



California ISO

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## **Market Simulation Structured Scenarios**

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# **Energy Imbalance Market Implementation – Powerex**

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## Location of Document

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## Revision History

Date	Version	Description	Author
11/13/17	Draft	Initial Draft	Christopher McIntosh
12/8/17	1.1	Combined 3 new scenarios with 7 of the standard set that were approved for Powerex	Joanne Alai
12/11/17	1.2	Final Review	Khaled Abdul-Rahman
12/15/17	1.3	Added scheduled dates/times, updated ISO MP Actions to align with latest template	Trang Deluca
1/10/18	1.4	Updated dates/times, removed N/A verbiage for scenario 1 per review with Powerex, added additional details for scenario 4 expected outcome, updated ISO MP Actions details	Trang Deluca
2/1/18	1.5	Updated dates/times	Trang Deluca

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# 1. Introduction

The objective of this document is to provide the information needed for new EIM entities to participate in the structured market simulation scenarios.

## 2. Structured Scenario Approach

### 2.1 High Level Overview

These identified scenarios will be executed during the structured scenario portion of the EIM Powerex implementation market simulation.

### 2.2 Structured Scenarios Conditions and Setup

The following additional setup will be used by the ISO during the scenario execution.

1. ISO is will use a production 11/8/17 base case. ISO will augment this data with the relevant EIM data and use the TD's bids as the base bid set. This will also include base schedules for EIM and demand forecast for non EIM entities from WECC. Interchange Schedules will be pulled from WIT for this TD as well.
2. Determined by the scenario specifics ISO may seed MP's bids or allow the MP's to bid in whatever resources they see fit for the scenario.
3. All EIM Entity's will need to balance during the timeframes identified in the scenario "Execution Time" as well as provide the EIM Transfer Resource Limits.

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## 2.4 Structured Scenarios

Scenario Number	EIM Implementation – TD 1/3 HE10	
<b>1</b>	Description	BAA fails Flex ramp sufficiency test upward direction
	ISO Actions	For EIM entities ISO will validate the schedules are balanced and feasible. ISO will set the Flex Ramp requirements (FRR) greater than available flex ramp up capability in the EIM BAA. Broadcast the ISO, EIM BAA, and EIM footprint total load forecast, broadcast the FRR for the ISO, EIM BAAs, and EIM footprint to the Market. Perform flexible ramping requirement sufficiency test. T-75, T-55, T-40.
	EIM Market Participant Actions	Verify outcome Real Time results, Expected Energy and Settlements Statements.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	Import is curtailed to the lesser of the FMM a) net EIM transfer import at T-7.5 or b) the base import transfer of the prior hour.
	Anticipated Settlement Outcome	Daily Statement: CC 7070, CC 7071, CC 7076, and CC 7077. Monthly Statement: CC 7078

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Scenario Number	EIM Implementation – TD 1/19 HE11	
<b>2</b>	Description	BAA fails Flex ramp sufficiency test downward direction
	ISO Actions	For EIM entities ISO will validate the schedules are balanced and feasible. ISO will set the Flex Ramp requirements (FRR) greater than available flex down ramp capability in the EIM BAA. Broadcast the ISO, EIM BAA, and EIM footprint total load forecast, broadcast the FRR for the ISO, EIM BAAs, and EIM footprint to the Market. Perform flexible ramping requirement sufficiency test. T-75, T-55, T-40.
	EIM Market Participant Actions	Verify outcome Real Time results, Expected Energy and Settlements Statements.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	Export is curtailed to the lesser of the FMM a) net EIM transfer export at T-7.5 and b) the base export transfer of the prior hour. Requirements will not reflect the EIM diversity benefit, but will include any FRD credit (for EIM import deviations below the net imbalance energy import for trading hour). Failed BAA will not be included in the Flex Ramp BAA constraint, but will be included in the EIM Area BAA constraint (relevant with FRMP breakdown).
	Anticipated Settlement Outcome	Daily Statement: CC 7070, CC 7081, CC 7076, and CC 7087. Monthly Statement: CC 7088

