



**Portland General
Electric**

PGE EIM OATT Stakeholder Kick-Off October 14, 2016

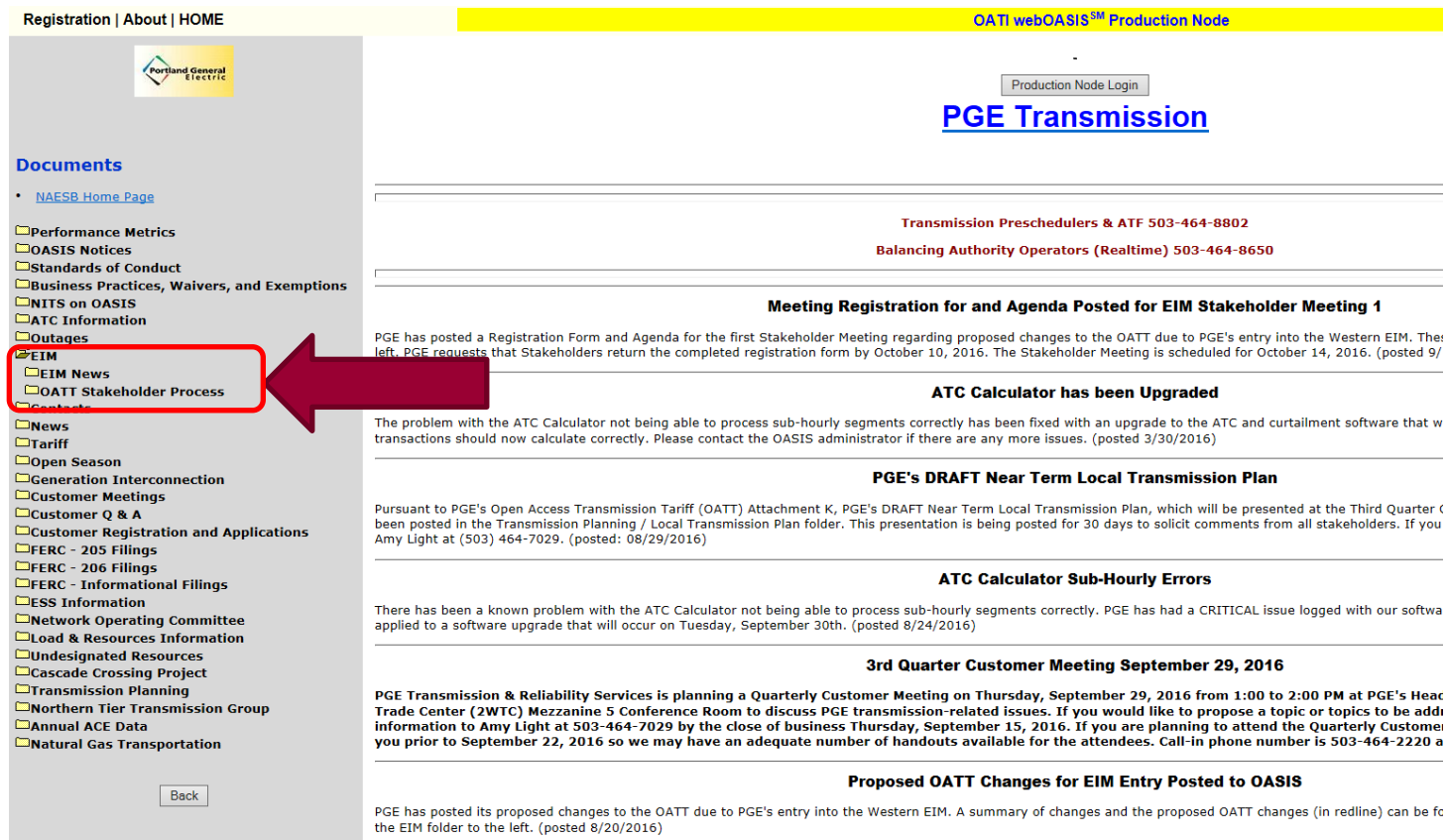


Welcome and Introductions

Frank Afranji

Time	Topic	Presenter
9:00 to 9:10 am	Welcome and Introductions	Frank Afranji and Amy Light, PGE
9:10 to 9:45 am	EIM Benefits and Implementation Milestones	Pam Sporborg, PGE
9:45 to 10:45 am	EIM Background	Dave Timson, CAISO
10:45 to 11:00 am	Break	
11:00 to 11:40 am	Key OATT Provisions and Customer Impacts	Amy Light and John Walker, PGE
11:40 to 11:50 am	Stakeholder Process and Next Steps	Amy Light, PGE
11:50 am to Noon	Wrap Up	Amy Light, PGE

Comments or questions about PGE's proposed OATT modifications or about today's presentations can be submitted to transmissionprovider@pge.com through November 1, 2016.



