



November 21, 2022

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

**Re: California Independent System Operator Corporation
Docket No. ER23-____-000**

**Tariff Amendment to Implement Reference Level Changes for
Washington Resources to Reflect Costs of Greenhouse Gas
Compliance**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this tariff amendment to allow in-state Washington resources to reflect the costs of greenhouse gas (GHG) compliance associated with Washington's cap-and-invest program in their default energy bids and commitment costs.¹ Under Washington's Climate Commitment Act,² Washington begins its cap-and-invest program on January 1, 2023 pursuant to which the Washington Department of Ecology will impose a compliance obligation on GHG emitters, including electricity generators located in the state of Washington.³

¹ The CAISO submits this filing pursuant to section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d, and Part 35 of the Commission's Regulations, 18 C.F.R. Part 35. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the CAISO tariff, and references herein to specific tariff sections are references to sections of the CAISO tariff unless otherwise specified.

² Washington Senate Bill 5126 (2021); codified Rev. Code Wash. § 70A.65 (2021).

³ The regulations generally impose a compliance obligation on electricity serving Washington demand, including imports. However, because there is uncertainty regarding how Washington will address energy transactions in the Western Energy Imbalance Market (WEIM), the CAISO has declined to move forward with any additional market design changes so as to remain in line with, and not ahead of, Washington's regulations. This is further discussed in Section I below.

The CAISO proposes tariff amendments to recognize Washington-specific GHG reference levels that reflect these compliance costs for those resources within Washington participating in the Western Energy Imbalance Market (WEIM). GHG reference levels are employed in the market as part of commitment cost bid caps and the default energy bids that are used in the CAISO's market power mitigation process. These GHG reference levels will allow the CAISO to reflect the GHG compliance costs of resources within the state of Washington.

Washington's initial allowance auction is not scheduled until February 2023. For this reason, the CAISO proposes a phased approach to setting the Washington-specific GHG allowance price. For the first phase, the CAISO proposes to use an administrative GHG allowance price based on an assessment performed by consultants to the Washington Department of Ecology. In the second phase, the CAISO will use Washington's GHG allowance auction price. In the third phase, the CAISO will use an average of two GHG allowance prices from relevant indices. These proposed phased rates are independent and severable from each other. The rate the CAISO proposes to use for each phase does not affect the justness and reasonableness of the rate the CAISO will use in the other phases.

Because of the effective date of Washington's cap-and-invest program, the CAISO is targeting implementation as early as possible in Quarter 1 of 2023 and respectfully requests the Commission issue an order by January 26, 2023. The CAISO is developing an implementation schedule for technology enhancements necessary to implement the proposed changes, and once it has a final implementation schedule, the CAISO commits to inform market participants through its release user group. The CAISO also commits to inform market participants of the actual effective date through a market notice and requests authorization to notify the Commission of the actual effective date of the tariff changes within five days of actual implementation.⁴

I. Background

A. Washington Cap-and-Invest Program

Washington's cap-and-invest program begins on January 1, 2023. The program sets a limit on overall carbon emissions in Washington and requires

⁴ The CAISO has included an effective date of 12/31/9998 as part of the tariff records submitted in this filing. The CAISO will notify the Commission of the actual effective date of these tariff records within five business days of implementation in an eTariff submittal using Type of Filing code 150 – Report. See *Cal. Indep. Sys. Operator Corp.*, 172 FERC ¶ 61,263 (2020).

emitters to obtain allowances equal to their covered GHG emissions.⁵ Relevant here, the program applies to electric generators that operate within the state of Washington and emit over 25,000 metric tons of carbon dioxide equivalent.⁶ The first quarterly allowance auction for emitters to obtain these allowances is scheduled to be held in February 2023. Until Washington completes this allowance auction, only estimates for the cost of a GHG allowance exist. Though Washington anticipates linkage in the future, the Washington program is not linked with the California GHG program and, therefore, the price of a GHG allowance in Washington's market will likely be different for the initial compliance period.

The Washington program includes four compliance periods, the first being a four-year period covering emissions years 2023-2026.⁷ The program phases in more stringent requirements over additional compliance periods, with the program also expanding to include new sectors.⁸ Washington will utilize the cap reduction in order to achieve its 2030, 2040, and 2050 climate goals, culminating with a reduction in overall emissions of greenhouse gases in the state to five million metric tons, or ninety-five percent below 1990 levels, by 2050.

Under Washington statute, the Washington Department of Ecology, in consultation with other Washington agencies, must adopt a methodology for addressing imported electricity associated with a centralized energy market by October 1, 2026.⁹ Although a compliance obligation exists for the first compliance period, without this anticipated rulemaking, the rules under the cap-and-invest program are less clear as to how they apply to resources outside of Washington serving Washington load, such as in the case of resources participating in the Western Energy Imbalance Market.¹⁰ The CAISO intends to

⁵ Rev. Code Wash. § 70A.65. (2021).

⁶ Rev. Code Wash. § 70A.65.80(1)(b) (2021).

⁷ Rev. Code. Wash. § 70A.65 (2021).

⁸ The total program allowance budget for 2023 through 2026, as well as the second compliance period of 2027 through 2030, decreases annually relative to the previous year by an additional seven percent of the total program baseline. For emissions year 2031 through 2042, the annual decrease is one and eight tenths percent. Finally, the total program allowance budget for 2043 through 2049 decreases each year by an additional two and six tenths percent. The baseline in years 2027 and 2030 also includes an upward adjustment to accommodate new sectors entering the program at the start of that compliance period.

⁹ "In consultation with any linked jurisdiction to the program created by this chapter, by October 1, 2026, the department, in consultation with the department of commerce and the utilities and transportation commission, shall adopt by rule a methodology for addressing imported electricity associated with a centralized electricity market." Rev. Code Wash. § 70A.65.080(1)(c).

¹⁰ The Washington Department of Ecology issued regulations on September 29, 2022 providing limited guidance on the application to WEIM. The rules identify the recipient of WEIM

work with Washington's Department of Ecology and stakeholders to ensure the WEIM aligns with the cap-and-invest program as these rules evolve.¹¹

Notwithstanding this effort, electric generators in the state of Washington must comply with Washington's cap-and-invest program starting in 2023 and may include these costs in their energy bids. It is likewise appropriate to reflect the cost of compliance with Washington's program in these resources' calculated default energy bids and commitment cost bid caps.

B. Reference Levels

The CAISO uses reference levels to calculate a participating resource's default energy bid and default commitment costs.

Default energy bids are used in the local market power mitigation process. The default energy bid seeks to mirror competitive outcomes in those situations where participants can exercise local market power. In such cases, the CAISO adjusts a resource's submitted energy bid downward to the resource's default energy bid or the competitive locational marginal price, whichever is higher.¹² Default commitment costs serve as the cap of the values that scheduling coordinators may submit for minimum load cost bids, start-up cost bids, and transition cost bids. The CAISO's market processes use these bids to determine whether to commit the resource as part of a security constrained unit commitment.¹³ The CAISO uses the same methodology in the WEIM to mitigate energy bids from WEIM Participating Resources in the Real Time Market where a resource is exerting market power.¹⁴ In such cases, the CAISO will similarly adjust the WEIM Participating Resource's bid downward to the cost. Additionally, within the WEIM, the CAISO performs optimized economic commitment of

electricity as the entity with a compliance obligation for the first compliance period (2023-2026), with the expectation that a new rulemaking will occur within the next three years to revise these rules. The rules do not align with California's treatment of imports or with Washington signaling a future linkage with California's market. The ISO expects some alignment may take place. The CAISO has determined not to propose additional modifications regarding Washington's cap-and-invest program at this time due to concerns about making market rule changes for a temporary framework.

¹¹ For example, the CAISO is aware of the asymmetry that may arise between in-state and out-of-state resources serving Washington load when resources internal to Washington include a GHG cost in their energy bids, but out-of-state resources have no option for a GHG bid adder. Without timely guidance from Washington on which entity will have the compliance obligation in the WEIM context, the CAISO was unable to address this issue in this filing. However, the CAISO plans to initiate a new stakeholder process in 2023 to address this and other issues.

¹² See Section 39 of the CAISO tariff.

¹³ See Section 30.4 of the CAISO tariff.

¹⁴ Section 29.39 of the CAISO tariff applies the Real-Time Local Market Power Mitigation procedure in Section 39.7 of the CAISO tariff to the Energy Imbalance Market.

resources based on resources' market bids and their commitment costs, which are the costs to start up a resource (start-up costs) of running the resource at its minimum operating levels (minimum load costs). Without updating these reference level inputs for Washington resources to account for GHG compliance, Washington resources will still have a GHG compliance cost associated with their generation, but such costs will not be included in the market processes. As such, these resources inappropriately will appear to be less expensive than their actual costs.