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Scenario Number	EIM Implementation – TD 1/9 HE11	
<b>3</b>	Description	EIM Real Time – GHG Charges
	ISO Actions	ISO to increase the Load Forecast for the ISO BA. EIM specific energy bids are cheaper than other imports to ISO BA.
	EIM Market Participant Actions	MP will provide GHG bid adder for selected participating resources in the EIM BAA. Review Settlements Statements.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	GHG payments will be properly awarded to the exporting resources based on their export allocation values.
	Anticipated Settlement Outcome	CC 64600, CC 64700, CC 491, CC 67740, CC 69850, CC 64770, and CC 66200

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Scenario Number	EIM Implementation – TD 1/9 PM	
<b>4</b>	Description	EIM Real Time – Neutrality
	ISO Actions	ISO to increase the Load Forecast for the ISO BA. EIM specific bids are cheaper than other imports to ISO BA.
	EIM Market Participant Actions	Review Settlements Statements – Offset Charge Codes are calculating and EIM MP understands how sum of the Real Time Imbalance Charge Codes (64600, 64700, 64740, 64750) contribute to the calculation of Offsets.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	Transfer of RT neutrality between BAA and allocation to relevant SC's based on the EIM transfer.
	Anticipated Settlement Outcome	CC 64600, CC 64700, CC 67740, CC 69850, and CC 64770

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Scenario Number	EIM Implementation – TD 1/3 HE16	
<b>5</b>	Description	EIM Real Time – Contingency Event in the ISO BA
	ISO Actions	ISO will simulate a contingency in the ISO BA via RT contingency. ISO will load our standard bid set, for existing EIM entities we will create base schedules based on interchange data, and demand forecast. For EIM new entities ISO will validate the schedules are balanced and feasible. ISO will run DAM and Real Time markets and publish results. Publish Settlements Statements.
	EIM Market Participant Actions	EIM resources receive dispatch instructions through ADS.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	Contingency event in CAISO area does not affect dispatches or prices in the EIM BAs.
	Anticipated Settlement Outcome	CC 64600, CC 64700, CC 67740, CC 69850, and CC 64770

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Scenario Number	EIM Implementation – TD 1/3 HE15	
<b>6</b>	Description	EIM Entity BAA Isolation
	ISO Actions	ISO to set EIM Transfer to base transfer, Energy Transfer limits will be set on all interties for a given BAA.
	EIM Market Participant Actions	Verify transfer limits.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	ISO and EIM Entity BAs are dispatched separately.
	Anticipated Settlement Outcome	CC 64600, CC 64700, CC 67740, CC 69850, and CC 64770

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Scenario Number	EIM Implementation – TD 1/19 HE11	
<b>7</b>	Description	Available Capacity (Reserves)
	ISO Actions	ISO will change system conditions to cause infeasibility in an EIM BAA, to demonstrate the available capacity functionality.
	EIM Market Participant Actions	EIM Entities will need to register their non-PR and PR for regulation capacity. Also submit energy bids in regulation range for PR and regulation capacity base schedules for both PR and NPR. Please note that for Powerex, there may not be ABC on a PR resource but if for testing purposes, Powerex wants to test the functionality then this scenario can be used for this purpose.
	ISO Market Participant Actions	No Action
	Expected Outcome	Energy bid for participating resources in regulation range and default energy bid for non-participating resources will be used for dispatch to resolve infeasibility. If infeasibility is resolved price will be set by the last marginal bid. If infeasibility is not resolved price will go to \$1,000.
	Anticipated Settlement Outcome	<p>For participating resources that have bids in regulation range being dispatched, bid cost in regulation range associated with instructed energy will be included in Energy Bid Cost Recovery.</p> <p>For non-participating resources that have default energy bids being dispatched, default energy bid cost associated with instructed energy will be included in energy Bid Cost Recovery.</p> <p>CC 64600, 64700, 64750, 7070, 7076, 7071, 7077, 7081, 7087, 701, 4515, 4564, 66200 and 66780</p>

