

June 9, 2017

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 CAISO Rate Schedule No. 92  
Powerex EIM Implementation Agreement  
Docket No. ER17-\_\_\_\_\_-000**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits for filing and acceptance an agreement dated June 1, 2017, between the CAISO and Powerex Corp. (Powerex), a British Columbia corporation (Implementation Agreement).<sup>1</sup> The Implementation Agreement sets forth the terms under which the CAISO will enable Powerex's participation in the CAISO's Energy Imbalance Market (EIM). The EIM is the vehicle by which entities outside the CAISO's balancing authority area participate in the CAISO's real-time market. Under the Implementation Agreement, Powerex will compensate the CAISO for its share of the costs of system changes, software costs, and other configuration activities related to its participation in the EIM. Powerex's participation will proceed based upon certain principles included in the Implementation Agreement, which will also be reflected in participation agreements filed with the Commission for acceptance before Powerex commences participation in the EIM. The CAISO requests that the Commission accept the Implementation Agreement effective August 15, 2017, consistent with a schedule that will allow Powerex to commence EIM participation on April 4, 2018.<sup>2</sup>

## **I. Background**

The EIM enables entities outside the CAISO balancing authority area 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 to join the EIM, under market rules that went into effect on October 24, 2014, with the first trading day

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<sup>1</sup> The CAISO submits the Implementation Agreement pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d.

<sup>2</sup> See Implementation Agreement, Section 1.

November 1, 2014. NV Energy was the next entity to join the EIM on December 1, 2015. Puget Sound Energy and Arizona Public Service Company began participation on October 1, 2016.

The EIM continues to develop and attract the interest of a diverse array of participants throughout the Western Interconnection. Portland General Electric will be the sixth balancing authority area to participate in the EIM commencing October 1, 2017, and the Idaho Power Company will be the seventh, starting in April 2018. The most recent entities committing to join the EIM are municipal utilities. The City of Seattle, by and through its City Light Department (SCL) and the Balancing Authority of Northern California (BANC) on behalf of the Sacramento Municipal Utility District (SMUD) will commence participation on April 1, 2019.<sup>3</sup>

The Implementation Agreement between the CAISO and Powerex represents an important next step in the expansion of the EIM, to permit an entity with resources located in a balancing authority area outside the United States to participate. Powerex is a Canadian corporation with its principal place of business in Vancouver, British Columbia. As an independent, wholly owned subsidiary of British Columbia Hydro & Power Authority (BC Hydro), a Provincial Crown Corporation, Powerex, in its own capacity, markets the residual capability of the BC Hydro system and is a key participant in energy markets across North America. Its activities help balance the BC Hydro system efficiently and yield trade revenues that benefit BC Hydro. BC Hydro acts as a balancing authority, generation owner, transmission owner, and service provider in the Province of British Columbia under the regulatory authority of the British Columbia Utilities Commission (BCUC), pursuant to the Utilities Commission Act, and is responsible for, inter alia, ensuring that customers within the Province of British Columbia receive safe and reliable service on a non-discriminatory basis.

## **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 enable Powerex to participate in the EIM consistent with the identified key milestones and associated payment provisions.<sup>4</sup> The CAISO-Powerex Implementation Agreement is modeled after the CAISO-PacifiCorp, CAISO-NV Energy, CAISO-Puget Sound Energy, CAISO-Arizona Public Service Company, CAISO-Portland General Electric, CAISO-Idaho Power Company, CAISO-SCL, and CAISO-BANC implementation agreements previously accepted

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<sup>3</sup> Implementation Agreements with the Salt River Project and the Los Angeles Department of Water and Power have been executed and will be filed with the Commission for acceptance.

<sup>4</sup> See Implementation Agreement, Sections 3-4 and Exhibit A.

by the Commission.<sup>5</sup> This Implementation Agreement differs somewhat from these prior agreements because Powerex's EIM participation will involve generation, transmission, and load located outside of the US and subject to the legal authority of the BCUC, not the Commission.<sup>6</sup> To address legal and regulatory issues associated with these jurisdictional differences, this Implementation Agreement adopts eight principles to guide the negotiation and implementation of the agreements necessary to support Powerex's participation in the EIM and to set forth the limited role of BC Hydro.<sup>7</sup>

Including the principles in the Implementation Agreement is similar to the approach taken in the CAISO-PacifiCorp implementation agreement accepted by the Commission in 2014.<sup>8</sup> The CAISO and PacifiCorp agreed upon a set of principles to guide the development of the EIM in order to align the CAISO and PacifiCorp implementation processes. In response to commenters who sought assurance that the articulated principles did not predispose any outcome concerning the EIM design, the Commission found that nothing in the implementation agreement prejudices or predetermines any market design issues.<sup>9</sup> The Implementation Agreement presented here follows the same model: Powerex's participation in the EIM will be subject to a later Federal Power Act Section 205 filing and the Commission's rulings on that filing; nothing in the Implementation Agreement prejudices or predetermines any outcome.

