Market monitoring update: resource sufficiency tests in the energy imbalance market

Eric Hildebrandt, Ph.D.
Executive Director, Department of Market Monitoring

WEIM Governing Body Meeting
General Session
October 25, 2022

Overview

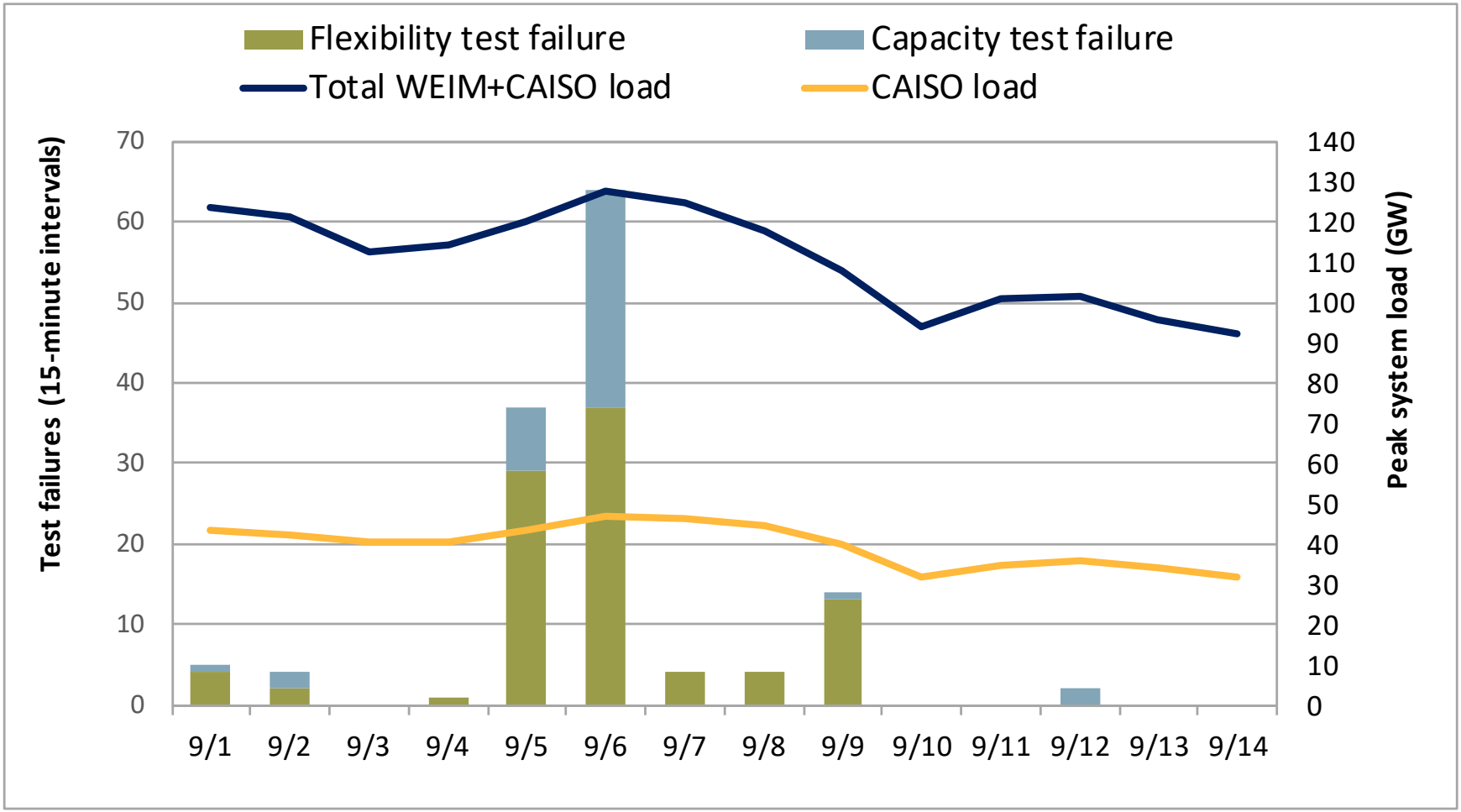
- Phase 1 enhancements implemented in June
  - Incorrect accounting for batteries would have caused ISO to fail 4 additional 15-minute intervals on Sept 5 and 6 (7 → 11 failures)
- Performance under challenging conditions during September heat wave
  - Overall test failures by BAAs in WEIM relatively low considering extremely high load conditions on Sept 5 and 6.
  - Most BAAs failing test were importing relatively small amounts or even next exporters though WEIM
  - ISO imported about 1,600 MW during seven 5-minute intervals when it failed the test on Sept 5 and 6
  - Import limits resulting from failing test did not have significant impact in terms of limiting additional imports into ISO
- DMM continues to recommend consideration of further enhancements
  - Consider other (mandatory) financial consequences of failing test.
  - Further analysis and consideration of uncertainly adder

