

November 20, 2015

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

**Re: California Independent System Operator Corporation
Filing of ISO Rate Schedule No. 81
Docket No. ER16-____-000**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits for filing and acceptance an agreement dated May 15, 2015, between the CAISO and Portland General Electric Company (“PGE”), an Oregon corporation (“Implementation Agreement”).¹ The Implementation Agreement sets forth the terms under which the CAISO will extend its existing real-time energy market systems to provide imbalance energy service to PGE pursuant to the CAISO’s Energy Imbalance Market tariff. Under the Implementation Agreement, PGE will compensate the CAISO for its share of the costs of related system changes, software licenses, and other configuration activities. The CAISO requests that the Commission accept the Implementation Agreement effective January 20, 2016, so that the extension of the real-time energy market to include PGE participation may proceed towards implementation on October 1, 2017.²

I. Background

The Energy Imbalance Market provides other balancing authority areas the opportunity to participate in the real-time market for imbalance energy that the CAISO operates in its own balancing authority area. PacifiCorp’s balancing authority areas (PacifiCorp East and PacifiCorp West) were the first two to join the Energy Imbalance Market. The CAISO’s market rules went into effect on October 24, 2014, for the first trading day November 1, 2014. NV Energy will become the third balancing authority to join the Energy Imbalance Market

¹ The CAISO submits the Implementation Agreement pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d (2012).

² See Implementation Agreement, Section 1.

following Commission authorization to proceed.³ Puget Sound Energy, the fourth balancing authority to join, will be implemented concurrently with Arizona Public Service Company on October 1, 2016.

The CAISO has reported on the benefits of PacifiCorp's participation in the Energy Imbalance Market while the implementation efforts with other balancing authorities have been ongoing. For the period from November 2014 through the third quarter of 2015, the Energy Imbalance Market produced \$33.41 million in benefits.⁴ These results are within the range of benefits that the PacifiCorp study estimated.

II. The Implementation Agreement

The Implementation Agreement details the contractual terms, including the scope of work and the agreed-upon fee, under which the CAISO will take the steps necessary to incorporate PGE into the Energy Imbalance Market consistent with the identified key milestones and associated payment provisions.⁵ The Implementation Agreement is modeled after the CAISO-PacifiCorp, CAISO-NV Energy, CAISO-Puget Sound Energy, and CAISO-Arizona Public Service Company implementation agreements previously accepted by the Commission.⁶

Under the Implementation Agreement, the CAISO and PGE must complete a variety of project tasks necessary for implementation by October 1, 2017. The parties chose this date to provide sufficient time for completion of all expected activities based on the size, complexity, and compatibility of PGE, including filing a certification of readiness with the Commission. The specific tasks may be modified by mutual agreement of the parties.⁷

The Implementation Agreement specifies that PGE will pay a fixed implementation fee of \$645,000, subject to completion of six specific milestones for recovery of the portion of the costs attributable to the CAISO's effort to configure its real-time market systems and incorporate PGE into the Energy Imbalance Market. The methodology that the CAISO used to determine the implementation fee for PGE is the same methodology that the CAISO used to

³ See Docket No. ER15-861-005 (pending readiness certification filed by the CAISO on October 1, 2015).

⁴ See CAISO EIM Benefits Report, dated October 27, 2015. A copy of the report is available at: http://www.caiso.com/Documents/PacifiCorp_ISO_EIMBenefitsReportQ3_2015.pdf.

⁵ See Implementation Agreement, Sections 3-4 and Exhibit A.

⁶ See *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,298 (June 28, 2013); *Cal. Indep. Sys. Operator Corp.*, 147 FERC ¶ 61,200 (June 13, 2014), *Cal. Indep. Sys. Operator Corp.*, 151 FERC ¶ 61,158 (May 19, 2015), and *Cal. Indep. Sys. Operator Corp.*, 152 FERC ¶ 61,090 (July 31, 2015).

⁷ Implementation Agreement, Section 3.

determine the Arizona Public Service Company, Puget Sound Energy, NV Energy, and PacifiCorp implementation fees.

The implementation fee is based on the CAISO's estimate of the costs it will incur to configure its real-time energy market to function as the Energy Imbalance Market available to all balancing authority areas in the Western Electricity Coordinating Council ("WECC").⁸ The components of that estimate are described in the Declaration of Michael K. Epstein, the CAISO's Director of Financial Planning, which is included with this filing as Attachment B, and are summarized below.

| Implementation Costs (in thousands of dollars) | |
|---|-----------------|
| Licenses | 12,150 |
| EMS system improvements | 1,000 |
| Data storage | 2,000 |
| Necessary hardware upgrades | 500 |
| Production software modifications | 1,000 |
| Network configuration and mapping | 500 |
| Integration | 500 |
| Testing | 1,500 |
| System performance tuning | 250 |
| Training and operations readiness | 150 |
| Project management | 100 |
| Total | \$19,650 |

Using this estimate, the CAISO derived a rate that allocates the \$19.65 million to potential entrants into the Energy Imbalance Market according to their proportionate share of the total WECC load (excluding the CAISO's load), using updated data reported to WECC.⁹ This increased the CAISO's total estimated costs from \$18.3 million to \$19.65 million.¹⁰ The CAISO then applied this fee to PGE's share of the updated WECC load (exclusive of the CAISO) to account for the PGE implementation fee.

The \$645,000 implementation fee is just and reasonable because it allocates a portion of the overall cost to PGE in an amount proportionate to PGE's share of the benefits that will ensue from the Energy Imbalance Market,

⁸ The total estimated cost is a projection assuming the total work effort remains. Implementations either completed or underway are not considered in this estimate.

⁹ These figures were recently updated to include current WECC reported load figures.

¹⁰ Prior implementation fees were based on a total estimated cost of \$18.3 million. Going forward, implementation fees will be based on a total estimated cost of \$19.65 million until the WECC reported load figures are updated or other significant developments occur.

as measured by usage. In addition, as explained in Mr. Epstein's declaration, the CAISO confirmed the reasonableness of the resulting allocation by comparing it to an estimate of the costs the CAISO projects it will incur to configure its real-time energy market to function as the Energy Imbalance Market that serves both the CAISO and PGE. This comparison confirmed that the fee reasonably represents those costs even though certain costs, for example data storage and production software modifications, are not triggered by the PGE implementation but may be incurred by the CAISO to incorporate later entrants. In future implementations, the CAISO will similarly confirm that the rate is reasonable by conducting a similar comparison test of the total implementation costs to the individual entity costs.

The Implementation Agreement also provides for adjustment of the fixed implementation fee by mutual agreement of the parties in the event that the CAISO's actual or expected costs exceed the estimate that forms the basis of the implementation fee.¹¹ This provision allows for appropriate consideration of the allocation of costs associated with incorporation of PGE into the Energy Imbalance Market. At the same time, the requirement for PGE to agree to any increase in the implementation fee ensures that PGE's share of those costs remains reasonable. The Implementation Agreement therefore reflects a reasonable balance of the parties' interest in preserving a level of cost certainty for PGE customers while appropriately allocating the costs of implementing the Energy Imbalance Market.