Subsequent to the CAISO-PacifiCorp implementation agreement, the CAISO has modified implementation agreements where necessary to reflect unique circumstances of an incoming EIM participant. For example, the CAISO-BANC implementation agreement provides for a phased implementation to account for the fact that not all of the load serving entities within the BANC balancing authority area are able or in a position to participate at the same time as SMUD. The CAISO and BANC recognized that the agreed upon phased approach would necessitate the filing of a non-conforming EIM Entity Agreement to account for participation by less than the entire BANC balancing authority

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<sup>5</sup> 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), *Cal. Indep. Sys. Operator Corp.*, 152 FERC ¶ 61,090 (July 31, 2015), *Cal. Indep. Sys. Operator Corp.*, 154 FERC ¶ 61,020 (January 19, 2016); *Cal. Indep. Sys. Operator Corp.*, 155 FERC ¶ 61,311 (June 27, 2016); Letter Order in Docket No. ER17-868-000 (March 14, 2017); and Letter Order in Docket No. ER17-1300-000 (May 18, 2017).

<sup>6</sup> The Commission has recognized that Canadian Crown corporation participation in an ISO/RTO market may require some special consideration. See, e.g., *Midwest Indep. Transmission Sys. Operator, Inc.*, 129 FERC ¶ 61,282 (2009).

<sup>7</sup> See Implementation Agreement, Section 14.

<sup>8</sup> See *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,298 (June 28, 2013) (accepting the CAISO-PacifiCorp implementation agreement before the EIM was developed).

<sup>9</sup> *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,298 (June 28, 2013), at P 35.

area.<sup>10</sup> The Commission issued a delegated order accepting the CAISO-BANC agreement effective June 1, 2017 as requested.<sup>11</sup> Similarly, the instant Implementation Agreement recognizes the need to develop and file participation agreements that reflect the legal and regulatory considerations specific to Powerex's participation with resources located in a balancing authority area in the Province of British Columbia, and the Commission should defer any judgment about such matters to a future proceeding. Nonetheless, the CAISO will describe the principles and their foundation to facilitate the Commission's understanding of the anticipated nature of the participation framework.

#### **A. Participation Framework**

The CAISO and Powerex are working to develop an EIM participation framework that takes into account the unique legal and regulatory considerations that arise from Powerex's EIM participation with resources and load located in Canada, while at the same time preserving all CAISO functional tariff obligations necessary for EIM participation. The parties intend that Powerex's EIM participation, and CAISO's activity as market operator, remain subject to the Commission's jurisdiction under the Federal Power Act – without disrupting or altering the legal and regulatory structures and requirements applicable to BC Hydro's actions within the Province of British Columbia.

The anticipated EIM participation framework will provide for Powerex's participation in the EIM with (1) voluntary offers from residual BC Hydro flexible generation; (2) intra-hour deviations in load and generation in the BC Hydro balancing authority area; and (3) transmission arrangements to support EIM transfers. BC Hydro will continue to operate as a wholly Canadian provincial governmental balancing authority and as a transmission owner, operator, and service provider and generation owner and operator for the BC Hydro system. BC Hydro will not assume any participant role or undertake any commercial activities in the EIM. Recognizing that Powerex is not authorized to have access to all of the data required by the CAISO from participating EIM entities for the CAISO's operation of the EIM, BC Hydro is willing to supply specific data and information directly to the CAISO that is necessary for Powerex's EIM participation. The CAISO and BC Hydro anticipate entering into a data sharing agreement that the CAISO intends to file with the Commission along with the agreements entered into with Powerex that support Powerex's EIM participation.

The Implementation Agreement sets forth the terms upon which the CAISO will timely configure its systems to incorporate Powerex into the EIM so that Powerex and the CAISO are both prepared for Powerex's EIM participation beginning on April 4, 2018. At the same time, the CAISO and Powerex will

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<sup>10</sup> CAISO Transmittal Letter in Docket No. ER17-1300-000, at p. 3.

<sup>11</sup> Letter Order in Docket No. ER17-1300-000 (May 18, 2017)

develop and file for Commission acceptance an EIM participation framework that preserves all CAISO functional tariff obligations necessary for EIM participation, but that does not extend United States legal and regulatory obligations or United States-regulated activity into a Canadian province. The Implementation Agreement acknowledges that the rules and procedures governing an alternative EIM participation framework must be set forth in the provisions of an agreement enforceable under the law of the State of California and accepted by the Commission, as well as in corresponding pro forma CAISO service agreements, and in any necessary CAISO tariff revisions.

Consistent with these objectives, the Implementation Agreement sets forth the following eight principles that will guide the negotiation and implementation of agreements necessary to support Powerex's EIM participation, including the anticipated data sharing agreement with BC Hydro. The EIM participation framework established by these principles will be subject to any and all legally binding conditions imposed in the EIM participation agreement approval processes, which would include review by the Commission under Section 205 of the Federal Power Act.

(a) EIM Arrangement for Canadian Participation. An arrangement will be constructed to permit EIM participation by Powerex that will utilize residual capability of generation resources that are owned and operated by a foreign entity, BC Hydro, and located wholly outside of the US, and settle the intra-hour variations in generation and load in the BC Hydro Balancing Authority Area, which is likewise located wholly outside of the US. The rules and obligations governing this Canadian EIM participation arrangement will be set forth in the provisions of a bilateral agreement or agreements accepted by the Commission, and where applicable in pro forma service agreements and the CAISO tariff.

(b) Structure. The arrangement will be constructed to preserve functional CAISO tariff obligations and enable CAISO visibility and access necessary for EIM operations, while taking all steps necessary to preserve existing legal and regulatory authorities and requirements that are specifically applicable to the activity of BC Hydro, Powerex, and the CAISO in their respective jurisdictions.

