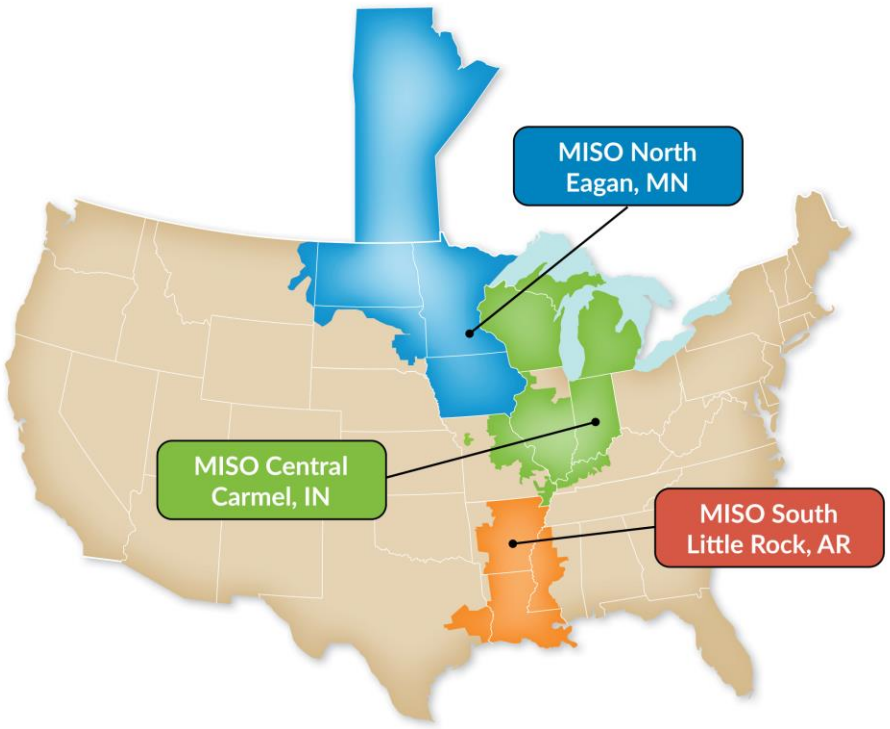
IURC Summer Readiness Forum

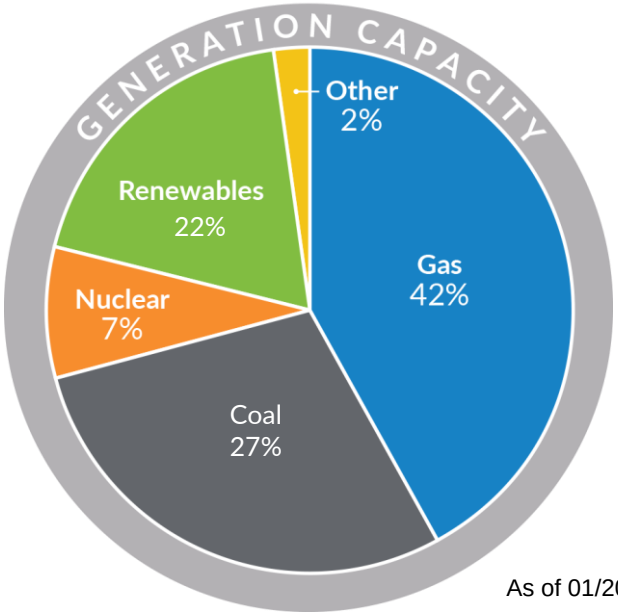
May 3, 2023

MISO drives value creation through efficient and reliable markets, operations, planning, and innovation



MISO's reliability footprint and locations of regional control centers.

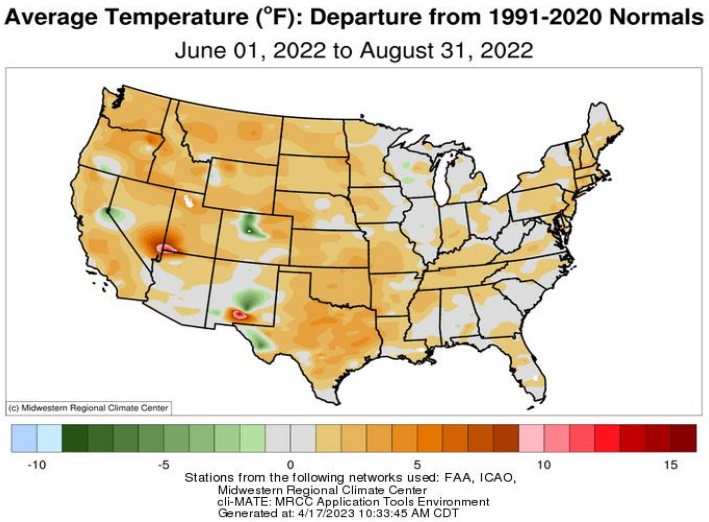
MISO by the numbers	
High Voltage Transmission	68,000 miles
Generation Capacity	190 GW
Record Demand	127.1 GW
Population Served	45 Million