The Implementation Agreement represents a binding commitment of the parties. As such, it must provide a workable framework for the parties to resolve any differences and make course corrections along the way. On the other hand, the Implementation Agreement recognizes that the parties are entering into the agreement on a voluntary basis and circumstances may arise that interfere with the incorporation of PGE into the Energy Imbalance Market. Accordingly, the Implementation Agreement allows either party to terminate the agreement for any or no reason, provided it has first entered into good faith discussions for thirty (30) days in an effort to resolve any differences.¹² This and other related provisions mean that the parties must work closely together to achieve the goal of implementing PGE into the Energy Imbalance Market in a timely manner.

The Implementation Agreement also includes a variety of standard provisions that round out the parties' commitments. These are confidentiality (Section 5), limitations of liability (Section 6), representations and warranties (Section 7), general provisions such as notices, amendments, etc. (Section 8),

¹¹ See Letter Order dated April 8, 2014, Docket No. ER14-1350-000 (accepting an amendment to increase the PacifiCorp implementation fee to cover additional scope identified in the stakeholder process).

¹² Implementation Agreement, Section 2.

governing law and venue (Section 9), communication (Section 10), and dispute resolution (Section 11).

III. Next Steps

Following Commission acceptance of this filing, the CAISO will incorporate PGE into the Energy Imbalance Market. PGE's implementation will be subject to the readiness requirements filed by the CAISO in compliance with the Commission's directive in ER15-861 and EL15-53, which the Commission accepted in its November 19, 2015 order.¹³ Those criteria will apply to the NV Energy implementation in the first instance, followed by the concurrent Arizona Public Service Company and Puget Sound Energy implementations a year later. Likewise, PGE and the CAISO will measure and report progress to the Commission on the readiness criteria in place at the appropriate time in the implementation schedule. The CAISO will consider lessons learned from the NV Energy, Arizona Public Service Company, and Puget Sound Energy implementations, as the readiness criteria represent the baseline for measuring the readiness of each new EIM entity's processes and systems for EIM participation. A certification would also be filed by the CAISO and PGE at least 30 days prior to implementation.

The CAISO also expects that PGE will initiate a process to modify its open access transmission tariff during the implementation process. The CAISO recognizes that PGE will be working with its transmission customers and other interested parties to facilitate implementation of the Energy Imbalance Market and will engage in that effort as PGE considers appropriate.

IV. Effective Date

The CAISO requests that the Implementation Agreement be made effective on January 20, 2016.

V. Request for Waivers

The CAISO submits that the filing substantially complies with the requirements of section 35.13 of the Commission's rules, 18 C.F.R. § 35.13 (2013), applicable to filings of this type. The CAISO respectfully requests waiver of any such requirement to the extent this filing does not satisfy that requirement. In particular, the CAISO requests waiver of the requirement to submit Period 1 and Period 2 schedules, because the implementation fee is a one-time fee that is not based on historical data in Period 1 schedules or on the projections in Period 2 schedules. In either event, there is good cause to waive filing requirements

¹³ See *Cal. Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,205 (2015)

that are not material to the Commission's consideration of the Implementation Agreement.

VI. Service

The CAISO has served copies of this filing upon all scheduling coordinators, PGE, the California Public Utilities Commission, and the California Energy Commission. In addition, the CAISO has posted the filing on the CAISO website.

Enclosed for filing is each of the following:

- (1) This letter of transmittal;
- (2) Implementation Agreement (Attachment A); and
- (3) Declaration of Michael K. Epstein, Director of Financial Planning (Attachment B).

VII. Correspondence

The CAISO requests that all correspondence, pleadings, and other communications concerning this filing be served upon the following:

John C. Anders*
Lead Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7287
E-mail: janders@caiso.com

* Individual designated for service pursuant to Rule 203(b)(3),
18 C.F.R. § 203(b)(3).

VIII. Conclusion

The CAISO respectfully requests that the Commission accept this filing and permit the Implementation Agreement, CAISO Rate Schedule No. 81, to be effective January 20, 2016, as requested. If there are any questions concerning

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this filing, please contact the undersigned.

Respectfully submitted,

By: /s/ John C. Anders

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Attorneys for the California Independent
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Attachment A

CAISO-Portland General Electric Company EIM Implementation Agreement

California Independent System Operator Corporation

ENERGY IMBALANCE MARKET IMPLEMENTATION AGREEMENT

This Implementation Agreement (“Agreement”) is entered into as of November 20, 2015, by and between Portland General Electric Company, an Oregon corporation (“PGE”), and the California Independent System Operator Corporation, a California nonprofit public benefit corporation (“ISO”). PGE and the ISO are sometimes referred to in the Agreement individually as a “Party” and, collectively, as the “Parties.”

RECITALS

A. WHEREAS, PGE has determined there is an opportunity to secure benefits for PGE’s customers through improved dispatch and operation of PGE’s generation fleet and through the efficient use and continued reliable operation of existing and future transmission facilities and desires to participate in the energy imbalance market operated by the ISO (“EIM”);

B. WHEREAS, the ISO has determined there are benefits to ISO market participants through greater access to energy imbalance resources in real-time and through the efficient use and reliable operation of the transmission facilities and markets operated by the ISO, and desires to expand operation of the EIM to include PGE;

C. WHEREAS, PGE acknowledges that the rules and procedures governing the EIM are set forth in the provisions of the ISO tariff as filed with the Federal Energy Regulatory Commission (“FERC”) and that participation in the EIM requires corresponding revisions to PGE’s Open Access Transmission Tariff (“PGE Tariff”) and the execution of associated service agreements; and

D. WHEREAS, the Parties are entering into this Agreement to set forth the terms upon which the ISO will timely configure its systems to incorporate PGE into the EIM (“Project”) on or before October 1, 2017 (“Implementation Date”).

NOW THEREFORE, in consideration of the mutual covenants contained herein, and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

AGREEMENT

1. Effective Date and Term.

(a) This Agreement shall become effective upon the date the Agreement is accepted, approved or otherwise permitted to take effect by FERC, without condition or modification unsatisfactory to either Party (“Effective Date”).

(b) In the event FERC requires any modification to the Agreement or imposes any other condition upon its acceptance or approval of the Agreement, each Party shall have ten (10) days to notify the other Party that any such modification or condition is

unacceptable to that Party. If no Party provides such notice, then the Agreement, as modified or conditioned by FERC, shall take effect as of the date determined under Section 1(a). If either Party provides such notice to the other Party, the Parties shall take any one or more of the following actions: (i) meet and confer and agree to accept any modifications or conditions imposed by such FERC order; (ii) jointly seek further administrative or legal remedies with respect to such FERC order, including a request for rehearing or clarification; or (iii) enter into negotiations with respect to accommodation of such FERC order, provided however, if the Parties have not agreed to such an accommodation within thirty (30) days after the date on which such FERC order becomes a final and non-appealable order, such order shall be deemed an adverse order and the Parties shall have no further rights and obligations under the Agreement.

