California ISO
Shaping a Renewed Future

Briefing on EIM Deployment

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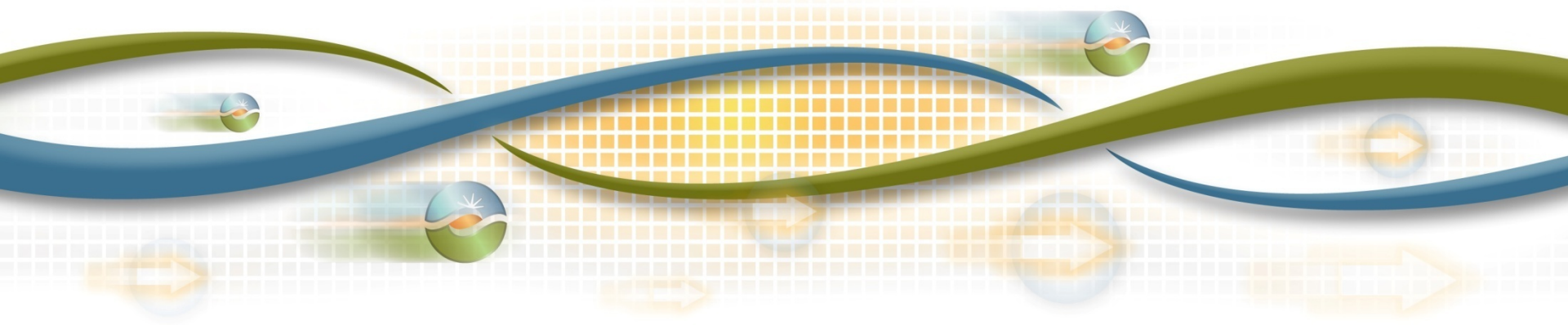
EIM Transitional Committee meeting
General Session

November 20, 2014



Update on EIM deployment

- Update of initial results
- Tracking of EIM benefits

Update on

INITIAL RESULTS

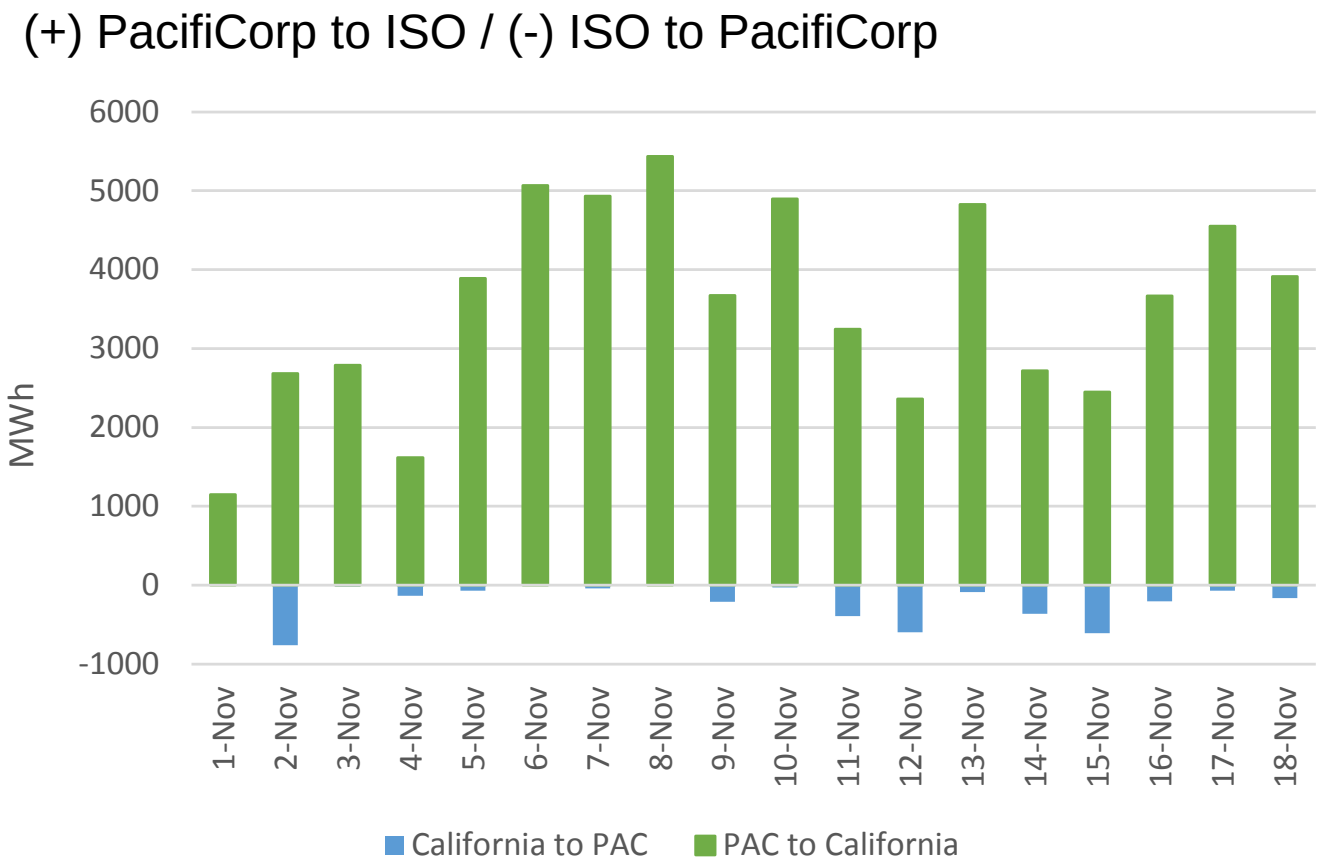
EIM deployment update (1)

