California ISO

# Western Energy Imbalance Market (WEIM) Resource Sufficiency Evaluation Enhancements

Stakeholder Meeting

May 3, 2022

# Housekeeping reminders

- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- Meeting is structured to stimulate dialogue and engage different perspectives.
- Please keep comments professional and respectful.
- Please try and be brief and refrain from repeating what has already been said so that we can manage the time efficiently.

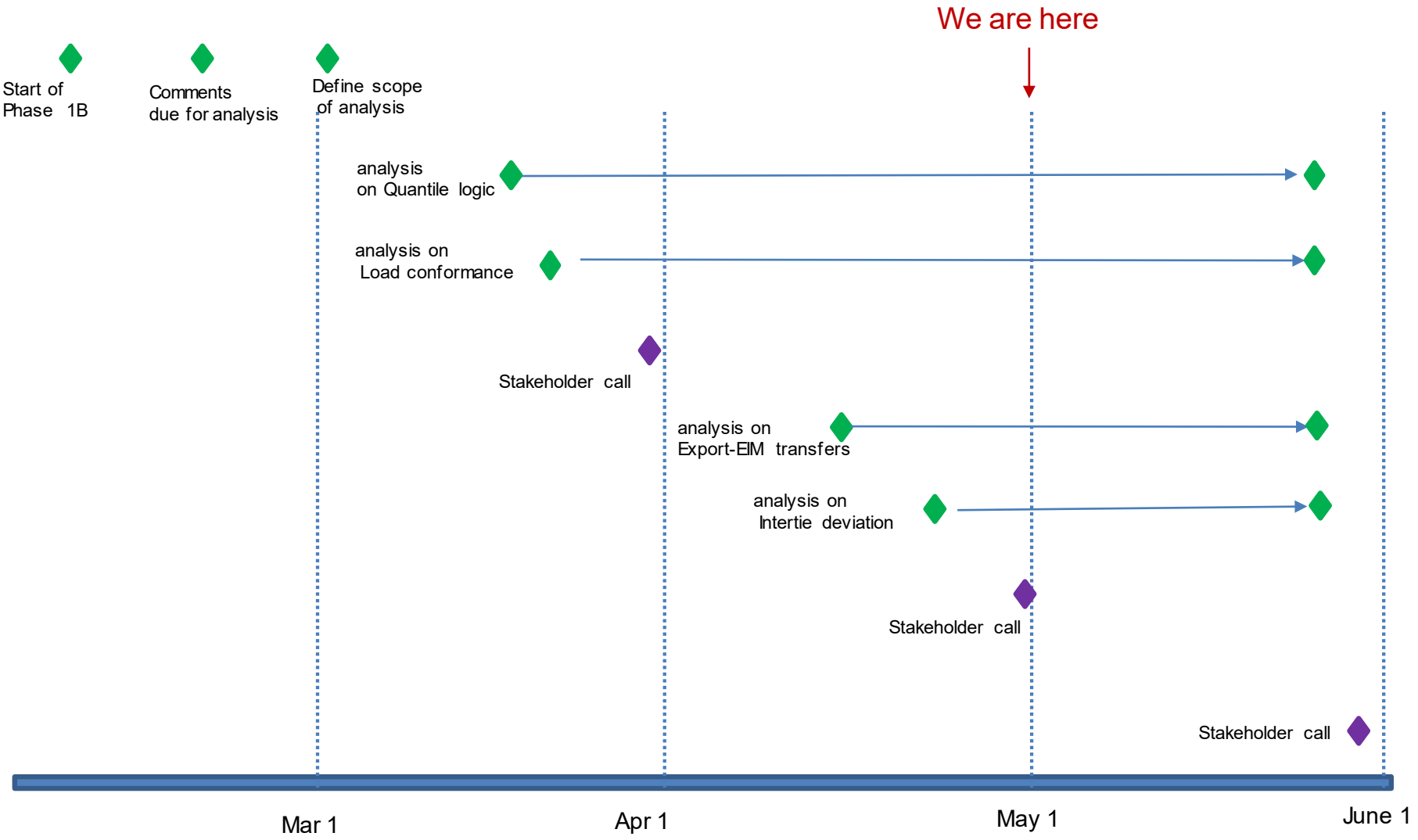
# Instructions for raising your hand to ask a question

- If you are connected to audio through your computer or used the “call me” option, select the raise hand icon  located on the top right above the chat window. **Note**: #2 only works if you dialed into the meeting.
  - Please remember to state your name and affiliation before making your comment.
- If you need technical assistance during the meeting, please send a chat to the event producer.
- You may also send your question via chat to either Brenda Corona or to all panelists.

# Agenda

| Time | Topic | Presenter |
|---|---|---|
| 9:00 – 9:05 | Welcome and Introduction | Brenda Corona |
| 9:05 - 10:00 | Interaction of Hourly Intertie Schedules and WEIM Transfers | Guillermo Bautista Alderete |
| 10:00 - 10:50 | Intertie Deviation Adder | Katie Wikler |
| 10:50 - 11:00 | Next Steps | Brenda Corona |