(c) The term of the Agreement (“Term”) shall commence on the Effective Date and shall terminate upon the earliest to occur of (1) the date FERC permits all necessary revisions to the PGE Tariff to take effect and the service agreements under such tariff and the ISO tariff necessary for the commencement of PGE’s participation in the EIM have taken effect; (2) termination in accordance with Section 2 of this Agreement; or (3) such other date as mutually agreed to by the Parties (“Termination Date”).

(d) This Agreement shall automatically terminate on the Termination Date and shall have no further force or effect, provided that the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as provided therein.

2. Termination.

(a) The Parties may mutually agree to terminate this Agreement in writing at any time. In addition, either Party may terminate this Agreement in its sole discretion after conclusion of the negotiation period in Section 2(b) or as provided in Section 2(d) or 2(e) as applicable.

(b) If either the ISO or PGE seeks to unilaterally terminate this Agreement, it must first notify the other Party in writing of its intent to do so (“Notice of Intent to Terminate”) and engage in thirty (30) days of good faith negotiations in an effort to resolve its concerns. If the Parties successfully resolve the concerns of the Party issuing the Notice of Intent to Terminate, the Party that issued such notice shall notify the other Party in writing of the withdrawal of such Notice (“Notice of Resolution”).

(c) At the time the Notice of Intent to Terminate is provided, or any time thereafter unless a Notice of Resolution is issued, PGE may provide written notice directing the ISO to suspend performance on any or all work on the Project for a specified period of time (“Notice to Suspend Work”). Upon receipt of a Notice to Suspend Work, the ISO shall: (1) discontinue work on the Project; (2) place no further orders with subcontractors related to the Project; (3) take commercially reasonable actions to suspend all orders and subcontracts; (4) protect and maintain the work on the

Project; and (5) otherwise mitigate PGE's costs and liabilities for the areas of work suspended. The ISO will not invoice PGE pursuant to Section 4(c) of this Agreement for any milestone payment following the issuance of a Notice to Suspend Work. To the extent a Notice of Resolution is issued pursuant to Section 2(b), the Notice to Suspend Work in effect at the time shall be deemed withdrawn and the ISO shall be entitled to invoice PGE for any milestone completed as specified in Section 4(c) of this Agreement and PGE shall pay such invoice pursuant to Section 4.

(d) Any time after thirty (30) days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a Notice of Resolution, the ISO may terminate this Agreement by providing written notice to PGE that it is terminating this Agreement ("Termination Notice") effective immediately. The ISO may terminate this Agreement under the terms of this Section 2(d) at its sole discretion for any reason.

(e) Any time after 30 days from the date of the Notice of Intent to Terminate under Section 2(b), issued by either Party, and prior to the date of a Notice of Resolution, PGE may terminate this Agreement by providing written notice to the ISO that it is terminating this Agreement ("Termination Notice") effective immediately. PGE may terminate this Agreement under the terms of this Section 2(e) at its sole discretion for any reason.

(f) In the event this Agreement is terminated by either or both of the Parties pursuant to its terms, this Agreement will become wholly void and of no further force and effect, without further action by either Party, and the liabilities and obligations of the Parties hereunder will terminate, and each Party shall be fully released and discharged from any liability or obligation under or resulting from this Agreement as of the date of the Termination Notice provided in Section 2(d) or 2(e), as applicable, notwithstanding the requirement for the ISO to submit the filing specified in Section 2(g). Notwithstanding the foregoing, the rights and obligations set forth in Sections 5 and 6 shall survive the termination of this Agreement and remain in full force and effect as specified in Sections 5 and 6, and any milestone payment obligation pursuant to Section 4(c) that arose prior to the Termination Notice in accordance with Section 2(d) or 2(e) shall survive until satisfied or resolved in accordance with Section 11.

(g) The Parties acknowledge that the ISO is required to file a timely notice of termination with FERC. The Parties acknowledge and agree that the filing of the notice of termination by the ISO with FERC will be considered timely if the filing of the notice of termination is made after the preconditions for termination have been met, and the ISO files the notice of termination within ten (10) days after the Termination Notice has been provided by either the ISO in accordance with Section 2(d) or PGE in accordance with Section 2(e). This Agreement shall terminate upon acceptance by FERC of such a notice of termination.

3. Implementation Scope and Schedule.

(a) The Parties shall complete the Project as described in Exhibit A, subject to modification only as described in Section 4(e) below.

(b) The Parties shall undertake the activities described in Exhibit A with the objective of completing the Project and implementing the EIM no later than the Implementation Date, including all milestones listed under Exhibit A for the Implementation Date, subject to modification only as described in Section 3(c) below.

(c) Either Party may propose a change in Exhibit A or the Implementation Date to the other Party. If a Party proposes a change in Exhibit A or the Implementation Date, the Parties shall negotiate in good faith to attempt to reach agreement on the proposal and any necessary changes in Exhibit A and any other affected provision of this Agreement, provided that any change in Exhibit A, or any change to the Implementation Date, must be mutually agreed to by the Parties. The agreement of the Parties to a change in Exhibit A, or a change to the Implementation Date, shall be memorialized in a revision to Exhibit A, which will then be binding on the Parties and shall be posted on the internet web sites of the ISO and PGE, without the need for execution of an amendment to this Agreement. Changes that require revision of any provision of this Agreement other than Exhibit A shall be reflected in an executed amendment to this Agreement and filed with FERC for acceptance.

(d) At least once per calendar month during the Term, the Parties' Designated Executives, or their designees, will meet telephonically or in person (at a mutually agreed to location) to discuss the status of the performance of the tasks necessary to achieve the milestones in Exhibit A and the continued appropriateness of Exhibit A to ensure that the Project can meet the Implementation Date. For purposes of this section, "Designated Executive" shall mean the individual identified in Section 8(g), or her or his designee or successor.

4. Implementation Charges, Invoicing and Milestone Payments.

(a) As itemized in Section 4(c) below, PGE shall pay the ISO a fixed fee of \$645,000 for costs incurred by the ISO to implement the Project ("Implementation Fee"), subject to completion of the milestones specified in Section 4(c) and subject to adjustment only as described in Section 4(b).

(b) The ISO will provide prompt written notice to PGE when the sum of its actual costs through the date of such notice and its projected costs to accomplish the balance of the Project exceed the Implementation Fee. The Implementation Fee shall be subject to adjustment only by mutual agreement of the Parties if the Parties agree to a change in Exhibit A, or a change to the Implementation Date, in accordance with Section 3(c) and the Parties agree that an adjustment to the Implementation Fee is warranted in light of such change.

