



California ISO

DMM Report on resource sufficiency evaluation in the EIM (July and August, 2021)

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Department of Market Monitoring

September 28, 2021

Expanded DMM role in monitoring and reporting on EIM resource sufficiency test performance and issues

- Special monthly reporting beginning in September
 - Aimed at providing quicker feedback on performance
 - Additional information in quarterly reports
- DMM will work with stakeholders and CAISO on development of reporting metrics and analysis
 - Standardized metrics for all BAAs and CAISO
 - Provision of detailed underlying data to participants
 - Analysis of potential changes in how requirement and available supply which are being discussed in stakeholder process
- Enhanced informational reporting to Governing Body

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Overview

- **Enhanced role of DMM in reporting and analysis**
- **Monthly reports**
 - Existing metrics
 - Metrics in development
 - Analysis
 - Interval level data
- **Questions and suggestions from stakeholders**

Failure frequency and shortfall metrics

Upward flexible ramping sufficiency test failures (percent of intervals)

Arizona PS	—	—	—	0.3	0.8	0.7	0.6	0.5	0.5	0.2	—	0.6	—	0.0	—	
BANC	—	—	0.2	0.0	0.1	—	0.1	—	—	—	—	—	—	—	—	
California ISO	—	0.1	1.1	0.5	0.4	0.5	—	—	—	—	—	—	0.0	0.3	0.1	
Idaho Power	0.3	0.1	0.2	—	—	—	—	—	0.1	—	—	—	—	—	—	
LADWP											0.0	0.1	—	0.1	—	
NorthWestern													1.3	3.6	0.7	
NV Energy	2.3	4.5	7.1	2.6	1.4	0.8	—	0.1	0.5	0.4	0.4	0.7	0.9	0.4	0.5	
PacifiCorp East	0.1	0.2	0.2	0.1	0.5	0.0	—	0.1	0.1	0.1	0.1	0.0	0.1	0.0	—	
PacifiCorp West	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.1	0.0	—	0.0	0.1	
Portland GE	0.0	0.2	0.2	0.6	0.1	0.1	0.2	0.3	0.6	0.1	0.2	0.2	0.3	0.5	0.2	
Powerex	0.2	0.2	0.1	0.3	0.1	0.6	0.2	0.2	0.1	0.1	0.1	—	0.1	0.5	—	
PSC New Mexico											0.4	0.0	0.1	0.5	—	
Puget Sound En	0.3	0.6	0.4	—	0.2	—	—	—	—	—	—	0.1	0.1	0.0	0.0	
Salt River Proj.	0.5	0.7	1.8	1.1	1.7	0.9	0.3	0.2	7.1	0.3	0.5	0.2	0.9	1.9	1.7	
Seattle City Light	—	0.1	—	0.1	0.2	0.2	0.1	—	—	—	—	—	—	0.0	—	
Turlock ID											—	—	0.3	—	—	—
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020							2021								

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Upward flexible ramping sufficiency test failures (average shortfall - MW)

Arizona PS	—	—	—	232	56	60	716	913	1140	57	—	33	—	38	—	
BANC	—	—	52	8	15	—	18	—	—	—	—	—	—	—	—	
California ISO	—	111	710	1031	872	516	—	—	—	—	—	—	404	585	400	
Idaho Power	17	5	19	—	—	—	—	—	8	—	—	—	—	—	—	
LADWP											32	59	—	70	—	
NorthWestern													45	36	18	
NV Energy	52	65	77	94	82	99	—	87	56	59	60	47	39	45	36	
PacifiCorp East	4	38	33	95	64	20	—	62	26	61	67	47	53	44	—	
PacifiCorp West	31	28	74	38	58	17	15	27	20	21	18	8	—	2	33	
Portland GE	4	13	20	20	11	31	27	30	33	77	105	20	36	33	19	
Powerex	54	30	664	48	64	115	65	82	64	26	69	—	137	111	—	
PSC New Mexico											21	58	19	112	—	
Puget Sound En	15	38	31	—	27	—	—	—	—	—	—	47	24	6	24	
Salt River Proj.	32	66	69	46	56	49	52	20	64	27	75	27	69	61	53	
Seattle City Light	—	11	—	10	9	6	4	—	—	—	—	—	—	7	—	
Turlock ID											—	—	6	—	—	—
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020							2021								

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Upward bid-range capacity test failures (percent of intervals)

Arizona PS	0.0	—	—	—	—	—	0.3	0.2	0.4	—	—	0.3	—	0.2	0.3	
BANC	—	0.0	0.0	—	0.1	0.0	—	—	—	0.1	—	—	—	0.2	—	
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	0.1	0.2	0.0	
Idaho Power	—	—	—	—	—	—	—	—	—	—	—	—	—	0.4	0.8	
LADWP	—										—	—	0.1	—	—	
NorthWestern	—										—	—	—	0.6	1.2	0.6
NV Energy	—	—	—	—	0.1	0.2	—	—	0.3	—	0.0	0.5	0.8	0.5	0.2	
PacifiCorp East	—	—	—	—	—	0.1	—	—	—	—	—	—	0.3	0.3	0.1	
PacifiCorp West	—	—	—	—	—	0.1	—	—	—	0.1	—	0.0	0.1	0.2	0.1	
Portland GE	—	—	—	—	—	—	—	—	0.1	—	0.4	—	0.7	0.8	1.0	
Powerex	—	—	—	0.1	0.1	0.1	—	0.1	0.0	—	—	—	0.0	0.0	—	
PSC New Mexico	—										—	—	—	0.4	—	
Puget Sound En	—	—	—	—	—	—	—	—	0.1	0.6	1.0	0.6	1.6	0.5	0.7	
Salt River Proj.	—	—	—	—	0.1	0.1	—	—	8.0	—	0.1	0.1	0.7	3.0	2.6	
Seattle City Light	—	0.2	0.1	—	—	—	—	—	—	—	—	—	—	—	0.0	
Turlock ID	—										—	—	0.0	—	—	1.1
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020							2021								

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Upward bid-range capacity test failures (average shortfall - MW)

Arizona PS	60	—	—	—	—	—	1387	2325	1443	—	—	48	—	92	45	
BANC	—	6	3	—	20	5	—	—	—	13	—	—	—	53	—	
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	405	601	274	
Idaho Power	—	—	—	—	—	—	—	—	—	—	—	—	—	17	34	
LADWP											—	—	46	—	—	
NorthWestern											—	—	—	25	24	61
NV Energy	—	—	—	—	23	15	—	—	26	—	15	27	82	55	25	
PacifiCorp East	—	—	—	—	—	1214	—	—	—	—	—	—	73	40	38	
PacifiCorp West	—	—	—	—	—	2228	—	—	—	12	—	4	10	26	16	
Portland GE	—	—	—	—	—	—	—	—	268	—	42	—	34	46	36	
Powerex	—	—	—	85	79	258	—	41	32	—	—	—	63	3	—	
PSC New Mexico											—	—	—	129	—	
Puget Sound En	—	—	—	—	—	—	—	—	21	68	28	49	50	58	74	
Salt River Proj.	—	—	—	—	26	72	—	—	54	—	25	38	30	75	121	
Seattle City Light	—	131	2	—	—	—	—	—	—	—	—	—	—	—	4	
Turlock ID											—	—	1	—	—	7
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020						2021									

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Downward flexible ramping sufficiency test failures (percent of intervals)

Arizona PS	2.3	0.1	—	0.1	1.9	0.9	2.5	2.2	2.3	4.3	1.9	0.3	0.1	—	0.1
BANC	0.3	—	—	—	0.1	0.3	—	—	0.6	0.4	—	—	—	—	—
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho Power	—	0.0	—	—	0.0	0.0	—	—	—	—	—	0.0	—	—	—
LADWP	—										—	—	0.1	—	—
NorthWestern	—										—	—	0.7	0.6	0.4
NV Energy	5.1	0.7	0.8	2.2	0.5	1.4	1.1	0.2	6.1	1.4	0.5	4.3	2.0	3.0	2.5
PacifiCorp East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PacifiCorp West	—	—	—	—	—	—	—	—	—	0.1	—	—	0.1	—	—
Portland GE	0.1	—	—	—	—	—	—	0.0	—	—	—	—	—	—	—
Powerex	—	0.0	0.1	0.1	0.1	—	—	0.4	—	1.4	0.2	0.9	1.3	0.4	0.2
PSC New Mexico	—										1.4	—	0.0	—	—
Puget Sound En	0.8	0.1	—	—	—	—	—	—	—	—	—	—	—	—	—
Salt River Proj.	0.1	—	0.0	0.1	0.1	0.2	0.8	1.1	1.6	1.2	0.2	0.1	0.2	—	0.1
Seattle City Light	—	0.1	0.2	0.2	0.1	0.1	0.1	—	—	—	—	—	—	0.2	—
Turlock ID	—									0.4	0.1	0.5	—	—	0.0
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
	2020							2021							

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Downward flexible ramping sufficiency test failures (average shortfall - MW)

