August 29, 2018

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Energy Imbalance Market Bid Adder

Docket No. ER18-___-000

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this filing to revise its tariff rules relating to the bid adder for the western Energy Imbalance Market (EIM).[1] The proposed changes will more accurately attribute energy produced by EIM participating resources to serve demand in the CAISO or another EIM Entity that operates a balancing authority area within California. The CAISO requests that the Commission accept the tariff revisions contained in this filing on 60 days' notice and make them effective for trade day November 1, 2018. Additionally, the CAISO respectfully requests an order by October 29, 2018, to provide sufficient time for the CAISO to promote updates to its market systems and provide market participants with certainty regarding EIM rules in advance of the November 1, 2018 trade date.

I. Introduction and Summary of Tariff Revisions

The CAISO operates the EIM, which enables entities with balancing authority areas outside of the CAISO to buy and sell energy as part of the CAISO's real-time market to satisfy energy imbalance needs. The CAISO implemented the EIM in 2014, with the first trade day on November 1, 2014. Several entities have since joined the EIM. These entities now include PacifiCorp, NV Energy, Arizona Public Service Company, Puget Sound Energy, Portland General Electric, Idaho Power Company, and Powerex Corp. The Sacramento Municipal Utility District (SMUD) plans to join the EIM in 2019 with

[1] The CAISO submits this filing pursuant to Section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d, and Section 35.13 of the Commission's regulations, 18 C.F.R. § 35.13. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the CAISO tariff.

additional entities planning to join in future years.[2]

In order to buy and sell energy through the EIM, EIM Entities submit base schedules for each hour that demonstrate that their respective balancing authority area can meet certain resource sufficiency tests by independently serving the balancing authority area's load.[3] These base schedules also serve as the reference point from which to measure and settle imbalance energy.

EIM participating resource scheduling coordinators submit economic bids to offer output from EIM participating resources to serve imbalance needs across the combined CAISO and EIM footprint. For purposes of offering output to serve demand in the CAISO, EIM participating resource scheduling coordinators also submit EIM bid adders consisting of a MW quantity and a price that reflects the EIM participating resource's costs to comply with California's greenhouse gas (GHG) regulations.[4] The submission of this bid adder is voluntary and reflects the willingness of EIM participating resource scheduling coordinators to serve demand in the CAISO. Based on a least cost dispatch methodology, EIM bid adders allow the CAISO to attribute which EIM participating resources support EIM transfers to serve CAISO demand and compensate EIM participating resource scheduling coordinators for their costs of compliance as electricity importers under California's GHG regulations.

In this filing, the CAISO proposes to refine its market rules associated with EIM bid adders to limit the MW quantity of an EIM bid adder that can be used in the market optimization. The CAISO proposes to limit the MW quantity included in the EIM bid adder of an EIM participating resource to a value equal to the dispatchable bid range between the EIM participating resource's base schedule and the EIM participating resource's effective upper economic bid for the relevant operating hour. This change will result in a more accurate attribution of energy produced by the EIM participating resource to support an EIM transfer serving demand in the combined area of the CAISO or another EIM Entity that operates a balancing authority area within California. The change will improve the accuracy of the CAISO's attribution because the MW limit will reduce the potential magnitude of assigning an EIM transfer to the output from a base schedule of the EIM participating resource to serve load outside the CAISO. In addition, the CAISO proposes minor clarifications to its EIM bid adder rules to reflect the fact that SMUD – an EIM Entity balancing authority area located within California – will be joining the EIM in 2019.

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[2] More information about the western EIM is available on the following website: https://www.westerneim.com/pages/default.aspx.

[3] *See generally Cal. Indep. Sys. Operator Corp.,* 147 FERC ¶ 61,231 (2014) at PP 110-124; see also CAISO tariff at section 29.34.

[4] CAISO tariff section 29.32(a).

II. Background

Energy generated in California or imported into the state to serve California demand is subject to California's GHG regulations adopted by the California Air Resources Board (CARB).[5] Under these regulations, compliance obligations apply to first deliverers – generators within California or electricity importers.[6] Under CARB's regulations, EIM participating resource scheduling coordinators are considered electricity importers if their resource(s) are dispatched to serve load within California.[7] These entities have a GHG compliance obligation under CARB's GHG regulations and incur a compliance cost to produce power that is delivered to serve demand within California.

To address CARB's regulations, the CAISO developed a bid adder at the outset of EIM that would permit the CAISO to reflect GHG compliance costs within locational marginal prices for EIM participating resources serving CAISO demand. EIM participating resource scheduling coordinators submit the EIM bid adder separately from their energy bids. This design allows the CAISO market to identify a price difference for transactions serving CAISO demand versus transactions serving demand outside of the CAISO. When dispatching resources to serve load outside the CAISO, the market optimization considers only the energy bid. When dispatching resources to serve load inside the CAISO, the market optimization considers the energy bid plus the EIM bid adder.[8]

At the outset of EIM, the Commission recognized that EIM participating resource scheduling coordinators could submit a bid adder to reflect their GHG costs on a daily basis for each of their EIM participating resources.[9] The bid adder allowed the CAISO to attribute EIM transfers to serve CAISO demand to specific EIM participating resources based on least cost dispatch. CAISO demand paid the marginal energy price, which included the GHG costs because scheduling coordinators with resources inside the CAISO include that cost within their energy bids. Non-CAISO demand paid the marginal energy price less the marginal GHG costs. If there were no transfers into the CAISO, the marginal GHG cost would be zero. If EIM transfers to serve CAISO demand occurred, the marginal GHG costs would reflect the emission cost of the marginal unit attributed to support the transfer into the CAISO. EIM participating resources attributed as serving CAISO demand received compensation at the marginal

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5 *See generally* California Air Resource Board website relating to Cap and Trade program: https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm. *See also* Title 17, California Code of Regulations sections 95801-96022.

6 Title 17, California Code of Regulations section 95811(b).

7 *Id.* at section 95802 (a) definition of Electricity Importer.

8 CAISO tariff section 29.32 (b).

9 *California Indep. Sys. Operator Corp*., 147 FERC ¶ 61,231 (2014) at PP 238-240.

energy cost plus the marginal GHG cost. EIM participating resources serving demand outside of the CAISO received only a marginal energy cost. In this way, the GHG cost did not affect the locational marginal price in the EIM Entity balancing authority area outside of California.

The CAISO did not mitigate the GHG bid adder or restrict the quantity of output from EIM participating resources that the market dispatch attributed as serving CAISO demand. The only restriction was that the combined energy bid and bid adder had to be less than or equal to the $1000/MWh maximum energy bid price. Under this approach, EIM participating resource scheduling coordinators that did not want to comply, or that were legally barred from complying, with California's GHG regulations could use a high bid adder to provide a signal the market that their resource(s) was not available for dispatch to serve CAISO demand. In accepting these market design elements, the Commission directed the CAISO to submit a compliance filing within one year to implement a bid flag to preclude the market from dispatching an EIM participating resource to serve CAISO load.[10] Since the bid flag mechanism would obviate the need for the EIM participating resource scheduling coordinator to use a high bid adder to signify that the market should not dispatch an EIM participating resource to serve CAISO demand, the Commission also directed the CAISO include revisions implementing a cost-based bid adder.

