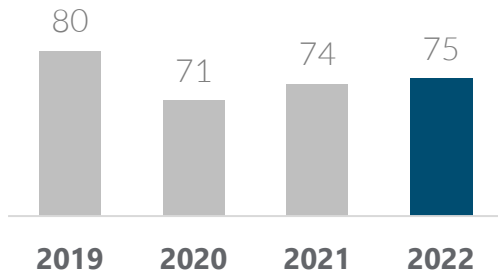# MISO Monthly Operations Report

September 2022

Reliability, markets and operational functions performed well in September

AVERAGE LOAD (GW)
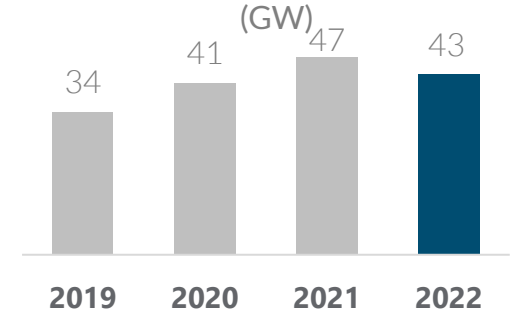
- 2019: 80
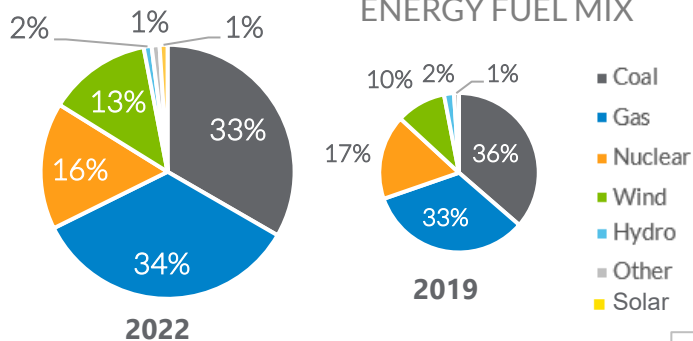- 2020: 71
- 2021: 74
- 2022: 75

SYSTEM-WIDE PEAK

107 GW

September 1, HE 16

AVG. DAILY GENERATION OUTAGES (GW)

- 2019: 34
- 2020: 41
- 2021: 47
- 2022: 43

ENERGY FUEL MIX

2022
- Coal: 33%
- Gas: 34%
- Nuclear: 16%
- Wind: 13%
- Hydro: 1%
- Other: 2%
- Solar: 1%

2019
- Coal: 36%
- Gas: 33%
- Nuclear: 17%
- Wind: 10%
- Hydro: 1%
- Other: 2%

Legend:
- Coal
- Gas
- Nuclear
- Wind
- Hydro
- Other
- Solar

REAL-TIME LMP

AVG. FUEL PRICE/MMBtu

- 2019: $25 / $2 / $2
- 2020: $19 / $2 / $1
- 2021: $44 / $5 / $2
- 2022: $68 / $7 / $8
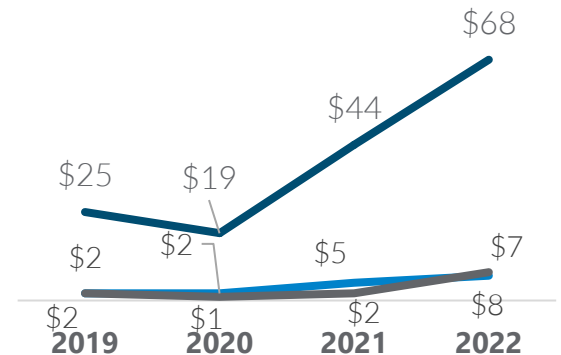
OPERATING CONDITIONS

SEPTEMBER

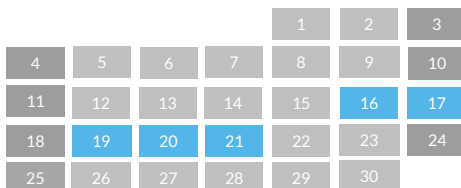|					
			1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

- **9/16, 9/17, 9/19 – Footprint-wide:** *System Status Level 1*
- **9/20 – Footprint-wide:** *Capacity Advisory*
- **9/20-21 – North and Central Regions:** *Hot Weather Alert*

- *Awareness and Weather*
- *Alerts and Warnings*
- *Reliability Actions and Events*

All data shown for the month of September 2022 (unless noted)

HE = Hour ending

MISO

Dashboard

Operational Excellence						Operational Excellence					
Metric	**Chart**	**Sept 2022**	**Aug '22**	**July '22**	**Jun '22**	**Metric**	**Chart**	**Sept 2022**	**Aug '22**	**July '22**	**Jun '22**
Percentage Price Deviation	A	●	●	●	●	Unit Commitment Efficiency	H	●	●	●	●
Monthly Average Gross Virtual Profitability	B	●	●	●	●	Real-Time Obligation fulfilled by Day-Ahead Supply at the Peak Hour	I	●	●	●	●
FTR Funding	C	●	●	●	●	Day Ahead Wind Generation Forecast Error	K	●	●	●	●
Market Efficiency Metric	D	■	■	▼	■	Tie Line Error	L	●	●	●	●
RSG per MWh to Energy Price	E	●	●	●	●	Control Performance – BAAL	M	●	●	●	●
Day Ahead Mid-Term Load Forecast	F	■	●	■	■	Control Performance – CPS1 and CPS1 12-month rolling	N	●	●	●	●
Short-Term Load Forecast	G	■	●	●	■	ARS Deployment	P	●	●	●	●
Customer Service											
System Impact Study Performance	Q	●	●	●	●	Settlement Disputes	S	●	●	●	●

● *Expected* ■ *Concern/Monitor* ▼ *Review*

Note: Dashboard metric criteria are reviewed and revised each year and is included in the Appendix.

MISO

Three metric fell outside of the expected range for the month

Metric	Expected Criteria	Actual	Status	Comments
Market Efficiency	Monthly Metric is >= 92% and Rolling 12-Month Metric is >= 94%	Monthly = 89.3% Rolling = 99.3%	Monitor	A Financial Transmission Rights (FTR) funding surplus drove lower metric performance
Day-Ahead Mid-Term Load Forecast	# of days that forecast error exceeds 3% <=6 AND # days that forecast error exceeds 4% <=4	Forecast error exceeded 6% on one day	Monitor	An extreme temperature drop occurred across the MISO footprint from September 21 to 22 and the model did not handle the temperature impact as well as expected, which led to a large over-forecast on September 22
Short-Term Load Forecast	Forecast error exceeding the 95% percentile of forecast error for the past year <= 2 days	Forecast error exceeded threshold for forecast error on three days	Monitor	Errors on these three days were driven primarily by non-conforming load in heavily industrial Load Balancing Authorities (LBAs)

Progress on key issues, filings and implementations

- On September 20, MISO filed proposed Tariff revisions to enhance the demand curves for the Short-Term Reserve and Up Ramp Capability products, effective November 29, 2022

- On September 28, MISO filed proposed Tariff revisions to clarify the Forecast Maximum Limit and Tolerance Band for Excessive and Deficient Energy calculations with respect to hybrid resources registered as Dispatchable Intermittent Resources for participation in the MISO Day Ahead and Real Time Energy and Reserve Markets

Appendix

Contents

MISO

MISO System-wide Day-Ahead and Real-Time Locational Marginal Pricing
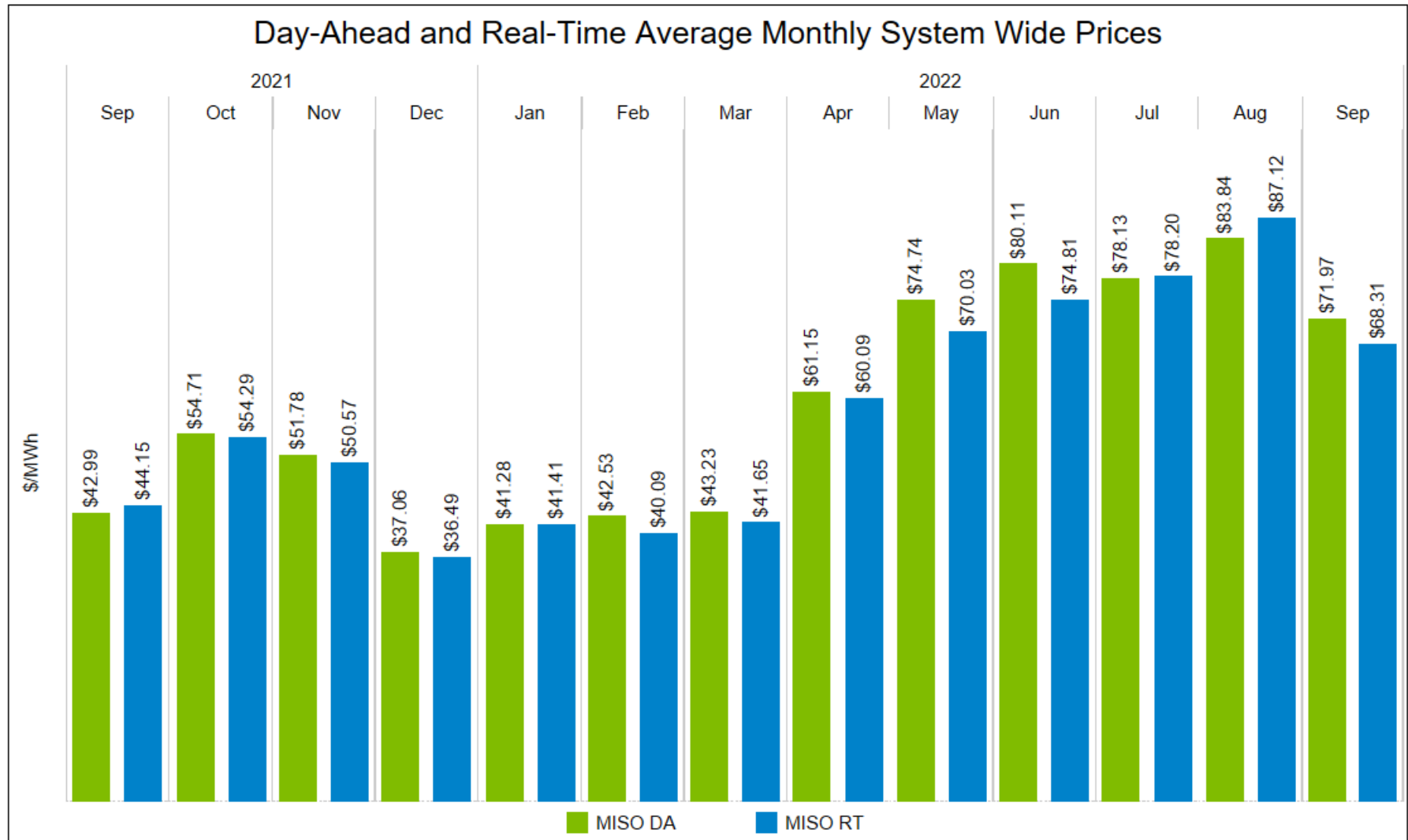
Day-Ahead and Real-Time Average Monthly System Wide Prices

	2021						2022					
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep

MISO DA (green) / MISO RT (blue), $/MWh:

- Sep: $42.99 / $44.15
- Oct: $54.71 / $54.29
- Nov: $51.78 / $50.57
- Dec: $37.06 / $36.49
- Jan: $41.28 / $41.41
- Feb: $42.53 / $40.09
- Mar: $43.23 / $41.65
- Apr: $61.15 / $60.09
- May: $74.74 / $70.03
- Jun: $80.11 / $74.81
- Jul: $78.13 / $78.20
- Aug: $83.84 / $87.12
- Sep: $71.97 / $68.31

Note: MISO System-Wide price is based on the monthly hourly average of the active hubs
Source: MISO Market and Operations Analytics Department

MISO

Price Convergence: Day-Ahead and Real-Time Locational Marginal Pricing

^{A}

DA/RT Price Deviation

- Avg. Absolute Average DA-RT Difference
- Avg. Average DA-RT Difference

2021

	Sep	Oct	Nov	Dec
Abs. Avg.	$7.47	$8.62	$8.41	$6.89
Avg.	$-1.16	$0.42	$1.21	$0.57

2022

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Abs. Avg.	$8.58	$6.91	$6.83	$10.87	$11.69	$15.88	$16.70	$13.11	$10.88
Avg.	$-0.13	$2.44	$1.59	$1.06	$4.71	$5.30	$-0.07	$-3.28	$3.66

$/MWh

% Price Divergence

Review Threshold (25.7%)
Monitor Threshold (22.2%)

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
17.4%	15.8%	16.2%	18.6%	20.8%	16.2%	15.8%	17.8%	15.6%	19.8%	21.4%	15.6%	15.1%

Monthly deviation, expressed as a percent of average DA LMP, is calculated as the average of hourly absolute (DA-RT) price difference divided by the average of hourly DA LMPs for the month

Note: MISO System-Wide price is based on the monthly hourly average of the active trading hubs
Source: MISO Market and Operations Analytics Department

MISO

MISO Day-Ahead and Real-Time Hub Locational Marginal Pricing

Day-Ahead and Real-Time Average Monthly LMP for MISO and Hubs: September 2022
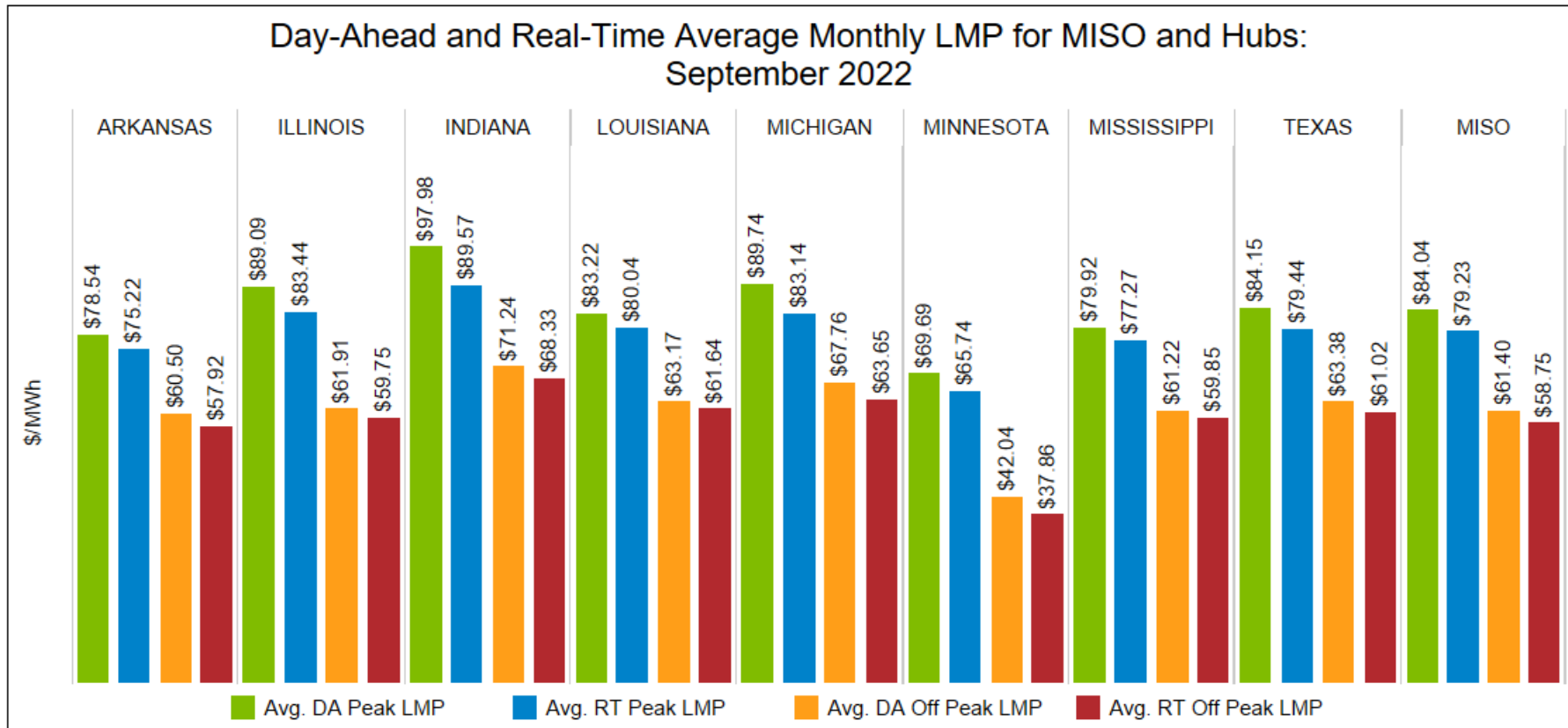
		ARKANSAS	ILLINOIS	INDIANA	LOUISIANA	MICHIGAN	MINNESOTA	MISSISSIPPI	TEXAS	MISO
Marginal Congestion Component of LMP ($/MWh)	DA Peak	-4.38	2.01	7.73	-3.23	-0.02	-9.84	-5.48	-1.69	-1.86
	RT Peak	-2.69	2.30	5.38	-1.75	-0.08	-9.79	-2.82	-1.76	-1.40
	DA Off Peak	-0.20	-0.91	5.59	-0.35	2.29	-13.98	-1.25	0.17	-1.08
	RT Off Peak	-0.72	-0.37	5.43	-0.34	1.34	-16.30	-0.50	-0.51	-1.50

Source: MISO Market and Operations Analytics Department

Price Duration Curve - Peak Hours
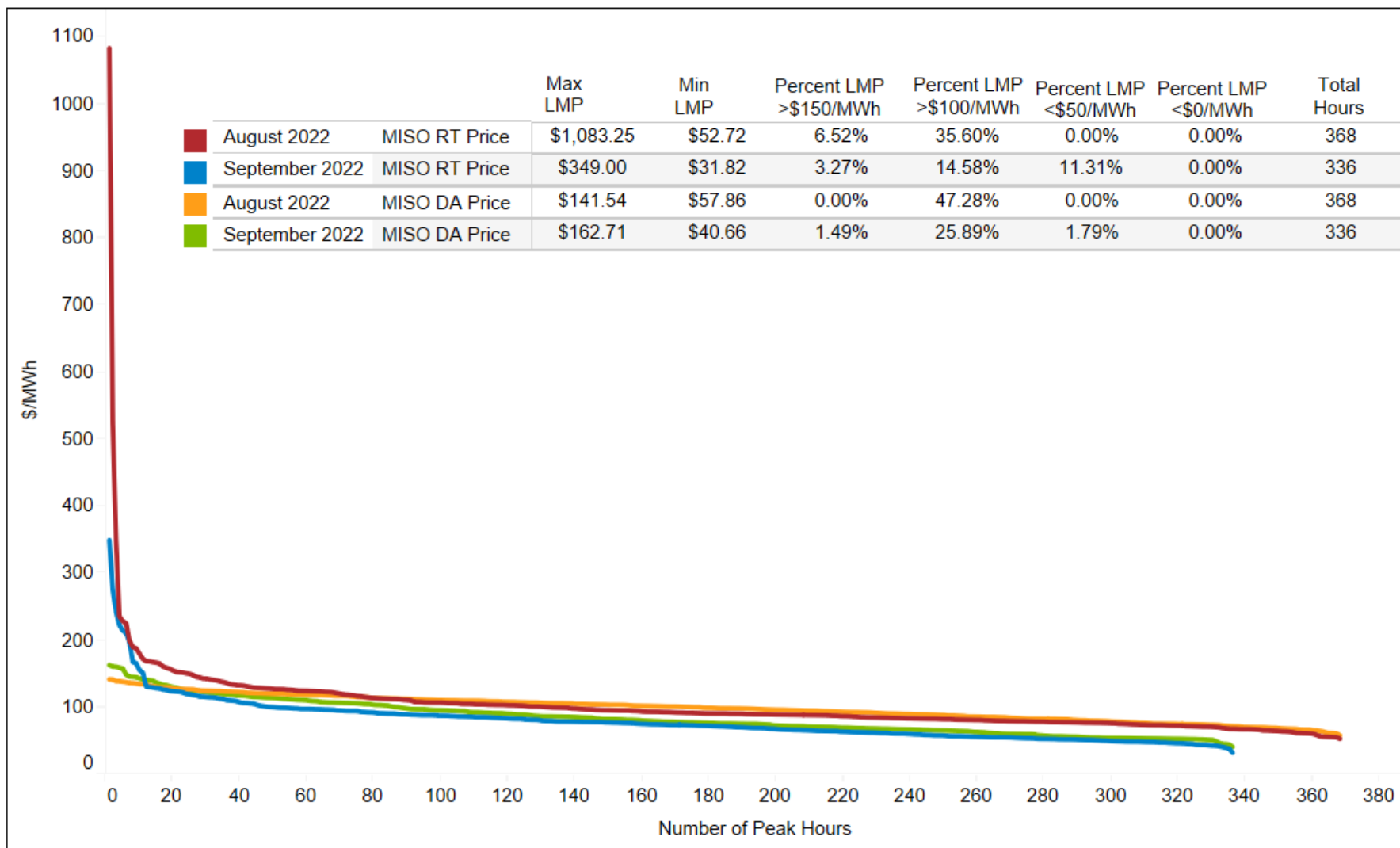
			Max LMP	Min LMP	Percent LMP >$150/MWh	Percent LMP >$100/MWh	Percent LMP <$50/MWh	Percent LMP <$0/MWh	Total Hours
■	August 2022	MISO RT Price	$1,083.25	$52.72	6.52%	35.60%	0.00%	0.00%	368
■	September 2022	MISO RT Price	$349.00	$31.82	3.27%	14.58%	11.31%	0.00%	336
■	August 2022	MISO DA Price	$141.54	$57.86	0.00%	47.28%	0.00%	0.00%	368
■	September 2022	MISO DA Price	$162.71	$40.66	1.49%	25.89%	1.79%	0.00%	336

Note: MISO System-Wide price is based on the hourly average of the active hubs
Source: MISO Market and Analytics Department