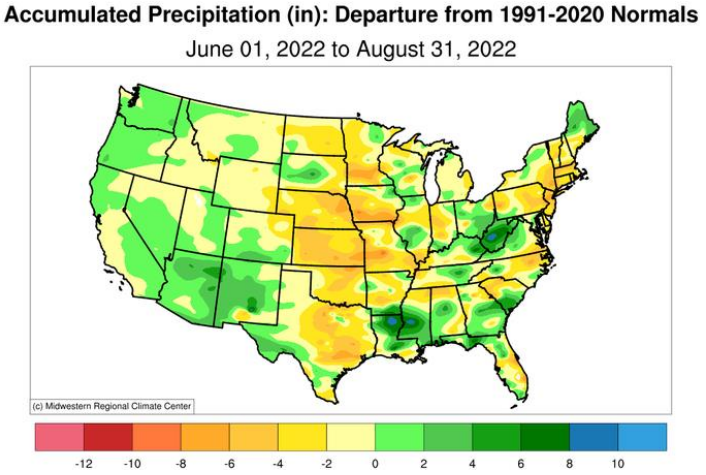


As of 01/2023

Last Summer

- Last summer is not an analog year for the upcoming summer
- Drier pattern across most of the MISO footprint
- Heat was frontloaded last summer mainly focused in June.
- Above normal temperatures prevailed across the South Region
- Last summer saw 9 days above 90°F Systemwide temperature. All in June and July.