Arizona PS	126	51	—	36	73	44	55	63	94	52	73	38	26	—	50
BANC	17	—	—	—	63	98	—	—	16	13	—	—	—	—	—
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho Power	—	45	—	—	5	10	—	—	—	—	—	9	—	—	—
LADWP											—	—	14	—	—
NorthWestern											259	14	29		
NV Energy	88	55	71	87	30	31	32	150	49	56	64	74	65	141	70
PacifiCorp East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PacifiCorp West	—	—	—	—	—	—	—	—	—	9	—	—	140	—	—
Portland GE	24	—	—	—	—	—	—	10	—	—	—	—	—	—	—
Powerex	—	19	54	47	71	—	—	95	—	64	26	38	199	83	44
PSC New Mexico											124	—	12	—	—
Puget Sound En	41	43	—	—	—	—	—	—	—	—	—	—	—	—	—
Salt River Proj.	99	—	118	92	58	26	33	57	45	55	47	65	44	—	25
Seattle City Light	—	10	8	7	25	20	88	—	—	—	—	—	—	2	—
Turlock ID										2	6	7	—	—	4
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
	2020							2021							

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Downward bid-range capacity test failures (percent of intervals)

Arizona PS	—	—	—	—	—	—	—	—	—	—	—	0.0	—	—	—	
BANC	—	—	—	—	0.1	0.1	—	—	0.0	0.1	—	—	—	—	—	
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Idaho Power	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
LADWP	[REDACTED]										—	—	0.1	—	—	
NorthWestern	[REDACTED]										—	—	—	—	—	
NV Energy	—	—	—	—	—	—	—	—	—	—	—	—	0.0	—	—	
PacifiCorp East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
PacifiCorp West	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Portland GE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Powerex	—	0.0	0.0	—	0.0	—	—	—	—	—	0.0	—	0.3	0.1	—	
PSC New Mexico	[REDACTED]										—	—	—	—	—	
Puget Sound En	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Salt River Proj.	0.0	—	—	—	—	—	—	—	—	—	0.0	—	0.0	—	—	
Seattle City Light	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.0	
Turlock ID	[REDACTED]										—	—	0.3	0.2	0.0	0.2
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020							2021								

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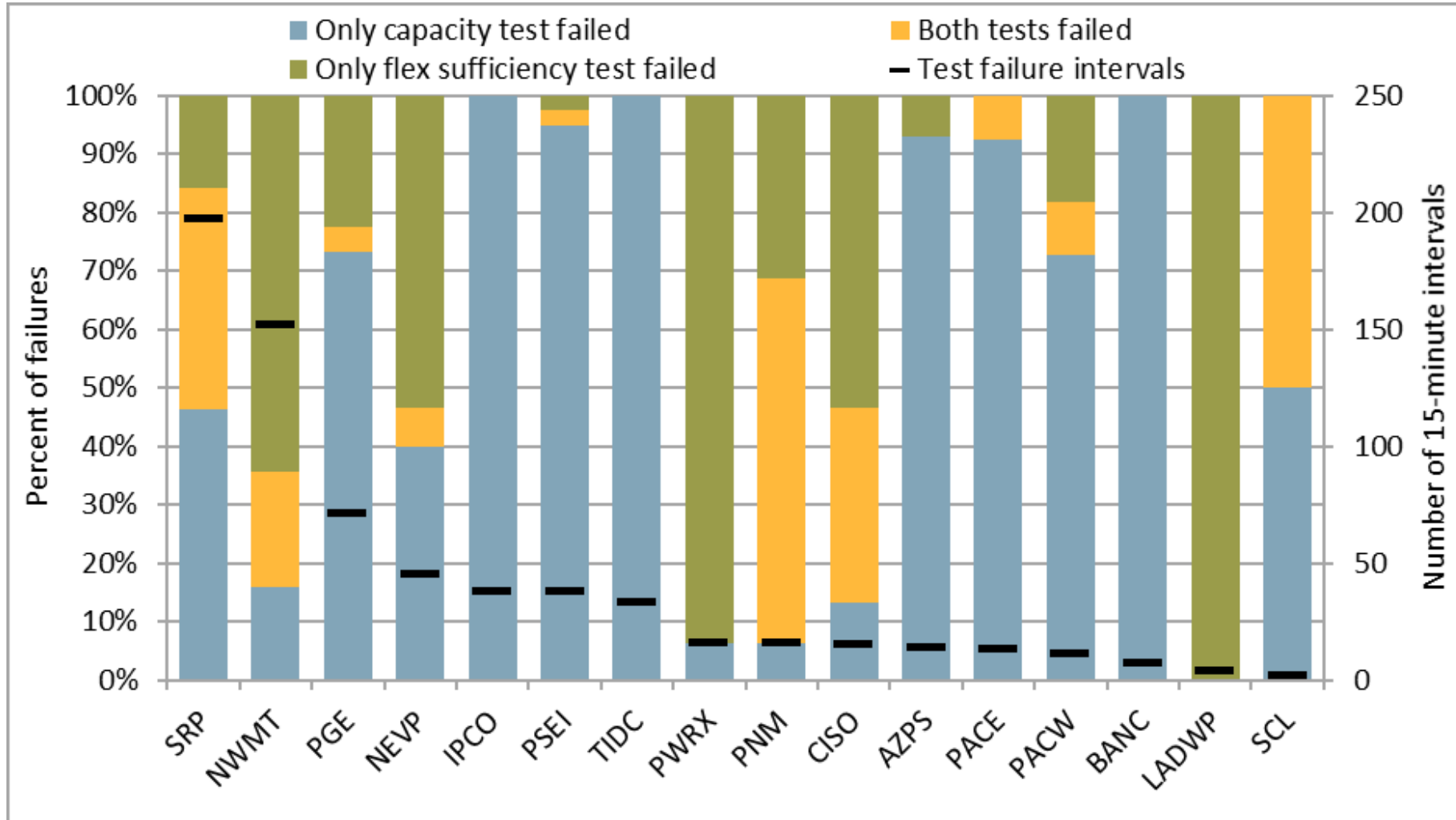
Downward bid-range capacity test failures (average shortfall - MW)

Arizona PS	—	—	—	—	—	—	—	—	—	—	—	8	—	—	—	
BANC	—	—	—	—	831	341	—	—	1	6	—	—	—	—	—	
California ISO	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Idaho Power	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
LADWP	[Redacted]										—	—	16	—	—	
NorthWestern	[Redacted]										—	—	—	—	—	
NV Energy	—	—	—	—	—	—	—	—	—	—	—	—	26	—	—	
PacifiCorp East	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
PacifiCorp West	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Portland GE	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Powerex	—	15	29	—	13	—	—	—	—	—	8	—	350	33	—	
PSC New Mexico	[Redacted]										—	—	—	—	—	
Puget Sound En	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Salt River Proj.	27	—	—	—	—	—	—	—	—	—	11	—	29	—	—	
Seattle City Light	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8	
Turlock ID	[Redacted]										—	—	4	4	3	8
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
	2020							2021								

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Upward capacity/sufficiency test failures by concurrence

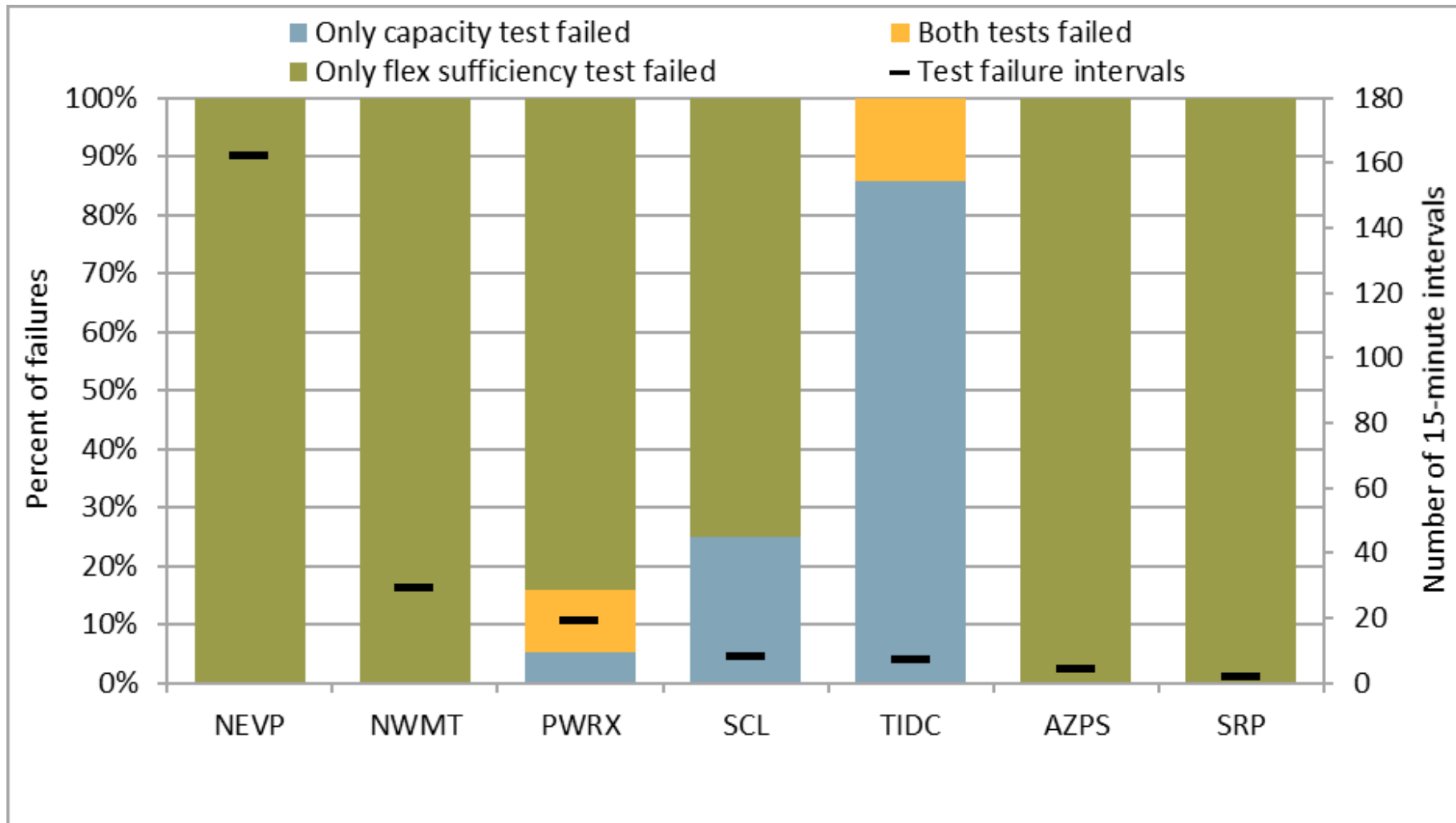
(July – August, 2021)