As part of the CAISO's year one enhancements for EIM, the CAISO proposed revisions to its EIM bid adder design. Specifically, the CAISO proposed to allow EIM participating resource scheduling coordinators to submit an hourly bid quantity to express how much of the resource's output could support an EIM transfer serving CAISO demand. The CAISO proposed to also allow EIM participating resource scheduling coordinators to submit an hourly price in its bid adder for each participating resource at or below the resource's daily maximum GHG cost cap as determined by CAISO, but not less than zero.[11] Under this approach, an EIM participating resource scheduling coordinator submits a single megawatt quantity and single bid price on an hourly basis for its

[10] *Id.*

[11] The CAISO calculates a daily maximum GHG cost using a process similar to the process the CAISO uses to calculate the GHG cost included in the default energy bids of CAISO resources. This includes a variable cost option and a negotiated rate option. However, rather than calculating a cost curve as is done for default energy bids within the CAISO, the CAISO calculates a single daily maximum cap for the EIM participating resource. Under the variable cost option, on a daily basis, the CAISO calculates each unit's maximum GHG cost based on the unit's maximum heat rate as registered with the CAISO, the applicable GHG allowance price, and the resource's emission rate. These are the same three components that the CAISO uses to calculate the greenhouse gas cost included in the default energy bid curves of CAISO resources. The standard GHG emission rate is documented in the United States Environmental Protection Agency Subpart C default emission factors. Similar to the default energy bids of CAISO resources, the CAISO applies a 10 percent adder to the calculated maximum cost.

resource(s) to express its interest in serving CAISO demand. If the EIM participating resource scheduling coordinator does not submit a bid adder for its resource(s), or submits a bid adder with a zero MW quantity, the CAISO market will not dispatch the EIM participating resource to serve CAISO demand. The proposed changes did not require changes to the CAISO's least cost dispatch. Instead, the proposed changes modified rules involving input data into the market optimization. The Commission accepted these revisions to the market design for EIM and the CAISO implemented them in 2015.[12]

Since the Commission's Order on EIM Year 1 Enhancements, stakeholders have raised concerns that the CAISO's attribution of EIM transfers serving CAISO demand may not in all instances accurately reflect the energy produced by EIM participating resources. Stakeholder argue that the market will attribute EIM transfers to serve CASIO demand to base schedules of EIM participating resources that would have operated irrespective of an EIM transfer to serve CASIO demand. This outcome can arise because least cost dispatch has the effect of attributing EIM transfers to lower emitting participating resources based on their combined energy bid and bid adder and that other, potentially higher-emitting, resources may need to backfill this attribution in order to serve load outside of the CAISO. This phenomenon is often referred to as secondary dispatch.[13] As a result, stakeholders have argued that the CAISO's attribution also does not accurately reflect the emissions from the operation of EIM participating resources associated with EIM transfers to serve CAISO demand.

III. Proposed tariff revisions

The CAISO proposes to enhance to its EIM bid adder rules to more accurately attribute energy produced by EIM participating resources to serve demand in the combined area of the CAISO and other EIM Entities that operate balancing authority areas within California. For purposes of this filing, the CAISO proposes to add language that limits the hourly MW quantity of an EIM bid adder to the EIM participating resource's dispatchable bid range between the EIM participating resource's base schedule and the resource's effective upper economic bid, in that hour. In identifying the dispatchable bid range, the proposed rule would exclude derated capacity or capacity that is subject to an ancillary services reservation by the relevant EIM Entity. Excluding any derated capacity or capacity that is subject to an ancillary services reservation by the

[12] *California Indep. Sys. Operator Corp*., 153 FERC ¶ 61,087 (2015) at PP 57-58 (Order on EIM Year 1 Enhancements).

[13] The market optimization simultaneously solves to serve load in the CAISO and the other balancing authority areas in the EIM footprint. The term "secondary" dispatch simply illustrates the backfill effect of lower emitting cost resources supporting EIM transfers to serve CAISO demand with higher emitting cost resources serving demand in EIM Entities' balancing authority areas. Secondary dispatch does not mean that the market optimization has multiple distinct steps in dispatching resources to serve CAISO load versus load in EIM balancing authority areas.

relevant EIM Entity is consistent with the CAISO's current practice under the EIM bid adder rules.

The CAISO proposes to add section 29.32(b)(2) to its tariff to read as follows:

> **EIM Participating Resources EIM Bid Adder MW Quantity.**
>
> The CAISO's Real-Time Unit Commitment and Real-Time Dispatch will limit the maximum EIM Bid Adder MW quantity of an EIM Participating Resource to a value equal to the EIM Participating Resource's dispatchable Bid range between the EIM Participating Resource's Base Schedule and the EIM Participating Resource's effective upper economic Bid, considering any applicable derates and ancillary services capacity reservations, for the relevant Operating Hour.

Although the CAISO's optimization currently attributes EIM transfers to serve CAISO demand to EIM participating resources based on least cost dispatch principles, it can have the effect of attributing these transfers to energy from EIM participating resources that would have otherwise operated to serve demand outside of the CAISO. This outcome creates the potential for a secondary dispatch to serve demand outside of the CAISO. Based on stakeholder feedback, the CAISO is proposing a rule in this filing to refine its attribution of EIM transfers serving demand in the CAISO or another EIM Entity balancing authority area within California to more accurately reflect the energy produced by EIM participating resources as a result of a market dispatch. Table 1 summarizes the proposed refinement to the CAISO's EIM Bid Adder rules.

Table 1 – Summary of Proposed EIM Bid Adder Rule Change

Today's EIM Bid Adder Rule	**Proposed Rule Change**
Hourly EIM Bid Adder • Cost-based; and • MW quantity between 0 MW and effective upper economic bid.	Hourly EIM Bid Adder • Cost-based; and • MW quantity between zero and *the difference between the effective upper economic bid and base schedule*.
CAISO attributes EIM transfer serving California demand to EIM participating resources based on least cost dispatch.	CAISO attributes EIM transfer serving California demand to EIM participating resources based on least cost dispatch.

As explained in the background section of this filing, the EIM bid adder rules have evolved since initial EIM implementation. The refinement to the EIM bid adder rules proposed in this filing is a further refinement to the bid adder quantity. The proposal reflects that capacity associated with base schedules in advance of the real-time market is effectively committed to serve EIM demand and meet specific resource sufficiency tests. This commitment creates a base from which the market can determine what incremental capacity a resource has available to serve demand in the CAISO or other EIM Entity balancing authority areas located within California. As with prior enhancements to the EIM bid adder rules, the proposed changes do not require changes to the CAISO least cost dispatch. Instead, the proposed changes modify the rules regarding the allowable input data into the market optimization.

The following examples compare the existing EIM bid adder rules to the proposed rules and explain why this refinement represents an incremental improvement:

- Under the current EIM bid adder rules, if an EIM participating resource with a 100 MW effective upper economic bid submits a 100 MW bid adder, then the market optimization may attribute up to 100 MW of that transfer to the EIM participating resource as serving CAISO demand. Assume the EIM participating resource has a 60 MW base schedule for the operating hour. In this example, there is a potential for 60 MW of secondary dispatch to occur because the resource's base schedule reflects a 60 MW value to support non-CAISO load.

- Under the CAISO's proposed rule change, the market optimization may attribute only up to 40 MW of an EIM transfer serving CAISO demand to the EIM participating resource. There is still a potential that a secondary dispatch may occur because the optimal dispatch of the resource may be less than 100 MW and the market may still attribute up to 40 MW of an EIM transfer serving CAISO demand to the EIM participating resource.

