

# WESTERN ENERGY IMBALANCE MARKET

## Briefing on western energy imbalance market and benefits

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EIM Governing Body Meeting

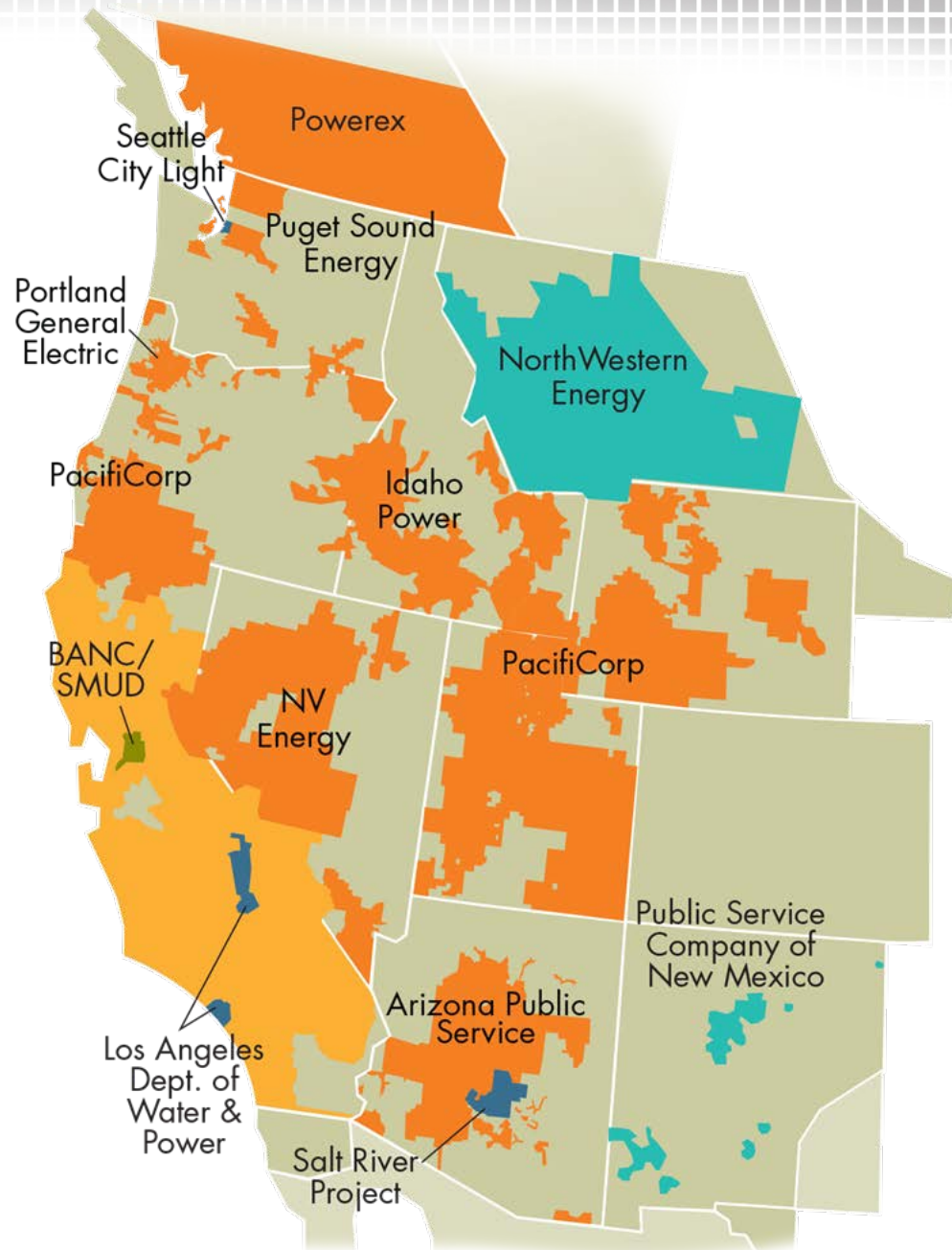
General Session

March 12, 2019

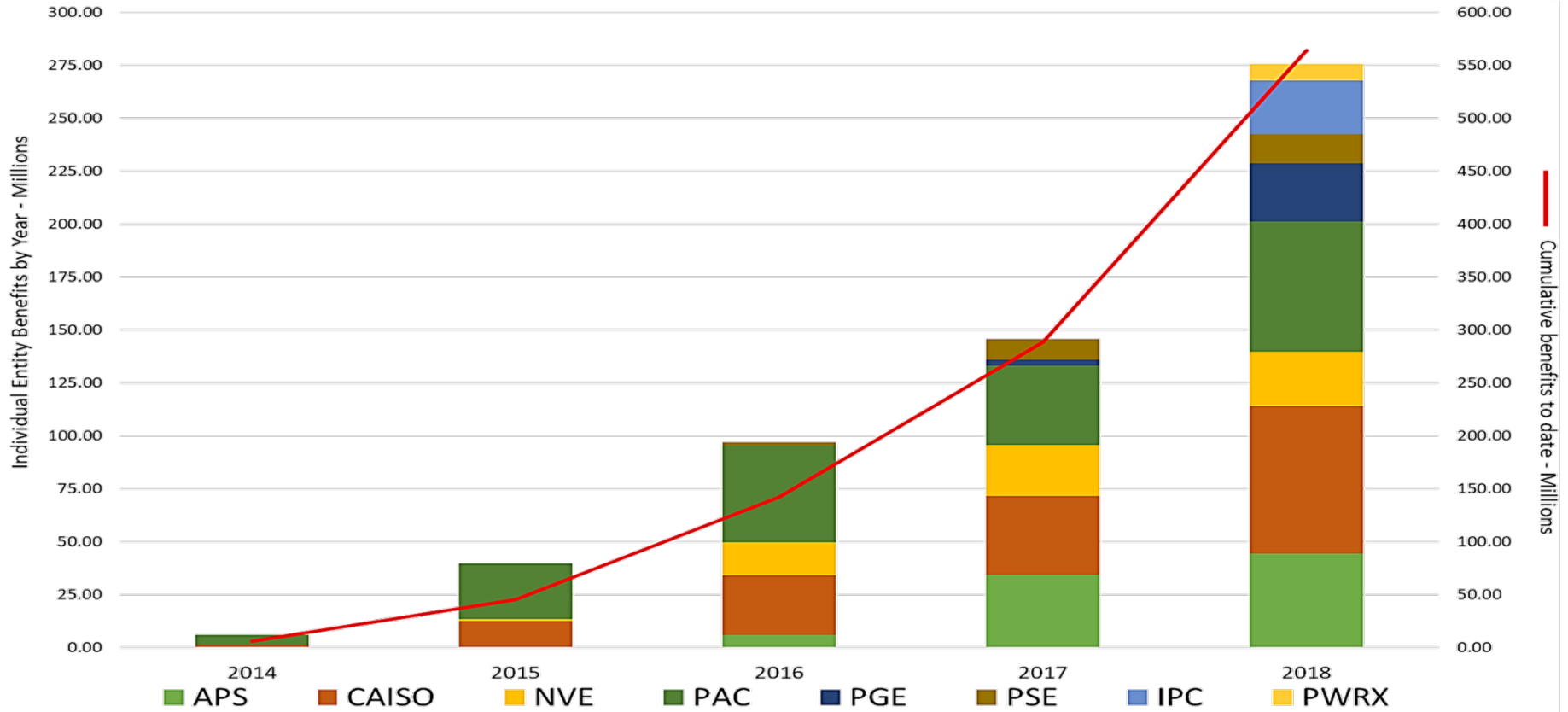


# EIM Update

- NorthWestern Energy signed implementation agreement – planned entry in 2021.
- BANC/SMUD is currently in parallel operations. All readiness criteria has been passed with an expected Go-Live date of April 4.
- Work continues with BPA in their process towards stakeholder consideration of EIM.