Price Duration Curve - Off-Peak Hours

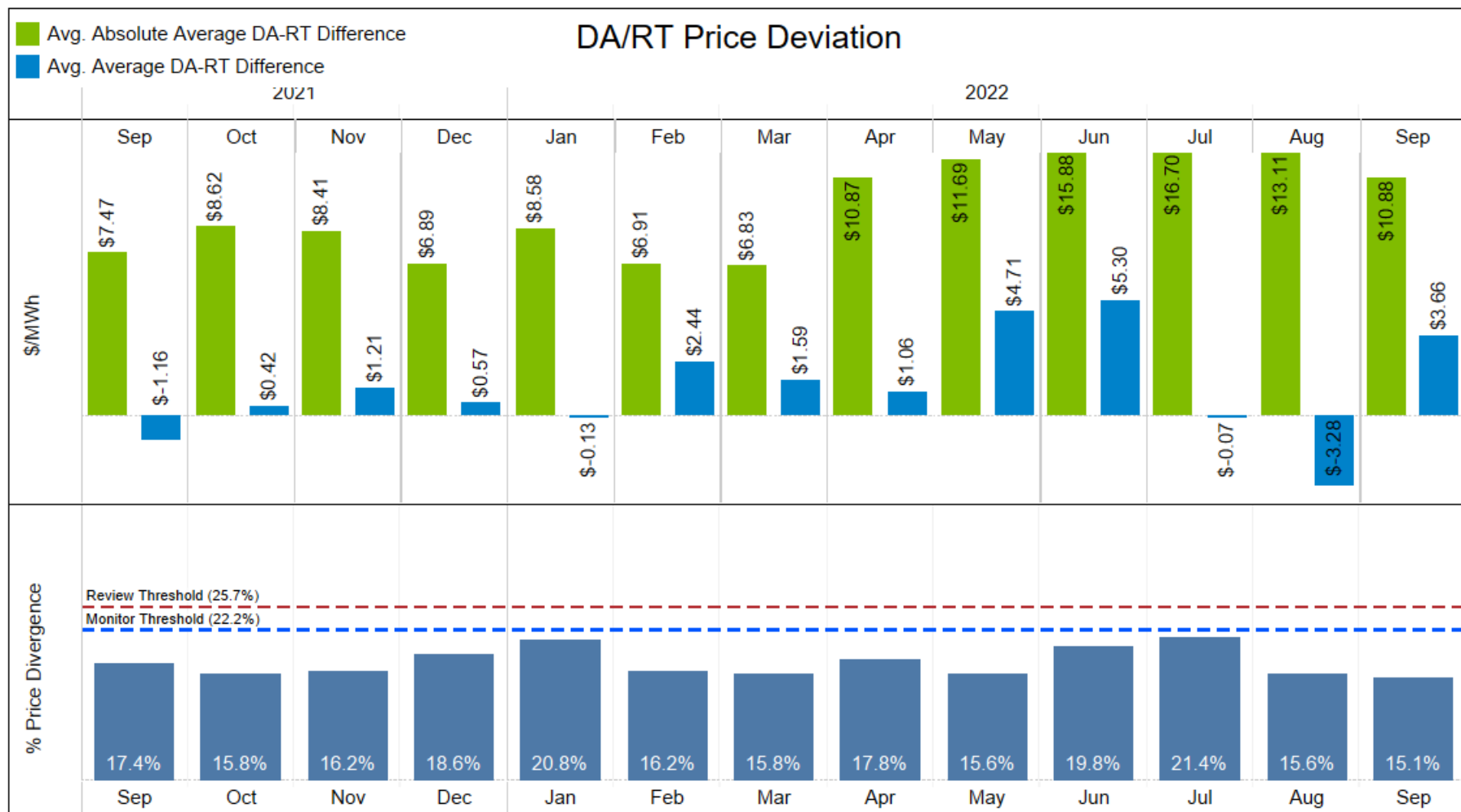|		Max LMP	Min LMP	Percent LMP >$150/MWh	Percent LMP >$100/MWh	Percent LMP <$50/MWh	Percent LMP <$0/MWh	Total Hours
August 2022	MISO RT Price	$326.59	$41.72	2.93%	12.23%	11.44%	0.00%	376
September 2022	MISO RT Price	$238.91	$7.25	1.30%	4.17%	36.72%	0.00%	384
August 2022	MISO DA Price	$132.66	$44.42	0.00%	8.78%	6.12%	0.00%	376
September 2022	MISO DA Price	$129.82	$26.09	0.00%	4.43%	27.86%	0.00%	384

Note: MISO System-Wide price is based on the hourly average of the active hubs
Source: MISO Market and Analytics Department

MISO

MISO Hubs Real-Time Price Duration Peak Hours - September

	ARKANSAS	ILLINOIS	INDIANA	LOUISIANA	MICHIGAN	MINNESOTA	MISSISSIPPI	TEXAS
# Hours with Negative Prices	0	0	0	0	0	0	0	0
Maximum Price ($/MWh)	$338.55	$359.70	$368.60	$346.19	$365.22	$319.48	$342.72	$351.50
Minimum Price ($/MWh)	$33.60	$17.67	$33.98	$35.72	$30.85	$5.83	$34.47	$35.86

Legend: Arkansas, Illinois, Indiana, Louisana, Michigan, Minnesota, Mississippi, Texas

X-axis: Number of Peak Hours

Y-axis: $/MWh

MISO

MISO Hubs Real-Time Price Duration Off Peak Hours - September

	ARKANSAS	ILLINOIS	INDIANA	LOUISIANA	MICHIGAN	MINNESOTA	MISSISSIPPI	TEXAS
# Hours with Negative Prices	0	8	0	0	0	36	0	0
Maximum Price ($/MWh)	$235.57	$259.36	$265.65	$247.84	$263.28	$228.36	$242.57	$242.32
Minimum Price ($/MWh)	$13.79	$-49.24	$13.00	$13.91	$14.90	$-21.59	$13.68	$14.06

Legend: Arkansas, Illinois, Indiana, Louisiana, Michigan, Minnesota, Mississippi, Texas

Y-axis: $/MWh
X-axis: Number of Off-Peak Hours

MISO

Ancillary Services - Day-Ahead and Real-Time Market Clearing Prices

Monthly Average of Day-Ahead Reserve Prices

Legend: Regulation, Spinning, Supplemental

2021 / 2022

Month	Regulation	Spinning	Supplemental
September (2021)	$14.64	$4.19	$0.67
October	$15.61	$5.79	$0.60
November	$14.99	$3.56	$0.39
December	$12.88	$2.76	$0.30
January	$13.37	$2.83	$0.32
February	$12.89	$2.97	$0.23
March	$12.68	$3.39	$0.21
April	$19.03	$5.52	$0.30
May	$21.83	$5.68	$0.37
June	$17.39	$4.85	$0.96
July	$16.27	$3.79	$1.79
August	$15.45	$3.64	$0.55
September	$14.73	$2.98	$0.36

Monthly Average of Real-Time Reserve Prices

Legend: Regulation, Spinning, Supplemental, Regulation Mileage

Month	Regulation	Spinning	Supplemental	Regulation Mileage
September (2021)	$16.00	$4.36	$0.79	$0.71
October	$16.09	$4.39	$1.20	$0.79
November	$17.76	$3.11	$0.35	$0.96
December	$15.73	$3.09	$0.87	$0.67
January	$13.13	$2.39	$0.91	$0.56
February	$12.62	$2.14	$0.18	$0.68
March	$13.08	$2.72	$0.18	$0.71
April	$18.65	$4.78	$0.58	$0.84
May	$20.99	$3.96	$0.67	$0.84
June	$17.61	$2.90	$0.55	$0.77
July	$19.91	$7.96	$5.50	$0.62
August	$19.10	$5.90	$3.05	$0.72
September	$15.48	$3.11	$0.73	$0.78

Source: MISO Market and Operations Analytics Department

MISO

Ancillary Services - Day-Ahead and Real-Time Market Clearing Prices

Monthly Average of Ramp Product Prices — Ramp Up, DA · Ramp Up, RT · Ramp Down, DA · Ramp Down, RT

Monthly Average of Short-Term Reserve Prices — DA · RT

Source: MISO Market and Operations Analytics Department

MISO

Nominal Fuel Prices

Monthly oil prices are estimates and subject to change upon finalization
Source: EIA

Monthly Average Gross Virtual Profitability

MISO Cleared Virtual Market Profit Index*

■ Decrement ■ Increment

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Profit Index	0.85	1.09	1.47	1.09	1.06	0.70	1.13	1.92	1.88	1.68	1.20	0.86	0.69

Monthly Standard Deviation

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
1.11	1.58	1.38	0.96	1.45	0.99	0.98	1.58	1.85	2.32	1.41	1.36	1.10

* The virtual profitability market index is defined as the sum of profits/losses for all cleared virtual transactions divided by the volume (MWh) of total cleared transactions.
* Virtual profits/losses are calculated by multiplying the cleared virtual MW and the imbalance between RT LMP and DA LMP for a cpnode, then summed across all cpnodes, all hours.
* Upper Limit is Threshold (average of monthly indices from the previous year) plus Daily Average Standard Deviation for the previous 13 months (current reporting month inclusive)
* Lower Limit is Threshold (average of monthly indices from the previous year) minus Daily Average Standard Deviation for the previous 13 months (current reporting month inclusi..

Source: MISO Market and Operations Analytics Department

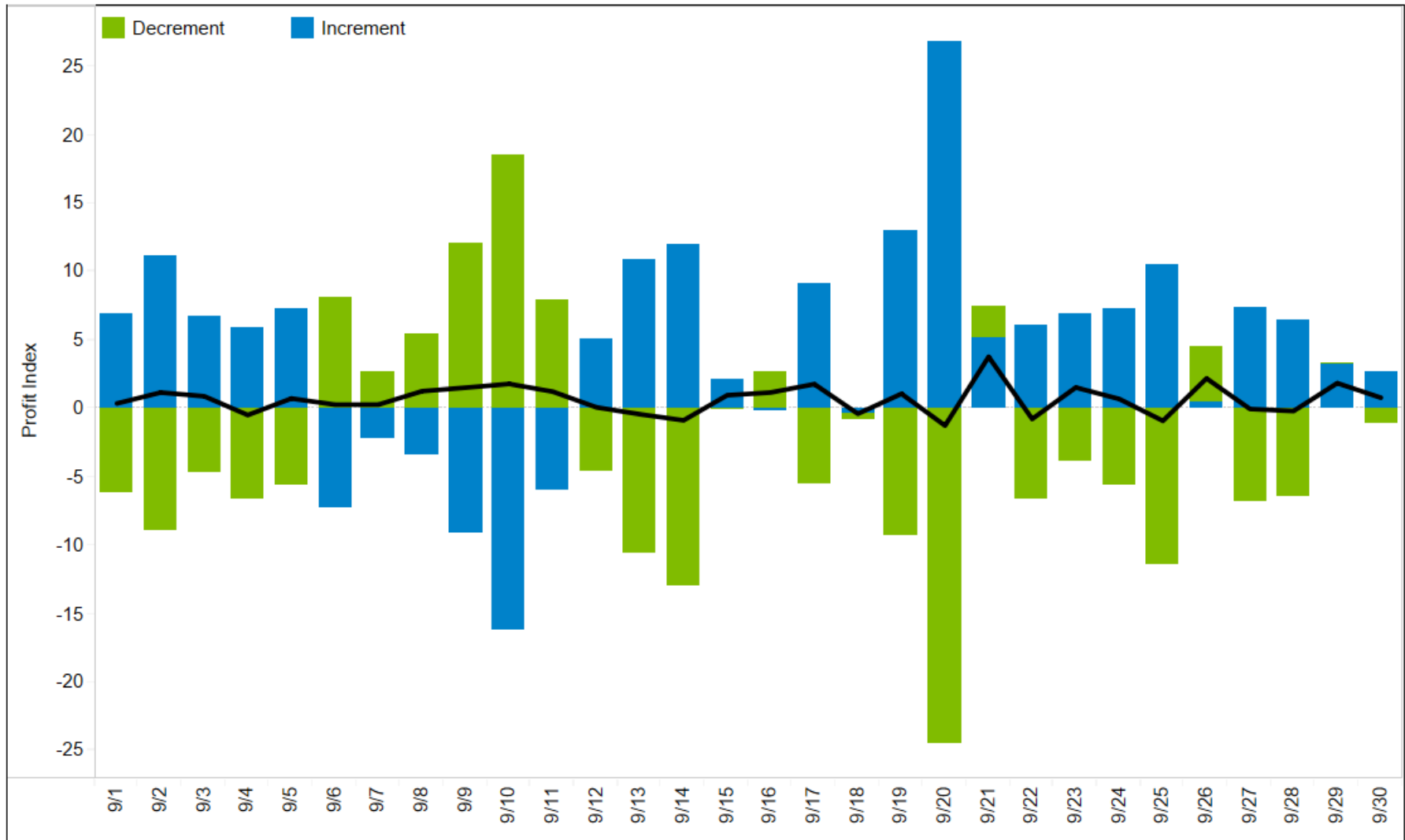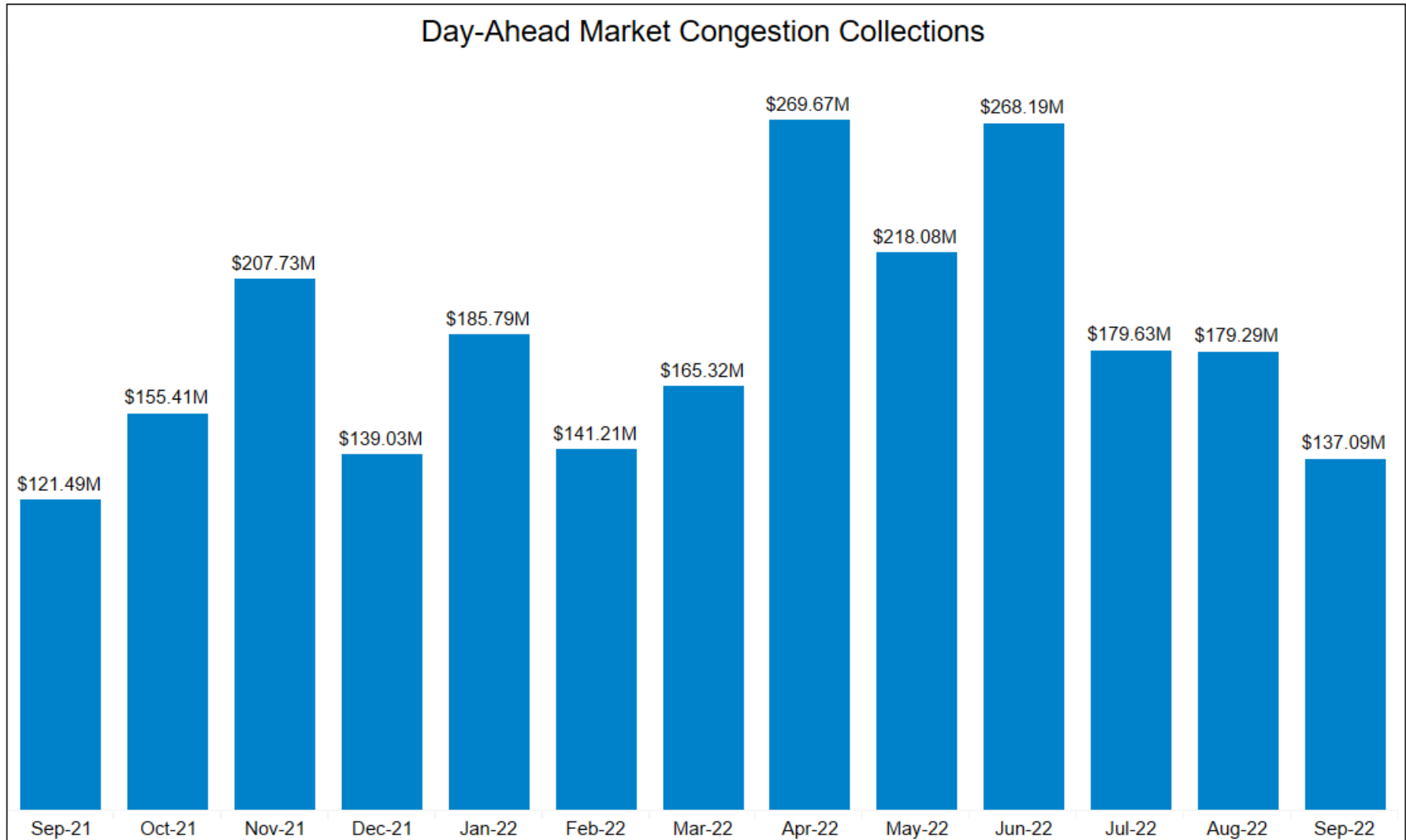# Daily Gross Cleared Virtual Profitability

The virtual profitability market index is defined as the sum of profits/losses for all cleared virtual transactions divided by the volume (MWh) of total cleared transactions
Source: MISO Market and Operations Analytics Department

Day-Ahead Congestion Collections

Day-Ahead Market Congestion Collections

Month	Value
Sep-21	$121.49M
Oct-21	$155.41M
Nov-21	$207.73M
Dec-21	$139.03M
Jan-22	$185.79M
Feb-22	$141.21M
Mar-22	$165.32M
Apr-22	$269.67M
May-22	$218.08M
Jun-22	$268.19M
Jul-22	$179.63M
Aug-22	$179.29M
Sep-22	$137.09M

Financial Transmission Rights, Monthly and Rolling Year-to-Date Allocation Funding

FTR Funding
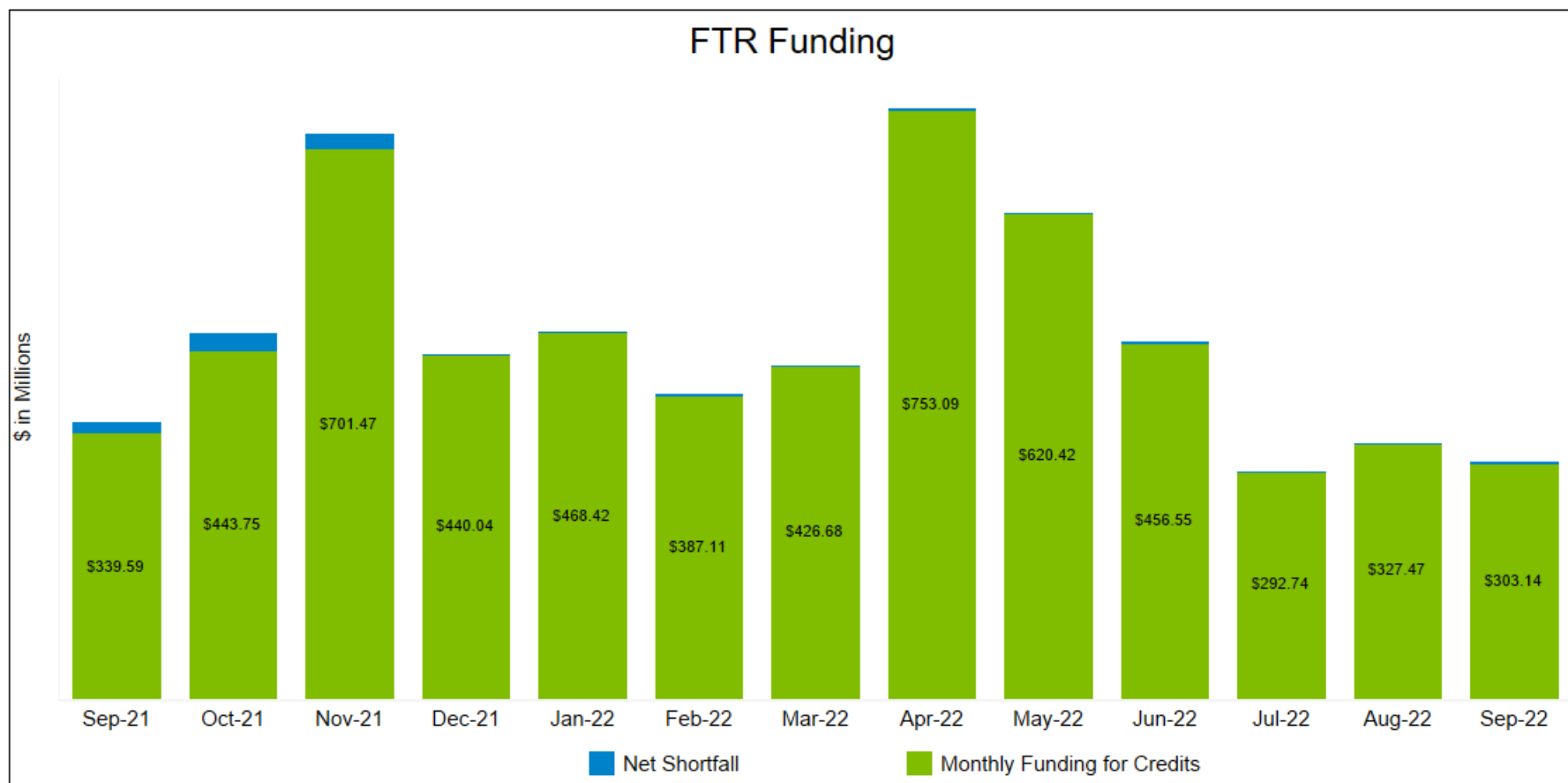
	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Monthly FTR Allocation (%)	95.6%	95.0%	97.4%	100.0%	100.0%	99.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
YTD FTR Allocation (%)	100.0%	100.0%	100.0%	100.0%	NA	NA	NA	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

YTD metric is applied beginning April
Values may change due to resettlement
Source: MISO Market ECF Report

Market Efficiency Metric
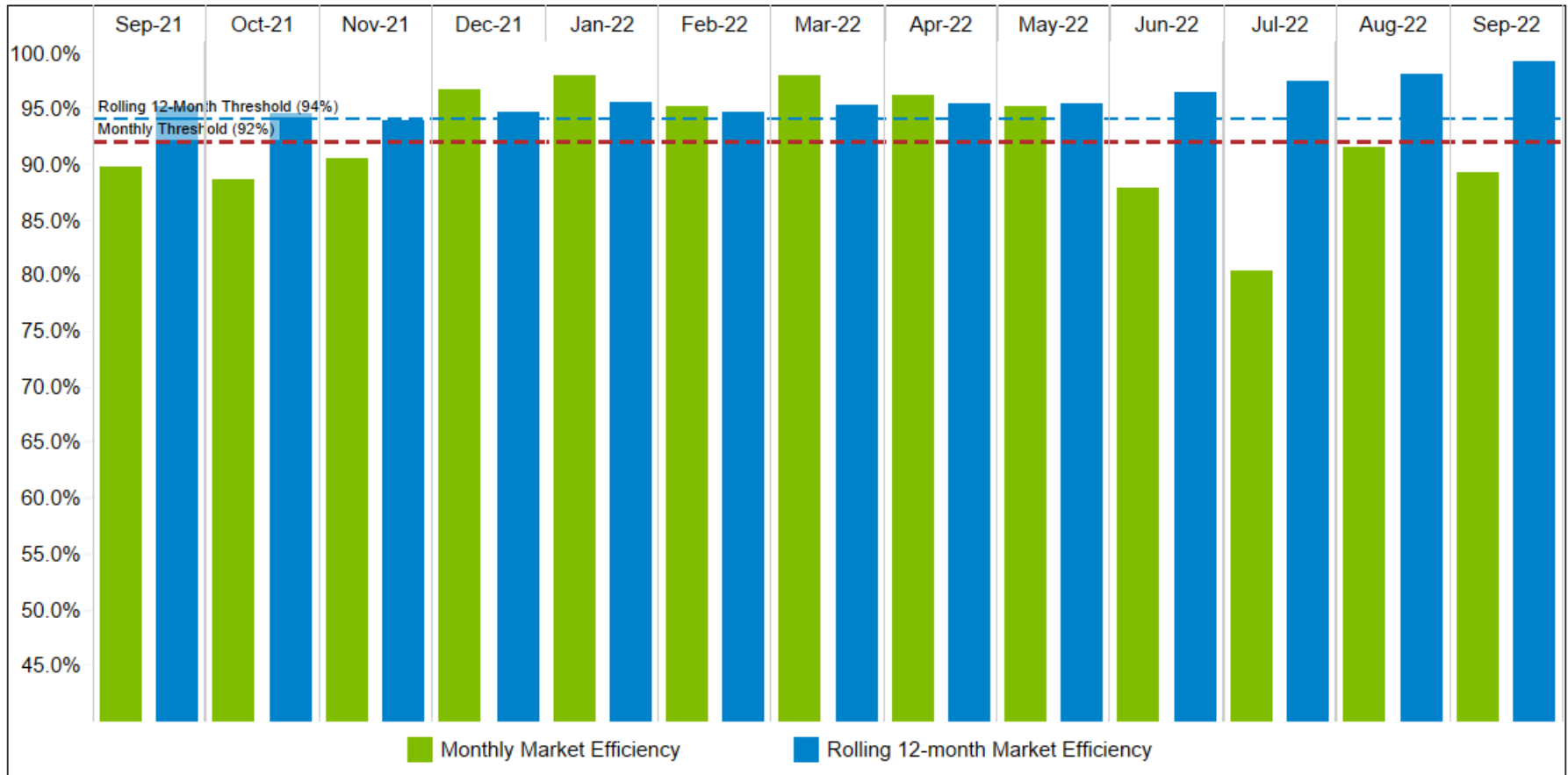
	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Monthly Market Efficiency	89.8%	88.8%	90.7%	96.7%	97.9%	95.2%	98.0%	96.3%	95.2%	88.0%	80.5%	91.5%	89.3%
Rolling 12-month Market Efficiency	95.1%	94.5%	94.0%	94.7%	95.7%	94.8%	95.3%	95.4%	95.4%	96.5%	97.5%	98.1%	99.3%