For resources in California subject to the California Air Resources Board's (CARB) cap-and-trade program, the default energy bid and commitment costs utilize a GHG allowance price based on the average of two index prices from separate vendors.¹⁵ The CAISO used index prices for the cost of GHG compliance because, prior to implementation, stakeholders expressed concern that the futures market may not be sufficiently developed to allow the CAISO to rely on a futures price.¹⁶ The CAISO ultimately plans to utilize the same approach for Washington. Including the cost of GHG compliance in these reference levels is important to ensure the market processes accurately consider GHG compliance costs for a resource.

II. Proposed Tariff Changes

To reflect the costs of Washington's cap-and-invest program¹⁷ in the reference levels of participating resources located in the state of Washington, the CAISO proposes to update the default energy bid and commitment costs to include a Washington-specific GHG allowance price.¹⁸ The calculations the

¹⁵ The CAISO currently utilizes the Intercontinental Exchange and ARGUS indices. The CAISO proposes to identify the specific vendors in the business practice manuals rather than the tariff to allow for needed flexibility as more states adopt cap-and-trade programs and the vendors for these indices differ.

¹⁶ The ISO filed the tariff revisions on October 29, 2012, to reflect the fact that the California Air Resources Board was going to implement a cap-and-trade program for greenhouse gas emissions on January 1, 2013. The Commission accepted the tariff revisions effective as of January 1, as requested by the CAISO. California Independent System Operator Corp., 141 FERC ¶ 61,237 (2012); Commission letter order, Docket No. ER13-219-001 (Feb. 26, 2013).

¹⁷ The compliance costs represent one allowance, or the dollar value per metric ton of CO₂.

¹⁸ Section 39.7 of the CAISO tariff outlines various default energy bid options but, through these tariff amendments, the CAISO only proposes to modify the Variable Cost option which estimates a generating resource's costs based on Master File parameters and other more dynamic inputs such as natural gas price indices. The negotiated default energy bid option also remains available to scheduling coordinators but, due to the resource-specific nature of the negotiations, there is no set formula to modify in the tariff. Section 30.4.4 of the CAISO tariff also outlines two methodologies for the calculation of default commitment costs: the Proxy Cost and Registered Cost methodologies. The CAISO proposes to update the calculation of default commitment costs under both methodologies.

CAISO uses will be consistent with the default energy bid and default commitment cost calculations the CAISO uses for resources subject to the CARB's cap-and-trade program, but it will utilize a Washington-specific GHG allowance price. The CAISO proposes tariff changes to refer to the State of Washington and Washington Department of Ecology in tariff sections pertaining to the calculation of these reference levels where California and CARB are already included.¹⁹

For the Washington-specific allowance price, the CAISO proposes a phased implementation approach because it does not expect Washington Department of Ecology to hold an allowance auction until February 2023.²⁰ In the first phase, the CAISO proposes to use an estimate value for the cost of a GHG allowance. The Washington Department of Ecology, through a consultant, has conducted economic and market modeling (source report) which indicates that a reasonable starting point for this value is \$41 per MT CO₂e.²¹ In the first phase of implementation, the CAISO proposes to use this static, assumed value of \$41 per MTCO₂e for the cost of compliance with Washington's cap-and-invest program.²² The source report serves as a better approximation of GHG allowance costs than using California-indexed costs as a proxy because it reflects Washington-specific assumptions. The CAISO expects resources will bid costs that reflect the best available information pending the outcome of an allowance auction. Further supporting the reasonableness of the \$41 per MT CO₂e estimate is the fact that it falls near the midpoint between the cap-and-invest program's allowance price floor of \$19.70 per MT CO₂e and the allowance price ceiling of \$72.29 per MT CO₂e.²³ This first rate will remain in place until Washington completes its GHG allowance auction. This proposed rate is severable from the rest of the CAISO's proposal, and Commission action on it

¹⁹ Proposed Sections 30.4.5, 30.4.4.5, 39.6.1.6.2, and 39.7.1.1.1 of the CAISO tariff.

²⁰ Rev. Code Wash. § 70A.65.100(2)(a) directs the Washington Department of Ecology to hold a maximum of four auctions annually. Wash. Admin. Code § 173-446-300(3)(b) (2022) requires the Washington Department of Ecology to develop an annual schedule of auction dates by January 15, 2024 and for each successive year. An exact date for the first allowance auction is not yet available. However, the Washington Department of Ecology's auction website indicates the first auction will be held in the second half of February 2023. Available at <https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act/Cap-and-invest/Auctions-and-trading>.

²¹ Vivid Economics for the Washington Department of Ecology. *Summary of market modeling and analysis of the proposed Cap-and-Invest Program*. June 2022. Accessible at: <https://ecology.wa.gov/DOE/files/4a/4ab74e30-d365-40f5-9e8f-528caa8610dc.pdf>.

²² Proposed Section 39.7.1.1.1.4 of the CAISO tariff.

²³ Wash. Admin. Code § 173-446-335. These floor and ceiling numbers correspond to the 2023 auctions. The auction floor and ceiling shall be increased by five percent plus the rate of inflation each subsequent year.

will not affect the justness and reasonableness of the other proposals in this filing.

Once Washington holds an allowance auction, the CAISO proposes to use the initial clearing price, and thereafter until index prices become available, it will use the most recent auction clearing price.²⁴ The auction price will allow the CAISO to calculate reference levels to respond to actual allowance trading market information once it is available. In the third phase, when index prices are available, the CAISO will use index prices for Washington similar to how the CAISO uses index prices for the cost of compliance with California's cap-and-trade program.²⁵ An index price provides a more accurate reflection of the market for these allowances and thus more accurately reflects the cost of compliance. Although the auction price is a starting point, as the cap-and-invest program evolves, the CAISO expects market participants will engage in bilateral trading, which will cause deviations from the auction price. An index price, updated daily on weekdays, provides a timelier estimate of the allowance price. The CAISO will inform market participants via release user group as it moves to the next phase and implements a new methodology.²⁶ The CAISO expects to use the same vendors for Washington as used in the California context, the Intercontinental Exchange and Argus. In order to expedite the move to the third phase and sufficiently reflect the daily fluctuation in greenhouse gas allowance prices, the CAISO asks the Commission to approve the use of these vendors at this time, prior to the indices being available.²⁷ The table below summarizes the proposed phases:

²⁴ Proposed Section 39.7.1.1.1.4 of the CAISO tariff. The proposed section allows implementation to take place shortly after the triggering event to allow the CAISO adequate time to make necessary adjustments to the relevant systems.

²⁵ *Id.*

²⁶ As discussed above, each phase of the CAISO's proposal is separate from, and independent of, the other two phases. FERC's action regarding one phase does not affect the justness and reasonableness of the tariff language regarding any other phase.

²⁷ The CAISO does not propose changes to the tariff's inclusion of the Intercontinental Exchange and Argus as the vendors used for the greenhouse gas allowance price index, but requests an extension of these to Washington. However, to the extent these two vendors do not offer an index for Washington, the CAISO will make a future tariff filing to identify other vendors to be used in this context. See *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,237 (2012), directing the CAISO to include specific vendor names in the CAISO tariff.

Table 1: Summary of Washington-specific GHG allowance price implementation phases

| Phase | Implementation Trigger | Methodology | Price |
|--------------|--|---|---|
| 1 | Initial phase, no trigger | Utilize economic and market modeling completed for the Washington Department of Ecology | \$41/ MTCO ₂ e |
| 2 | First auction held in Washington Expected February 2023 | Utilize the most recent allowance auction price | Variable, updated approximately quarterly, following any subsequent auctions prior to phase 3 triggering event. |
| 3 | Two vendor indices available ²⁸ | Utilize an average of two vendor index prices | Variable, updated daily on weekdays |

III. Stakeholder Process for this Tariff Amendment

Stakeholders generally supported the CAISO’s proposal because it will allow the Washington resources to reflect their costs of compliance with Washington’s cap-and-invest program in their default energy bids and commit cost bid caps. One stakeholder suggested that the CAISO should allow market participants to submit offers for reference levels that are consistent with their own estimates. This is unnecessary because there is a separate process for negotiating default energy bids to accommodate this request.²⁹

Through the stakeholder process, the CAISO reduced the scope of the initial initiative in response to several stakeholders’ concerns that incorporating further tariff amendments should wait until Washington finalizes its program design. The CAISO anticipates future stakeholder processes to address further design elements as the Washington cap-and-invest program evolves.³⁰

²⁸ See *id.*

²⁹ Section 39.7.1.3 of the CAISO tariff.

³⁰ See, *supra*, note 7.