Registration | About | HOME OATI webOASISSM Production Node

[Production Node Login](#)
PGE Transmission

Transmission Preschedulers & ATF 503-464-8802
Balancing Authority Operators (Realtime) 503-464-8650

Meeting Registration for and Agenda Posted for EIM Stakeholder Meeting 1

PGE has posted a Registration Form and Agenda for the first Stakeholder Meeting regarding proposed changes to the OATT due to PGE's entry into the Western EIM. The left. PGE requests that Stakeholders return the completed registration form by October 10, 2016. The Stakeholder Meeting is scheduled for October 14, 2016. (posted 9/29/2016)

ATC Calculator has been Upgraded

The problem with the ATC Calculator not being able to process sub-hourly segments correctly has been fixed with an upgrade to the ATC and curtailment software that transactions should now calculate correctly. Please contact the OASIS administrator if there are any more issues. (posted 3/30/2016)

PGE's DRAFT Near Term Local Transmission Plan

Pursuant to PGE's Open Access Transmission Tariff (OATT) Attachment K, PGE's DRAFT Near Term Local Transmission Plan, which will be presented at the Third Quarter (3Q) Open Access Transmission Tariff (OATT) Attachment K, PGE's DRAFT Near Term Local Transmission Plan folder. This presentation is being posted for 30 days to solicit comments from all stakeholders. If you have any questions, please contact Amy Light at (503) 464-7029. (posted: 08/29/2016)

ATC Calculator Sub-Hourly Errors

There has been a known problem with the ATC Calculator not being able to process sub-hourly segments correctly. PGE has had a CRITICAL issue logged with our software that will occur on Tuesday, September 30th. (posted 8/24/2016)

3rd Quarter Customer Meeting September 29, 2016

PGE Transmission & Reliability Services is planning a Quarterly Customer Meeting on Thursday, September 29, 2016 from 1:00 to 2:00 PM at PGE's Head Office (2WTC) Mezzanine 5 Conference Room to discuss PGE transmission-related issues. If you would like to propose a topic or topics to be added to the meeting, please contact Amy Light at 503-464-7029 by the close of business Thursday, September 15, 2016. If you are planning to attend the Quarterly Customer Meeting, please call in prior to September 22, 2016 so we may have an adequate number of handouts available for the attendees. Call-in phone number is 503-464-2220 and the meeting agenda is available at [http://www.pge.com/2016/09/09/quarterly-customer-meeting-september-29-2016](#).

Proposed OATT Changes for EIM Entry Posted to OASIS

PGE has posted its proposed changes to the OATT due to PGE's entry into the Western EIM. A summary of changes and the proposed OATT changes (in redline) can be found in the EIM folder to the left. (posted 8/20/2016)

Documents

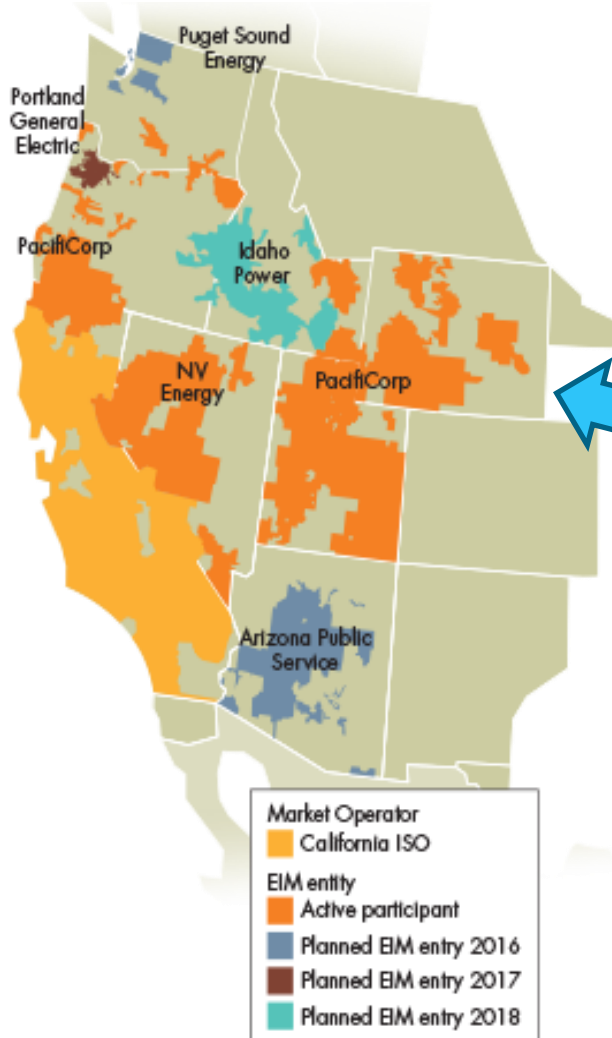
- [NAESB Home Page](#)
- Performance Metrics
- OASIS Notices
- Standards of Conduct
- Business Practices, Waivers, and Exemptions
- NITS on OASIS
- ATC Information
- Outages
- EIM**
 - EIM News
 - OATT Stakeholder Process
 - Contacts
- News
- Tariff
- Open Season
- Generation Interconnection
- Customer Meetings
- Customer Q & A
- Customer Registration and Applications
- FERC - 205 Filings
- FERC - 206 Filings
- FERC - Informational Filings
- ESS Information
- Network Operating Committee
- Load & Resources Information
- Undesignated Resources
- Cascade Crossing Project
- Transmission Planning
- Northern Tier Transmission Group
- Annual ACE Data
- Natural Gas Transportation

[Back](#)

