

Energy Imbalance Market update

John Anders, Mark Rothleder and Petar Ristanovic
EIM Transitional Committee meeting – General Session
January 12, 2015

Agenda

- Regulatory update on ISO Board decisions and FERC filings related to EIM
- Update on EIM performance
- Update on EIM operations

John Anders, Lead Counsel, Assistant General Counsel-Tariff
and Compliance

REGULATORY UPDATE

The ISO filed a second EIM waiver request to cover the period from November 1 – November 13.

- Initial waiver filing did not cover the first two weeks
 - anticipated that more of the observed price excursions would be correctable
- Requests application of the same pricing parameters as accepted by FERC with respect to the initial waiver
- Pending with FERC in ER15-817-000
- Comments are due January 21

The ISO will file two tariff amendments to implement policies approved by the Board on January 5.

- The first will provide a twelve month transition period for all new EIM entities
 - need to gain operational experience in all seasons
 - when modeled constraints are relaxed, energy priced on marginal economic bid (same as waiver)
 - bid caps subject to further stakeholder input
- The second will change the EIM administrative charge
 - current design results in over collection
 - will charge 5% of supply plus 5% of demand
 - long term design subject to further stakeholder input

EIM year one enhancements remain on track for a Board decision this March.

- Stakeholder meeting in Portland on January 8
- Primary focus was on three issues
 - GHG proposal that provides flexibility and maintains the “flag” concept with cost based bids
 - settlement of non-participating resources
 - how available transfer capability can be used to support EIM transfers between balancing authorities
- Stakeholders were engaged and the ISO will consider:
 - deferring economic participation on EIM external interties until transmission charges are considered

EIM Year One Enhancements are being vetted with stakeholders.

Phase 1 Stakeholder process milestones completed

Nov 10 Issue paper / straw proposal posted

Nov 17 Stakeholder meeting

Dec 1 Stakeholder comments due

Jan 8 Stakeholder meeting

Phase 1 Stakeholder process upcoming milestones

Jan 22 Stakeholder comments due

Feb 11 Post Draft Final Proposal

Feb 18 Stakeholder meeting

Feb 25 Stakeholder comments due

Mar 26 Board of Governor's briefing

Phase 2 will start in May 2015 utilizing 1 full year of operational data before finalizing if any design changes needed