The CAISO has coordinated with the Washington Department of Ecology, Washington Utilities and Transportation Commission, and Washington Department of Commerce to ensure the proposed tariff amendments are consistent with Washington's cap-and-invest program. The CAISO will also provide support to WEIM participating resource scheduling coordinators and WEIM Entities in connection with their required reporting.³¹

The CAISO stakeholder process leading to this filing began with posting a combined issue paper/straw proposal on August 17, 2022 and a web conference on August 22, 2022. The CAISO subsequently posted a draft final proposal and draft tariff language on September 22, 2022 and October 20, 2022, respectively. For each of these postings, the CAISO held a stakeholder call and accepted written comments on the proposals. The stakeholder process culminated on October 26, 2022 with the Joint CAISO Governing Board and WEIM Governing Body approving the policy proposal underlying this filing.

IV. Effective Date and Request for Order

The CAISO respectfully requests the Commission issue an order by January 26, 2023. The CAISO is developing an implementation schedule for the technology enhancements necessary to implement the proposed changes, and once it has a final implementation schedule, the CAISO will inform market participants through its release user group. The CAISO also commits to inform market participants of the actual effective date of the tariff revisions through a market notice, and it requests authorization to notify the Commission of the actual effective date of the tariff changes within five days of their implementation.³² The CAISO recognizes there will be a gap between the implementation date of the CAISO's change to reference levels and the start of the Washington cap-and-invest program on January 1, 2023. We expect the impacts to the market to be minimal in this short interval because of the relatively few resources³³ that will be impacted and the availability of the negotiated default energy bid option. During this time period, the CAISO encourages Washington generators to reach out to the CAISO to take advantage of the negotiated default energy bid option. Finally, the CAISO requests that the Commission grant any

³¹ Pursuant to Washington State's recently revised Clean Air Act and beginning in 2023, Washington will require reporting of greenhouse gas (GHG) emissions associated with WEIM transactions in emissions year 2022 and each subsequent year. Rev. Code Wash. § 70A.15.2200. See also Wash. Admin. Code § 173-441-030(3)(a).

³² The CAISO has included an effective date of 12/31/9998 as part of the tariff records submitted in this filing. The CAISO will notify the Commission of the actual effective date of these tariff records within five business days of implementation in an eTariff submittal using Type of Filing code 150 – Report. See *Cal. Indep. Sys. Operator Corp.*, 172 FERC ¶ 61,263 (2020).

³³ There are approximately twenty emitting generators in Washington.

and all waivers that might be necessary to approve the CAISO's proposed tariff revisions effective as proposed herein, including any necessary waivers of Rules 35.3 and 35.11 of the Commission's Rules and Regulations (18 C.F.R. §§ 35.3 and 35.11). Such waivers are appropriate in the event the actual effective date for the proposed tariff provisions turns out to be more than 120 days after the date of this filing. As indicated above, the effective date of the tariff revisions depends on the finalization of a schedule for implementing the technology upgrades necessary to support this proposal.

V. Communications

Under Rule 203(b)(3),³⁴ the CAISO respectfully requests that all correspondence and other communications about this filing be served upon:

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VI. Service

The CAISO has served copies of this filing on the CPUC, the California Energy Commission, affected Washington agencies, and all parties with scheduling coordinator agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

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18 C.F.R. § 385.203(b)(3).

VIII. Contents of this filing

Besides this transmittal letter, this filing includes these attachments:

| | |
|--------------|------------------------------|
| Attachment A | Clean CAISO tariff sheets |
| Attachment B | Redlined CAISO tariff sheets |
| Attachment C | Draft Final Proposal |
| Attachment D | Board of Governors Memo |

IX. Conclusion

For the reasons set forth in this filing, the CAISO respectfully requests that the Commission issue an order accepting the tariff revisions in this filing by January 26, 2023, effective as of the dates specified herein.

Respectfully submitted,

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Attachment A – Clean Tariff
Tariff Amendment – Washington Greenhouse Gas Compliance
California Independent System Operator Corporation
November 21, 2022

Section 30

30.4.4 Default Commitment Cost Bids

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30.4.4.5 Resources with Greenhouse Gas Compliance Obligations

For each resource registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, the information provided to the CAISO by the Scheduling Coordinator must be consistent with the information submitted to the California Air Resources Board or the Washington Department of Ecology.

30.4.4.6 Maximum Default Minimum Load Bid

In no case shall a Default Minimum Load Bid exceed the Minimum Load Cost Hard Cap.

30.4.5 Proxy Cost Methodology

The CAISO will calculate Proxy Costs as described in this Section 30.4.5.

30.4.5.1 Natural Gas-Fired Resources

For each natural gas-fired resource, the CAISO will calculate a resource's Proxy Costs based on the resource's actual unit-specific performance parameters and applicable gas prices as described below.

- (a) **Fuel Input.** The CAISO will calculate Proxy Costs using formulaic natural gas cost values adjusted for fuel-cost variation, based on the natural gas price calculated pursuant to Section 39.7.1.1.1.3, and consistent with the requirements specified below.
- (b) **Proxy Start-Up Cost.** Proxy Start-Up Costs will also include:
 - (i) a Variable Start-Up Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (ii) a greenhouse gas cost adder for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as

having a greenhouse gas compliance obligation, which is calculated for each Start-Up as the product of the resource's fuel requirement per Start-Up, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price;

- (iii) the rates for the Market Services Charge and System Operations Charge multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource as registered in the Master File, multiplied by 0.5; and
- (iv) the cost of auxiliary power calculated using the unit-specific MWh quantity of auxiliary power used for Start-Up multiplied by a resource-specific electricity price.

(c) **Proxy Cost Minimum Load Costs.** Proxy Cost Minimum Load Costs will also include:

- (i) a Variable Energy Operations and Maintenance Adder as provided in Section 30.4.5.4;
- (ii) a Variable Minimum Load Operations and Maintenance Adder as provided in Section 30.4.5.4.
- (iii) a greenhouse gas cost adder for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California and Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, which is calculated for each run-hour as the product of the resource's fuel requirement at Minimum Load as registered in the Master File, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price;

- (iv) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource as registered in the Master File;
and
 - (v) the Bid Segment Fee.
- (d) **Proxy Transition Costs.** For each Multi-Stage Generating Resource under the Proxy Cost methodology, the CAISO will calculate the Proxy Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Proxy Start-Up Costs for the higher MSG Configuration, and the Proxy Start-Up Costs for the lower MSG Configuration, as those costs are determined in accordance with the Proxy Start-Up Cost calculation methodology set forth in Section 30.4.5. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Proxy Transition Cost shall be zero.

30.4.5.2 Non-Natural Gas-Fired Resources

For each non-natural gas-fired resource, the CAISO shall calculate the Proxy Start-Up Cost and Proxy Minimum Load Cost values under the Proxy Cost methodology as specified below.

- (a) **Fuel Input.** The Scheduling Coordinator for the resource will provide the fuel or fuel-equivalent input costs, which the CAISO will maintain in the Master File, pursuant to Section 39.7.1.1.1.2.
- (b) **Proxy Start-Up Costs.** Proxy Start-Up Costs will also include, if applicable:
 - (i) a Variable Start-Up Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (ii) greenhouse gas allowance costs for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator;
 - (iii) the rates for the Market Services Charge and System Operations Charge

multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource as registered in the Master File, multiplied by 0.5.

- (c) **Proxy Minimum Load Costs.** Proxy Minimum Load Costs will also include, if applicable:
- (i) A Variable Energy Operation and Maintenance Adder as provided in Section 30.4.5.4 multiplied by the PMin of the resource or MSG Configuration of the resource as registered in the Master File;
 - (ii) a Variable Minimum Load Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (iii) greenhouse gas allowance costs for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator;
 - (iv) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource as registered in the Master File; and
 - (v) the Bid Segment Fee.
- (d) **Proxy Transition Costs.** For each Multi-Stage Generating Resource under the Proxy Cost methodology, the CAISO will calculate the Proxy Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Proxy Start-Up Costs for the higher MSG Configuration, and the Proxy Start-Up Costs for the lower MSG Configuration, as those costs are determined in accordance with the Proxy Start-Up Cost calculation methodology set forth in Section 30.4.5. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Proxy Transition Cost shall be zero.

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Section 39

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39.6.1.6.2 Projected Greenhouse Gas Allowance Price

For resources that are registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, the CAISO will calculate a projected Greenhouse Gas Allowance Price component to be used in establishing maximum Default Start-Up Bids and Default Minimum Load Bids after the twenty-first (21st) day of each month and will post it on the CAISO Website by the end of that month. The projected Greenhouse Gas Allowance Price component will be applicable for Scheduling Coordinators on behalf of eligible Use-Limited Resources electing to use the Registered Cost methodology until a new projected Greenhouse Gas Allowance Price component is calculated and posted on the CAISO Website. The projected Greenhouse Gas Allowance Price component will be calculated by averaging the applicable daily Greenhouse Gas Allowance Prices calculated over the first twenty (20) days of the month using the methodology set forth in Section 39.7.1.1.1.4. The CAISO will calculate a projected Greenhouse Gas Allowance Price separately for each unlinked jurisdiction that regulates greenhouse gas compliance obligations.