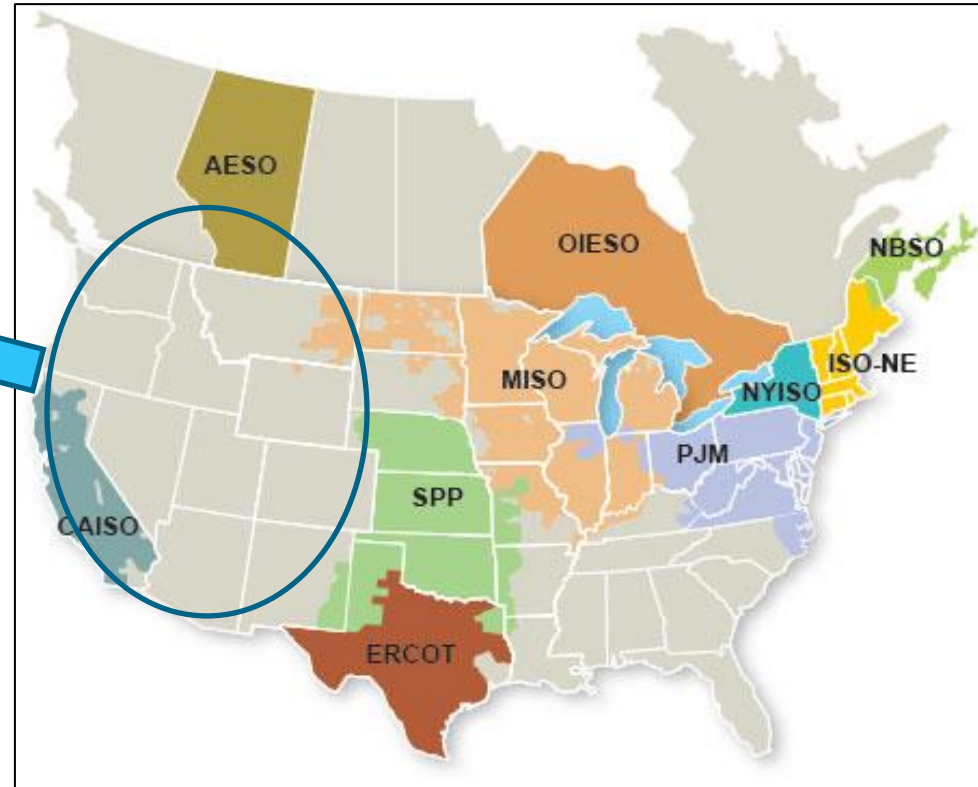
The Benefits of EIM and Implementation Milestones

Pam Sporborg

Western Energy Imbalance Market



Existing Organized Markets



- **PGE contracted with Energy and Environmental Economics (E3) to conduct a study on the benefits of PGE participating in the Western EIM**
- **PGE utilized an incremental approach in calculating EIM participation benefits**
- **PGE expects to see modest positive annual savings from joining the Western EIM**
 - PGE participation in the Western EIM results in dispatch savings of: **\$2.7-6.1 million**
 - PGE participation also creates positive incremental savings to the existing EIM participants (range: \$2.7-\$3.7M)
- **Savings are larger in the presence of higher gas prices, larger renewable resource buildout, or reserve pooling**
- **PGE also expects to realize a reduction in BPA Wind Integration Costs of \$15.0M annually**
 - Assumes 2020 wind in PGE system of 1034 MW nameplate capacity



Geographical diversity benefits of loads and generators

- Load diversity across time and climate zones
- Varying weather conditions
- Renewable resources may be available at different times

EIM utilizes advanced forecasting and automated dispatch to more closely follow renewable resources' production.

CAISO Department of Market Monitoring estimates that in the second quarter of 2016, the EIM allowed the ISO to avoid renewable curtailment of 158,806 MWh.



The EIM Enhances Regional Reliability Through:

- Situational awareness of regional generation portfolio
- Real-time visibility into transmission constraints
- Coordinated dispatch of resources to reduce and avoid congestion issues
- Geographical diversity of load and resources



Image: CAISO Control Center, Folsom, CA

- PGE will begin participation in the Western EIM on October 1, 2017
- PGE's implementation project impacts many functional areas, including:
 - Transmission Operations
 - Power Operations/Merchant
 - Settlements
 - Metering
 - OATT Modifications
 - Information Technology



Regulatory

- Need for Tariff Changes and Readiness Certification to enable PGE to participate in the Western EIM

Scheduling & Forecasting

- Importance of Base Schedules in the EIM
- Timing and content of forecasting and data requirements

Outage Coordination

- Planned Outages
- Unplanned Outages and De-rates
- Accurate reporting and timely communications

Metering Compatibility

- Metering assessment to endure compliance with CAISO metering requirements

Parallel Operations & Go Live

- Prior to market participation, extensive testing and parallel operations will take place
- Go-Live October 1, 2017

Billing & Settlements

- New EIM related charges

Engage

- We want to engage with our customers regarding changes

Inform

- We will seek to inform our customers and to provide education

Input

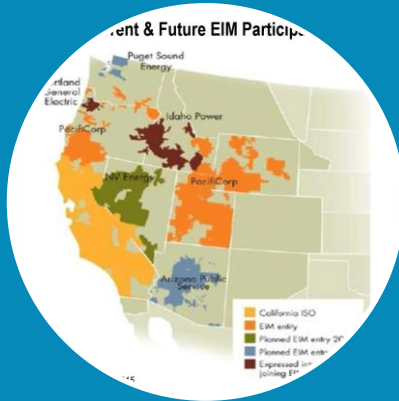
- Input from customers on these changes and the stakeholder process is desired

Refine

- Where possible, PGE will look to make refinements in our process or tariff

Benefit

- PGE wants customers to benefit from EIM. Your understanding of these changes will help prepare for this new operational model



EIM enhances system reliability

It does so by spreading the burden of balancing wind, solar, & load across a more diverse footprint.