(c) Compatibility. This Canadian EIM arrangement will be implemented in a manner that is compatible with the rest of the CAISO's EIM framework with respect to adherence to EIM scheduling requirements, satisfaction of EIM resource sufficiency requirements, incorporation into the CAISO's full network model, comparable metering standards, and conformity with EIM settlement processes. Powerex's participation obligations under its bilateral agreement(s) with the CAISO will be tied to CAISO tariff obligations as applicable, such that the parties' obligations are able to evolve in keeping with EIM enhancements as approved and implemented.

(d) Data Sharing. BC Hydro will undertake an independent obligation under a bilateral agreement with the CAISO to supply a defined set of data necessary to enable Powerex to independently engage in EIM participation using residual capability of the BC Hydro system.

(e) Voluntary Nature. Consistent with the current design of the EIM, Powerex's bilateral agreement(s) with the CAISO will expressly and specifically recognize the voluntary nature of Powerex's EIM participation with resources located outside the US, including voluntary market entry and exit, voluntary bid and offer volumes and pricing, voluntary designation of transmission rights available for EIM use, and the ability to forego engaging in EIM Transfers in one or more specified operating intervals.

(f) Bilateral Real-Time Market Activities Outside the EIM. Consistent with the current design of the EIM, Powerex shall have the continued ability to enter into non-EIM transactions, including after the CAISO's base scheduling timelines. These transactions will not create energy imbalance that must be served by the EIM, provided they utilize residual capability of the BC Hydro system that has not been offered into the EIM. Powerex will be subject to all applicable EIM charges for its non-EIM transactions, including the EIM Administrative Fee, unless the transaction is wholly outside of the United States.

(g) Local Market Power Mitigation. Any local market power mitigation framework to be applied will be consistent with the CAISO tariff, will mitigate potential market power concerns during constrained periods to the satisfaction of the DMM and FERC, and will provide Powerex with sufficient flexibility to reflect the opportunity costs associated with the use of an external multi-facility hydro system with long term multi-year storage capability.

(h) Greenhouse Gas Attributes. This Canadian EIM arrangement as well as Powerex's EIM transactions will reflect and be consistent with the Cap and Trade program administered by the California Air Resources Board, including Powerex's current status as an Asset Controlling Supplier (ACS).<sup>12</sup>

## **B. Implementation Fee**

The Implementation Agreement specifies that Powerex will pay a fixed implementation fee of \$1,923,955 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 Powerex into the EIM. The methodology that the CAISO used to determine the implementation fee for Powerex is the same methodology that the CAISO used to determine the BANC,

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<sup>12</sup> See Implementation Agreement, Section 14.

SCL, Idaho Power Company, Portland General Electric, Arizona Public Service Company, Puget Sound Energy, NV Energy, and PacifiCorp implementation fees accepted by the Commission.

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 EIM available to all balancing authority areas in the Western Electricity Coordinating Council (WECC).<sup>13</sup> The components of that estimate are described in the Declaration of April D. Gordon, the CAISO's Director of Financial Planning and Procurement, which is included with this filing as Attachment B, and summarized below.

<b>Implementation Costs (in thousands of dollars)</b>	
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
<b>Total</b>	<b>\$19,650</b>

Using this estimate, the CAISO derived a rate that allocates the \$19.65 million to potential entrants into the EIM according to their proportionate share of the total WECC load (excluding the CAISO's load), using updated data reported to WECC. The CAISO then applied this fee to Powerex's share of the updated WECC load (exclusive of the CAISO) to account for the Powerex implementation fee.

The \$1,923,955 implementation fee is just and reasonable because it allocates a portion of the overall cost to Powerex in an amount proportionate to CAISO's estimate of Powerex's share of the benefits that will ensue from the EIM, as measured by BC Hydro's load, consistent with the methodology CAISO has used to allocate similar costs to the other EIM participants. In addition, as explained in Ms. Gordon'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 EIM

<sup>13</sup> The total estimated cost is a projection assuming the total work effort remains stable. Efforts to integrate other EIM participants are either completed or underway are not considered in this estimate.

that serves both the CAISO and Powerex. This comparison confirmed that the fee reasonably represents those costs even though certain costs are not triggered by enabling Powerex's participation in the EIM. For example, the CAISO does not anticipate incurring any additional data storage costs or EMS system improvement costs, but to integrate Powerex, the CAISO will incur production software modification costs and integration costs up front. 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 that the parties can adjust the fixed phase 1 implementation fee by mutual agreement if the CAISO's actual or expected costs exceed the estimate that forms the basis of the implementation fee.<sup>14</sup> This provision allows for appropriate consideration of the allocation of costs associated with incorporation of Powerex into the EIM. At the same time, the requirement for Powerex to agree to any increase in the implementation fee ensures that Powerex'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 Powerex.

### **C. Other Provisions**

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 incorporating Powerex into the EIM. 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.<sup>15</sup> This and other related provisions mean that the parties must work closely together to achieve the goal of implementing Powerex into the EIM in a timely manner.

The Implementation Agreement also includes general 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), venue (Section 9), communication (Section 10), and dispute resolution (Section 11).

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<sup>14</sup> 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).

<sup>15</sup> Implementation Agreement, Section 2.



### **III. Next Steps**

Following Commission acceptance of this filing, the CAISO will begin the process of incorporating Powerex into the EIM. Commencement of Powerex's participation will be subject to the Commission approval of the participation agreements, CAISO tariff readiness requirements, and the filing of a certificate of readiness with the Commission.<sup>16</sup> The CAISO will also take into consideration lessons learned from the prior implementations, as the readiness criteria represent the baseline for measuring the readiness of each new EIM entity's processes and systems for EIM participation.