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39.7.1 Calculation of Default Energy Bids

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39.7.1.1 Variable Cost Option

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39.7.1.1.1 Incremental Cost Calculation Under the Variable Cost Option

39.7.1.1.1.1 Natural Gas-Fired Resources

- (a) Calculation of incremental fuel cost - For natural gas-fueled units, incremental fuel cost is calculated based on an incremental heat rate curve multiplied by the natural gas price calculated as described below.

Resource owners shall submit to the CAISO average heat rates (Btu/kWh) measured for at least two (2) and up to eleven (11) generating operating points (MW), where the first and last operating points refer to the minimum and maximum operating levels (i.e., PMin and PMax), respectively. The average heat rate curve formed by the (Btu/kWh, MW) pairs is a piece-wise linear curve between operating points, and two (2) average heat rate pairs yield one (1) incremental heat rate segment that spans two (2) consecutive operating points. The incremental heat rates (Btu/kWh) in the incremental heat rate curve are calculated by converting the average heat rates submitted by resource owners to the CAISO to requirements of heat input (Btu/h) for each of the operating points and dividing the changes in requirements of heat input from one (1) operating point to the next by the changes in MW between two (2) consecutive operating points as specified in the Business Practice Manual. For each segment representing operating levels below eighty (80) percent of the unit's PMax, the incremental heat rate is limited to the maximum of the average heat rates for the two (2) operating points used to calculate the incremental heat rate segment.

The unit's final incremental fuel cost curve is calculated by multiplying this incremental heat rate curve by the applicable natural gas price, and then, if necessary, applying a left-to-right adjustment to ensure that the final incremental cost curve is monotonically non-decreasing. Heat rate and cost curves shall be stored, updated, and validated in the Master File.

- (b) Calculation of greenhouse gas cost adder - For each natural gas-fired resource registered with the California Air Resources Board or the Washington Department of

Ecology as having a greenhouse gas compliance obligation, the CAISO will calculate a greenhouse gas cost adder as the product of the resource's incremental heat rate, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price.

- (c) Calculation of volumetric Grid Management Charge adder - For each natural gas-fired resource, the CAISO will include a volumetric Grid Management Charge adder that consists of: (i) the Market Services Charge; (ii) the System Operations Charge; and (iii) the Bid Segment Fee divided by the MW in the Bid segment.

39.7.1.1.1.2 Non-Natural Gas-Fired Resources

For non-natural gas-fueled units, incremental fuel cost is calculated based on an average cost curve as described below.

Resource owners for non-natural gas-fueled units shall submit to the CAISO average fuel or fuel equivalent costs (\$/MW) measured for at least two (2) and up to eleven (11) generating operating points (MW), where the first and last operating points refer to the minimum and maximum operating levels (i.e., PMin and PMax), respectively. The average cost curve formed by the (\$/MWh, MW) pairs is a piece-wise linear curve between operating points, and two (2) average cost pairs yield one (1) incremental cost segment that spans two (2) consecutive operating points. For each segment representing operating levels below eighty percent (80%) of the unit's PMax, the incremental cost rate is limited to the maximum of the average cost rates for the two (2) operating points used to calculate the incremental cost segment. The unit's final incremental fuel cost curve is then adjusted, if necessary, applying a left-to-right adjustment to ensure that the final incremental cost curve is monotonically non-decreasing. The CAISO will include, if applicable: (i) greenhouse gas allowance costs for each non-natural gas-fired resource registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator for the resource; (ii) variable operation and maintenance cost; and (iii) a volumetric Grid Management Charge adder that consists of: (a) the Market Services Charge; (b) the System Operations Charge; and (c) the Bid Segment Fee divided by the MW in the Bid segment. Cost curves shall be stored, updated, and

validated in the Master File.

39.7.1.1.1.3 Calculation of Natural Gas Price

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39.7.1.1.1.4 Calculation of Greenhouse Gas Allowance Price

The CAISO will calculate the Greenhouse Gas Allowance Price separately for each unlinked jurisdiction that regulates greenhouse gas compliance obligations. To calculate the Greenhouse Gas Allowance Price for each unlinked jurisdiction, the CAISO will average two prices from the following vendors: the Intercontinental Exchange and ARGUS. If a greenhouse gas price from a vendor is unavailable for any reason, the CAISO will use the most recent available greenhouse gas price from that vendor. If greenhouse gas prices from these vendors have not yet been calculated for a jurisdiction, the CAISO will utilize the best available proxy, as follows: for Washington State, the CAISO will utilize \$41/MT CO₂e until an allowance auction is held by the State of Washington, at which point the CAISO will use, as soon as is practicable, the most recent allowance auction clearing price. If for any reason the CAISO cannot calculate a Greenhouse Gas Allowance Price, it will use the most recently calculated value.

The CAISO will update the Greenhouse Gas Allowance Price by approximately 22:00 Pacific Time each day (T). The daily Greenhouse Gas Allowance Price will be used in the next day's Real-Time Market (T+1) and in the Day-Ahead Market for the following Trading Day (T+2). The CAISO will calculate each Greenhouse Gas Allowance Price during a year using prices for greenhouse gas allowances from that same year.

Attachment B – Marked Tariff

Tariff Amendment – Washington Greenhouse Gas Compliance

California Independent System Operator Corporation

November 21, 2022

Section 30

30.4.4 Default Commitment Cost Bids

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30.4.4.5 Resources with Greenhouse Gas Compliance Obligations

For each resource registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, the information provided to the CAISO by the Scheduling Coordinator must be consistent with the information submitted to the California Air Resources Board or the Washington Department of Ecology.

30.4.4.6 Maximum Default Minimum Load Bid

In no case shall a Default Minimum Load Bid exceed the Minimum Load Cost Hard Cap.

30.4.5 Proxy Cost Methodology

The CAISO will calculate Proxy Costs as described in this Section 30.4.5.

30.4.5.1 Natural Gas-Fired Resources

For each natural gas-fired resource, the CAISO will calculate a resource's Proxy Costs based on the resource's actual unit-specific performance parameters and applicable gas prices as described below.

- (a) **Fuel Input.** The CAISO will calculate Proxy Costs using formulaic natural gas cost values adjusted for fuel-cost variation, based on the natural gas price calculated pursuant to Section 39.7.1.1.1.3, and consistent with the requirements specified below.
- (b) **Proxy Start-Up Cost.** Proxy Start-Up Costs will also include:
 - (i) a Variable Start-Up Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (ii) a greenhouse gas cost adder for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as

having a greenhouse gas compliance obligation, which is calculated for each Start-Up as the product of the resource's fuel requirement per Start-Up, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price;

- (iii) the rates for the Market Services Charge and System Operations Charge multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource as registered in the Master File, multiplied by 0.5; and
- (iv) the cost of auxiliary power calculated using the unit-specific MWh quantity of auxiliary power used for Start-Up multiplied by a resource-specific electricity price.

(c) **Proxy Cost Minimum Load Costs.** Proxy Cost Minimum Load Costs will also include:

- (i) a Variable Energy Operations and Maintenance Adder as provided in Section 30.4.5.4;
- (ii) a Variable Minimum Load Operations and Maintenance Adder as provided in Section 30.4.5.4.
- (iii) a greenhouse gas cost adder for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California and Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, which is calculated for each run-hour as the product of the resource's fuel requirement at Minimum Load as registered in the Master File, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price;

- (iv) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource as registered in the Master File; and
 - (v) the Bid Segment Fee.
- (d) **Proxy Transition Costs.** For each Multi-Stage Generating Resource under the Proxy Cost methodology, the CAISO will calculate the Proxy Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Proxy Start-Up Costs for the higher MSG Configuration, and the Proxy Start-Up Costs for the lower MSG Configuration, as those costs are determined in accordance with the Proxy Start-Up Cost calculation methodology set forth in Section 30.4.5. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Proxy Transition Cost shall be zero.

30.4.5.2 Non-Natural Gas-Fired Resources

For each non-natural gas-fired resource, the CAISO shall calculate the Proxy Start-Up Cost and Proxy Minimum Load Cost values under the Proxy Cost methodology as specified below.

- (a) **Fuel Input.** The Scheduling Coordinator for the resource will provide the fuel or fuel-equivalent input costs, which the CAISO will maintain in the Master File, pursuant to Section 39.7.1.1.1.2.
- (b) **Proxy Start-Up Costs.** Proxy Start-Up Costs will also include, if applicable:
 - (i) a Variable Start-Up Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (ii) greenhouse gas allowance costs for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator;
 - (iii) the rates for the Market Services Charge and System Operations Charge

multiplied by the shortest Start-Up Time listed for the resource in the Master File, multiplied by the PMin of the resource as registered in the Master File, multiplied by 0.5.