Questions

Mark Rothleder, Vice President Market Quality and Renewable
Integration

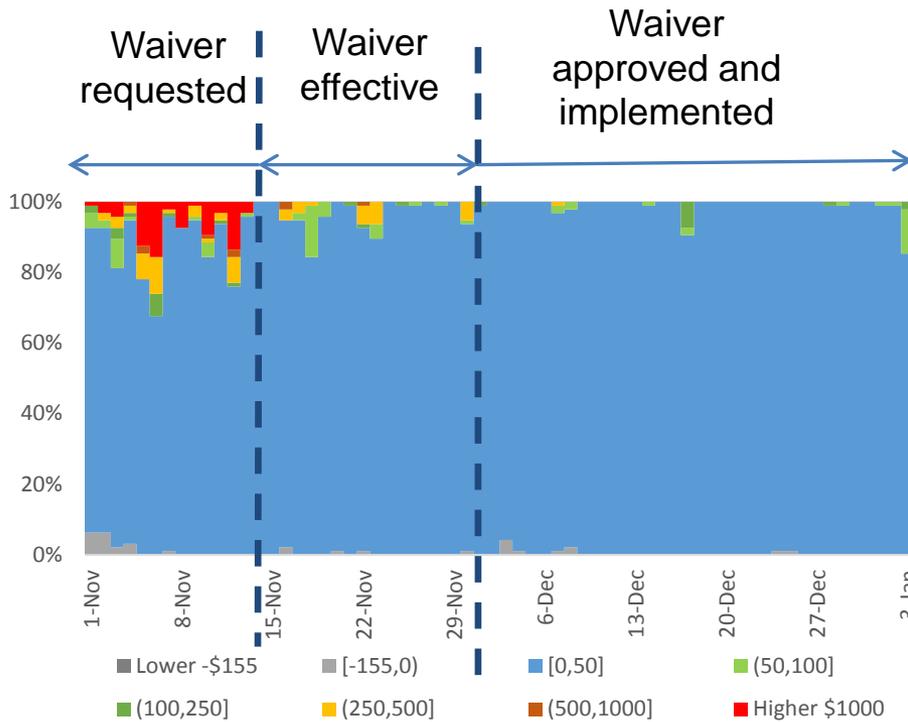
UPDATE ON EIM PERFORMANCE

EIM Performance Update

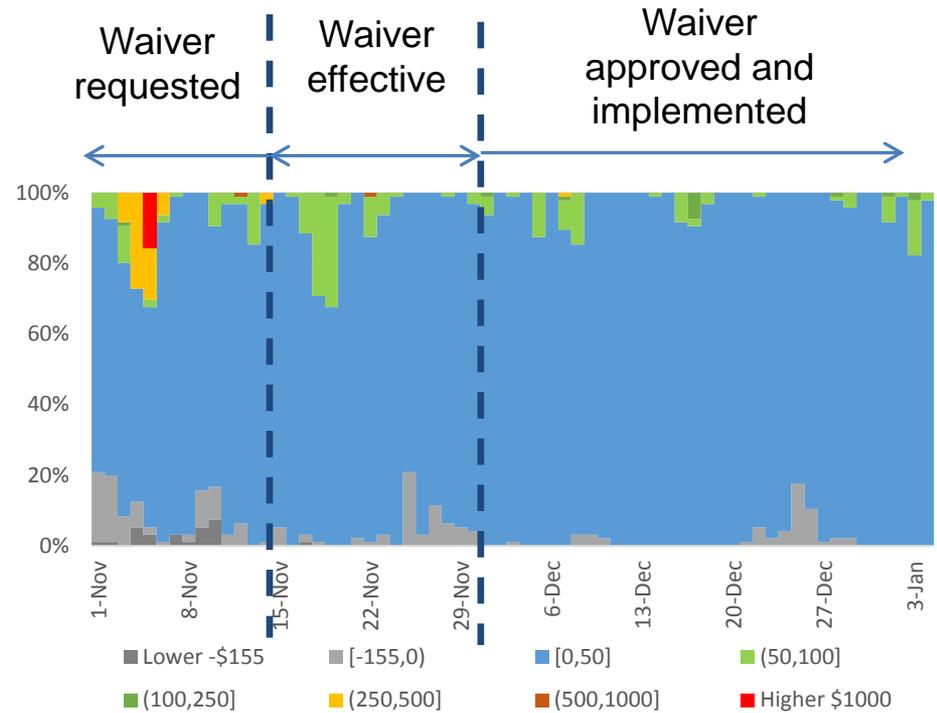
- Pricing performance stabilizing under marginal pricing
- Benefits assessment expected end of January
 - simplified counter-factual for November and December
- Bi-directional 15-minute transfers continue:
 - transfers from PacifiCorp to ISO reduced during period of COI north to south congestion.