(c) Upon completion of the milestones identified in Exhibit A, the ISO shall invoice PGE for the Implementation Fee as follows:

- i. \$107,500 upon the Effective Date as further described in Section 1 of this Agreement and Exhibit A as Milestone 1;
- ii. \$107,500 upon deployment into the ISO test environment of the full network model database that includes the topology of the PGE system as further described in Exhibit A as Milestone 2;
- iii. \$107,500 upon ISO promotion of market network model including PGE area to non-production system with PGE connection and data exchange data in advance of market simulation as further described in Exhibit A as Milestone 3;
- iv. \$107,500 upon commencement of EIM market simulation as further described in Exhibit A as Milestone 4;
- v. \$107,500 upon start of parallel operations as further described in Exhibit A as Milestone 5; and
- vi. \$107,500 upon the Implementation Date as further described in Exhibit A as Milestone 6.

(d) Following the completion of each milestone identified in Section 4(c)(i) through (v), the ISO will deliver to PGE an invoice which will show the amount due, together with reasonable documentation supporting the completion of the milestone being invoiced. PGE shall pay the invoice no later than forty-five (45) days after the date of receipt. Any milestone payment past due will accrue interest, per annum, calculated in accordance with the methodology specified for interest in the FERC regulations at 18 C.F.R. § 35.19a(a)(2)(iii) (the "FERC Methodology").

(e) If a milestone has not been completed as described in Section 4(c)(i), (ii), (iii), (iv), or (v) and in Exhibit A, as Exhibit A may have been modified in accordance with Section 3(c), the Parties shall negotiate in good faith an agreed upon change to the Project Delivery Dates (as defined in Exhibit A) consistent with Section 3(c) such that the timing of milestone payments in Section 4(c) can be adjusted to correspond to the updated Exhibit A.

(f) If PGE disputes any portion of any amount specified in an invoice delivered by the ISO in accordance with Section 4(c), PGE shall pay its total amount of the invoice when due, and identify the disputed amount and state that the disputed amount is being paid under protest. Any disputed amount shall be resolved pursuant to the provisions of Section 11. If it is determined pursuant to Section 11 that an overpayment or underpayment has been made by PGE or any amount on an invoice is incorrect, then (i) in the case of any overpayment, the ISO shall promptly return the amount of the overpayment (or credit the amount of the overpayment on the next invoice) to PGE; and (ii) in the case of an underpayment, PGE shall promptly pay the amount of the underpayment to the ISO. Any overpayment or underpayment shall include interest for the period from the date of overpayment, underpayment, or incorrect

allocation, until such amount has been paid or credited against a future invoice calculated in the manner prescribed for calculating interest in Section 4(d).

(g) All costs necessary to implement the Project not provided for in this Agreement shall be borne separately by each Party, which in the case of the ISO will be recovered through rates as may be authorized by its regulatory authorities.

(h) All milestone payments required to be made under the terms of this Agreement shall be made to the account or accounts designated by the Party which the milestone payment is owed, by wire transfer (in immediately available funds in the lawful currency of the United States).

5. Confidentiality.

(a) All written or oral information received from the other Party in connection with this Agreement (but not this Agreement after it is filed with FERC) necessary to complete the Project and marked or otherwise identified at the time of communication by such Party as containing information that Party considers commercially sensitive or confidential shall constitute "Confidential Information" subject to the terms and conditions herein.

(b) If PGE publicly releases PGE's Confidential Information in connection with a public process or a regulatory filing, or if the ISO publicly releases the ISO's Confidential Information in connection with a public process or a regulatory filing, then the information released shall no longer constitute Confidential Information; provided, however, that Confidential Information disclosed under seal (or in such other manner as to be treated confidentially) in connection with a regulatory filing shall retain its status as Confidential Information under this Agreement. In addition, Confidential Information does not include information that (i) is or becomes generally available to the public other than as a result of disclosure by either Party, its officers, directors, employees, agents, or representatives; (ii) is or becomes available to such Party on a non-confidential basis from other sources or their agents or representatives when such sources are not known by such Party to be prohibited from making the disclosure; (iii) is already known to such Party or has been independently acquired or developed by such Party without violating any of such Party's obligations under this Section 5; (iv) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, with regard to information for discussion at any stakeholder meetings or during the stakeholder process or with any regulatory authority; or (v) is the subject of a mutual written agreement between the Parties, including an agreement evidenced through an exchange of electronic or other communications, to allow for such disclosure and designation as non-confidential or public information on a case-by-case basis in accordance with Section 10 of this Agreement.

(c) The Confidential Information will be kept confidential by each Party and each Party agrees to protect the Confidential Information using the same degree of care, but no less than a reasonable degree of care, as a Party uses to protect its own

confidential information of a like nature. Notwithstanding the preceding sentence, a Party may disclose the Confidential Information or portions thereof to those of such Party's officers, employees, partners, representatives, attorneys, contractors, advisors, or agents who need to know such information for the purpose of analyzing or performing an obligation related to the Project. Notwithstanding the foregoing, a Party is not authorized to disclose such Confidential Information to any officers, employees, partners, representatives, attorneys, contractors, advisors, or agents without (i) informing such officer, employee, partner, representative, attorney, contractor, advisor, or agent of the confidential nature of the Confidential Information and (ii) ensuring that such officer, employee, partner, representative, attorney, contractor, advisor, or agent is subject to confidentiality duties or obligations to the applicable Party that are no less restrictive than the terms and conditions of this Agreement. Each Party agrees to be responsible for any breach of this Section 5 by such Party or a Party's officers, employees, partners, representatives, attorneys, contractors, advisors or agents, subject to the limitations set forth in Section 6 below.

(d) In the event that a Party is required by a court of competent jurisdiction or regulatory authority (by law, rule, regulation, order, deposition, interrogatory, request for documents, data request issued by a regulatory authority, subpoena, civil investigative demand or similar request or process) to disclose any of the Confidential Information, such Party shall (to the extent legally permitted) provide the other Party with prompt written notice of such requirement so that the other Party may seek a protective order or other appropriate remedy and/or waive compliance with the terms of this Section 5. In the event that such protective order or other remedy is not obtained, the disclosing Party hereby waives compliance with the provisions hereof with respect to such Confidential Information. In such event, the Party compelled to disclose shall (i) furnish only that portion of the Confidential Information which, in accordance with the advice of its own counsel (which may include internal counsel), is legally required to be furnished, and (ii) exercise reasonable efforts to obtain assurances that confidential treatment will be accorded the Confidential Information so furnished.

