



Western energy imbalance market and benefits update

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Vice President, Market Quality & Renewable Integration

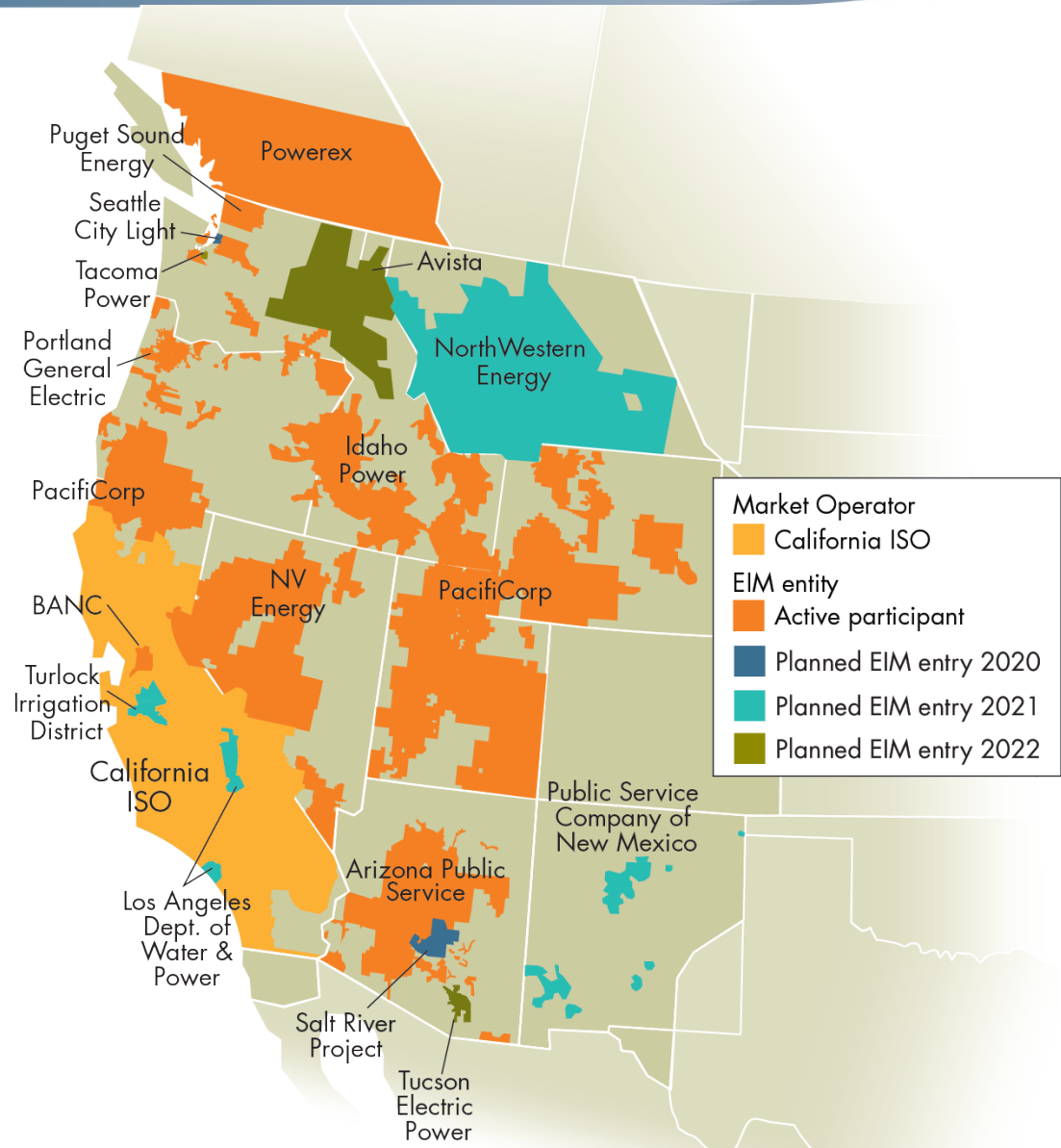
Board of Governors Meeting

General Session

September 18, 2019

EIM Update

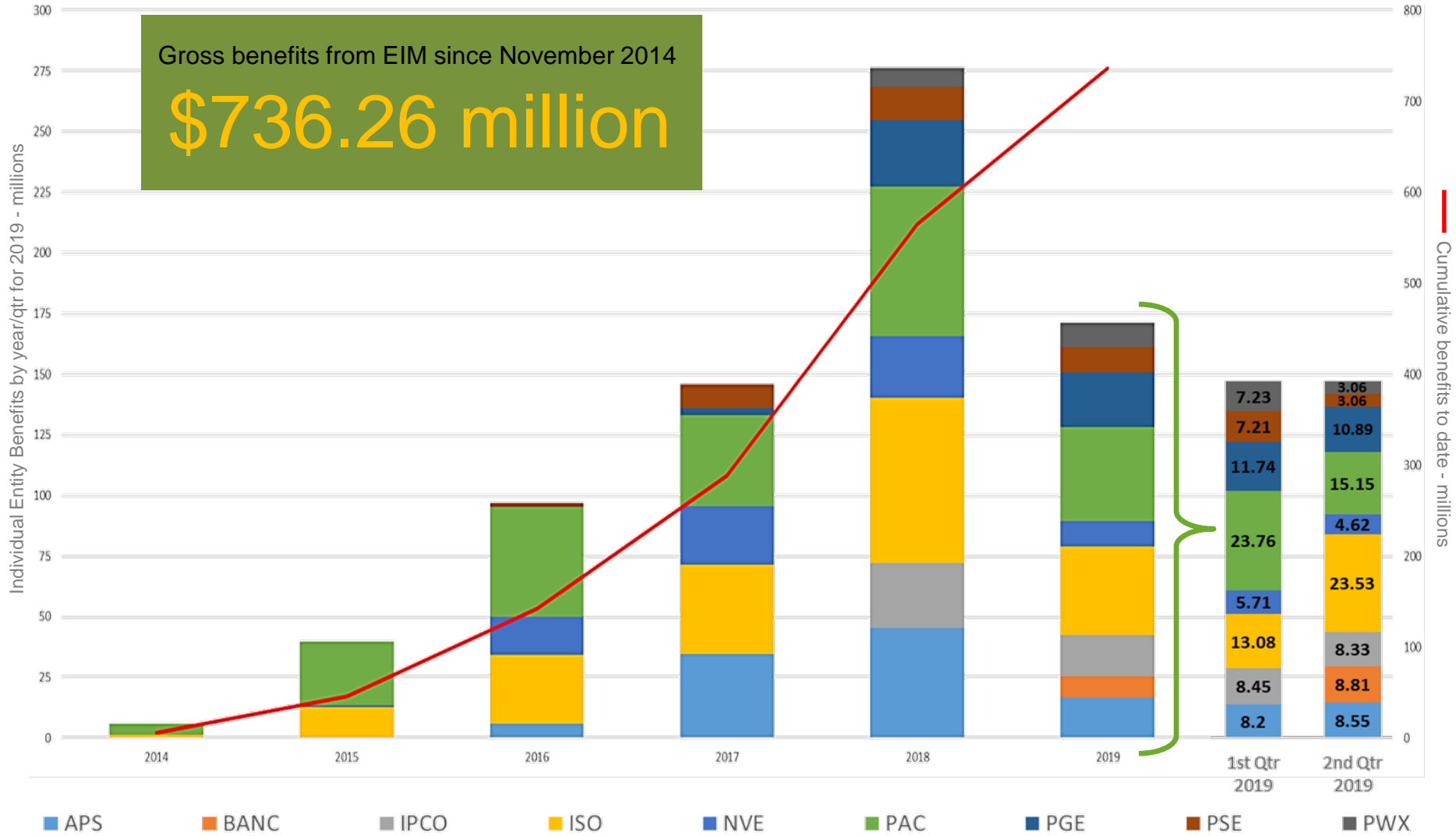
- Entities with signed implementation agreements:
 - 2020 – Salt River Project & Seattle City Light