# Estimated timeline to complete Analysis effort



# Interaction of Hourly Intertie Schedules and WEIM Transfers

Guillermo Bautista Alderete
Haifeng Liu

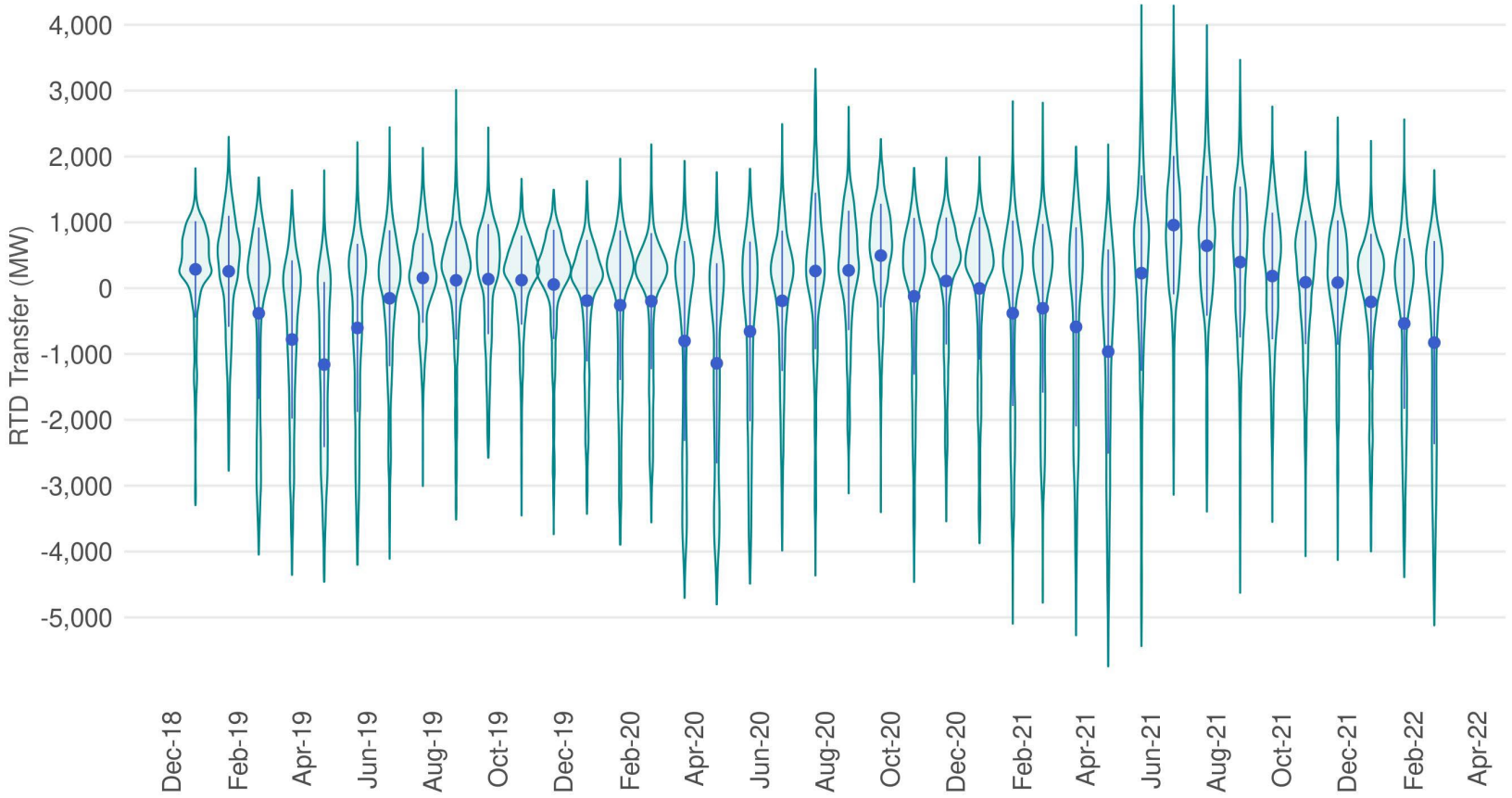
Market Analysis and Forecasting

May 3, 2022

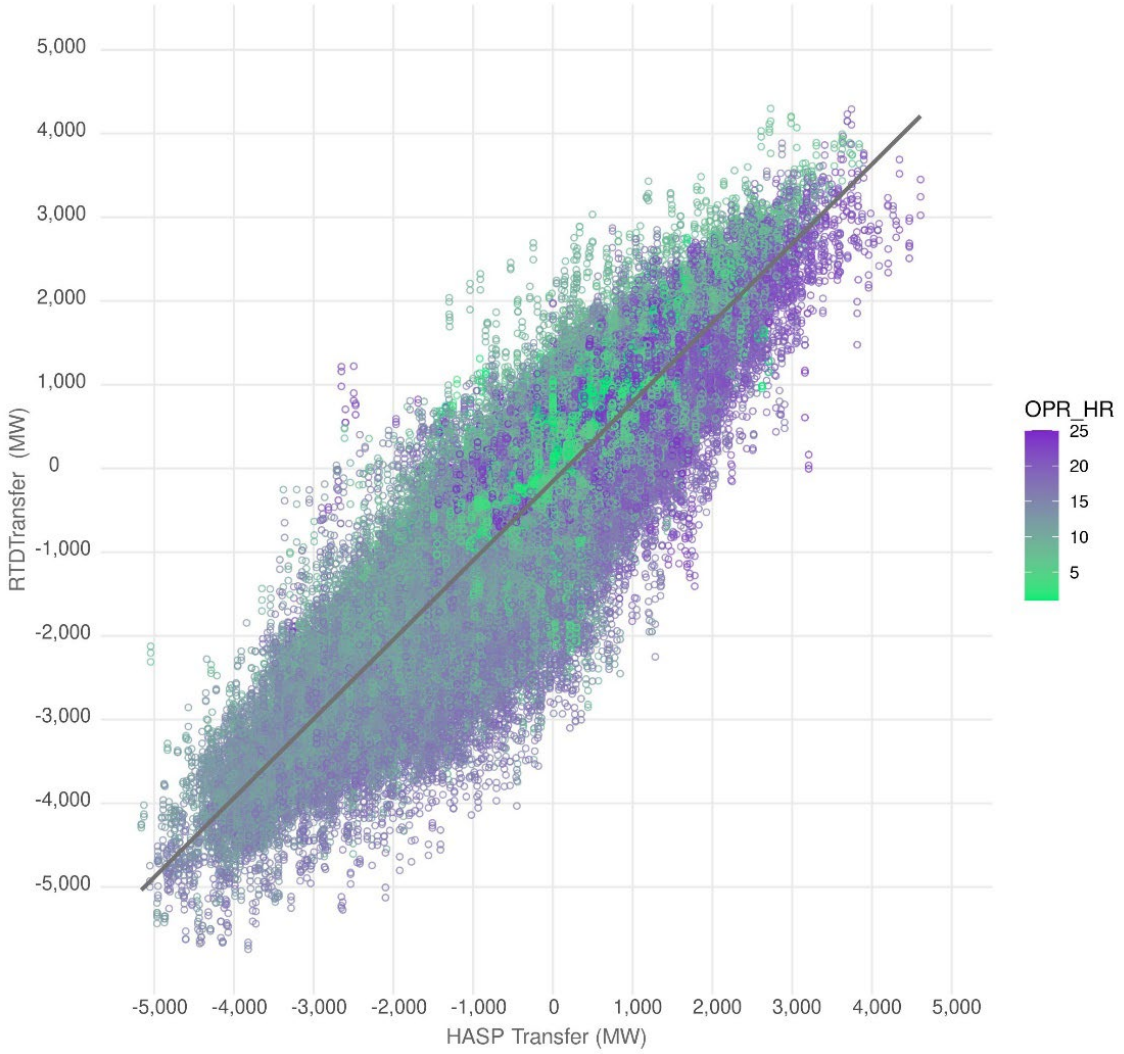
# Summary of findings

- There are robust volumes of WEIM transfer for CAISO area in both import and export directions
- The majority of hourly exports bid-in and cleared in the HASP market were for real-time self schedules exports
- WEIM import transfers into CAISO area are consistently unrealized from the HASP and FMM market to the RTD market
- During peak hours in tight-supply summer days, the volume of WEIM import transfers were lower than the volume of scheduled hourly exports
- The unrealized WEIM import transfers represent an additional requirement to CAISO's area supply to support the cleared hourly exports

# Western Energy Imbalance Market transfers for CAISO's area are robust in both import and export directions



# Although overall there is a relative close tracking of WEIM transfers across markets, certain intervals show divergence



# WEIM transfers in RTD came in lower than HASP transfers during peak hours in critical summer days

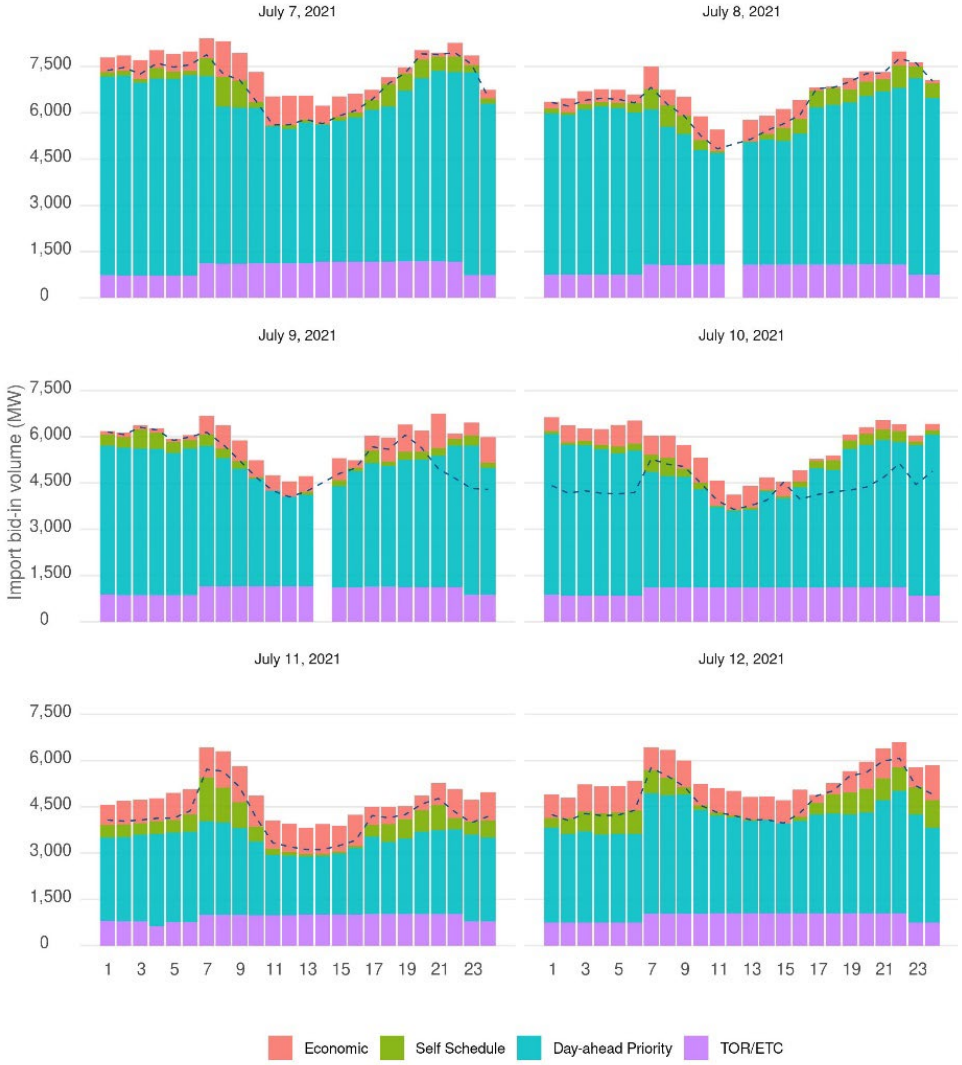

# Implications of WEIM transfers

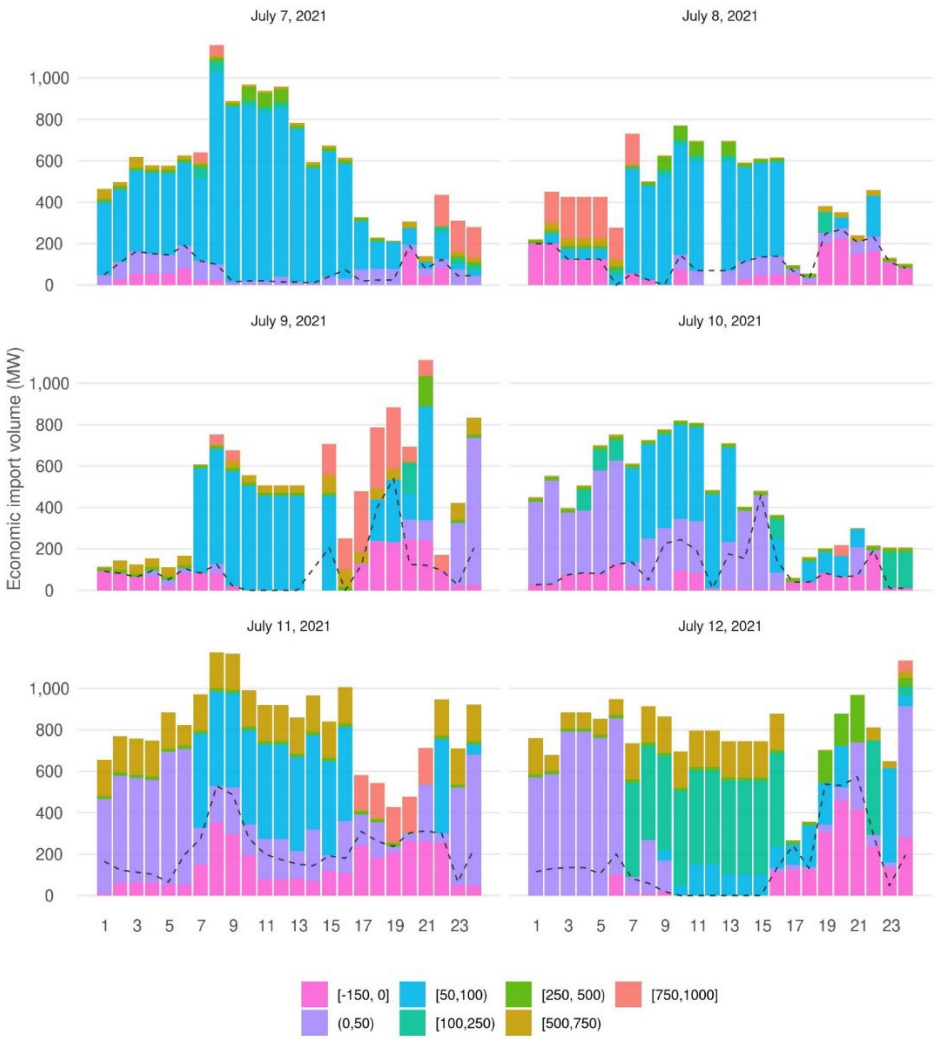
- WEIM transfers are dynamically determined based on overall economics of the system-wide market
- As conditions change across markets, including load conformance changes, WEIM transfers can change
- A reduction of WEIM transfer imports to CAISO from HASP to RTD represents unrealized transfers
- WEIM transfers in HASP market are advisory, they are not operationally binding, but they can influence the clearing of hourly interties and commitments
- WEIM transfers in RTD market are binding, but they cannot longer influence the clearing of hourly interties