Phase 1 enhancements implementation in June

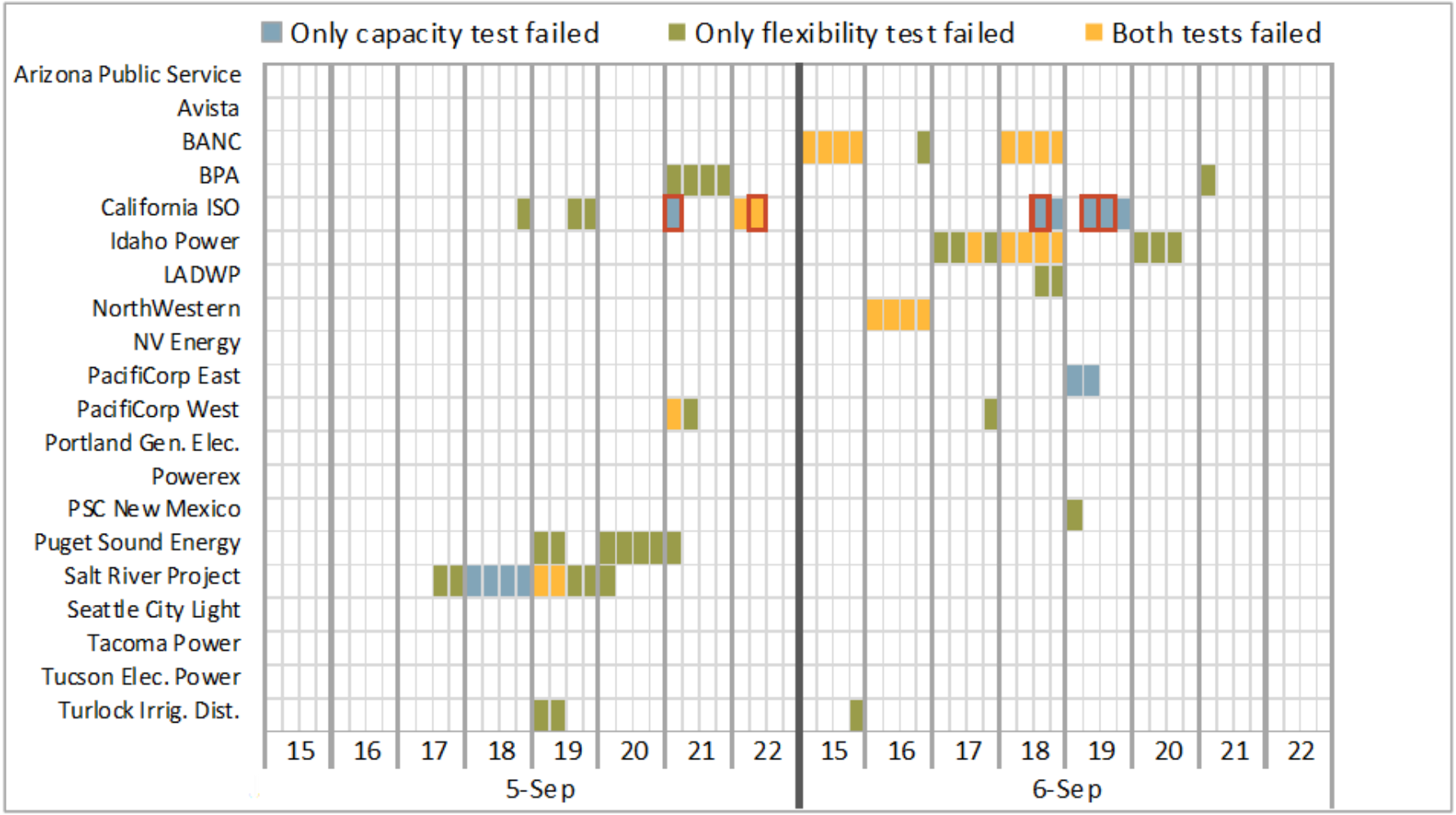
- Intertie uncertainty removed from the capacity test on June 1.
  - Net load uncertainty removed from the capacity test on February 15, 2022.
- Exclude long start units that ate off-line and short start units that fail to start from capacity test.
- Account for the state-of-charge of batteries from the market run immediately prior to the test hour.*
- Reduce ISO import/exports awards counted in test based on transmission profile e-Tags submitted at T-40.*
- Flexibility test requirement now accounts for any power balance constraint shortage during the interval immediately prior to the test hour.
- Demand response actions taken which aren't accounted for in real-time market can be submitted as an adjustment to load forecast used in test.
- ISO excluded from distribution of potential revenues from failures of the balancing test.

**** DMM analysis indicates these changes were not implemented correctly.***

Large number of test failures on September 5 and 6 driven by combination of high WEIM and ISO loads