EIM reduces customer costs

Expected annual power cost savings of \$3.5 million and beyond, starting in 2020, as more renewables are added to the system.



EIM supports a renewable future

EIM contributes to PGE's ability to fully "self-integrate" its wind, instead of paying BPA \$15 million annually for the balancing service.

EIM is good for Reliability, Customers, & Renewables

Western EIM Background

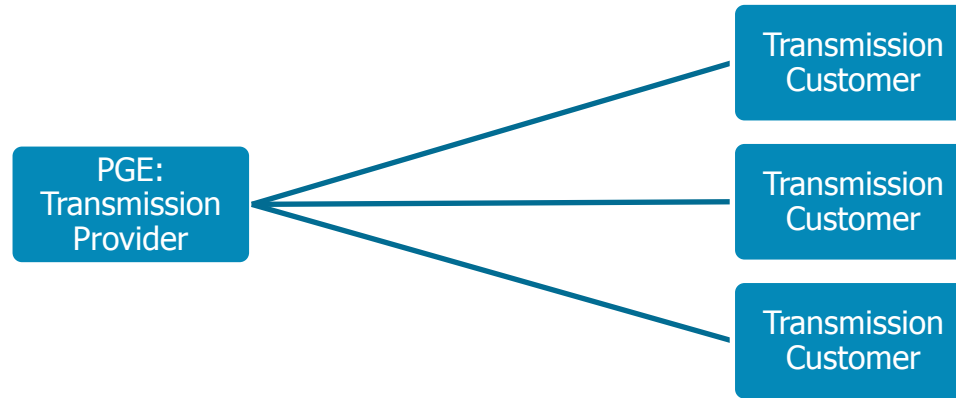
Dave Timson, CAISO

Key OATT Provisions and Customer Impacts

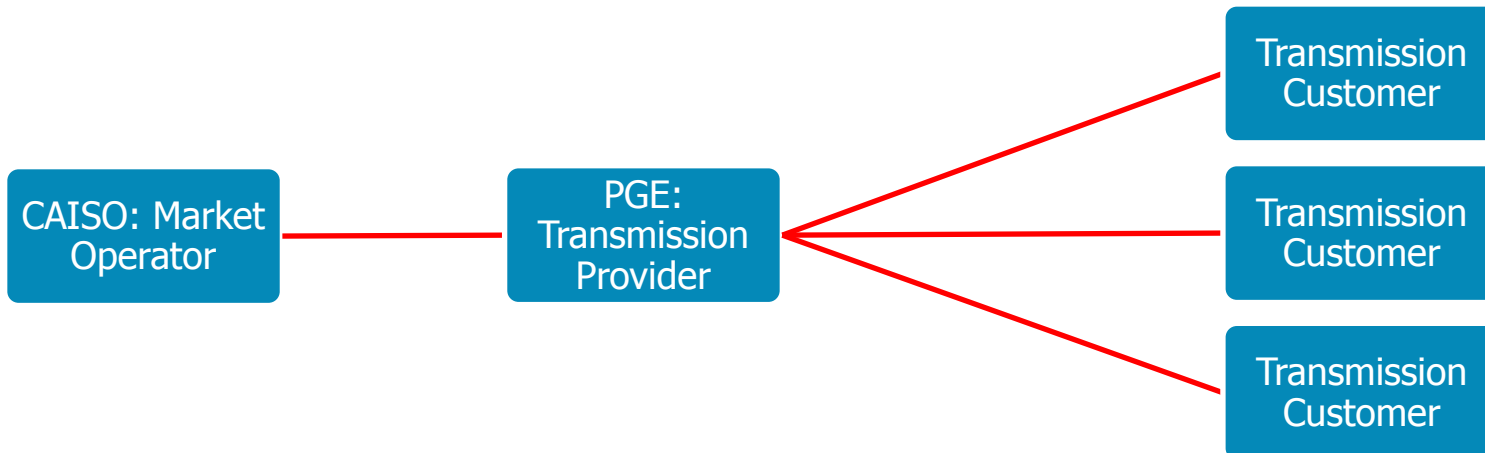
Amy Light and John Walker

- FERC regulates the rates, terms, and conditions of the transmission services provided by PGE under PGE's Open Access Transmission Tariff (OATT).
- On January 19, 2016, FERC approved the EIM Implementation Agreement between PGE and CAISO.
- Transmission services and procedures will need to be amended and approved by FERC to implement EIM.
- Four other regional entities have previously completed this implementation process and successfully entered the Western EIM over the last two years, so there are many examples for us to work with.
- Each of PGE's proposed OATT revisions is based on language that FERC has previously approved in other EIM Entity OATT filings.
- PGE plans to file the entire OATT to make certain formatting and administrative corrections throughout, but the redline posted on OASIS for your review and comment contains only the sections with substantive changes for convenience.