The attribution of EIM transfers to EIM participating resources under this proposed rule change more accurately reflects the quantity of incremental capacity of the resource available to serve CAISO demand prior to the market optimization. This MW quantity will reflect a value equal to the difference between an EIM participating resource's base schedule and the effective dispatchable capacity of its upper economic bid. Based on least cost dispatch principles, this limit will also more accurately reflect the energy produced by EIM participating resources in an EIM entity balancing authority area outside of California to serve California demand.

The following illustrative dispatch scenarios help explain the CAISO's proposal and its effect of reducing the potential for secondary dispatch. Assume available transmission capacity exists, and an EIM participating resource with a 60 MW base schedule submits an EIM bid adder quantity and price with an effective upper economic bid of 100 MW. Under the CAISO's proposal rule, the resource may only receive an attribution to serve CAISO demand of up to 40 MW:

- If the actual dispatch of the resource is 30 MW, the attribution of an EIM transfer serving CAISO demand cannot exceed this dispatch. There remains the potential for up to 30 MW of secondary dispatch resulting from the attribution.

- If the actual dispatch of the resource was 60 MW and the attribution of an EIM transfers serving CAISO demand was 40 MW, then there is the potential for up to 40 MW of secondary dispatch.

- If the actual dispatch of the resource was 75 MW and the attribution of an EIM transfers serving CAISO demand was 40 MW, then there is the potential for up to 25 MW of secondary dispatch because the 15 MW dispatch above the base schedule does not create the potential for secondary dispatch.

- If the actual dispatch of the resource was 100 MW and the attribution of an EIM transfers serving CAISO demand was 40 MW, then there is the potential for 0 MW of secondary dispatch because the 40 MW dispatch above the base schedule does not create the potential for secondary dispatch.

Under the CAISO's proposal, the market may still attribute an EIM transfer serving CAISO demand to capacity covered by a resource's base schedule. Importantly, the CAISO's is not proposing to limit attribution only to available capacity above an EIM participating resource's base schedule. Imposing such a resource-specific constraint could potentially create price inconsistent dispatch schedules among EIM participating resources and affect efficient price formation when the CAISO runs a market optimization for the combined CAISO and EIM balancing authority areas. This is the case because the market may dispatch a resource to a level below its base schedule based on a number of factors. For example, assume load in EIM balancing authority areas is less than the load reflected in EIM Entities' base schedules for that operating hour. Absent CAISO demand, the market optimization would reduce output from EIM participating resources below the resources' base schedules to maintain supply and demand balance. If, however, CAISO demand also increases relative to its forecast, it is still appropriate to attribute capacity from the EIM participating resources' base schedules to serve CAISO demand. If the EIM bid adder rules prevented

attribution of EIM transfers to EIM participating resources because they were dispatched at or below their base schedules, this could create anomalous market outcomes. By adding a resource constraint that allows attribution to occur only if the resource is dispatched above its base schedule is inconsistent with optimizing the total output all resources across combined the CASIO and EIM footprint.

The CAISO's proposal seeks to balance the need for a more accurate attribution of EIM transfers to EIM participating resources serving California demand with the need to reach an efficient and reliable market solution. In this regard, the CAISO's proposal maintains the CAISO's existing dispatch logic without injecting additional resource specific constraints. The proposal minimizes the potential for secondary dispatch but also maintains the use of cost-based EIM bid adders and the optimization of resources across the combined footprint of the CAISO and EIM Entity balancing authority areas. The Commission should accept this proposal because it enhances the current EIM design and result in a more accurate attribution of which resource operated to support EIM transfers serving California demand.

During its stakeholder process, the CAISO did evaluate the potential impact of its proposal on dispatch outcomes. All else being equal, the CAISO's proposal will have the effect of spreading the attribution of EIM transfers serving California demand to a larger number of resources. In some instances, these resources may be more expensive because the marginal resource to support an EIM transfer may have higher emission costs than would be the case under the current EIM bid adder rules. In some instances, the market may dispatch an internal CAISO resource instead of an EIM participating resource, if that internal resource's energy bid is more economic than the combined energy and EIM bid adder of an EIM participating resource. The CAISO's Department of Market Monitoring (DMM) also identified that the CAISO's proposal could reduce EIM benefits by reducing the efficiency of total EIM area dispatch.[14] Stakeholders have acknowledged these possible outcomes but still generally support the rule change because it increases the accuracy of dispatch based on the costs of energy produced to meet demand.

The CAISO is also proposing additional tariff revisions to section 29.32 to recognize that SMUD is joining the EIM and will have EIM participating resources within an EIM Entity balancing authority area located within California. These resources will not submit EIM bid adders because any emission associated with its output is already subject to CARB's GHG regulations. There is no need to create a separate bid adder for it. Like CAISO resources, SMUD's resources will

[14] *See* DMM comments dated June 14, 2018 at 3-4: http://www.caiso.com/Documents/DMMComments-EIMGreenhouseGasEnhancements-ThirdRevisedDraftFinalProposal.pdf.

recover the cost of compliance with CARB's GHG regulations through its energy bids. Accordingly, the CAISO proposes to clarify that only EIM participating resources within an EIM Entity balancing authority area located outside California may submit EIM bid adders.[15] The CAISO is also proposing clarifications to section 29.32 to recognize that EIM participating resources that receive an attribution based on their EIM bid adder are serving demand within the combined area of the CAISO and other EIM Entity balancing authority areas located within California.[16]

IV. Stakeholder Process

In response to concerns about the current attribution rules for EIM transfers that serve CAISO demand, the CAISO conducted an extensive stakeholder process to explore options for addressing these concerns. This process explored various alternatives and resulted in the proposed refinements to the EIM bid adder rules.[17] Among others, the CAISO explored developing a two-step process in its optimization as well as a minimum EIM bid adder for use by all EIM participating resources.

The two-step optimization or two-pass approach would involve a first pass to identify resources that serve demand in the combined EIM area. Base schedules are not optimized by the CAISO market. The CAISO considered optimizing those schedules across the combined EIM area outside of California without EIM transfers to serve CAISO demand. The results of this first pass would establish an allocation base from which the CAISO could attribute EIM transfers serving CAISO demand to remaining capacity of EIM participating resources based on the resources' economic energy bids and EIM bid adder. Stakeholders raised concerns that the proposal could result in EIM participating resources bidding at more than their marginal costs in an attempt to avoid a dispatch in the first pass of the optimization in order to be available to serve CAISO demand in the second pass of the optimization. This element of the design raised concerns with efficient dispatch and potential pricing impacts on load in EIM areas outside of California. After multiple discussions with stakeholders, the CAISO could not identify an effective means to mitigate these concerns. As a result, the CAISO decided not to pursue this proposal.

The CAISO also explored a minimum EIM bid adder that would apply to all EIM participating resources offering their capacity to serve CAISO demand. This proposed approach would effectively have created a hurdle rate that reflected the

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15 *See e.g.* proposed change to CAISO tariff section 29.32(a)(2)(A).

16 *See e.g.* proposed change to CAISO tariff section 29.32(b)(1) and (3).

17 More information about the CAISO stakeholder initiative is available on the CAISO's website, including alternatives explored and stakeholder comments: http://www.caiso.com/informed/Pages/StakeholderProcesses/RegionalIntegrationEIMGreenhouseGasCompliance.aspx

emissions cost associated with secondary dispatch that might occur when CAISO demand benefited from an EIM transfer. This minimum bid adder would have permitted the CAISO market to compensate EIM participating resources for their cost of compliance with CARB's GHG regulations for their resource-specific emissions and for emissions associated with secondary dispatch. However, it would have resulted in a framework under which EIM participating resource scheduling coordinators for non-emitting resources would need to submit an EIM bid adder reflecting an emission costs but non-emitting resources with the CAISO would not. The CAISO explored various ways to refine this proposed approach, including different minimum bid adders by resource type, but ultimately could not find an effective means to mitigate this fundamental concern. As a result, the CAISO decided not to pursue this proposal.