# Intertie schedules

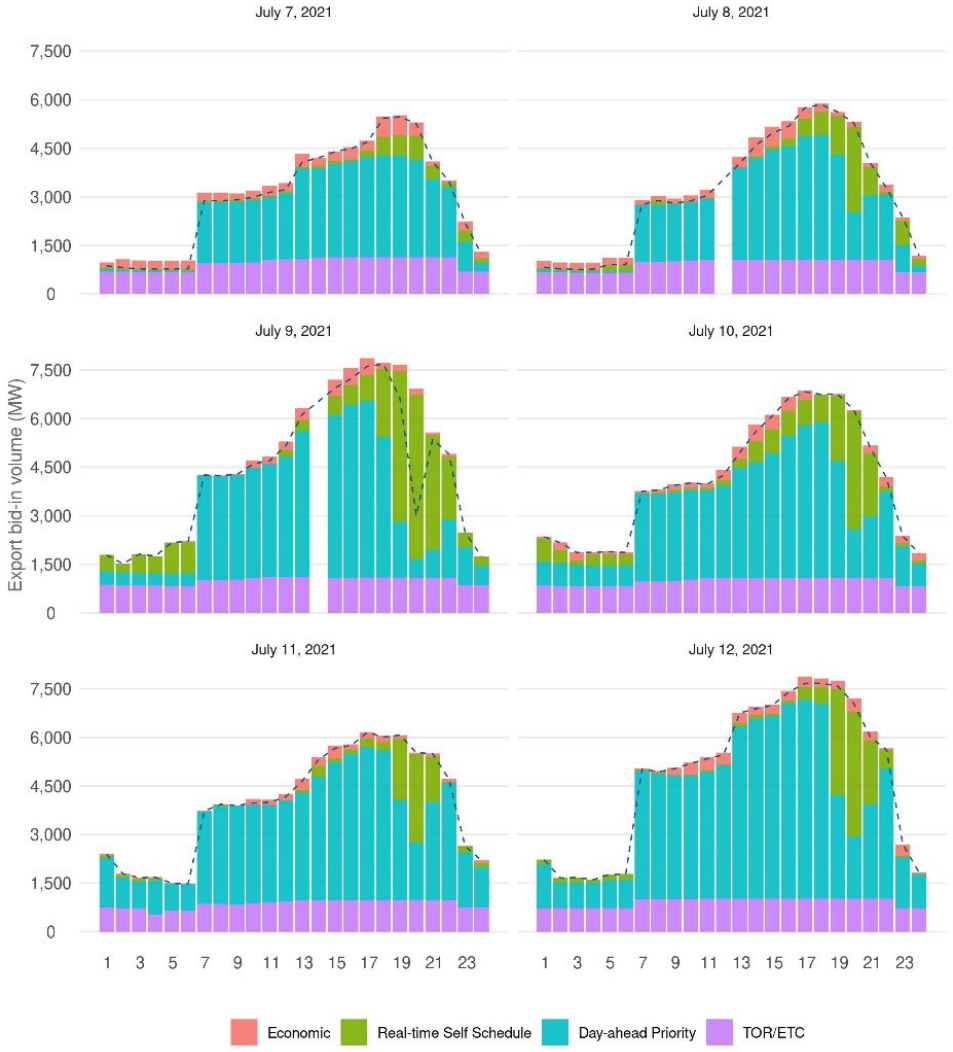
- Majority of intertie transactions are hourly
- HASP is the last opportunity to clear interties
- Interties can participate with economical bids or self schedules
- HASP is a centralized market clearing interties concurrently with internal resources and consideration of implied WEIM transfers
- WEIM import transfers may support exports
- Real-time self-schedule exports come with priority higher than any economical bid and will drive the full utilization of supply, even from in other EIM areas

# During summer days, the volume of imports with economical bids was small



# The majority of exports cleared in HASP were self schedules

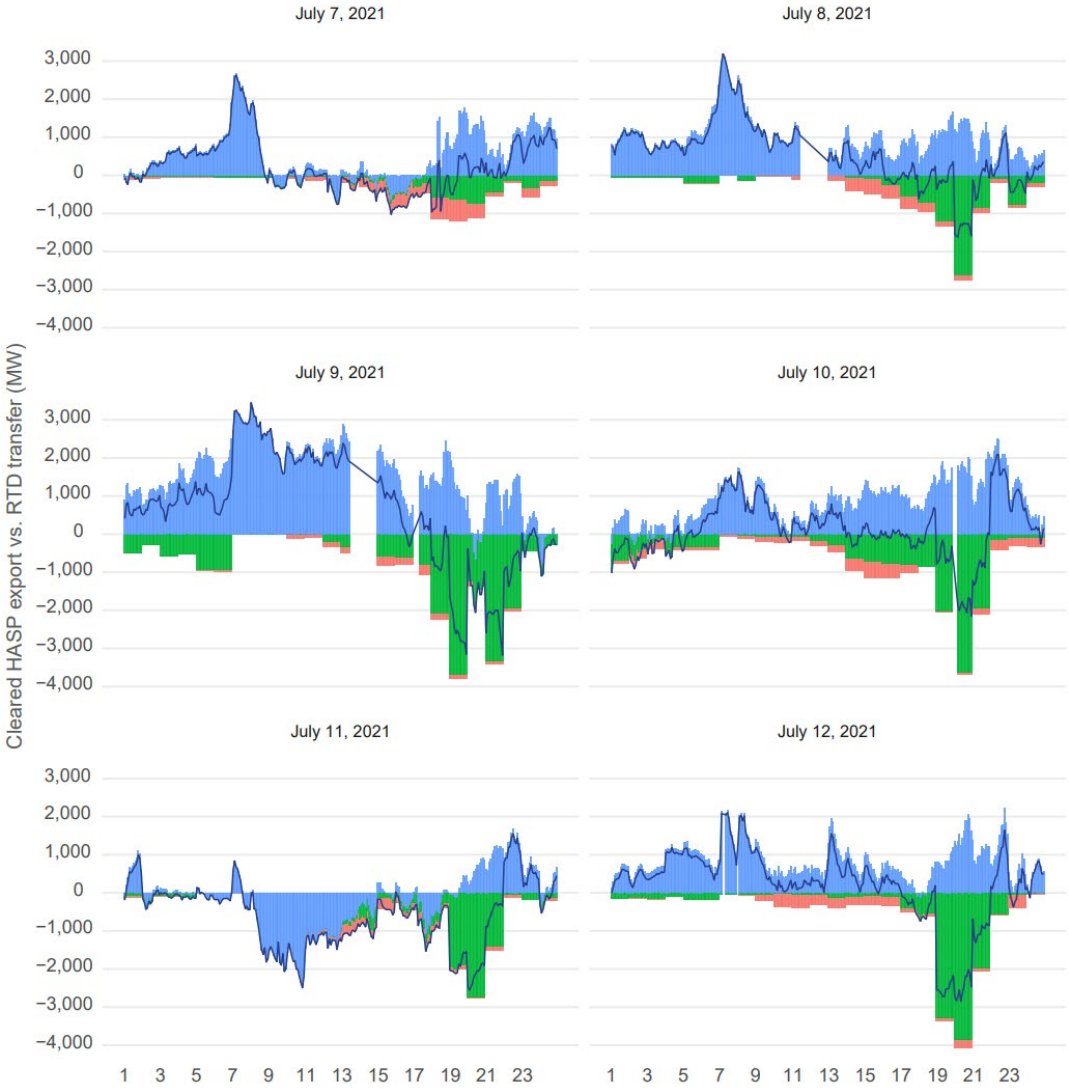



# There have been concerns about the interaction between intertie schedules and WEIM transfers

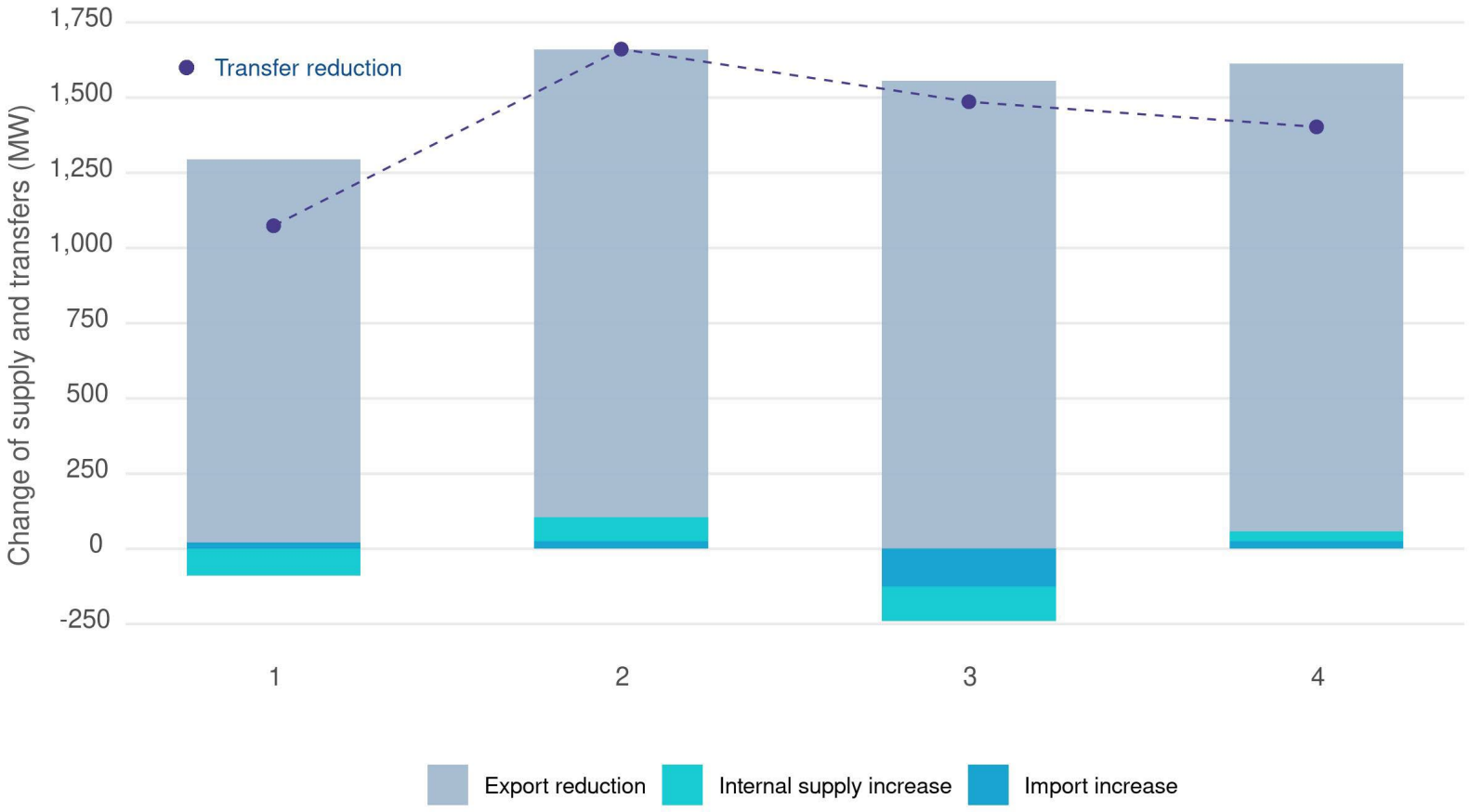
- A concern about WEIM transfers in HASP, which are advisory, can end up supporting the awards of binding intertie exports

- A concern that CAISO during tight supply conditions is relying in WEIM import transfers to meet its own load obligation