- Smooth transition on November 1 with PacifiCorp relative to scope of implementation.
- EIM dispatching participating resources as designed to balance real-time supply/demand across the EIM areas.
- Optimized transfers benefiting both supply and demand.
- Experienced some transitional data transfer and software issues.
- T+12 day settlement statement issued for 11/1 and 11/2 with price corrections.

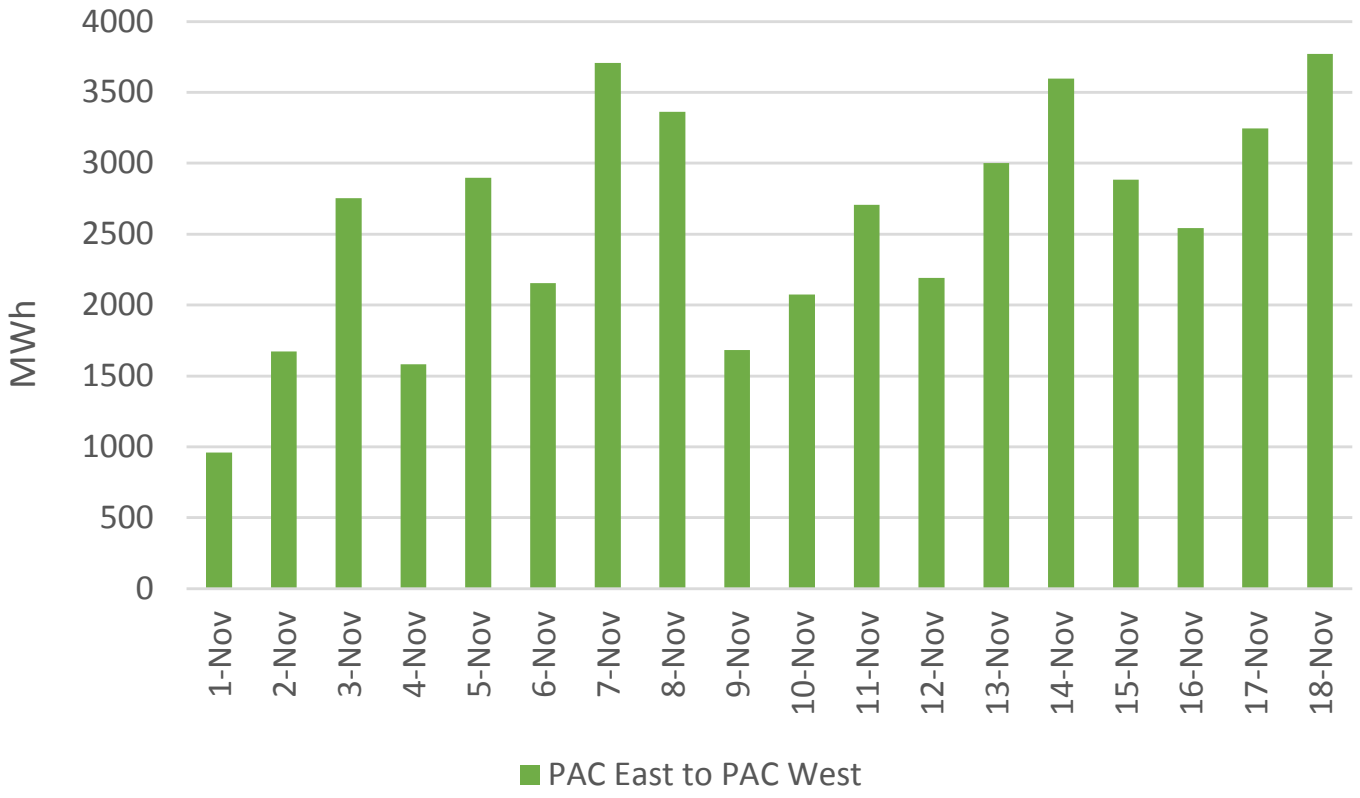
EIM deployment update (2)

- Observed price excursions during some periods when market is not accurately informed of manual operator