 - 2021 – LADWP, NorthWestern Energy, Public Service Company of New Mexico & Turlock Irrigation District
 - 2022 – Avista, Tacoma Power & Tucson Electric Power



Gross economic benefits – 2019 2nd Quarter

Gross benefits from EIM since November 2014

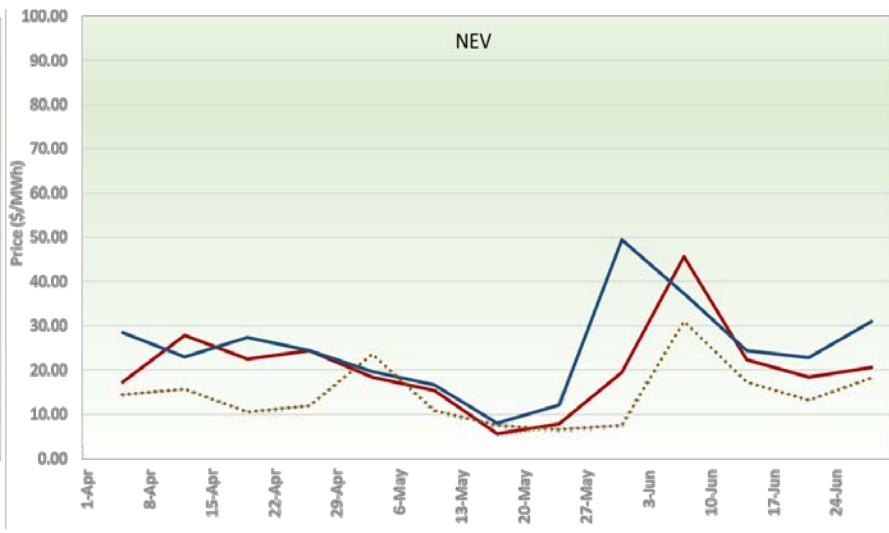
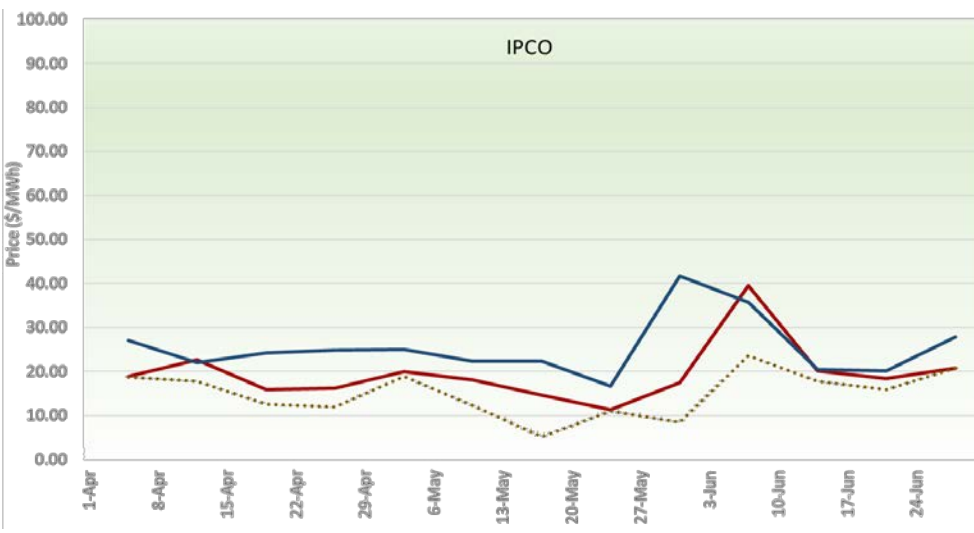
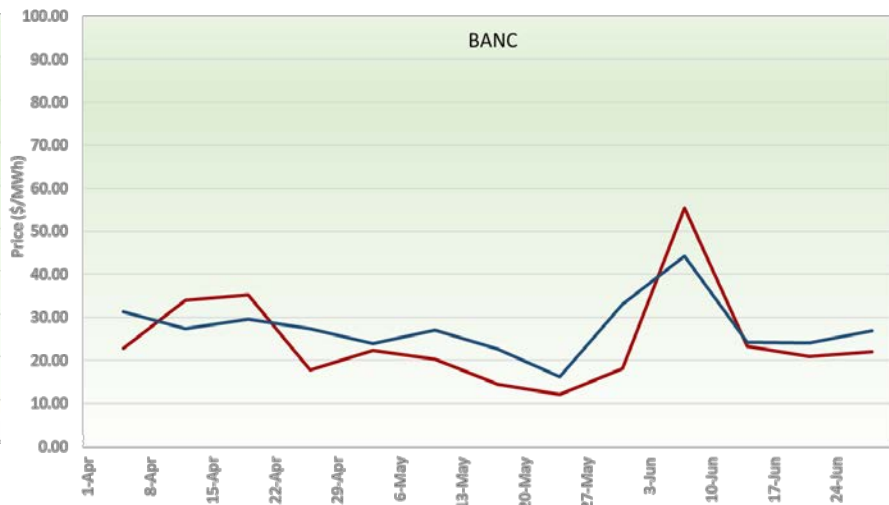
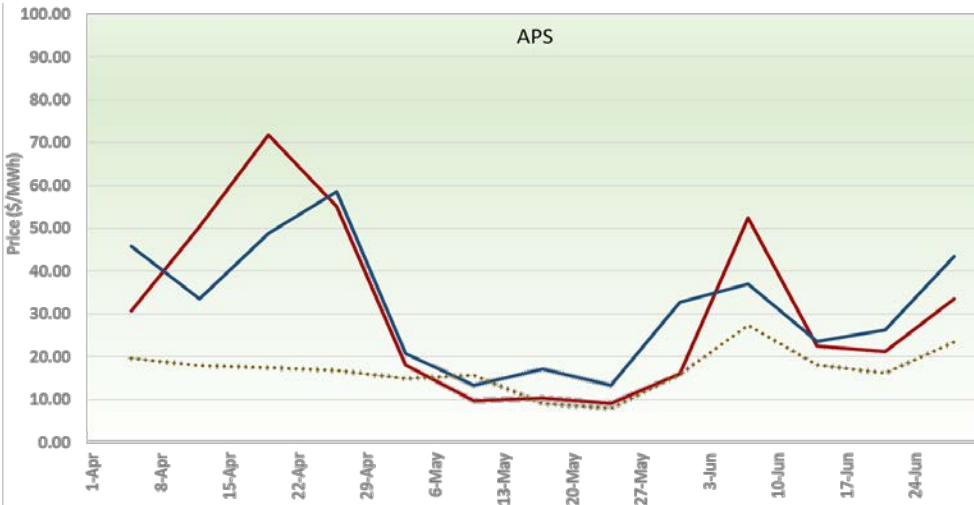
\$736.26 million