15-Minute price frequency in PACE and PACW

15-minute PACE Aggregate Price



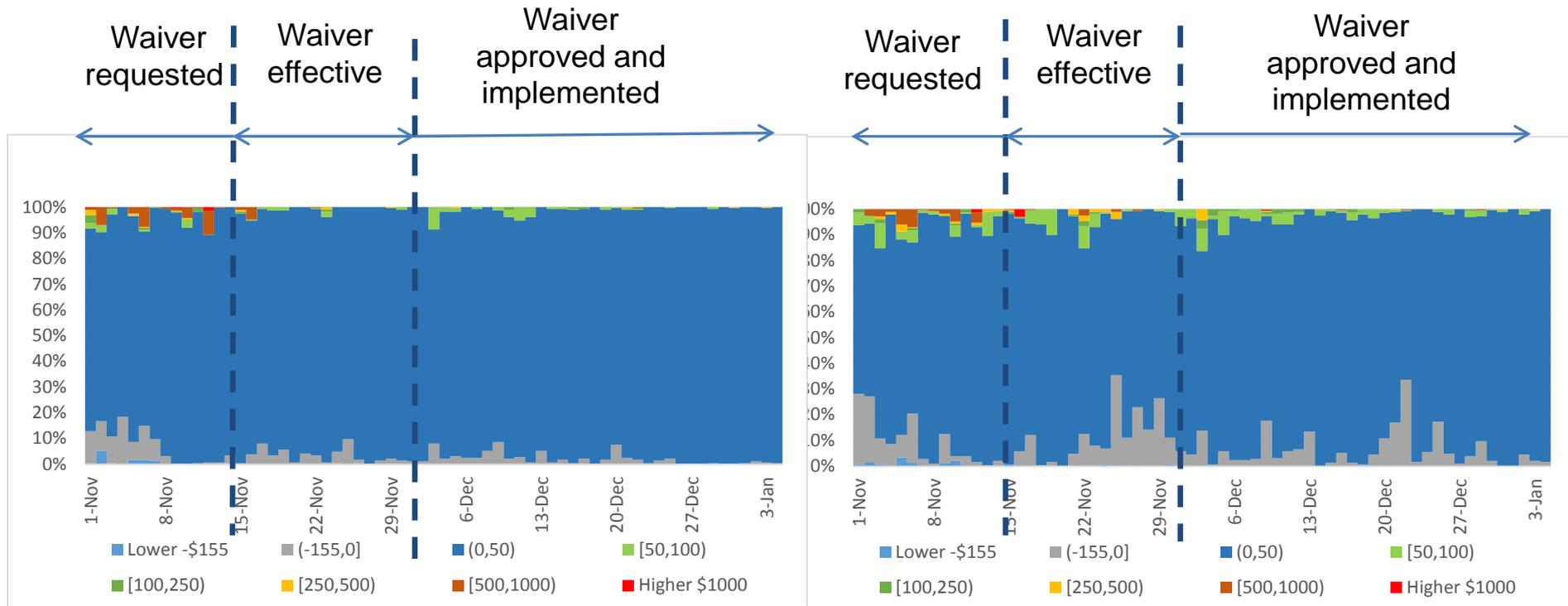
15-minute PACW Aggregate Price



5-Minute price frequency in PACE and PACW

