bidding to be reinstated, its efforts produced proposals that would also create a number of market and reliability issues.[121]

59. CAISO, Six Cities, SoCal Edison, Powerex, and P&GE assert that it is reasonable to focus efforts to develop a market redesign proposal within the broader context of also implementing Order No. 764 requirements.[122] CAISO

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[118] *Id.* at 7. Financial Marketers support WPTF's motion, and specifically, WPTF's arguments regarding Order No. 764 compliance. Financial Marketers September 12, 2012 Answer to WPTF's Motion at 2, 5.

[119] *Id.* at 9.

[120] CAISO September 13, 2012 Answer to WPTF's Motion at 10; SWP September 13, 2012 Answer to WPTF's Motion at 1; SoCal Edison September 13, 2012 Answer to WPTF's Motion at 1-2; PG&E September 13, 2012 Answer to WPTF's Motion at 1-2.

[121] CAISO also disagrees that its decision to fold ongoing efforts into a new stakeholder proceeding was "unilateral," arguing that it did not act before soliciting and receiving input from stakeholders. CAISO September 13, 2012 Answer to WPTF's Motion at 3, 12-13.

[122] CAISO September 13, 2012 Answer to WPTF's Motion at 14-16; Six Cities September 13, 2012 Answer to WPTF's Motion at 5-6; SoCal Edison

(continued…)

explains that, while it understands that Order No. 764 does not require a change in settlement of the interties but only requires that CAISO consider whether it must adopt additional intertie scheduling flexibilities, it is reasonable to consider compliance and intertie scheduling changes together in one stakeholder proceeding because they both concern the intertie settlement process. CAISO anticipates that its stakeholder effort addressing the Order No. 764 changes could likely include replacing the current HASP energy dispatch with a 15-minute dispatch that dispatches interties and internal resources at the same time and settles them at the same price. CAISO argues that such a proposal would significantly address the real-time imbalance energy offset issues in the current market.[123]

60. PG&E states that a short-term fix to solely accommodate intertie convergence bidding is narrow and unreasonable since CAISO may be required to implement substantial modifications to its market design to accommodate Order No. 764.[124] In the event that the Commission requires CAISO to reinstate intertie convergence bidding prior to allowing changes to its market design, PG&E requests that the method for allocating real-time imbalance energy offset is changed to make the distribution of such costs consistent with cost causation principles.[125]

C. Commission Determination

61. We find CAISO's proposal to eliminate intertie convergence bidding to be just, reasonable, and not unduly discriminatory, subject to certain conditions. Upon further review of the record, as supplemented by information provided at the technical conference and the comments received after the technical conference, we find that CAISO has demonstrated that the costs associated with intertie convergence bidding outweigh the limited benefits being realized under the existing dual real-time market structure. As discussed further below, the Commission finds that CAISO should focus its efforts on developing a comprehensive, long-term structural solution that will permit the reinstatement of

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September 13, 2012 Answer to WPTF's Motion at 2; PG&E September 13, 2012 Answer to WPTF's Motion at 4; Powerex September 13, 2012 Answer to WPTF's Motion at 8.

[123] CAISO September 13, 2012 Answer to WPTF's Motion at 16.

[124] PG&E September 13, 2012 Answer to WPTF's Motion at 4.

[125] *Id.* at 3.

intertie convergence bidding with just and reasonable outcomes, improving market efficiency by committing supply resources to meet real-time needs.

62. We find that, due to the dual real-time market structure, virtual transactions at CAISO interties did not improve market efficiency. Based on our review of the information and data provided in all comments and at the technical conference, we find that the anticipated benefits of converging prices were not observed. In CAISO's markets, the improved efficiency of committing resources that meet supply needs in the real-time is impeded by the dual real-time market structure, in particular the HASP process for settling the interties based on forecasted demand prior to the real-time market.[126] Rather than efficiently committing resources, we find that intertie convergence bidding led to increased costs to ratepayers during the period that it was in place.