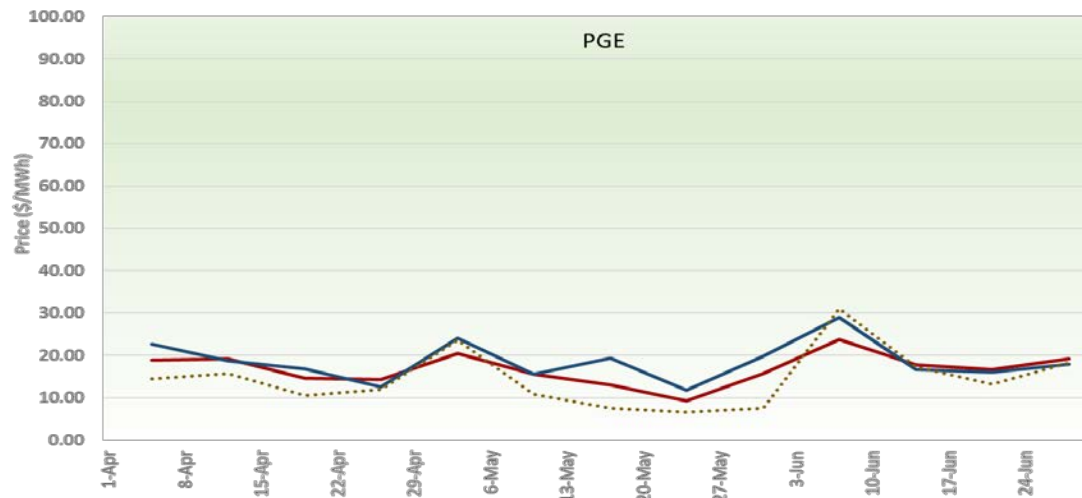
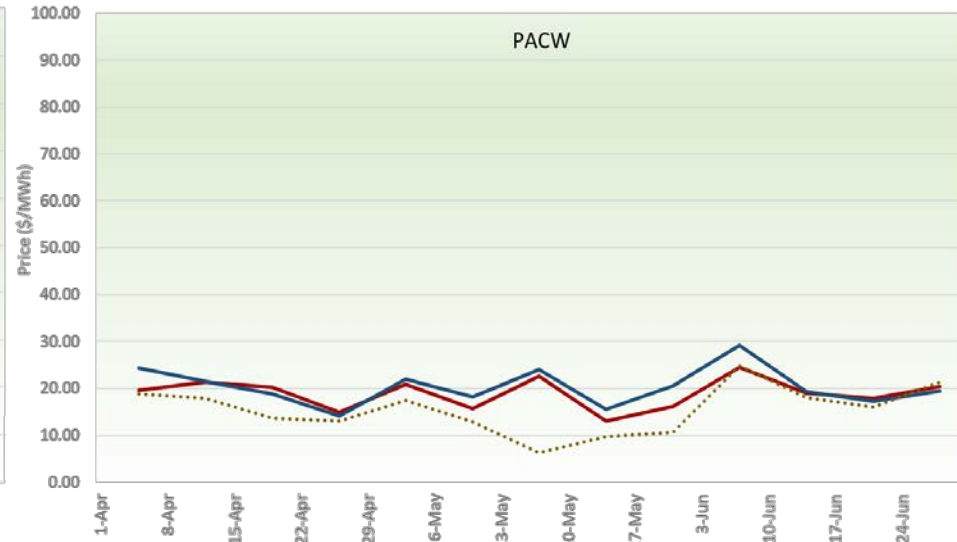
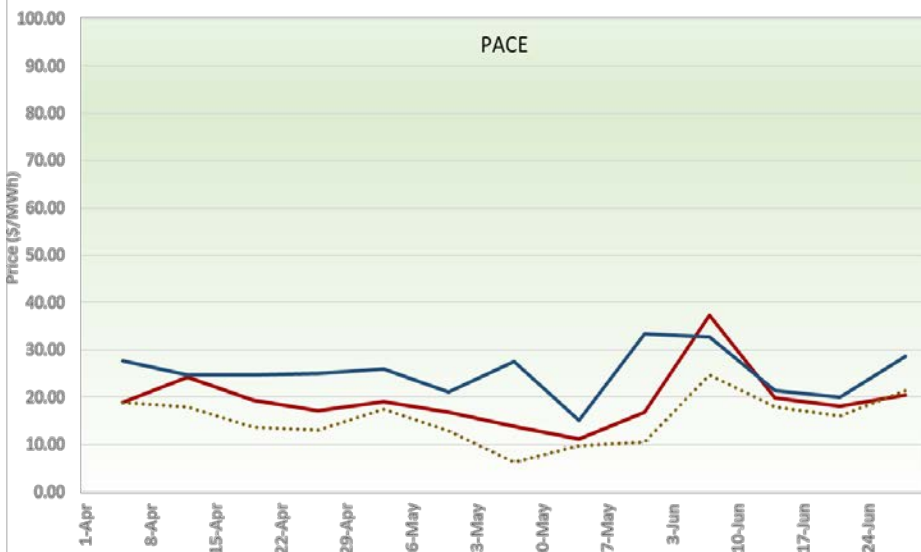
Flexible ramping procurement diversity savings for 2nd Quarter, 2019