Stakeholders, including market participants as well as California state regulators,[18] have expressed general support for the CAISO's current proposal because it maintains the current principles that EIM participating resource scheduling coordinators voluntarily make their resources available to serve California demand, the rules do not impact the locational marginal price demand outside of California pays, the proposal does not change the objective function of the CAISO's optimization, and the proposal mitigates the potential for secondary dispatches that might occur as result of EIM transfer to serve California demand. DMM has stated that the CAISO's proposal should have less of a detrimental impact on pricing and dispatch efficiency than other alternatives explored with stakeholders and is an improvement over the CAISO's previous proposals for addressing secondary dispatch.[19]

Some stakeholders have observed that market participants could take steps to configure EIM participating resources' base schedules to maximize GHG revenue as opposed to the most optimal operation of their resources. The CAISO does not think this outcome is likely because of market rules that would create significant financial disincentive to do so. Specifically, if an EIM participating resource scheduler configures base schedules so that the EIM Entity does not pass resource sufficiency tests then there is no opportunity to participate in EIM transfers during the relevant operating hour.[20] In addition, sub-optimal schedules will result in economic re-dispatch independent of changes in load. This will result in imbalance settlement for instructed deviations from the

[18] *See* Comments from CARB dated April 11, 2018: http://www.caiso.com/Documents/CARBComments-EIMGHGEnhancements-SecondRevisedDraftFinalProposal.pdf.

[19] *See* DMM comments dated June 14, 2018 at 3. http://www.caiso.com/Documents/DMMComments-EIMGreenhouseGasEnhancements-ThirdRevisedDraftFinalProposal.pdf.

[20] CAISO tariff section 29.34.

base schedule.[21] In addition to energy settlement, the imbalances will be charged EIM administrative fees for both the resource that was dispatched higher and the resource dispatched lower.[22] Moreover, if the sub-optimal schedules have unresolved congestion, the re-dispatch will result in uplift costs through the real-time congestion offset which is allocated to the EIM Entity balancing authority area that submitted sub-optimal base schedules.[23] Finally, short start and multi-stage resources are not eligible for cost recovery of commitment or transition costs, respectively if the resource is self-committed by submitting a base schedule.[24] In contrast, when the market determines the commitment, these costs are shared with the EIM balancing authority area that is receiving the EIM transfer. The CAISO believes the sub-optimal commitment of resources can also exacerbate intertemporal constraints such as must-stage generation transitions, minimum up time, and other resource constraints. The cost to EIM participating resource scheduling coordinators could outweigh any benefit that may result from submitting sub-optimal base schedules. Nevertheless, the CAISO will monitor any changes to the formation of base schedules it observes after the new EIM bid adder rules take effect and provide a report to stakeholders after obtaining six months of market data. The CAISO intends to provide such a report as part of an EIM Governing Body meeting.

The CAISO's stakeholder process concluded with approval of this proposal by the EIM Governing Body on July 12, 2018. The EIM Governing Body has primary authority over this matter because the EIM bid adder is an EIM-specific rule; it would not exist absent the EIM.[25] Under the EIM Governing Body Charter, policy initiatives that are subject to the EIM Governing Body's primary authority go first to the EIM Governing Body for approval, and then to the consent agenda of the CAISO Board. The CAISO Board of Governors subsequently approved this matter as part of its consent agenda at its July 26, 2018, meeting.

V. Effective Date and Request for Order

The CAISO requests that the Commission make the tariff revisions contained in this filing effective November 1, 2018. The CAISO respectfully requests that the Commission issue an order by no later than October 29, 2018. Obtaining an order by this date will provide sufficient time for the CAISO to

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21 *Id.* at section 29.11

22 *Id.* at section 29.26.

23 *Id.* at 29.11(e).

24 *Id.* at section 29.11(f).

25 *See* Charter for EIM Governance at pp 3-4. https://www.westerneim.com/Documents/CharterforEnergyImbalanceMarketGovernance.pdf.

undertake final steps to promote updates to its market systems and provide market participants with certainty regarding the EIM bid adder rules in advance of trade day November 1, 2018.

VI. Communications

In accordance with Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,[26] please provide communications regarding this filing to the following individuals, whose names should appear on the official service list established by the Commission with respect to this submittal:

Anthony Ivancovich
Deputy General Counsel
Andrew Ulmer
Director, Federal Regulatory Affairs
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7209
Fax: (916) 608-7222
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VII. Service

The CAISO has served copies of this transmittal letter, and all attachments, on the California Public Utilities Commission, the California Energy Commission, and all parties with effective scheduling coordinator service agreements under the CAISO tariff. In addition, the CAISO is posting this transmittal letter and all attachments on its public website.

[26] 18 C.F.R. § 385.203(b)(3).

VIII. Attachments

The following attachments, in addition to this transmittal letter, support the instant filing:

Attachment A	July 2018 Board of Governors Materials;
Attachment B	July 2018 Energy Imbalance Market Governing Body Materials;
Attachment C	Revised CAISO tariff sheets that incorporate the proposed changes described above; and
Attachment D	Proposed changes to the CAISO tariff shown in red-line format.

IX. Conclusion

The CAISO respectfully requests that the Commission accept the proposed revisions to its EIM bid adder rules without modification. These revisions refine the EIM bid adder rules to more accurately attribute energy produced by EIM participating resources as a result of a market dispatch to serve demand in the CAISO or another EIM Entity that operates a balancing authority area within California.

Please contact the undersigned if you have any questions regarding this matter.

Respectfully submitted,

By: */s/ Andrew Ulmer*

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Counsel for the California Independent System Operator Corporation

Attachment A – July 2018 Board of Governors Materials

Energy Imbalance Market Bid Adder Amendment

California Independent System Operator Corporation

Memorandum

To: ISO Board of Governors

From: Roger Collanton, Vice President, General Counsel, and Corporate Secretary

Date: July 18, 2018

Re: **Decision on consent agenda**

This memorandum requires Board action.

Pursuant to the ISO bylaws and the Charter for Energy Imbalance Market Governance, the EIM Governing Body has primary authority, as delegated by the Board of Governors, over changes to market rules that are specific to the energy imbalance market. The Charter specifies that such market rules changes go first to the EIM Governing Body for approval, and then to the Board for approval via consent agenda. In its general session meeting on July 12, 2018, the EIM Governing Body took the following action that is subject to Board approval via consent agenda:

- Approved, in a 5-0 vote, Management's proposal for tariff clarifications enhancing the EIM greenhouse gas attribution.

Management proposes the following motion:

> ***Moved, that the Board of Governors approves the July 26, 2018 consent agenda comprised of EIM greenhouse gas attribution enhancements; and***
>
> ***Moved, that the Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the enhancements described in Management's memorandum to the EIM Governing Body dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.***

Management's memorandum to the EIM Governing Body detailing the proposal and the EIM Governing Body's corresponding motion approving the proposal are included as Attachment 1.

Memorandum

To: Energy Imbalance Market Governing Body

From: Mark Rothleder, VP, Market Quality and Renewable Integration

Date: July 5, 2018

Re: **Decision on EIM Greenhouse Gas Attribution Enhancements**

This memorandum requires EIM Governing Body action.