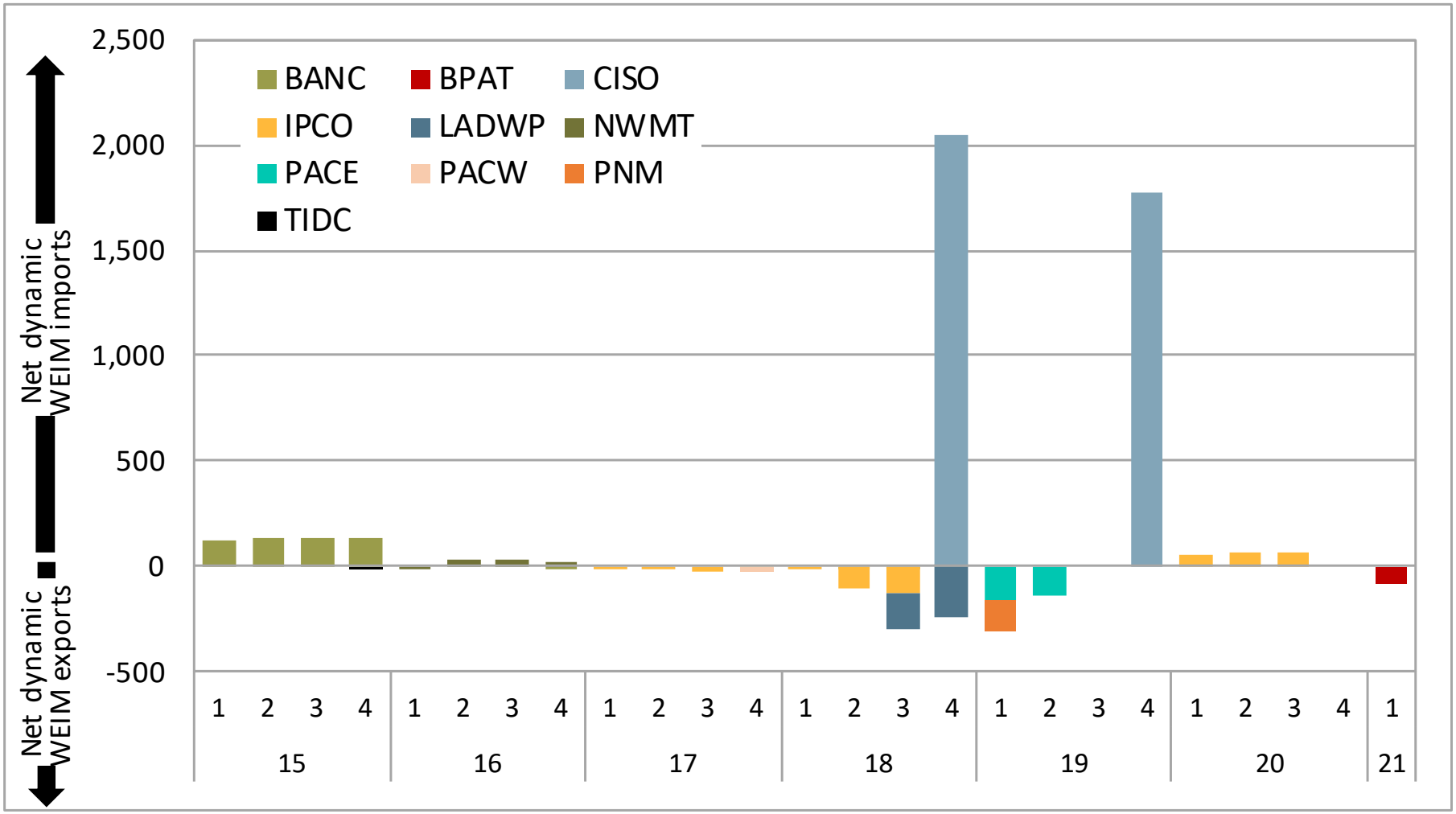


On September 5-6, 12 different BAAs failed resource sufficiency test

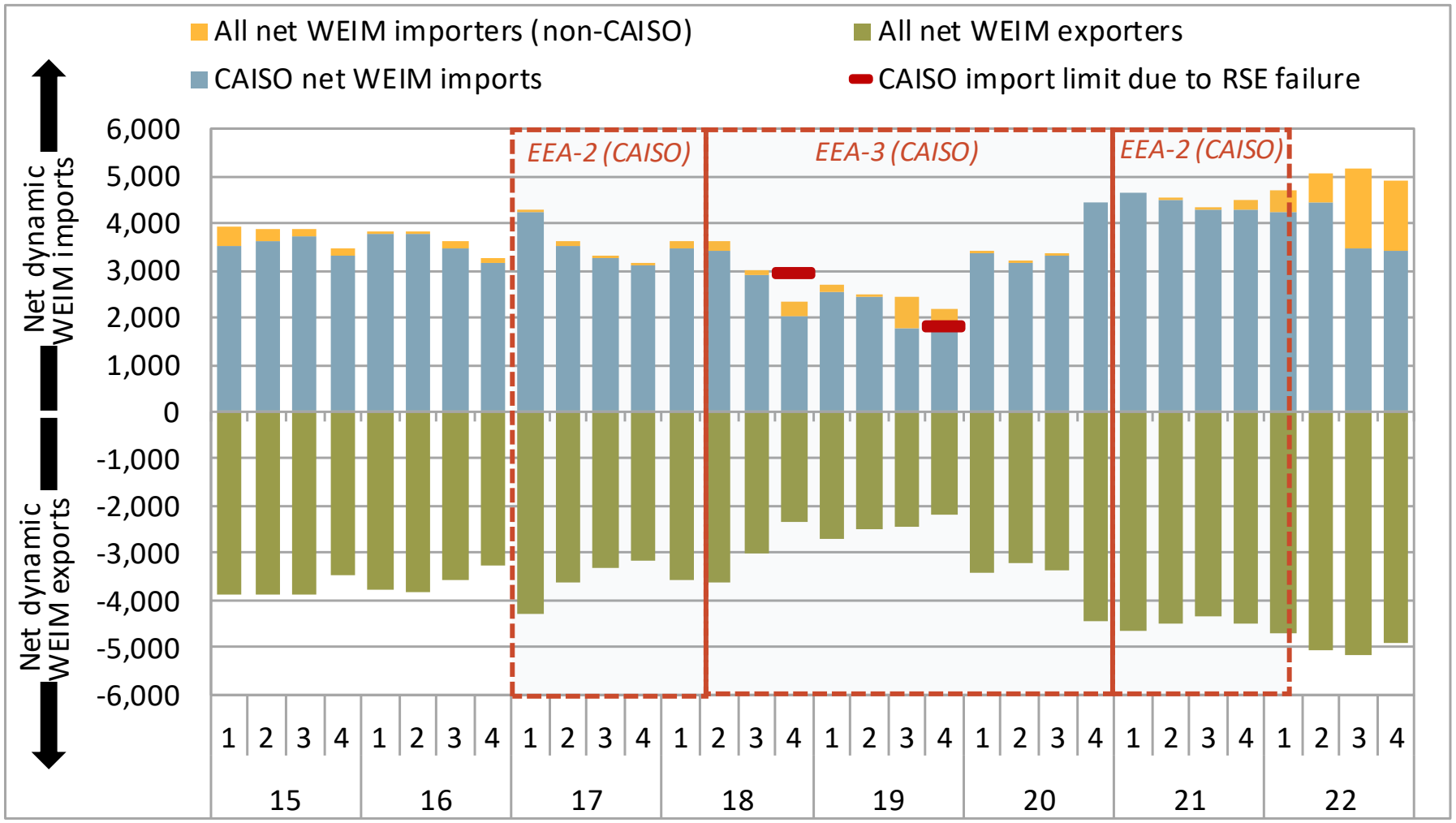


Red boxes indicate intervals when ISO should have failed capacity test if available battery capacity was correctly calculated.