### **IV. Effective Date**

The CAISO requests that the Commission accept the Implementation Agreement effective on August 15, 2017.

### **V. Request for Waivers**

The CAISO submits that this filing substantially complies with the requirements of Section 35.13 of the Commission's Rules of Practice and Procedure<sup>17</sup> are 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 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, Powerex, the California Public Utilities Commission, and the California Energy Commission. In addition, the CAISO has posted the filing on the CAISO website.

### **VII. Contents of Filing**

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A      Executed Implementation Agreement; and

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<sup>16</sup> See CAISO Tariff, Section 29.2(b).

<sup>17</sup> 18 C.F.R. § 35.13 (2013).

Attachment B Executed Declaration of April D. Gordon, Director of  
Financial Planning and Procurement.

### VIII. Correspondence

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure,<sup>18</sup> the CAISO requests that all correspondence, pleadings, and other communications concerning this filing be served upon the following:

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

### IX. Conclusion

The CAISO respectfully requests that the Commission accept this filing and permit the Implementation Agreement, CAISO Rate Schedule No. 92, to be effective August 15, 2017, as requested. If there are any questions concerning this filing, please contact the undersigned.

Respectfully submitted,

**By: /s/ John C. Anders**

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<sup>18</sup> 18 C.F.R. § 385.2010.

**Attachment A – EIM Implementation Agreement**  
**Powerex EIM Implementation Agreement**  
**California Independent System Operator Corporation**

## **ENERGY IMBALANCE MARKET IMPLEMENTATION AGREEMENT**

This Implementation Agreement (“Agreement”) is entered into as of June 1, 2017, by and between Powerex Corp., a British Columbia corporation (“Powerex”), and the California Independent System Operator Corporation, a California nonprofit public benefit corporation (“CAISO”). Powerex and the CAISO are sometimes referred to in this Agreement individually as a “Party” and, collectively, as the “Parties”.

### **RECITALS**

WHEREAS, Powerex is a wholly owned subsidiary of British Columbia Hydro & Power Authority (“BC Hydro”), a Provincial Crown Corporation, and in its own capacity Powerex both markets the residual capability of the BC Hydro system and is a key participant in energy markets across North America, with those activities helping to efficiently balance the BC Hydro system and yield trade revenues that benefit BC Hydro’s shareholder, the Province of British Columbia;

WHEREAS, Powerex has determined there is an opportunity to secure benefits through its participation in the energy imbalance market operated by the CAISO (“EIM”) with residual capability it sources from the BC Hydro system;

WHEREAS, the CAISO has determined there would be benefits to CAISO market participants from Powerex’s participation in the EIM utilizing the residual capability of the BC Hydro system in real-time and desires to expand operation of the EIM to include that capability;

WHEREAS, BC Hydro undertakes activity in the Province of British Columbia under the regulatory authority of the British Columbia Utilities Commission (“BCUC”), pursuant to the Utilities Commission Act, and is responsible for ensuring that customers within the Province of British Columbia receive safe and reliable service on a non-discriminatory basis;

WHEREAS, BC Hydro will continue to operate as a wholly Canadian provincial governmental balancing authority as well as a transmission owner, operator and service provider, and as a generation owner and operator for the BC Hydro system and will not assume any participant role or undertake any commercial activities in the EIM;

WHEREAS, Powerex is not authorized to have, and will not have, access to all of the data required by the CAISO from participating EIM Entities under the CAISO tariff, and necessary for the CAISO’s operation of the EIM, but BC Hydro is willing to supply certain data and information as necessary for Powerex’s participation in the EIM that Powerex otherwise does not make available to the CAISO, pursuant to an agreement with the CAISO;

WHEREAS, an alternative structural arrangement will be necessary to permit EIM participation by Powerex, utilizing the residual capability of the BC Hydro system and the intra-hour variation in generation and load in the BC Hydro Balancing Authority

Area, both of which are located wholly outside the United States (“US”), while preserving BC Hydro’s compliance with provincial and Canadian law and non-US jurisdictional status;

WHEREAS, the CAISO and Powerex will develop an EIM participation framework that preserves all CAISO functional tariff obligations necessary for EIM participation, but that does not extend US legal and regulatory obligations or US-regulated activity into a Canadian province;

WHEREAS, the Parties acknowledge that the rules and procedures governing an alternative EIM participation framework must be set forth in the provisions of an agreement enforceable under the law of the State of California and accepted by the Federal Energy Regulatory Commission (“FERC”), as well as corresponding pro forma CAISO service agreements, and any necessary CAISO tariff revisions;

WHEREAS, the Parties are entering into this Agreement to set forth the terms upon which the CAISO will timely configure its systems to incorporate Powerex into the EIM (“Project”) consistent with a set of principles agreed upon by Powerex and the CAISO for Powerex participation in the EIM (“Principles”), such that Powerex and the CAISO are prepared for an April 4, 2018 implementation of the Project (“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 permitted to take effect by FERC. 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, that 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 this Agreement.

(c) The term of this Agreement ("Term") shall commence on the Effective Date and shall terminate upon the earliest to occur of (1) the date FERC permits any necessary participation agreements to take effect and the service agreements under the CAISO tariff necessary for the commencement of 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.