# Gross economic benefits since start of EIM = \$564.88M



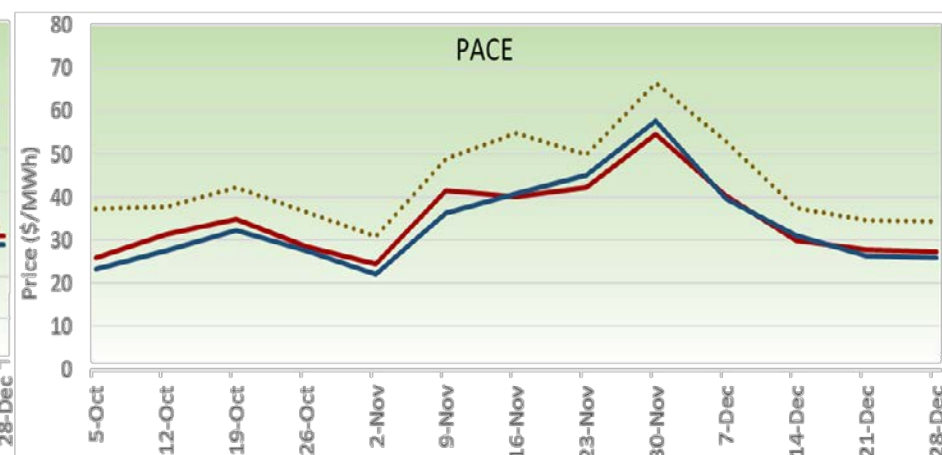
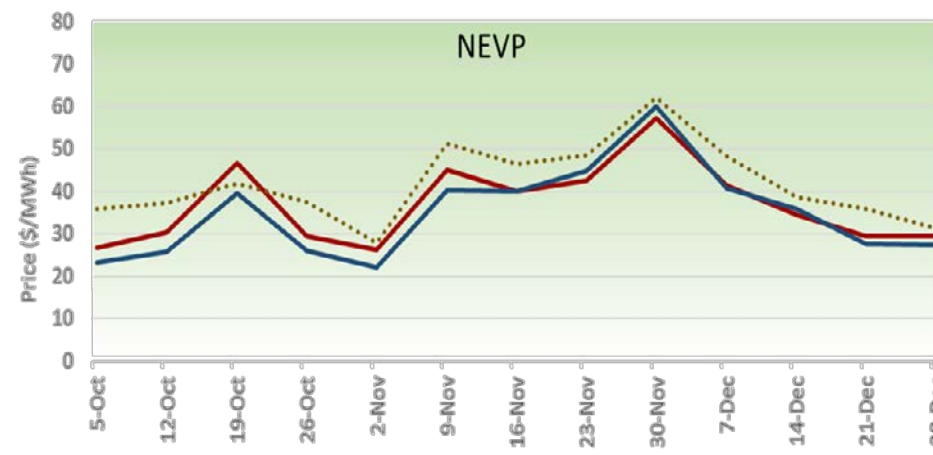
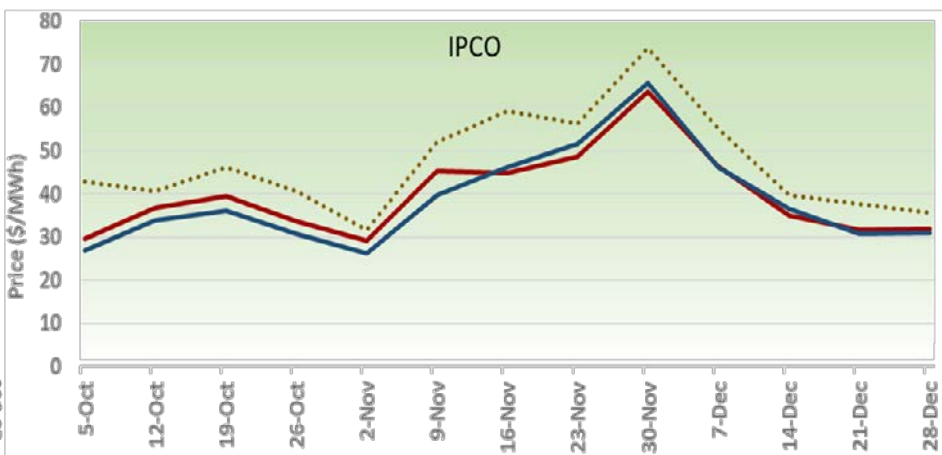
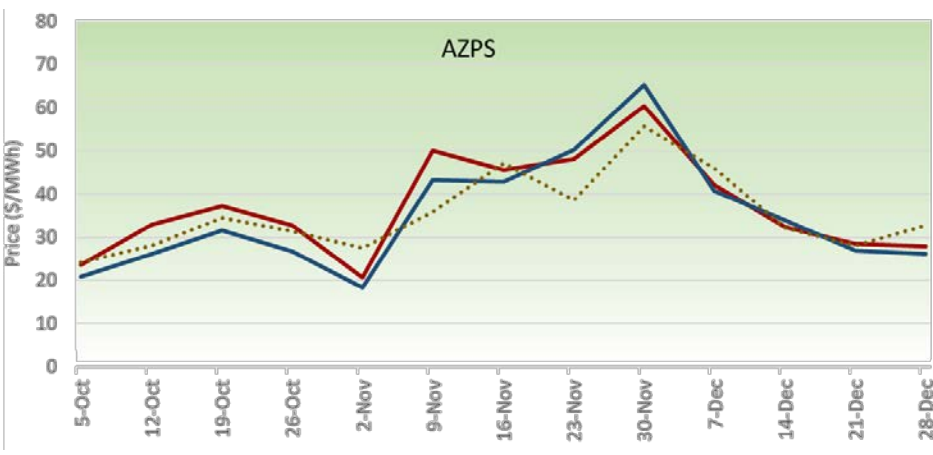
Region	October	November	December	Total
APS	\$3.94	\$2.92	\$3.17	\$10.03
ISO	\$0.27	\$1.17	\$2.70	\$4.14
IPC	\$2.01	\$1.70	\$2.11	\$5.82
NVE	\$1.73	\$1.51	\$1.71	\$4.95
PAC	\$5.25	\$6.79	\$9.64	\$21.68
PGE	\$3.20	\$3.04	\$2.88	\$9.12
PSE	\$1.15	\$1.54	\$1.22	\$3.91
PWX	\$0.62	\$1.23	\$1.07	\$2.92
<b>Total</b>	<b>\$18.17</b>	<b>\$19.90</b>	<b>\$24.50</b>	<b>\$62.57</b>