Values may change due to resettlement
Source: MISO Market ECF Report

Day-Ahead and Real-Time Revenue Sufficiency Guarantee
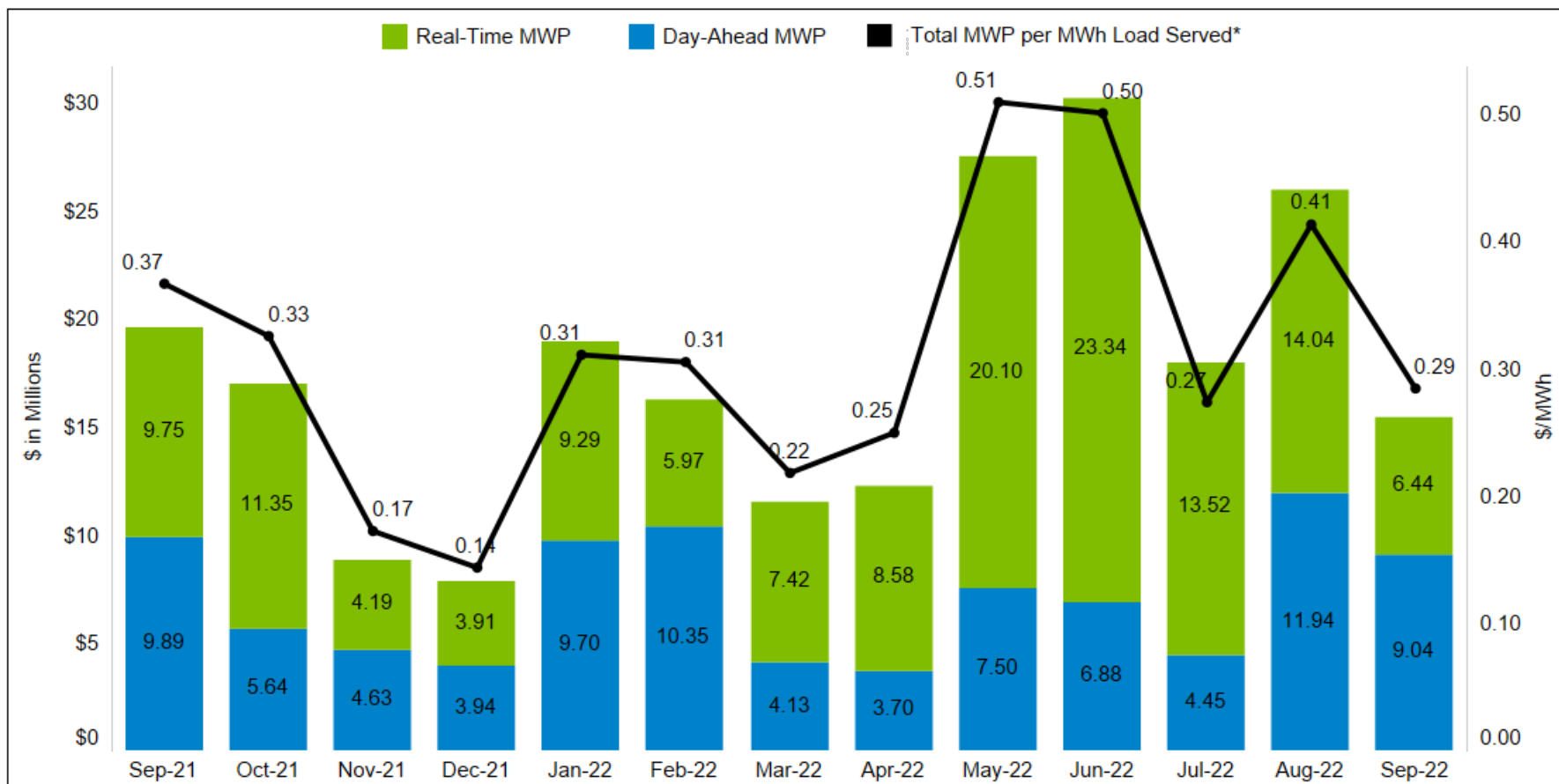
	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Chicago Gas Prices ($/MMBtu)	4.75	5.26	4.88	3.60	4.18	4.40	4.57	6.38	7.71	7.66	6.77	8.20	7.00
Henry Gas Prices ($/MMBtu)	4.88	5.47	5.09	3.72	4.17	4.77	4.85	6.42	7.93	7.75	7.15	8.82	7.90
^^RSG Per MWh to Energy Price (%)	0.86	0.60	0.33	0.39	0.75	0.72	0.51	0.41	0.68	0.63	0.35	0.49	0.40

*Based on hourly ICCP Data; ^^metric value
Values may change due to resettlement
Source: The Web-based Revenue Sufficiency Gurantee Report

Price Volatility Make Whole Payment

*Hourly ICCP data
Source: Web-based Revenue Neutrality Uplift Report
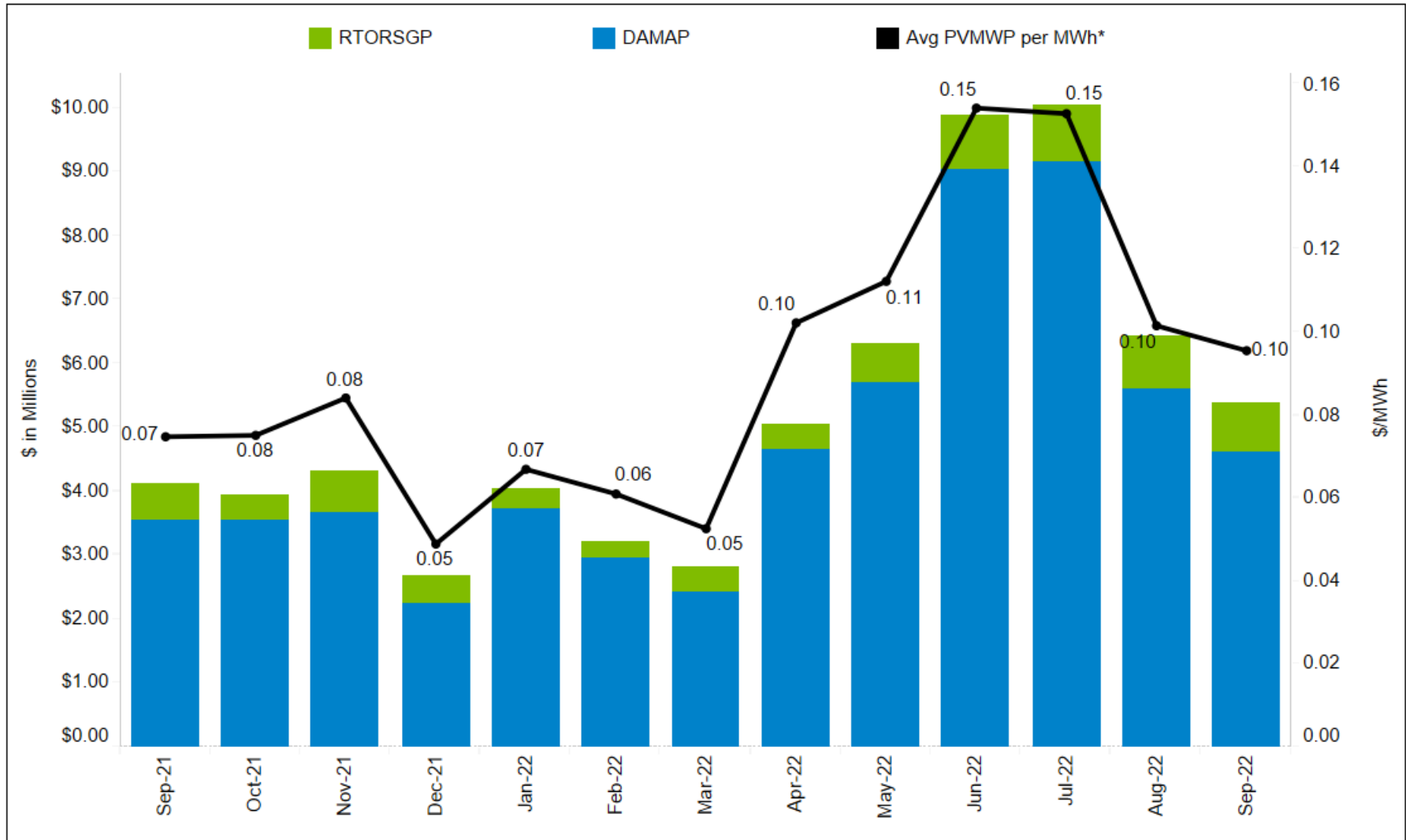
Day-Ahead and Real-Time Cleared Physical Energy

Total Day-Ahead Physical Load

TWh

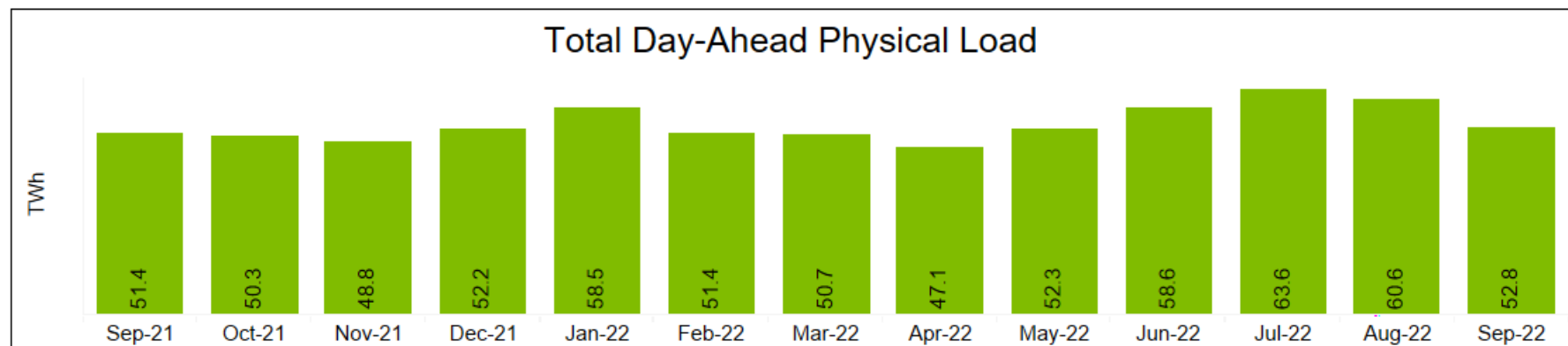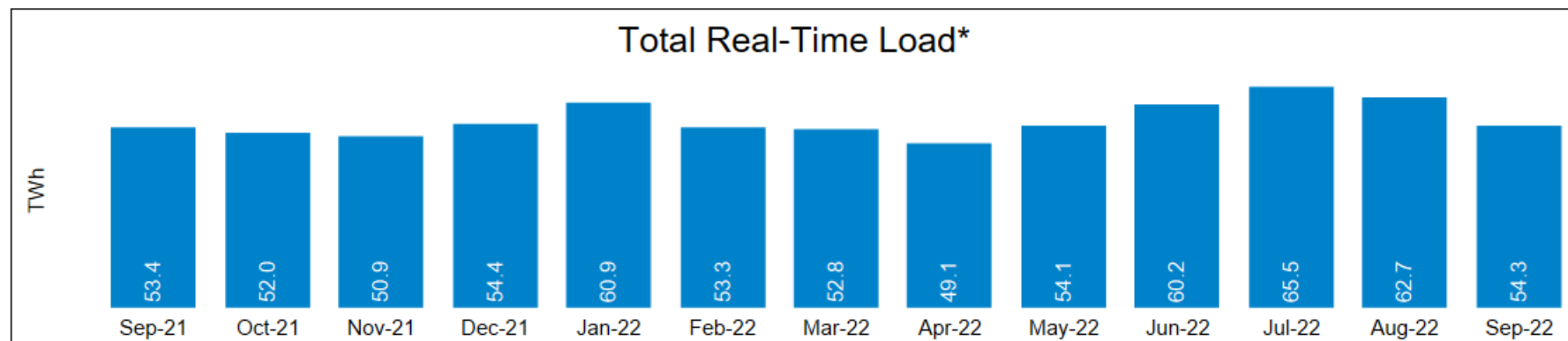|	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
TWh	51.4	50.3	48.8	52.2	58.5	51.4	50.7	47.1	52.3	58.6	63.6	60.6	52.8

Day-Ahead Cleared Load Value (including Virtuals)

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
$2.57B	$3.08B	$2.86B	$2.27B	$2.95B	$2.53B	$2.40B	$3.17B	$4.54B	$5.68B	$5.87B	$6.08B	$4.54B

Total Real-Time Load*

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
TWh	53.4	52.0	50.9	54.4	60.9	53.3	52.8	49.1	54.1	60.2	65.5	62.7	54.3

Real-Time Cleared Load Value ($ in Billions)

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
$2.42B	$2.73B	$2.53B	$2.02B	$2.60B	$2.11B	$2.05B	$2.71B	$3.87B	$4.76B	$5.30B	$5.70B	$3.80B

*Sum of Hourly ICCP Load Data
Source: MISO Market and Operations Analytics Department

MISO

Monthly System Load and Temperature

System Wide Real Time Peak and Average Load

Legend: Average Load (blue), Peak Load (green)

Peak Load values: Sep-21: 97.9, Oct-21: 87.4, Nov-21: 85.4, Dec-21: 88.7, Jan-22: 100.2, Feb-22: 96.1, Mar-22: 84.4, Apr-22: 77.8, May-22: 103.7, Jun-22: 121.1, Jul-22: 119.1, Aug-22: 112.4, Sep-22: 107.4

Average Load values: Sep-21: 74.2, Oct-21: 70.0, Nov-21: 70.7, Dec-21: 73.1, Jan-22: 81.9, Feb-22: 79.4, Mar-22: 71.0, Apr-22: 68.2, May-22: 72.7, Jun-22: 83.7, Jul-22: 88.0, Aug-22: 84.3, Sep-22: 75.4

Y-axis: GW

System Wide Load Weighted Temperature °F

	Sep-21	Aug-22	Sep-22
Average	69°F	77°F	68°F
Maximum	84°F	95°F	88°F
Minimum	49°F	63°F	45°F

Monthly data based on hourly ICCP Load Data; Hourly Integrated Peak Load Hour could differ from the Instantaneous Peak Load Hour.
Source: MISO Market and Operations Analytics Department

MISO

Day-Ahead Mid-Term Load Forecast*

September 2022 Mid-Term Forecasted Daily Peak Load vs. Actual

Legend: MTLF | Load | % Forecast Error

Monthly Average of Mid-Term Forecasted Daily Peak Load vs. Actual
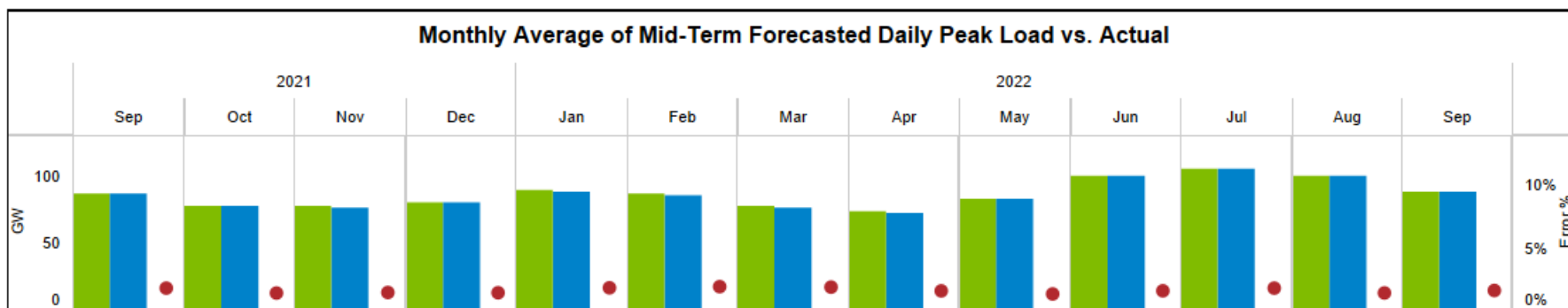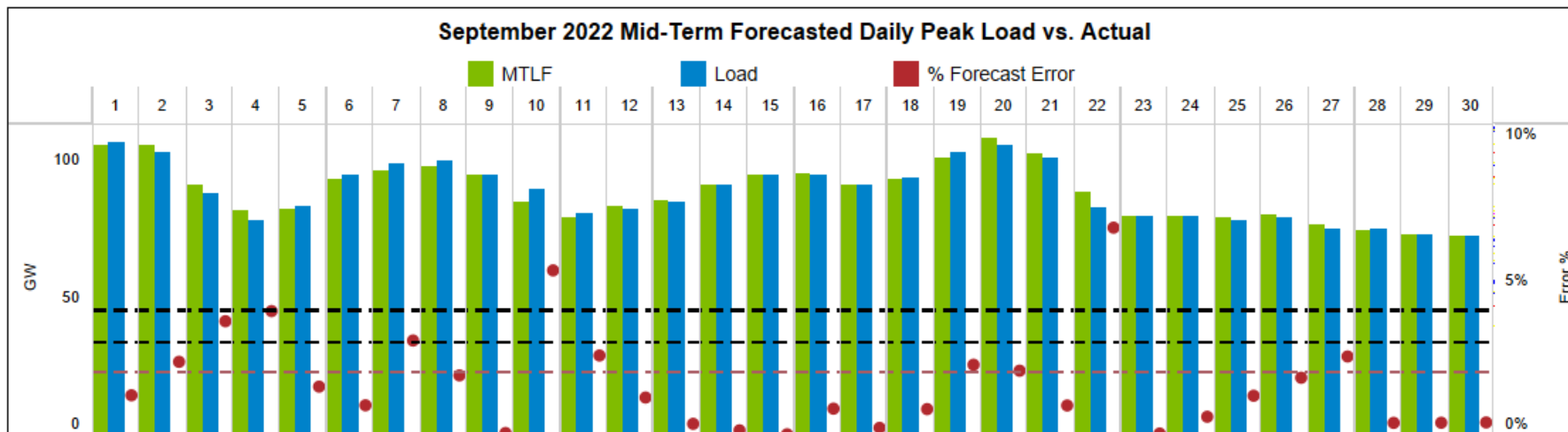
	2021				2022								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
% Std of Error (CV)	58.99	84.40	60.74	78.37	69.12	72.72	112.33	65.44	105.95	83.62	84.54	81.96	94.64
Mean of Error (MW)	1,619	1,129	1,163	1,174	1,681	1,691	1,508	1,194	1,164	1,632	1,889	1,469	1,469
Std of Error (MW)	955	953	706	920	1,162	1,230	1,694	782	1,233	1,364	1,597	1,204	1,391

* Monthly data based on the average of the daily integrated peak hours in the month
* Daily data based on the integrated peak hour of the day
* Peak Day and Hour End based on Hourly Integrated Peak Load Hour

Source: MISO Day-Ahead Market Reliability and Commitment

Short-Term Load Forecast*

September 2022 Short-Term Forecasted Daily Peak Load vs Actual

Legend: STLF, Peak Load, % Forecast Error

Mean Absolute Percent Error: 0.22%

Daily data based on the average of five-minute interval data at the peak hour of the day
Error Threshold calculated as 95% quantile of Forecast Error from Jan-Dec of the previous year

Peak Day and Hour End based on Hourly Integrated Peak Load Hour

Source: MISO Day-Ahead Market Reliability and Commitment
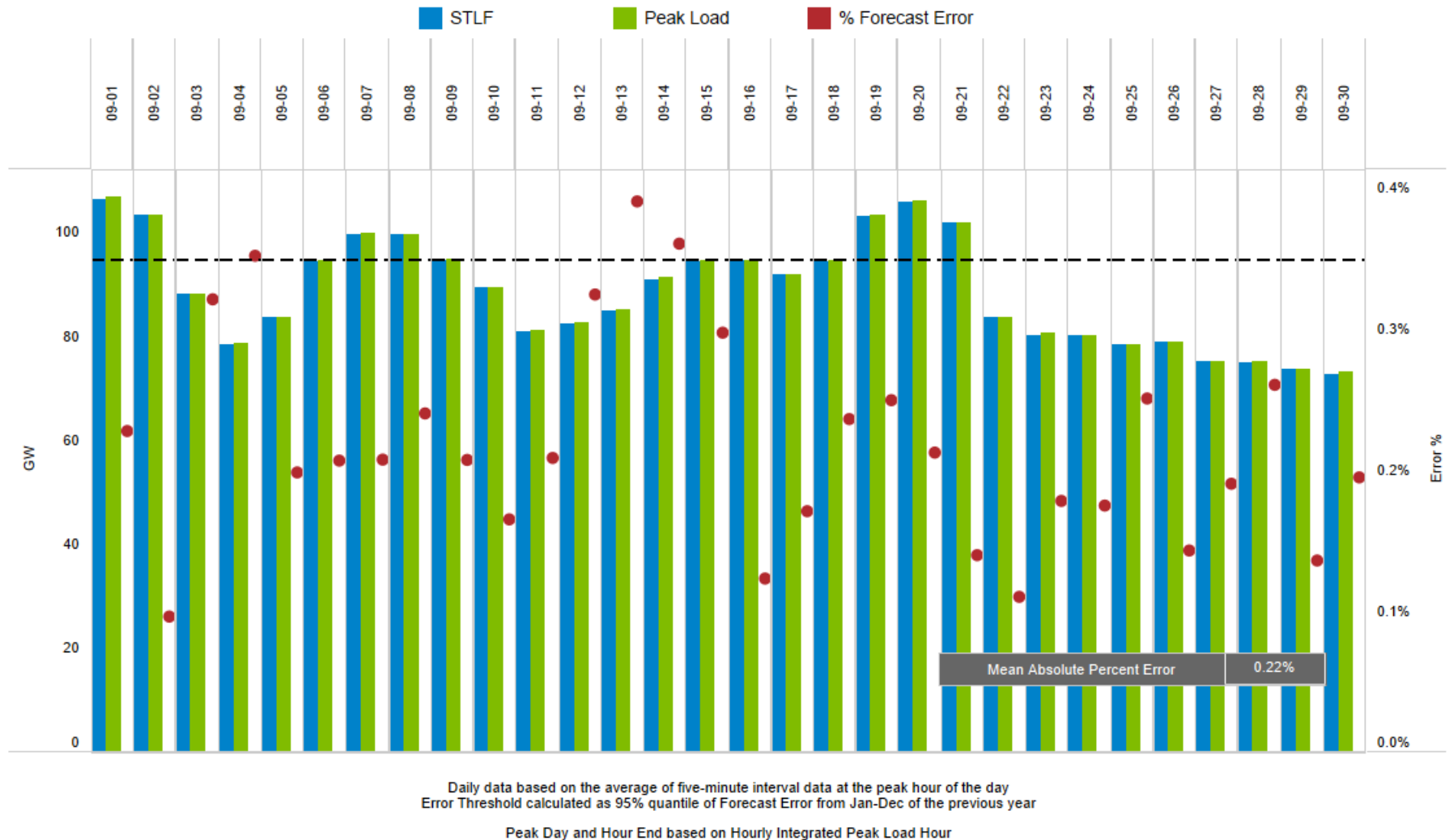
Load Duration Curve and Weather Summary