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Downward capacity/sufficiency test failures by concurrence

(July – August, 2021)



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Additional capacity test failures with implementation of uncertainty

Arizona PS	—	3	7	—	—	—
BANC	—	3	—	—	—	—
California ISO	3	2	1	—	—	—
Idaho Power	—	13	21	—	—	—
LADWP	—	—	—	—	—	—
NorthWestern	4	30	12	—	—	—
NV Energy	3	9	6	—	—	—
PacifiCorp East	7	9	4	—	—	—
PacifiCorp West	4	7	2	—	—	—
Portland GE	17	20	25	—	—	—
Powerex	1	1	—	4	3	—
PSC New Mexico	—	3	—	—	—	—
Puget Sound En	7	8	10	—	—	—
Salt River Proj.	8	49	19	—	—	—
Seattle City Light	—	—	1	—	—	—
Turlock ID	—	—	9	4	—	1
	Jun*	Jul	Aug	Jun*	Jul	Aug
	Upward capacity test			Downward capacity test		

*June 16-30, 2021 only (implementation of uncertainty in the capacity test)

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Additional capacity test failures with implementation of uncertainty excluding sufficiency test failures

Arizona PS	—	3	7	—	—	—
BANC	—	3	—	—	—	—
California ISO	3	2	—	—	—	—
Idaho Power	—	13	21	—	—	—
LADWP	—	—	—	—	—	—
NorthWestern	2	9	9	—	—	—
NV Energy	2	9	6	—	—	—
PacifiCorp East	7	8	4	—	—	—
PacifiCorp West	4	6	2	—	—	—
Portland GE	17	19	25	—	—	—
Powerex	1	1	—	3	1	—
PSC New Mexico	—	1	—	—	—	—
Puget Sound En	7	8	10	—	—	—
Salt River Proj.	5	34	15	—	—	—
Seattle City Light	—	—	1	—	—	—
Turlock ID	—	—	9	4	—	1
	Jun*	Jul	Aug	Jun*	Jul	Aug
	Upward capacity test			Downward capacity test		

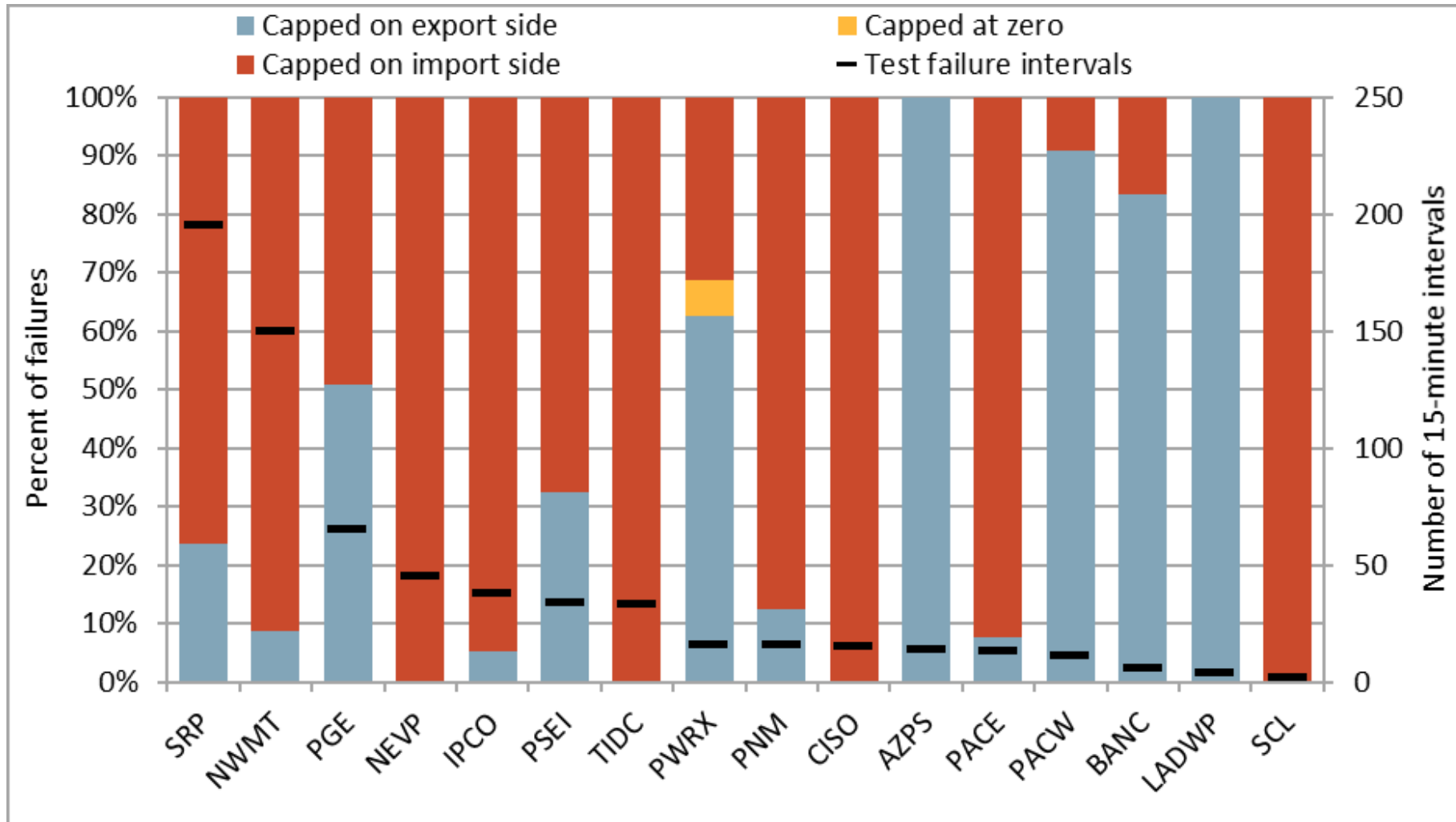
*June 16-30, 2021 only (implementation of uncertainty in the capacity test)

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Impacts of failing resource sufficiency evaluation