actions, outages or resource configuration status resulting in shortages not reflective of actual conditions.
- Tuning new business practices to enhance information flow between operations and market inputs.
- Working to bring additional resources into the EIM market.
- Requested a temporary tariff waiver from FERC allowing the ISO to price energy based on marginal bid instead of ISO relaxation parameters when transmission constraints or the power balance constraint in PacifiCorp area binds.

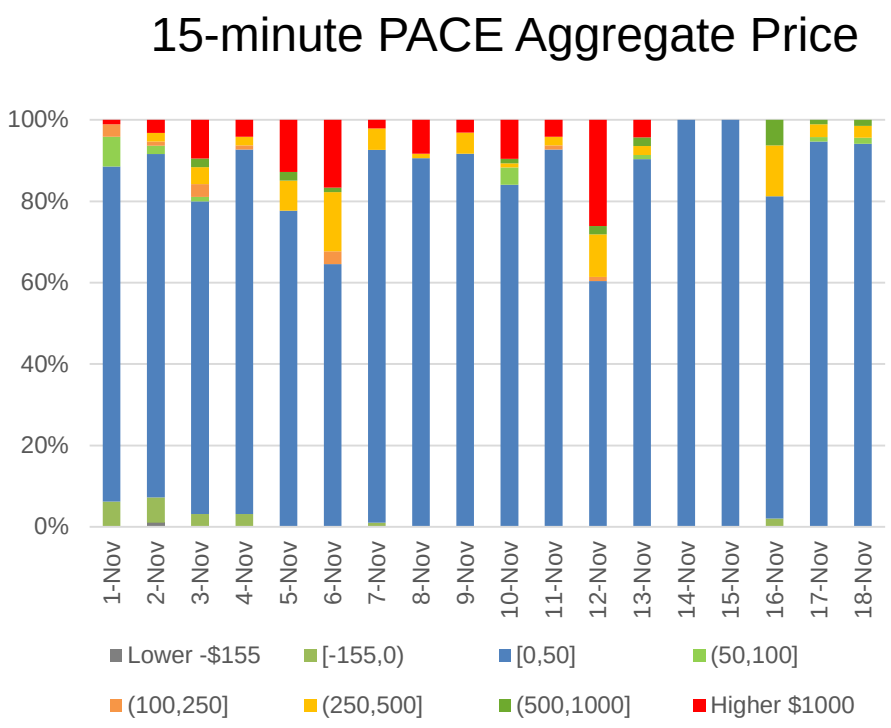
15-minute transfers between PacifiCorp and ISO