	April		May		June	
Direction	Up	Down	Up	Down	Up	Down
Average MW saving	827	881	844	880	853	880
Sum of BAA requirements	1,861	1,959	1,867	1,934	1,953	1,879
Diversity Benefit	44%	45%	45%	45%	44%	47%
Estimated Savings	\$924,398	\$93,021	\$352,966	\$145,267	\$330,719	\$13,316

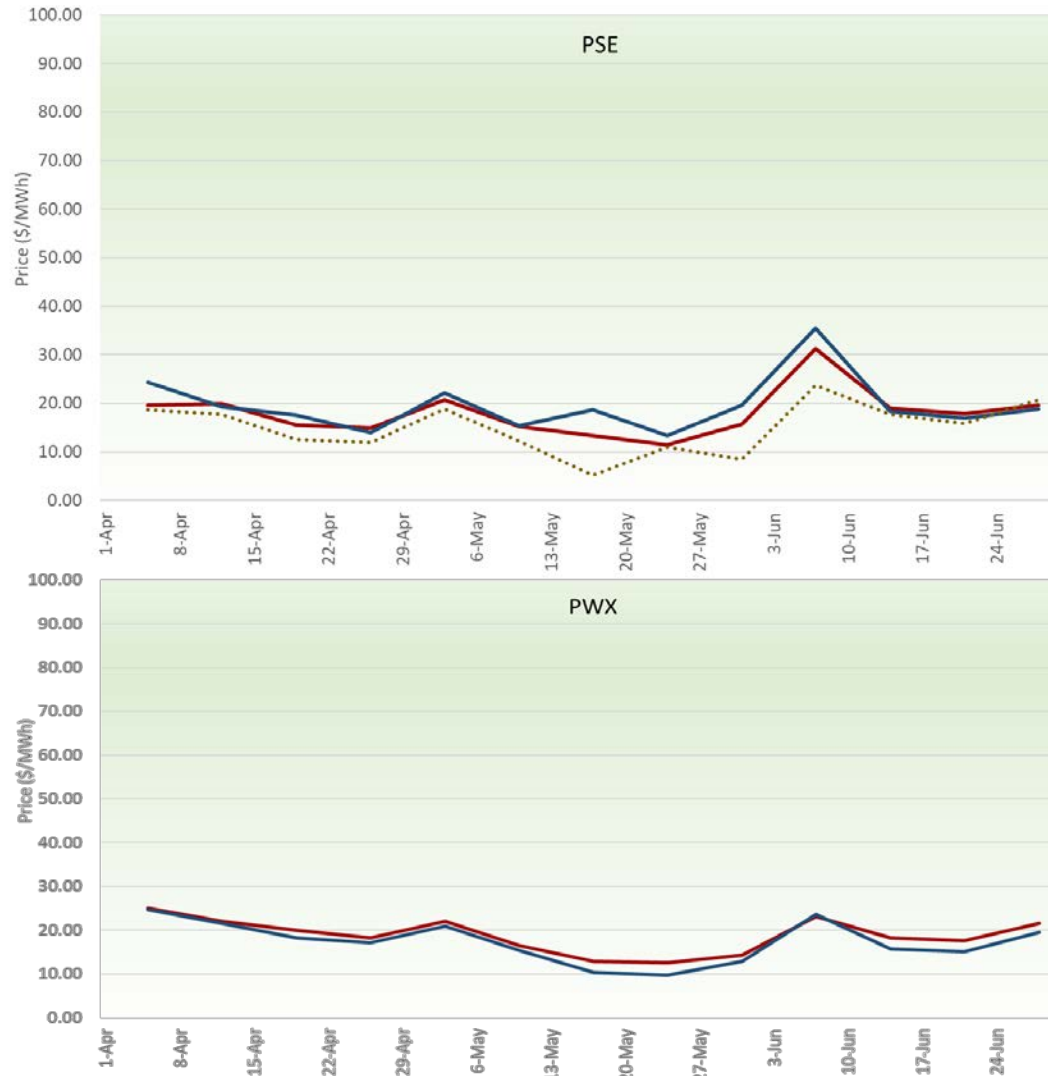
Weekly average prices in EIM areas



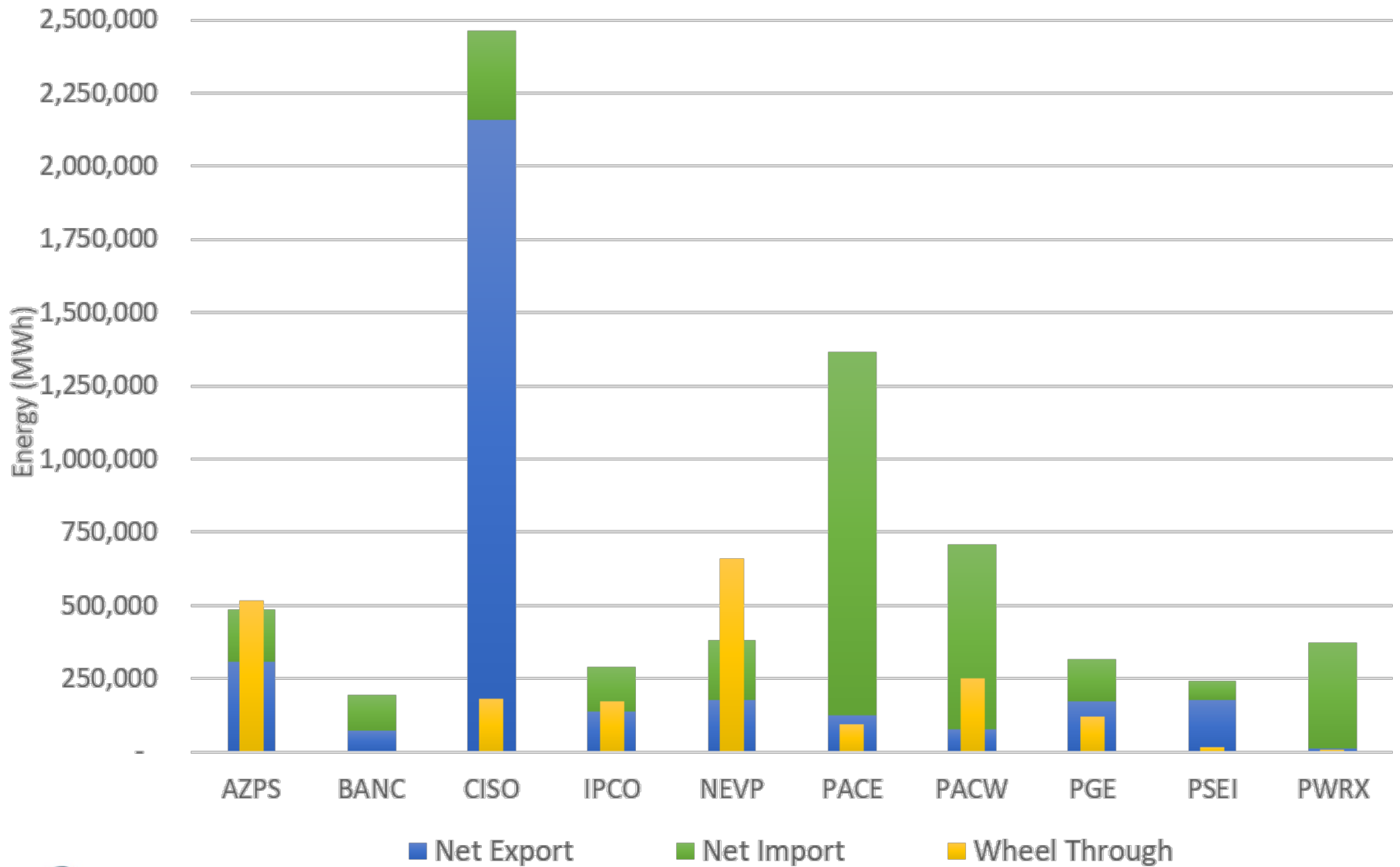
Weekly average prices in EIM areas



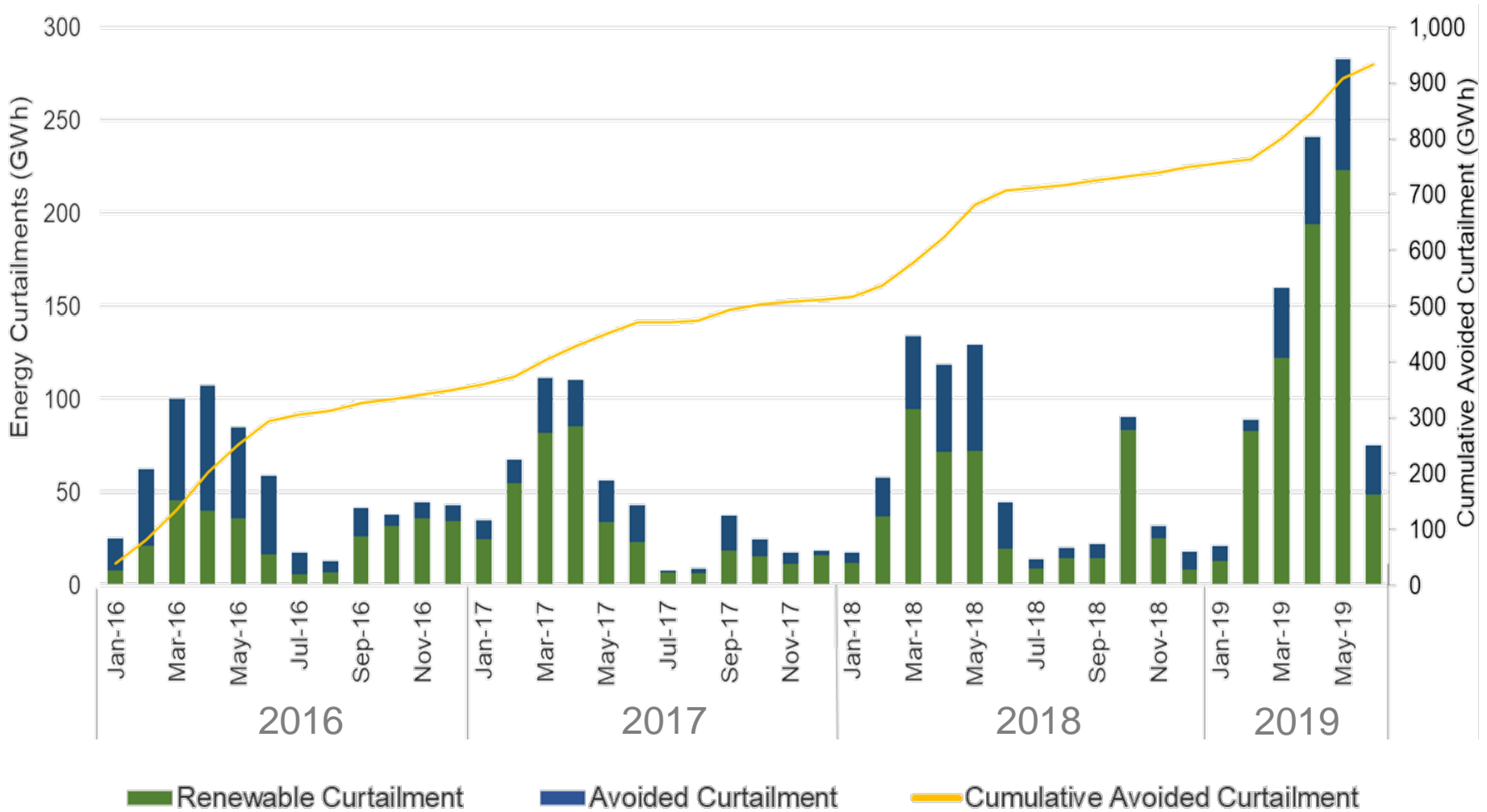