Upward capacity/sufficiency test failure intervals by import limit

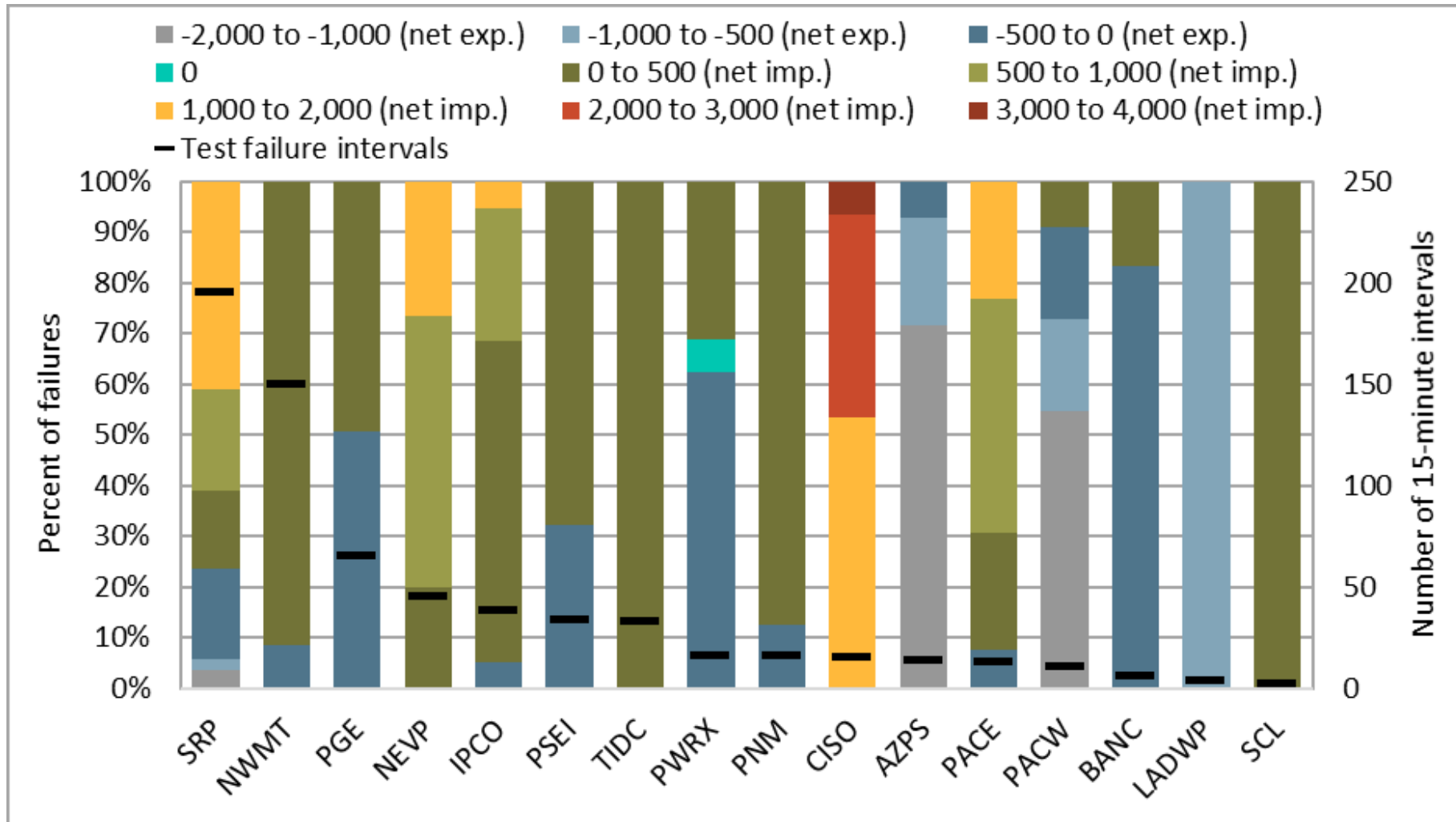
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Upward capacity/sufficiency test failure intervals by import limit

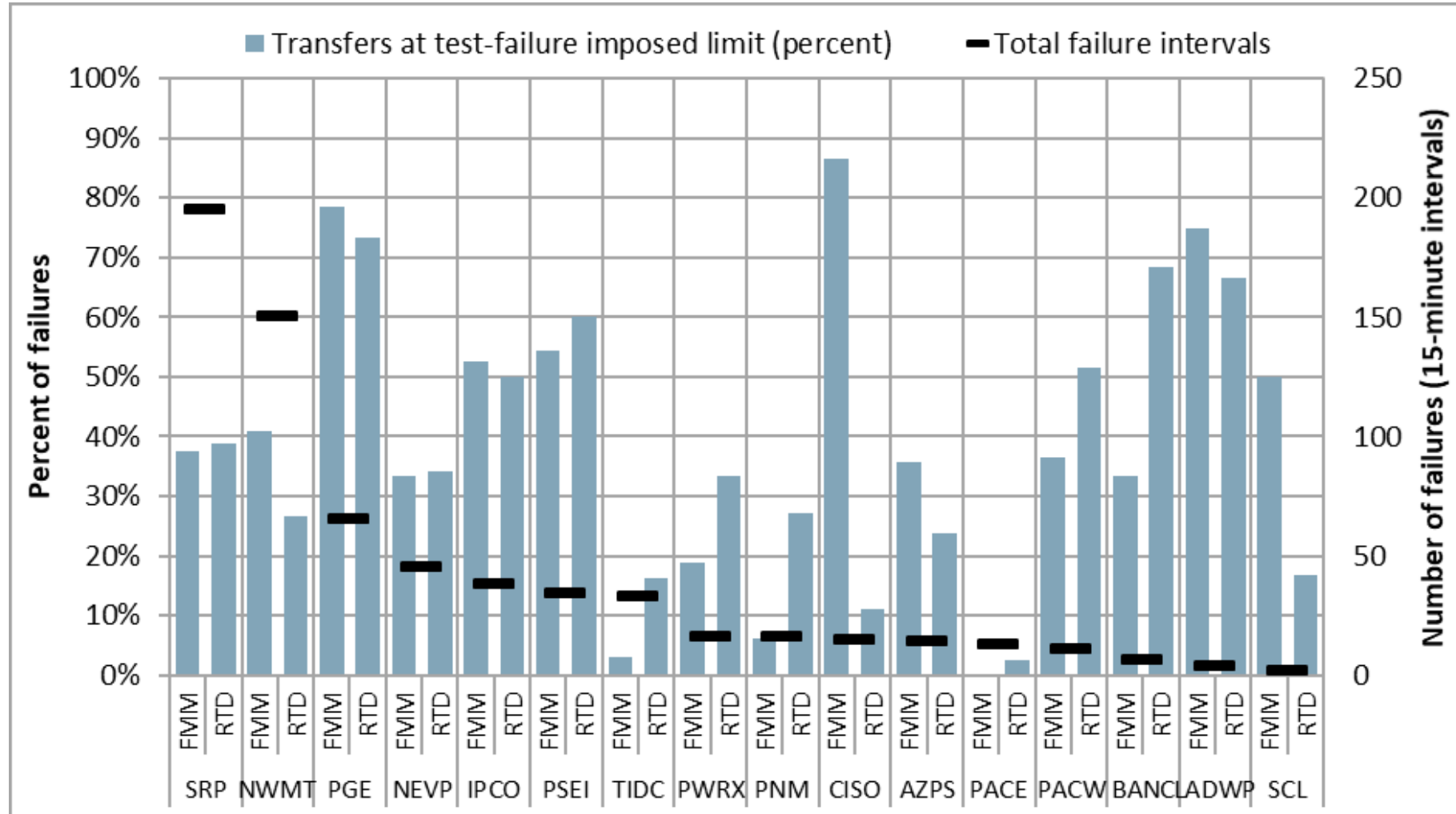
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Upward test failure intervals with market transfers at the imposed cap

(July – August, 2021)

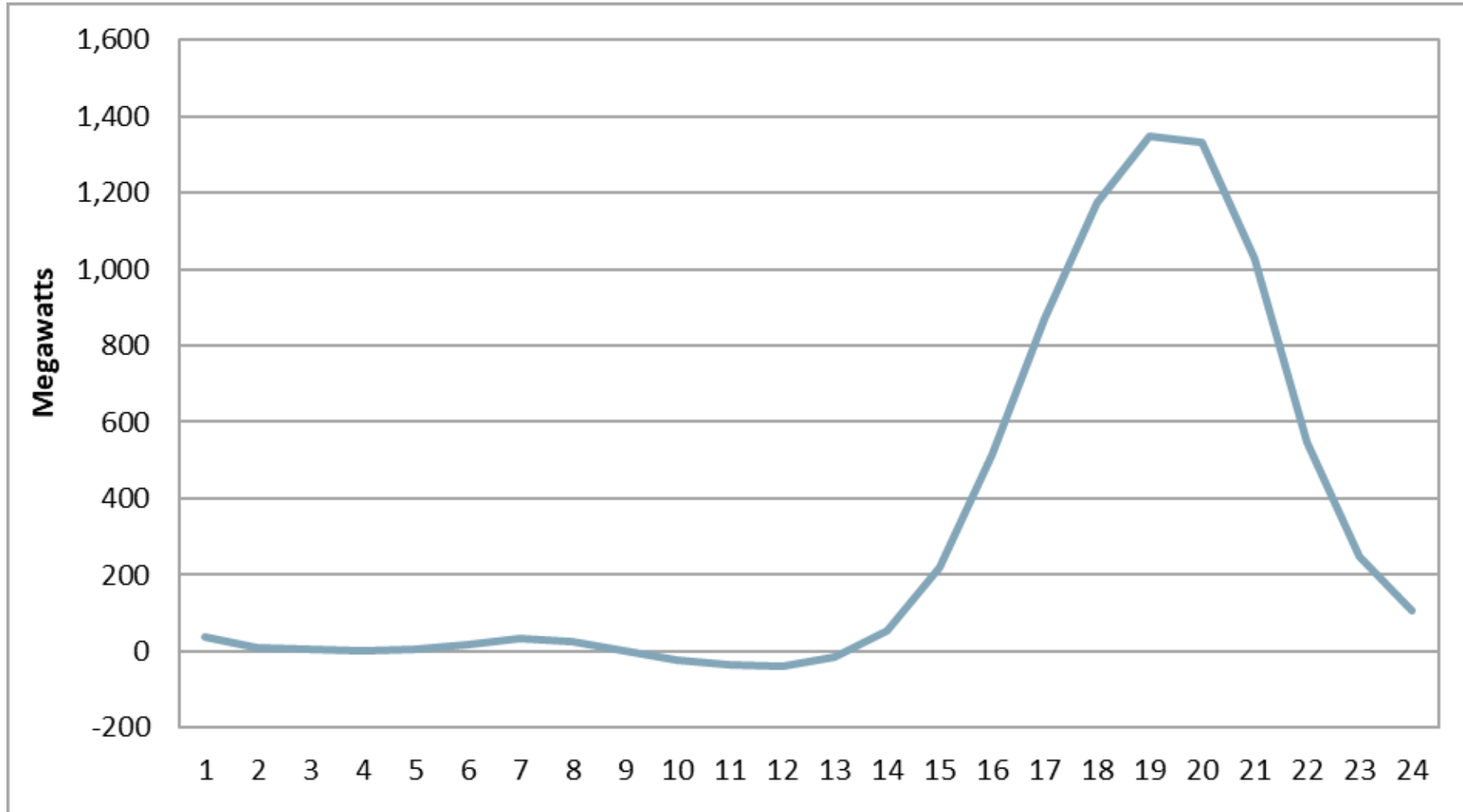


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Imbalance conformance adjustments