(e) Notwithstanding the foregoing, the Parties acknowledge that they are required by law or regulation to report certain information that could embody Confidential Information from time to time, and may do so from time to time without providing prior notice to the other Party. Such reports may include models, filings, and reports of costs, general rate case filings, cost adjustment mechanisms, FERC-required reporting, investigations, annual state reports that include resources and loads, integrated resource planning reports, reports to entities such as FERC, the North American Electric Reliability Council ("NERC"), Western Electricity Coordinating Council ("WECC"), or similar or successor organizations, or similar or successor forms, filings, or reports, the specific names of which may vary by jurisdiction, along with supporting documentation. Additionally, in regulatory proceedings or investigations in all state and federal jurisdictions in which they may do business, the Parties will from time to time be required to produce Confidential Information, and may do so without prior notice using its business judgment in compliance with all of the foregoing and including the appropriate level of confidentiality for such disclosures in the normal course of business.

(f) Each Party is entitled to seek equitable relief, by injunction or otherwise, to enforce its rights under this Section 5 to prevent the release of Confidential Information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision, subject to the limitations set forth in Section 6 below.

(g) Upon written request by a Party, the other Party shall promptly return to the requesting Party or destroy all Confidential Information it received, including all copies of its analyses, compilations, studies or other documents prepared by or for it, that contain the Confidential Information in a manner that would allow its extraction or that would allow the identification of the requesting Party as the source of the Confidential Information or inputs to the analysis. Notwithstanding the foregoing, neither Party shall be required to destroy or alter any computer archival and backup tapes or archival and backup files (collectively, "Computer Tapes"), provided that such Computer Tapes shall be kept confidential in accordance with the terms of this Agreement.

(h) Nothing in this Agreement shall be deemed to restrict either Party from engaging with third parties with respect to any matter and for any reason, specifically including the EIM, provided Confidential Information is treated in accordance with this Section 5.

(i) This Section 5, Confidentiality, applies for two years (24 months) after the Termination Date or the date of any expiration or termination of this Agreement.

6. Limitation of Liability; Indemnity.

(a) The Parties acknowledge and agree that, except as otherwise specified in Section 4(f) of this Agreement, neither Party shall be liable to the other Party for any claim, loss, cost, liability, damage or expense, including any direct damage or any special, indirect, exemplary, punitive, incidental or consequential loss or damage (including any loss of revenue, income, profits or investment opportunities or claims of third party customers), arising out of or directly or indirectly related to such other Party's decision to enter into this Agreement, such other Party's performance under this Agreement, or any other decision by such Party with respect to the Project.

(b) Each Party shall indemnify, defend and hold harmless each of the other Party and its officers, directors, employees, agents, contractors and sub-contractors, from and against all third-party claims, judgments, losses, liabilities, costs, expenses (including reasonable attorneys' fees) and damages for personal injury, death or property damage, to the extent caused by the negligence, willful misconduct, or breach of this Agreement of the indemnifying Party, its officers, directors, agents, employees, contractors or sub-contractors related to this Agreement; provided, that this indemnification shall be only to the extent such personal injury, death or property damage is not attributable to the negligence or willful misconduct related to this Agreement or breach of this Agreement of the Party seeking indemnification, its officers, directors, agents, employees, contractors or sub-contractors. The indemnified Party shall give the other Party prompt notice of any such claim. The indemnifying Party, in

consultation with the indemnified Party, shall have the right to choose competent counsel, control the conduct of any litigation or other proceeding, and settle any claim. The indemnified Party shall provide all documents and assistance reasonably requested by the indemnifying Party.

(c) The rights and obligations under this Section 6 shall survive the Termination Date and any expiration or termination of this Agreement.

7. Representation and Warranties.

(a) Representations and Warranties of PGE. PGE represents and warrants to the ISO as of the Effective Date as follows:

(1) It is duly formed, validly existing and in good standing under the laws of the jurisdiction of its formation.

(2) It has all requisite corporate power necessary to own its assets and carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary corporate power and authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized by all necessary corporate action on its part.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organizational documents; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms, except as the same may be limited by bankruptcy, insolvency or other similar laws affecting creditors' rights generally and by principles of equity regardless of whether such principles are considered in a proceeding at law or in equity.

(6) All material governmental authorizations in connection with the due execution and delivery of this Agreement, have been duly obtained or made prior to the date hereof and are in full force and effect.

(b) Representations and Warranties of the ISO. ISO represents and warrants to PGE as of the Effective Date as follows:

(1) It is duly formed, validly existing and in good standing under the laws of the jurisdiction of its formation.

(2) It has all requisite corporate power necessary to own its assets and carry on its business as now being conducted or as proposed to be conducted under this Agreement.

(3) It has all necessary corporate power and authority to execute and deliver this Agreement and to perform its obligations under this Agreement, and the execution and delivery of this Agreement and the performance by it of this Agreement have been duly authorized by all necessary corporate action on its part.

(4) The execution and delivery of this Agreement and the performance by it of this Agreement do not: (i) violate its organizational documents; (ii) violate any governmental requirements applicable to it; or (iii) result in a breach of or constitute a default of any material agreement to which it is a party.

(5) This Agreement has been duly and validly executed and delivered by it and constitutes its legal, valid and binding obligation enforceable against it in accordance with its terms, except as the same may be limited by bankruptcy, insolvency, regulatory authority, or other similar laws affecting creditors' rights generally and by principles of equity regardless of whether such principles are considered in a proceeding at law or in equity.

(6) All material governmental authorizations in connection with the due execution and delivery of, and performance by it of its obligations under this Agreement, have been duly obtained or made prior to the date hereof and are in full force and effect.

8. General Provisions.

(a) This Agreement, including Exhibit A to this Agreement, constitutes the entire agreement between the Parties, and supersedes any prior written or oral agreements or understandings between the Parties, relating to the subject matter of this Agreement, except the Confidentiality Agreement dated March 4, 2015 by and between PGE and the ISO; provided, that nothing in this Agreement shall limit, repeal, or in any manner modify the existing legal rights, privileges, and duties of each of the Parties as provided by any other agreement between the Parties, or by any statute or any other law or applicable court or regulatory decision by which such Party is bound.

(b) This Agreement may not be amended except in writing hereafter signed by both of the Parties; provided, however, the Parties may mutually agree to changes in Exhibit A in accordance with Section 4(e).

(c) Any waiver by a Party to this Agreement of any provision or condition of this Agreement must be in writing signed by the Party to be bound by such waiver, shall be effective only to the extent specifically set forth in such writing and shall not limit or affect any rights with respect to any other or future circumstance.

(d) This Agreement is for the sole and exclusive benefit of the Parties and shall not create a contractual relationship with, or cause of action in favor of, any third party.

(e) Neither Party shall have the right to voluntarily assign its interest in this Agreement, including its rights, duties, and obligations hereunder, without the prior written consent of the other Party, which consent may be withheld by the other Party in its sole and absolute discretion. Any assignment made in violation of the terms of this Section 8(e) shall be null and void and shall have no force and effect.