	Average HDD	Std Dev HDD	Average CDD	Std Dev CDD
Sep-22	1.34	3.37	7.59	6.70
Aug-22	0.00	0.00	14.53	6.98
Sep-21	0.75	2.24	7.98	6.45

Hours with Load Greater than:

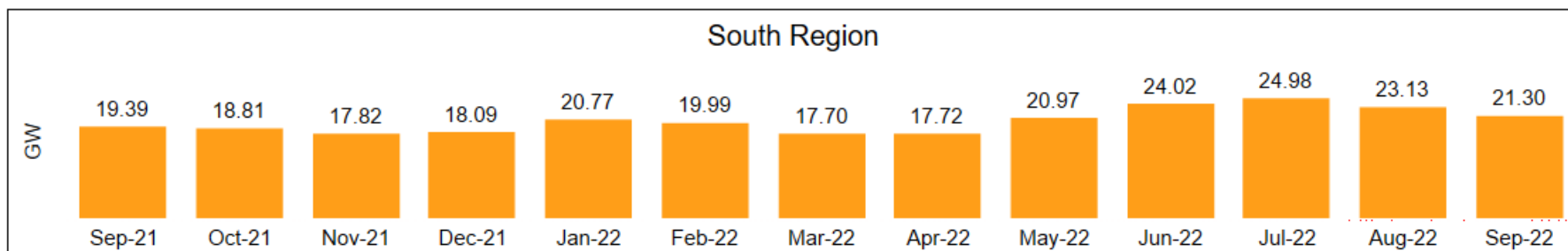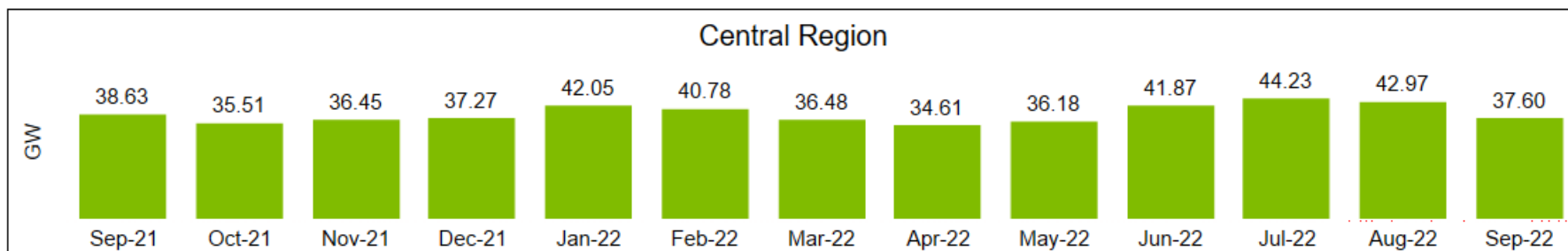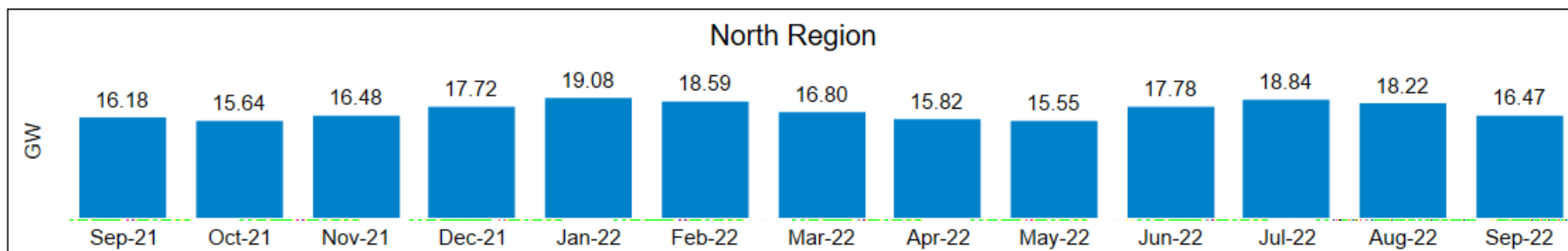|	100 GW	% 100 G..	80 GW	% 80 GW	60 GW	% 60 GW
Sep-22	24	3.33%	224	31.11%	674	93.61%
Aug-22	88	11.83%	442	59.41%	744	100.00%
Sep-21	0	0.00%	237	32.92%	650	90.28%
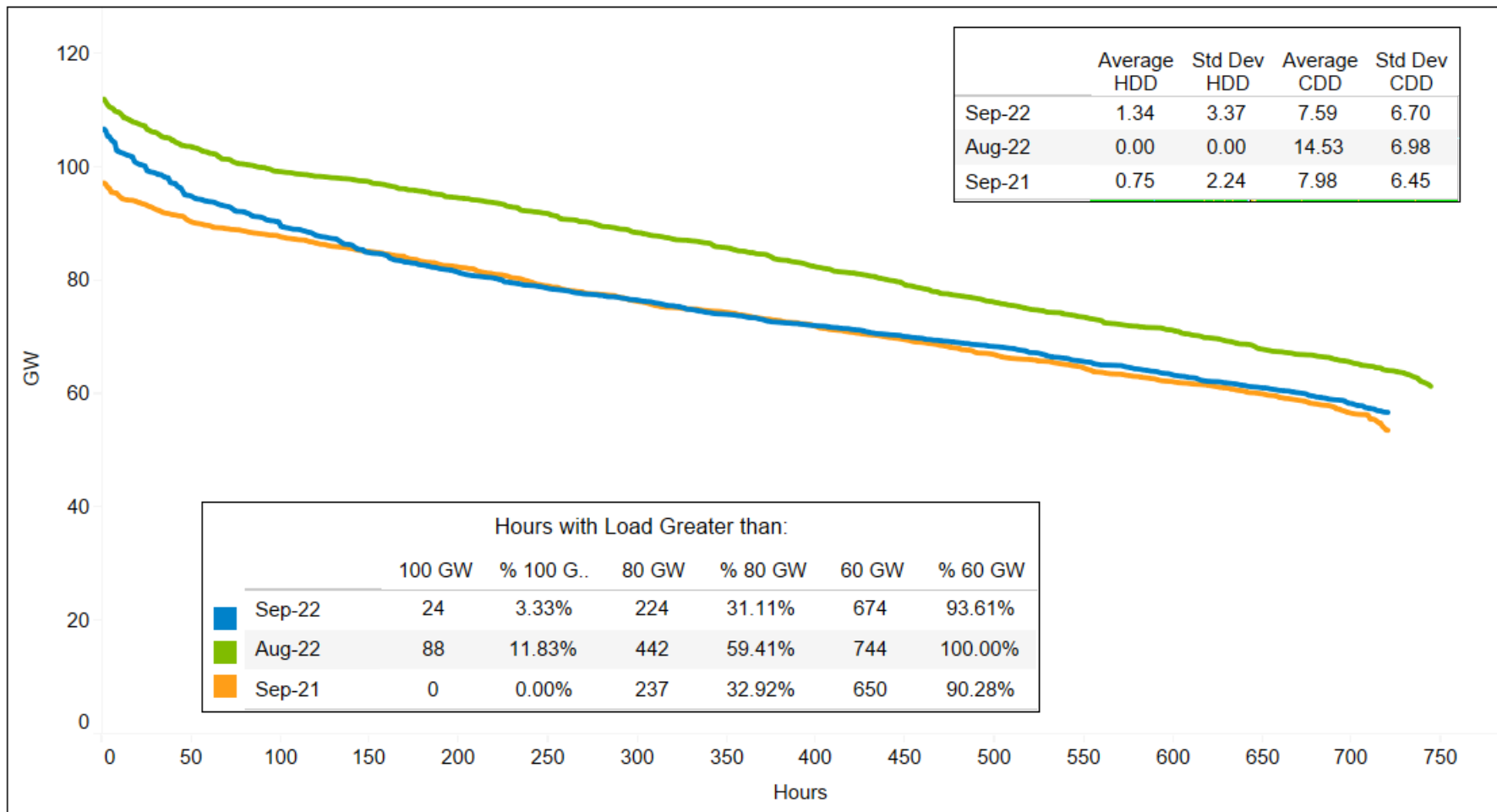
Load Weighted Heating Degree Days (HDD) is defined as max(62 - Load Weighted Weather Index, 0)
Load Weighted Cooling Degree Days (CDD) is defined as max(Load Weighted Weather Index - 62, 0)
The weather index is the wind chill index for the winter months, dry bulb temperature during the fall and spring months, and heat index during the summer months.
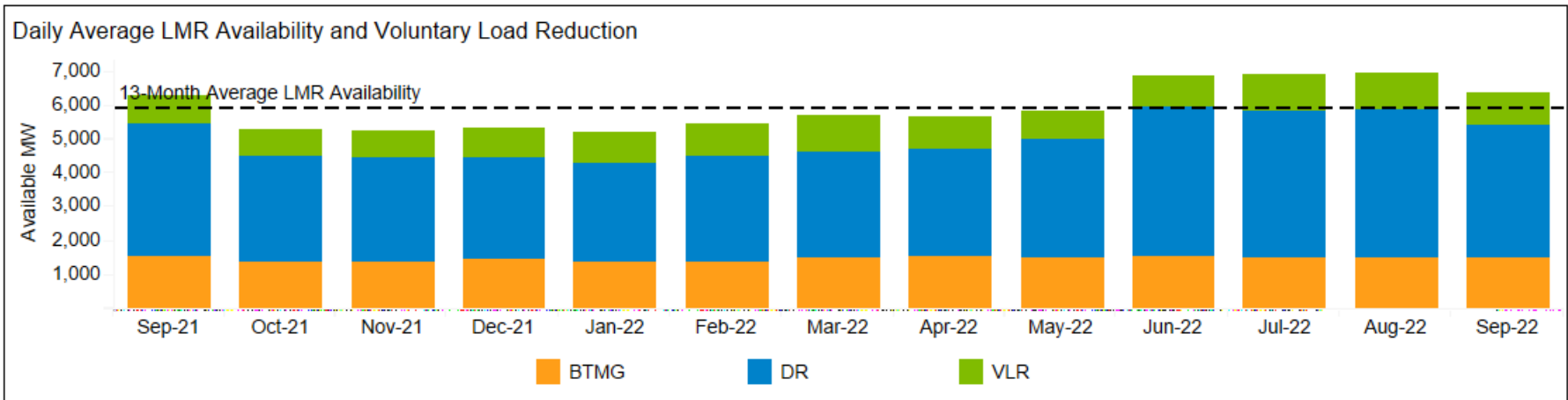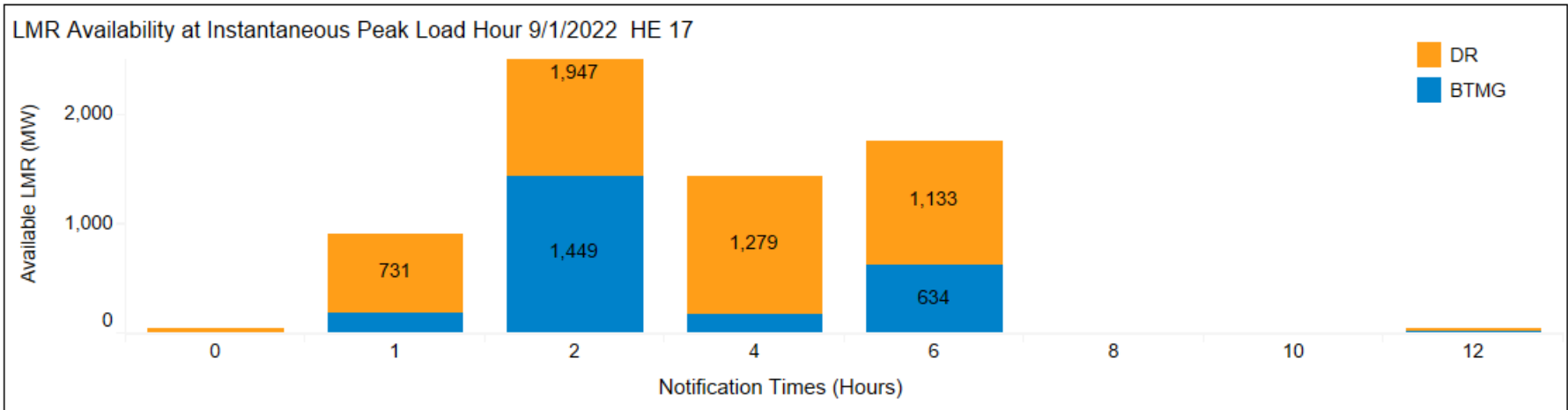
Hourly ICCP Load Data
Source: MISO Market and Operations Analytics Department

Average Load by Region

North Region

GW

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
16.18	15.64	16.48	17.72	19.08	18.59	16.80	15.82	15.55	17.78	18.84	18.22	16.47

Central Region

GW

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
38.63	35.51	36.45	37.27	42.05	40.78	36.48	34.61	36.18	41.87	44.23	42.97	37.60

South Region

GW

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
19.39	18.81	17.82	18.09	20.77	19.99	17.70	17.72	20.97	24.02	24.98	23.13	21.30

Hourly Integrated System Load Peak Hour Ending: 09/01/2022 17 EST

North	23.69 GW
Central	54.33 GW
South	30.31 GW
MISO	106.75 GW

Monthly data based on hourly ICCP Load Data; Hourly Integrated Peak Load Hour could differ from the Instantaneous Peak Load Hour.
Source: MISO Market and Operations Analytics Department

Market Participant entered LMR Availabililty

LMR Availability at Instantaneous Peak Load Hour 9/1/2022 HE 17

Legend: DR (orange), BTMG (blue)

Data labels: 1,947 · 731 · 1,449 · 1,279 · 1,133 · 634

Y-axis: Available LMR (MW); X-axis: Notification Times (Hours) — 0, 1, 2, 4, 6, 8, 10, 12

Daily Average LMR Availability and Voluntary Load Reduction

13-Month Average LMR Availability

Y-axis: Available MW; X-axis: Sep-21, Oct-21, Nov-21, Dec-21, Jan-22, Feb-22, Mar-22, Apr-22, May-22, Jun-22, Jul-22, Aug-22, Sep-22

Legend: BTMG (orange), DR (blue), VLR (green)

PRA Auction	BTMG (MW)	DR (MW)	Total BTMG and DR (MW)
2021-22	4,068	7,152	11,220
2022-23	4,169	7,542	11,711

Source: MISO Markets and Operations Analytics Department

MISO

Regional Directional Transfer**

Monthly Average Regional Transfer Flows (MW) — North-South Flow, South-North Flow

| | Sep-21 | Oct-21 | Nov-21 | Dec-21 | Jan-22 | Feb-22 | Mar-22 | Apr-22 | May-22 | Jun-22 | Jul-22 | Aug-22 | Sep-22 |
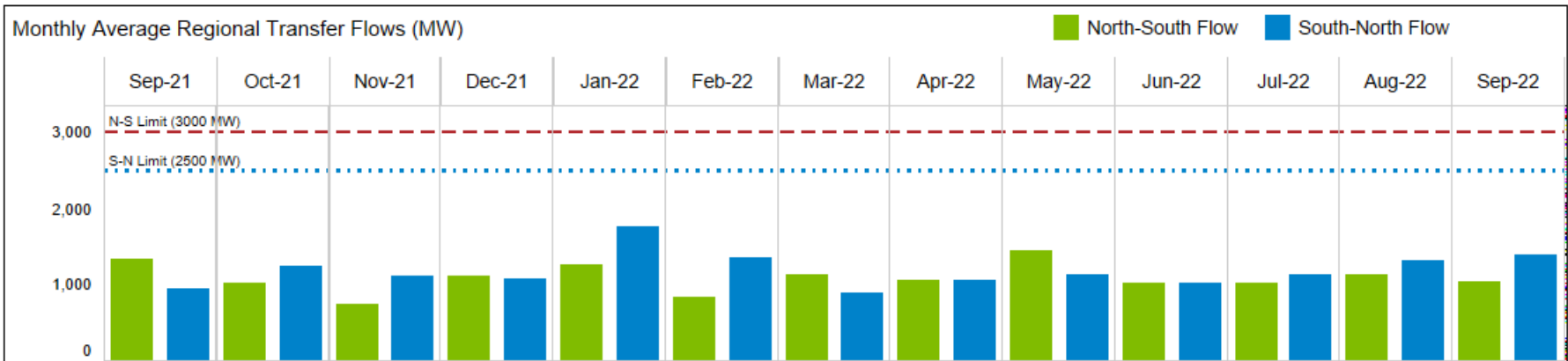
Percentage of Time Regional Directional Flow

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
North-South Flow	54%	38%	28%	44%	8%	29%	56%	45%	58%	43%	35%	26%	30%
South-North Flow	46%	62%	73%	56%	92%	71%	44%	55%	42%	57%	65%	74%	70%

Hourly Regional Transfer Flows (MW) for September 2022

% of Time Binding	
North-South Flow	0.2%
South-North Flow	2.2%

**Regional Directional Transfer between MISO South and Central/North Regions
Source: MISO Markets and Operations Analytics Department*
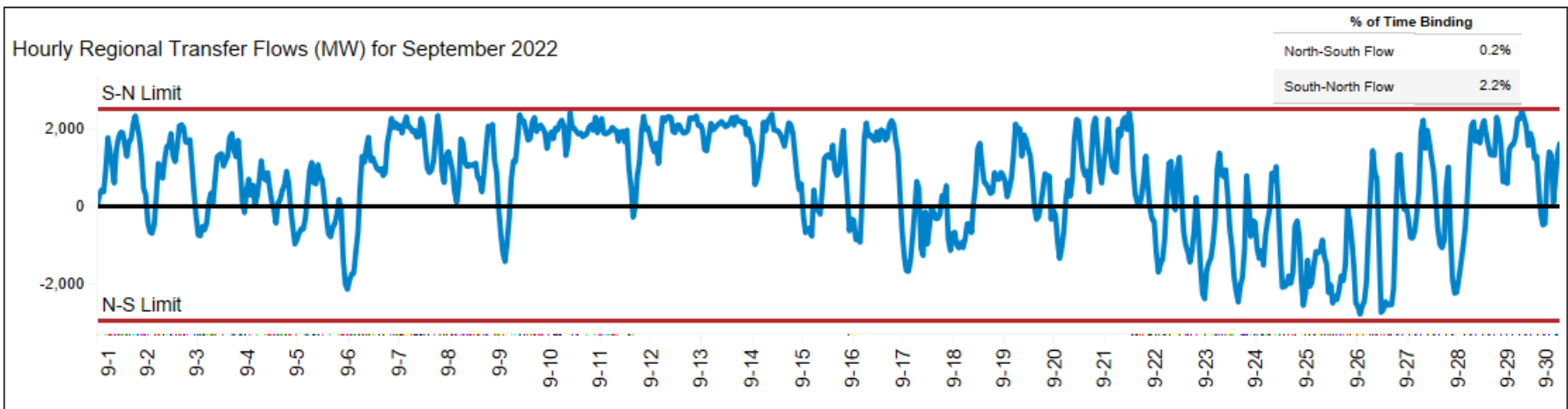
Unit Commitment Efficiency

Effectively commit generation to meet demand obligations and mitigate constraints

Legend:
- Monthly Unit Commitment Efficiency
- 12-month Rolling Unit Commitment Efficiency

Monthly values (blue / green):
- Sep-21: 92.3% / 92.8%
- Oct-21: 92.8% / 92.7%
- Nov-21: 95.4% / 92.9%
- Dec-21: 95.5% / 93.0%
- Jan-22: 94.4% / 93.0%
- Feb-22: 96.4% / 93.2%
- Mar-22: 96.5% / 93.4%
- Apr-22: 97.1% / 93.7%
- May-22: 94.0% / 93.7%
- Jun-22: 92.8% / 93.8%
- Jul-22: 94.5% / 94.3%
- Aug-22: 95.4% / 94.7%
- Sep-22: 94.6% / 94.8%