Average hourly ISO 15-minute market imbalance conformance

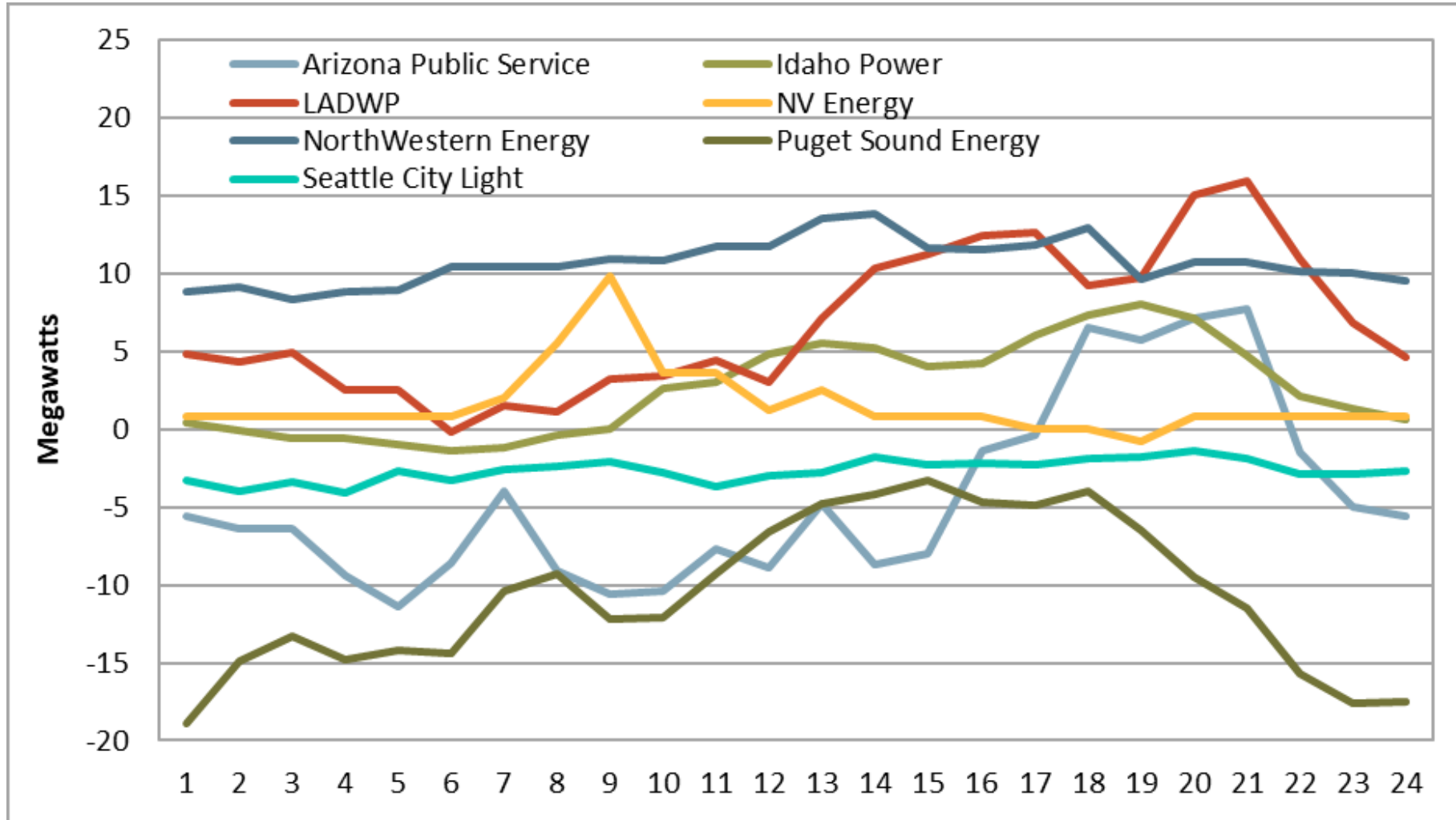
(July – August, 2021)



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Average hourly ISO 15-minute market imbalance conformance

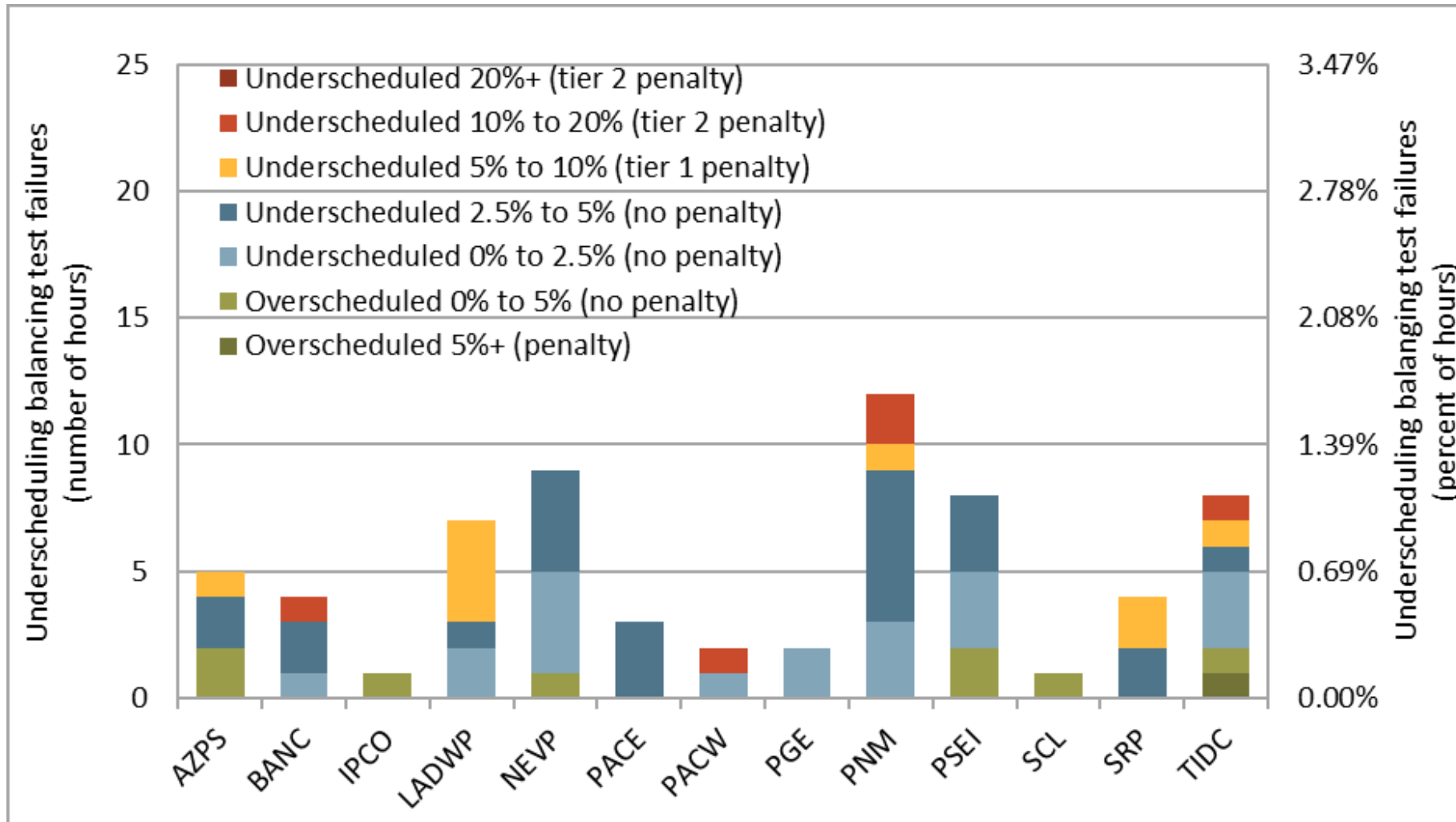
(July – August, 2021)