EXECUTIVE SUMMARY

Over the last year and a half, Management has worked with stakeholders, including state regulators, western energy imbalance market (EIM) participants, and California load serving entities to address the concern that the existing EIM design does not account for the full atmospheric greenhouse gas (GHG) emission effects associated with energy transfers into the ISO balancing area. This memorandum describes Management's proposed EIM design change to address this concern.

Under California GHG regulations, supply resources that the EIM dispatches to support energy transfers serving load in the ISO balancing area have an obligation to submit compliance instruments (allowances and/or offsets) to the California Air Resources Board (ARB) for the associated GHG emissions. The market dispatches EIM participating resources to support energy transfers into the ISO balancing area based on its least-cost dispatch optimization, which minimizes the total of both energy and GHG regulation compliance costs.

The existing least-cost dispatch tends to designate lower-GHG emitting EIM resources as supporting transfers into the ISO balancing area because these resources typically bid the least expensive GHG compliance costs. When this occurs, there can also be a "secondary" dispatch of other higher-emitting resources that the market dispatches to backfill to serve load outside the ISO, effectively replacing the energy transferred into the ISO. The existing EIM design arguably under-accounts for GHG emissions associated with these transfers because the market's GHG attribution rules do not account for the emissions associated with this secondary dispatch.

Management proposes to minimize the secondary dispatch and thus enhance the accounting of the atmospheric GHG effects through a market design change that will limit the amount of an EIM resource's output that the market can designate as supporting an energy transfer to serve load in the ISO balancing area. "Base schedules" are an EIM market feature representing a resource's output that an EIM

participant is scheduling to serve a forecast load outside of the ISO. The proposed modification will enable the market to designate as supporting a transfer only an amount no greater than the headroom on a resource above its base schedule. This change will more accurately account for GHG emissions because it will recognize that a base schedule represents resource output that has already been scheduled to serve load outside the ISO balancing area and consequently should not be designated as supporting an energy transfer.[1]

These policy changes fall within the EIM Governing Body's primary approval authority as the rules they relate to are EIM specific and would not exist without the EIM.

Management proposes the following motion:

> ***Moved, that the EIM Governing Body approves the proposal for tariff clarifications enhancing the EIM greenhouse gas attribution, as described in the memorandum dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Federal Energy Regulatory Commission guidance in any initial ruling on the proposed tariff amendment.***

DISCUSSION

Background

Energy generated in California or imported to serve California load is subject to GHG regulations adopted by the California Air Resources Board (ARB). Under these existing regulations, the compliance obligations apply to "first deliverers," which are generation owners or energy importers. The regulations identify an EIM participating resource scheduling coordinator as an energy importer if the EIM dispatches a supply resource it controls to support an energy transfer into the ISO balancing area. These entities have a GHG compliance obligation under ARB's GHG regulations, including the obligation to submit compliance instruments for the amount of imported energy, which the entities must acquire at a cost.

ARB's GHG regulations first went into effect before the start of the EIM. To address the associated compliance costs, the ISO developed a mechanism to reflect GHG compliance costs as part of energy bids and locational marginal prices within the ISO balancing area.

As part of the EIM, the ISO implemented market provisions in which locational marginal prices outside of the EIM balancing area do not include GHG regulation compliance costs, but external resources receive an uplift payment for GHG compliance costs when

[1] A base schedule could also be to support a non-EIM import into the ISO balancing area but these imports have a separate GHG regulation reporting mechanism outside of the EIM.

the market dispatches them to support energy transfers into the ISO balancing area. This uplift payment is based on a marginal GHG compliance cost that is based on GHG bid adders reflecting GHG compliance costs, which suppliers submit for EIM participating resources along with energy bids.

When dispatching EIM resources to serve load outside the ISO balancing area, the market optimization considers only the energy bid. When dispatching EIM resources to support energy transfers into the ISO, the market optimization considers the energy bid cost plus the GHG bid adder cost. Suppliers voluntarily submit the GHG bid adders if they want their resource to be eligible to support energy transfers into the ISO balancing area and earn GHG cost uplift payments.

The EIM's resource-specific attribution of transfers into the ISO balancing authority area provides transparency regarding the resources dispatched to support EIM transfers. However, these transfers can result in a phenomenon known as secondary dispatch.

Secondary Dispatch

Under the current EIM design, the ISO's least-cost dispatch tends to dispatch lower GHG-emitting resources as supporting transfers to serve load in the ISO balancing area because these resources submit the lowest cost GHG bid adders to the market. Because all resources in an EIM balancing area are generally equally effective in supporting energy transfers to another balancing area, the market minimizes costs by designating the resources with the lowest GHG costs as supporting transfers to the ISO balancing area.

Currently, the market can designate all of a participating resource's output for which there is a corresponding GHG bid adder as supporting a transfer. This can include output corresponding to a resource's base schedule, despite that a base schedule means the supplier has already scheduled that output to serve load outside the ISO.

The market may designate a resource as supporting a transfer into the ISO even though that resource would have operated at the same output to serve load outside of the ISO without an energy transfer. The market will dispatch another resource or resources to "backfill" this dispatch to serve the load outside of the ISO that would have been served by the resource designated as supporting the transfer. This "secondary dispatch" results in greater actual atmospheric GHG emissions than what is accounted for by the market if the backfilling resource or resources have higher GHG emission rates than the resource the market designates as supporting the transfer.

This secondary dispatch effect does not occur every time there are energy transfers into the ISO. The market may have dispatched a resource above a base schedule to enable a transfer into the ISO. There would be no backfilling resource in this case. Also, the secondary dispatch may not result in increased GHG emissions if the backfilling resource has the same or lower GHG emission rate as the designated resource.

Nevertheless, some stakeholders have expressed concern that the secondary dispatch effect in the EIM results in GHG accounting that does not fully reflect the atmospheric effect of the EIM dispatching resources to support energy transfers into the ISO. The stakeholders' concern is the market optimization's least cost dispatch can designate low GHG emitting resources as supporting transfers, while not accounting for the resulting secondary dispatch of other possibly higher GHG emitting resources.

Proposal

Management proposes to address this concern by limiting the amount of a resource's output that the market can designate as supporting an energy transfer into the ISO balancing area. Management proposes to only allow the market to designate a resource as supporting a transfer in an amount no greater than the headroom on a resource above any base schedule. The market will calculate this headroom as the megawatt quantity for which the supplier has submitted an energy bid and a corresponding GHG bid adder for the resource minus the amount of any base schedule. In no case will the market designate as supporting a transfer an amount greater than the GHG bid adder submitted by the supplier. This change will reduce the magnitude of any secondary dispatch, improving the accuracy of the market attribution.

With this modification, the market optimization will limit the amount of a resource's output it designates as supporting a transfer into the ISO when the resource has already been scheduled to serve load outside the ISO through a base schedule. Since the amount will be limited, the resulting market dispatch will be different than under the current EIM design because the market will need to dispatch other resources that have capacity available above their base schedule. Consequently, the market will more appropriately account for the GHG emissions of the resources dispatched to serve load in the ISO Balancing Area.