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Scenario Number	EIM Winter 2017 – TD 1/9 PM	
<b>8</b>	Description	Auto-Match Functionality
	ISO Actions	ISO will load our standard bid set, for non EIM entities we will create base schedules based on interchange data, and demand forecast. For EIM entities ISO will validate the schedules are balanced and feasible. ISO will run DAM and Real Time markets and publish results. Publish Settlements Statements. For EIM entities ISO will validate the schedules are balanced and feasible in BSAP.
	EIM Market Participant Actions	After T-40 one of the interchange schedule mapped to auto-match resource will be changed in RTSI by the market participant. After execution of next RTPD/RTD the new schedule of auto-match resource will be available on CMRI, the schedule will reflect the change of the tag of the System Resource. Verify outcome Real Time results, Expected Energy and Settlements Statements.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	The output auto-balancer resource will be increased/decreased with respect to change of the tag of the system resource.
	Anticipated Settlement Outcome	Primary: 6045, 6046, 64600, 64700, 64750, 7070, 7071, 66200, 4564, 491 Secondary: 64770, 67740, 69850, 6478, 7076, 7077, 7078, 7081, 7087, 7088, 66780

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Scenario Number	EIM Winter 2017 – TD 1/9 PM	
<b>9</b>	Description	Base ETSR Schedule
	ISO Actions	ISO will load our standard bid set, for non EIM entities we will create base schedules based on interchange data, and demand forecast. For EIM entities ISO will validate the schedules are balanced and feasible. ISO will run DAM and Real Time markets and publish results. Publish Settlements Statements. For EIM entities ISO will validate the schedules are balanced and feasible in BSAP.
	EIM Market Participant Actions	EIM Market participant will submit base schedules for base ETSRs. Verify outcome Real Time results for base ETSRs.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	No deviation from submitted base schedules for base ETSRs. DOT in ADS for Base ETSRs is equal to the submitted base schedules. Operator is not able to modify limits for base ETSRs (EIM/ETSR Detail display). Base ETSR LMP is calculated using following formula: Base ETSR LMP = FROM_Location LMP * Split_Ratio + TO_Location LMP * (1 – Split_Ratio).
	Anticipated Settlement Outcome	Primary: 64600, 64700, 64750 Secondary: 64770, 67740, 69850, 6478

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Scenario Number	EIM Winter 2017 – TD 1/18 HE15	
<b>10</b>	Description	Auto Mirror Functionality
	ISO Actions	ISO will load our standard bid set, for non EIM entities we will create base schedules based on interchange data, and demand forecast. For EIM entities ISO will validate the schedules are balanced and feasible. ISO will run DAM and Real Time markets and publish results. Publish Settlements Statements. For EIM entities ISO will validate the schedules are balanced and feasible in BSAP.
	EIM Market Participant Actions	After T-40 one of the interchange schedule with CAISO mapped to auto-mirror resource will be changed in RTSI by the market participant. Verify outcome Real Time results, Expected Energy and Settlements Statements. Verify outcome Real Time results, Expected Energy and Settlements Statements.
	ISO Market Participant Actions	Review OASIS reports: Under Prices > All LMP reports, Scheduling Constraint Shadow Prices, EIM GHG Shadow Prices; Under System Demand > Sufficiency Evaluation Demand Forecast, CAISO Demand Forecast, EIM Transfer; Under Energy > EIM Transfer Limits, EIM Transfer Limits by Tie, EIM Transfer by Tie, EIM BAA Hourly Base NSI, Flexible Ramp Requirements Inputs, Flexible Ramp Surplus Demand Curves
	Expected Outcome	After execution of next RTPD/RTD the new schedule of auto-mirror will be available on CMRI, the schedule will reflect the change of the tag of the System Resource mapped to CAISO. Verify that for all different ties where auto-mirror resource exists in MF, auto-mirror resource schedule is always equal to sum of schedules of mapped ISO Import/Exports. Auto-mirroring will not fire if there is an economic bid submitted for the ISO Import/Export System Resource expected to be auto-mirrored. Also, if an economic bid submitted for such System Resources, the resource will not be auto-matched if the System Resource is mapped to an auto-match resource (note auto-match is different functionality, see scenario 8).
	Anticipated Settlement Outcome	Primary: 64600, 64700, 64750, 7070, 7071, 66200, 4564  Secondary: 6477, 6774, 6985, 64770, 67740, 69850, 6478, 7076, 7077, 7078, 7081, 7087, 7088, 66780

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### 3. ISO Market Simulation Contact

Please contact [MarketSim@caiso.com](mailto:MarketSim@caiso.com) if you have any questions or concerns regarding these scenarios.