(f) In the event that any provision of this Agreement is determined to be invalid or unenforceable for any reason, in whole or part, the remaining provisions of this Agreement shall be unaffected thereby and shall remain in full force and effect to the fullest extent permitted by law, and such invalid or unenforceable provision shall be replaced by the Parties with a provision that is valid and enforceable and that comes closest to expressing the Parties' intention with respect to such invalid or unenforceable provision.

(g) Whenever this Agreement requires or provides that (i) a notice be given by a Party to the other Party or (ii) a Party's action requires the approval or consent of the other Party, such notice, consent or approval shall be given in writing and shall be given by personal delivery, by recognized overnight courier service, email or by certified mail (return receipt requested), postage prepaid, to the recipient thereof at the address given for such Party as set forth below, or to such other address as may be designated by notice given by any Party to the other Party in accordance with the provisions of this Section 8(g):

If to PGE:

Portland General Electric Company
121 SW Salmon Street
Portland, OR 97204
1WTC1712
Attention: Maria Pope, Sr. Vice President, Power Supply & Operations, and
Resource Strategy
E-mail: maria.pope@pgn.com

If to the ISO:

California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Attention: Vice President, Technology
E-mail: PRistanovic@caiso.com

Each notice, consent or approval shall be conclusively deemed to have been given (i) on the day of the actual delivery thereof, if given by personal delivery, email sent by

5:00 p.m., or overnight delivery, or (ii) date of delivery shown on the receipt, if given by certified mail (return receipt requested). It is the responsibility of each Party to provide, in accordance with this Section, notice to the other Party of any necessary change in the contact or address information herein.

(h) This Agreement may be executed in one or more counterparts (including by facsimile or a scanned image), each of which when so executed shall be deemed to be an original, and all of which shall together constitute one and the same instrument.

(i) Nothing contained in this Agreement shall be construed as creating a corporation, company, partnership, association, joint venture or other entity with the other Party, nor shall anything contained in this Agreement be construed as creating or requiring any fiduciary relationship between the Parties. No Party shall be responsible hereunder for the acts or omissions of the other Party.

(j) The decision to execute an EIM service agreement and participate in the EIM remains within the sole discretion of PGE and the decision whether to continue to offer EIM services (subject to Sections 1(c) and 2) remains within the sole discretion of the ISO.

(k) Nothing in this Agreement shall preclude a Party from exercising any rights or taking any action (or having its affiliates take any action) with respect to any other project.

(l) Unless otherwise expressly provided, for purposes of this Agreement, the following rules of interpretation shall apply: (i) any reference in this Agreement to gender includes all genders, and the meaning of defined terms applies to both the singular and the plural of those terms; (ii) the insertion of headings are for convenience of reference only and do not affect, and will not be utilized in construing or interpreting, this Agreement; (iii) all references in this Agreement to any "Section" are to the corresponding Section of this Agreement unless otherwise specified; (iv) words such as "herein," "hereinafter," "hereof," and "hereunder" refer to this Agreement (including Exhibit A to this Agreement) as a whole and not merely to a subdivision in which such words appear, unless the context otherwise requires; (v) the word "including" or any variation thereof means "including, without limitation" and does not limit any general statement that it follows to the specific or similar items or matters immediately following it; and (vi) the Parties have participated jointly in the negotiation and drafting of this Agreement and, in the event an ambiguity or question of intent or interpretation arises, this Agreement shall be construed as jointly drafted by the Parties and no presumption or burden of proof favoring or disfavoring any Party will exist or arise by virtue of the authorship of any provision of this Agreement.

9. Governing Law; Venue. This Agreement shall be governed by, and construed and interpreted in accordance with, the laws of the State of California without regard to its principles of conflicts of laws. Venue for any action hereunder shall be FERC, where subject to its jurisdiction, or otherwise any state or federal court with jurisdiction.

10. Communication. The Parties shall develop a communication protocol for the dissemination of material information associated with the Project, which shall be approved by PGE and the ISO. Pursuant to the communication protocol, the individual identified in Section 8(g), or their designee or successor, shall provide reasonable advance notice to the other Party of planned press releases, public statements, and meetings with the public or governmental authorities in which material information concerning the Project or PGE's involvement will be shared. The Parties shall mutually consult with each other as provided in the communication protocol prior to making such public statements or disclosures; provided that nothing herein shall prevent, limit, or delay either Party from making any disclosure required by applicable law or regulation, subject to the provisions of Section 5 hereof. In the event either Party engages in material unplanned communications about the Project that otherwise should have been subject to this Section and the communication protocol, such Party shall provide notice to the other Party as promptly as possible of the nature and content of such communication.

11. Dispute Resolution. Unless otherwise provided herein, each of the provisions of this Agreement shall be enforceable independently of any other provision of this Agreement and independent of any other claim or cause of action. In the event of any dispute arising under this Agreement, the Parties shall first attempt to resolve the matter through direct good faith negotiation between the Parties, including a full opportunity for escalation to executive management within the Parties' respective organizations. If the Parties are unable to resolve the issue within thirty (30) days after such escalation of the dispute, then for matters subject to FERC jurisdiction either Party shall have the right to file a complaint under Section 206 of the Federal Power Act. For all other matters, then:

(a) To the fullest extent permitted by law, each of the Parties hereto waives any right it may have to a trial by jury in respect of litigation directly or indirectly arising out of, under or in connection with this Agreement. Each Party further waives any right to consolidate, or to request the consolidation of, any action in which a jury trial has been waived with any other action in which a jury trial cannot be or has not been waived.

(b) If a waiver of jury trial is deemed by any court of competent jurisdiction to not be enforceable for any reason, then to the fullest extent permitted by law, each of the Parties hereto agrees to binding arbitration. Such arbitration shall be in accordance with the rules and procedures of the American Arbitration Association (AAA). Notwithstanding any AAA rules and procedures or any other provisions or any state or federal laws, the Parties agree that the arbitrators shall not consider or award punitive, special or exemplary damages as a remedy. Upon request by either Party, AAA shall provide the Parties a list of arbitrators each of who have experience and expertise with respect to integration. Upon each of the Parties receipt of such list, each Party shall have ten (10) days to select an arbitrator. The two selected arbitrators shall then select a third arbitrator within thirty (30) days from the date the initial two arbitrators were selected and the matter subject to arbitration shall be arbitrated within sixty (60) days after the selection of the third arbitrator.

12. Third Party Agreements. The Parties may engage in discussions with third parties, either jointly or unilaterally, to facilitate the Project. Each Party may adopt or modify tariffs or enter into or modify binding agreements between such Party and third parties to implement the approved terms and conditions of the Project or EIM as necessary and appropriate.

13. Compliance. Each Party shall comply with all federal, state, local or municipal governmental authority; any governmental, quasi-governmental, regulatory or administrative agency, commission, body or other authority exercising or entitled to exercise any administrative, executive, judicial, legislative, policy, regulatory or taxing authority or power, including FERC, NERC, WECC; or any court or governmental tribunal; in each case, having jurisdiction over either Party in connection with the execution, delivery and performance of its obligations under this Agreement. This Agreement is not intended to modify, change or otherwise amend the Parties' current functional responsibilities associated with compliance with WECC and NERC Reliability Standards; provided, however, the Parties may enter into separate mutually agreed to arrangements to clarify roles and responsibilities associated with compliance with WECC and NERC Reliability Standards in respect of this Agreement.