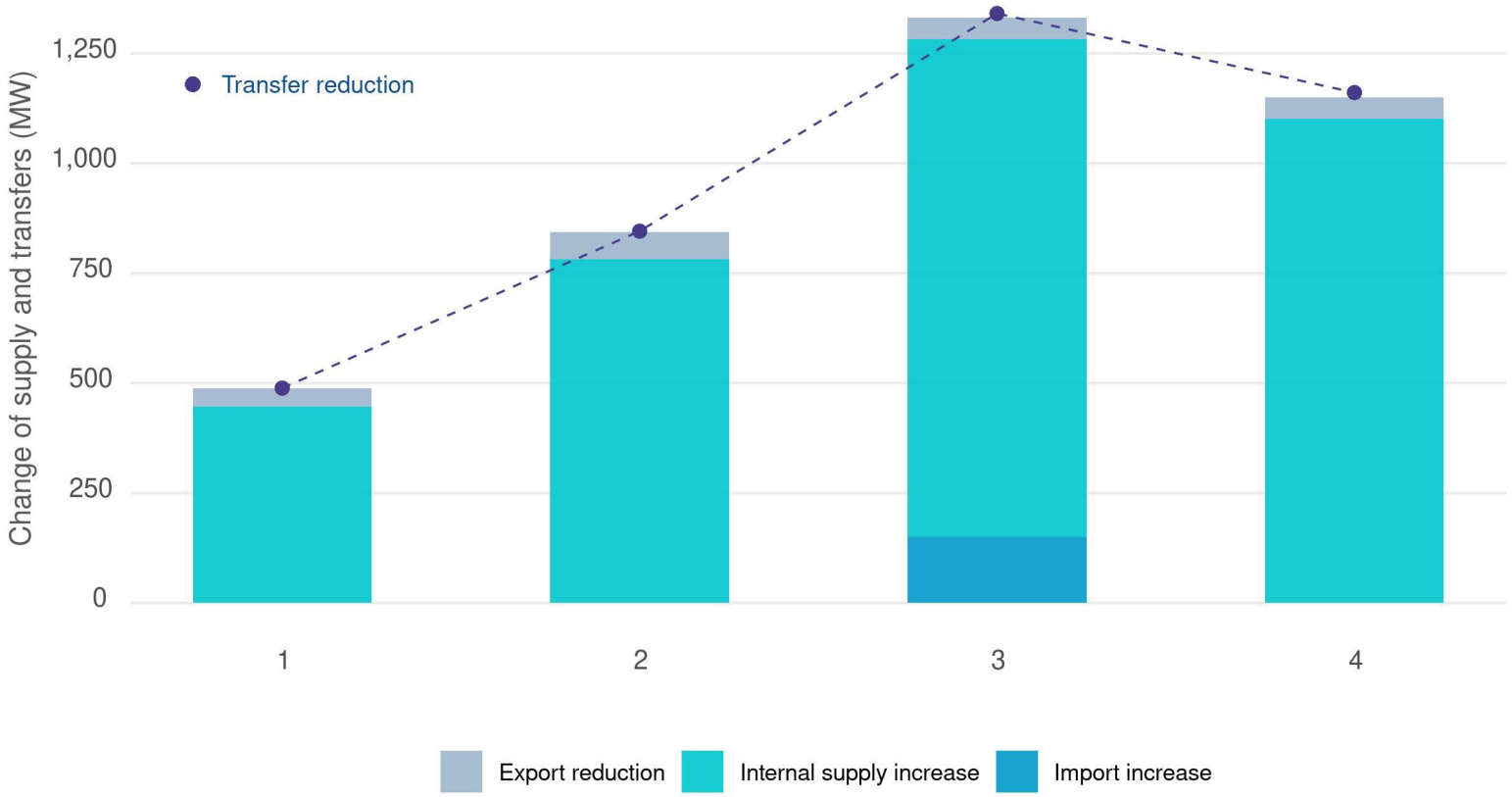
# During tight supply conditions in summer 2021, WEIM import transfers to CAISO were lower than real-time exports



# On July 9, HE19 the advisory and unrealized WEIM import transfers supported about 1,500MW of intertie real-time exports



# On August 11, HE19 the unrealized advisory WEIM import transfers supported a very small volume of real-time exports




Real-time exports were mainly supported by CAISO internal resources

# Net Scheduled Interchange Requirements in the Western Energy Imbalance Market (WEIM)

Katie Wikler
Market Analysis and Forecasting

May 3, 2022

# Overview

- Executive Summary
- Actual NSI Deviation in 2021
- Historical Performance of NSI Uncertainty Requirement
- Correlation of Actual NSI Deviation with External Factors

# Executive Summary

- Analysis on historical performance of NSI uncertainty requirement used in the capacity test was performed for the study period Jan – Dec 2021

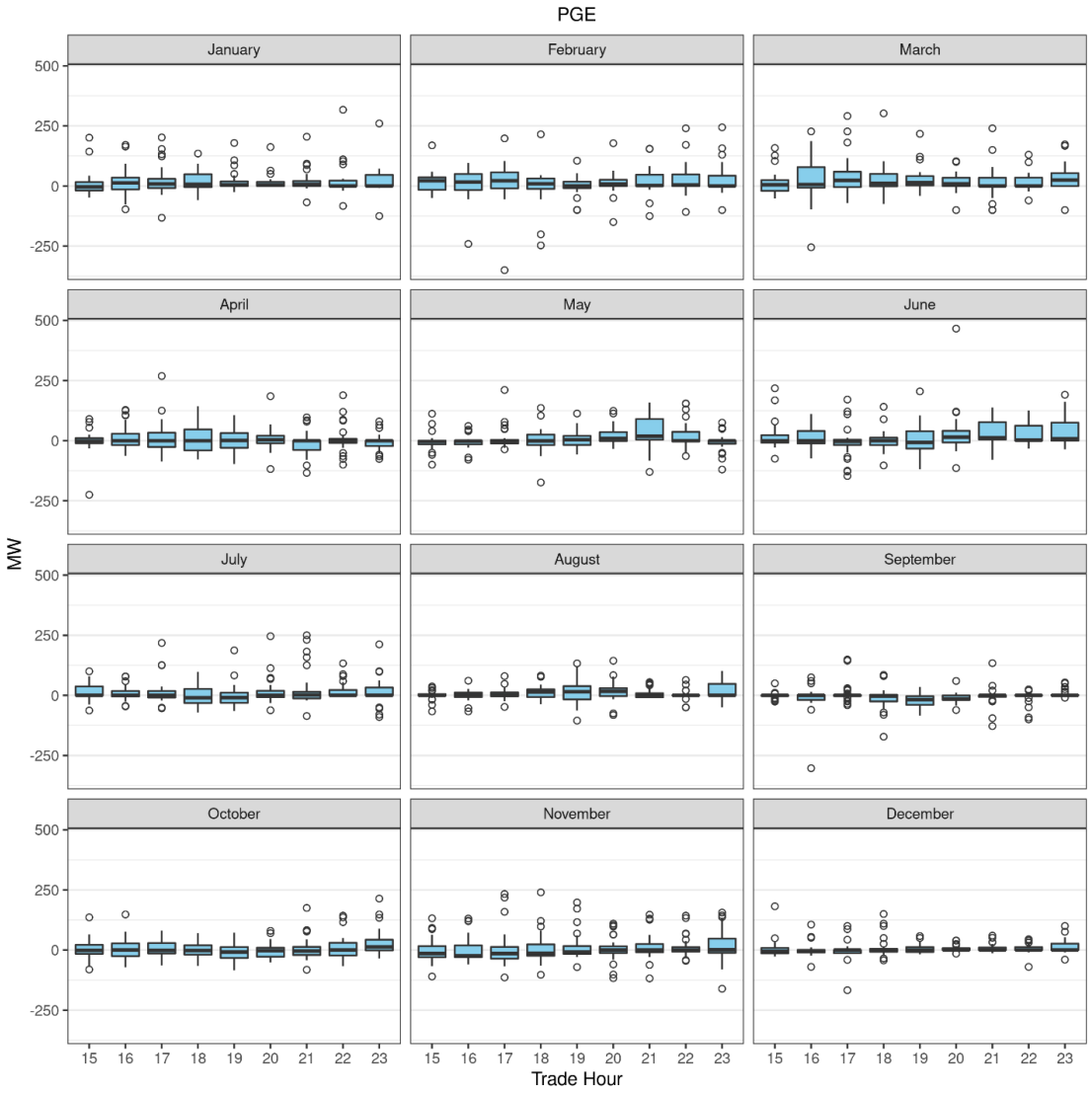
- Primary findings:
  - The historical approach used to calculate the NSI uncertainty requirement may not accurately predict actual NSI deviation
  - The NSI uncertainty requirement consistently exceeded actual NSI deviation during periods of non-coverage
  - Actual NSI deviation is not clearly correlated with external factors and does not consistently follow seasonal trends

# Actual NSI Deviation in 2021

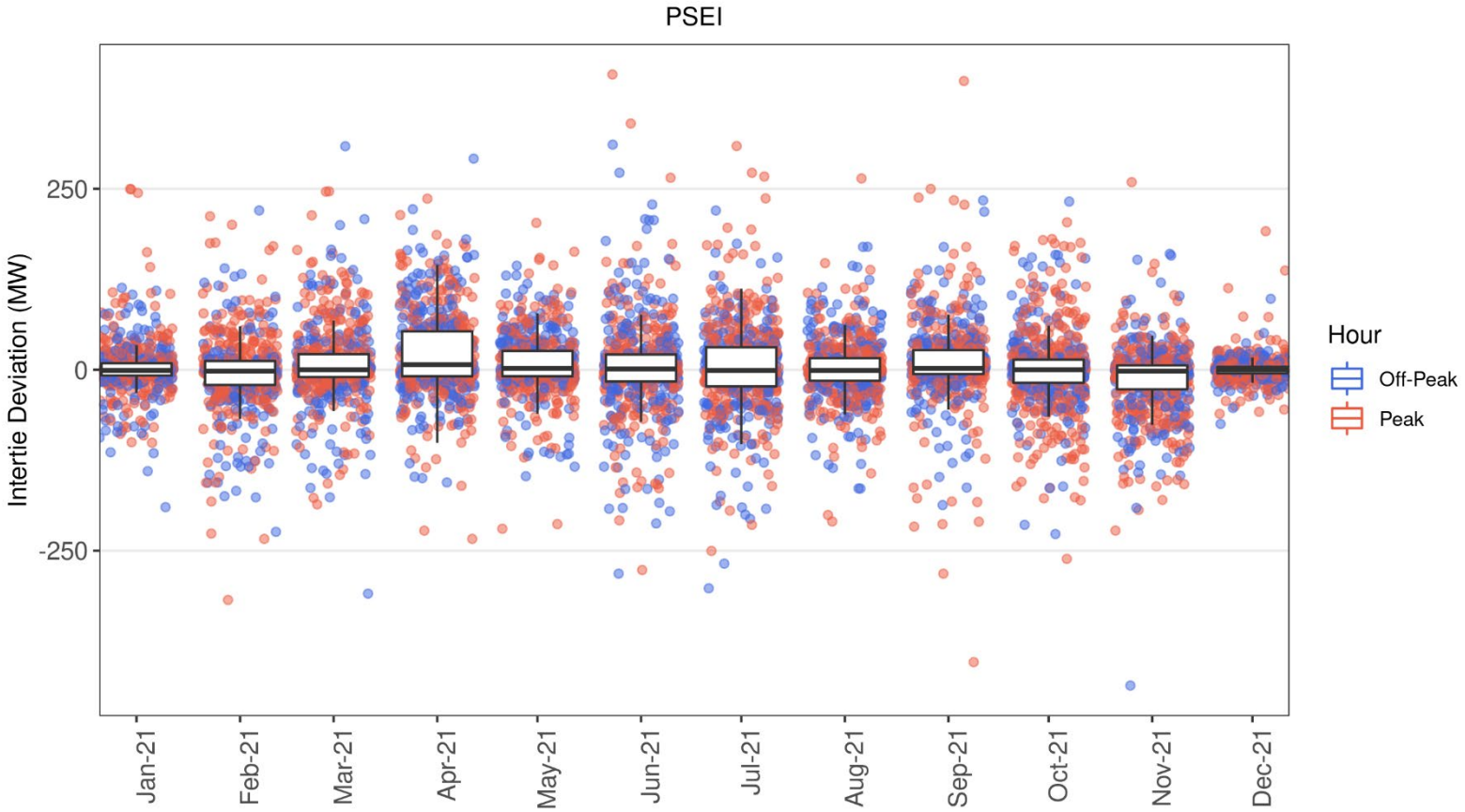
$$Actual\ NSI\ deviation = \sum Base\ Schedules_{T-40} - \sum Tagged\ Schedules_{T-20}$$