Weekly average prices in EIM areas



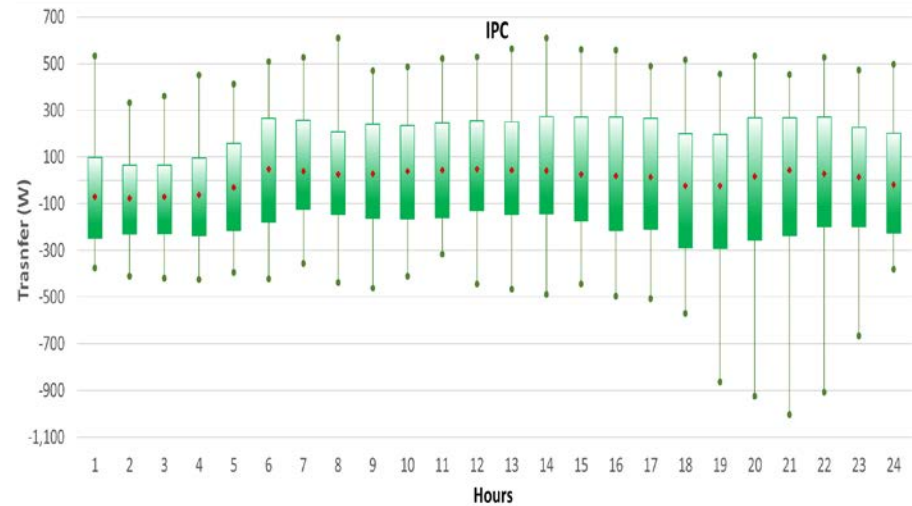
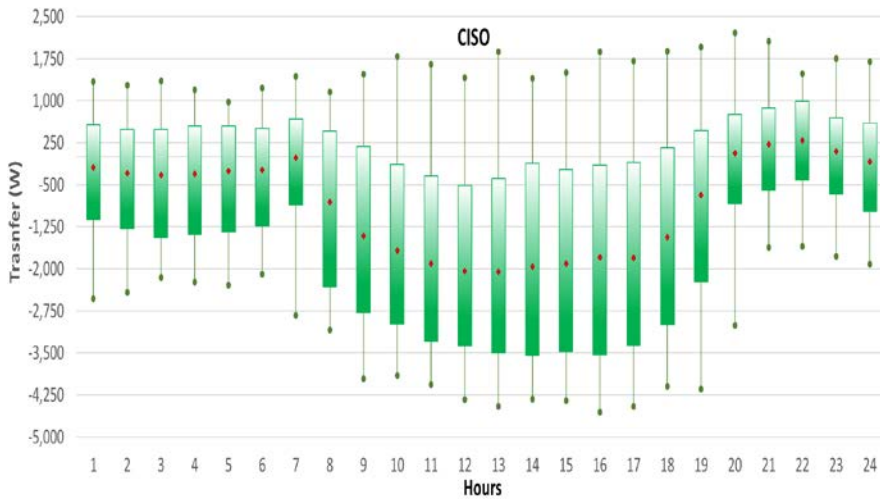
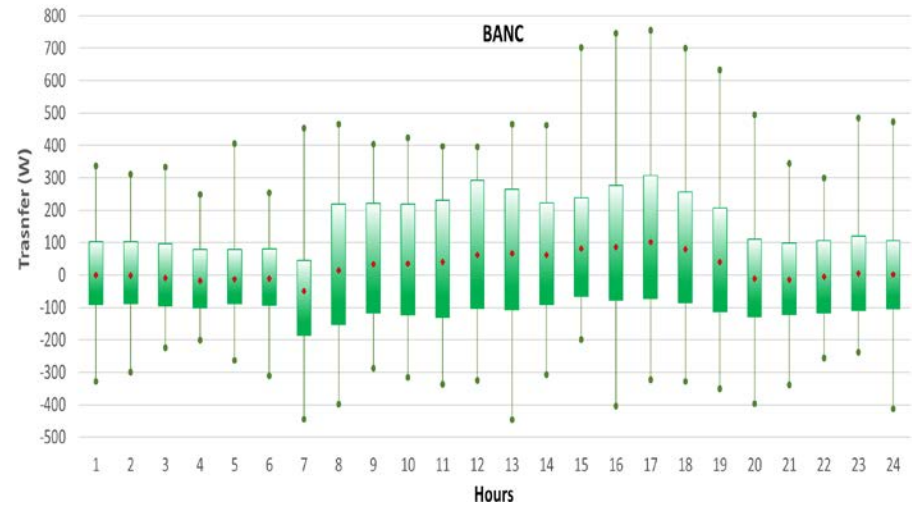
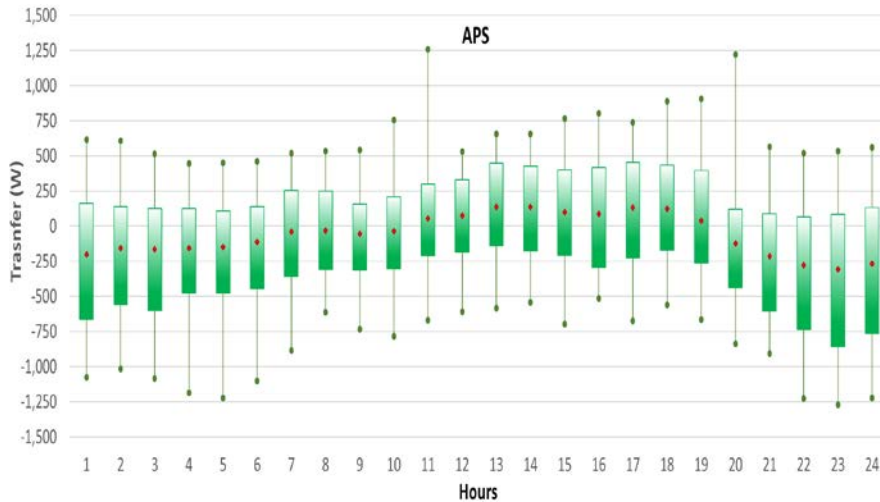
Estimated wheel through transfers in Q2, 2019