IN WITNESS WHEREOF, each of the Parties has caused its duly authorized officer to execute this Implementation Agreement as of the date first above written.

PORTLAND GENERAL ELECTRIC COMPANY



By: 

Name: Maria Pope

Title: Sr. Vice President, Power Supply & Operations, and Resource Strategy

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

By: 

Name: Petar Ristanovic

Title: Vice President, Technology



EXHIBIT A: PROJECT SCOPE AND SCHEDULE

The Project consists of the activities and delivery dates identified in this Exhibit A, implemented in accordance with the Agreement. The Parties have included a schedule for the Implementation Date to coordinate their efforts required for completion of the Project on a milestone track.

The Parties understand that input received from stakeholders during the course of implementing the Project, conditions imposed or questions raised in the regulatory approval process, and the activities of the Parties in implementing the Project may cause the Parties to determine that changes in the Project are necessary or desirable. Accordingly, this Exhibit A may be modified in accordance with Section 3(c) of the Agreement.

Each Party is responsible for performing a variety of tasks necessary to achieve the milestones on the scheduled dates specified in the table below (“Project Delivery Dates”) and shall plan accordingly. The Parties shall communicate and coordinate as provided in the Agreement to support the planning and execution to complete the Project.

| Project Scope and Milestones | Project Delivery Dates |
|--|------------------------|
| Detailed Project Management Plan – The Parties will develop and initiate a final project management plan that describes specific project tasks each Party must perform, delivery dates, project team members, meeting requirements, and a process for approving changes to support completion of the Project. | January 2016 |
| <ul style="list-style-type: none"> • Milestone 1 – This milestone is completed when the Agreement has been made effective in accordance with Section 1 of the Agreement. | January 29, 2016 |
| Full Network Model Expansion – Full Network Model expansion for PGE and EMS/SCADA, including, proof of concept of export/import of EMS data; complete model into the ISO test environment; complete validation for all SCADA points from PGE; testing of the new market model; and validation of the Outage and State Estimator applications. | November 2016 |
| <ul style="list-style-type: none"> • Milestone 2 - This milestone is completed upon modeling PGE into the ISO Full Network Model through the EMS which will be deployed into a non-production test environment using the ISO's network and resource modeling process. | November 30, 2016 |
| System Implementation and Connectivity Testing – System requirements and software design, the execution of necessary software vendor contracts, | April 2017 |

| | |
|--|-----------------|
| development of Market network model including PGE, allow PGE to connect to a non-production test system. | |
| <ul style="list-style-type: none"> • Milestone 3 - ISO to promote market network model including PGE area to non-production system, and allow PGE to connect and exchange data in advance of Market Simulation. | April 28, 2017 |
| <p>Construction, Testing and Training in Preparation for Market Simulation - This task includes IT infrastructure upgrades, security testing, training, Day-in-life simulation, and functional testing.</p> | May 2017 |
| <ul style="list-style-type: none"> • Milestone 4 - The EIM market simulation will allow PGE and the ISO to conduct specific market scenarios in a test environment prior to the production deployment to ensure that all system interfaces are functioning as expected and to produce simulated market results. To complete this milestone, the commencement of EIM simulation will signal that the PGE and the ISO have independently completed EIM system design, development and testing to participate in joint testing. | June 6, 2017 |
| <p>Activate Parallel Operations - Beginning August 1, 2017, the ISO will activate a parallel operation environment to practice production grade systems integration as well as market processes and operating procedures in anticipation of the impending PGE activation as an EIM Entity and to confirm compliance with the EIM readiness criteria set forth in the ISO tariff.</p> | July 2017 |
| <ul style="list-style-type: none"> • Milestone 5 – Start of parallel operations | August 1, 2017 |
| <p>System Deployment and Go Live – Implementing the Project and going live will include resource registration, operating procedures and updates, execution of service agreements, completion of the PGE tariff process, applicable board approvals, the filing and acceptance of service agreements and tariff changes with FERC, and completion and filing of a readiness criteria certification in accordance with the ISO tariff.</p> | September 2017 |
| <ul style="list-style-type: none"> • Milestone 6 – This milestone is complete upon the first production PGE energy imbalance market trade date. | October 1, 2017 |

Attachment B

**Declaration of Michael K. Epstein in Support of
CAISO-Portland General Electric Company EIM Implementation Agreement
California Independent System Operator Corporation**

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**California Independent System)
Operator Corporation)** **Docket No. ER16-____-000**

**DECLARATION OF MICHAEL K. EPSTEIN
ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

I, Michael K. Epstein, state as follows:

1. I am employed as Director of Financial Planning for the California Independent System Operator Corporation (the "CAISO"). My business address is 250 Outcropping Way, Folsom, California 95630. I am responsible for the CAISO's budget preparation and management; long term planning; accounting for the FERC refund case; market cash settlements; and audit coordination for all the CAISO's settlement and operations activities. As part of my duties at the CAISO, I oversee the development of the CAISO's grid management charge.
2. I received both an MBA and a BA with a major in accounting from the University of Southern California in Los Angeles, California. Prior to my current position, I was the Controller of the CAISO from 1997 - 2009. From 1994 – 1997, I was Vice President (Finance) of Siskon Gold Corporation, a publicly-traded mining company located in Grass Valley, California. From 1989 -1994, I was Controller of the Grupe Company, a privately held diversified real estate company located in Stockton, California. From 1985-1989, I was Controller of Brush Creek Mining and

Development Company located in Auburn, California. Prior to that, I was a Certified Public Accountant in the practice of public accounting with both local and international accounting firms.

3. The purpose of my declaration is to provide cost support for the fixed implementation fee that the CAISO proposes to charge Portland General Electric Company (“PGE”) for the development and implementation of the energy imbalance market under the Implementation Agreement that the CAISO is filing today.

The Implementation Fee

4. The implementation fee is based on the CAISO’s estimate of the start-up cost of implementing an energy imbalance market that could ultimately accommodate the entire Western Electric Coordinating Council (“WECC”), should the WECC utilities all choose to participate.
5. As explained below, the CAISO estimates that the total start-up cost for the energy imbalance market would be \$19.6 million. (Throughout this declaration, I am rounding millions to a single decimal point.) The CAISO would not incur this entire cost up front, however. Rather, the CAISO would incur the costs incrementally as the imbalance energy activity from additional balancing authority areas is incorporated into the market.
6. This total cost comprises eleven components: licenses, \$12.1 million; energy management system upgrades, \$1.0 million; data storage, \$2.0 million; hardware upgrades, \$500,000; production software modification, \$1.0 million; and network configuration and mapping, \$500,000;

integration, \$500,000; testing, \$1.5 million; system performance tuning, \$250,000; training and operations readiness, \$150,000; and project management, \$100,000.