12-month Rolling Monitor Threshold (92%)
Monthly Monitor Threshold (90%)
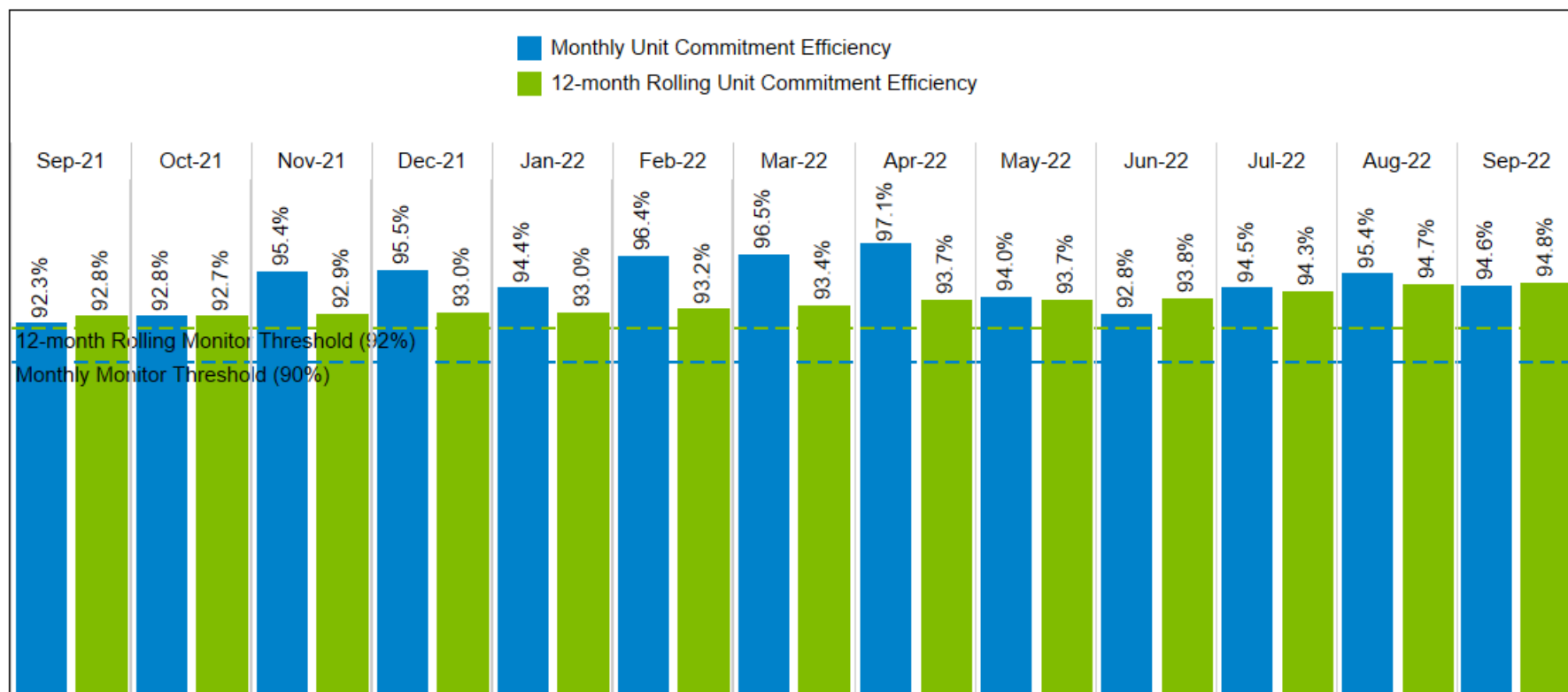
	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Actual Cost	$1,234M	$1,382M	$1,233M	$1,044M	$1,344M	$1,148M	$1,053M	$1,213M	$1,830M	$2,291M	$2,587M	$2,759M	$1,947M
Optimal Cost	$1,219M	$1,365M	$1,224M	$1,036M	$1,331M	$1,142M	$1,047M	$1,207M	$1,811M	$2,266M	$2,566M	$2,739M	$1,930M
Sunk Cost	$1,035M	$1,155M	$1,019M	$872M	$1,114M	$962M	$876M	$985M	$1,515M	$1,931M	$2,218M	$2,318M	$1,644M
Rolling Actual Cost	$10,972M	$11,717M	$12,327M	$12,599M	$13,124M	$13,341M	$13,730M	$14,307M	$15,377M	$16,563M	$17,812M	$19,118M	$19,831M
Rolling Optimal Cost	$10,837M	$11,571M	$12,177M	$12,449M	$12,968M	$13,191M	$13,579M	$14,157M	$15,216M	$16,395M	$17,646M	$18,952M	$19,663M
Rolling Sunk Cost	$9,086M	$9,709M	$10,220M	$10,456M	$10,895M	$11,121M	$11,453M	$11,929M	$12,821M	$13,833M	$14,921M	$16,000M	$16,609M

Source: MISO Optimal Dispatch Calculator (ODC) Version 2104

Unit Commitment Efficiency = 1-((Actual cost – Optimal cost)/(Actual cost – Sunk cost))

MISO

Day-Ahead Supply and Real-Time Load Obligation at the Peak Load Hour

Top chart (GW, monthly):

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
%	97%	97%	99%	100%	100%	100%	100%	100%	100%	100%	100%	99%	103%
DA Supply	86.33	77.87	78.45	81.32	91.30	88.80	79.00	75.02	84.55	102.35	106.59	100.94	92.56

Legend: ■ Incremental RT   ■ DA Supply

Bottom chart (daily percents):

9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	9/17	9/18	9/19	9/20	9/21	9/22	9/23	9/24	9/25	9/26	9/27	9/28	9/29	9/30
96.7%	100.5%	104.1%	106.6%	101.5%	98.7%	97.6%	101.6%	98.2%	97.2%	101.4%	104.5%	103.5%	104.0%	100.1%	97.8%	99.9%	95.8%	100.1%	104.8%	101.1%	107.4%	111.0%	107.3%	110.9%	108.0%	109.5%	107.0%	104.2%	111.6%

Incremental GW Commited in Real-Time

9/1	9/2	9/3	9/4	9/5	9/6	9/7	9/8	9/9	9/10	9/11	9/12	9/13	9/14	9/15	9/16	9/17	9/18	9/19	9/20	9/21	9/22	9/23	9/24	9/25	9/26	9/27	9/28	9/29	9/30
3.61	-0.52	-3.64	-5.29	-1.31	1.24	2.45	-1.63	1.71	2.53	-1.20	-3.73	-3.07	-3.70	-0.07	2.09	0.08	4.07	-0.10	-5.12	-1.09	-6.25	-8.97	-6.00	-8.74	-6.40	-7.22	-5.34	-3.12	-8.60

Day-Ahead Supply is the Day-Ahead Economic Maximum received in Real-Time plus Behind-the-Meter plus Day-Ahead NSI at the Peak Hour
Real-Time Obligation is the Real-Time ICCP Load plus Real-Time Regulation Requirement plus Real-Time Spinning Requirement at the Peak Hour
Real-Time Increment is the Real-Time Obligation less Day-Ahead Supply at the Peak Hour
Percents calculated as Day-Ahead Supply divided by Real-Time Obligation

Source: MISO Market and Operations Analytics Department

Self Committed and Economically Dispatched Energy - September 2022
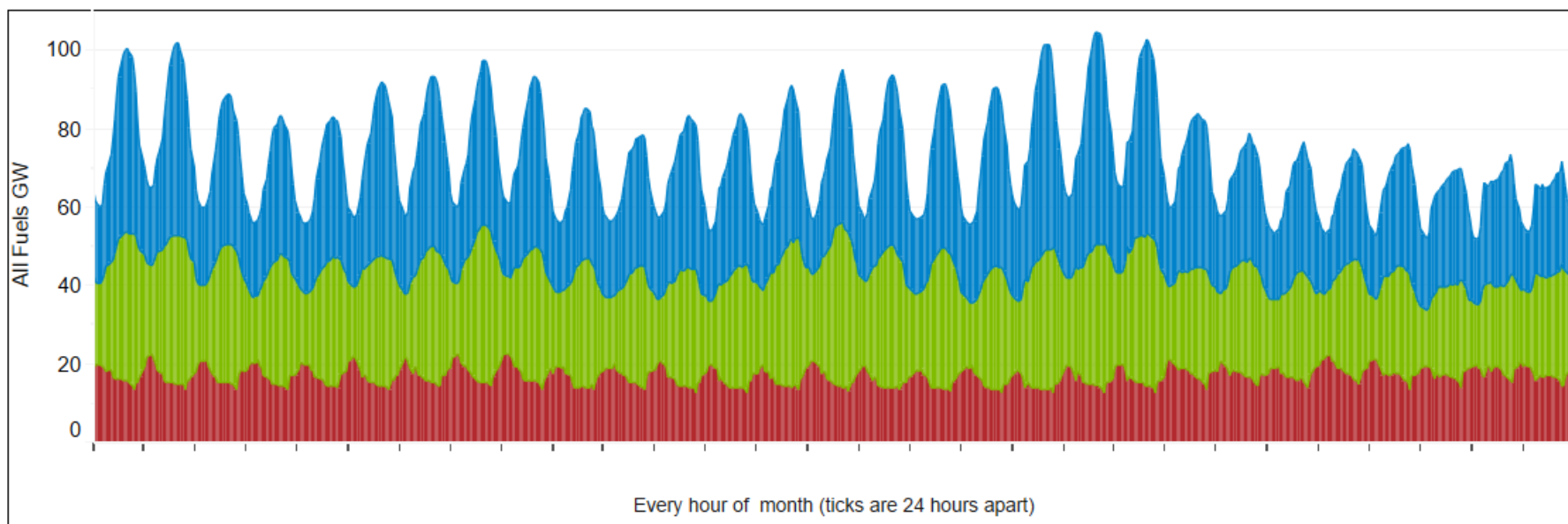
	All Fuels		Coal		Gas	
	TWh	%	TWh	%	TWh	%
Economically Committed: Economically Dispatched	20.4	39%	5.8	33%	12.1	68%
Self Committed: Economically Dispatched	19.3	37%	9.5	54%	4.7	26%
Self Committed: Not Economically Dispatched	12.3	24%	2.4	14%	1.1	6%
Grand Total	**52.0**	**100%**	**17.7**	**100%**	**17.9**	**100%**

Economically Committed: Economically Dispatched	Generation committed by MISO and dispatched on economic offers.
Self Committed: Economically Dispatched	Generation that is self-committed, but Resource Owners allow MISO to dispatch economically after the self-schedule portion of their resource offer is satisfied. Self-commitments can be used to manage local reliability, operational constraints, and fuel contract constraints.
Self Committed: Not Economically Dispatched	Energy from self-committed generation produced at its minimum level or is block-loaded and cannot be dispatched. Block Loaded energy is not necessarily uneconomic, but MISO has no ability to dispatch it based on economics.

Monthly Trend - Self Committed and Economically Dispatched Energy

Source: MISO Market and Operations Analytics Department

Offered Capacity and Real-Time Peak Load Obligation

Offered Capacity MW (Hourly Average per Category)

Legend:
- Real-Time Obligation*
- Other**
- Oil
- CT
- CC
- Gas***
- Coal
- Hydro
- Nuclear
- Wind
- Avg NSI

* Real-Time ICCP Load plus Real-Time Regulation Requirement plus Real-Time Spinning Requirement at the daily Peak hour.

** Other includes DRR, SER, pet coke, and waste units.

*** Gas excludes CC and CT.

Marginal Fuel

Percentage of Time a Fuel is Marginal in the Real-Time Market
September 2022

Note: Binding transmission constraints can produce instances where more than one unit is marginal in the system. Consequently, more than one fuel may be on the margin; and since each marginal unit is included in the analysis, the percentage may sum to more than 100%.
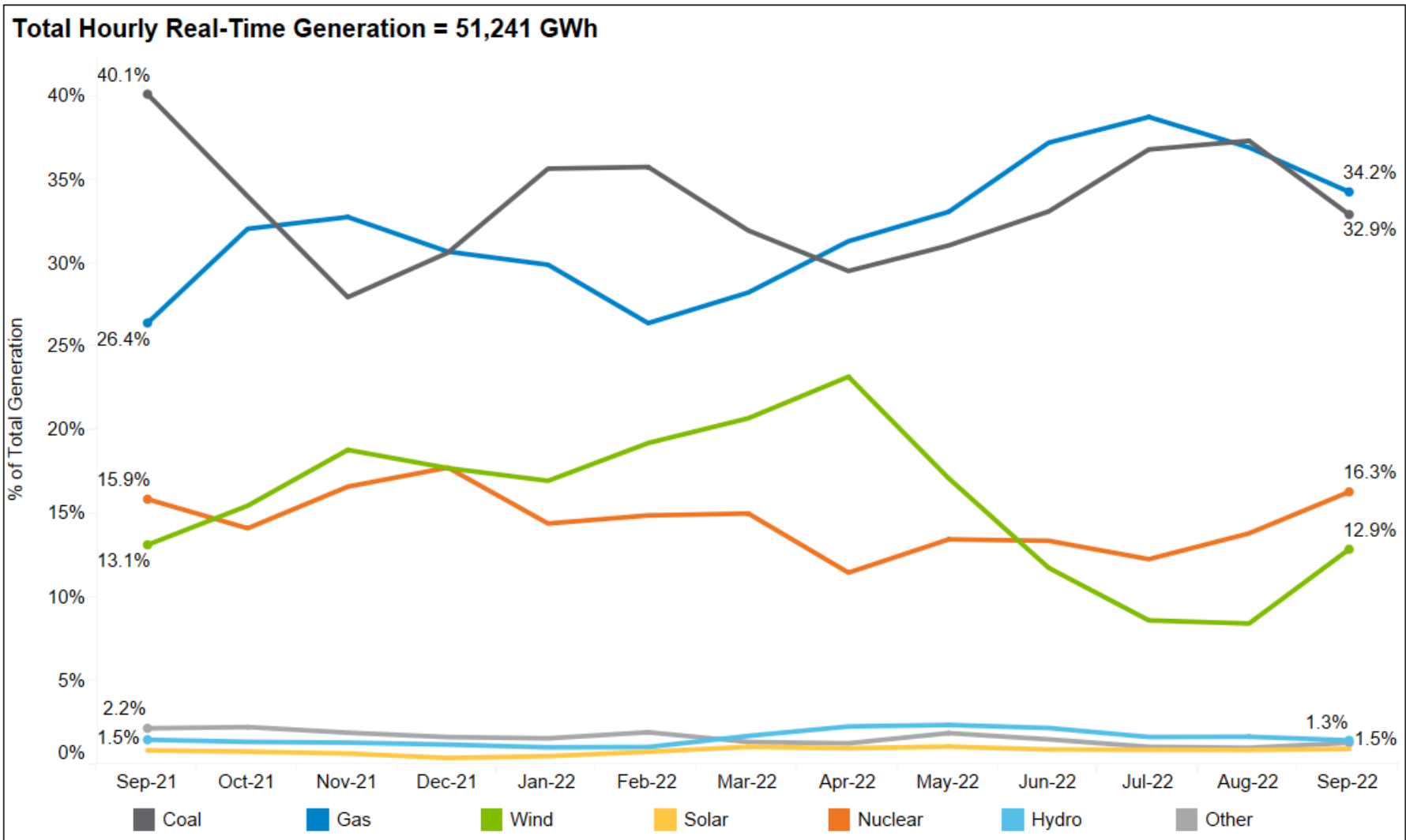
Source: MISO Market and Operatoins Analytics Department

Real-Time Generation Fuel Mix

Total Hourly Real-Time Generation = 51,241 GWh

Based on hourly unit level state estimator data
Other includes: Battery, Oil, Pet Coke, Waste and Other fuels
Source: MISO Market and Operations Analytics Department

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Real-Time Generation Fuel Mix by Region

Legend: Coal · Gas · Wind · Solar · Nuclear · Hydro · Other

Central

August 2022
- Other: 0.7%
- Hydro: 2.8%
- Nuclear: 12.5%
- Solar: 1.3%
- Wind: 4.3%
- Gas: 29.1%
- Coal: 49.4%

September 2022
- Other: 0.6%
- Hydro: 2.7%
- Nuclear: 14.9%
- Solar: 1.4%
- Wind: 6.0%
- Gas: 26.6%
- Coal: 47.8%

North

August 2022
- Other: 1.1%
- Hydro: 0.8%
- Nuclear: 9.3%
- Solar: 0.6%
- Wind: 27.3%
- Gas: 15.0%
- Coal: 45.9%

September 2022
- Other: 1.4%
- Hydro: 0.6%
- Nuclear: 9.9%
- Solar: 0.6%
- Wind: 40.6%
- Gas: 12.3%
- Coal: 34.7%

South

August 2022
- Other: 1.4%
- Hydro: 0.7%
- Nuclear: 19.3%
- Solar: 0.5%
- Gas: 65.2%
- Coal: 13.0%

September 2022
- Other: 2.1%
- Hydro: 0.5%
- Nuclear: 23.4%
- Solar: 0.6%
- Gas: 62.4%
- Coal: 11.0%

Based on hourly unit level state estimator data
Other includes: Battery, Oil, Pet Coke, Waste and Other fuels
Source: MISO Market and Operations Analytics Department

MISO

Day-Ahead Wind Forecast Performance: Mean Absolute Error (MAE)

Source: MISO Day-Ahead Market Reliability and Commitment
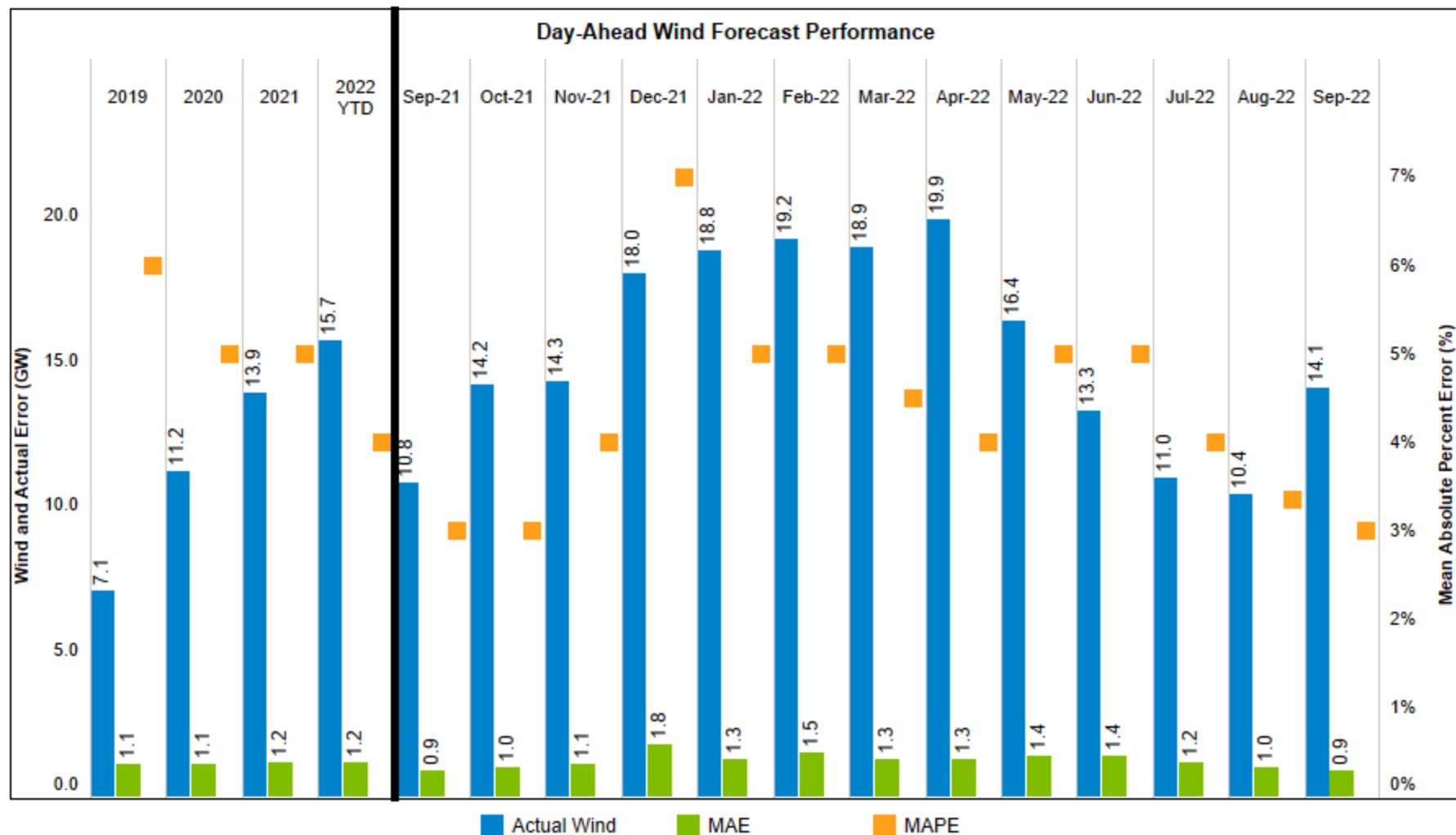
Day-Ahead Wind Forecast Performance: Mean Absolute Percentage Error (MAPE)

Source: MISO Day-Ahead Market Reliability and Commitment
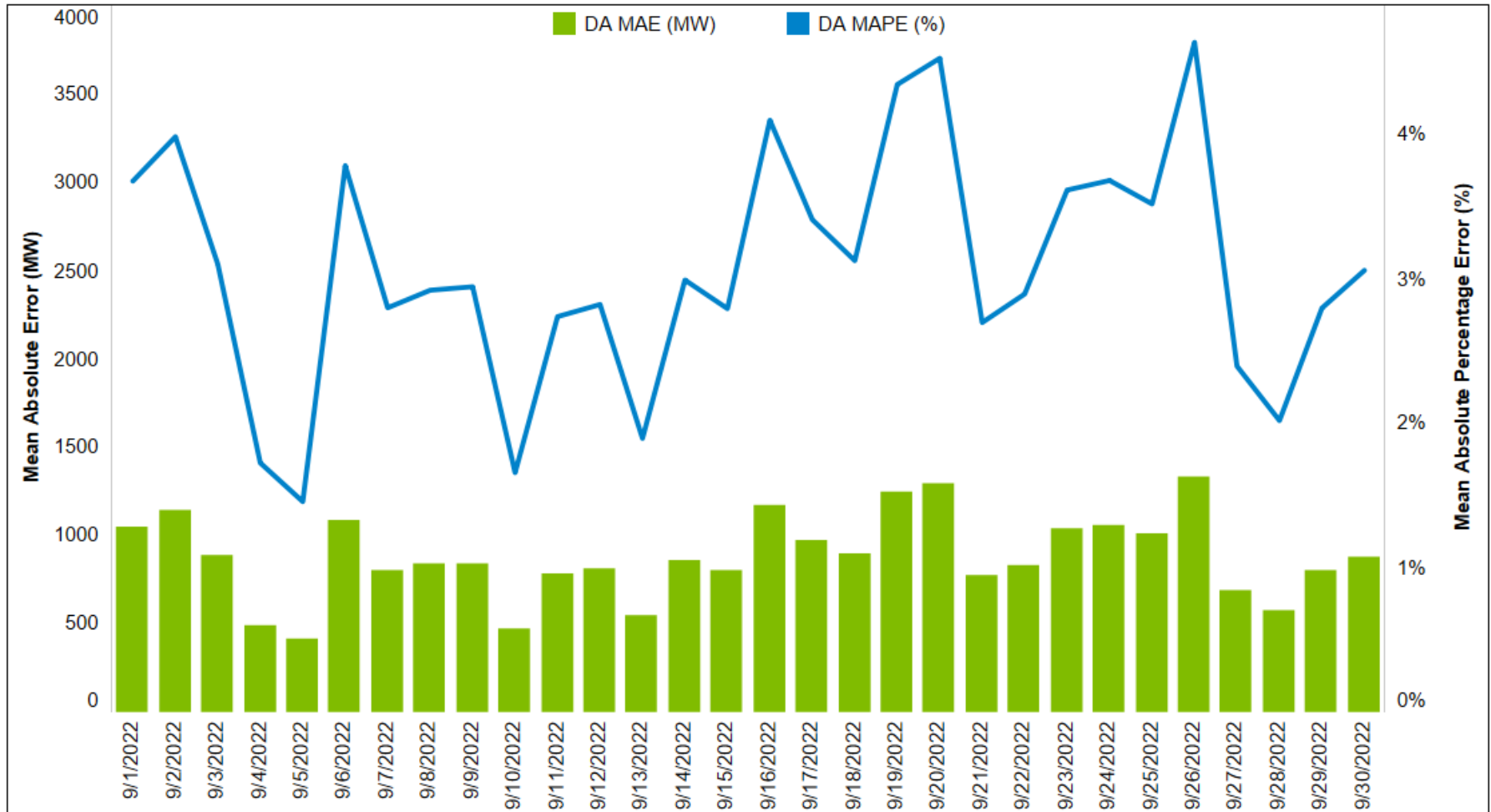
Monthly Wind Energy Generation

Legend: ■ Dispatchable Intermittent Resources (DIR) ■ Non-Dispatchable Intermittent Resources (non-DIR)