## 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), as provided in Section 2(d) or 2(e) as applicable.

(b) If either the CAISO or Powerex seeks to 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, Powerex may provide written notice directing the CAISO 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 CAISO 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 Powerex's costs and liabilities for the areas of work suspended. The CAISO will not invoice Powerex pursuant to Section 4(d) 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 CAISO shall be entitled to invoice Powerex for any milestone completed as specified in Section 4(d) of this Agreement and Powerex shall pay such invoice pursuant to Section 4.

(d) 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, the CAISO may terminate this Agreement by providing written notice to Powerex that it is terminating this Agreement ("Termination Notice") effective immediately. The CAISO may terminate this Agreement at its sole discretion for any reason, including (i) a lack of reasonable progress in the development of the Project in

accordance with Exhibit A to this Agreement, subject to modification only as described in Section 3(c); (ii) a disagreement between the Parties regarding Project design, scope, or implementation, which disagreement the Parties are unable to resolve to their mutual satisfaction; or (iii) if the CAISO determines in its sole discretion that the Project is not likely to provide the benefits the CAISO is seeking to obtain.

(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, Powerex may terminate this Agreement by providing written notice to the CAISO that it is terminating this Agreement ("Termination Notice") effective immediately. Powerex may terminate this Agreement at its sole discretion for any reason, including: (i) a lack of reasonable progress in the development of the Project in accordance with Exhibit A to this Agreement, subject only to modification only as described in Section 3(c); (ii) a disagreement between the Parties regarding Project design, scope, or implementation, which disagreement the Parties are unable to resolve to their mutual satisfaction; or (iii) if Powerex determines in its sole discretion that the Project is not likely to provide the benefits Powerex is seeking to obtain.

(f) In the event this Agreement is terminated by either or both of the Parties, the liabilities and obligations of the Parties under this Agreement 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, pending approval of the termination by FERC. 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(d) 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) Within ten (10) days after the Termination Notice has been provided by either the CAISO in accordance with Section 2(d) or Powerex in accordance with Section 2(e), the CAISO is required to file a timely notice of termination with FERC. The notice will request a waiver of the time requirements of Section 205(d) of the Federal Power Act and 18 C.F.R. § 35.15 such that the Agreement will terminate as of the date of the Termination Notice provided in Section 2(d) or 2(e), as applicable. This Agreement shall terminate upon the date specified in the 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 3(c) below.

(b) The Parties shall undertake the activities described in Exhibit A with the objective of completing the Project and implementing the EIM not later than 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 in order to further the Project objectives in accordance with Section 14. 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. Any change in Exhibit A or the Implementation Date must be mutually agreed to by the Parties. The agreement of the Parties to a change in Exhibit A or the Implementation Date shall be memorialized in a revision to Exhibit A, which will be binding on the Parties and shall be posted on the internet web sites of the CAISO and Powerex, 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 require an executed amendment to this Agreement accepted by FERC.

(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 upon location) to discuss 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 his or her designee or successor.

#### 4. Implementation Charges, Invoicing and Milestone Payments.

(a) All amounts stated in this section are in US dollars.

(b) Powerex shall pay the CAISO a fixed fee of \$1,923,955 for costs incurred by the CAISO to implement the Project ("Implementation Fee"), subject to completion of the milestones specified in Section 4(d) and subject to adjustment only as described in Section 4(c).

(c) Absent an amendment to this agreement, the Implementation Fee shall be subject to adjustment by mutual agreement of the Parties in either of the following circumstances: (1) if the Parties agree to a change in Exhibit A or 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; or (2) the CAISO provides notice to Powerex that the sum of its actual costs through the date of such notice and its projected costs to accomplish the balance of the Project exceeds the Implementation Fee.

(d) Upon completion of the milestones identified in Exhibit A, the CAISO shall invoice Powerex for the Implementation Fee as follows:

- i. \$320,660 upon the Effective Date as further described in Section 1 of this Agreement and Exhibit A as Milestone 1;
- ii. \$320,660 upon deployment into the CAISO test environment of the full network model database that includes the topology of the BC Hydro system as further described in Exhibit A as Milestone 2;



- iii. \$320,660 upon the CAISO promotion of a market network model in advance of market simulation that includes the BC Hydro system for purposes of Powerex participation to a non-production system that has Powerex and BC Hydro connection and data exchange as further described in Exhibit A as Milestone 3;
- iv. \$320,660 upon commencement of EIM market simulation as further described in Exhibit A as Milestone 4;
- v. \$320,660 upon start of parallel operations as further described in Exhibit A as Milestone 5; and
- vi. \$320,665 upon the Implementation Date as further described in Exhibit A as Milestone 6.

(e) Following the completion of each milestone identified in Section 4(d)(i) through (vi), the CAISO will deliver to Powerex an invoice that will show the amount due, together with reasonable documentation supporting the completion of the milestone being invoiced. Powerex shall pay the invoice no later than forty-five (45) days after the date of receipt. Any milestone payment past due will accrue interest determined in accordance with FERC regulations at 18 C.F.R. § 35.19a(a)(2)(iii) (the "FERC Methodology").

(f) If a milestone has not been completed as described in 4(d)(i), (ii), (iii), (iv), (v), or (vi) and 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 Exhibit A consistent with Section 3(c) such that the timing of milestone payments in Section 4(d) can be adjusted to correspond to the updated Exhibit A.