- Deviation calculated at an hourly granularity
  - Negative deviation = more tagged MWs than base-scheduled MWs
  - Positive deviation = more base-scheduled MWs than tagged MWs
- No notable seasonal/hourly trend across WEIM BAAs
  - Focused on HEs 15 - 23 which saw approx. 65% of upward capacity test failures in 2021
- No notable trend across peak and off-peak hours throughout 2021

# Actual NSI deviation generally clustered within tight IQR between HE15-23 with no consistent hourly or seasonal trend across WEIM BAAs



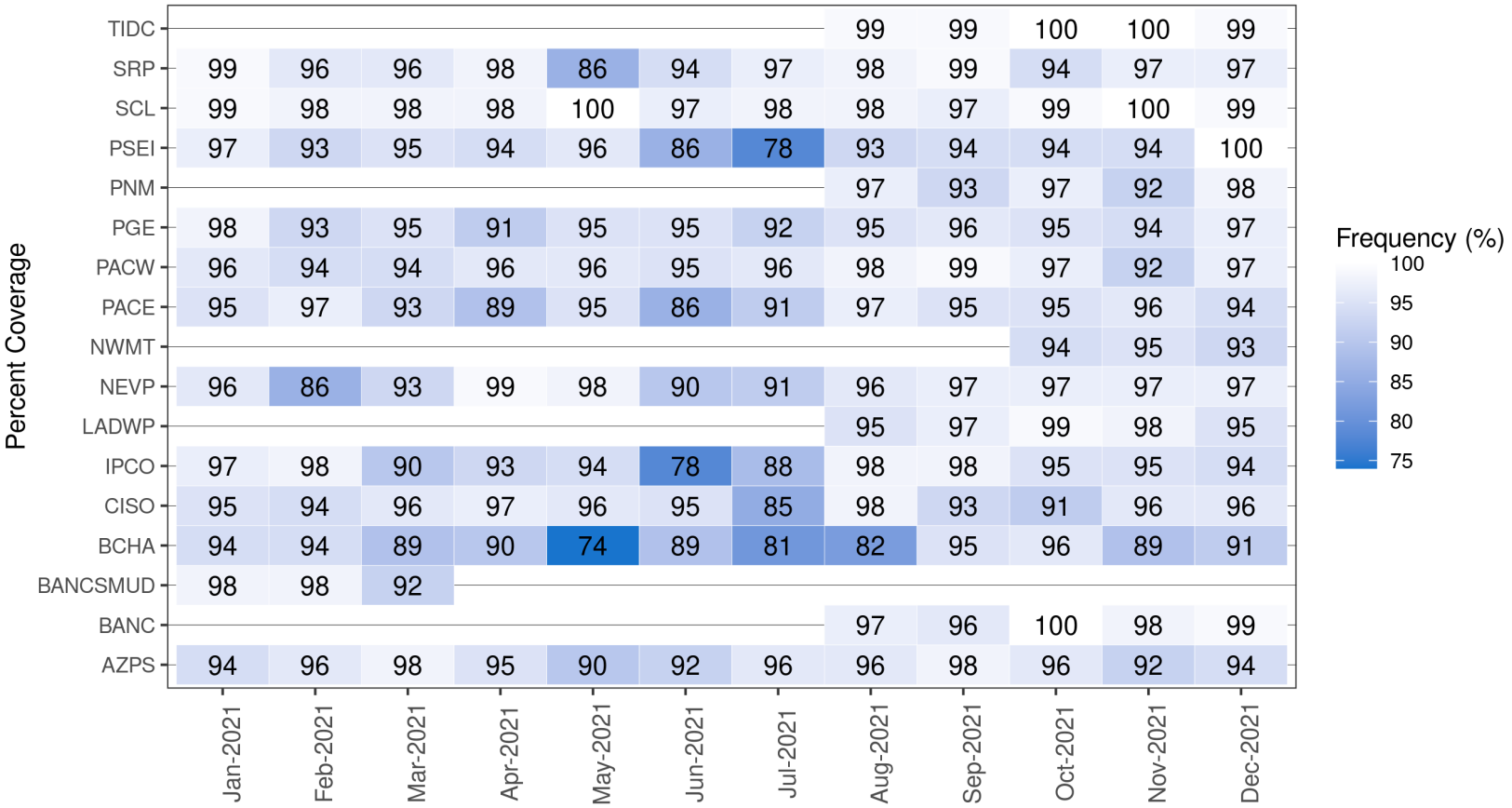
# Actual NSI deviation outliers occurred across both peak and off-peak hours with no consistent trend across BAAs.



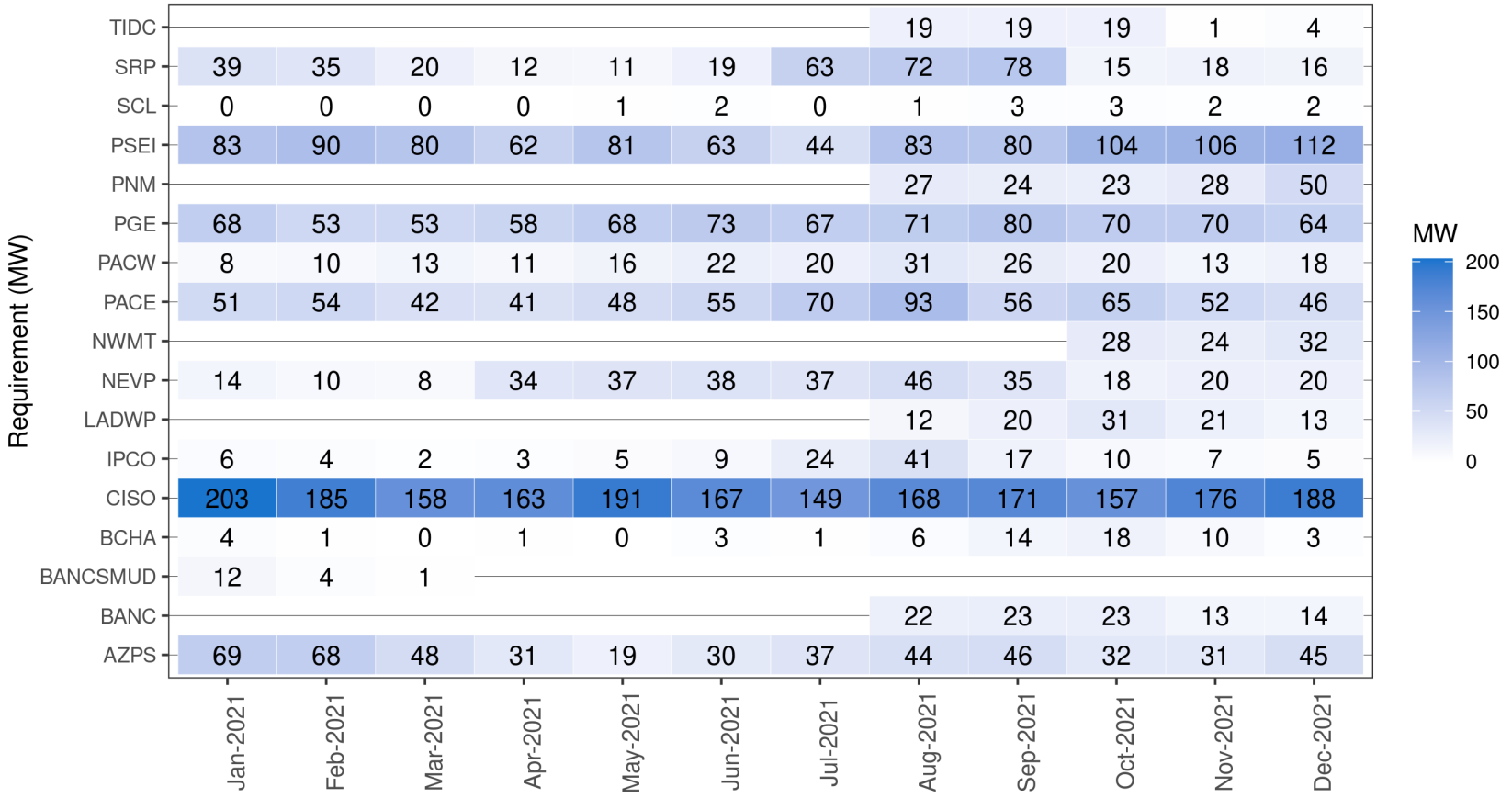
# Four metrics used to analyze historical relationship between actual NSI deviation and NSI uncertainty requirement in 2021

1. Coverage: coverage of actual NSI deviation by the estimated NSI uncertainty requirement in the upward direction, or how frequently the requirement was sufficient to cover the actual deviation.
2. Requirement: the average MW quantity of the estimated NSI uncertainty requirement in the upward direction.
3. Closeness: the average absolute MW difference between the actual NSI deviation and the estimated NSI uncertainty requirement.
4. Exceedance: the average MW difference between the actual NSI deviation and the estimated NSI uncertainty requirement, when the estimated requirement was not sufficient to cover the actual deviation.