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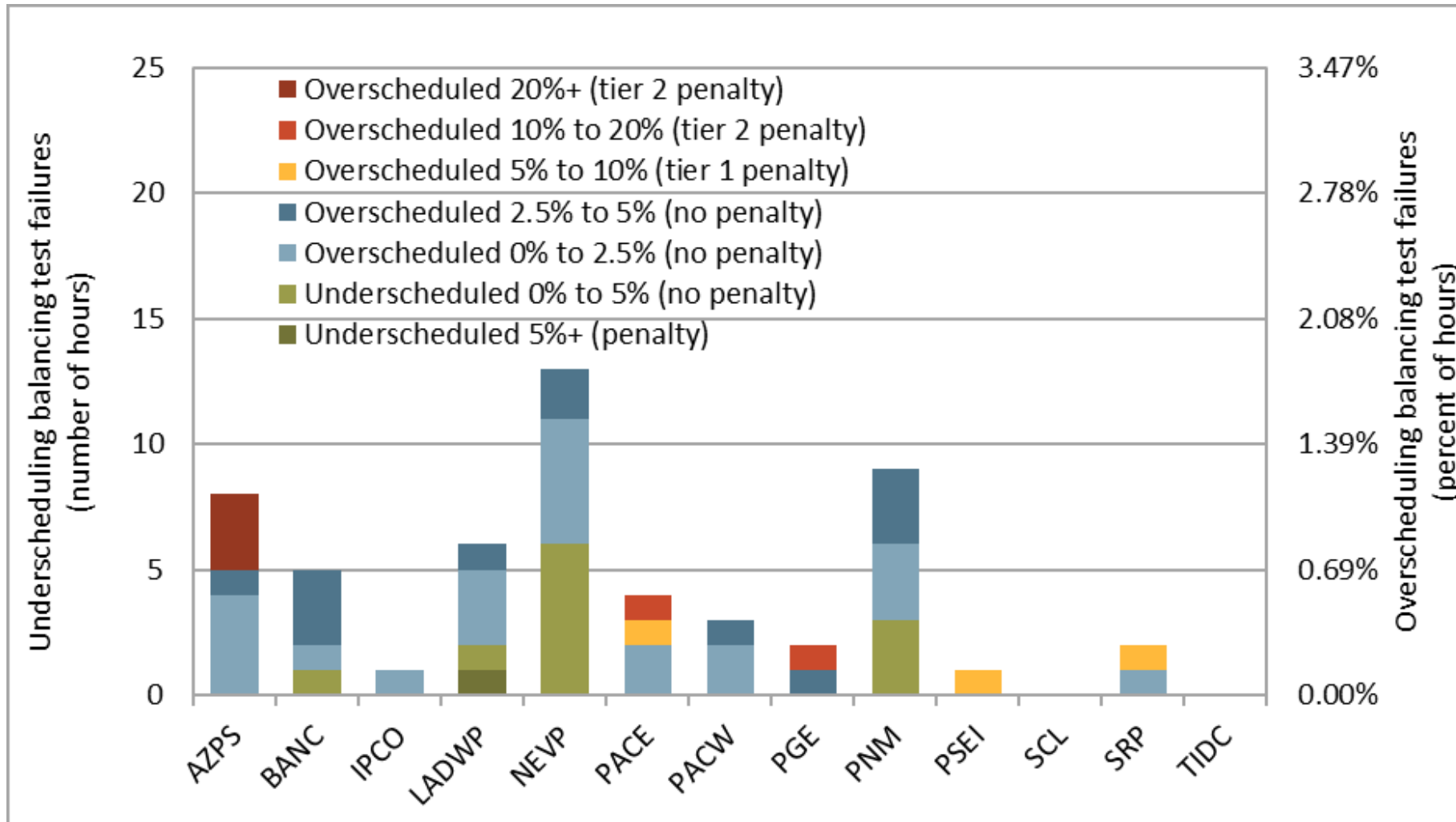
Balancing test failure and penalty

Underscheduling balancing test failures (April, 2021)



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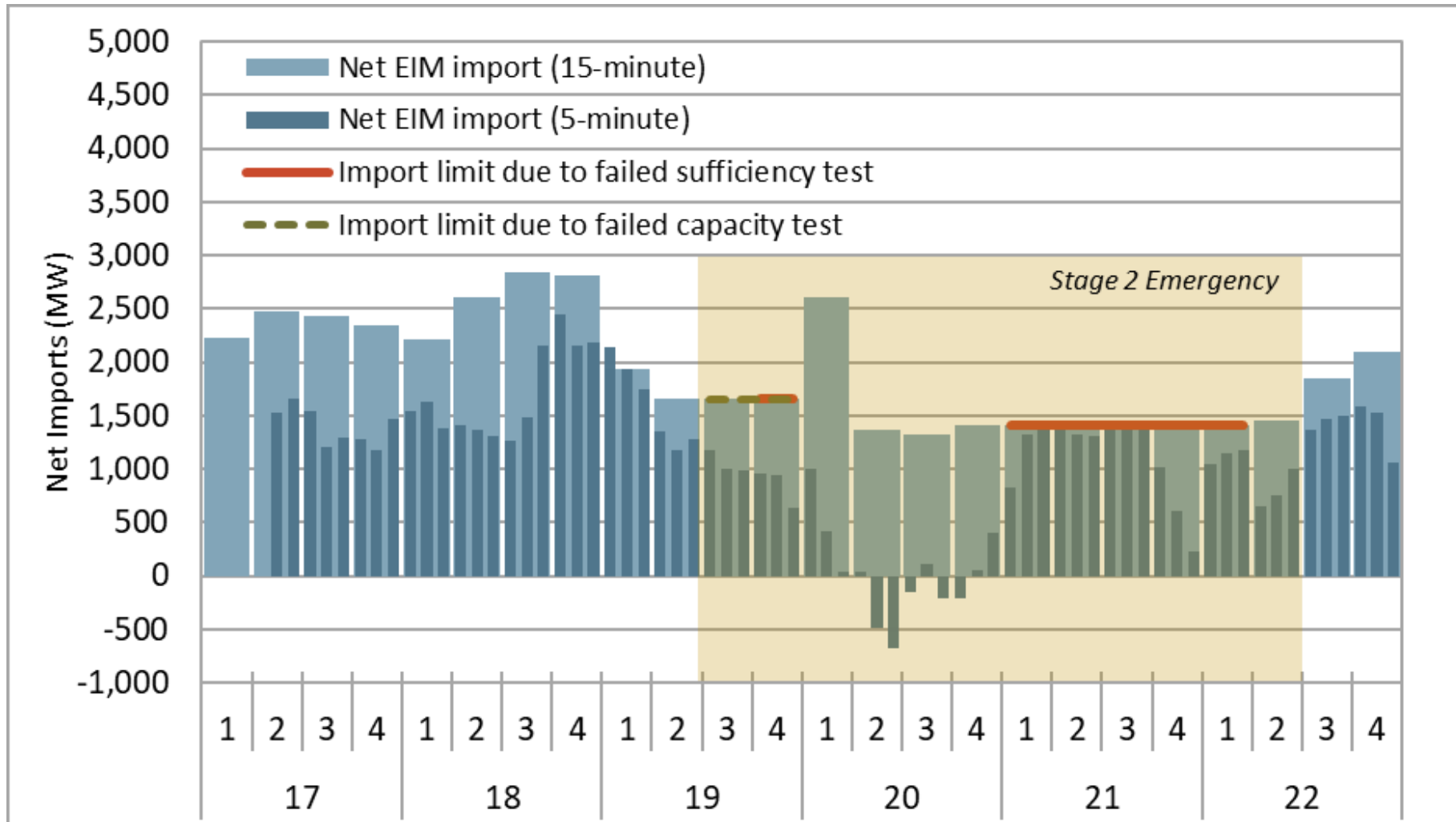
Overscheduling balancing test failures (April, 2021)