Current State



Future State



- Section 29.4 of the CAISO Tariff requires an EIM Entity such as PGE to have provisions in its OATT to enable operation of the EIM in its Balancing Authority Area
- Most of the rates, terms, and conditions in the PGE OATT that you are familiar with are not changing, but customers will notice changes related to
 - Timing and content of forecasting and data requirements
 - Price at which imbalance and losses are settled
- The majority of the changes related to PGE's EIM participation are contained in the new Attachment P to our OATT, but key changes are also located in
 - Part I: Definitions
 - Schedule 1A: EIM Administrative Fees
 - Schedules 4, 4R, and 10: Imbalance Services
 - Schedule 11: Losses

EIM Entity

- Balancing Authority that represents one or more EIM Transmission Service Providers and that enters into an EIM Entity Agreement with CAISO to enable the operation of the Real-Time Market in its Balancing Authority Area

Participating Resources

- Owner, operator or seller of energy from a resource that elects to participate in the Real-Time Market and enters into a EIM PR Agreement under which it is responsible for meeting requirements of Section 29 of the CAISO Tariff

Non-Participating Resources

- A resource in an EIM Entity's BAA that is not a participating resource

Resources inside PGE's BAA

- May elect to participate in EIM as a Participating Resource
- The resource must be associated with a qualified transmission service under Section 3.1 of Attachment P to PGE's OATT

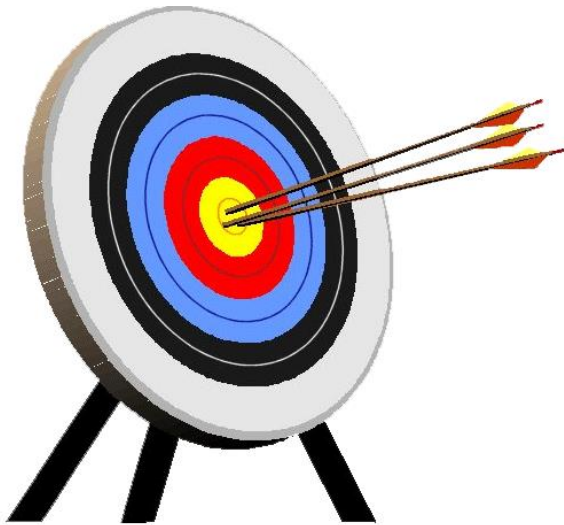
Resources outside PGE's BAA

- Requires a pseudo-tie into the PGE BAA
- Must be associated with firm transmission to a PGE boundary equal to the amount of energy that will be dynamically transferred
- Must follow all PGE Business Practices, including the upcoming EIM Business Practice

Efficient EIM operations rely on **accurate scheduling** by transmission customers.

Current OATT framework includes penalties for over and under scheduling.

In the EIM, the framework shifts to motivating accurate scheduling by matching the EIM charges caused by scheduling errors to the entity that made the scheduling errors.



EIM Base Schedule

- Submitted by all Transmission Customers to the PGE EIM Entity
- Used to balance loads and resources within PGE's BA
- Also used as a base line for settlements

Forecast Submittal

- Forecast submittal for service is required at T-7 days
- Must update forecast at least once by T-1 day
- Forecasts serve to support market functions but are not financially binding until base schedule submission