WEIM transfers following resource sufficiency evaluation failures (September 6, 2022)



ISO accounted for most net WEIM imports in net peak hours during heat wave

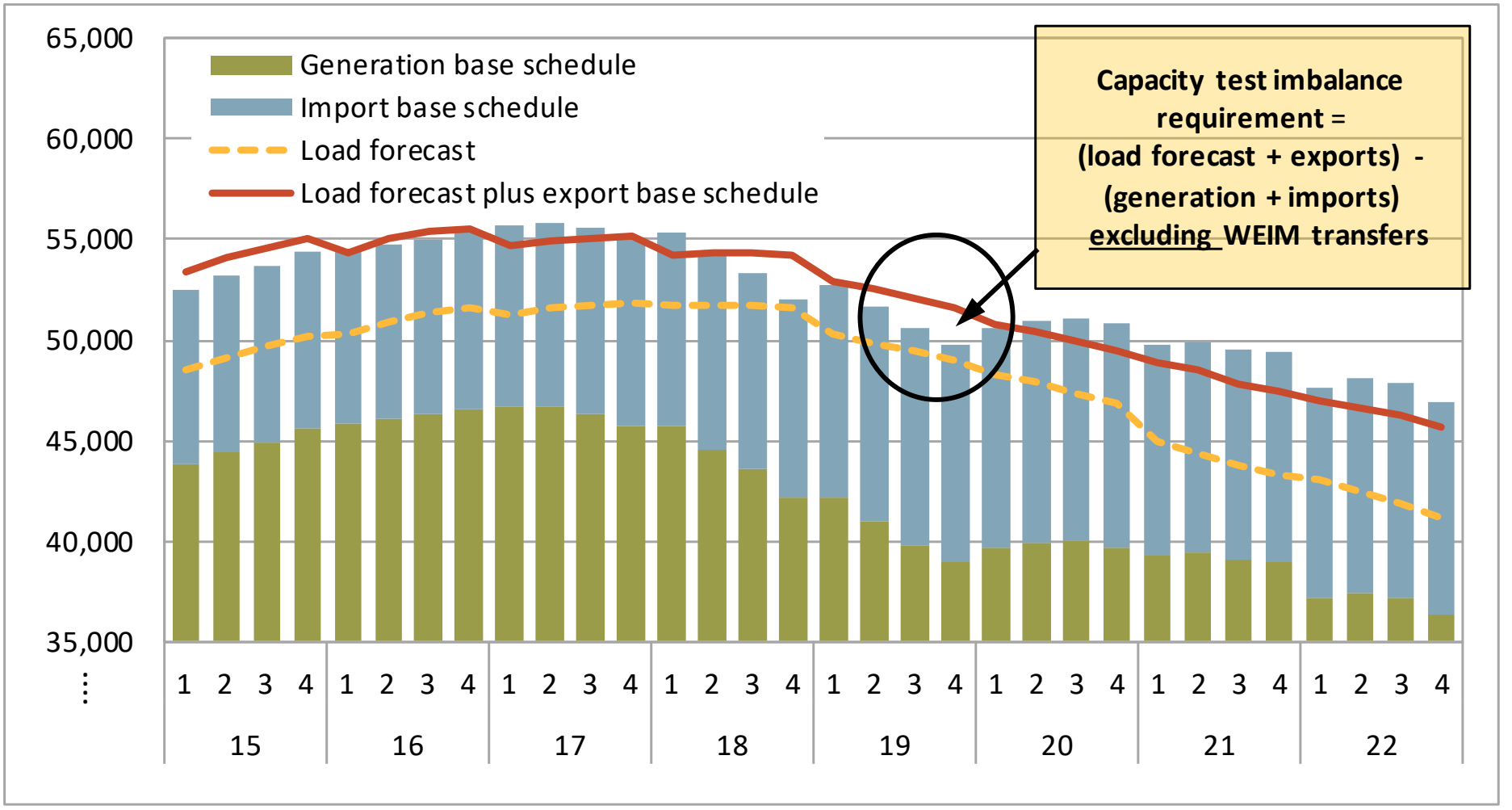


WEIM transfers during intervals when BAAs failed the resource sufficiency evaluation (September 5-6, 2022)