(g) If Powerex disputes any portion of any amount specified in an invoice delivered by the CAISO, Powerex 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 Powerex or any amount on an invoice is incorrect, then (i) in the case of any overpayment, the CAISO shall promptly return the amount of the overpayment (or credit the amount of the overpayment on the next invoice) to Powerex; and (ii) in the case of an underpayment, Powerex shall promptly pay the amount of the underpayment to the CAISO. Any overpayment or underpayment shall include interest for the period from the date of overpayment, underpayment, or incorrect allocation, determined in accordance with the FERC Methodology until such amount has been paid or credited against a future invoice calculated in the manner prescribed for calculating interest in Section 4(e).

(h) All costs necessary to implement the Project not provided for in this Agreement shall be borne separately by each Party and recovered through rates as may be authorized by their respective regulatory authorities.

(i) 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 US).

5. Confidentiality.

(a) All written or oral information received from another 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 Powerex releases Powerex's Confidential Information in connection with the public EIM stakeholder process or a regulatory filing, or if the CAISO releases the CAISO's Confidential Information in connection with the public EIM stakeholder process or a regulatory filing, then the information released shall no longer constitute Confidential Information. 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, affiliates, 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, 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, affiliates, 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, affiliates, advisors, or agents without (i) informing such officer, employee, partner, representative, affiliate, advisor, or agent of the confidential nature of the Confidential Information and (ii) receiving the agreement of such officer, employee, partner, representative, affiliate, advisor, or agent as to the confidentiality

obligation herein. Each Party agrees to be responsible for any breach of this Section 5 by such Party or a Party's officers, employees, partners, representatives, affiliates, advisors or agents.

(d) In the event that a Party becomes compelled 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 other than as may be provided under Section (5)(e), such Party shall provide the other Party with prompt prior written notice of such requirement so that the other Party may seek a protective order or other appropriate remedy or waive compliance with the terms of this Section 5. In the event that such protective order or other remedy is not obtained, or that such Party waives compliance with the provisions hereof, 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) The Parties acknowledge that they are required by law or regulation to report certain information that could contain 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 equitable relief, by injunction or otherwise, to enforce its rights under this provision 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.

(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 the Confidential Information and all of its analyses, compilations, studies or other documents prepared by or for it, including copies, 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, "Archival Files"), but only if such Archival Files are 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.

#### 6. Limitation of Liability; Indemnity.

(a) Each Party acknowledges and agrees that the other Party shall not be liable to it 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 the other Party's decision to enter into this Agreement, the other Party's performance under this Agreement, or any other decision with respect to the Project or the EIM.

(b) Each Party shall indemnify, defend and hold harmless the other Party and its officers, directors, employees, affiliates, 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, caused by the negligence or willful misconduct related to this Agreement or breach of this Agreement of the indemnifying Party, its officers, directors, affiliates, agents, employees, contractors or sub-contractors, 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, affiliates, 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 expiration and termination of this Agreement.

#### 7. Representation and Warranties

(a) Representations and Warranties of Powerex. Powerex represents and warrants to the CAISO 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, if required, have been obtained by it prior to the date hereof 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 and are in full force and effect.

(b) Representations and Warranties of the CAISO. CAISO represents and warrants to Powerex 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 have been obtained by it prior to the date hereof 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 and are in full force and effect.

## 8. General Provisions.

(a) This Agreement, including Exhibit A to this Agreement, represents the entire agreement between the Parties and supersedes any prior written or oral agreements between the Parties relating to the subject matter of this Agreement, 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, statute or any other law or applicable court or regulatory decision.

(b) This Agreement may not be amended except in writing signed by both of the Parties; provided, however, that the Parties may mutually agree to changes in Exhibit A in accordance with Section 3(c). This Agreement may be modified to include one or more additional parties upon mutual agreement, not to be unreasonably withheld or delayed, of the then-current Parties, if the new party agrees to fund its share of implementation costs in a manner similar to Powerex.

(c) Any waiver by a Party to this Agreement of any provision or condition of this Agreement must be in writing signed by each 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 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. If the Parties are unable to agree on such a provision within a reasonable period of time, either Party may terminate in accordance with Section 2.

(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 Powerex:

Powerex Corp.  
1300 – 666 Burrard Street  
Vancouver, BC V6C 2X8 CANADA  
Attention: Chief Legal Officer  
E-mail: jay.ratzlaff@powerex.com

If to the CAISO:

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 or overnight delivery, or (ii) date of delivery shown on the receipt, if given by certified mail (return receipt requested).

(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, and nothing contained in this Agreement shall 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 Powerex and the decision whether to proceed with development of the EIM remains within the sole discretion of the CAISO.

(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, including an energy imbalance market or similar project that may compete with the Project or the EIM.

(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 word "or" is used in the conjunctive sense, unless the context requires otherwise; (vii) 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 in any United States District Court located within the State of California.

10. Communication. The Parties shall develop a mutually acceptable communication protocol for the dissemination of material information associated with the Project.

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 within the Parties' respective organizations. If the Parties are unable to resolve the issue within thirty (30) days after presentation 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 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 construction. 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 or EIM implementation process. Each Party may enter into binding agreements or tariffs or modify existing agreements or tariffs with these third parties to implement the approved terms and conditions of the Project or EIM as necessary and appropriate and not inconsistent with the terms of this Agreement.

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.