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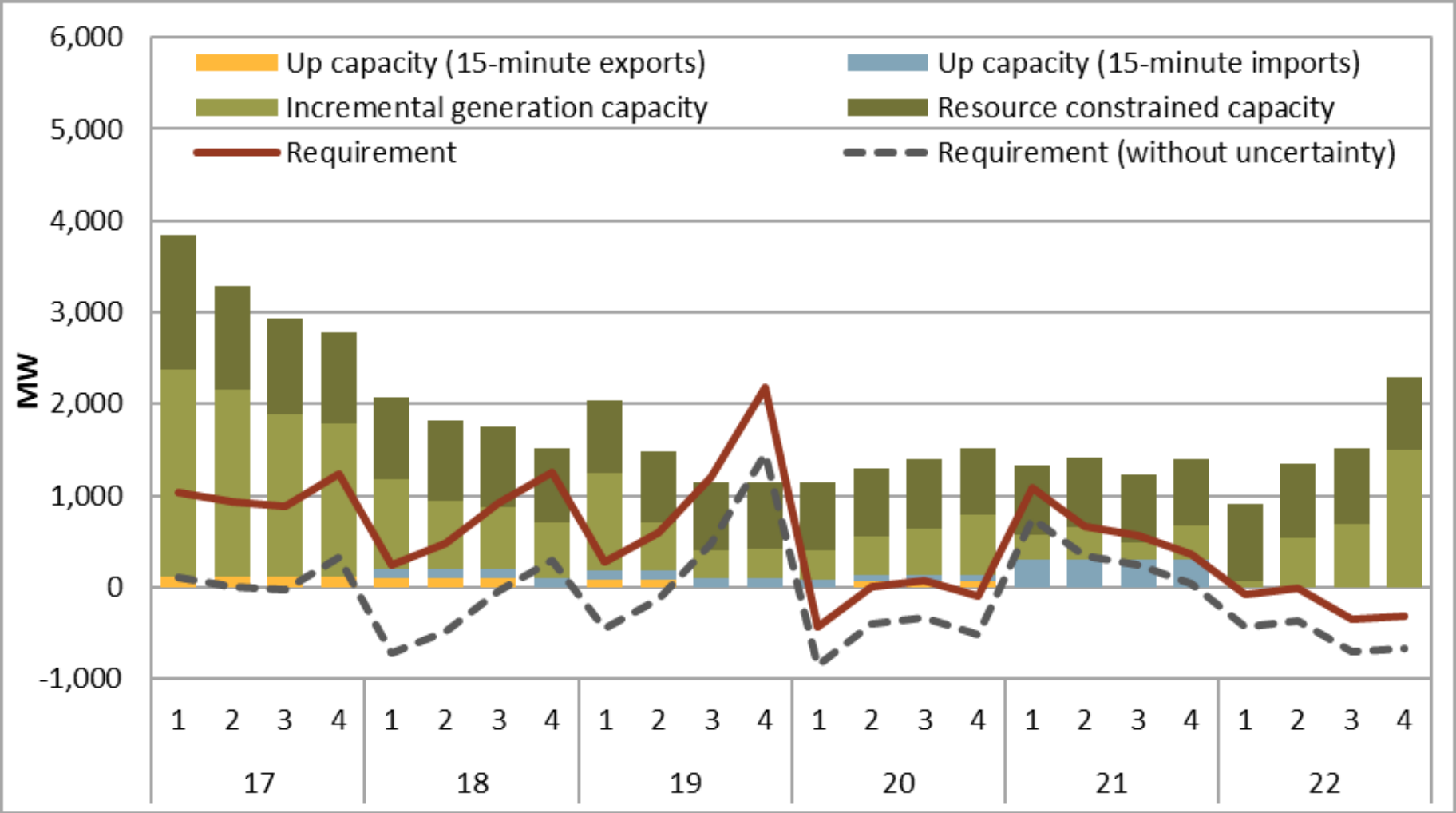
Metrics for key time periods

Limits on EIM imports into CAISO due to RSE failure (July 9, 2021)



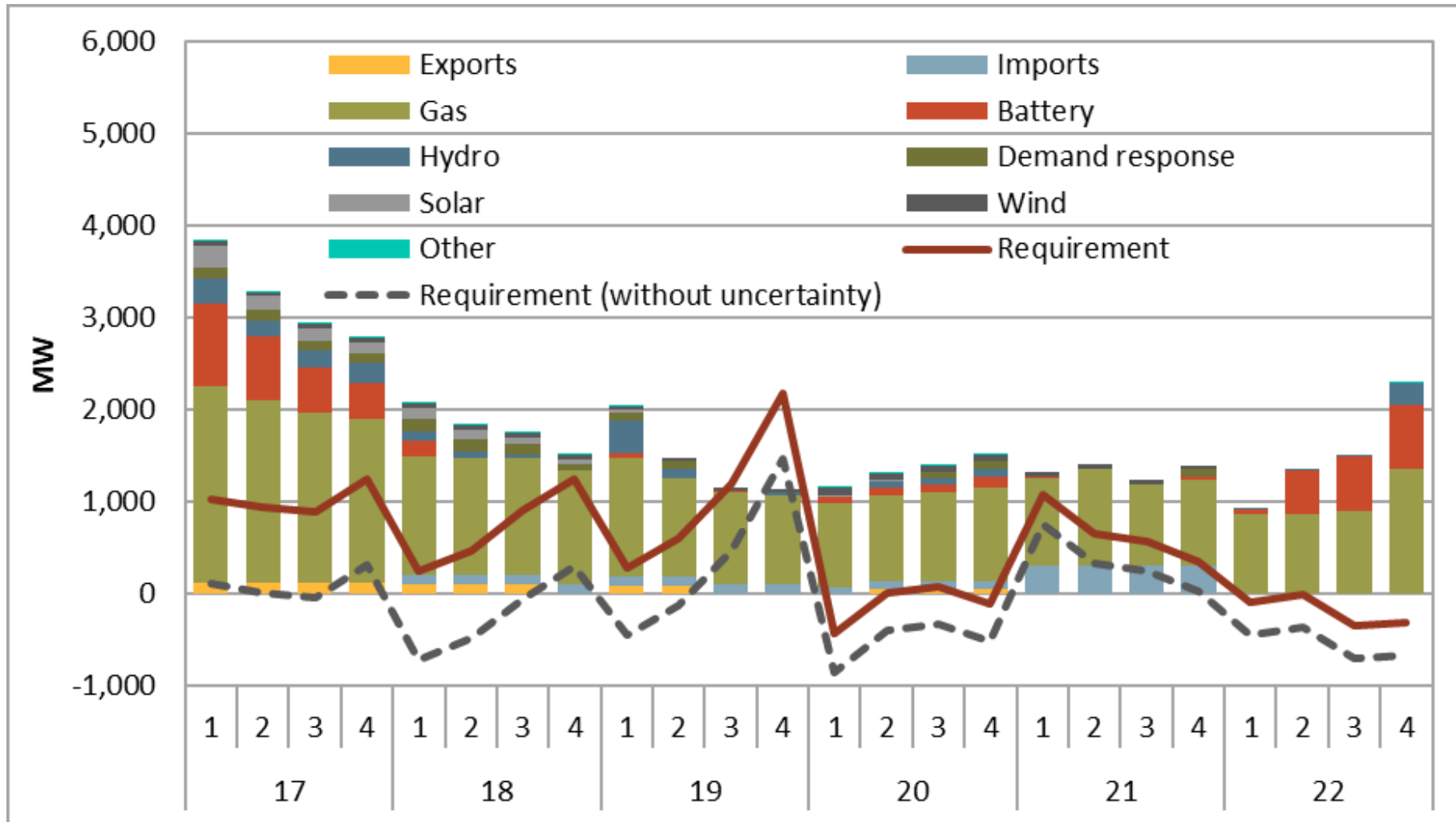
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CAISO upward bid-range capacity test requirement and capacity (July 9, 2021)



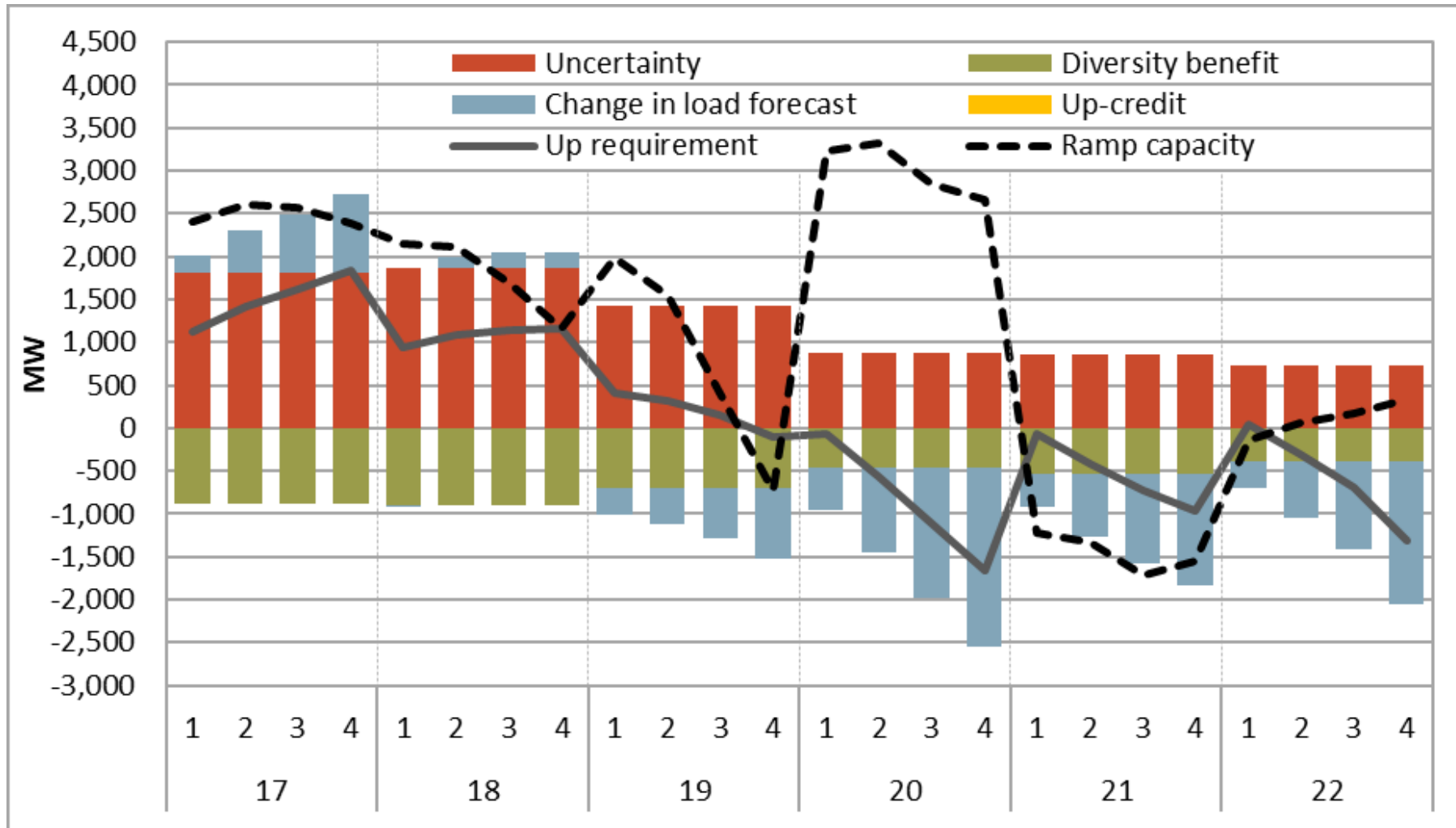
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CAISO upward bid-range capacity test requirement and capacity (July 9, 2021)