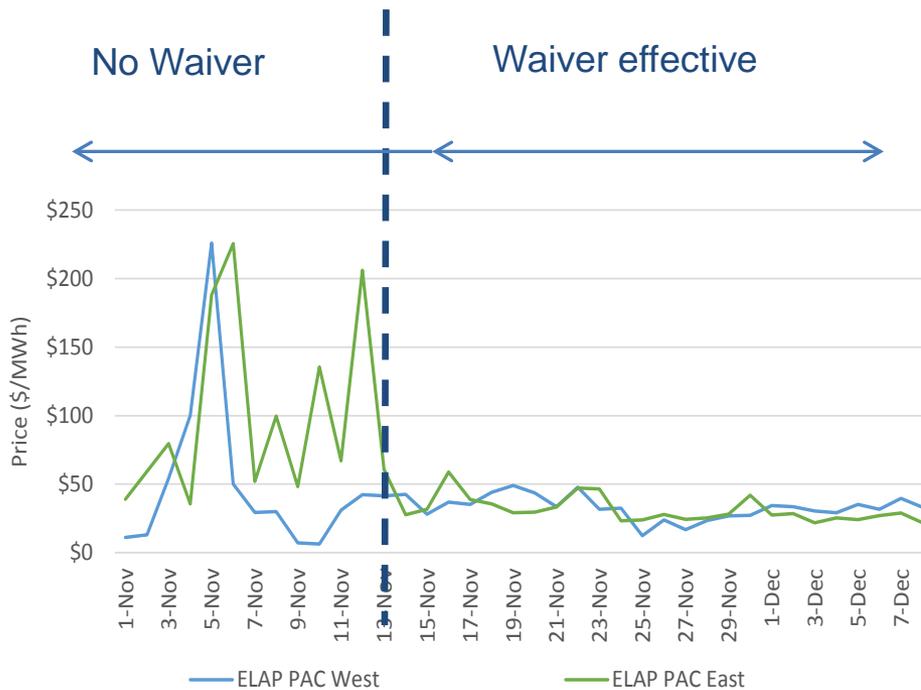
5-minute PACE Aggregate Price

5-minute PACW Aggregate Price

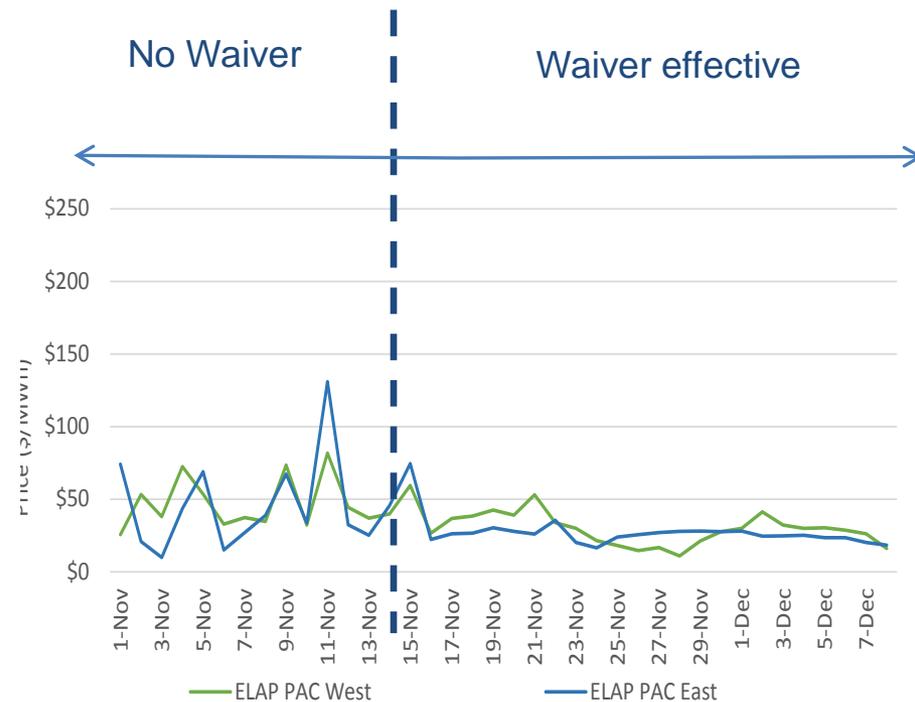


Prices stabilized after November 14

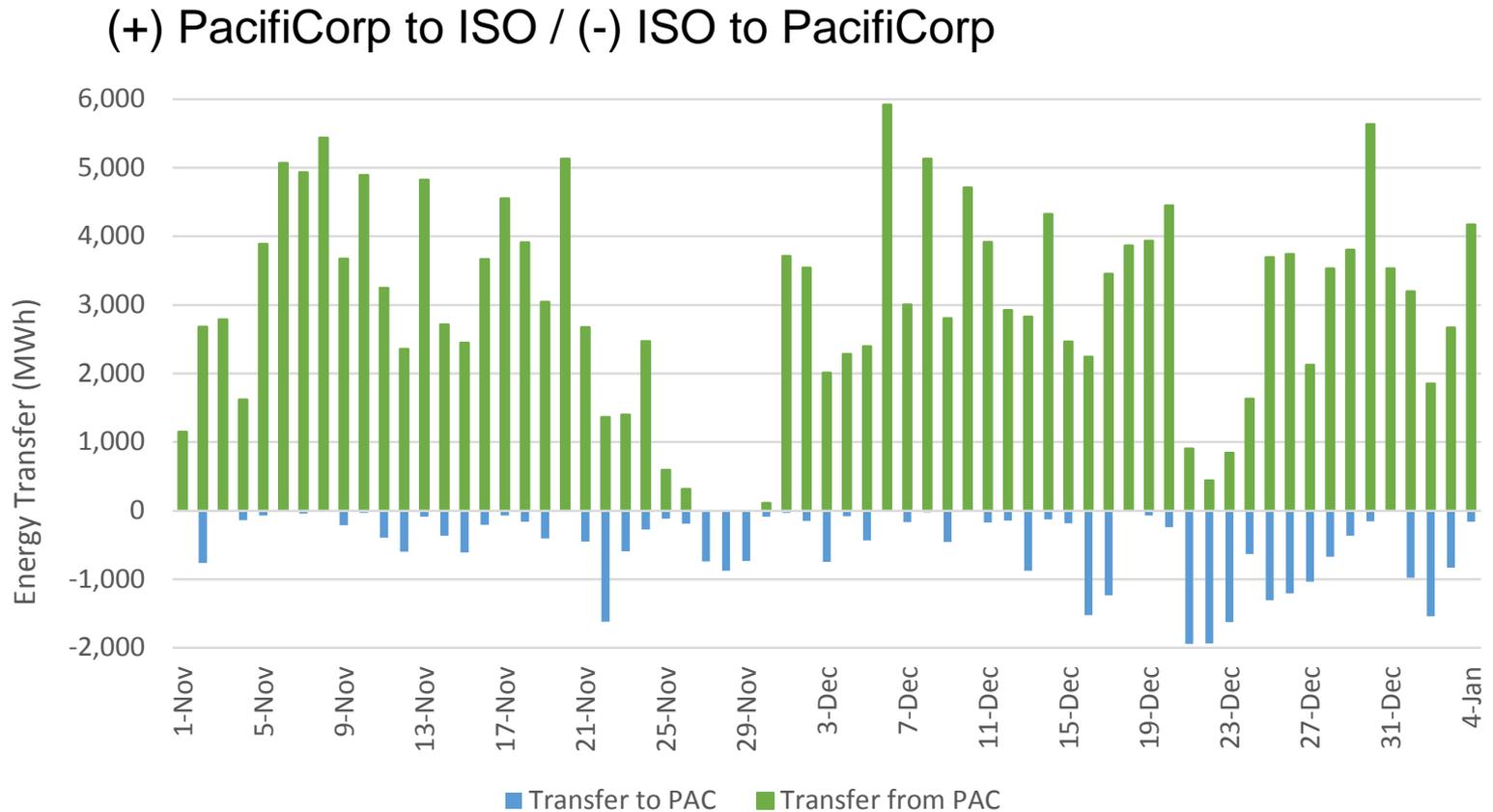