14. Principles. The Parties recognize and acknowledge that input during the course of implementing the Project, conditions imposed or questions raised in the EIM approval process, and analyses the Parties may perform or information the Parties receive or develop in the course of implementing the Project may require adjustments in the Project. The Project shall nevertheless be implemented consistent with the following Principles, which will form the basis of the Powerex participation agreement:

(a) EIM Arrangement for Canadian Participation. An arrangement will be constructed to permit EIM participation by Powerex that will utilize residual capability of generation resources that are owned and operated by a foreign entity, BC Hydro, and located wholly outside of the US, and settle the intra-hour variations in generation and load in the BC Hydro Balancing Authority Area, which is likewise located wholly outside of the US. The rules and obligations governing this Canadian EIM participation arrangement will be set forth in the provisions of a bilateral agreement or agreements accepted by FERC, and where applicable in *pro forma* service agreements and the CAISO tariff.

(b) Structure. The arrangement will be constructed to preserve functional CAISO tariff obligations and enable CAISO visibility and access necessary for EIM operations, while taking all steps necessary to preserve existing legal and regulatory authorities and requirements that are specifically applicable to the activity of BC Hydro, Powerex, and the CAISO in their respective jurisdictions.

(c) Compatibility. This Canadian EIM arrangement will be implemented in a manner that is compatible with the rest of the CAISO's EIM framework with respect to adherence to EIM scheduling requirements, satisfaction of EIM resource sufficiency requirements, incorporation into the CAISO's full network model, comparable metering standards, and conformity with EIM settlement processes. Powerex's participation obligations under its bilateral agreement(s) with the CAISO will be tied to CAISO tariff obligations as applicable, such that the parties' obligations are able to evolve in keeping with EIM enhancements as approved and implemented.

(d) Data Sharing. BC Hydro will undertake an independent obligation under a bilateral agreement with the CAISO to supply a defined set of data necessary to enable Powerex to independently engage in EIM participation using residual capability of the BC Hydro system.

(e) Voluntary Nature. Consistent with the current design of the EIM, Powerex's bilateral agreement(s) with the CAISO will expressly and specifically recognize the voluntary nature of Powerex's EIM participation with resources located outside the US, including voluntary market entry and exit, voluntary bid and offer volumes and pricing, voluntary designation of transmission rights available for EIM use, and the ability to forego engaging in EIM Transfers in one or more specified operating intervals.

(f) Bilateral Real-Time Market Activities Outside the EIM. Consistent with the current design of the EIM, Powerex shall have the continued ability to enter into non-EIM transactions, including after the CAISO's base scheduling timelines. These transactions will not create energy imbalance that must be served by the EIM, provided they utilize residual capability of the BC Hydro system that has not been offered into the EIM. Powerex will be subject to all applicable EIM charges for its non-EIM transactions,

including the EIM Administrative Fee, unless the transaction is wholly outside of the United States.

(g) Local Market Power Mitigation. Any local market power mitigation framework to be applied will be consistent with the CAISO tariff, will mitigate potential market power concerns during constrained periods to the satisfaction of the DMM and FERC, and will provide Powerex with sufficient flexibility to reflect the opportunity costs associated with the use of an external multi-facility hydro system with long term multi-year storage capability.

(h) Greenhouse Gas Attributes. This Canadian EIM arrangement as well as Powerex's EIM transactions will reflect and be consistent with the Cap and Trade program administered by the California Air Resources Board, including Powerex's current status as an Asset Controlling Supplier ("ACS").

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.

POWEREX CORP.

By:   
Name: Teresa Conway  
Title: Chief Executive Officer



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, including specifically the Principles set forth in Section 14.

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 schedule 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.

Scope and Milestones	Delivery Dates supporting April 2018
<p><b>Detailed Project Management Plan</b> – The Parties will develop and initiate a final project management plan consistent with their technical shared understandings 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.</p>	<p>May 31, 2017</p>
<ul style="list-style-type: none"> <li>• <b>Milestone 1</b> – This milestone is completed when the Agreement has been made effective in accordance with Section 1.</li> </ul>	<p>August 31, 2017</p>
<p><b>Full Network Model Expansion</b> – CAISO Full Network Model expansion for the BC Hydro Balancing Authority Area and EMS/SCADA data, including, proof of concept of export/import of EMS data; complete model into the CAISO test environment; complete validation for all SCADA points from BC Hydro; testing of the new market model; and validation of the Outage and State Estimator applications.</p>	<p>August 31, 2017</p>

<ul style="list-style-type: none"> <li>• <b>Milestone 2</b> - This milestone is completed upon modeling BC Hydro into the CAISO Full Network Model through the EMS which will be deployed into a non-production test environment using the CAISO's network and resource modeling process.</li> </ul>	September 30, 2017
<p><b>System Implementation and Connectivity Testing –</b> System requirements and software design, the execution of necessary software vendor contracts, development of Market network model that includes the BC Hydro Balancing Authority Area, allow Powerex (and BC Hydro, as applicable) to connect to a non-production test system.</p>	September 30, 2017
<ul style="list-style-type: none"> <li>• <b>Milestone 3</b> - CAISO to promote market network model including the BC Hydro Balancing Authority Area to non-production system, and allow Powerex (and BC Hydro, as applicable) to connect and exchange data in advance of Market Simulation.</li> </ul>	September 30, 2017
<p><b>Construction, Testing and Training in Preparation for Market Simulation</b> - This task includes IT infrastructure upgrades, security testing, training, preparation for Day-in-life simulation, and functional testing.</p>	October 31, 2017
<ul style="list-style-type: none"> <li>• <b>Milestone 4a</b> – Start of Connectivity to CAISO testing.</li> </ul>	September 30, 2017
<ul style="list-style-type: none"> <li>• <b>Milestone 4b</b> – Interface testing with minimum data requirements and functional integration testing. CAISO will make the test environment available for Powerex and BC Hydro connectivity testing prior to the delivery date assuming BC Hydro and Powerex have provided all requisite data and non-production system availability does not conflict with CAISO production system Fall Release schedule.</li> </ul>	October 31, 2017
<ul style="list-style-type: none"> <li>• <b>Milestone 4c</b> –Begin ‘Day in the Life’ scenario testing</li> </ul>	November 30, 2017
<ul style="list-style-type: none"> <li>• <b>Milestone 4d</b> – Begin Structured Market simulation</li> </ul> <p>*Milestone 4 requires 4a-4d to be completed.</p>	December 31, 2017
<p><b>Activate Parallel Operations</b> - Beginning February 1, 2018, the CAISO will activate a parallel operation environment to practice production grade systems integration as well as</p>	February 1, 2018