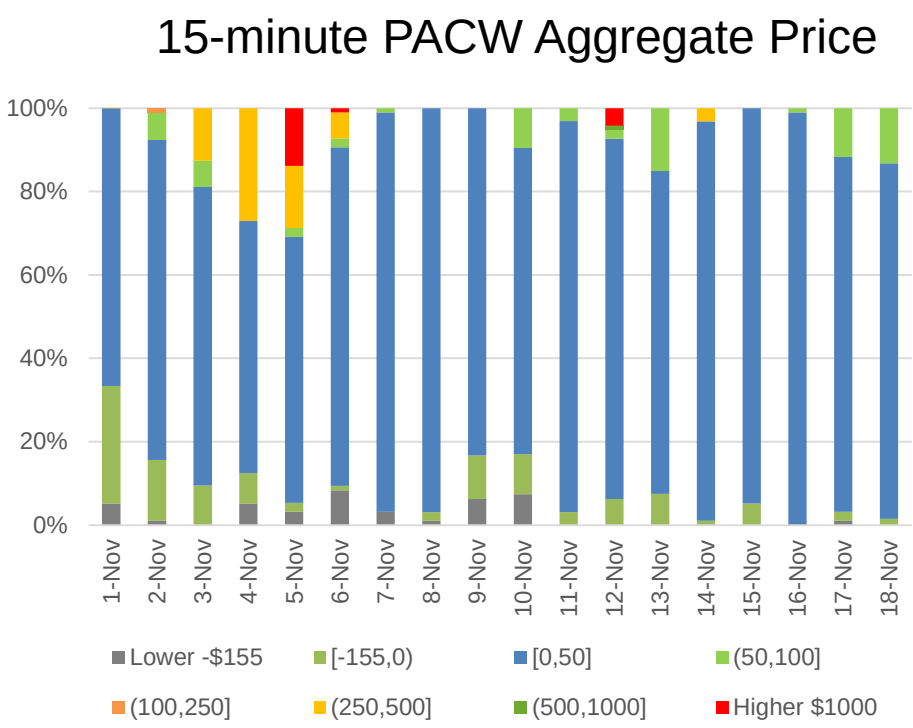


15-minute transfers between PacifiCorp East (PACE) and PacifiCorp West (PACW)