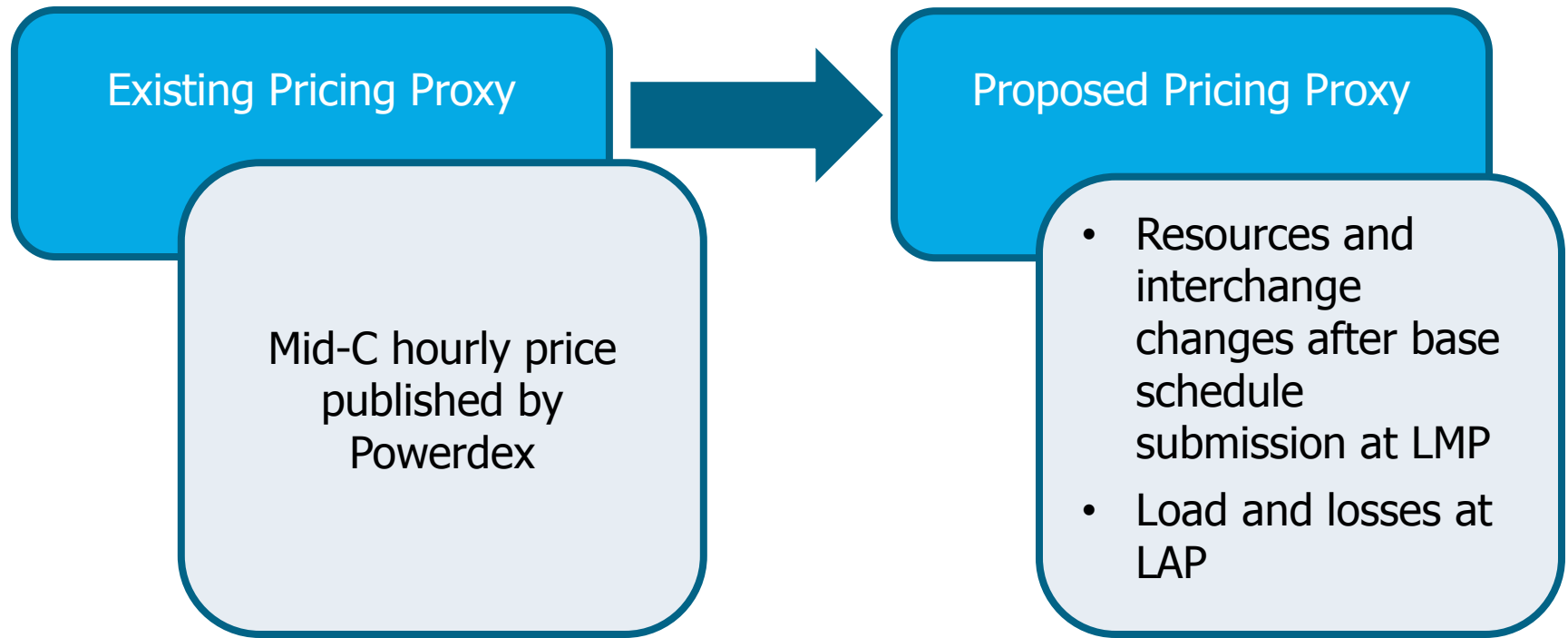
Base Schedule Submittal

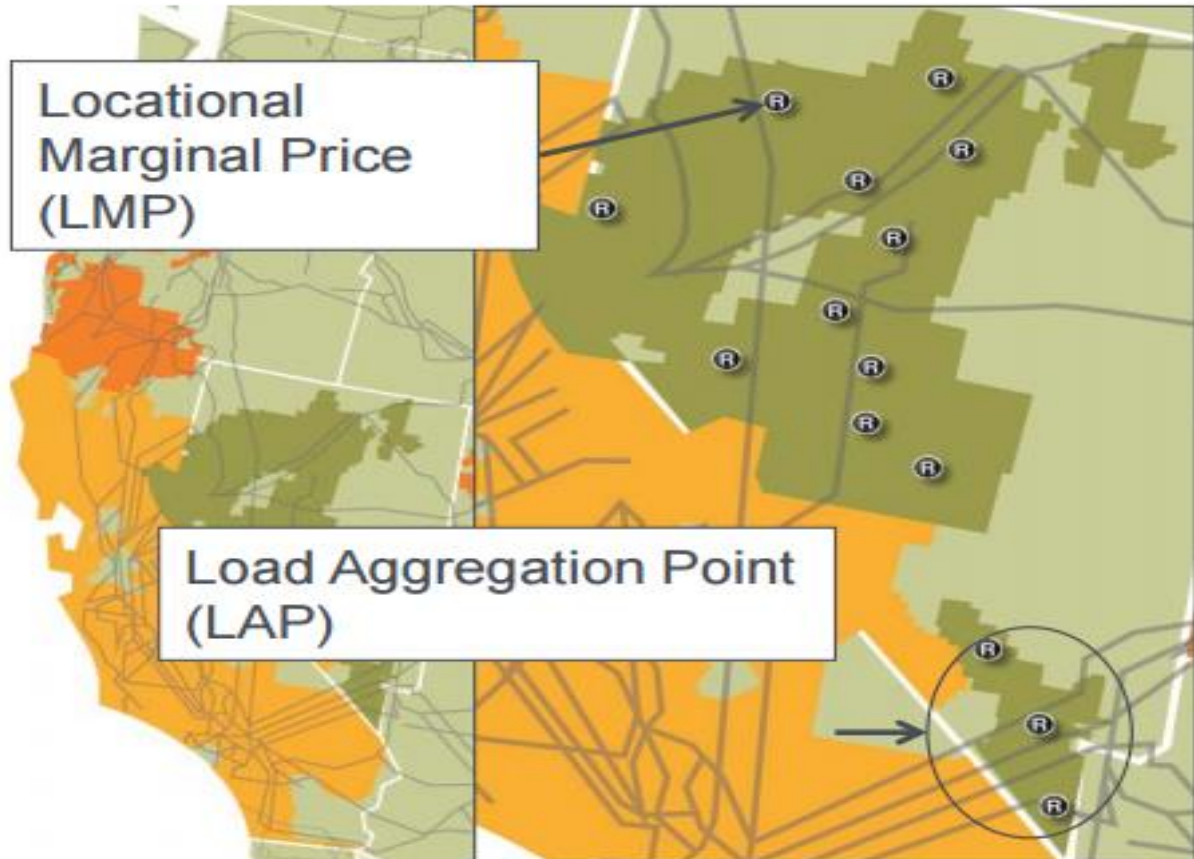
- Final base schedule submission at T-77 minutes
- Modifications are accepted up to T-57 minutes

Adjustments After Base Schedule Submits

- Transmission customers have full access to purchased transmission rights past base schedule submission; however, modifications are settled as imbalance at the respective LMPs