market processes and operating procedures in anticipation of the impending Powerex activation as an EIM participant and to confirm compliance with the EIM readiness criteria.	
<ul style="list-style-type: none"> <li>• <b>Milestone 5</b> – Start of parallel operations</li> </ul>	February 1, 2018
<p><b>System Deployment and Go Live</b> – Implementing the Project and going live will include resource registration, operating procedures and updates, execution of service agreements, completion of necessary participation agreements, applicable management approvals, the presentation and acceptance of service agreements by applicable governing boards, and completion and filing of a readiness criteria certification.</p>	March 31, 2018
<ul style="list-style-type: none"> <li>• <b>Milestone 6</b> – This milestone is complete upon the first production Powerex energy imbalance market trade date.</li> </ul>	April 4, 2018

**Attachment B – Declaration of April D. Gordon**  
**Powerex EIM Implementation Agreement**  
**California Independent System Operator Corporation**

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

**California Independent System     )     Docket No. ER17-\_\_\_\_-000  
Operator Corporation                 )**

**DECLARATION OF APRIL D. GORDON  
ON BEHALF OF THE  
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

I, April D. Gordon, state as follows:

1. I am employed as Director of Financial Planning and Procurement for the California Independent System Operator Corporation (CAISO). My business address is 250 Outcropping Way, Folsom, California 95630. As part of my duties at the CAISO, I oversee the development of the CAISO's grid management charge. I also oversee the CAISO's budget preparation and management; long term financial planning; corporate procurement and contract management. I received an undergraduate degree in Business Administration with a major in accounting from the California State University of Sacramento. Prior to my current position I was a Financial Analyst at the CAISO from 2010 - 2014. Prior to the CAISO I was a Senior Accountant at the California Association of Hospitals and Health Systems (2003 - 2010) and an Accountant at Enterprise Resource Group (1999 – 2003).
2. The purpose of my declaration is to provide cost support for the fixed implementation fee that the CAISO proposes to charge the Powerex Corp. (Powerex) for the development and implementation of the energy



imbalance market under the Implementation Agreement that the CAISO is filing today.

***The Implementation Fee***

3. 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.
4. 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. Rather, the CAISO would incur the costs incrementally as the imbalance energy activity from additional balancing authority areas are incorporated into the market.
5. This total estimated 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; 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***

6. 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.
7. 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 from the July 20, 2006 Commission Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization.<sup>1</sup> 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 Peak Reliability 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 Peak Reliability’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

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<sup>1</sup> *North American Electric Reliability Corporation*, 116 FERC ¶ 61,062 (2006), at fn. 73.

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.

8. The WECC load, exclusive of the CAISO, was 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***

9. 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 the CAISO's system. The storage will provide the required highly available and redundant storage as well as cover long-term archiving.
10. The storage for current CAISO production requires 200 terabytes at a total 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 additional cost of \$2.0 million.

### ***Hardware Upgrades***

11. 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.
12. 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.***

13. 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.

14. 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***

15. To build the energy imbalance market for the entire WECC region, the CAISO will need to improve the existing energy management system (EMS), 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.
16. The CAISO will also require production software modifications to support new inputs and outputs associated with the energy imbalance market, including base schedules.
17. 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.

18. 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***

19. 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***

20. Having determined that the total cost of implementing the WECC-wide energy imbalance market would be \$19.6 million, the CAISO proceeded to develop a rate that could be used for individual participants. To do so, the CAISO divided the \$19.6 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.

21. Finally, to determine the implementation fee for Powerex as established in the Implementation Agreement, the CAISO applied the rate to the BC Hydro most recently reported net energy for load for 2015 of 62,063 million MWh, for a rounded total of \$1,923,955.

**Comparison of Powerex Fee to Generic Rate**

22. Although the CAISO intends to base the implementation fee on a generic rate that would reasonably allocate the costs of a WECC-wide energy imbalance market to all potential participants, the CAISO thought it worthwhile to compare Powerex’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 Powerex. Using the same process described above, the CAISO estimated the costs (in thousands) that appear in the following table:

Component	Amount (in thousands)
Software license costs	\$1,350
Production software modification	200
Network configuration and mapping	50
Integration	100
Testing	59
Project management	165
<b>Total</b>	<b>\$1,924</b>

23. As is readily apparent, although the total costs are the same, the proportion of the total Powerex specific costs that each component represents differs from proportion of the WECC-wide costs that the

component represents. For example, the CAISO does not anticipate incurring any additional data storage costs or EMS improvement costs, but to integrate Powerex, the CAISO will need to incur production software modification costs and integration costs up front. Although the Powerex specific costs are the same as the Powerex 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: June 9, 2017

/s/ April D. Gordon  
April D. Gordon