Energy imbalance market helps avoid curtailment




Robust energy transfers in 2nd quarter, 2019

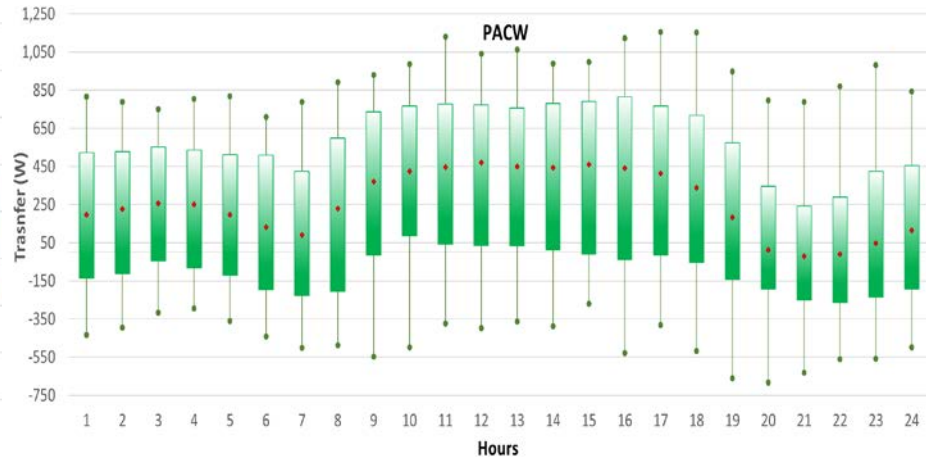
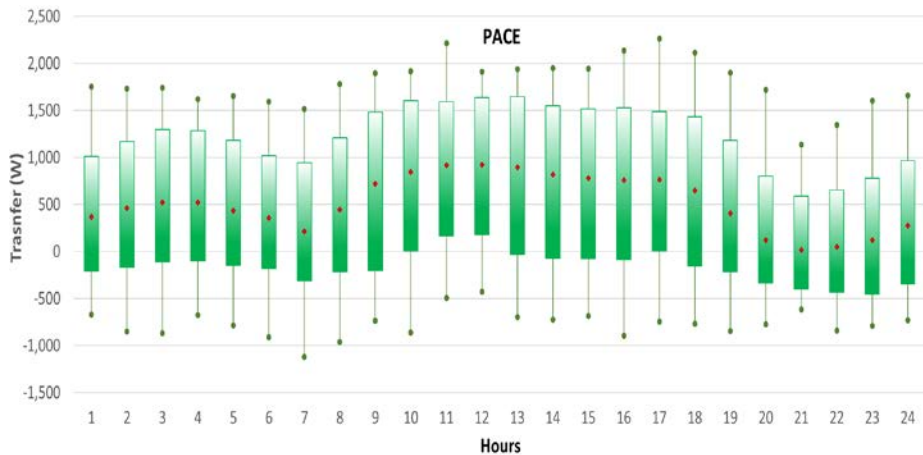
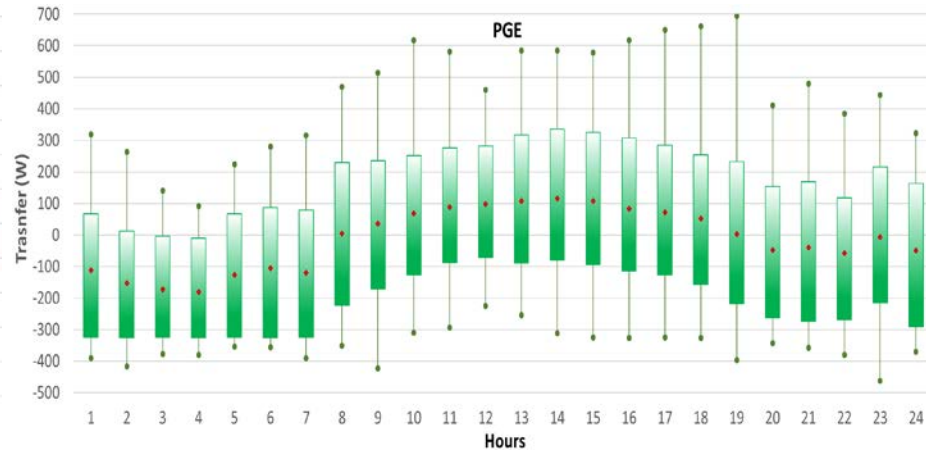
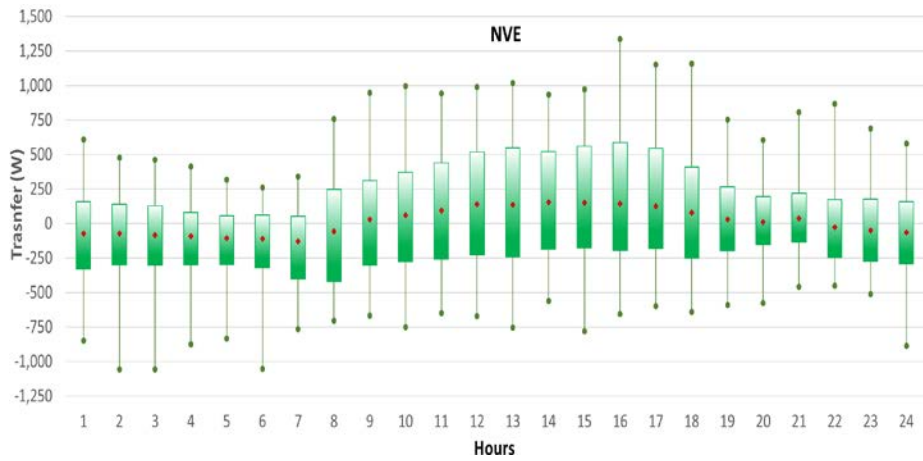