63. Convergence bidding increased the volume of transactions in the market, and aggravated the inefficiencies, discussed below, associated with the dual real-time market structure. In the HASP, if forecasted demand is lower than cleared day-ahead bid-in demand, the market will identify surplus supply, which depresses prices and may result in export of supply, thus making that supply unavailable in the real-time market. However, actual demand conditions in the real-time market may vary from forecasted demand in the HASP, and the supply available in real-time is higher cost than the supply that had previously been committed. This scenario would result in lower-cost power that was exported in the HASP being replaced with higher-cost power from internal sources in the real-time. Therefore, the dual real-time market structure could result in lower HASP prices and higher real-time prices.

64. Additionally, CAISO observed that net virtual supply positions at intertie scheduling points were larger than the net virtual demand positions at internal nodes. This net virtual supply resulted in less physical supply being committed in the day-ahead market. This result is contrary to the expected outcome of convergence bidding when the real-time price is greater than the day-ahead price. On internal nodes, the Commission anticipated that when the day-ahead price is expected to be lower than the real-time price, due to the market trend, market participants would be incented to submit virtual demand bids, which would result

[126] In the HASP, CAISO settles and prices its intertie transactions based on forecasted demand. However, in the real-time market, CAISO settles and prices based on real-time conditions. Imbalance conditions can change after the HASP and before the real-time market; therefore, the market clearing prices may change.

in greater physical supply being scheduled in the day-ahead market. The expected result would be that the day-ahead price would increase and units would be efficiently scheduled. Instead, the net virtual supply may result in less physical supply being scheduled in the day-ahead market. The reduction in physical supply commitments could artificially drive day-ahead prices down, resulting in a need to dispatch more physical supply in the real-time market and creating day-ahead and real-time price divergence. This result inefficiently scheduled too little physical supply to meet real-time needs in the day-ahead market. We note that it is possible for convergence bidding to result in convergence of day-ahead and HASP prices on intertie scheduling points in some hours and, separately, convergence of day-ahead and real-time prices on internal nodes in other hours. However, this price convergence, as described above, may be incidental and has not been shown to encourage operational efficiency.

65. We note that the inefficient unit scheduling described above, resulting from net virtual supply positions, may result in increased reliance on the RUC process.[127] If the amount of physical supply that clears the day-ahead market is below CAISO's projected load forecast, CAISO procures additional resources to meet its load forecast in the RUC process. Therefore, where physical supply is lower due to increased virtual supply volumes and potentially insufficient to meet physical demand forecasts, CAISO relies on the RUC process to commit additional physical units. CAISO observed increased RUC costs while convergence bidding on the interties was permitted. The cost of committing units through the RUC process is not accounted for in the clearing price and therefore, this occurrence does not contribute to the convergence of prices.

66. As described in the background, to the extent that real-time prices are different from the HASP prices, CAISO may not collect sufficient revenues from load, or may collect surplus revenues, and the real-time imbalance energy offset is an uplift account that reconciles the settlement values. CAISO has demonstrated that intertie convergence bidding led to an increase in real-time imbalance energy offset costs under the current dual real-time market structure. Given that the dual real-time market structure provides for separate market settlements, the behavior of virtual bidders responding to predictable pricing trends did not converge prices in a way that resulted in efficient unit commitment, but rather increased the amount of transactions in the market, and the virtual bidding transactions

[127] The RUC process, which occurs after the IFM, removes convergence bids and reviews CAISO forecasted load. If additional physical units are needed, the RUC process will commit more resources.

increased the real-time imbalance energy offset that was allocated to measured demand.

67. While it is not possible to predict the long-term fluctuations in the contribution of intertie convergence bidding to uplift costs, we find that, until the dual real-time market structure is revised, intertie convergence bidding will continue to contribute costs to the market while providing limited benefits. In particular, the record shows that there is significant contribution of intertie convergence bidding to the real-time imbalance energy offset uplift cost.[128] Market improvements, such as the implementation of the flexible ramping constraint, are not sufficient to address the underlying design issues associated with the dual real-time market structure. CAISO has not succeeded in fully eliminating predictable pricing disparities that cannot be addressed by convergence bidding, and as long as such price disparities exist, the dual real-time market structure and the ability to submit convergence bids at both internal nodes and intertie scheduling points create incentives and opportunities for market participants to continue the same bidding strategies. Therefore, suspension of intertie convergence bidding should limit costs until the dual real-time market structure can be revised.