The proposed modification reduces the potential for the secondary dispatch effect, but does not eliminate it. For example, assume that a resource had a base schedule of 80 MW and energy and GHG bid adder bids for up to 100 MW. If the market dispatched the resource to 85 MW, it could currently designate the entire 85 MW as supporting a transfer into the ISO balancing area. Since the dispatch only increased the resource's output by 5 MW from its base schedule, the potential secondary dispatch amount is 80 MW. Under the proposed modification, the market will be able to only designate 20 MW of the resource's output as supporting a transfer. Consequently, the potential secondary dispatch would only be 15 MW, representing the 20 MW that the market can designate as supporting a transfer minus the 5 MW the market dispatched the resource above its base schedule. Thus, in this example, the proposed modification reduces the magnitude of secondary dispatch from 80 MW to 15 MW.

Management's proposal outlined in this memorandum is the result of an extensive stakeholder process conducted over the last year and a half. This stakeholder process

explored several alternative modifications including one that would run a counterfactual dispatch that does not allow for transfers into the ISO, and one that would designate resources as supporting transfers using a default emission rate. These alternatives were ultimately ruled out because they would either create adverse incentives in the market, result in inappropriate pricing, or inequitably designate resources as supporting energy transfers.

POSITIONS OF THE PARTIES

Stakeholders, including the ARB, generally support Management's proposal to limit the amount of a resource's output that the market can designate as supporting a transfer into the ISO balancing area. As described above, Management's proposal is the result of weighing several alternative modifications over a lengthy and informed stakeholder process. Stakeholders' comments throughout the process highlighted the complexity of balancing the accuracy of GHG accounting with price formation and bidding incentive issues. Management will continue to work closely with ARB, in ARB's regulatory process, to address any remaining GHG under-accounting from the remaining amount of secondary dispatch that can still occur under the proposed modification.

Stakeholders also recognize continued discussions will occur regarding GHG market design to address expansion of the EIM functionality into the day-ahead market and under a possible multi-state GHG regulation paradigm.

Some stakeholders have observed that market participants may configure resources' base schedules to maximize GHG revenue as opposed to the most optimal operation of their resources. Management plans to monitor for changes in base scheduling practices, and notes that there may not be an incentive to engage in this behavior because sub-optimal base schedules will result in re-dispatch costs that may be greater than any GHG compliance cost uplift payment.

CONCLUSION

Management requests the EIM Governing Body approve Management's proposal to limit the amount of a resource's output the market can designate as supporting an energy transfer into the ISO balancing area. This modification will improve the accuracy of GHG accounting by limiting the potential amount of secondary dispatch that can occur.

EIM Governing Body **July 12, 2018** **Decision on EIM Greenhouse Gas Attribution Enhancements**

General Session

Motion

Moved, that the EIM Governing Body approves the proposal for tariff clarifications enhancing the EIM greenhouse gas attribution, as described in the memorandum dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Federal Energy Regulatory Commission guidance in any initial ruling on the proposed tariff amendment.

Moved: Fong **Second: Schmidt**

EIM Governing Body Action: **Passed**	Vote Count: **5-0**
Fong	Y
Kavulla	Y
Linvill	Y
Prescott	Y
Schmidt	Y

Motion Number: 2018-07-G5

Board of Governors **July 26, 2018** **Decision on consent agenda**

General Session

Motion

Moved, that the Board of Governors approves the July 26, 2018 consent agenda comprised of EIM greenhouse gas attribution enhancements; and

Moved, that the Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the enhancements described in Management's memorandum to the EIM Governing Body dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

Moved: Ferron **Second:** Bhagwat

Board Action: **Passed**	Vote Count: **5-0**
Bhagwat	Y
Ferron	Y
Galiteva	Y
Maullin	Y
Olsen	Y

Motion Number: 2018-07-G5

Attachment B – July 2018 Energy Imbalance Market Governing Body Materials

Energy Imbalance Market Bid Adder Amendment

California Independent System Operator Corporation

Memorandum

To: Energy Imbalance Market Governing Body

From: Mark Rothleder, VP, Market Quality and Renewable Integration

Date: July 5, 2018

Re: **Decision on EIM Greenhouse Gas Attribution Enhancements**

This memorandum requires EIM Governing Body action.

EXECUTIVE SUMMARY

Over the last year and a half, Management has worked with stakeholders, including state regulators, western energy imbalance market (EIM) participants, and California load serving entities to address the concern that the existing EIM design does not account for the full atmospheric greenhouse gas (GHG) emission effects associated with energy transfers into the ISO balancing area. This memorandum describes Management's proposed EIM design change to address this concern.

Under California GHG regulations, supply resources that the EIM dispatches to support energy transfers serving load in the ISO balancing area have an obligation to submit compliance instruments (allowances and/or offsets) to the California Air Resources Board (ARB) for the associated GHG emissions. The market dispatches EIM participating resources to support energy transfers into the ISO balancing area based on its least-cost dispatch optimization, which minimizes the total of both energy and GHG regulation compliance costs.

The existing least-cost dispatch tends to designate lower-GHG emitting EIM resources as supporting transfers into the ISO balancing area because these resources typically bid the least expensive GHG compliance costs. When this occurs, there can also be a "secondary" dispatch of other higher-emitting resources that the market dispatches to backfill to serve load outside the ISO, effectively replacing the energy transferred into the ISO. The existing EIM design arguably under-accounts for GHG emissions associated with these transfers because the market's GHG attribution rules do not account for the emissions associated with this secondary dispatch.

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participant is scheduling to serve a forecast load outside of the ISO. The proposed modification will enable the market to designate as supporting a transfer only an amount no greater than the headroom on a resource above its base schedule. This change will more accurately account for GHG emissions because it will recognize that a base schedule represents resource output that has already been scheduled to serve load outside the ISO balancing area and consequently should not be designated as supporting an energy transfer.[1]

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Management proposes the following motion:

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DISCUSSION

Background

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ARB's GHG regulations first went into effect before the start of the EIM. To address the associated compliance costs, the ISO developed a mechanism to reflect GHG compliance costs as part of energy bids and locational marginal prices within the ISO balancing area.

As part of the EIM, the ISO implemented market provisions in which locational marginal prices outside of the EIM balancing area do not include GHG regulation compliance costs, but external resources receive an uplift payment for GHG compliance costs when

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Nevertheless, some stakeholders have expressed concern that the secondary dispatch effect in the EIM results in GHG accounting that does not fully reflect the atmospheric effect of the EIM dispatching resources to support energy transfers into the ISO. The stakeholders' concern is the market optimization's least cost dispatch can designate low GHG emitting resources as supporting transfers, while not accounting for the resulting secondary dispatch of other possibly higher GHG emitting resources.

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POSITIONS OF THE PARTIES

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Stakeholders also recognize continued discussions will occur regarding GHG market design to address expansion of the EIM functionality into the day-ahead market and under a possible multi-state GHG regulation paradigm.

Some stakeholders have observed that market participants may configure resources' base schedules to maximize GHG revenue as opposed to the most optimal operation of their resources. Management plans to monitor for changes in base scheduling practices, and notes that there may not be an incentive to engage in this behavior because sub-optimal base schedules will result in re-dispatch costs that may be greater than any GHG compliance cost uplift payment.

CONCLUSION

Management requests the EIM Governing Body approve Management's proposal to limit the amount of a resource's output the market can designate as supporting an energy transfer into the ISO balancing area. This modification will improve the accuracy of GHG accounting by limiting the potential amount of secondary dispatch that can occur.