- (c) **Proxy Minimum Load Costs.** Proxy Minimum Load Costs will also include, if applicable:
- (i) A Variable Energy Operation and Maintenance Adder as provided in Section 30.4.5.4 multiplied by the PMin of the resource or MSG Configuration of the resource as registered in the Master File;
 - (ii) a Variable Minimum Load Operations and Maintenance Adder as provided in Section 30.4.5.4;
 - (iii) greenhouse gas allowance costs for each resource located within the CAISO Balancing Authority Area or an EIM Entity Balancing Authority Area within California or Washington, and registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator;
 - (iv) the rates for the Market Services Charge and System Operations Charge multiplied by the PMin of the resource as registered in the Master File; and
 - (v) the Bid Segment Fee.
- (d) **Proxy Transition Costs.** For each Multi-Stage Generating Resource under the Proxy Cost methodology, the CAISO will calculate the Proxy Transition Costs utilized for each feasible transition from a given MSG Configuration to a higher MSG Configuration based on the difference between the Proxy Start-Up Costs for the higher MSG Configuration, and the Proxy Start-Up Costs for the lower MSG Configuration, as those costs are determined in accordance with the Proxy Start-Up Cost calculation methodology set forth in Section 30.4.5. If the result of this calculation is negative for any transition between two MSG Configurations, then the associated Proxy Transition Cost shall be zero.

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Section 39

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39.6.1.6.2 Projected Greenhouse Gas Allowance Price

For resources that are registered with the California Air Resources Board [or the Washington Department of Ecology](#) as having a greenhouse gas compliance obligation, the CAISO will calculate a projected Greenhouse Gas Allowance Price component to be used in establishing maximum Default Start-Up Bids and Default Minimum Load Bids after the twenty-first (21st) day of each month and will post it on the CAISO Website by the end of that month. The projected Greenhouse Gas Allowance Price component will be applicable for Scheduling Coordinators on behalf of eligible Use-Limited Resources electing to use the Registered Cost methodology until a new projected Greenhouse Gas Allowance Price component is calculated and posted on the CAISO Website. The projected Greenhouse Gas Allowance Price component will be calculated by averaging the applicable daily Greenhouse Gas Allowance Prices calculated over the first twenty (20) days of the month using the methodology set forth in Section 39.7.1.1.1.4. [The CAISO will calculate a projected Greenhouse Gas Allowance Price separately for each unlinked jurisdiction that regulates greenhouse gas compliance obligations.](#)

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39.7.1 Calculation of Default Energy Bids

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39.7.1.1 Variable Cost Option

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39.7.1.1.1 Incremental Cost Calculation Under the Variable Cost Option

39.7.1.1.1.1 Natural Gas-Fired Resources

- (a) Calculation of incremental fuel cost - For natural gas-fueled units, incremental fuel cost is calculated based on an incremental heat rate curve multiplied by the natural gas price calculated as described below.

Resource owners shall submit to the CAISO average heat rates (Btu/kWh) measured for at least two (2) and up to eleven (11) generating operating points (MW), where the first and last operating points refer to the minimum and maximum operating levels (i.e., PMin and PMax), respectively. The average heat rate curve formed by the (Btu/kWh, MW) pairs is a piece-wise linear curve between operating points, and two (2) average heat rate pairs yield one (1) incremental heat rate segment that spans two (2) consecutive operating points. The incremental heat rates (Btu/kWh) in the incremental heat rate curve are calculated by converting the average heat rates submitted by resource owners to the CAISO to requirements of heat input (Btu/h) for each of the operating points and dividing the changes in requirements of heat input from one (1) operating point to the next by the changes in MW between two (2) consecutive operating points as specified in the Business Practice Manual. For each segment representing operating levels below eighty (80) percent of the unit's PMax, the incremental heat rate is limited to the maximum of the average heat rates for the two (2) operating points used to calculate the incremental heat rate segment.

The unit's final incremental fuel cost curve is calculated by multiplying this incremental heat rate curve by the applicable natural gas price, and then, if necessary, applying a left-to-right adjustment to ensure that the final incremental cost curve is monotonically non-decreasing. Heat rate and cost curves shall be stored, updated, and validated in the Master File.

- (b) Calculation of greenhouse gas cost adder - For each natural gas-fired resource registered with the California Air Resources Board or the Washington Department of

Ecology as having a greenhouse gas compliance obligation, the CAISO will calculate a greenhouse gas cost adder as the product of the resource's incremental heat rate, the greenhouse gas emissions rate authorized by the California Air Resources Board or the Washington Department of Ecology, and the applicable Greenhouse Gas Allowance Price.

- (c) Calculation of volumetric Grid Management Charge adder - For each natural gas-fired resource, the CAISO will include a volumetric Grid Management Charge adder that consists of: (i) the Market Services Charge; (ii) the System Operations Charge; and (iii) the Bid Segment Fee divided by the MW in the Bid segment.

39.7.1.1.1.2 Non-Natural Gas-Fired Resources

For non-natural gas-fueled units, incremental fuel cost is calculated based on an average cost curve as described below.

Resource owners for non-natural gas-fueled units shall submit to the CAISO average fuel or fuel equivalent costs (\$/MW) measured for at least two (2) and up to eleven (11) generating operating points (MW), where the first and last operating points refer to the minimum and maximum operating levels (i.e., PMin and PMax), respectively. The average cost curve formed by the (\$/MWh, MW) pairs is a piece-wise linear curve between operating points, and two (2) average cost pairs yield one (1) incremental cost segment that spans two (2) consecutive operating points. For each segment representing operating levels below eighty percent (80%) of the unit's PMax, the incremental cost rate is limited to the maximum of the average cost rates for the two (2) operating points used to calculate the incremental cost segment. The unit's final incremental fuel cost curve is then adjusted, if necessary, applying a left-to-right adjustment to ensure that the final incremental cost curve is monotonically non-decreasing. The CAISO will include, if applicable: (i) greenhouse gas allowance costs for each non-natural gas-fired resource registered with the California Air Resources Board or the Washington Department of Ecology as having a greenhouse gas compliance obligation, as provided to the CAISO by the Scheduling Coordinator for the resource; (ii) variable operation and maintenance cost; and (iii) a volumetric Grid Management Charge adder that consists of: (a) the Market Services Charge; (b) the System Operations Charge; and (c) the Bid Segment Fee divided by the MW in the Bid segment. Cost curves shall be stored, updated, and

validated in the Master File.

39.7.1.1.1.3 Calculation of Natural Gas Price

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39.7.1.1.1.4 Calculation of Greenhouse Gas Allowance Price

The CAISO will calculate the Greenhouse Gas Allowance Price separately for each unlinked jurisdiction that regulates greenhouse gas compliance obligations. To calculate the Greenhouse Gas Allowance Price for each unlinked jurisdiction, the CAISO will average two prices from the following vendors: the Intercontinental Exchange and ARGUS. If a greenhouse gas price from a vendor is unavailable for any reason, the CAISO will use the most recent available greenhouse gas price from that vendor. If greenhouse gas prices from these vendors have not yet been calculated for a jurisdiction, the CAISO will utilize the best available proxy, as follows: for Washington State, the CAISO will utilize \$41/MT CO₂e until an allowance auction is held by the State of Washington, at which point the CAISO will use, as soon as is practicable, the most recent allowance auction clearing price. If for any reason the CAISO cannot calculate a Greenhouse Gas Allowance Price, it will use the most recently calculated value.

The CAISO will update the Greenhouse Gas Allowance Price by approximately 22:00 Pacific Time each day (T). The daily Greenhouse Gas Allowance Price will be used in the next day's Real-Time Market (T+1) and in the Day-Ahead Market for the following Trading Day (T+2). The CAISO will calculate each Greenhouse Gas Allowance Price during a year using prices for greenhouse gas allowances from that same year.

Attachment C – Draft Final Proposal
Tariff Amendment – Washington Greenhouse Gas Compliance
California Independent System Operator Corporation
November 21, 2022



California ISO

Washington State Western Energy Imbalance Market Greenhouse Gas Enhancements

Draft Final Proposal

September 22, 2022

Prepared by:

Anja Gilbert

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1. Executive Summary

This initiative proposes minor enhancements to the Western Energy Imbalance Market (WEIM) to support Washington State WEIM Entity greenhouse gas (GHG) reporting for emissions year 2022 and beyond. These enhancements include: updating GHG reference levels (used in committing resources and mitigating bids) as well as developing reports to support the WEIM Entities with their reporting to the Washington Department of Ecology. As a key change from the Issue Paper / Straw Proposal, the CAISO has removed the enhancement to associate generation with Washington or model the demand forecast in Washington for reporting purposes in emissions year 2023 and beyond.