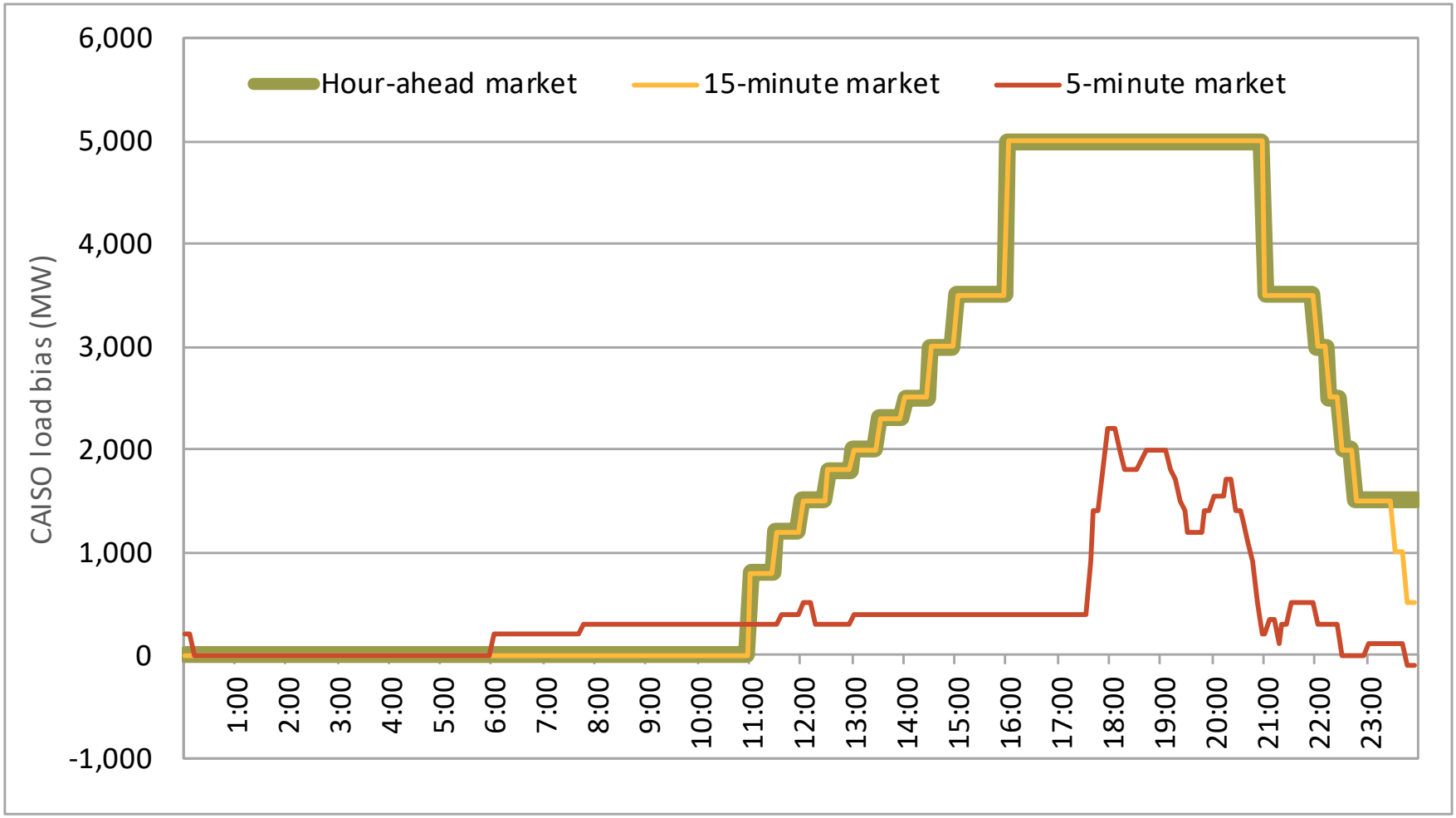
Net WEIM transfers in 5-minute market during intervals with test failures

BAA	Resource sufficiency evaluation failures	WEIM transfers < import limit			WEIM transfers = import limit		
		Percent of RTD failure intervals	Average RTD dynamic import limit	Average RTD dynamic net WEIM import	Percent of RTD failure intervals	Average RTD dynamic import limit	Average RTD dynamic net WEIM import
BANC	9	41%	84	56	59%	65	65
BPAT	7	10%	24	-65	90%	13	13
CAISO	7	100%	3,002	1,625	0%	—	—
IPCO	11	11%	78	63	89%	18	18
LADWP	2	100%	0	-59	0%	—	—
NWMT	4	33%	27	-67	67%	40	40
PACE	2	33%	0	-69	67%	186	186
PACW	3	33%	0	-260	67%	1	1
PNM	1	100%	0	-153	0%	—	—
PSEI	7	48%	17	-26	52%	16	16
SCL	9	100%	26	-7	0%	—	—
SRP	11	42%	71	-20	58%	0	0
TIDC	3	89%	2	-20	11%	0	0