	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
Peak Wind Date and Hour Ending	9/7 15	10/31 17	11/12 13	12/12 22	1/18 22	2/20 9	3/11 19	4/14 12	5/9 14	6/20 23	7/20 17	8/2 23	9/21 8
Peak hourly wind output (MW)	17,482	17,931	21,664	21,428	23,285	22,242	21,486	20,990	21,288	18,655	18,206	18,028	17,799
Peak wind output as % of MISO load in that hour	18.6%	27.3%	28.6%	28.1%	28.9%	28.8%	26.3%	28.6%	25.8%	19.8%	15.3%	19.6%	22.7%
Wind Energy as a percent of MISO Energy	12.8%	14.4%	18.5%	17.8%	16.6%	18.6%	20.3%	22.4%	16.9%	11.7%	8.5%	8.5%	13.3%
DIR dispatch below Max as % of avail. DIR	5.3%	6.6%	5.2%	3.5%	3.7%	4.5%	5.3%	8.8%	6.3%	4.4%	3.1%	1.9%	3.3%

*Hourly State Estimator data
Source: MISO Market and Operations Analytics Department

MISO

Daily Average Wind Generation and Curtailment

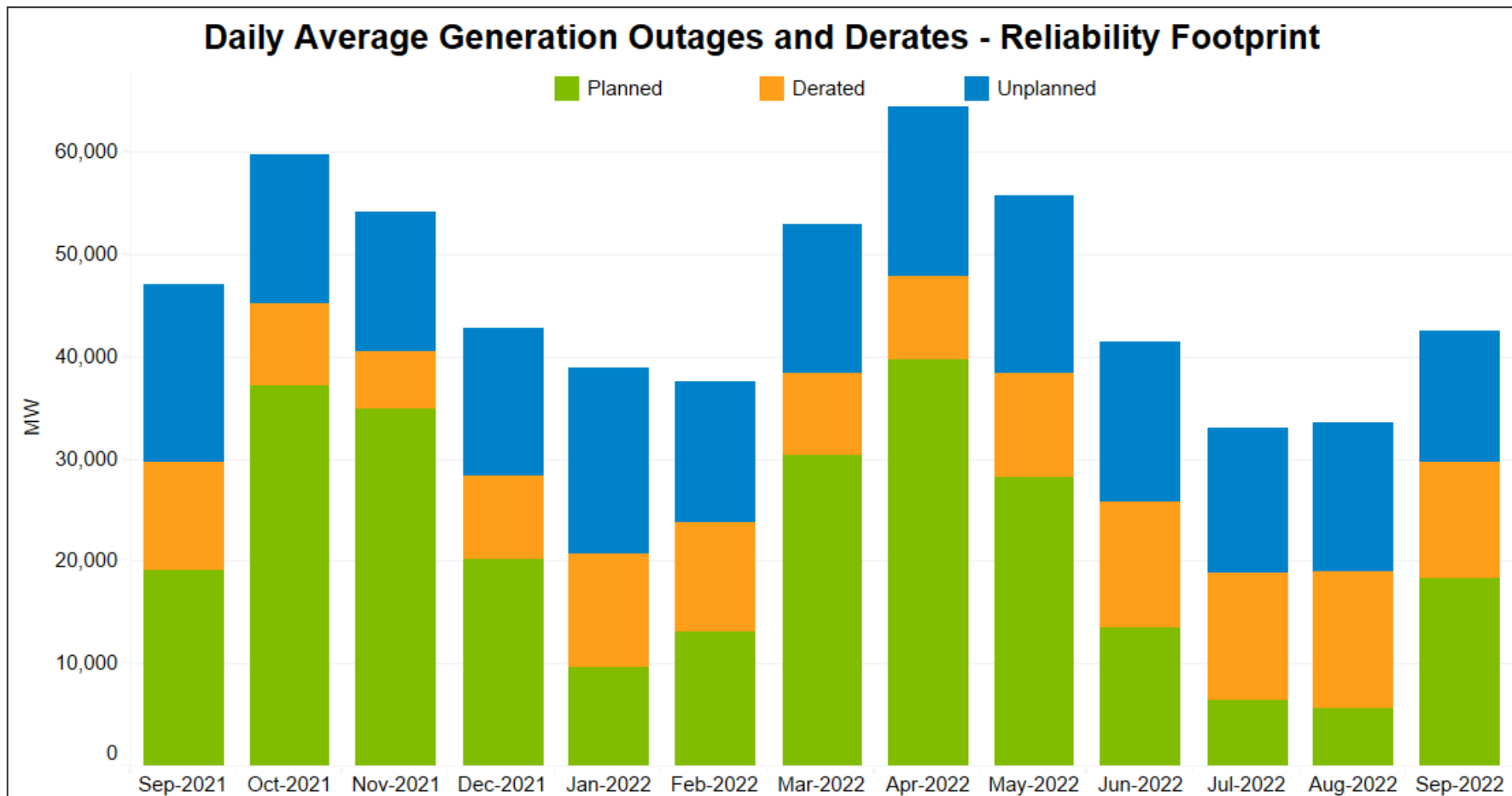Source: MISO Market and Operations Analytics Department
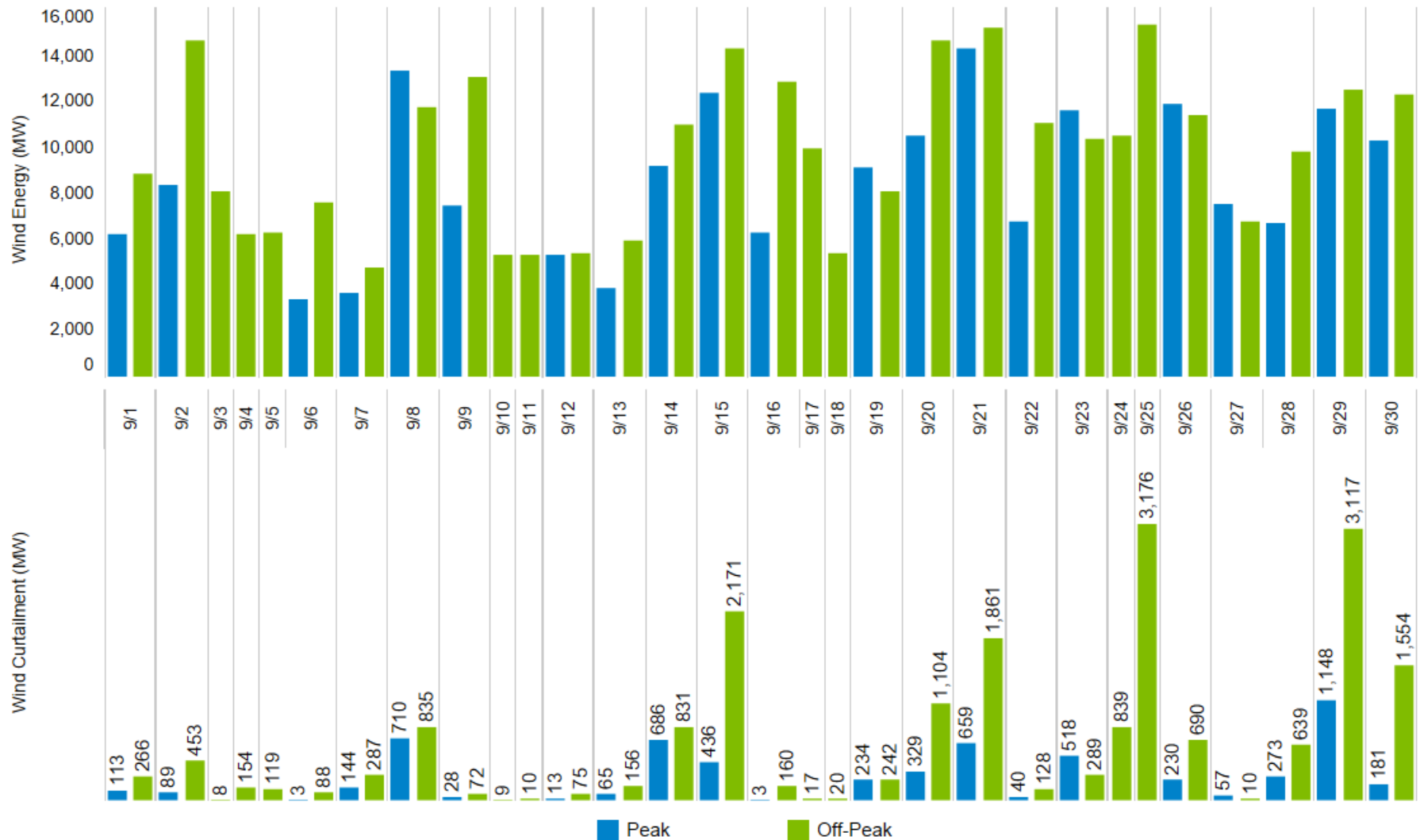
Solar Energy and Daily Peak

Registered Solar Capacity = 4,228 MW; Inservice Solar Capacity = 2,193 MW
Registered DIR Capacity = 4,056 MW; Inservice DIR Capacity = 2,021 MW

Total Solar Energy Generation

Daily Peak Solar Generation: September 2022
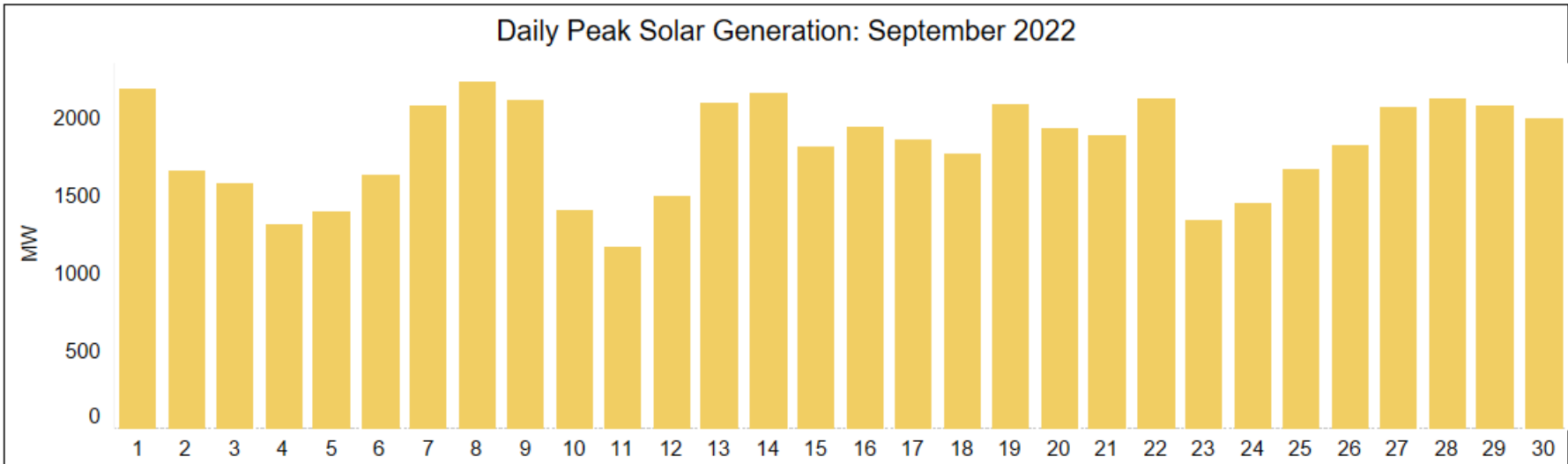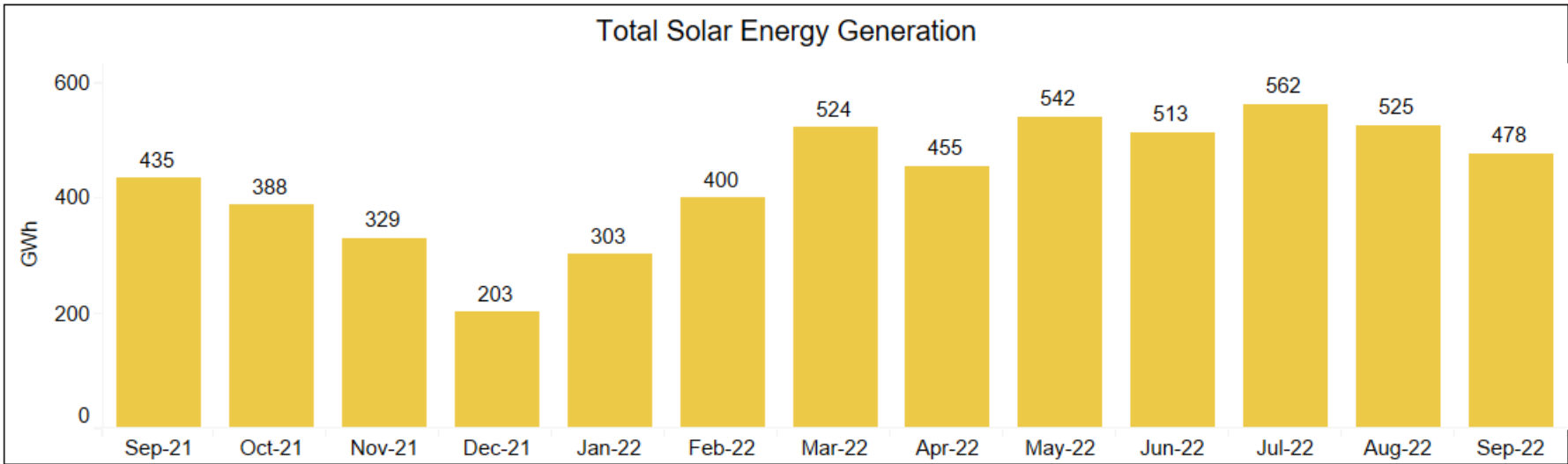
*Hourly State Estimator data
Source: MISO Forecast Department

Generation Outages and Derates

Daily Average Generation Outages and Derates - Reliability Footprint

Legend: Planned (green), Derated (orange), Unplanned (blue)

Y-axis: MW (0 to 60,000+)

X-axis months: Sep-2021, Oct-2021, Nov-2021, Dec-2021, Jan-2022, Feb-2022, Mar-2022, Apr-2022, May-2022, Jun-2022, Jul-2022, Aug-2022, Sep-2022
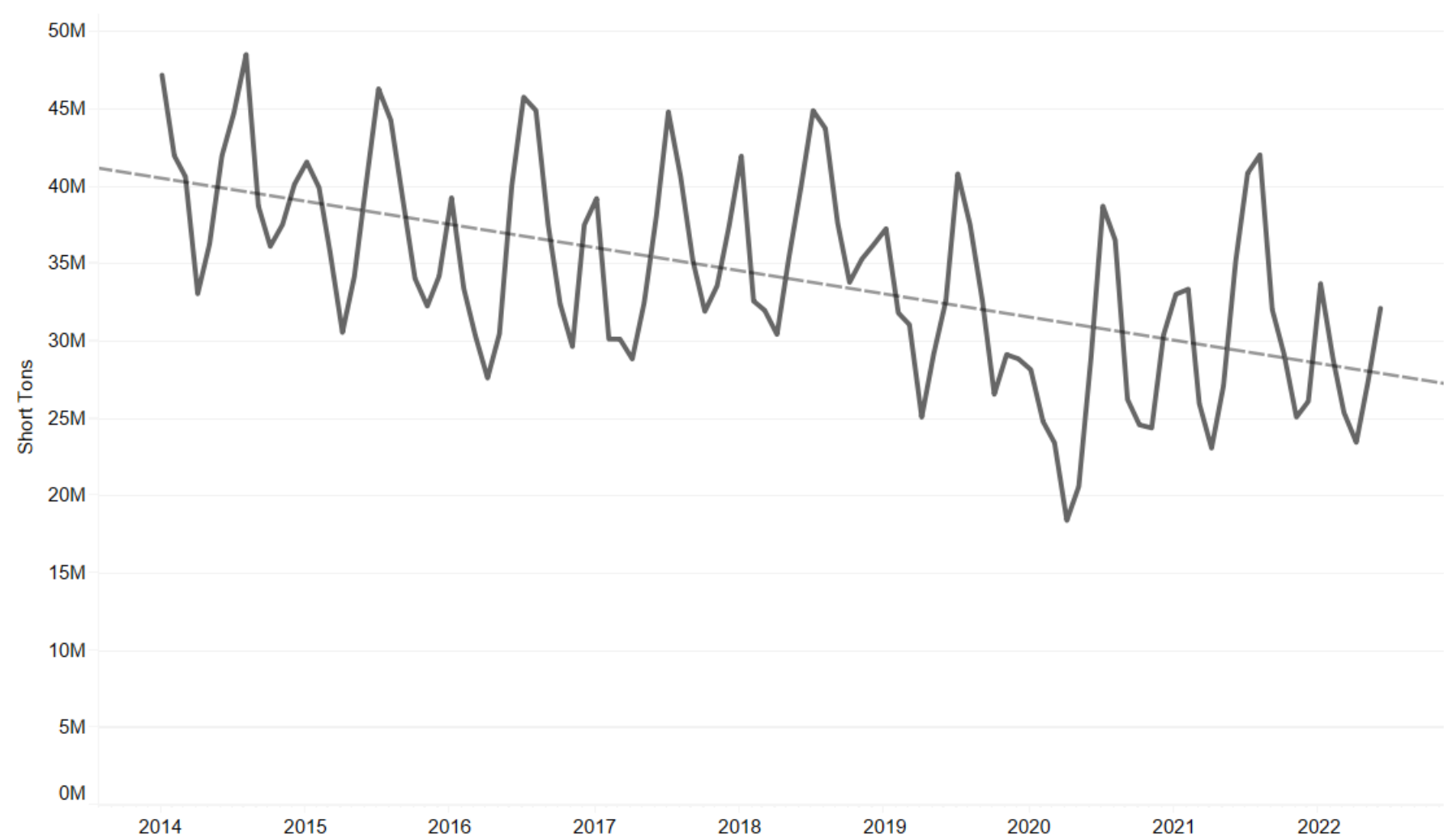
Notes:
- Unplanned Outages include Emergency, Forced, and Urgent
- Planned Outages include Planned
- De-rates are based on limits observed in Real-Time and may not reflect normal seasonal de-rates or de-rates for maintenance or other operating conditions

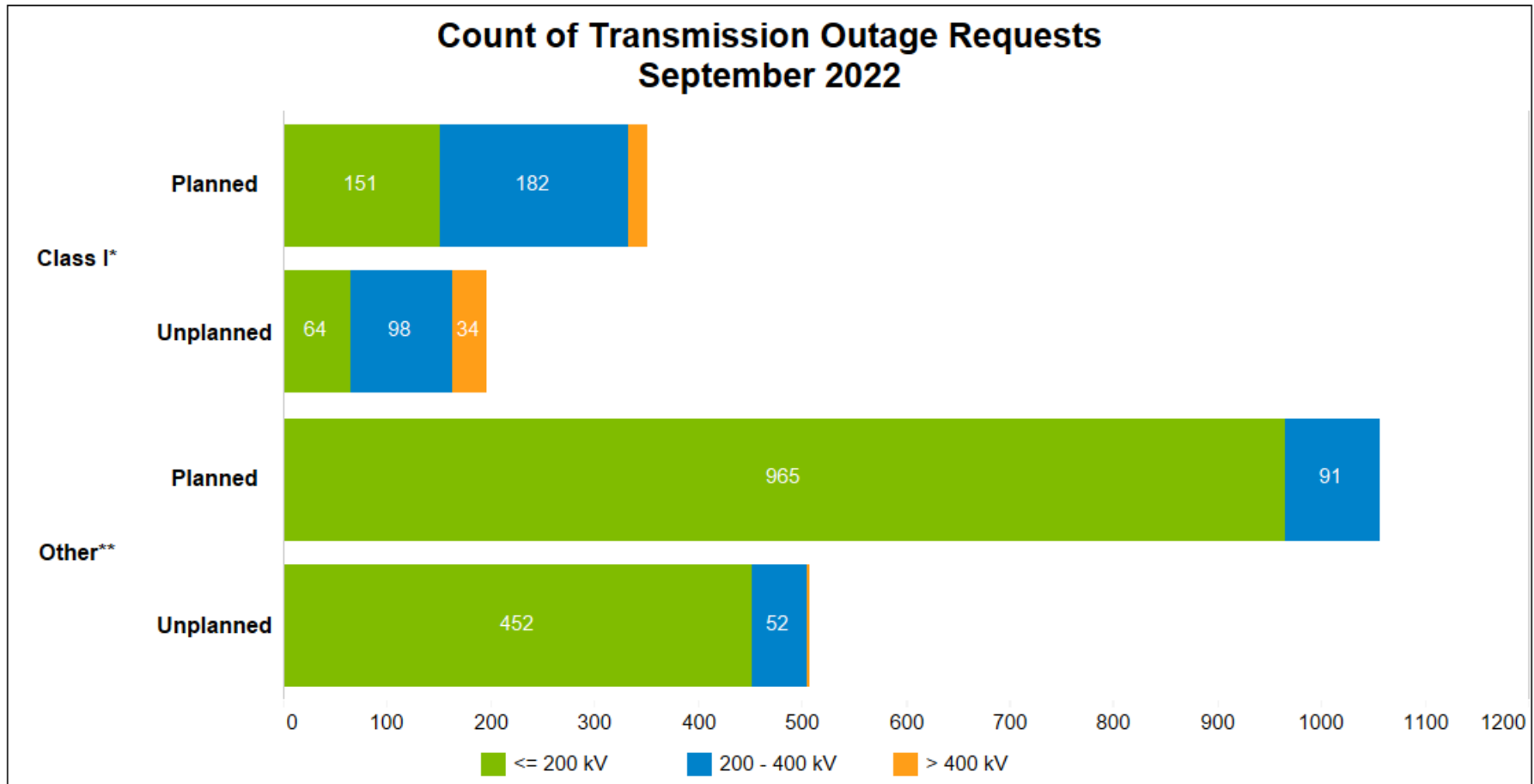*Outage data is "point in time" and can change; the chart reflects the data as it resided in the system on the date of extraction*
Source: MISO CROW Outage Scheduler

Generation Outages by Fuel

Daily Average Generation Outages and Derates - Reliability Footprint
September 2022

Notes:
•Other includes Oil ,Hydro, Pet coke, Waste, BTMG, and units not in market footprint
•Unplanned Outages include Emergency, Forced, and Urgent
•Planned Outages include Planned
•De-rates are based on limits observed in Real-Time and may not reflect normal seasonal de-rates or de-rates for maintenance or other operating conditions

Legend:
- Steam Turbine
- Coal
- Hydro
- Nuclear
- Gas
- Wind
- Solar
- Other

Outage data is "point in time" and can change; the chart reflects the data as it resided in the system on the date of extraction
Source: MISO CROW Outage Scheduler