68. We note that some parties, including WPTF, Brookfield Energy, and Morgan Stanley, argued that overall day-ahead price fell as a result of intertie convergence bidding and that the suspension of intertie convergence bidding deprives the market from that benefit. The parties did not support their claim that the lower day-ahead price accurately reflected market conditions, resulting in efficient unit commitment. While overall day-ahead prices fell, the increased RUC costs indicate that the day-ahead unit commitment is not accurately reflecting market needs. The Commission finds that the reduced day-ahead price when viewed with other costs does not indicate that the market is operating efficiently. For instance, a low day-ahead price may result in committed supply

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[128] Specifically, CAISO demonstrates that during the 10-month period that intertie convergence bidding was permitted, offsetting virtual bids contributed $58.6 million to the RTIEO, with $36.7 million caused by offsetting convergence bids made by the same scheduling coordinator and $21.9 million caused by independently offsetting bids submitted by different scheduling coordinators. Although the monthly values fell after the first few months, CAISO shows that they were still significant, ranging from $1.1 to 3.6 million per month for the last five months that intertie convergence bidding was permitted.

being insufficient to meet load needs, resulting in increased commitment through the RUC process, as discussed above.

69. Additionally, several parties highlight the ability of intertie convergence bidding to improve the capability to hedge intermittency of variable energy resources. In particular, Morgan Stanley and Gila River assert that virtual transactions permitted them to hedge their resources, providing a benefit to their market operations. The Commission recognizes that convergence bidding on the interties provides a valuable hedging tool for some market participants, both intermittent and otherwise. However, in order to ensure that this benefit can be realized without significant costs to other market participants, a solution must be developed to address the underlying market structure issues prior to reinstating convergence bidding at the intertie scheduling points.

70. Convergence bidding has long been supported because it distinguishes between physical and convergence transactions, permitting hedging virtually, and deterring implicit convergence bidding. We note that CAISO claims that implicit convergence bidding has remained low since the suspension of intertie convergence bidding at intertie scheduling points. As noted by Morgan Stanley and Financial Marketers, implicit convergence bidding can result in reliability impacts. Therefore, we reject Brookfield Energy's assertion that, if intertie convergence bidding remains suspended, that the Commission should direct the removal of the HASP reversal settlement rule.[129] We find that the HASP reversal settlement rule continues to be an important deterrent against implicit convergence bidding. Noting Brookfield's and others' concerns, we encourage CAISO to evaluate the role of this settlement rule within its stakeholder proceedings.[130] We also recognize the costs and price inconsistency associated with the dual software constraints on the interties, and we urge CAISO to continue working with its stakeholders to develop a long-term solution to the pricing inconsistency that resulted from enforcing the dual software constraints.

71. The Commission continues to support intertie convergence bidding, but only under a market structure in which reinstatement will result in anticipated benefits to market participants. As long as the systematic market structure issues remain, and until price convergence can be achieved through more effective modeling or structural changes, arbitrage opportunities will continue to exist under

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[129] Brookfield Energy March 16, 2012 Initial Comments at 9-10.

[130] *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,039 at P 134.

the current dual real-time market structure without providing benefits to the market.

72. We are concerned that simply reinstating intertie convergence bidding without addressing the necessary structural changes will not result in a just and reasonable outcome. Thus, we find that the issues stemming from operating under a dual real-time market structure, including the significant uplift costs and their allocation, will need to be addressed before intertie convergence bidding is reinstated. Several parties offered short-term or interim alternatives that may enable intertie convergence bidding to be reinstated and potentially limit associated costs while CAISO is developing its market redesign proposal. For instance, we note that Powerex's proposed solution offers many different components that may improve the efficiency of CAISO's market processes. Additionally, some parties suggested that the Commission direct CAISO to ensure that costs are allocated consistent with cost causation. We elect to not direct or provide guidance on a specific design at this time. We expect that CAISO will thoroughly evaluate proposals from all stakeholders in its stakeholder process.