These examples are not meant to reflect actual resource or load locations

OATT Schedules 4, 4R, & 10

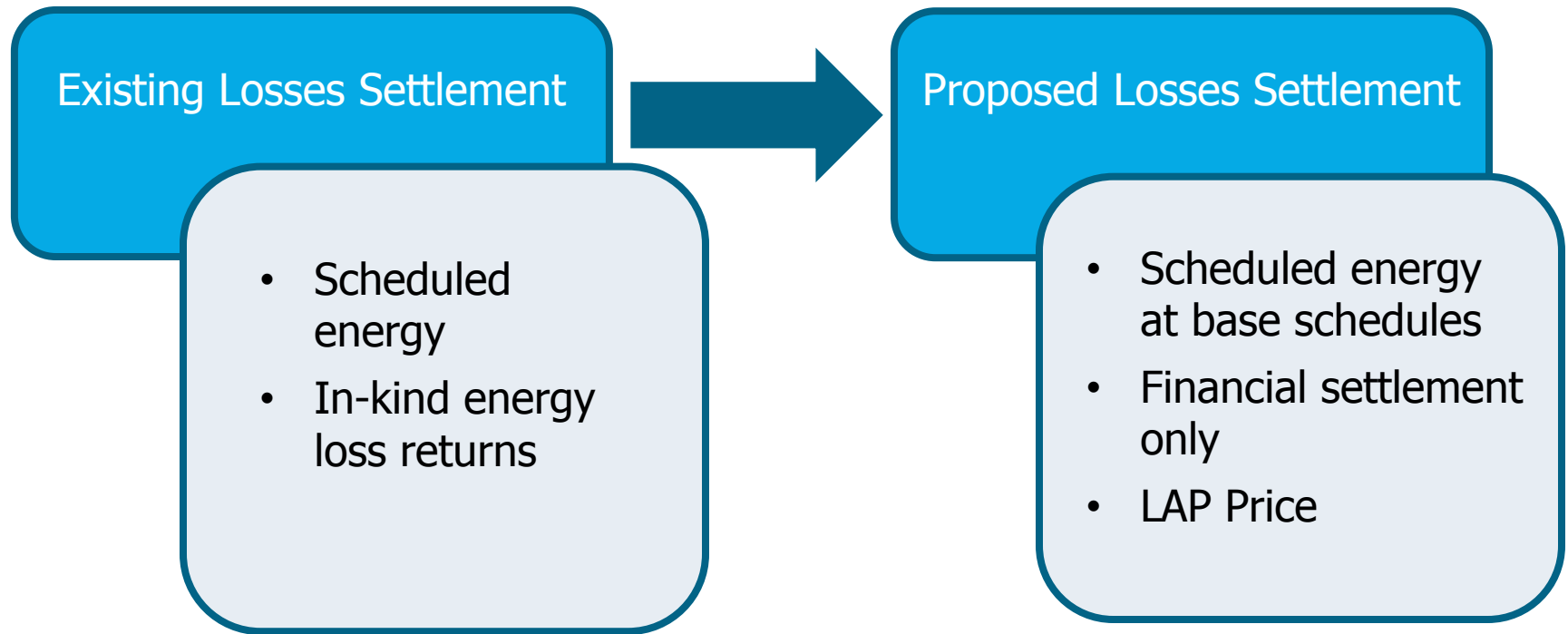
- **Currently—Mid-C Powerdex**

- The Mid-C hourly price published by Powerdex is used to calculate imbalance charges and penalty tiers are applied.

- **EIM—LMP and LAP**

- Imbalance pricing in the EIM is aligned with the geographic footprint of the EIM. No penalty tiers are applied
- **Generation and E-tag changes settle at LMP**
 - Locational Marginal Price (LMP): The marginal cost of serving the next increment of Demand at a particular node, consistent with transmission constraints
- **Load Changes Settle at LAP**
 - Load Aggregation Point (LAP): The weighted average of all LMPs in PGE's BAA.
 - PGE will have one LAP

Note: Schedule 4 applies to load, Schedule 4R applies to ESS load, Schedule 10 applies to non-participating resources.



Loss component settles as part of imbalance after base schedules

PGE Transmission Settlement Statements will include:

EIM Related Charges:

CAISO will invoice PGE (EIM Entity), which will then allocate charges to transmission customers

Will include:

- Schedule 1-A EIM Administrative Services
- Schedule 4 and & 4R Energy Imbalance
- Schedule 10 Generation Imbalance
- Schedule 11 Losses
- Other EIM Charges, e.g. uplift



Western EIM pricing reflects competitive, real-time energy market costs

Stakeholder Process and Next Steps

Amy Light

Activity	Date
Announcement of Stakeholder Process	July 15, 2016
Post OATT Round 1 Revisions on OASIS	August 15, 2016
Round 1 Stakeholder Comment Period	August 15-November 1, 2016
First OATT Stakeholder Meeting	October 14, 2016
Post OATT Round 2 Revisions on OASIS and PGE Response to Round 1 Stakeholder Comments	November 15, 2016
Round 2 Comment Period	November 15-December 9, 2016
Second Stakeholder Meeting	December 7, 2016
Post PGE Responses to Round 2 Stakeholder Comments	December 16, 2016
PGE Files OATT with FERC	March 01, 2017

Please submit questions to transmissionprovider@pgn.com

Activity	Date
Announcement of Stakeholder Process	July 15, 2016
Post OATT Round 1 Revisions on OASIS	August 15, 2016
Round 1 Stakeholder Comment Period	August 15-November 1, 2016
First OATT Stakeholder Meeting	October 14, 2016
Post OATT Round 2 Revisions on OASIS and PGE Response to Round 1 Stakeholder Comments	November 15, 2016
Round 2 Comment Period	November 15-December 9, 2016
Second Stakeholder Meeting	December 7, 2016
Post PGE Responses to Round 2 Stakeholder Comments	December 16, 2016
PGE Files OATT with FERC	March 01, 2017

Please submit questions to transmissionprovider@pgn.com

Activity	Date
Announcement of Stakeholder Process	July 15, 2016
Post OATT Round 1 Revisions on OASIS	August 15, 2016
Round 1 Stakeholder Comment Period	August 15-November 1, 2016
First OATT Stakeholder Meeting	October 14, 2016
Post OATT Round 2 Revisions on OASIS and PGE Response to Round 1 Stakeholder Comments	November 15, 2016
Round 2 Comment Period	November 15-December 9, 2016
Second Stakeholder Meeting	December 7, 2016
Post PGE Responses to Round 2 Stakeholder Comments	December 16, 2016
PGE Files OATT with FERC	March 01, 2017