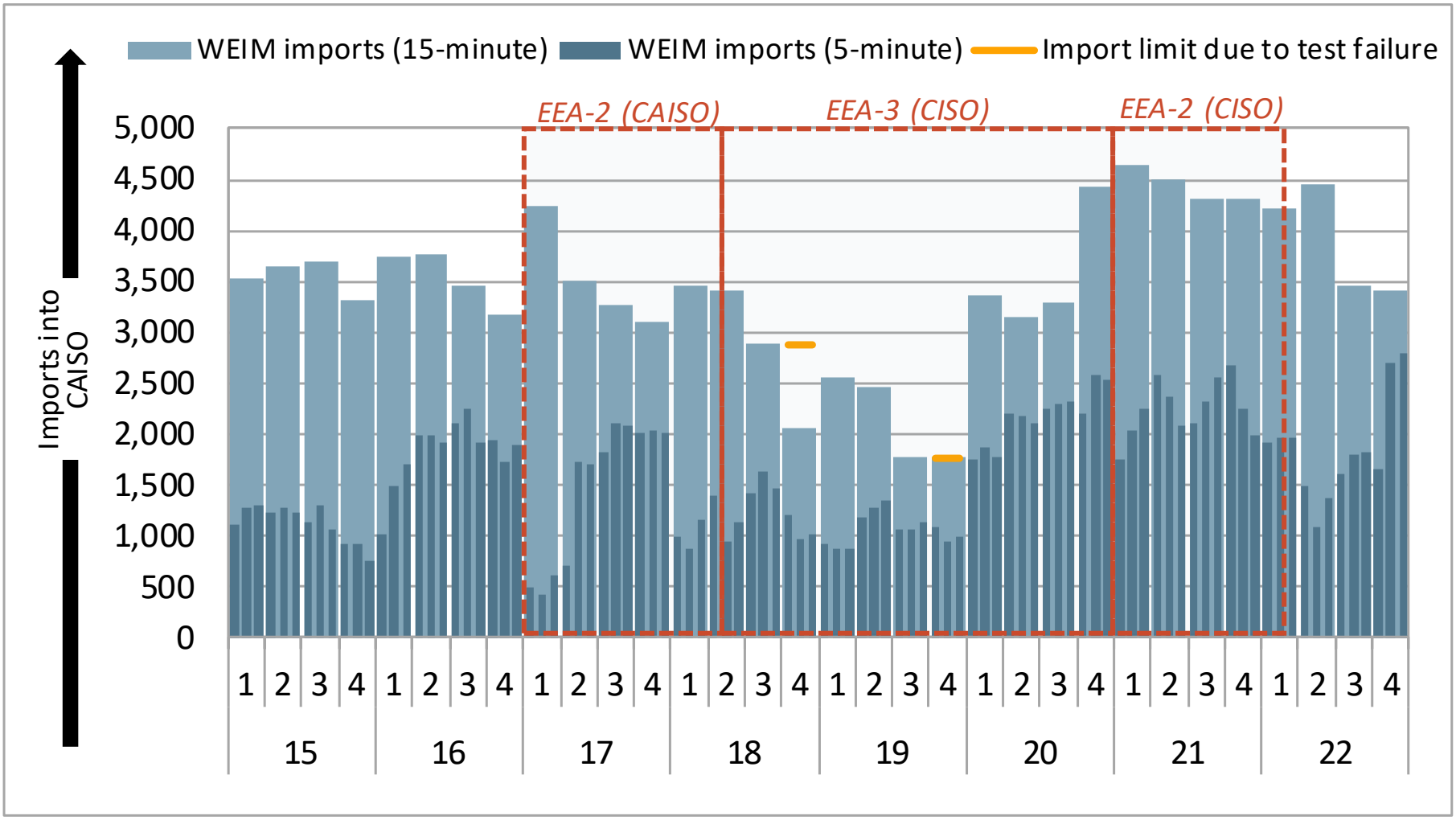
Capacity test requirements example (ISO, Sept 6)