Decision on EIM Greenhouse Gas Attribution Enhancements

Don Tretheway
Senior Advisor, Market Design Policy

EIM Governing Body Meeting
General Session
July 12, 2018

Current EIM greenhouse gas design recognizes only certain generation is subject to California Air Resources Board regulations

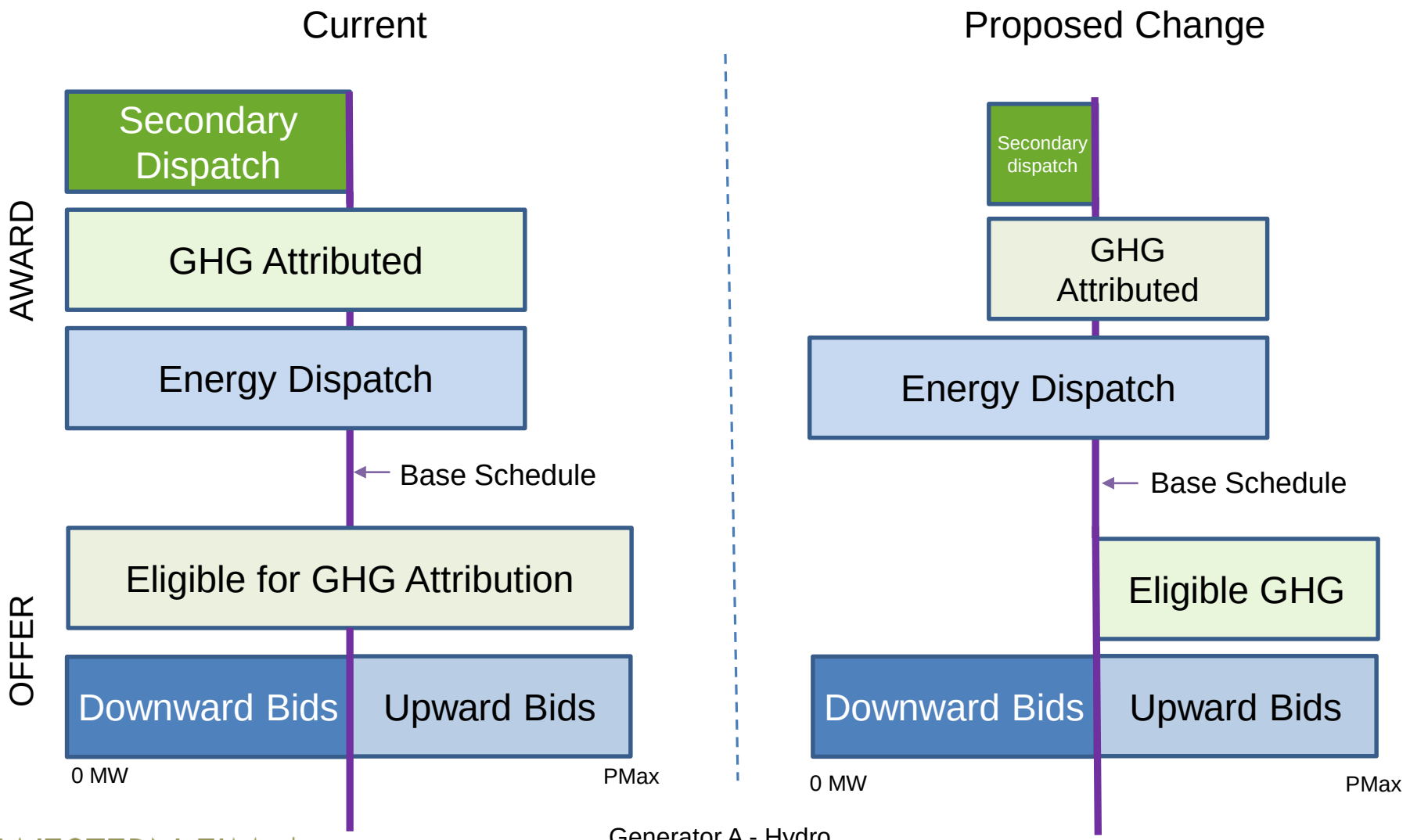
- Generation inside the ISO has a compliance obligation
- Generation outside the ISO has a compliance obligation when serving ISO load
- Generation outside the ISO does not have compliance obligation when serving non-ISO load

EIM participating resources submit a separate GHG bid MW quantity and price which expresses willingness to support EIM transfer to ISO

Current design may not account for full atmospheric effects of serving ISO load

- Least cost dispatch can have effect of sending base scheduled, low greenhouse gas emitting resources to ISO
- However, does not account for “secondary” dispatch of other resources backfilling to serve external demand
- The emission associated with the backfilling resource may or may not have higher emissions

Proposal reduces magnitude of secondary dispatch by reducing potential attribution quantity to base schedule



Generator A - Hydro

Secondary dispatch may or may not cause under-accounting of full atmospheric effects

No change in emissions

Backfill Energy Dispatch

Generator C - Hydro

Emissions $\leq$

Secondary Dispatch

Generator A - Hydro

Unaccounted emissions

Backfill Energy Dispatch

Generator B - Gas

Emissions $>$

Secondary Dispatch

Generator A - Hydro

Some stakeholders expressed concern that lower emitting resources may adjust base schedules lower to increase eligible MW for GHG attribution

- Sub-optimal base schedules will result in re-dispatch which can lead to additional costs
  - Imbalance energy settlement
  - Real-time congestion offset costs if unresolved congestion
  - No recovery of commitment costs if resource is self-committed
- Base schedules do not affect market optimization's price consistency or energy bidding incentives

After robust initiative process, stakeholders generally support the proposed enhancement

- Improves the greenhouse gas attribution relative to current implementation
- Does not have price inconsistency or energy bidding behavior issues of prior proposals
- Management will monitor for any changes in base schedule practices of low emitting resources to capture greenhouse gas premium

Management recommends approval of the EIM greenhouse gas attribution enhancements

- Reduces the potential magnitude of secondary dispatch
- Improves dispatch by more accurately attributing EIM transfers to upward dispatch capability
- Maintains the current price and incentive consistent market optimization

EIM Governing Body **July 12, 2018** **Decision on EIM Greenhouse Gas Attribution Enhancements**

General Session

Motion

Moved, that the EIM Governing Body approves the proposal for tariff clarifications enhancing the EIM greenhouse gas attribution, as described in the memorandum dated July 5, 2018, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Federal Energy Regulatory Commission guidance in any initial ruling on the proposed tariff amendment.

Moved: Fong **Second: Schmidt**

EIM Governing Body Action: **Passed**	Vote Count: **5-0**
Fong	Y
Kavulla	Y
Linvill	Y
Prescott	Y
Schmidt	Y

Motion Number: 2018-07-G5

Attachment C – Clean Tariff

Energy Imbalance Market Bid Adder Amendment

California Independent System Operator Corporation

29.32 Greenhouse Gas Regulation and EIM Bid Adders.

(a) **EIM Bid Adders.**

(1) **In General.** EIM Participating Resources will have an opportunity to recover costs of compliance with California Air Resources Board greenhouse gas regulations, which may include the cost of allowances, uncertainty on the final resource specific emission factor, and other costs of greenhouse gas regulation compliance.

(2) **EIM Bid Adder.**

(A) **Bid Submission.** EIM Participating Resource Scheduling Coordinators for EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California may submit an EIM Bid Adder as a separate hourly Bid component to recover costs of compliance with California Air Resources Board greenhouse gas regulations, which must include a price and quantity and the price portion of which must be equal to or less than 110% of the EIM Participating Resource's greenhouse gas maximum compliance cost as determined in accordance with section 29.32(a)(3).