15-Minute price frequency in PACE and PACW

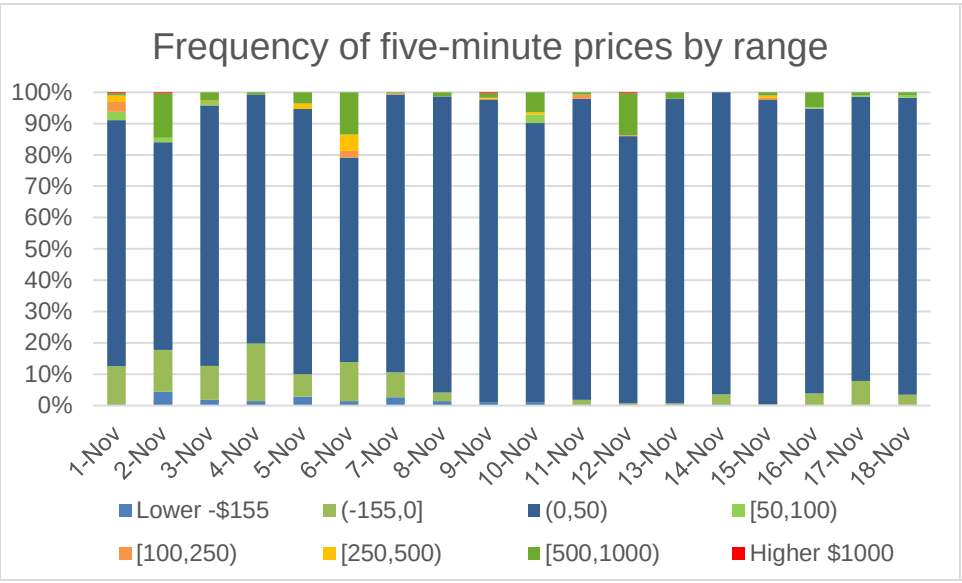




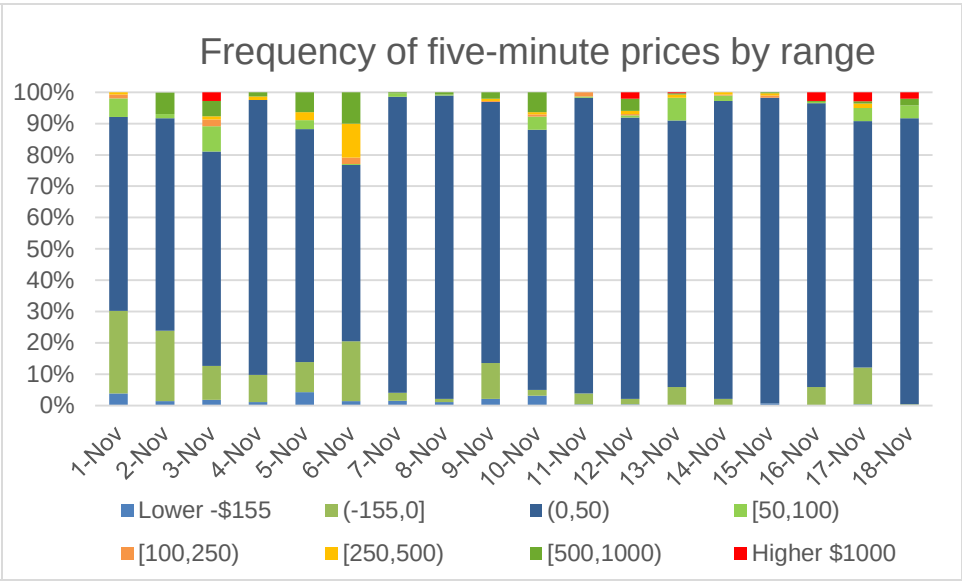
Price corrections for November 1st and 2nd reflected.