2. Introduction and Background

Pursuant to Washington’s recently revised Clean Air Act and beginning in 2023, Washington will require reporting of emissions associated with WEIM transactions in emissions year 2022 and each subsequent year.¹ This initiative proposes enhancements to recognize Washington-specific reference levels as well as an approach for reporting GHG emissions to the Washington Department of Ecology. As rules related to Washington reporting and cap-and-invest program design continue to develop, we will collaborate with the Washington Department of Ecology and stakeholders to evolve our market design to accommodate those changes.

Washington Administrative Code (WAC) Chapter 173-441 sets forth the requirements for reporting by Washington WEIM entities starting with emissions year 2022, reported in 2023. The regulations specify that energy from the WEIM is considered imported electricity. Specifically, WAC 173-441-124(2)(g) defines “imported electricity” to include “electricity from an organized market, such as the energy imbalance market.” The CAISO interprets this to mean that all transactions within the CAISO’s WEIM, including real-time market imbalance energy from resources located within the state of Washington, will constitute imported energy for purposes of Washington’s reporting regulations.

Washington’s cap-and-invest program, which sets a limit on overall carbon emissions in Washington and requires emitters to obtain allowances equal to their covered GHG emissions, similarly begins in 2023.² However, the CAISO is limiting the scope of the enhancements proposed to supporting the Washington reporting requirements only. The Washington cap-and-invest proposed rules do not yet contain sufficient details for the CAISO to immediately

¹ Revised Code of Washington (RCW) Chapter 70A.15.2200, under the Washington Clean Air Act. See also Washington Administrative Code (WAC) Chapter 173-441-030(3)(a).

² Washington’s Climate Commitment Act, RCW Chapter 70A.65. Note the Climate Commitment Act directs the Department of Ecology, in consultation with other Washington regulators, to adopt a rule by October 1, 2026 containing a methodology for addressing imported electricity associated with a centralized electricity market. See RCW Chapter 70A.65.080(1)(c).

implement market changes to facilitate compliance by entities participating in a centralized market.³

In comments, the Western Power Trading Forum (WPTF) requested additional information on the implications of not implementing market changes, given the uncertainty of the Washington regulations around the first jurisdictional deliverer. The CAISO clarifies that, without an entity identified as responsible for the compliance obligation, the CAISO cannot model the cost of carbon or settle it in its systems. Market design based on the existing broad definition of the “importer of electricity” could result in implementation that ranges from one end of the spectrum, using resource-specific bid adders to collect the costs of GHG compliance from sources of GHG emissions, to the other end of the spectrum, collecting the cost of GHG compliance from load. Without the GHG bid adders, there will also not be either a calculation of GHG transfers into Washington or attribution, as there will not be a mechanism to collect or calculate that information.

The current ambiguity in regulation results in a market design that has an asymmetric treatment of the GHG cost of compliance in and out of Washington. It is the CAISO’s understanding that Washington entities intend to include the cost of GHG compliance in their bids. However, as explained earlier, without a clear compliance entity, the CAISO cannot model where GHG costs should be incurred for resources in and out of Washington. As a result, the Washington resources that include their cost of GHG compliance in their energy bids will appear comparatively expensive to resources outside of the state that would otherwise have a cost of carbon but are not reflecting it in their bids into Washington. As the CAISO’s market dispatches resources at least cost, it is more likely that outside resources would be dispatched ahead of in-state Washington resources that have a GHG cost of compliance. Once the first jurisdictional deliverer is clarified in Washington’s regulations, the CAISO can begin a stakeholder process to develop a market design and associated settlement process to correct for this asymmetric treatment.

Resources in Washington will still be able to submit bid adders to offer supply to California. However, all non-Washington resources, including California, will not be able to submit bid adders for Washington. For Washington resources, it will be up to state air regulators to determine how to address the “double regulation cost” of Washington resources including the GHG cost of compliance in their energy bid and in any bid adder when voluntarily making supply available to California.

Lastly, the CAISO emphasizes that the scope of these enhancements is limited to the WEIM real-time market. The CAISO is separately engaging in an Extended Day Ahead Market (EDAM) initiative in order to allow WEIM participants to participate in the day-ahead market. However, EDAM is a separate stakeholder initiative and is out of scope for this initiative.

³ The Washington Department of Ecology is proposing a new rule, WAC Chapter 173-446, to implement the new cap-and-invest program. More information is available at <https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC-173-446>. The CAISO’s comments on proposed rule language in this rulemaking are available at: <https://aq.ecology.commentinput.com/comment/extra?id=6Nx2J>

3. Washington WEIM GHG Enhancements Straw Proposal

3.1 Modeling Washington Borders and the Demand Forecast

To move away from the Balancing Authority Area (BAA) construct and to better align with state-level GHG boundaries, the CAISO had planned to associate generation and demand with Washington. The purpose of this enhancement was to differentiate generation and load in and out of Washington for reporting purposes in emissions year 2023. However, based on stakeholder feedback, the initiative will no longer include this enhancement.

Stakeholder Feedback

In stakeholder comments, parties noted that to continue with this enhancement to model demand and generation for reporting would be imposing market design that moved ahead of the Washington Department of Ecology's rulemaking. Stakeholders including BPA, the Washington Utilities, and WPTF flagged the level of accuracy of reporting with this enhancement was not improved due to needed clarity in the Washington Department of Ecology's reporting rulemaking. Specifically, stakeholders sought greater clarity with respect to multi-jurisdictional entities and scenarios for federal power entities, depending on if they reported or not.

3.2 Updating GHG Reference Costs

In the Issue Paper / Straw Proposal, the CAISO proposed to revise the cost-based reference levels for resources inside of Washington. The revised calculation would use Washington-specific GHG allowance prices when calculating a GHG-emitting generating resource's default energy Bid (DEB) and default commitment costs (collectively referred to as reference levels). Currently, the GHG allowance price used in CAISO's market reflects the cost of allowances for CARB's Cap-and-Trade Program. The CAISO will need to adjust this allowance price to include the cost of allowances for Washington's GHG compliance program for resources subject to that program. Depending on the availability of pricing data from vendors, the CAISO expects to use a similar approach to calculate the cost of allowances for Washington's GHG compliance program. However, as pricing data will not be available from external vendors with sufficient lead time to be implemented by January 2023 the CAISO will need to implement an interim approach. One of the reasons for this situation is that the first auction of Washington GHG allowances is expected to occur in 2023, i.e. after the proposed implementation date of this initiative.

Stakeholder Feedback

In stakeholder comments, almost all stakeholders supported the CAISO's proposal to revise the cost-based reference levels for resources inside of Washington to include Washington-specific GHG allowance prices. The exception to this support was BPA, who commented that reference levels would not apply to them as BPA's resources will not be registered with the Washington Department of Ecology as having a GHG compliance obligation as they are not considered in-state generation per the CCA. The CAISO acknowledges and respects the different reporting, and thus market design considerations that will be in place for BPA.

In response to CAISO's open question in the Issue Paper / Straw Proposal of whether there should be a cost calculated ahead of an allowance auction in Washington, WPTF urged the CAISO to develop a proxy price ahead of a Washington allowance auction. The CAISO agrees with this recommendation on the basis that, if the CAISO were to omit this price from being reflected in a Washington resource's reference levels, the reference levels would not reflect the actual costs of the resource if the resource is subject to GHG compliance costs. This would create a situation in which a Washington resource could be unable to fully include the cost of GHG compliance in its bid. Accordingly, the CAISO plans to include a proxy cost ahead of any allowance auction.

Proposal

The proposal is that ahead of an allowance auction in Washington, the CAISO will use the economic and market modeling and analysis conducted by Vivid Economics for the Washington Department of Ecology.⁴ Specifically, the CAISO plans to use the assumption that GHG regulation areas will be linked, which assumes \$41 per MT CO₂e. Once an allowance auction is held in Washington, the CAISO will use the auction clearing price. At a later phase, when index prices are available and implementable by the CAISO, the CAISO will use index prices.

This report serves as an appropriate starting point for the allowance price as:

- The report serves as a better approximation of GHG allowance costs than using California indexed costs, as it reflects Washington-specific assumptions; and
- The report was prepared by a consultant of the entity that will run the auction and is independent of market participants.

In addition, the CAISO believes that using the \$41 per MT CO₂e and transitioning to the auction clearing price prior to the availability of index prices is a reasonable approach for several reasons:

- Through the inclusion of the GHG prices in Washington resource's reference levels, the CAISO is attempting to approximate the wider market's expectations about the cost of compliance. The CAISO believes it is reasonable to assume that market participants will use independent price estimates developed by well-qualified, independent consultants such as Vivid Economics in the absence of auction or index prices.
- The \$41 per MT CO₂e estimate falls near the midpoint between the cap-and-invest program's allowance price floor of \$19 per MT CO₂e and the allowance price ceiling of \$71 per MT CO₂e. This indicates that the estimate is not overly conservative or overly aggressive.
- The proposed approach of using the auction price once available will allow the CAISO's calculation of reference levels to respond to actual allowance trading market information once it is available.