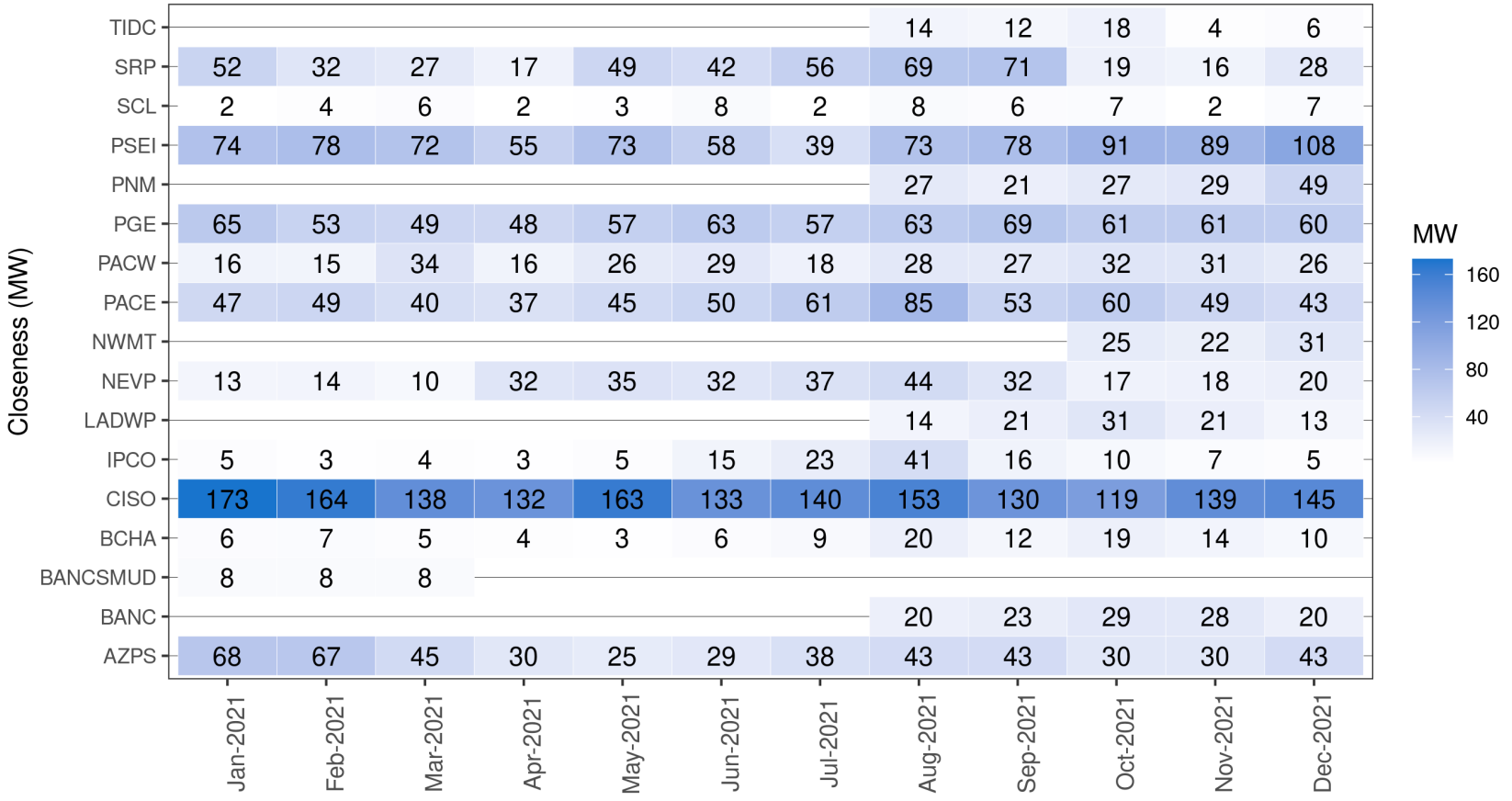
# Coverage was generally high across 2021, although only one BAA saw coverage greater than 95% for the entire year



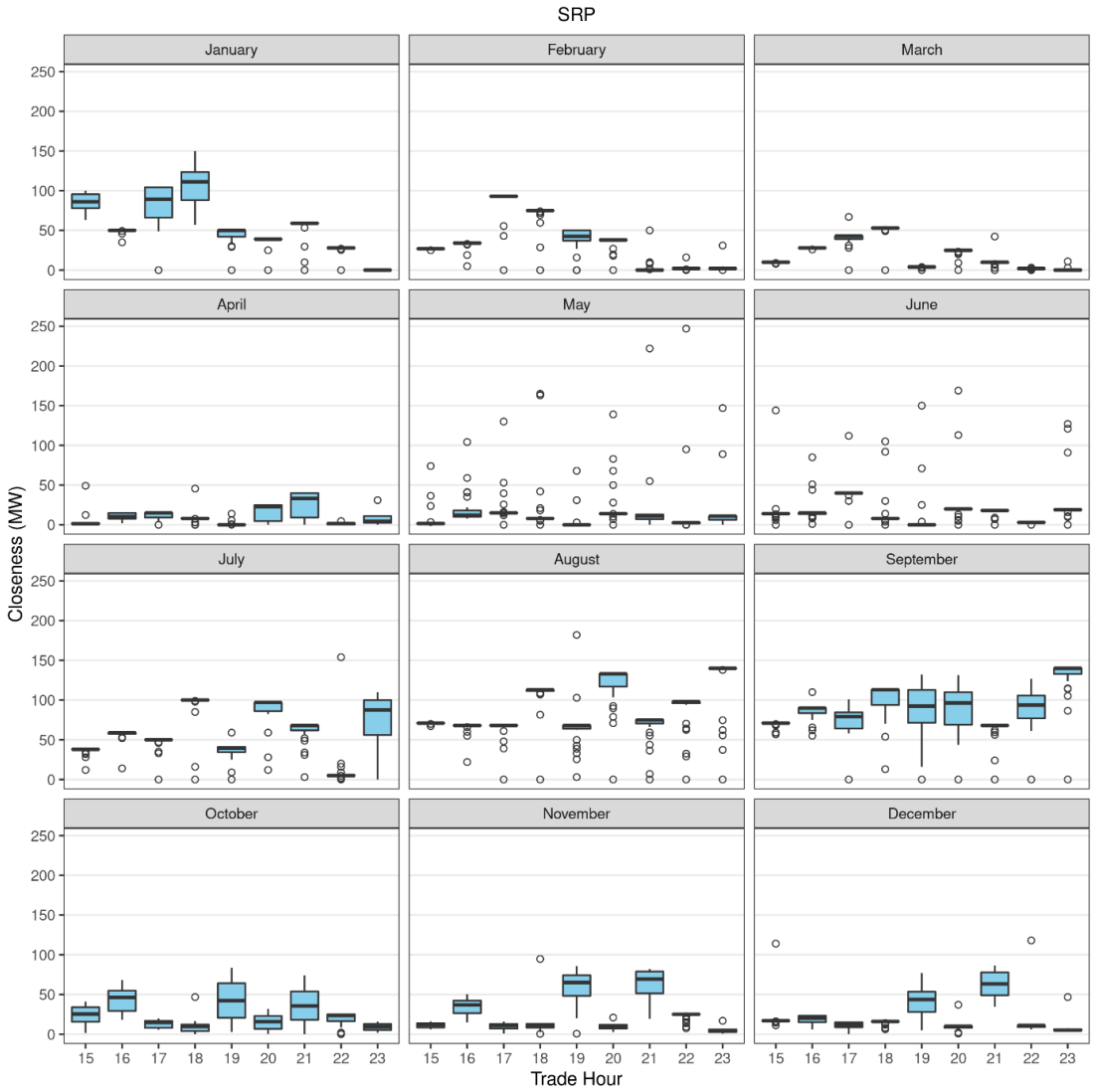
# Requirements varied in magnitude across BAAs; CAISO BAA consistently had highest average requirement



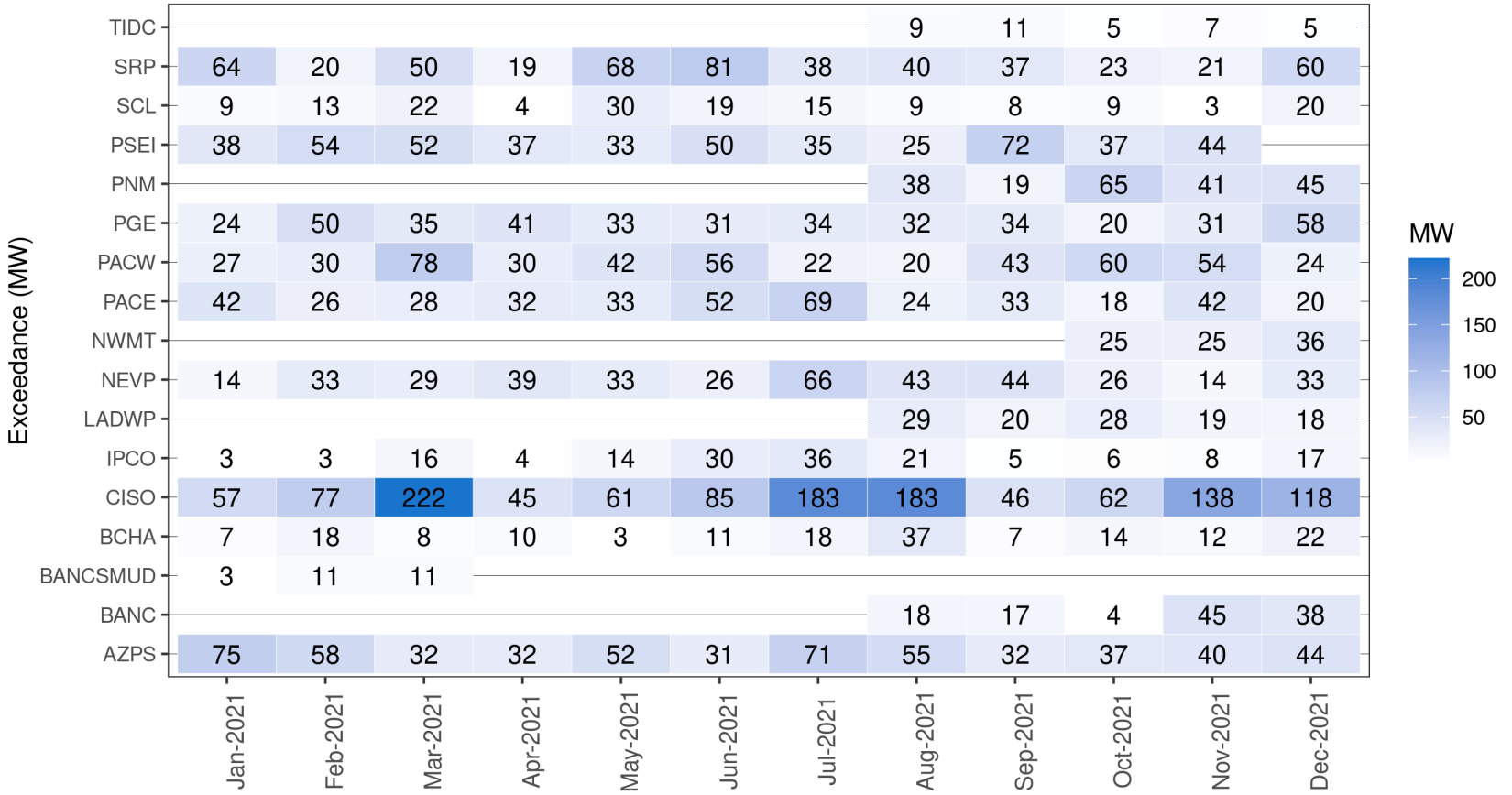
# Closeness varied in magnitude across BAAs with no consistent seasonal trend observed