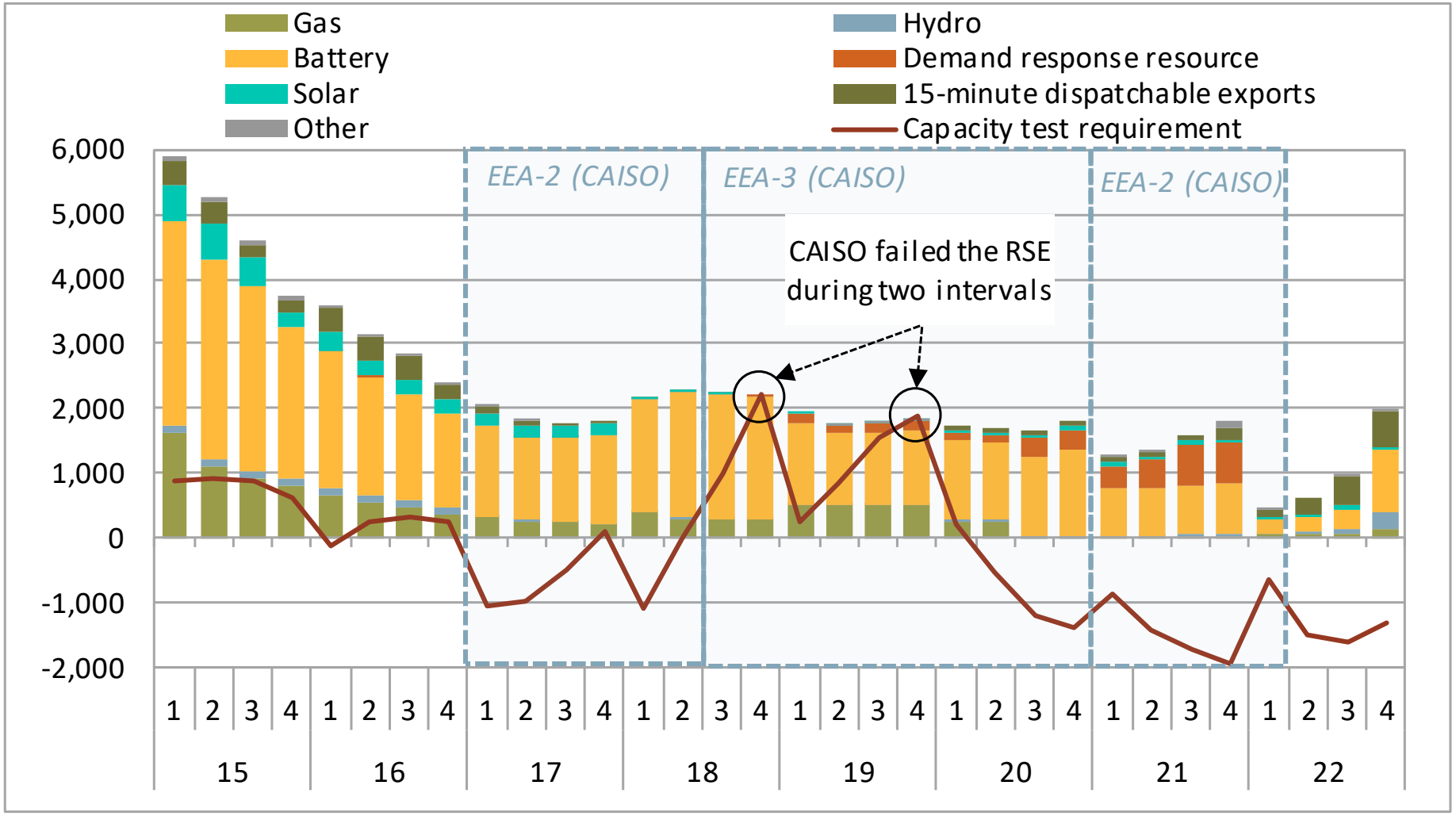
Upward load bias for ISO increased from ~3,000 MW to ~5,000 MW during heat wave (ISO, Sept 6)



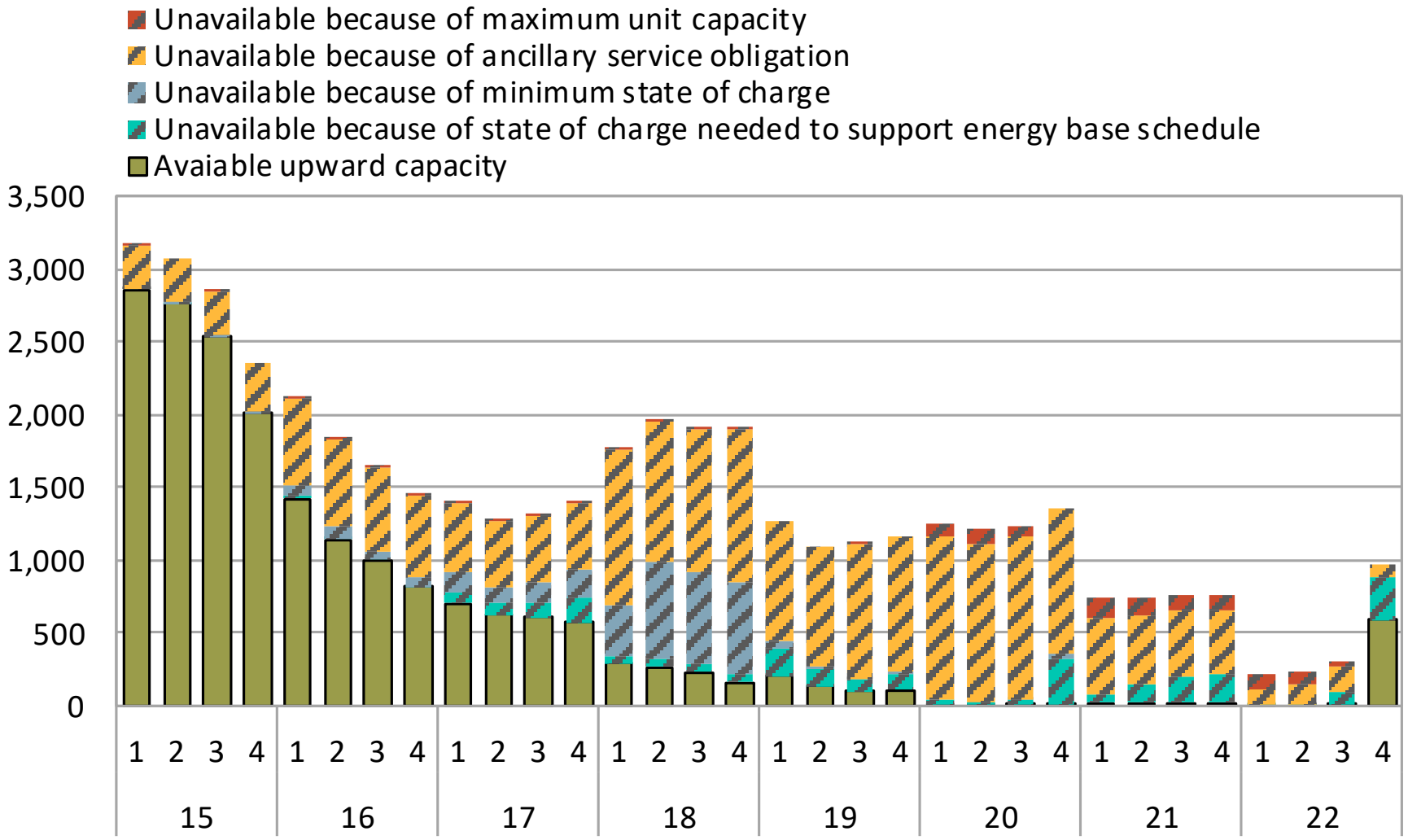
Net ISO imports from WEIM significantly higher in 15-minute market due to large upward load bias