73. The Commission agrees that CAISO should focus its efforts on developing a comprehensive, long-term structural solution that will permit for the reinstatement of intertie convergence bidding with just and reasonable outcomes, instead of on interim proposals that may reintroduce intertie convergence bidding more quickly, but with the possibility of increased market inefficiencies and operational risks. The Commission finds that developing a long-term solution through the stakeholder process should allow CAISO and the market participants to thoroughly evaluate the benefits and costs of various alternatives and develop the most efficient long-term solution that allows convergence bidding to be reinstated and the anticipated benefits to be observed.

74. CAISO stated, in its post-technical conference comments, that it would be able to reinstate intertie convergence bidding in the fall of 2013 under a longer-term proposal that would be developed within a stakeholder proceeding. We note, however, that CAISO suspended its existing stakeholder proceeding on intertie pricing and settlement and alternatively chose to address intertie settlement issues in a new stakeholder initiative that will also address compliance with Order No. 764.[131] We note that CAISO's Order No. 764 compliance filing should address only the requirements of the final rule. To the extent that CAISO's proposal

[131] Compliance filings pursuant to Order No. 764 are due on September 11, 2013.

addressing the Order No. 764 requirements also includes proposed tariff revisions that address the issues relevant in this proceeding but that are outside the immediate scope of Order No. 764, CAISO should include these proposed tariff revisions in a FPA section 205 filing.

75. We note that CAISO has expressed its commitment to reintroduce intertie convergence bidding once it has resolved the issues related to the dual real-time market. The Commission supports the reinstatement of intertie convergence bidding where it will not contribute to market inefficiencies and where anticipated benefits can be realized. We agree that the current dual real-time market design is hindering the potential benefits of convergence bidding from being realized and expect that, without the dual real-time market issues, convergence bidding should bring about the expected benefits, such as increased competition, reduced market power, and increased day-ahead to real-time price convergence.

76. Therefore, we will require that within 12-months of the date of this order, CAISO must either: (1) file tariff changes to reinstate intertie convergence bidding and address the underlying issues with the dual real-time market structure, or (2) submit an informational filing explaining why CAISO has not addressed the dual real-time market structure issues and cannot reinstate intertie convergence bidding at that time. The informational filing should also apprise the Commission of CAISO's progress in developing a solution to the dual real-time market structure that would permit reinstatement of intertie convergence bidding with just and reasonable outcomes.[132]

77. Further, because we find that CAISO should focus its efforts on developing a structural solution that would permit for the reinstatement of intertie convergence bidding with just and reasonable outcomes, instead of interim proposals, we will dismiss WPTF's motion for the Commission to order CAISO to submit an interim proposal by November 2012.

78. CAISO also noted that it had developed a proposal to resolve issues associated with the enforcement of the dual software constraints through parallel stakeholder processes but had not decided how it would incorporate such a proposal into its options to reinstate intertie convergence bidding. We encourage CAISO to continue its efforts to evaluate solutions to the dual software constraints issues and consider its resulting proposal in the broader context of how it will

[132] We note that this report is for informational purposes only and will neither be noticed, nor require Commission action.

resolve the dual real-time market structure and reinstate intertie convergence bidding, in order to prevent inefficiencies when intertie convergence bidding is reinstated.

The Commission orders:

(A) CAISO's proposed tariff revisions are hereby conditionally accepted, effective November 28, 2011, as discussed in the body of this order;

(B) CAISO is hereby directed to submit, within 12-months of the date of this order, either tariff changes or an informational filing, as discussed in the body of this order; and

(C) WPTF's motion for expedited consideration and other relief is hereby dismissed.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.