Carbon Emissions

Data Source: EPA emissions through June 2022 and EPA EIA-860 through 2021
Emissions generated from MISO generators and does not account for volume of imports or exports
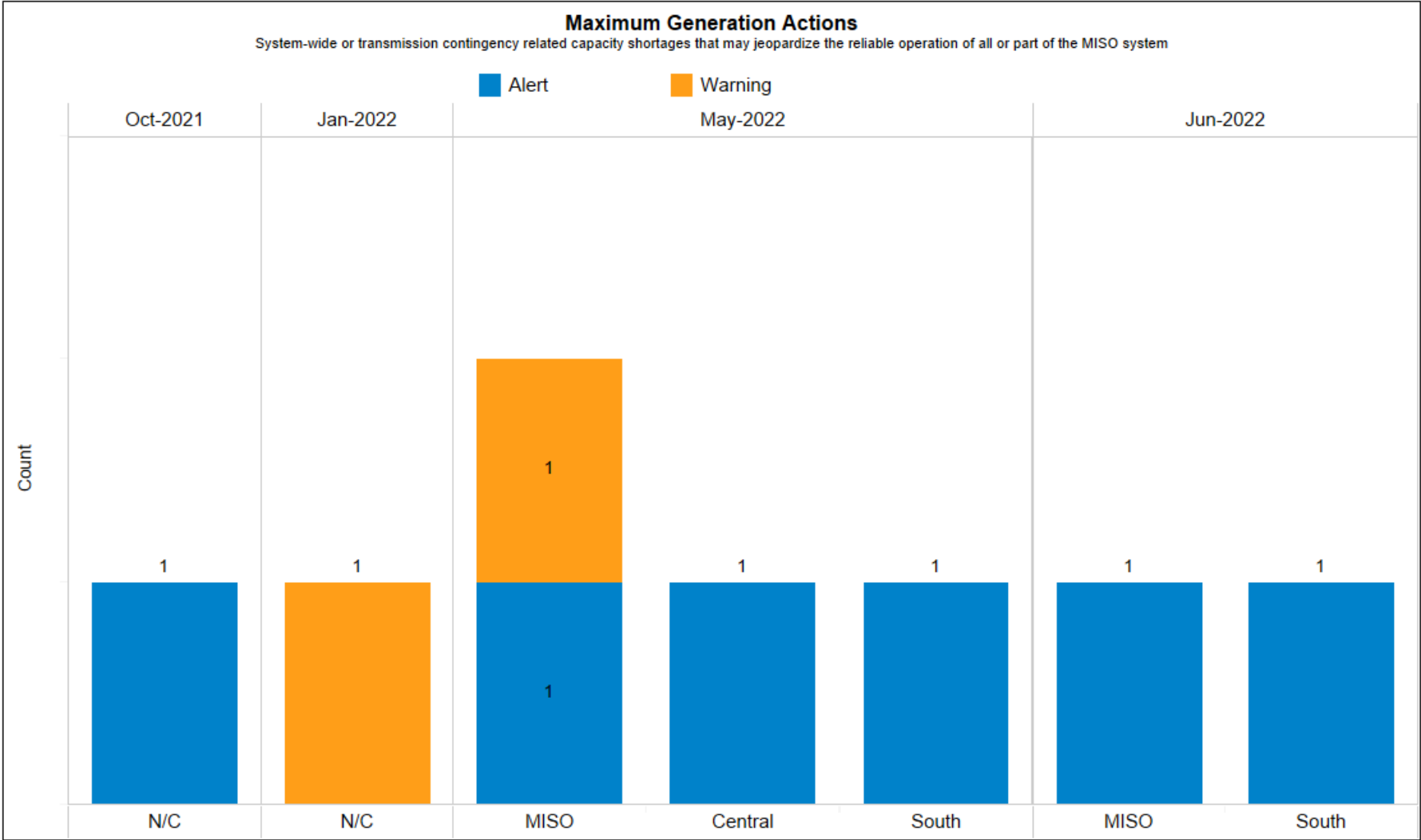One Short Ton = 2000 lbs

Transcription Outages

Count of Transmission Outage Requests September 2022

Class I*
- Planned: 151 (<= 200 kV), 182 (200 - 400 kV), (> 400 kV)
- Unplanned: 64 (<= 200 kV), 98 (200 - 400 kV), 34 (> 400 kV)

Other**
- Planned: 965 (<= 200 kV), 91 (200 - 400 kV)
- Unplanned: 452 (<= 200 kV), 52 (200 - 400 kV)

Legend: <= 200 kV, 200 - 400 kV, > 400 kV

Notes:
- Class 1 is any facility which has a reliability or market impact on transmission system operations
- Other is any facility which does NOT have a reliability or market impact on transmission system operations
- Unplanned Outages include Emergency, Forced, Discretionary and Urgent
- Planned Outages include Planned, Opportunity

Outage data is "point in time" and can change; the chart reflects the data as it resided in the system on the date of extraction
Source: MISO CROW Outage Scheduler

MISO

MISO Inadvertent Balance

Month/Year	Net	On-Peak	Off-Peak
9/1/2021	-18,737	-10,010	-8,727
10/1/2021	-37,032	-23,491	-13,541
11/1/2021	-27,420	-13,996	-13,424
12/1/2021	-25,218	-16,370	-8,848
1/1/2022	-23,219	-10,354	-12,865
2/1/2022	-7,184	-1,116	-6,068
3/1/2022	8,219	7,313	906
4/1/2022	24,883	15,522	9,361
5/1/2022	19,674	8,644	11,030
6/1/2022			
7/1/2022			
8/1/2022			
9/1/2022			
Running Total from 2009	35,446	-11,113	46,559

Source: NERC Tool (As of August 15, 2022)

Generation Notifications

Maximum Generation Actions

System-wide or transmission contingency related capacity shortages that may jeopardize the reliable operation of all or part of the MISO system

Legend: ■ Alert   ■ Warning

Oct-2021	Jan-2022	May-2022			Jun-2022	
1	1	1 (Warning) / 1 (Alert)	1	1	1	1
N/C	N/C	MISO	Central	South	MISO	South

* Alerts – forecasting specific emergency situations in a future time-frame
* Warnings – experiencing initial stages of an emergency situation and taking action
* Events – experiencing an emergency situation and taking action

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Tie Line and BAAL Performance

Tie Line Error ^L
Events when 15 minute average tie-line error exceeded +/- 1000 MW

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
0	0	0	0	0	0	0	0	0	0	0	0	0

Balancing Authority Area Control Error Limit Performance **M**

Score Interpretation 3:Excellent; 2:Good; 1: Needs Improvement; 0: Unacceptable

Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
3.0	3.0	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

The Balancing Authority Area Control Error Limit (BAAL) measures control performance over the _short-term_. *Exceeding BAAL for a continuous time period greater than 30 minutes constitutes a non-compliant event. The daily MISO BAAL performance rating is the lowest scored incident of the day.*
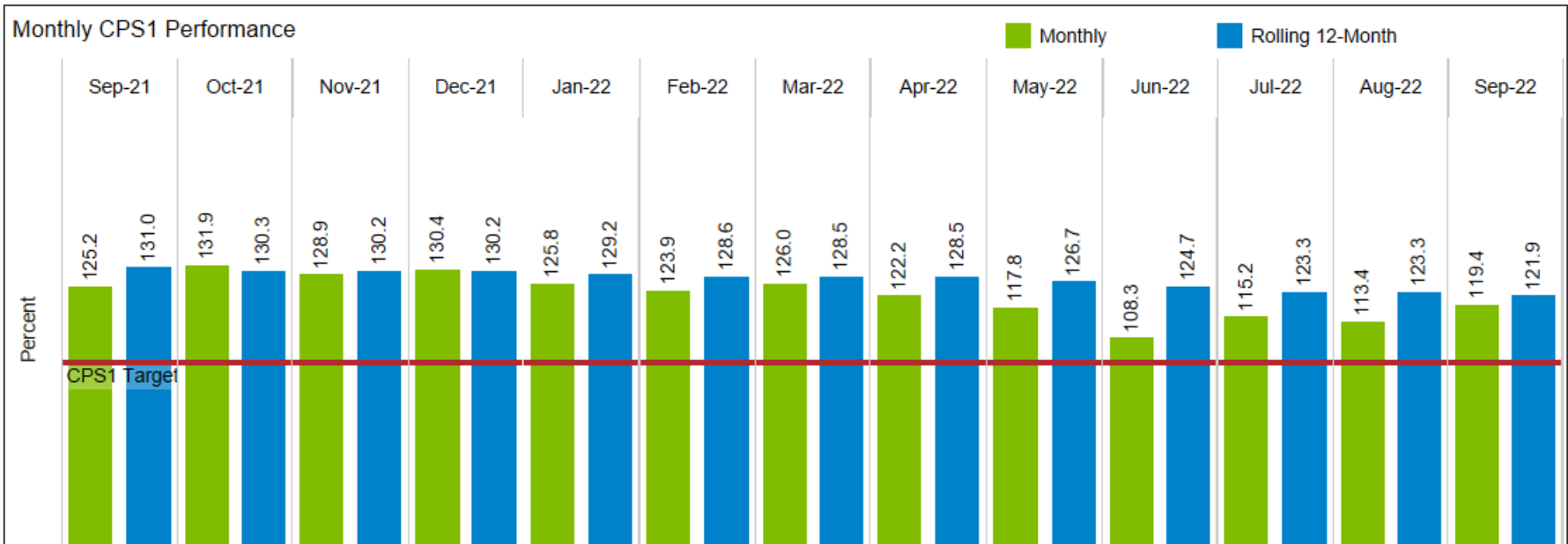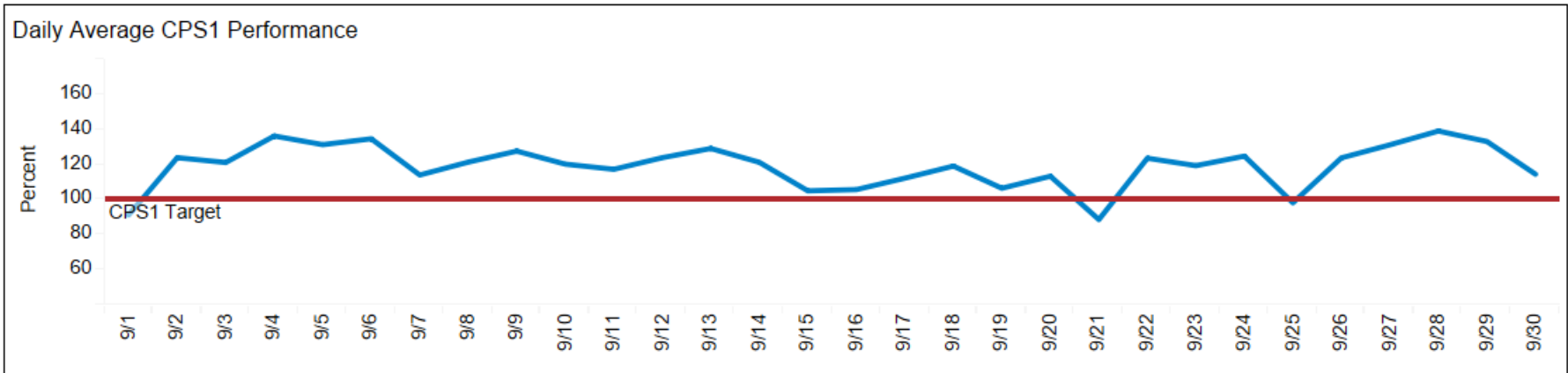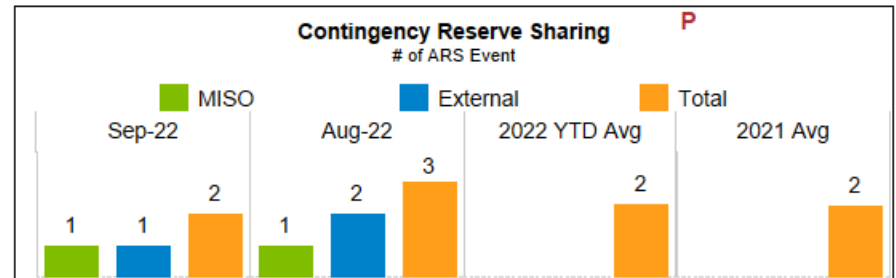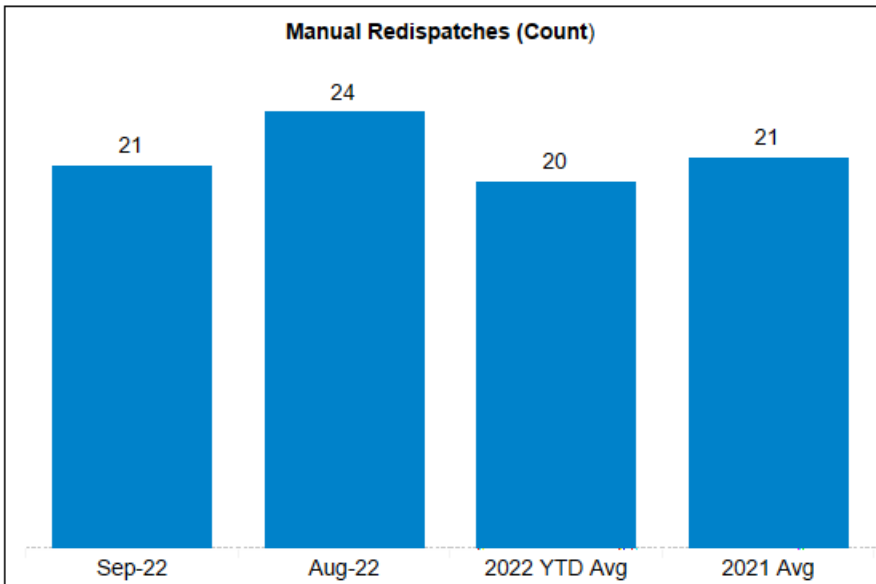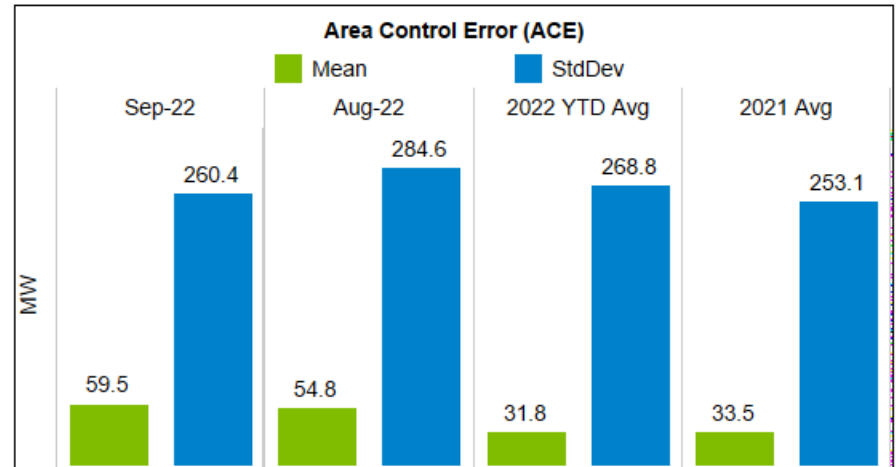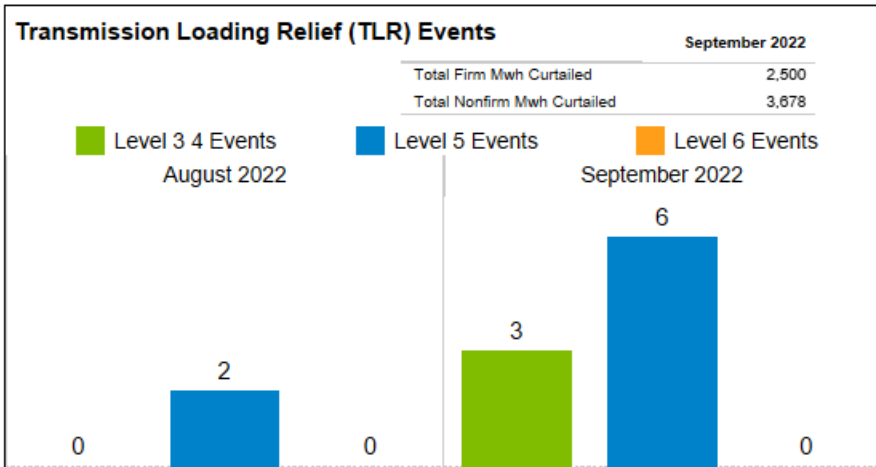
Source: MISO Real-Time Operations Department

MISO

CPS1 Performance

Daily Average CPS1 Performance

Monthly CPS1 Performance

Legend			
Monthly		Rolling 12-Month	

Reliability — Other Metrics

Transmission Loading Relief (TLR) Events

September 2022	
Total Firm Mwh Curtailed	2,500
Total Nonfirm Mwh Curtailed	3,678

Legend: Level 3 4 Events (green), Level 5 Events (blue), Level 6 Events (orange)

August 2022
- Level 3 4 Events: 0
- Level 5 Events: 2
- Level 6 Events: 0

September 2022
- Level 3 4 Events: 3
- Level 5 Events: 6
- Level 6 Events: 0

Area Control Error (ACE)

Legend: Mean (green), StdDev (blue) — MW

	Mean	StdDev
Sep-22	59.5	260.4
Aug-22	54.8	284.6
2022 YTD Avg	31.8	268.8
2021 Avg	33.5	253.1

Manual Redispatches (Count)

Sep-22	Aug-22	2022 YTD Avg	2021 Avg
21	24	20	21

Contingency Reserve Sharing
of ARS Event

P

Legend: MISO (green), External (blue), Total (orange)

	MISO	External	Total
Sep-22	1	1	2
Aug-22	1	2	3
2022 YTD Avg			2
2021 Avg			2

MISO deployed Contingency Reserves **

Date	HE	Deployment Type	MW
9/9/2022	14	ONLINE	352
9/19/2022	7	OFFLINE	161
9/19/2022	7	ONLINE	1,687
8/10/2022	22	ONLINE	101
8/13/2022	1	ONLINE	933

Source: MISO Real-Time Operations Department

**Historical Contingency Deployment data located in *Related Documents* at
https://cdn.misoenergy.org/202001-202103%20Additional%20Information%20Historical%20Contingency%20Deployment%20Data548321.pdf /
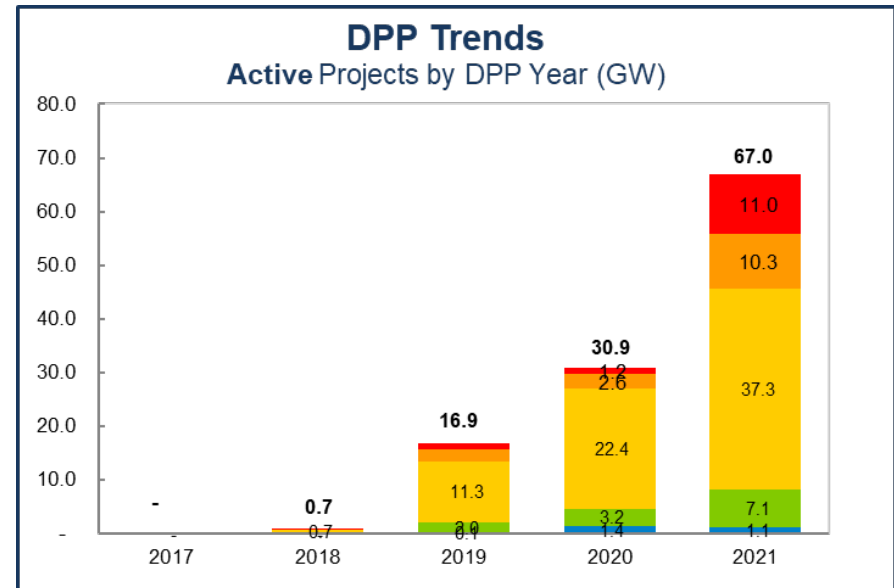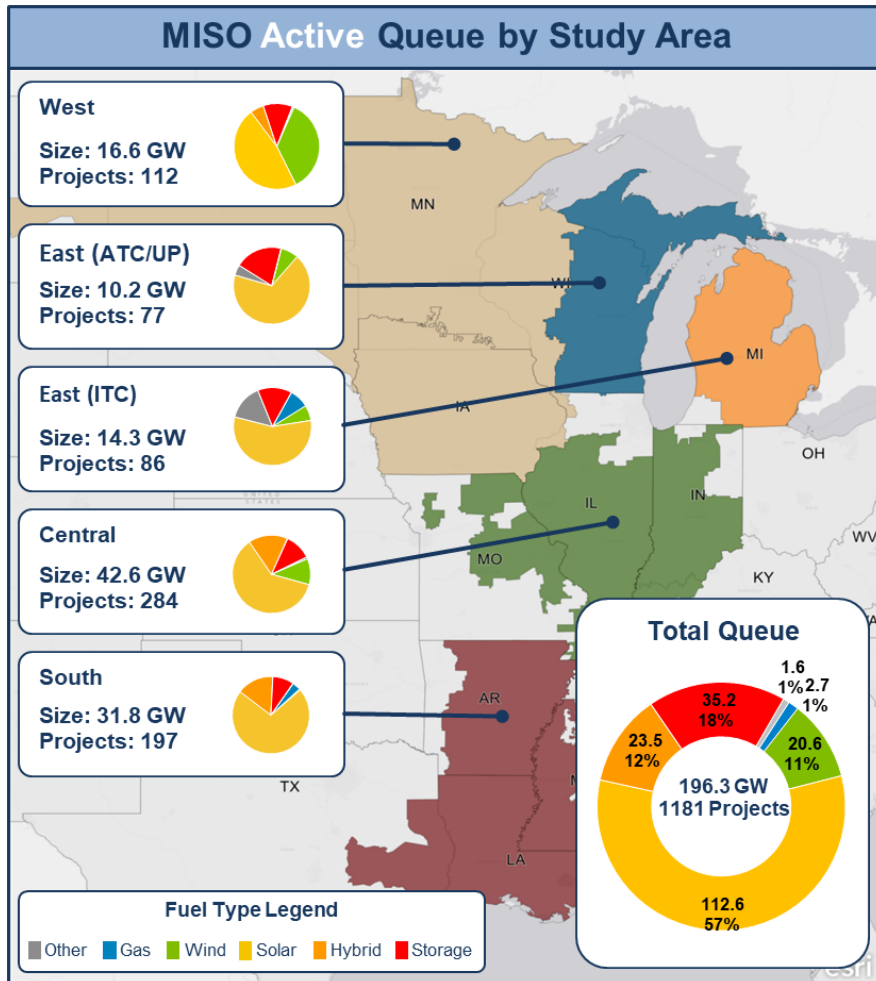
MISO

Transmission Service Request

of Requests in Study

Legend: > 195 (orange), 30 - 195 (blue), < 30 (green)

	Aug-22	Sep-22
> 195	16	16
30 - 195	8	8
< 30	2	2

Completed Studies Q

Legend: 0 - 60 (green), > 60 (blue)

	Aug-22	Sep-22
	0	0

Number of Long Term Transmission Service Requests

Legend: Total (blue), Processed (green)

New Added: 0
Total Processed: 0

Month	Total	Processed
Sep-21	15	6
Oct-21	18	4
Nov-21	30	2
Dec-21	17	16
Jan-22	26	17
Feb-22	30	13
Mar-22	22	11
Apr-22	29	7
May-22	37	6
Jun-22	38	0
Jul-22	24	16
Aug-22	26	0
Sep-22	26	0

Source: MISO Transmission Planning Department

MISO

Generator Interconnection: Queue Overview

*The current generator interconnection queue consists of **1181** active projects totaling **196.3** GW*