# Closeness displayed no consistent hourly profile across BAAs; large outliers in some hours drove higher requirements in those hours in future months



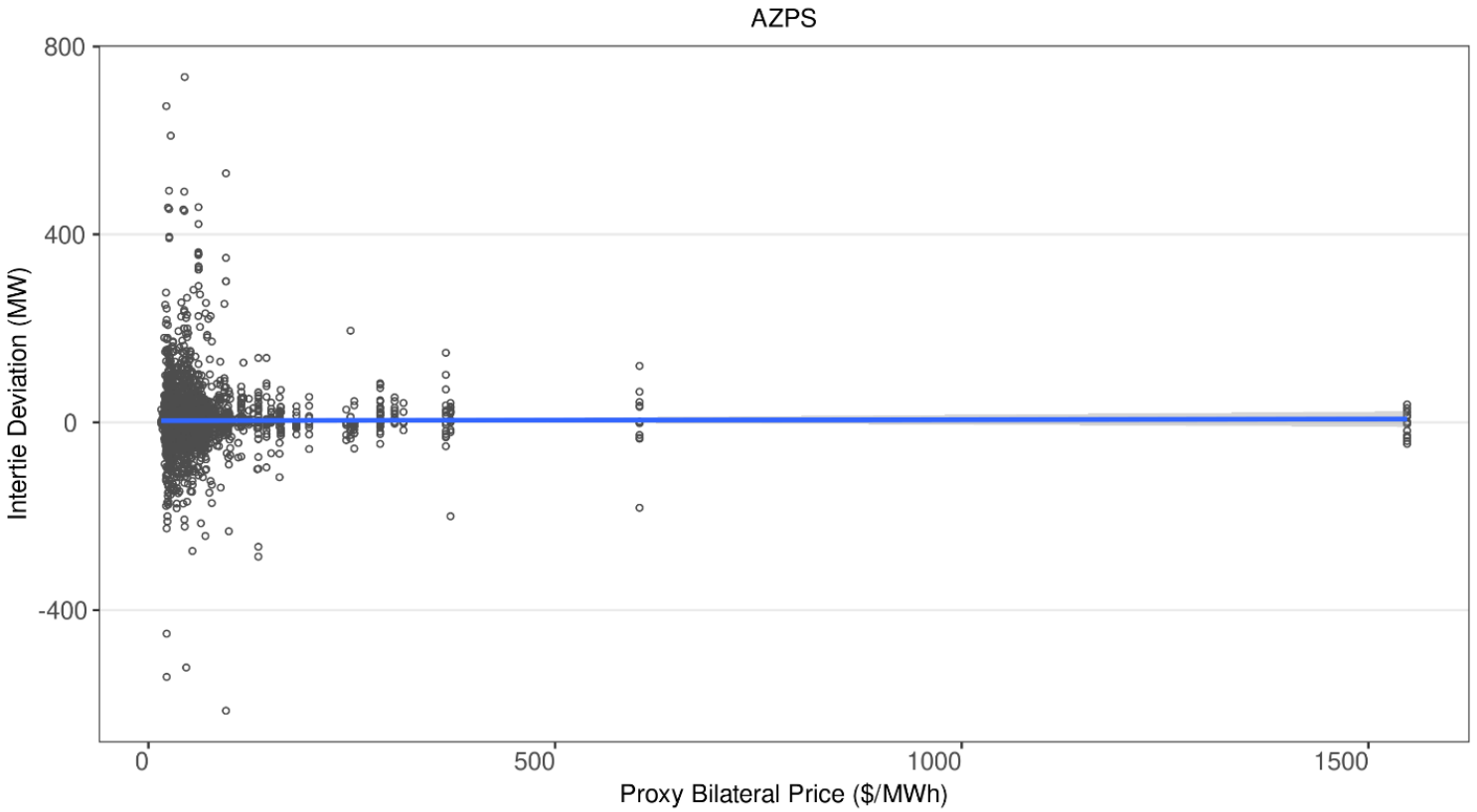
# Exceedance varied in magnitude across BAAs during periods of non-coverage; no consistent seasonal trend



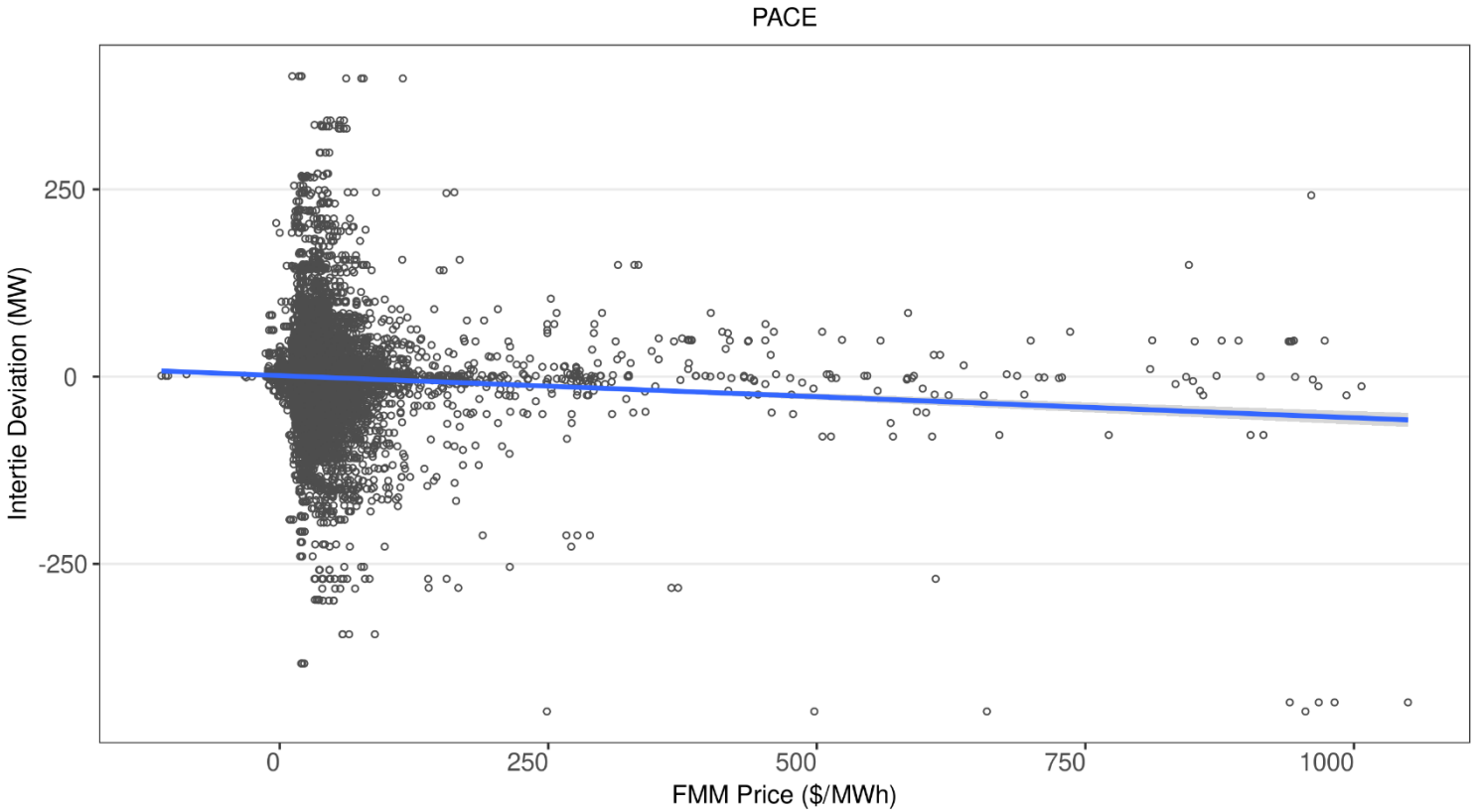
# External Factor Correlation Analysis - Overview

- Five external factors analyzed to investigate their potential correlation with actual NSI deviation:
  - Proxy bilateral energy prices
  - FMM prices
  - Net load uncertainty
  - Solar uncertainty
  - Wind uncertainty
- Data plotted as scatterplots with linear fit model applied
- Overall, no significant linear correlation observed