# Flexible ramping procurement diversity savings for 4<sup>th</sup> quarter, 2018

	October		November		December	
Direction	Up	Down	Up	Down	Up	Down
Average MW saving	743	754	753	749	752	765
Estimated savings	\$439,526	\$0	\$577,133	\$0	\$302,980	\$0
Sum of BAA requirements	1,645	1,674	1,625	1,674	1,654	1,611
Diversity Benefit	45%	45%	46%	45%	45%	47%

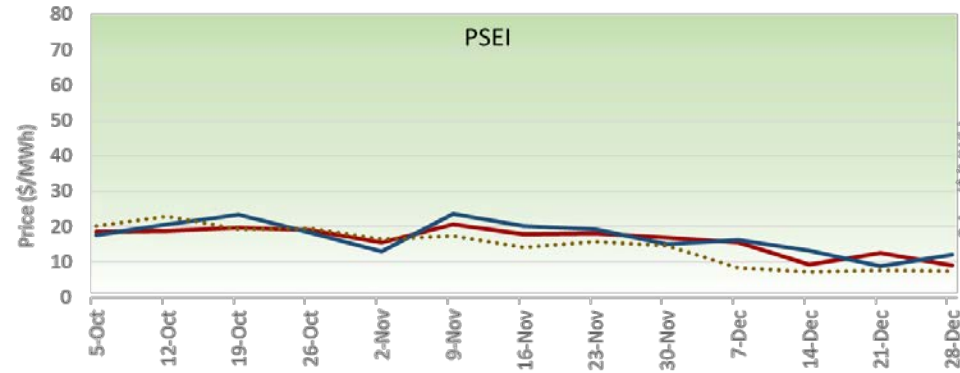
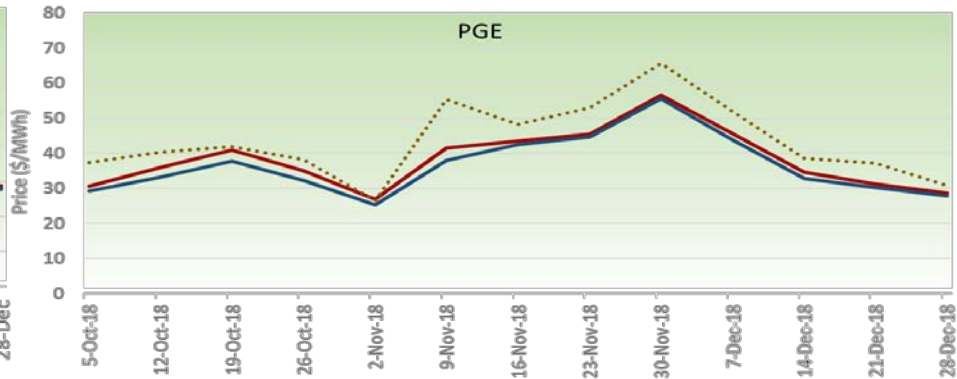
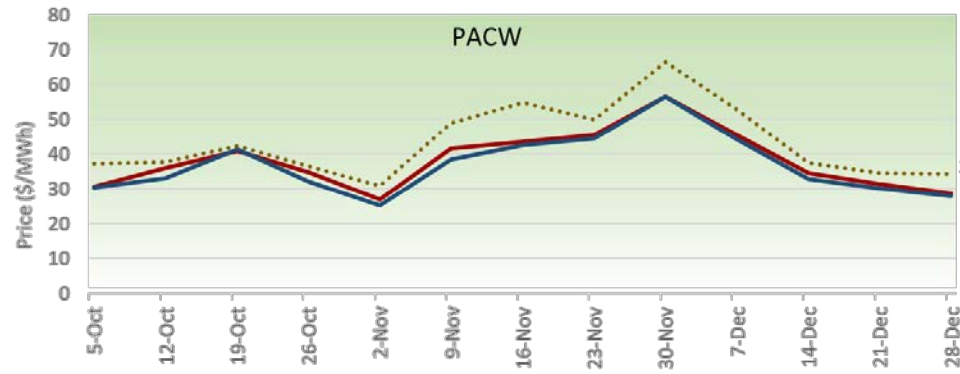
The percentage of savings is the average MW savings divided by the sum of the four individual BAA requirements.