15-minute PACE Aggregate Price



5-minute PACW Aggregate Price



15-minute transfers between PacifiCorp and ISO



Questions

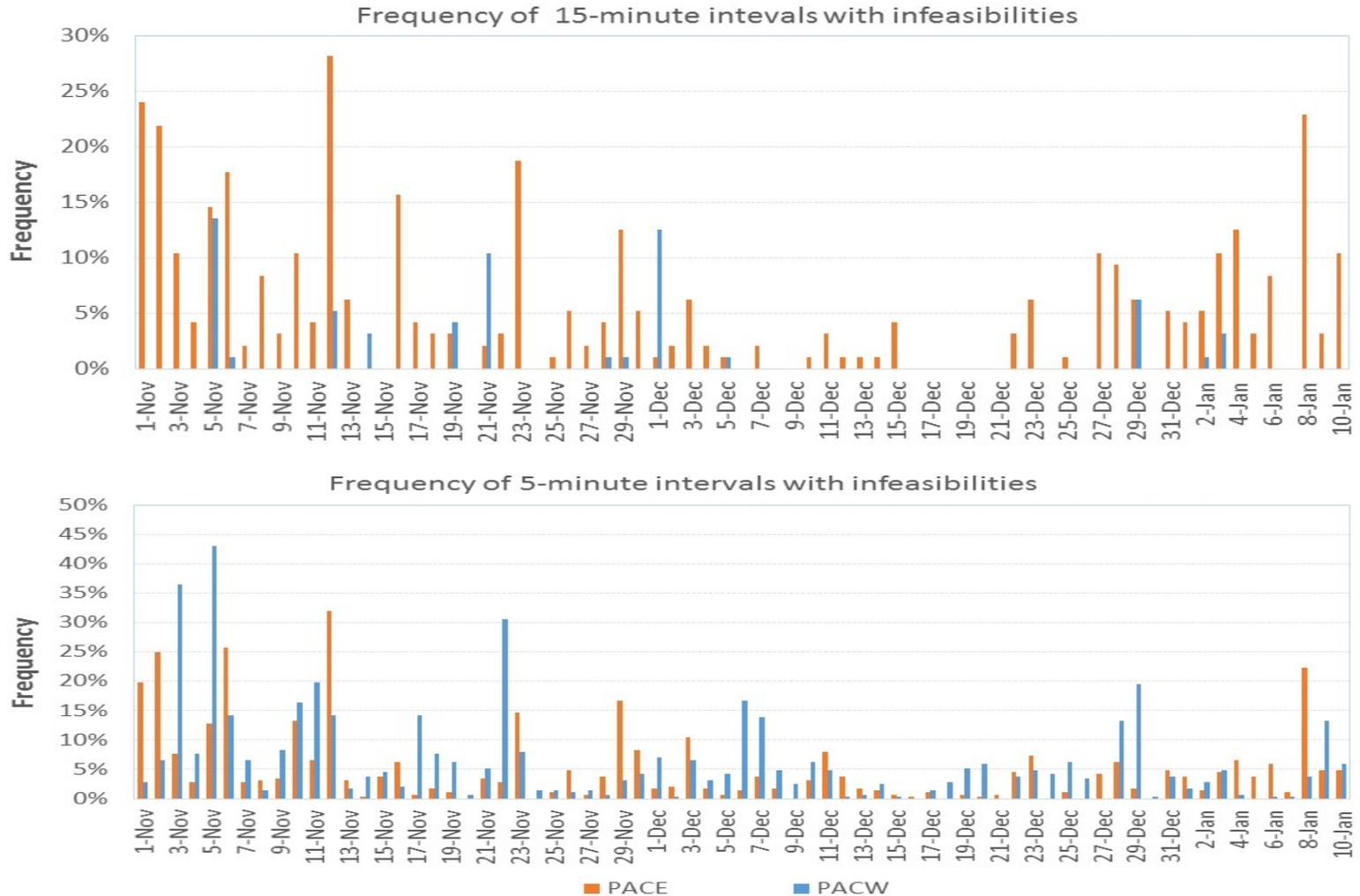
Petar Ristanovic, Vice President Technology

