

# Powerex's EIM Participation

EIM Governing Body meeting  
Seattle, WA

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# Overview Of Powerex Corp.

- **Powerex Corp. is a wholly-owned subsidiary of BC Hydro**
  - BC Hydro is the third largest electric utility in Canada
  - BC Hydro is a Crown Corporation, owned by the Province of British Columbia
  - BC Hydro operates 31 hydro facilities and 2 thermal plants
  - BC Hydro serves electricity customers in BC through a network of over 49,000 miles of transmission
- **Powerex's 3 key roles:**
  - Sell surplus capability from the BC Hydro system, procure energy to meet BC Hydro deficits (includes reliability)
  - Sell energy created by the Canadian Entitlement (Columbia River Treaty)
  - Generate trading income for benefit of BC Hydro's ratepayers
- **Powerex's focus:**
  - Physical delivery of wholesale power products and services across the West
  - Environmental products and services across the West
  - Natural gas across North America

# Overview Of Powerex's EIM Participation

- **Powerex's EIM participation expected to commence April 2018**
- **Powerex will be subject to CAISO's EIM requirements:**
  - Base schedule submission
  - Resource sufficiency
  - Pre-implementation readiness
  - Local market power mitigation
  - GHG treatment
  - Settlement of energy imbalances
- **Powerex will pay the EIM Implementation Fee (\$1.9 million) and EIM Administrative Fees (\$0.19/MWh)**
- **Powerex will participate in the EIM with:**
  1. **Voluntary bids and offers** from residual BC Hydro flexible generation
  2. **Deviations in load and generation output** from hourly base schedules
  3. **Transmission rights** voluntarily set aside ahead of the hour to support EIM transfers
    - EIM transfers to and from Puget Sound Energy at BC-US Border
    - EIM transfers to and from CAISO at Malin
    - Will include dynamic transfer capability (subject to availability, including BPA limitations)

# Overview Of Powerex's EIM Participation

- **The specific implementation framework developed by CAISO and Powerex reflects Powerex's unique participation with resources and load located in Canada**
  - **Powerex, not BC Hydro, will be the Canadian Entity joining and participating in the EIM**
    - Powerex will be subject to the CAISO tariff and will settle EIM transactions with the CAISO
    - BC Hydro will enter into a data-sharing arrangement with CAISO (CAISO's full network model will include BC Hydro generation, transmission and load data)
  - **Powerex will participate with modelled aggregate resources**
    - Similar to current EIM participation of Mid-C resources
    - Supported by data-sharing at plant/unit level (physical meters, GDFs, etc.)
  - **Powerex's EIM transactions will occur at the BC-US Border**
  - **BC Hydro will continue to maintain its regulatory, legal and operational autonomy**
    - CAISO will not manage congestion within BC
    - BC Hydro will continue to settle its tariff services, including Energy Imbalance Service, independent of the EIM

# Powerex's Expected EIM Participation

- **Powerex anticipates voluntarily participating with:**
  - **300 MW of INC and 300 MW of DEC bids/offers in most hours:**
    - Supported by BC Hydro residual generation flexibility (large storage hydro)
    - EIM enables “co-optimization” of balancing needs with market opportunities
      - Deviations in BC Hydro load and generation output in each interval can be offset with EIM transfers, rather than deploying BC Hydro’s balancing reserves
      - BC Hydro balancing capacity that is not deployed to meet domestic needs can be “freed up” to support Powerex’s EIM transactions
  - **Additional purchase bids may be submitted during hours of expected over-supply**
    - Will require set aside of additional transmission rights northbound
    - Most likely to occur during spring season, 9am-5pm
  - **Available transmission rights on two paths to support EIM transfers**
    - 150 MW to and from Puget Sound Energy at BC-US Border
    - 150 MW to and from CAISO at Malin
- **Powerex’s EIM activities are not expected to reduce Powerex’s participation in western bilateral energy markets**

# Powerex's EIM Cost-Benefit Analysis

- **Key Drivers of Benefits**

1. **Ability to use “stranded” balancing reserves**

- Estimated at 300 MW of INC and 300 MW of DEC, on average
- Does not displace non-EIM transactions

2. **Ability to purchase during regional over-supply events, particularly spring season**

- BC Hydro's residual capabilities (large storage hydro)

3. **Ability to participate in 15-minute and 5-minute purchase and sell opportunities**

- Powerex limited in 5-minute market by dynamic transfer capability

- **Key Drivers of Cost Savings**

1. **Powerex already participates in CAISO 15-minute and 5-minute markets**

- Experienced and knowledgeable staff
- Existing trading, delivery, and communication processes
- Existing settlements system and processes

2. **BC Hydro continues to settle its tariff services independent of EIM**

- Avoids need for secondary settlements

3. **Third-party transmission costs expected to be limited**

- Volume set aside is anticipated to be 150 MW in each direction
- Ability to participate in EIM congestion rent may partially offset costs

# Benefits to the EIM

- **Powerex is bringing clean, fast-ramping, flexible hydro generation**
  - Increases supply options to meet generation and load imbalances
  - Supports integration of renewable resources
  - Reduces GHG emissions, through deployment of clean hydro energy
- **Powerex is bringing transmission rights**
  - Supports EIM transfers to/from BC and increases transfer capability between EIM Entities
  - Includes dynamic scheduling rights to/from CAISO, which is a frequent EIM limitation
- **Powerex is bringing additional diversity to the EIM**
  - Deviations in generation and load in BC to be included in EIM algorithm, and settled by Powerex
  - BC load and wind deviations are significantly diverse from NW load and wind deviations
  - Will reduce flexible capacity requirements for EIM Entities and CAISO
    - Flexible Ramping Sufficiency Test diversity credit