# Weekly average prices in EIM areas



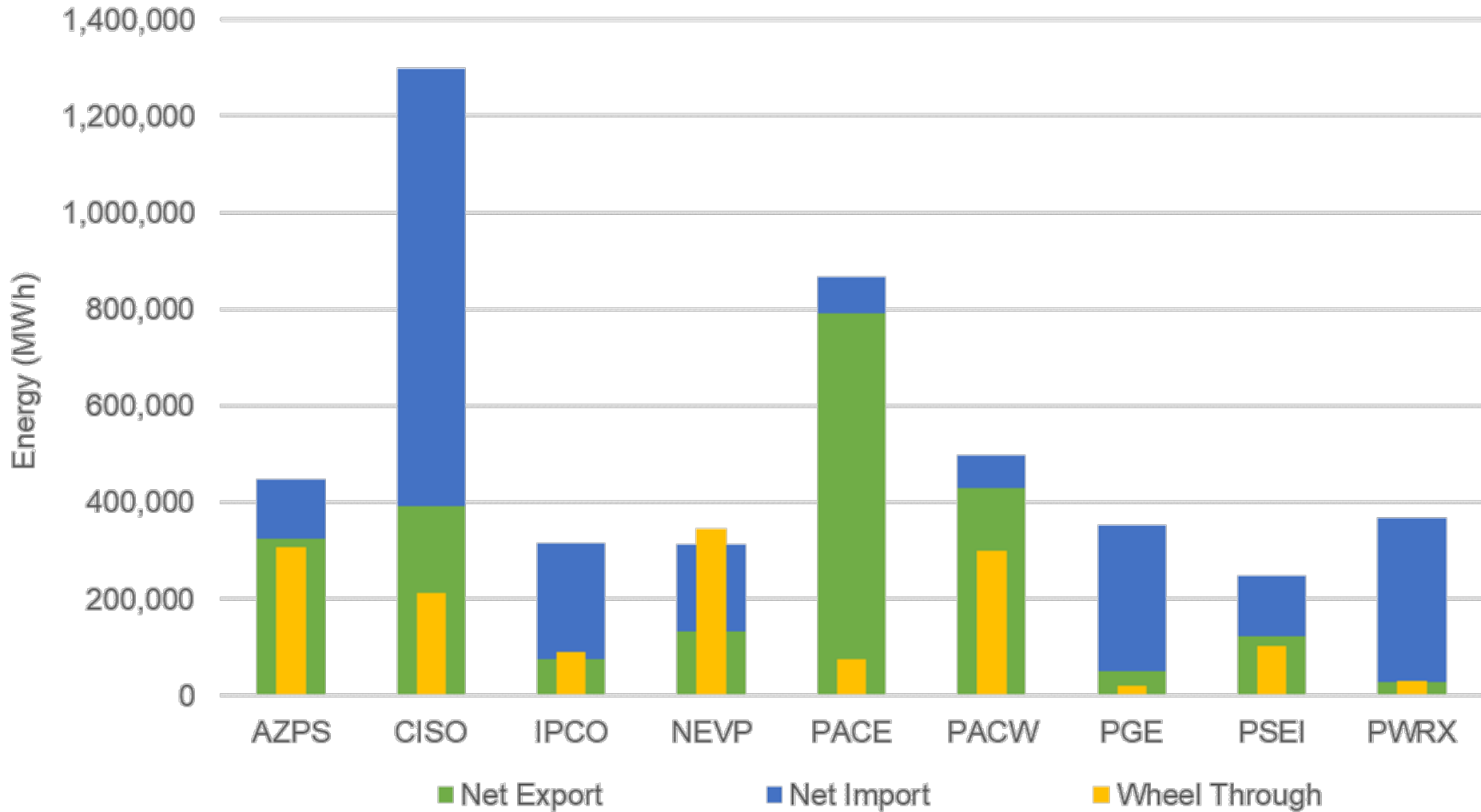
Estimated Proxy RTD ELAP FMM ELAP

# Weekly average prices in EIM areas

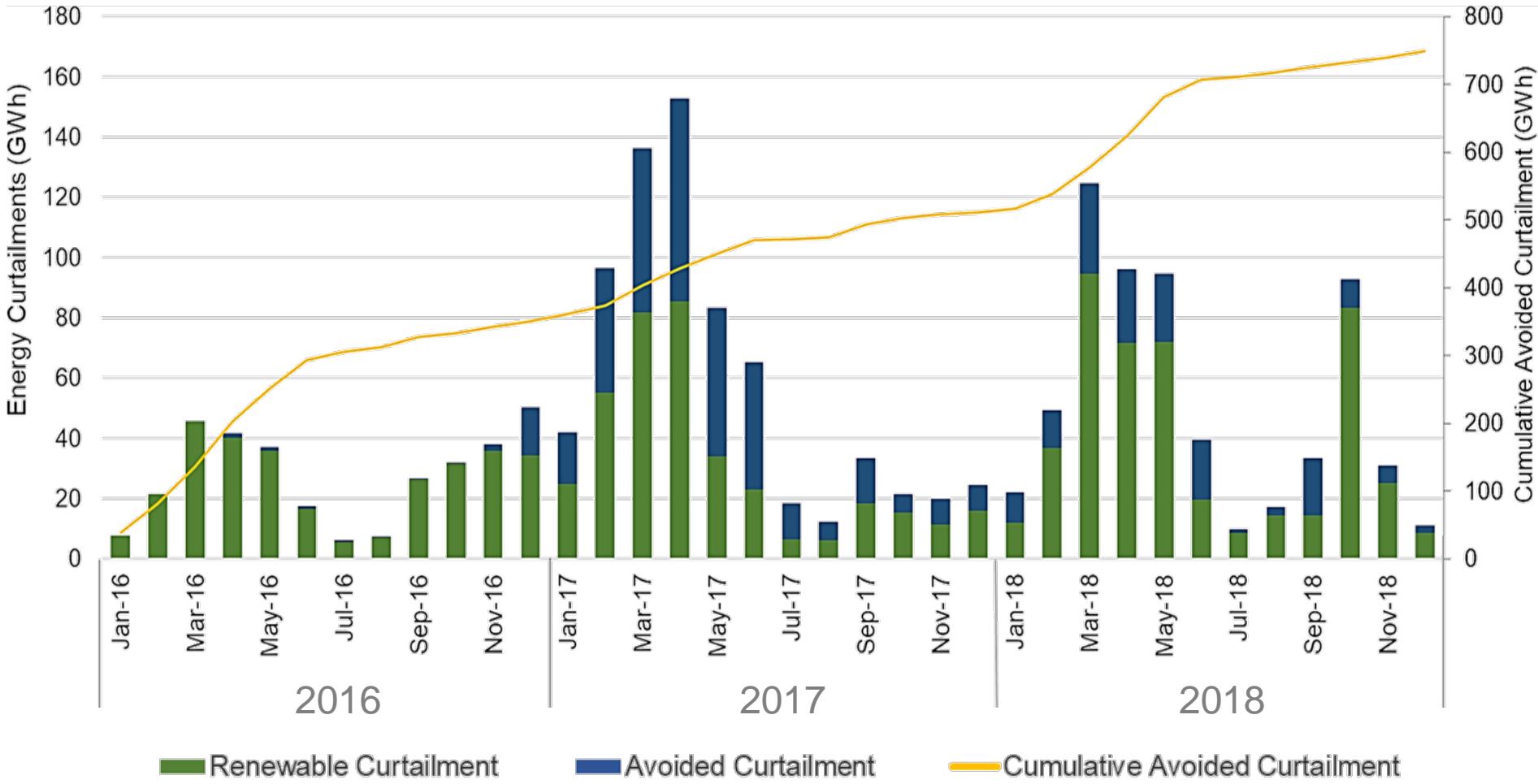


●●● Estimated Proxy 
 — RTD ELAP 
 — FMM ELAP

# Estimated wheel through transfers in Q4, 2018



# Energy imbalance market helps avoid curtailment





# Robust energy transfers in 4<sup>th</sup> quarter, 2018