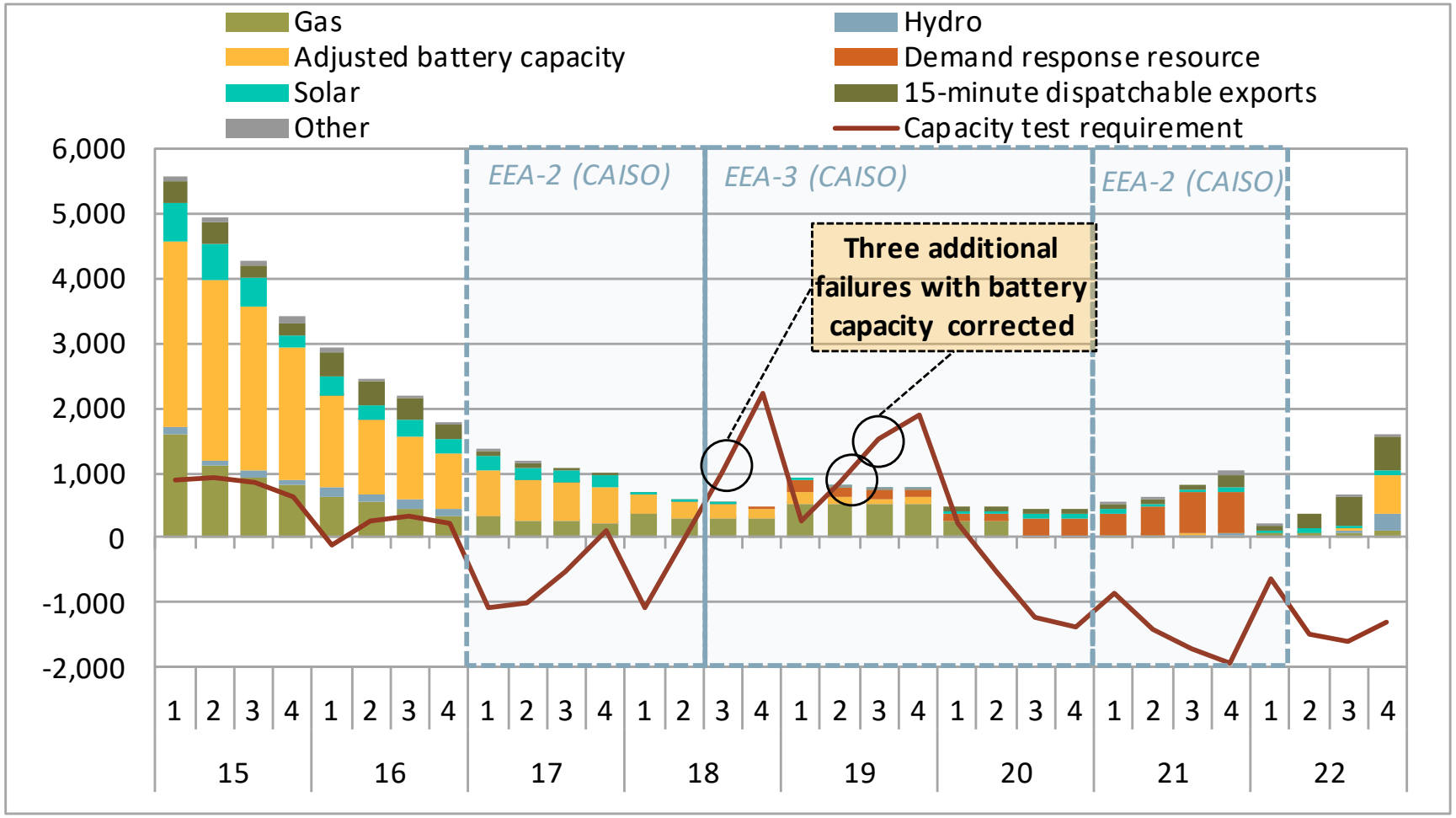
Capacity test results example (ISO, September 6)



Availability of battery capacity counted in the bid-range capacity test (September 6, 2022)



ISO would have failed test during three additional intervals if available battery capacity correctly calculated (September 6, 2022)



DMM recommendations

- Consider other options for modifying consequence of failing resource sufficiency test
  - Additional financial charge for WEIM transfers
- Low priority exports from ISO balancing area
  - Consider further refinements of proposed approach
  - Exclude low priority exports as supply for other areas during extremely tight conditions (e.g. when ISO is in EEA?)
- Incorporating uncertainty into test requirements
  - Closely monitor quartile regression approach for calculating uncertainty used in flexible ramping product and test in December
  - Consider different approaches before adding uncertainly into capacity test