Please submit questions to transmissionprovider@pgn.com

File Edit View Favorites Tools Help

Registration | About | HOME

OATI webOASISSM Production Node

Production Node Login

PGE Transmission

Transmission Preschedulers & ATF 503-464-8802
Balancing Authority Operators (Realtime) 503-464-8650

Meeting Registration for and Agenda Posted for EIM Stakeholder Meeting 1

PGE has posted a Registration Form and Agenda for the first Stakeholder Meeting regarding proposed changes to the OATT due to PGE's entry into the Western EIM. These materials can be found in the EIM folder to the left. Stakeholders return the completed registration form by October 10, 2016. The Stakeholder Meeting is scheduled for October 14, 2016. (posted 9/15/2016)

ATC Calculator has been Upgraded

The problem with the ATC Calculator not being able to process sub-hourly segments correctly has been fixed with an upgrade to the ATC and curtailment software that was implemented during HE 1000 today. Sub-Hourly transactions should now calculate correctly. Please contact the OASIS administrator if there are any more issues. (posted 3/30/2016)

PGE's DRAFT Near Term Local Transmission Plan

Pursuant to PGE's Open Access Transmission Tariff (OATT) Attachment K, PGE's DRAFT Near Term Local Transmission Plan, which will be presented at the Third Quarter Customer Meeting On September 29, 2016, has been posted in the Transmission Planning / Local Transmission Plan folder. This presentation is being posted for 30 days to solicit comments from all stakeholders. If you have any questions or comments, please contact Amy Light at (503) 464-7029. (posted: 08/29/2016)

ATC Calculator Sub-Hourly Errors

There has been a known problem with the ATC Calculator not being able to process sub-hourly segments correctly. PGE has had a CRITICAL issue logged with our software vendor to address this situation. A fix will be applied to a software upgrade that will occur on Tuesday, September 30th. (posted 8/24/2016)

3rd Quarter Customer Meeting September 29, 2016

PGE Transmission & Reliability Services is planning a Quarterly Customer Meeting on Thursday, September 29, 2016 from 1:00 to 2:00 PM at PGE's Headquarters in Portland, Oregon in the Two World Trade Center (2WTC) Mezzanine 5 Conference Room to discuss PGE transmission-related issues. If you would like to propose a topic or topics to be addressed at the meeting, please provide this information to Amy Light at 503-464-7029 by the close of business Thursday, September 15, 2016. If you are planning to attend the Quarterly Customer Meeting, we would appreciate hearing from you prior to September 22, 2016 so we may have an adequate number of handouts available for the attendees. Call-in phone number is 503-464-2220 and ID# 1114. (updated 8/18/16)

Proposed OATT Changes for EIM Entry Posted to OASIS


PGE has posted its proposed changes to the OATT due to PGE's entry into the Western EIM. A summary of changes and the proposed OATT changes (in redline) can be found in the OATT Stakeholder Process folder inside the EIM folder to the left. (posted 8/20/2016)

RoundButte to Redmond Path Posted

A new transmission path, W/PGE-BPAT/ROUNDBUTTE-REDMOND/, has been posted on the PGE OASIS. TTC of the path is 313 MW. The path becomes effective on August 1, 2016. (posted 7/27/2016)

Notice of PGE OATT Stakeholder Process Posted

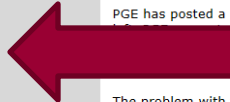
PGE has posted a Notice of OATT Stakeholder Process for proposed changes to the OATT due to PGE's entry into the Western EIM. The notice and timeline of the stakeholder process can be found in the EIM folder to the left. The first Stakeholder Meeting is scheduled for October 14, 2016. (posted 7/15/2016)



Documents

- [NAESB Home Page](#)
- Performance Metrics
- OASIS Notices
- Standards of Conduct
- Business Practices, Waivers, and Exemptions
- NITS on OASIS
- ATC Information
- Outages
 - EIM
 - EIM News
 - OATT Stakeholder Process
- Contacts
- News
- Tariff
- Open Season
- Generation Interconnection
- Customer Meetings
- Customer Q & A
- Customer Registration and Applications
- FERC - 205 Filings
- FERC - 206 Filings
- FERC - Informational Filings
- ESS Information
- Network Operating Committee
- Load & Resources Information
- Undesignated Resources
- Cascade Crossing Project
- Transmission Planning
- Northern Tier Transmission Group
- Annual ACE Data
- Natural Gas Transportation

Back



- CBT - Introduction to the Energy Imbalance Market

This Computer Based Training provides a high level overview of the Energy Imbalance Market

<http://content.caiso.com/training/Introduction%20to%20EIM/My%20Articulate%20Projects/Introduction%20to%20the%20Energy%20Imbalance%20Market/player.html>

- CBT - How the Energy Imbalance Market Works –

This Computer Based Training describes the roles and responsibilities of the key players in EIM and the business processes that will take place.

<http://content.caiso.com/training/HowEIMWorks/player.html>

- EIM Stakeholder processes and tariff filings

<http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyImbalanceMarket.aspx>

- EIM Business Process Manual

[http://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy Imbalance Market](http://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy%20Imbalance%20Market)