UPDATE ON EIM OPERATIONS

EIM Operation Update

- Working with PacifiCorp on eliminating main causes of supply infeasibilities resulting in price excursions
- Waiver requested to cover November 1-13 based on assessment of impacts after price correction period
- Proposed transition period to be extended to 12 months
- Performing daily review of infeasible conditions

Frequency of 15' and 5' intervals with MW undersupply infeasibilities



Main causes for MW undersupply infeasibilities

- Outages, derates/rerates management
- Timely informing the market about out-of-market actions impacting energy balance
- Wind forecast accuracy and managing wind deviations
- Data and software issues
- Within the hour interchange schedule variations
- Load forecast variation and load biasing coordination
- Network and resources model discrepancies
- 5 minute rate of change constraint on some BPA transmission interfaces

Activities to improve EIM post go-live (1 of 2)

- Reviewed and updated operational procedures
- Training provided to PacifiCorp operators December 9-10, 2014
 - Second training session February 3-4, 2015
- Updated operator tools for better situational awareness
- Coordination to increase the pool of available resources
 - 6 additional resources totaling 3150 MW
- Work underway to model customer interruptible loads as participating resources
- Improvements being made in PacifiCorp systems to prepare and submit bids to EIM, especially for MSG resources
- Improvements to PacifiCorp's wind forecasting software and integration with EIM expected by January 31, 2015

Activities to improve EIM post go-live (2 of 2)

- Improvements to PacifiCorp's outage management system complete by January 31, 2015
- Joint effort to improve accuracy of calculating flexi-ramp requirements and active power loss estimations
- Improved modeling to account for transitional energy during startup/shutdown and accuracy of configuration transition of MSG resources
- Daily analysis of infeasible scenarios leads to prompt resolution
- Work continues with BPA to improve modeling of 5 minute rate of change constraints