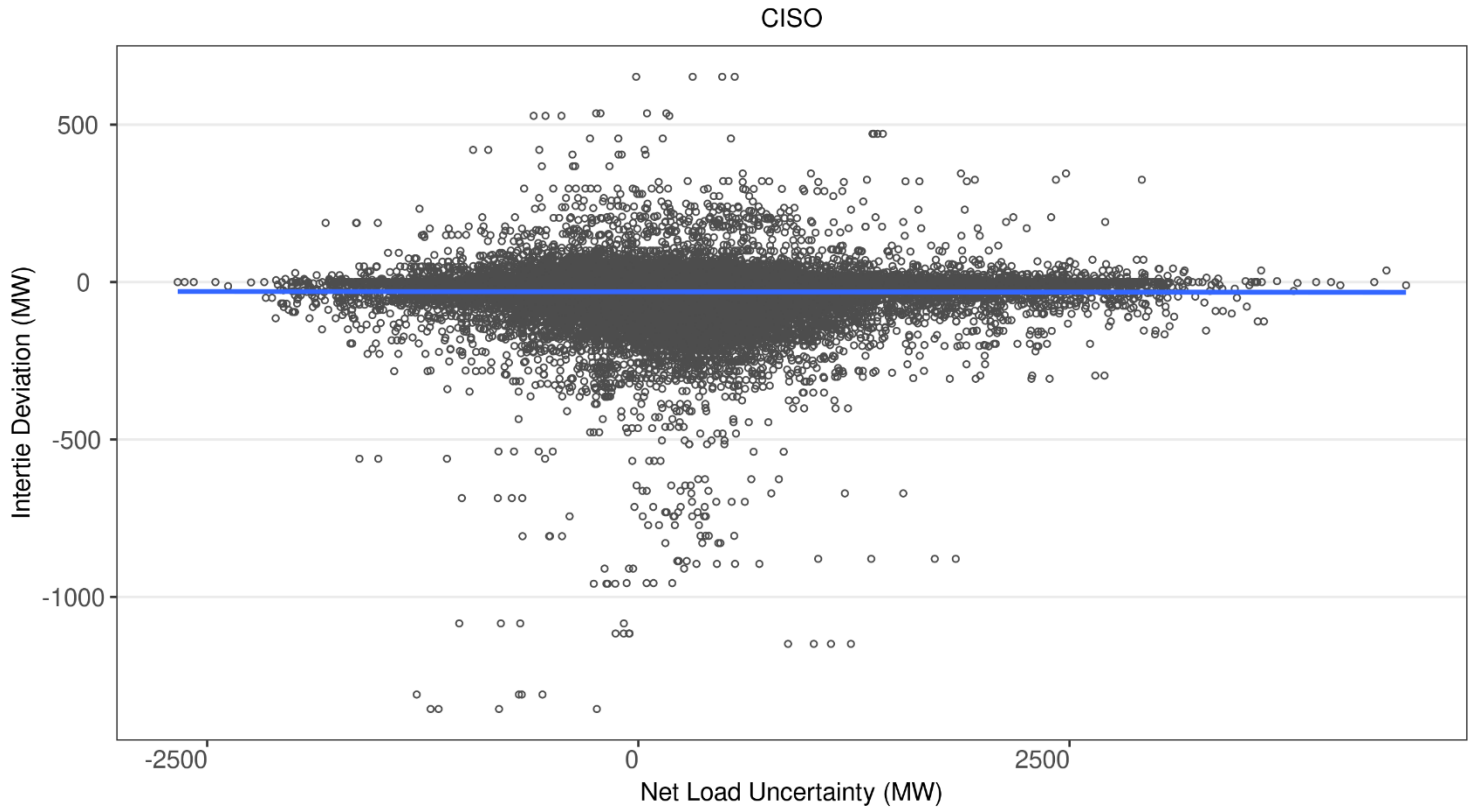
# No strong correlation of Proxy Bilateral Energy Prices with NSI Deviation, annual dataset



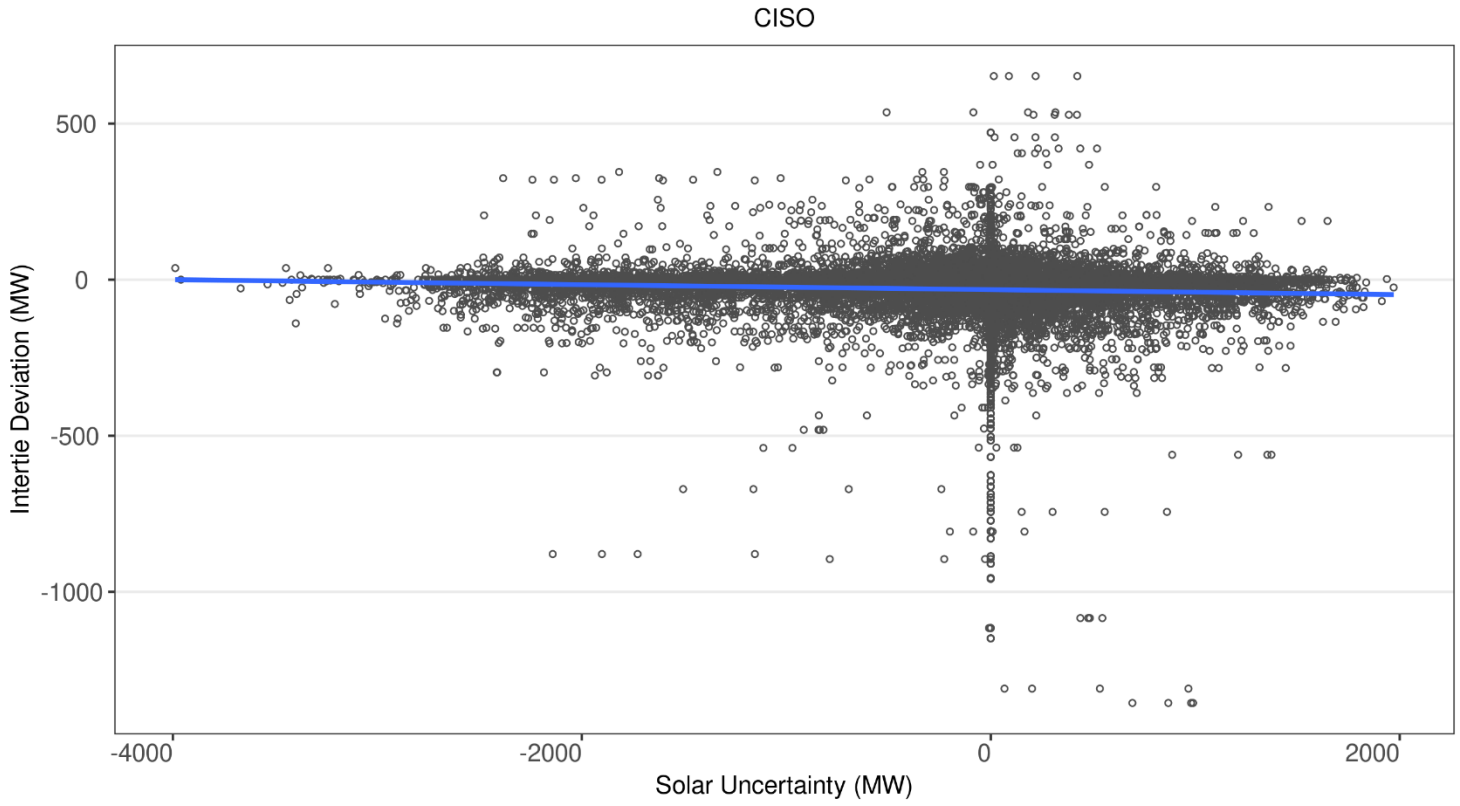
# No strong correlation of FMM Prices with NSI Deviation, annual dataset



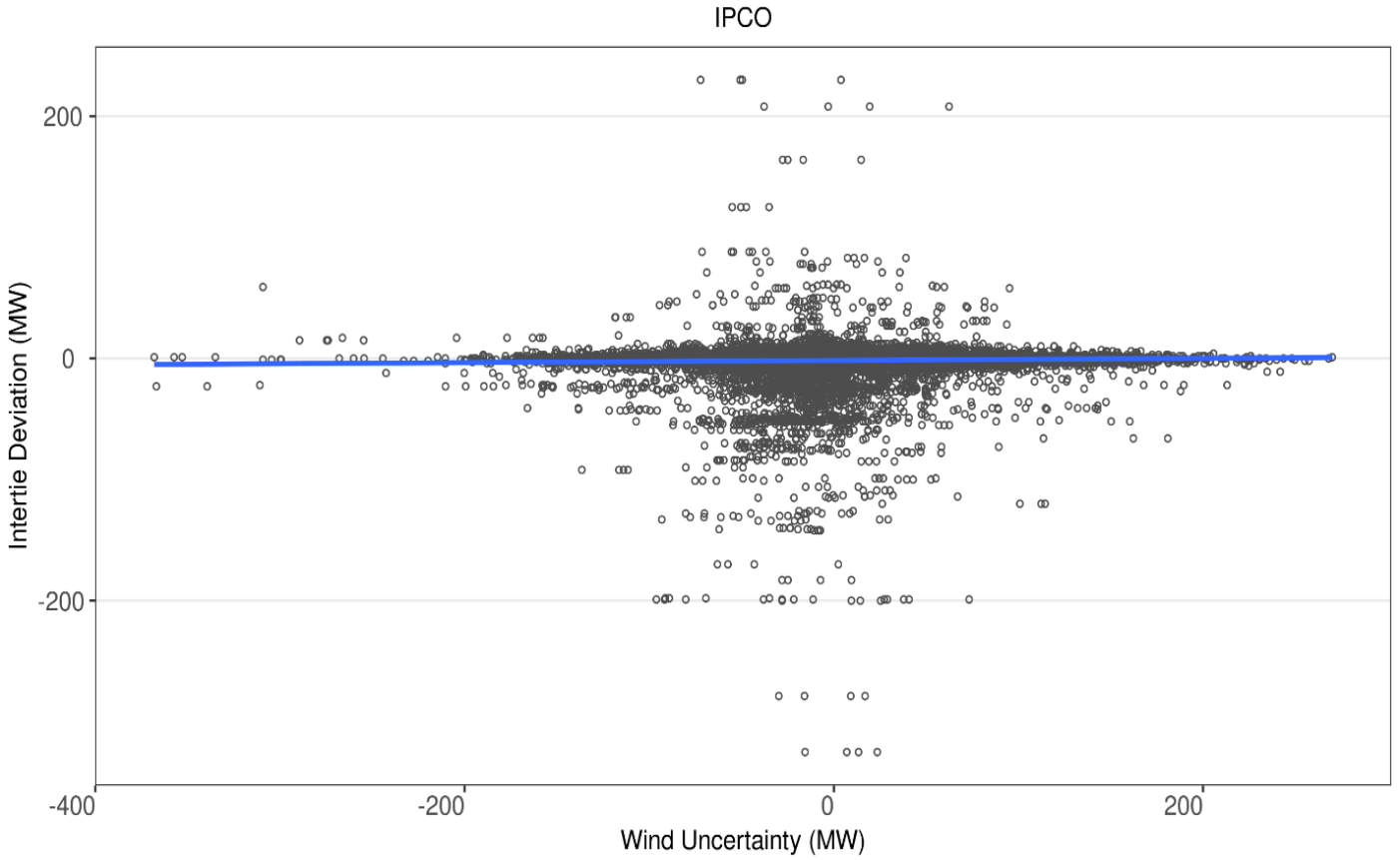
# No strong correlation of Net Load Uncertainty with NSI Deviation, annual dataset



# No strong correlation of Solar Uncertainty with NSI Deviation



# No strong correlation of Wind Uncertainty with NSI Deviation



# NEXT STEPS

# Next Steps

- Visit initiative webpage for more information: https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-parameter-changes-enhancement
- If you have any questions, please contact isostakeholderaffairs@caiso.com


- The ISO is pleased to be hosting the Stakeholder Symposium in-person at the Safe Credit Union Convention Center in downtown Sacramento on Nov. 9 – 10, 2022
- Registration will be open in May
  - Public notice will be issued once the site is available
- Additional information is available on the Stakeholder Symposium page on ISO's website at: http://www.caiso.com/informed/Pages/MeetingsEvents/StakeholderSymposium/Default.aspx
- Please direct questions to symposiumreg@caiso.com