⁴ Vivid Economics for the Washington Department of Ecology. "Summary of market modeling and analysis of the proposed Cap and Invest Program." June 2022. Accessible at: <https://ecology.wa.gov/DOE/files/4a/4ab74e30-d365-40f5-9e8f-528caa8610dc.pdf>

The CAISO believes that the price estimate achieves a reasonable balance between the competing factors of using an estimate that is too high versus an estimate that is too low. On one hand, the estimate will be a component in Washington resources' reference levels which themselves are effectively used to limit those resources' bids with the goal of limiting the exercise of market power. The CAISO has an obligation to limit the exercise of market power by not allowing bids that are substantially beyond a resource's costs. Because of the reasons mentioned above, the CAISO believes that the \$41 per MT CO₂e estimate achieves this goal.

On the other hand, the CAISO also doesn't want to use a value that is too low thus limiting a resource's ability to reflect their costs in their bids and negatively affecting market participation. If the scheduling coordinator believes that their compliance cost is lower than the price estimate, they will have the ability to bid lower than the bid cap. Indeed, due to the features of a marginal-cost based market, the scheduling coordinator would be incented to not bid beyond their compliance cost.

The CAISO welcomes feedback on this approach from stakeholders.

Background

As background, DEBs are used in the local market power mitigation process and default commitment costs limit the bids that scheduling coordinators can submit. The DEB mitigation system seeks to mirror competitive outcomes when participants might have the ability to exercise local market power. In such cases, the CAISO may adjust a resource's submitted energy bid downward to the resource's DEB or the competitive locational marginal price, whichever is higher. Default commitment costs serve a similar purpose but function differently in practice. Instead of applying only when the potential for the exercise of market power exists, default commitment costs always serve as the cap of the values that scheduling coordinators may submit for minimum load cost bids, start-up cost bids, and transition cost bids. These bids are then used by the CAISO's market processes in its determination of whether to commit the resource.

The CAISO's tariff (Section 29.7) outlines various DEB options but, through this initiative, the proposal is to only modify the Variable Cost option which estimates a generating resource's costs based on Master File parameters and other more dynamic inputs such as natural gas price indices. The CAISO's tariff (Section 30.4.4) also outlines two methodologies for the calculation of default commitment costs: the Proxy Cost and Registered Cost methodologies. The current proposal is to update the calculation of default commitment costs under both methodologies.

Specifically, the proposed updates will apply to generating resources registered with Washington Department of Ecology as having a GHG compliance obligation. The proposed calculations will be consistent with the Variable Cost DEB and default commitment cost calculations for resources subject to the California Air Resources Board's (CARB) Cap-and-Trade Program, with the primary exception that the GHG allowance price will differ. For the changes to the Variable Cost DEB, the proposal is to calculate a GHG cost adder as the product of the resource's incremental heat rate, the GHG emissions rate authorized by the Washington

Department of Ecology, and the applicable GHG allowance price. This adder will then be combined with the other components of the DEB (e.g. fuel costs, variable operations and maintenance costs) to arrive at the final DEB value. The default commitment cost calculations will include a similar GHG cost adder.

3.3 WEIM GHG Reporting

In the Issue Paper / Straw Proposal, the CAISO proposed two different reporting approaches: one for emissions year 2022, and a second approach for emissions year 2023 and beyond. The rationale for the difference in approaches was that, for emissions year 2022, the CAISO did not have sufficient time from a stakeholder engagement, IT, or implementation perspective to take a different approach other than providing an approximation of WEIM transactions used to serve load within the state of Washington. For emissions year 2023, with enhancements to model generation and the demand forecast in and out of Washington, the CAISO could come up with a more accurate means of reporting, particularly for the entities whose operations were both in Washington and outside of Washington.

Stakeholder Feedback

In comments, stakeholders supported the proposed approach for emissions year 2022 and suggested extending this approach for future years. The approach was supported on the basis that it was sufficient until further clarity came from the Washington Department of Ecology. Conversely, stakeholder comments largely disagreed with the CAISO's proposed approach for emissions year 2023 on the basis that moving ahead with the enhancements to facilitate 2023 reporting could be premature ahead of clarification from the Department of Ecology. Stakeholders cited examples where without clarity, the CAISO's intention of greater accuracy, would not materialize as a result of the current reporting rules. Stakeholders raised scenarios particularly in the cases of a multi-jurisdictional entity reporting or if a BPA did or did not decide to voluntarily report under Washington's reporting rules. (Note that if BPA did not report it would impact both the BPA, as well as any utilities served by BPA.)

WPTF also requested clarification on two topics: (1) if the CAISO will determine if a WEIM entity's load is served by a generation from Washington or a non-Washington BAA and (2) how the CAISO will treat California attributed Washington resources in determining the volume of net WEIM transfers into Washington and how this would compare to the volumetric quantity under California's Cap-and-Trade Program.

- In response to the first question, the CAISO will not separate what is served by a Washington or non-Washington BAA. The CAISO will calculate the WEIM market dispatches based upon instructed imbalance energy, the difference between the market real time market dispatch and base schedule of BAA generation and net schedule interchange. From a settlements perspective this is the net positive instructed imbalance energy quantity (Fifteen Minute Market Instructed Imbalance Energy + Real Time Market Instructed Imbalance Energy) which captures instances when a supply resource increased its output to serve load based on a forecast with a base schedule reference.

- In response to the second question, Washington resources attributed to California will not impact volume of net WEIM transfers into WA, as the GHG transfers will not be calculated. There will not be a change to how the CAISO treats Washington resources that are attributed to California. Also, as mentioned earlier, as there will not be the ability to indicate a GHG bid from a non-Washington resource, total GHG transfers to Washington are unable to be calculated. Thus, while GHG transfers will be calculated for California’s program, they cannot be calculated for Washington’s program until further clarity is obtained on the first jurisdictional deliverer and a stakeholder process begins at the CAISO.

Approach for Emissions Year 2022 and Beyond

The CAISO understands that under its reporting rules, the Department of Ecology will treat all transactions in the WEIM used to serve load within Washington as imported energy. It is also the CAISO’s understanding that Washington Department of Ecology will develop an Excel-based tool to support GHG reporting, in line with WAC 173-441-124.⁵

The CAISO plans to calculate the market dispatches, based on instructed imbalance energy, on an annual basis for WEIM Entities to meet the reporting requirements to the Washington Department of Ecology. Real-time instructed imbalance energy reflects WEIM transactions used to serve electricity demand. WEIM Entities operating in the state of Washington with BAAs that extend to other states would need to calculate a load ratio to estimate the volumes that served their Washington demand. This approach will only provide a rough approximation of WEIM transitions used to serve load with the state of Washington.

4. WEIM Governing Body Role

The WEIM Governing Body has joint authority with the Board of Governors over all of the proposed changes, as this initiative proposes to:

1. Update GHG reference levels to reflect Washington allowance prices; and
2. Develop reports to support the WEIM Entities.

The Board and the WEIM Governing Body have joint authority over any proposal to change or establish any CAISO tariff rule(s) applicable to the WEIM Entity balancing authority areas, WEIM Entities, or other market participants within the WEIM Entity balancing authority areas, in their capacity as participants in EIM. This scope excludes from joint authority, without limitation, any proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid. Charter for EIM Governance § 2.2.1.

The proposed tariff changes to implement the first element is “applicable to EIM Entity balancing authority areas, EIM Entities, or other market participants within EIM Entity balancing authority areas, in their capacity as participants in EIM.” It would not be applicable “only to the CAISO

⁵ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-441-124&pdf=true>

balancing authority area or to the CAISO-controlled grid.” Accordingly, the proposed changes to implement the first element would fall within the scope of joint authority.

Stakeholders are encouraged to submit a response in their written comments to the proposed classification of as described above, particularly if they have concerns or questions.

5. Stakeholder Engagement Plan

| Date | Milestone |
|------------------------------------|--|
| September 22, 2022 | Draft Final Proposal Posted |
| September 29, 2022 8:00-9:00 AM | Stakeholder Meeting |
| October 7, 2022 | Stakeholder Comments Due |
| Week of October 10, 2022 | Draft Tariff Posted |
| October 25-26 2022 | Joint CAISO and WEIM Board of Governors Meeting and WEIM Board of Governors Meeting |
| Early 2023 | Implementation |

6. Next Steps

In this Draft Final Proposal the CAISO has attempted to capture and describe enhancements to reflect the costs of GHG compliance and to support reporting WEIM transactions by WEIM Entities to the Washington Department of Ecology. The CAISO will hold a stakeholder call on September 29, 2022 to review this Draft Final Proposal. The CAISO encourages all stakeholders to submit comments by October 7, 2022.