Licenses

7. To estimate the license costs, the CAISO used the costs for its existing licenses for software systems development for scheduling infrastructure, integrated forward market, real time market and market quality system, and settlements software. The total base fees for the contracts covering these services are \$4.5 million. The fees in certain cases include a provision for a fee increase for each specified increment of additional CAISO peak demand. The details for these contracts are confidential, so I will need to describe the process without identifying the specific data.
8. Because the information on peak loads was not readily available, the CAISO decided to estimate costs by applying the 10% incremental cost to annual net energy for loads. The definition of “net energy for load” is posted on the WECC website. It comprises imports plus generation less exports with specific exclusions. Net energy for load is reported to WECC annually by each balancing authority area and used by WECC to allocate its reliability costs to each balancing authority area. The net energy for load (which I will hereafter refer to as load) for each balancing authority area is included with WECC’s billing to the balancing authority area for reliability costs. It is the most consistent and available data on all balancing authority areas in WECC. The CAISO used the 2013 load,

- which was included in the 2015 billing, for this allocation. The 2013 annual load for the CAISO was 232.3 million MWh. Using this data, the CAISO estimated the increment in CAISO load that would occasion a specific amount of additional license costs.
9. The WECC load, exclusive of the CAISO, is 636.2 million MWh. The CAISO calculated that this is a particular multiple of the load increments used in the license contracts. The CAISO calculated the product of this multiple and the increased costs associated with the contractual increment. Using this methodology, the CAISO estimates the license costs for implementing a WECC-wide energy imbalance market would be 27 times \$450,000, or \$12.15 million.

Data Storage

10. The CAISO will need to procure additional data storage to account for the expanded data requirements associated with integrating all WECC balancing authority areas into CAISO systems. The storage will provide the required highly available and redundant storage as well as cover long term archiving.
11. The storage for current CAISO production requires 200 terabytes at a cost of approximately \$7.5 million. The CAISO estimates that it will require a 10% increase for additional storage and faster retrieval, which would equate to \$750,000 at the same rate. Additional cabinets and ports will cost \$500,000 and licensing for databases, monitoring, storage, backups, etc. will be \$750,000, for a total cost of \$2.0 million.

Hardware Upgrades

12. Hardware upgrades will be necessary to meet the market timeline requirements, including 5 minute dispatch. These upgrades include servers and supporting network systems to provide the needed availability, reliability, and performance.
13. The CAISO currently uses about 100 servers. The CAISO estimates that it will need an additional 10%, or ten servers, with an estimated cost of \$30,000 each, for a total of \$300,000. The CAISO also estimates \$200,000 of networking and data acquisition costs for a total hardware upgrade cost of \$500,000.

Network Configuration and Mapping, Integration, System Performance Tuning.

14. The CAISO will need to include the other energy imbalance market balancing authority areas into the CAISO's network model and market model. It must also (1) integrate system interfaces to enable data exchange between systems to meet business and system requirements and (2) measure and analyze performance in a non-production environment and mitigate any identified performance issues to ensure that production performance is as expected.
15. The CAISO project management team determined the costs of these activities in consultation with the relevant directors and managers of the affected departments by estimating the level of effort required based on an extrapolation from the level of effort necessary for similar past activities. The staff consulted has extensive experience in estimating costs in this

area. In particular, the CAISO in 2009 completed a \$200 million implementation of a new market design and annually thereafter has carried out software implementation, modification and redesign projects averaging about \$20 million each.

Energy Management System Upgrades, Production Software Modification, and Testing

16. To build the energy imbalance market for the entire WECC region, the CAISO will need to improve the existing energy management system, which currently supports the CAISO control area with a peak demand of 50,000 MW. These system improvements would enable the CAISO to integrate the imbalance energy for the additional balancing authority areas within the four second data resource time.
17. The CAISO will also require production software modifications to support new inputs and outputs associated with the energy imbalance market, including base schedules.
18. Following the system integration described above, the CAISO will need to conduct testing to ensure that it meets all energy imbalance market business and system requirements.
19. The CAISO project management team determined the costs of these activities in consultation with the relevant directors and managers of the affected departments by estimating the resources (contractors and consultants) needed based on an extrapolation from the resources that the CAISO has required for recent software changes and modifications.

As described above, the staff consulted has extensive experience in estimating costs in this area.

Training and Operations Readiness, and Project Management

20. Similarly, CAISO project management personnel determined the costs of these activities in consultation with the relevant directors and managers of the affected disciplines by estimating the level of effort required based on an extrapolation from the level of effort necessary for similar past activities. As described in paragraph 14 above, the staff consulted has extensive experience in estimating costs in this area.

Derivation of Implementation Fee

21. Having determined that the total cost of implementing the WECC-wide energy imbalance market would be \$19.1 million, the CAISO proceeded to develop a rate that could be used for individual participants. To do so, the CAISO divided the \$19.1 million total cost by the 636.2 million MWh of non-CAISO net energy for load in the WECC, for a rate of \$0.031/MWh.
22. Finally, to determine the PGE fee as established in the Implementation Agreement, the CAISO applied the rate to PGE's most recently reported net energy for load for 2013 of 31.3 million MWh, for a rounded total of \$970,000.

Comparison of PGE Fee to Generic Rate

23. Although the CAISO intends to base the implementation fee on a generic rate that would reasonably allocate the costs of an WECC-wide energy imbalance market to all potential participants, the CAISO thought it

worthwhile to compare PGE's fee based on the \$0.031/MWh rate with an estimate of the specific costs of expansion of the existing energy imbalance market to include PGE. Using the same process described above, the CAISO estimated the costs (in thousands) that appear in the following table:

| | |
|-----------------------------------|--------------|
| Software license costs | \$450 |
| Network configuration and mapping | \$70 |
| Integration | \$50 |
| Testing | \$25 |
| Training and operations readiness | \$25 |
| Project Management | \$25 |
| Total | \$645 |

24. As is readily apparent, although the total costs are the same, the proportion of the total PGE-specific costs that each component represents differs from proportion of the WECC-wide costs that the component represents. For example, the CAISO will incur no additional storage costs or EMS upgrade, but to integrate PGE, the CAISO will need to incur the majority of total production software costs up front. Although the PGE-specific costs are the same as the PGE fee based on the generic rate, the CAISO cannot determine at this time if this will be the case with regard to all future participants. Nonetheless, the CAISO has concluded that the generic fee represents the most equitable methodology of allocating the costs of a WECC-wide energy imbalance market.

I hereby certify under penalty of perjury that the foregoing statements are true and correct to the best of my knowledge, information, and belief:

Executed on: November 20, 2015

s/ Michael K. Epstein
Michael K. Epstein