

Benefits for Participating in EIM

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Informational call

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Agenda

- Summary of results
- Summary of March 2013 benefit study
- Method of calculating benefits
- EIM benefits for November and December 2014

Summary of results

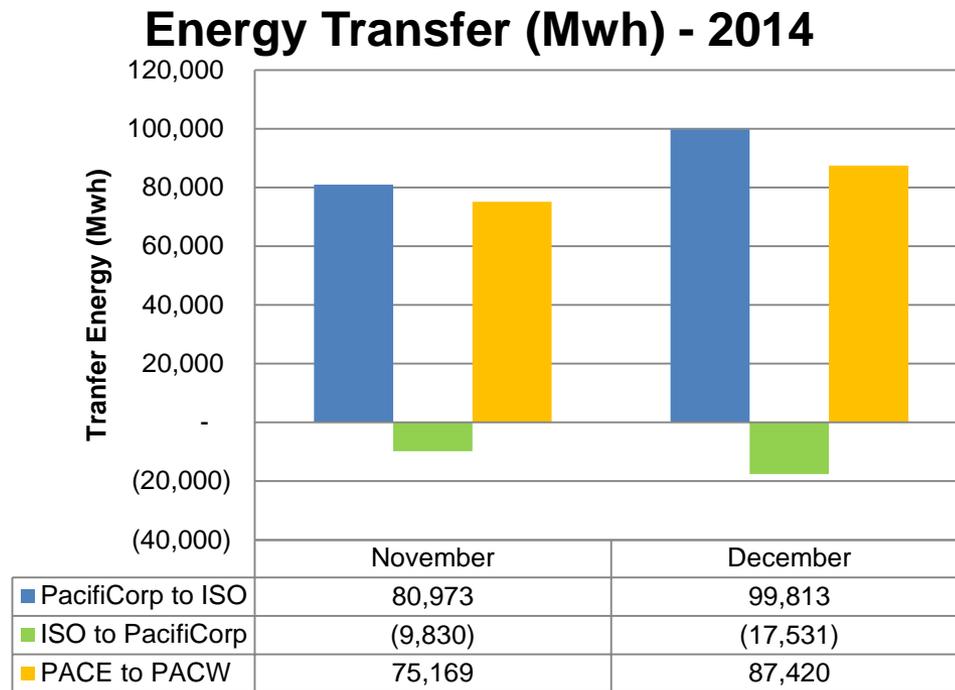
- Report estimates benefits accrued in November and December 2014 from EIM operation
- Total estimated benefit to EIM footprint is \$5.97M
- Benefits are consistent with earlier benefit study
- Benefits reflect:
 - More efficient dispatch, both inter- and intra-regional in the 15-minute market
 - Reduced economic renewable energy curtailment
- Subsequent reports will quantify the reduced flexibility reserves needed by both Balancing Authority Areas (BAAs) and 5-minute dispatch benefits

Summary of results for 4th Quarter 2014

BAA	November	December	Total (millions)
ISO	\$0.65	\$0.59	\$1.24
PACE	\$1.05	\$1.26	\$2.31
PACW	\$1.39	\$1.03	\$2.42
Total	\$3.09	\$2.88	\$5.97

- Results represent benefits from 79% of all the intervals where the largest absolute price difference between the Malin500 and PACE or between the Malin500 and PACW is less than \$50/MWh.

Summary of transfer results for 4th Quarter 2014



- The EIM dispatched energy transfers up to:
 - 421 megawatts (MW) in a 15-minute interval between the PacifiCorp West BAA (PACW) and ISO
 - 220 MW from ISO to PACW
 - 200 MW from PAC East BAA (PACE) to PACW

Pre-launch projections reflected prompt return on investment

	ISO/ PacifiCorp study (in millions)	ISO/NV Energy study on incremental benefits (in millions)
annual benefits	\$21.4 - \$129.0	\$9.0 - \$18.0 (2017)
		\$15.0 - \$29.0 (2022)
start-up costs	approx. \$20.0 (\$2.5 to ISO)	approx. \$11.20 (\$1.10 to ISO)
annual on-going costs	approx. \$3.00 (\$1.35 to ISO)	approx. \$2.60 (\$0.75 to ISO)

March 2013 study by Energy + Environmental Economics (E3) for PacifiCorp and the ISO can be viewed here:

<http://www.caiso.com/Documents/PacifiCorp-ISOEnergyImbalanceMarketBenefits.pdf>

Method of calculating benefits

COMPARE:

cost of the EIM optimized dispatch

- In the 15 minute market
- Excludes benefits from flexible ramping

TO:

counterfactual cost of dispatch without EIM optimization

- without intra-hour transfers between PacifiCorp and ISO that would not occur but for the EIM.

Counterfactual dispatch:

- Mimics imbalance operation without optimization within PacifiCorp and without transfers between PacifiCorp and ISO.
- The ISO would need to meet demand without EIM transfers between PacifiCorp and the ISO.
- PacifiCorp East/PacifiCorp West BAAs (PACE/PACW) would need to meet demand without EIM optimization and without intra-hour transfers between PacifiCorp and the ISO.

In summary, benefits are consistent with earlier benefit analysis and are reasonable

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Total	\$3.09	\$2.88	\$5.97

- Benefits reflect:
 - More efficient dispatch, both inter- and intra-regional in the 15-minute market
 - Reduced renewable energy economic or manual curtailment
- Subsequent reports will quantify the reduced flexibility reserves needed by both Balancing Authority Areas (BAAs) and 5-minute dispatch benefits

Questions

Please address any questions regarding this report to EIM@caiso.com