Updated: 10/27/2022

MISO Active Queue by Study Area

West
Size: 16.6 GW
Projects: 112

East (ATC/UP)
Size: 10.2 GW
Projects: 77

East (ITC)
Size: 14.3 GW
Projects: 86

Central
Size: 42.6 GW
Projects: 284

South
Size: 31.8 GW
Projects: 197

Total Queue

1.6 1%
2.7 1%
35.2 18%
20.6 11%
23.5 12%

**196.3 GW
1181 Projects**

112.6 57%

Fuel Type Legend
■ Other ■ Gas ■ Wind ■ Solar ■ Hybrid ■ Storage

DPP Trends
Active Projects by DPP Year (GW)

Year	Value	Breakdown
2017	-	
2018	0.7	0.7
2019	16.9	11.3 / 0.9
2020	30.9	1.2 / 2.6 / 22.4 / 3.2 / 1.4
2021	67.0	11.0 / 10.3 / 37.3 / 7.1 / 1.1

Notes:

- The total active queue size is **1181** projects totaling **196.3** GW
  - **46** projects GIAs completed in 2022
  - **29** projects have withdrawn in 2022

- In the past 90 days there were:
  - **18** project(s) that completed GIAs
  - **6** projects that withdrew from the queue

- **DPP-2022-Cycle**: Application Deadline date was 9/15/2022
  - Application validations are ongoing
  - Initial queue numbers expected for December report

Detailed queue cycle information can be found on the next page or [MISO's website](#)

Source: MISO Transmission Planning Department
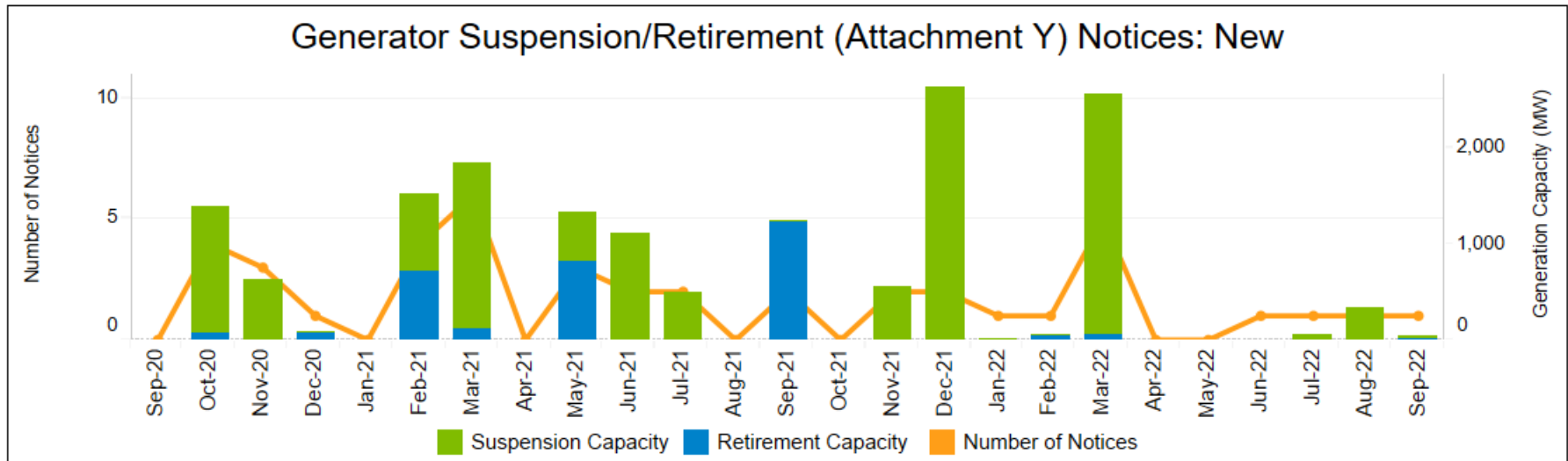
Generator Interconnection: Queue Status

*MISO is managing **21** ongoing queue cycles with **5** more set to start in the next 12 months*
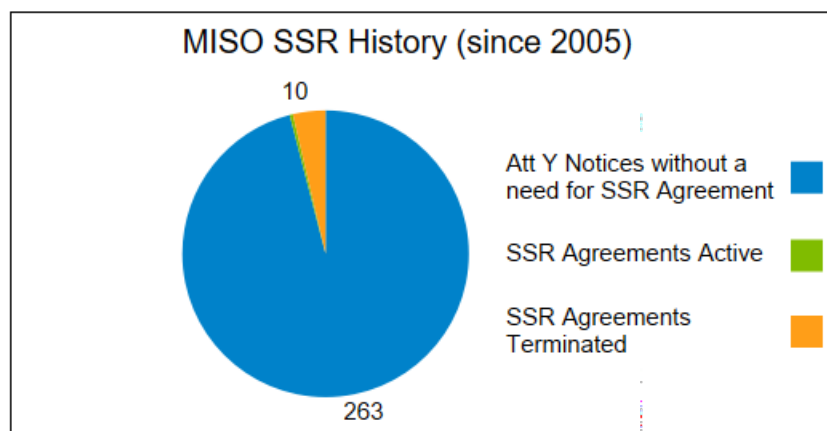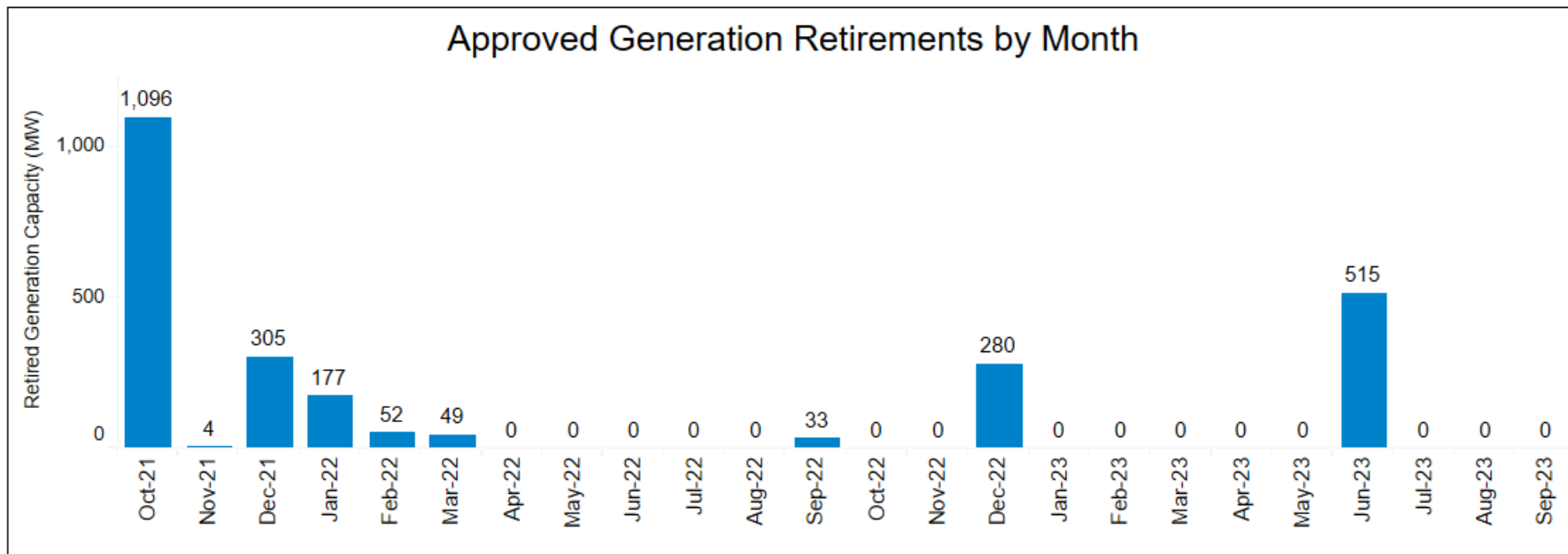
Updated: 10/01/2022

Study Area	Study Cycle	Number of Projects	MWs	Estimated Completion Date	Study Status	Study Comments
Central MO, IL & IN	DPP-2018-APR	34	7,344	4/30/2023	DPP 3	
	DPP-2019-Cycle	76	12,417	5/2/2023	DPP 3	AFS Delay
	DPP-2020-Cycle	85	13,173	8/28/2023	DPP 1	MISO Delay
	DPP-2021-Cycle	119	17,586	9/27/2023	DPP 1	IC Delay
	DPP-2022-Cycle	TBD	TBD	12/18/2023	Pre-Study	
East (ATC) WI & MI UP	DPP-2019-Cycle	13	1,607	5/4/2023	DPP 3	
	DPP-2020-Cycle	29	3,850	4/10/2023	DPP 2	AFS Delay
	DPP-2021-Cycle	37	5,016	9/27/2023	DPP 1	IC Delay
	DPP-2022-Cycle	TBD	TBD	12/18/2023	Pre-Study	
East (ITC) MI	DPP-2019-Cycle	26	3,271	12/3/2022	DPP 3	
	DPP-2020-Cycle	21	3,872	2/18/2023	DPP 2	
	DPP-2021-Cycle	54	8,907	9/27/2023	DPP 1	IC Delay
	DPP-2022-Cycle	TBD	TBD	12/18/2023	Pre-Study	
South TX, AR, LA & MS	DPP-2019-Cycle	34	5,545	10/28/2022	GIA In Progress	
	DPP-2020-Cycle	48	6,542	2/11/2023	DPP 3	
	DPP-2021-Cycle	144	24,603	9/27/2023	DPP 1	IC Delay
	DPP-2022-Cycle	TBD	TBD	12/18/2023	Pre-Study	
West IA, WI, MN, ND, SD & MT	DPP-2017-AUG	10	1,408	1/13/2022	GIA In Progress	
	DPP-2018-APR	20	2,317	5/11/2022	GIA In Progress	
	DPP-2019-Cycle	24	4,314	4/22/2023	DPP 3	MISO Delay
	DPP-2020-Cycle	30	3,638	4/9/2023	DPP 2	TO Delay
	DPP-2021-Cycle	66	10,534	9/27/2023	DPP 1	IC Delay
	DPP-2022-Cycle	TBD	TBD	12/18/2023	Pre-Study	

For the latest full schedule details and delay tracking information of DPP cycles, please visit MISO's website: Generator Interconnection
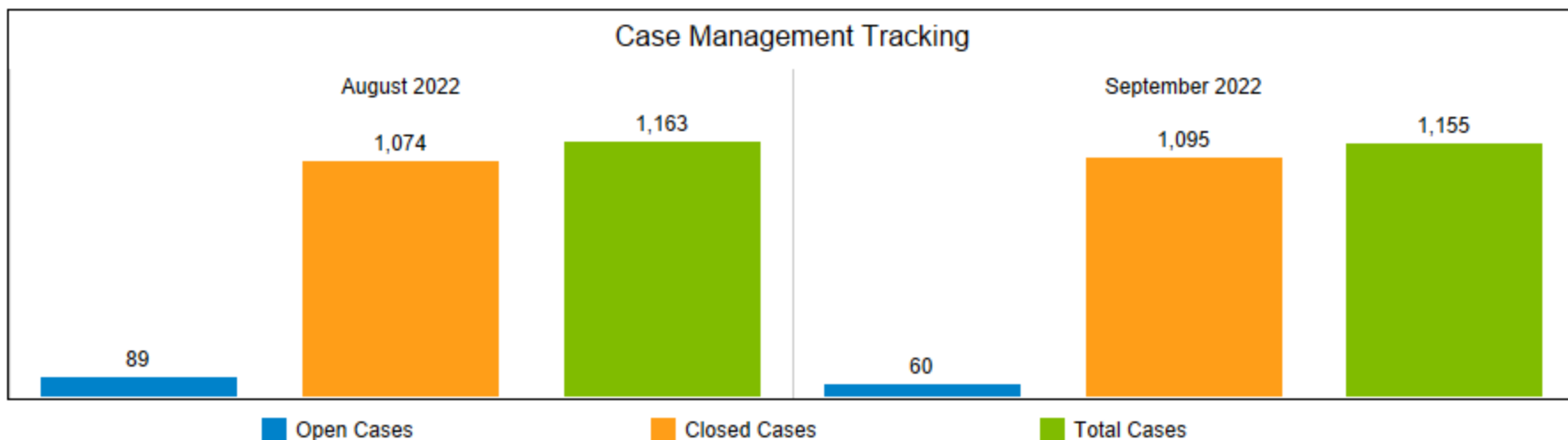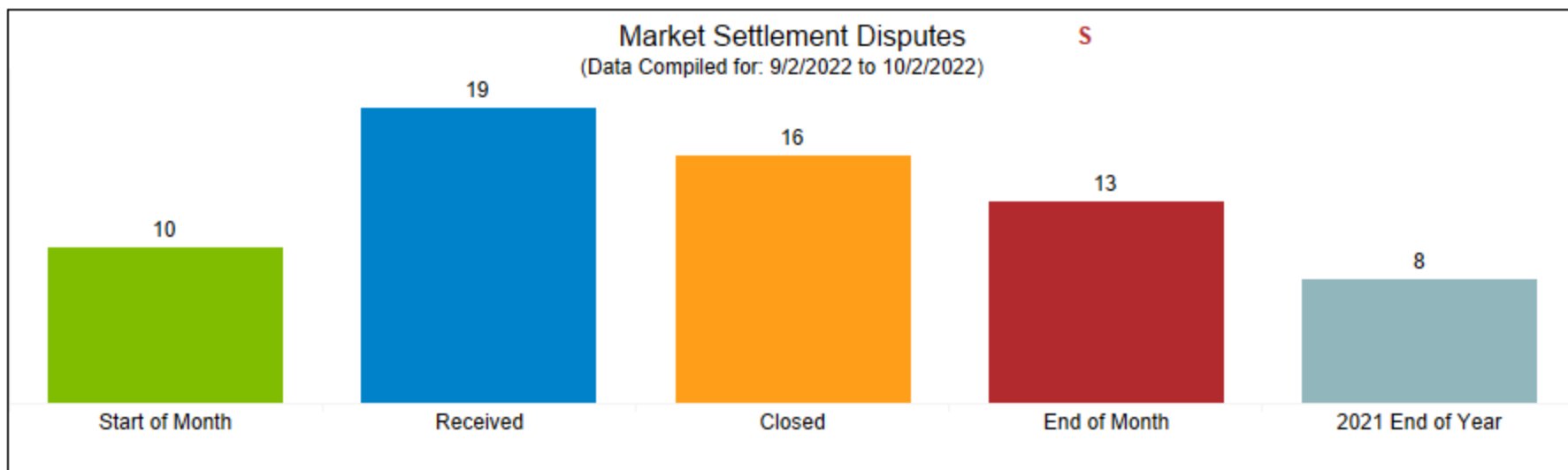
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Source: MISO Transmission Planning Department

Generator Suspension/Retirement - New and Resolved

Generator Suspension/Retirement (Attachment Y) Notices: New

Generator Suspension/Retirement (Attachment Y) Notices: Resolved

Source: MISO Transmission Planning Department
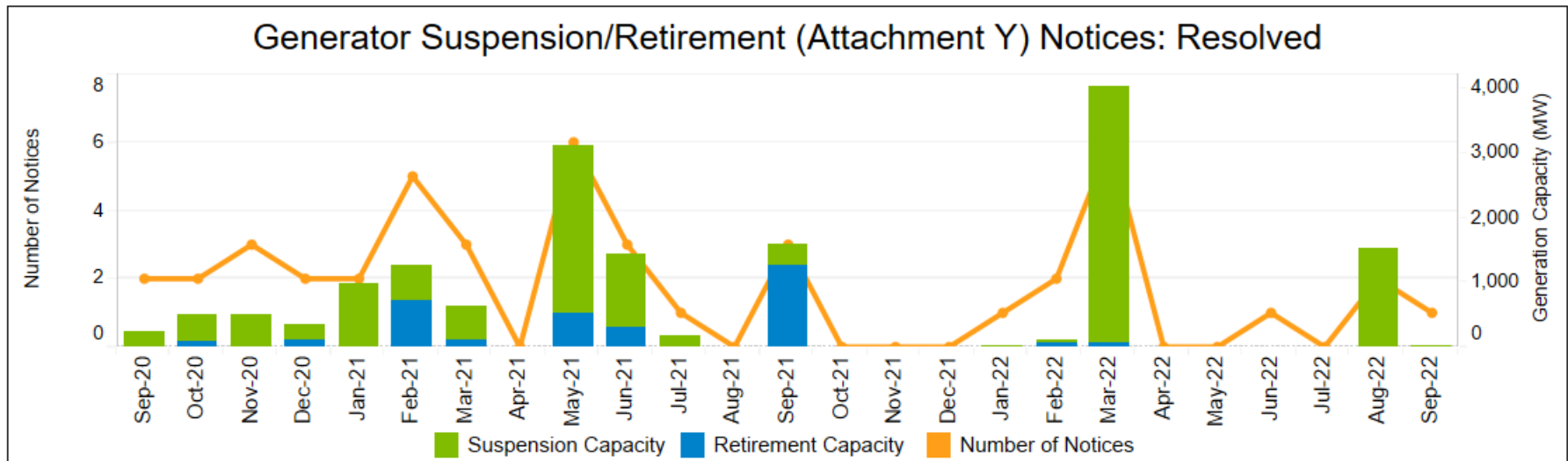
Generator Suspension/Retirement - Overall

Approved Generation Retirements by Month

MISO SSR History (since 2005)

Source - MISO Transmission Planning Department

Settlements/Client Services and Readiness

Market Settlement Disputes
(Data Compiled for: 9/2/2022 to 10/2/2022)   S

- Start of Month: 10
- Received: 19
- Closed: 16
- End of Month: 13
- 2021 End of Year: 8

Case Management Tracking

August 2022
- Open Cases: 89
- Closed Cases: 1,074
- Total Cases: 1,163

September 2022
- Open Cases: 60
- Closed Cases: 1,095
- Total Cases: 1,155

■ Open Cases   ■ Closed Cases   ■ Total Cases

MISO

IT Infrastructure and Operations is focused on providing secure, reliable and efficient technology

Through July 2022							

Short-Term Incentive Metrics

	Apr-22	May-22	Jun-22	Jul-22	Trend	YTD	Threshold | Target | Excellent
Critical Systems (Availability %)	100	99.91	100	100	⬌	99.97	99.91 | 99.93 | 99.95
Number of Critical System Incidents Exceeding 30 Minutes	0	0	0	0	⬌	0	4 | 3 | 2

Other Availability Metrics

	Apr-22	May-22	Jun-22	Jul-22	Trend	Monthly Target
ICCP (Availability %)	99.98	99.95	99.99	99.97	⬌	99.5
Customer Facing Applications - Portals (Availability Index)	9	10	10	10	⬌	10 of 10
Markets (Availability Index)	3	4	3	3	⬊	3 of 4
Reliability Targets (Availability Index)	4	4	4	4	⬌	4 of 4

ICCP = Inter-Control Center Communications Protocol

MISO

Dashboard Metric Criteria (1 of 2)

New or revised 2022 Metric;
Five days in February 2021 have been removed from threshold calculations

Operational Excellence										
Metric	**Chart**	**● Expected**	**■ Monitor**	**▼ Review**	**Metric**	**Chart**	**● Expected**	**■ Monitor**	**▼ Review**
Percentage Price Deviation*	A	Absolute DA-RT price difference divided by DA LMP <=22.2%	Absolute DA-RT price difference divided by DA LMP is >22.2% but <=25.7%	Absolute DA-RT price difference divided by DA LMP >25.7%	Unit Commitment Efficiency	H	Monthly Metric >= 90% AND Rolling 12-Month Metric >= 92%	Not in Good Status AND 90% > Monthly Metric >= 85% and 92% > Rolling 12-Month Metric >= 90%	Not in Good AND Not in Monitor Status
Monthly Average Gross Virtual Profitability*	B	Within the standard deviation bands (threshold $0.93/MWh)	Outside the standard deviation bands		Real-Time Obligation fulfilled by Day-Ahead Supply at the Peak Hour	I	>=95%	>=93% but <95%	<93%
FTR Funding	C	Monthly FTR Allocation % is >=92% and YTD FTR Allocation % is >=96%	Not in good status AND Monthly FTR Allocation % is >=87% AND Rolling 12-month FTR Allocation % is >=93%	Not in Good AND not in Monitor status	Day Ahead Wind Generation Forecast Error*	K	# of days that the hourly average forecast error exceeds 10% <= 6	# of days that the forecast error exceeds 10% >6 or Forecast error exceeds 15% in = 3 days	# of days that the forecast error exceeds 10% >8 or Forecast error exceeds 15% in > 3 days or Forecast error resulted in declaring 1 Real Time Event
Market Efficiency Metric	D	Monthly Metric is >= 92% and Rolling 12-Month Metric is >= 94%	Not in Good Status AND Monthly Metric is >= 87% and Rolling 12-Month Metric is >= 92%	Not in Good AND not in Monitor status	Tie Line Error	L	<=1	>1 but <=3	>3
^^RSG per MWh to Energy Price*	E	<=0.78%	>0.78% and <=0.98%	>0.98%	Control Performance – BAAL	M	Monthly performance score >=2	Monthly performance score<2 but >=1	Monthly performance score <1
Day Ahead Mid-Term Load Forecast**	F	# of days that forecast error exceeds 3% <=6 AND # days that forecast error exceeds 4% <=4	# of days that forecast error exceeds 3% > 6 OR # days that forecast error exceeds 4%> 4 OR forecast error exceeds 6% on >= 1 day	# of days that forecast error exceeds 3% > 10 OR # days that forecast error exceeds 4%> 8 OR forecast error exceeds 7% on >= 1 day OR Forecast error resulted in declaring 1 Real Time Event	Control Performance – CPS1 and CPS1 12-month rolling	N	>=100%	<100%	

FTR YTD metric is applied beginning April
*** Forecast errors observed in March, April, October and November will be measured by 1% lower thresholds*
^^5 days in September 2020 due to Hurricane Laura have been removed from the threshold calculation

MISO

Dashboard Metric Criteria (2 of 2)

Operational Excellence									
Metric	**Chart**	**● Expected**	**■ Monitor**	**▼ Review**	**Metric**	**Chart**	**● Expected**	**■ Monitor**	**▼ Review**
Short-Term Load* Forecast	G	Forecast error exceeding the 95% percentile of forecast error for the past year <= 2 days	3 days <= Forecast error exceeding the 95% percentile of forecast error for the past year <= 5 days	Forecast error exceeding the 95% percentile of forecast error for the past year > 5 days	ARS Deployment	P	DCS monthly average % recovery (APR) = 100%	Analysis of event not yet complete	DCS monthly average % recovery (APR) confirmed <100%
Customer Service									
System Impact Study Performance	Q	Studies completed in less than 60 days >=85%	Studies completed in less than 60 days <85% but >=75%	Studies completed in less than 60 days <75%	Settlement Disputes	S	Increase of up to 20 disputes	Increase of between 20 and 50 disputes	Increase of more than 50 disputes

FTR YTD metric is applied beginning April
*** Forecast errors observed in March, April, October and November will be measured by 1% lower thresholds*
^^5 days in September 2020 due to Hurricane Laura have been removed from the threshold calculation