Attachment D – Board of Governors Memo
Tariff Amendment – Washington Greenhouse Gas Compliance
California Independent System Operator Corporation
November 21, 2022



Memorandum

To: ISO Board of Governors and Western Energy Imbalance Market Governing Body
From: Anna McKenna, Vice President of Market Policy and Performance
Date: October 19, 2022
Re: **Decision on Washington WEIM Greenhouse Gas Enhancements**

This memorandum requires ISO Board of Governors and WEIM Governing Body action.

EXECUTIVE SUMMARY

Pursuant to Washington state's recently revised Clean Air Act and beginning in 2023, Washington will require reporting of greenhouse gas (GHG) emissions associated with WEIM transactions in emissions year 2022 and each subsequent year. Under Washington's Climate Commitment Act, Washington will also begin its cap-and-invest program in 2023, with a statutory requirement to address energy imports associated with a centralized energy market by October of 2026. Management proposes enhancements to recognize Washington-specific reference levels as well as an approach for supporting covered entity reporting obligations to the Washington Department of Ecology.

Through this stakeholder policy initiative, the ISO developed enhancements to the Western Energy Imbalance Market (WEIM) to update GHG reference levels as well as develop reports to support the WEIM Entities with their reporting obligations. GHG reference levels represent GHG compliance costs and are used in the market as part of commitment cost bid caps and default energy bids used in market power mitigation.

Moved, that the ISO Board of Governors and WEIM Governing Body approve the inclusion of greenhouse gas reference levels in bids for entities subject to the Washington state greenhouse gas regulations, and approve the development of reports to support those entities' reporting obligations as described herein; and

Moved, that the ISO Board of Governors and WEIM Governing Body authorize Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the change proposed in this memorandum, 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.

DISCUSSION AND ANALYSIS

Management proposes (1) enhancements to recognize Washington-specific GHG reference levels, as well as (2) an approach for reporting GHG emissions to the Washington Department of Ecology.

GHG Reference Levels

With the launch of Washington's GHG cap-and-invest program, the ISO and stakeholders have worked to develop a proposal for the inclusion of associated compliance costs – that is, GHG reference levels – in the calculations of market inputs. Specifically, for those resources within Washington that will have a compliance obligation under the regulation, Management recommends the inclusion of GHG compliance costs in default energy bids used in the local market power mitigation process, and also in default commitment costs used to cap bids for start-up and minimum-load.

Management recommends a phased approach to implementing the GHG cap-and-investment program within the ISO markets. This phased approach is proposed because an allowance auction is not expected until February 2023, after the start of the cap-and-invest program. In the interim, the CAISO seeks to use best available data to approximate the wider market's expectations regarding the cost of compliance. As a first phase, the Washington Department of Ecology, through a consultant, has conducted economic and market modeling which indicates that a reasonable starting point for this value is \$41 per MT CO₂e. In the first phase, Management recommends the ISO use a static, assumed value of \$41 per MT CO₂e for the cost of GHG compliance within the Washington GHG regulation area. As a second phase, once an allowance auction is held in Washington, Management recommends that the ISO then use the auction clearing price. The proposed approach of using the auction price once available will allow the ISO's calculation of reference levels to respond to actual allowance trading market information once it is available. In the third phase, when index prices are available and implementable by the ISO, the ISO will use index prices for Washington analogously to how it does for California.

The ISO has determined not to propose additional modifications related to Washington's cap-and-invest program at this time. Under Washington statute, the Washington Department of Ecology, in consultation with other Washington State agencies, must adopt by regulation a methodology in the cap-and-invest context for addressing imported electricity associated with a centralized energy market by October 1, 2026. In the interim, the Department of Ecology issued regulations on September 29, 2022 outlining other specifics of the cap-and-invest program, and providing limited guidance

on the application to WEIM. More specifically, the rules identify the recipient of WEIM electricity as the entity with a compliance obligation for the first compliance period (2023-2026). The timing of the September 29, 2022 identification of the point of regulation did not allow the ISO enough time for normal processes in order to implement the changes (i.e., stakeholder the enhancements, develop technology solutions, and seek board approval prior to filing at FERC). However, with the updated regulations and the statutory deadline for addressing a centralized market in 2026, the ISO intends to work with Washington's Department of Ecology and stakeholders to ensure the WEIM aligns with both the cap-and-invest program and associated reporting rules as these rules evolve.

GHG Emissions Reporting

Washington's cap-and-invest program sets forth requirements for compliance reporting starting with emissions year 2022, for reporting in 2023. The regulations specify that energy from the WEIM is considered imported electricity. Specifically, the code defines "imported electricity" to include "electricity from an organized market, such as the energy imbalance market." Thus, all transactions within the ISO's WEIM, including real-time market imbalance energy from resources located within the state of Washington, will constitute imported energy for purposes of Washington's reporting regulations.

To support WEIM entities' reporting requirements to the Washington Department of Ecology, Management recommends the ISO calculate the market dispatches, based on instructed imbalance energy, on an annual basis. Real-time instructed imbalance energy reflects WEIM transactions used to serve electricity demand. WEIM entities operating in Washington with balancing authority areas that extend to other states will need to calculate a load ratio to estimate the volumes that served their Washington demand. This approach will only provide a rough approximation of WEIM transfers used to serve load with the state of Washington.

POSITIONS OF THE PARTIES

GHG Reference Levels

In stakeholder comments, almost all stakeholders supported the ISO's proposal to revise the cost-based reference levels for resources with a reporting obligation inside of Washington to include Washington-specific GHG allowance prices. The exception to this support was one party who commented that CAISO should allow market participants to submit offers for reference levels that are consistent with their own estimates. The ISO notes there is a separate process for negotiating default energy bids that will accommodate this request.

Management received feedback from the Washington Utilities and Transportation Commission indicating concern that the inclusion of GHG reference level costs in default energy bids and commitment cost bid caps for Washington generating units with

a compliance obligation could lead to a market disadvantage for those resources. Management assumes resources in Washington will include their cost of compliance in their energy bid—which would give rise to the asymmetry as described earlier. Management notes efforts to separately reflect reference costs are included as caps and as such resources can adjust their bids to levels below the starting value proposed. To not include these costs would prevent the resource from reflecting its full costs. Further, without the value of GHG compliance included automatically in these calculated bids, each generator with a compliance obligation would have to individually negotiate a default energy bid, creating significant workload for both those entities and the ISO.

GHG Emissions Reporting

Stakeholders mostly supported the proposed approach for GHG emissions reporting for 2022 and beyond and thought this approach would assist them in meeting their reporting obligations during the initial compliance period of Washington’s program. The approach was supported on the basis that it was sufficient.

Some entities sought clarity on the treatment of in state generation and wheel-throughs in the reports. Management recognizes that as of September 29, 2022, the Washington Department of Ecology issued a final rule implementing the Climate Commitment Act Cap-and-Invest Program and addressing compliance related to in-state generation. In section WAC 173-446-040, the rules clarify that for electricity transferred through the energy imbalance market that is generated by a first jurisdictional deliverer with a compliance obligation, there is no compliance obligation for that same electricity if it is delivered to an energy imbalance market purchasing entity in Washington. These regulations, however, are related to Washington’s cap-and-invest compliance construct and do not impact reporting, which was addressed in a separate, earlier rulemaking and requires reporting of all WEIM transactions. Instead, management understands that Ecology may work with entities to address section WAC 173-446-040 in their GHG reporting tool worksheet. Second, Management clarifies that wheel-throughs are not included in the calculation of total instructed imbalance energy and are therefore not included in the Washington WEIM GHG reports.

In addition, one stakeholder raised concerns that power would be double counted for reporting to Washington and reporting to California. Management recognizes both may account for the same power but defers to the states in their data collection requirements. While the California Air Resources Board collects data on resources attributed to California, the Washington Department of Ecology is seeking data on all WEIM transactions. Management does not propose to change the reporting method in light of honoring both state’s reporting requirements.

Lastly, four entities urged further coordination with the Washington Department of Ecology regarding reporting for multi-jurisdictional entities. Management supports this recommendation and staff will continue working with the Washington Department of Ecology on coordination for this unique case.

CONCLUSION

To support Washington WEIM Entities subject to the State's cap-and-invest program, Management recommends inclusion of GHG reference levels in Default Energy Bids and commitment costs. Further, to support Washington WEIM Entities subject to the State's reporting rules, Management recommends the ISO annually provide those entities with data, as described herein, to support their compliance reporting obligations. As rules related to Washington reporting and cap-and-invest program design continue to develop, we will collaborate with the Washington Department of Ecology and stakeholders to ensure alignment between our market design and Washington's program.