5-Minute price frequency in PACE and PACW

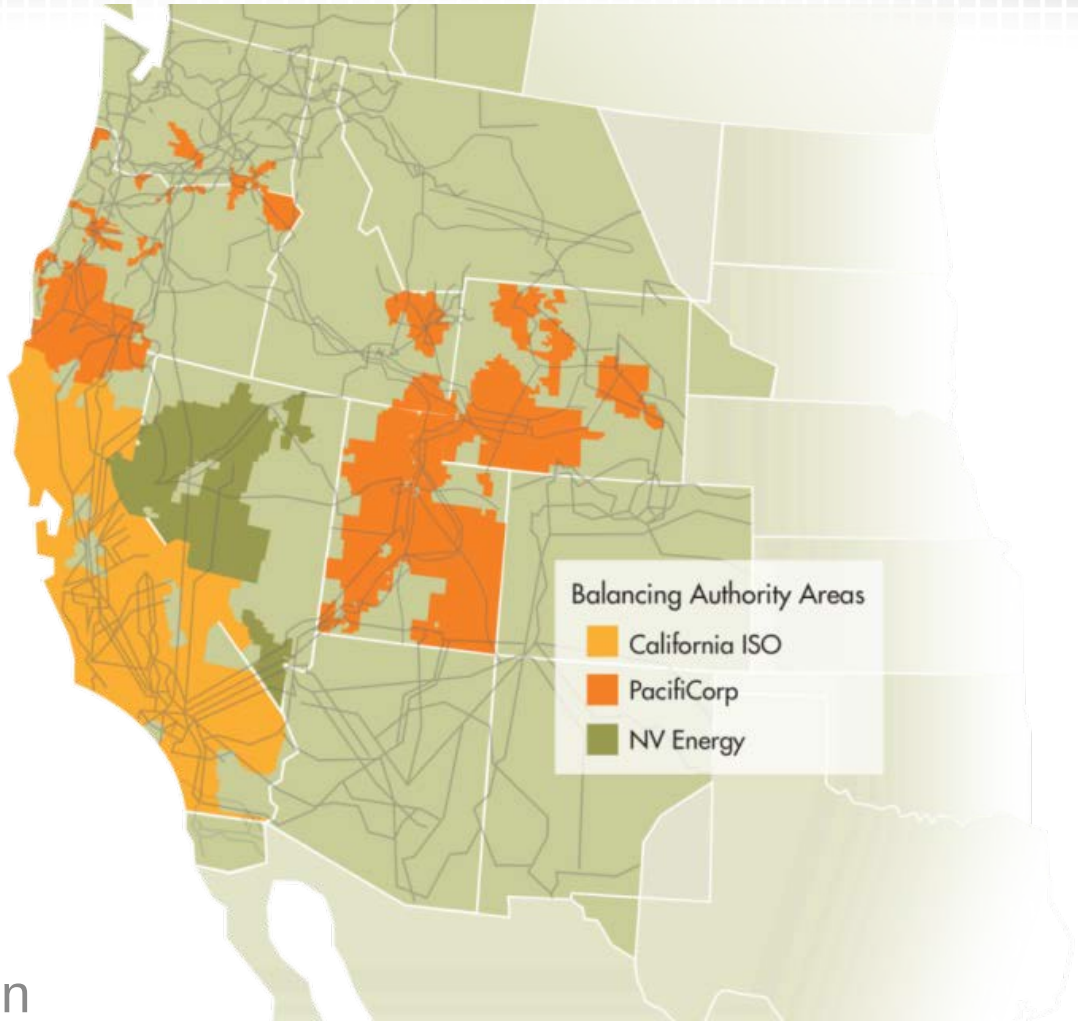
5-minute PACE Aggregate Price



5-minute PACW Aggregate Price



Price corrections for November 1st reflected



Proposal on

TRACKING OF EIM BENEFITS

ISO will track EIM regional benefits and provide quarterly reports to stakeholders

- Compare dispatch cost to a case without EIM
- Quantify imbalance energy dispatch benefits that enable:
  - real-time economic transfers
  - new balancing resources
  - efficient and secure dispatch
- Quantify flexibility benefits that enable:
  - diversity to reducing flexibility reserves
  - sharing and compensation of flexibility reserves

Quantifying the benefits

- EIM benefit is the difference between EIM dispatch cost and counter factual without EIM dispatch
  - Cost shifted from the supply region to the demand region
  - Calculated using 15-minute market solution due to practical computational considerations
- Benefits calculated by balancing authority
- In the future, we will explore tracking other metrics including associated with:
  - Over-generation
  - Negative prices
  - Renewable production

Quantifying the benefits – areas for cost savings

- Base schedules may be re-dispatched more efficiently to meet intra-hour imbalances and transmission constraints
- Access to economic transfers between EIM regions
- New resources have more opportunities to displace more expensive generation
- Real-time load and supply variability will be met economically
- EIM may result in less flexible ramping needs and allow flexible ramping between regions, reducing overall flexibility procurement costs

Questions