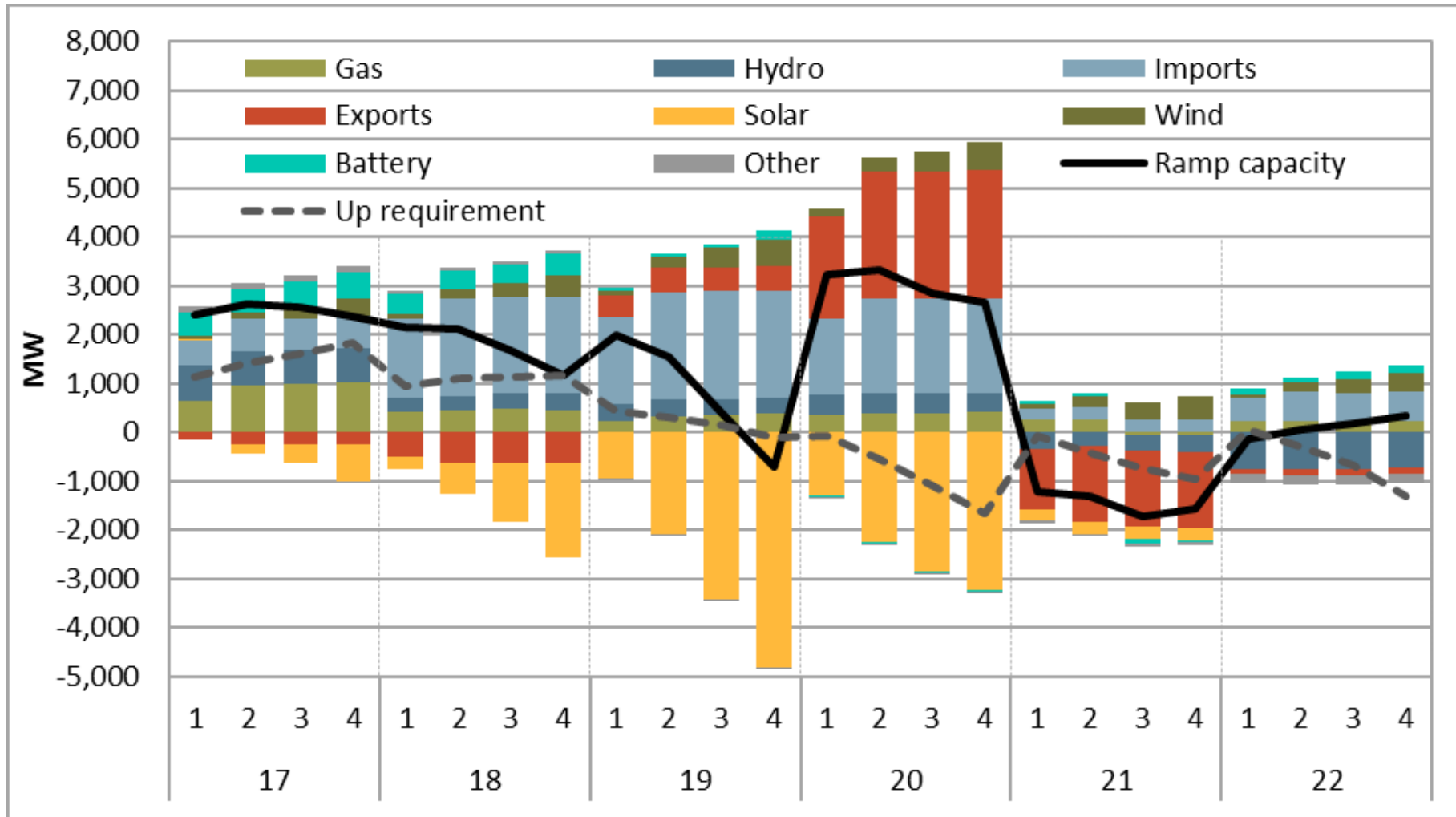
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CAISO upward flexible ramping sufficiency test requirement by component (July 9, 2021)



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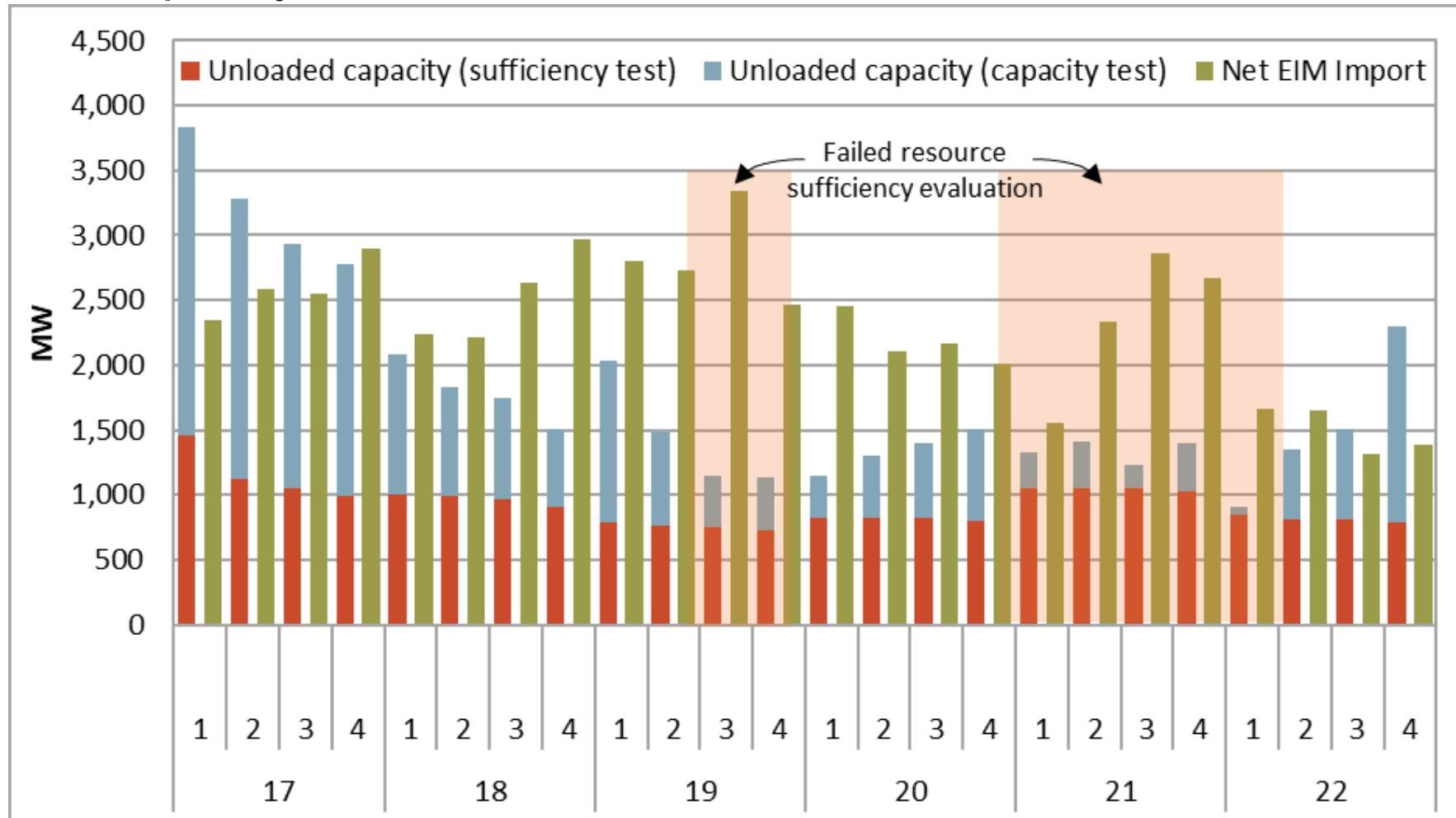
CAISO upward flexible ramping sufficiency test ramping capacity by type (July 9, 2021)



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Additional metrics in development

- Unloaded capacity versus EIM transfers



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Additional metrics in development

- Counterfactual of changes proposed in RSE enhancement initiative
 - Consideration of STUC in the capacity test
 - Inclusion of power balance constraint infeasibility in the sufficiency test
- VER and load forecast versus actuals
- Uncertainty

Interval level data

- Release of CSV files
- Additional avenues for transparency

Comments and questions to DMM@caiso.com