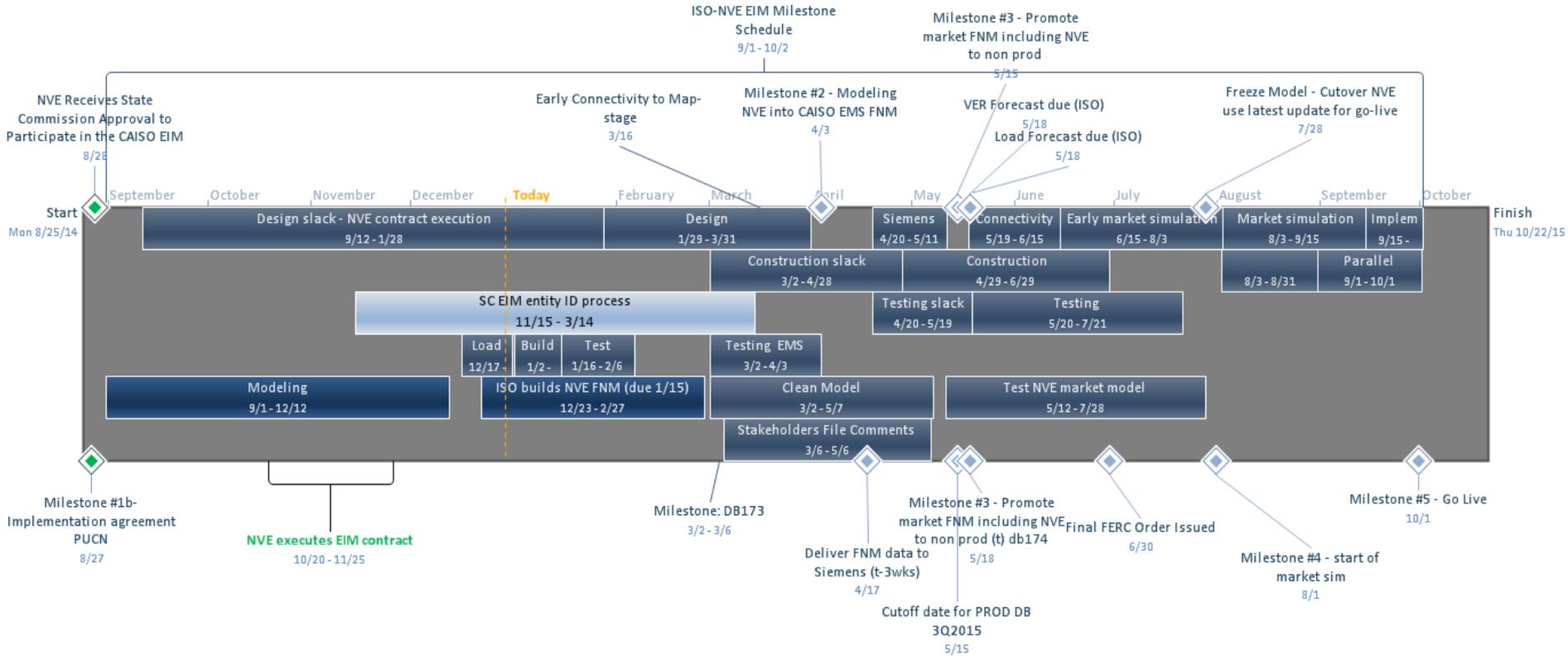
Enhanced training covers targeted issues

- ✓ EIM principal inputs (load forecast, interchange and outage schedules, bids, resource characteristics, state estimator solution)
- ✓ Multi-Stage Generation (MSG)
- ✓ Load and variable energy resources forecast
- ✓ EIM transfers: 15 minute static versus 5 minute dynamic
- ✓ BA control and interaction with EIM
- ✓ EIM balancing, base schedules
- ✓ Feasibility, balancing, capacity and flex ramp sufficiency tests
- ✓ RTPD (15 min) and RTD (5 min) market time lines
- ✓ BPA rate of change constraints
- ✓ Contingency dispatch, manual dispatch
- ✓ Automatic Dispatch System (ADS)
- ✓ EIM principal outputs (ADS, MRI, OASIS)
- ✓ Informing the market about out-of-market actions

NV Energy implementation is making steady progress.

- NV Energy hosted second set of public stakeholder meetings on 12/2 & 12/3. NVE plans to file their OATT revisions on 3/6/15.
- NV Energy provided a full network model with all content clean for import. ISO build of NVE FNM by 2/27/15.
- ISO and NV Energy held technical kick-off meetings with NV Energy's software vendors.
- Initial operations readiness impact assessments completed 12/12 and 12/13 in Las Vegas and Reno.
- Training session with NV Energy 12/15/14 in Las Vegas.
- NVE is scheduled for SC Certification for the EIM Entity SC in January.

Overall, NV Energy implementation is on track.



Questions