 California ISO  10th to 90th percentile


 Tails are max and min


 Simple averages

Robust energy transfers in 2nd quarter, 2019

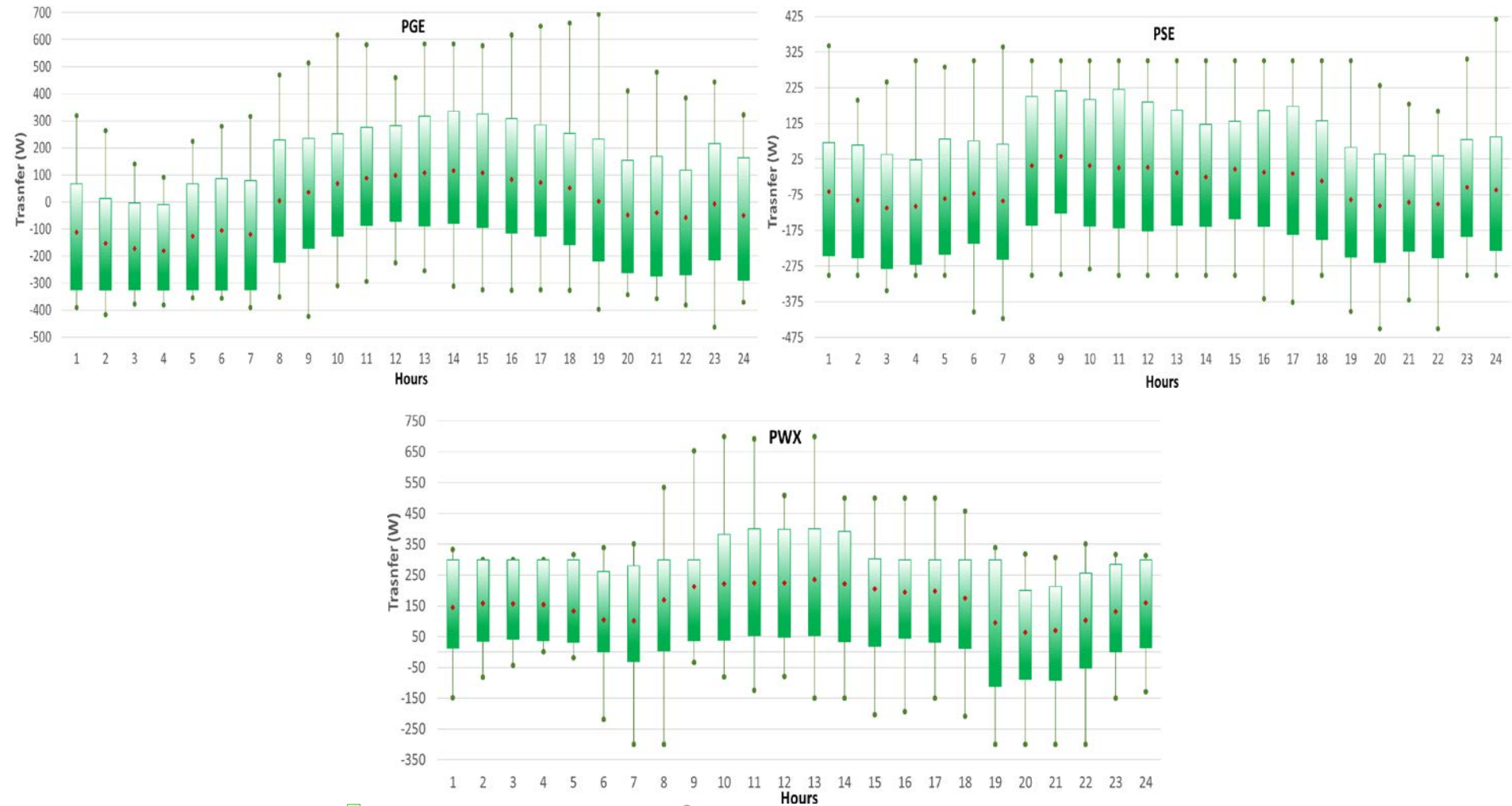


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10th to 90th percentile



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Simple averages