(B) **Default Treatment.** If an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California does not submit an EIM Bid Adder, the CAISO will assume that the EIM Participating Resource will not be selected for delivery to the CAISO Balancing Authority Area.

(3) **Determination of EIM Greenhouse Gas Maximum Cost.** Each day the CAISO will determine the greenhouse gas maximum compliance cost for each EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California as set forth in the EIM Business Practice Manual, based on-

(A) the EIM Resource's highest incremental heat rate; the applicable Greenhouse Gas Allowance Price; and the EIM Participating Resource's

emission rate, as set forth in the applicable U.S. Environmental Protection Agency publication and registered in the Master File; or

(B) a price determined in accordance with the negotiated rate option procedures in section 39.7.1.3.1; or,

(C) with respect to, and only with respect to, Bids at EIM External Interties, the carbon dioxide equivalent emission rate of the resource with the highest such rate in the WECC region and the applicable Greenhouse Gas Allowance Price index.

(4) **EIM Bid Adder Price.** The price included in the EIM Bid Adder shall not be less than $0/MWh and the sum of the price component of the EIM Bid Adder and the Energy cost portion of the Bid cannot exceed $1000/MWh.

(b) **Consideration of EIM Bid Adders in Market Clearing.**

(1) **Dispatch of EIM Participating Resources with Nonzero Bid Adders.** The CAISO's Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall take into account EIM Bid Adders in selecting Energy produced by EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California for import into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California up to the associated MW quantity included in the EIM Bid Adder, but not when selecting EIM Participating Resources to serve Load outside of the combined area of the CAISO Balancing Authority Area and other EIM Entity Balancing Authority Areas within California.

(2) **EIM Participating Resources EIM Bid Adder MW Quantity.** The CAISO's Real-Time Unit Commitment and Real-Time Dispatch will limit the maximum EIM Bid Adder MW quantity of an EIM Participating Resource to a value equal to the EIM Participating Resource's dispatchable Bid range between the EIM Participating Resource's BASE Schedule and the EIM Participating Resource's

effective upper economic Bid, considering any applicable derates and ancillary services capacity reservations, for the relevant Operating Hour.

(3) **Dispatch of EIM Participating Resources Bid Adders of Zero.** The CAISO's Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall not dispatch EIM Participating Resources outside the combined area of the CAISO Balancing Authority Area and other EIM Entity Balancing Authority Areas within California for delivery into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California if the MW quantity included in the EIM Bid Adder is zero.

(c) **Effect on Locational Marginal Price.** Using the methodology described in Appendix C, the CAISO will include the marginal EIM Bid Adder as a negative component in the Locational Marginal Prices for EIM Entity Balancing Authority Areas in addition to those specified in Appendix C and Section 27.

(d) **Notice to EIM Participating Resource.** The CAISO will notify the EIM Participating Resource Scheduling Coordinator through the Dispatch Instruction of the megawatt quantity of any Energy of an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California that is deemed to have been imported into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California as a result of the Market Clearing of the Real-Time Market.

(e) **Compensation.** The CAISO will allocate the Net Imbalance Energy Export optimally to EIM Participating Resource Scheduling Coordinators and will distribute revenues from the EIM Bid Adder to EIM Participating Resources pursuant to that allocation.

(f) **Reporting Requirements.** The CAISO will report to each EIM Participating Resource Scheduling Coordinator the portion of the FMM Energy Schedule and the portion of RTD Energy Dispatch that is associated with Energy deemed to have been imported to the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California from all EIM Resources as part of the Real-Time Market results publication from each of its EIM Resources.

Attachment D – Marked Tariff

Energy Imbalance Market Bid Adder Amendment

California Independent System Operator Corporation

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(2) **EIM Bid Adder.**

(A) **Bid Submission.** EIM Participating Resource Scheduling Coordinators for EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California may submit an EIM Bid Adder as a separate hourly Bid component to recover costs of compliance with California Air Resources Board greenhouse gas regulations, which must include a price and quantity and the price portion of which must be equal to or less than 110% of the EIM Participating Resource's greenhouse gas maximum compliance cost as determined in accordance with section 29.32(a)(3).

(B) **Default Treatment.** If an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California does not submit an EIM Bid Adder, the CAISO will assume that the EIM Participating Resource will not be selected for delivery to the CAISO Balancing Authority Area.

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(A) the EIM Resource's highest incremental heat rate; the applicable Greenhouse Gas Allowance Price; and the EIM Participating Resource's

emission rate, as set forth in the applicable U.S. Environmental Protection Agency publication and registered in the Master File; or

(B) a price determined in accordance with the negotiated rate option procedures in section 39.7.1.3.1; or,

(C) with respect to, and only with respect to, Bids at EIM External Interties, the carbon dioxide equivalent emission rate of the resource with the highest such rate in the WECC region and the applicable Greenhouse Gas Allowance Price index.

(4) **EIM Bid Adder Price.** The price included in the EIM Bid Adder shall not be less than $0/MWh and the sum of the price component of the EIM Bid Adder and the Energy cost portion of the Bid cannot exceed $1000/MWh.

(b) **Consideration of EIM Bid Adders in Market Clearing.**

(1) **Dispatch of EIM Participating Resources with Nonzero Bid Adders.** The CAISO's Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall take into account EIM Bid Adders in selecting Energy produced by EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California ~~the CAISO Balancing Authority Area~~ for import into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California up to the associated MW quantity included in the EIM Bid Adder, but not when selecting EIM Participating Resources to serve Load outside of the combined area of the CAISO Balancing Authority Area ~~or~~and other EIM Entity Balancing Authority Areas within California.

(2) **EIM Participating Resources EIM Bid Adder MW Quantity.** The CAISO's Real-Time Unit Commitment and Real-Time Dispatch will limit the maximum EIM Bid Adder MW quantity of an EIM Participating Resource to a value equal to the EIM Participating Resource's dispatchable Bid range between the EIM Participating Resource's BASE Schedule and the EIM Participating Resource's

effective upper economic Bid, considering any applicable derates and ancillary services capacity reservations, for the relevant Operating Hour.

(~~2~~3) **Dispatch of EIM Participating Resources Bid Adders of Zero.** The CAISO's Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall not dispatch EIM Participating Resources outside the combined area of the CAISO Balancing Authority Area and other EIM Entity Balancing Authority Areas within California for delivery into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California if the MW quantity included in the EIM Bid Adder is zero.

(c) **Effect on Locational Marginal Price.** Using the methodology described in Appendix C, the CAISO will include the marginal EIM Bid Adder as a negative component in the Locational Marginal Prices for EIM Entity Balancing Authority Areas in addition to those specified in Appendix C and Section 27.

(d) **Notice to EIM Participating Resource.** The CAISO will notify the EIM Participating Resource Scheduling Coordinator through the Dispatch Instruction of the megawatt quantity of any Energy of an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California that is deemed to have been imported into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California as a result of the Market Clearing of the Real-Time Market.

(e) **Compensation.** The CAISO will allocate the Net Imbalance Energy Export optimally to EIM Participating Resource Scheduling Coordinators and will distribute revenues from the EIM Bid Adder to EIM Participating Resources pursuant to that allocation.

(f) **Reporting Requirements.** The CAISO will report to each EIM Participating Resource Scheduling Coordinator the portion of the FMM Energy Schedule and the portion of RTD Energy Dispatch that is associated with Energy deemed to have been imported to the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California from all EIM Resources as part of the Real-Time Market results publication from each of its EIM Resources.