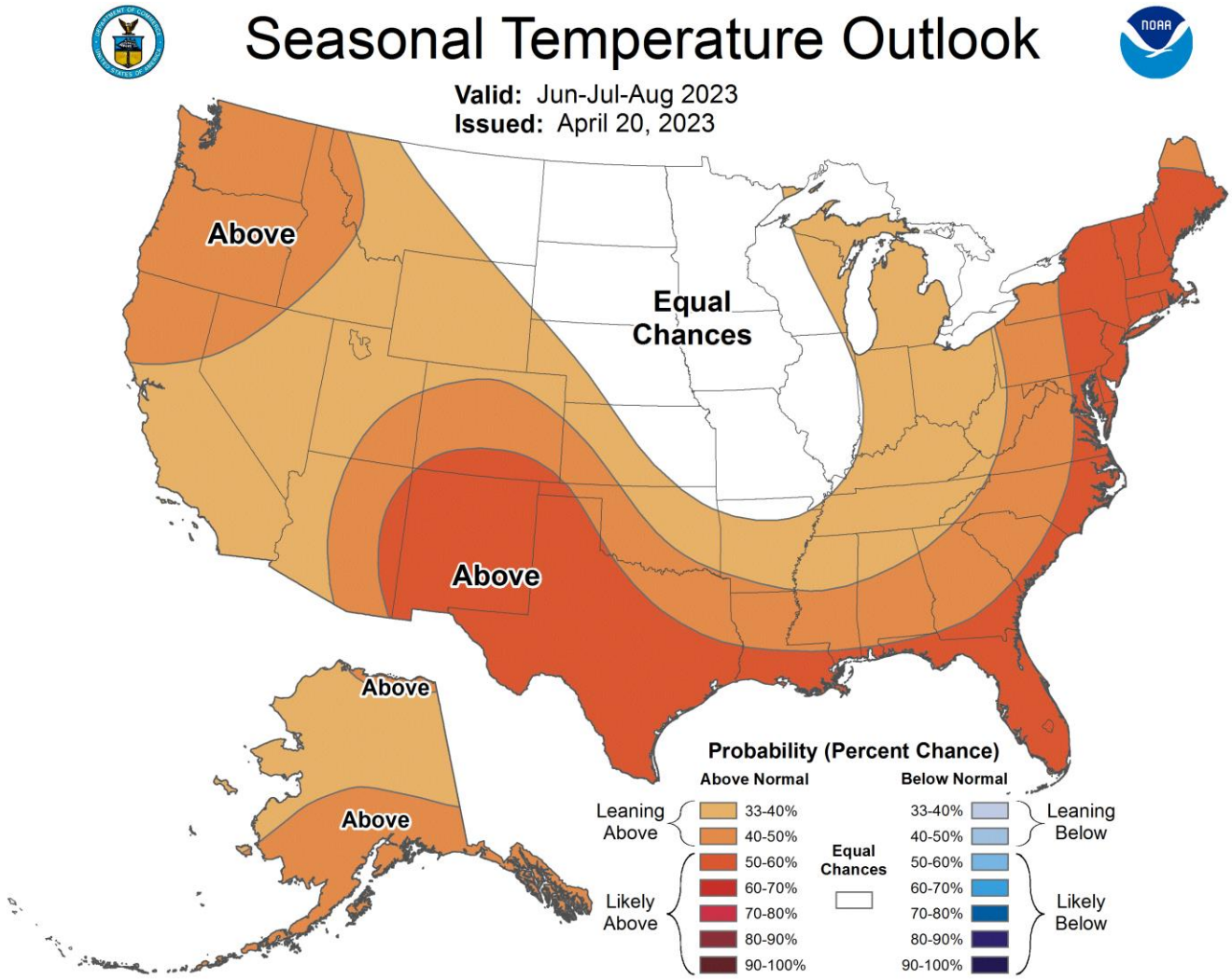


Expecting less risks than last summer…

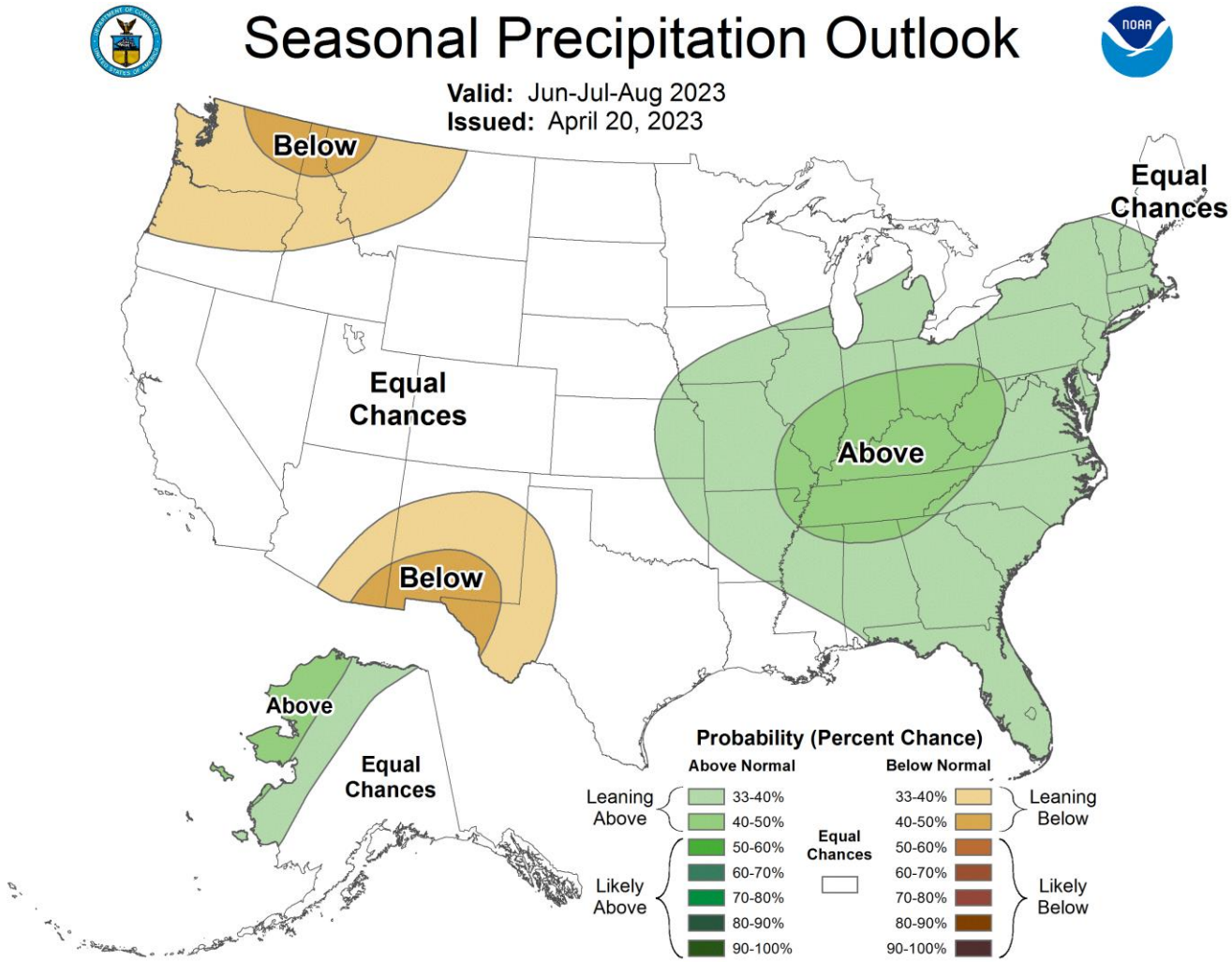
- Normal/slightly above normal temperatures in the Classic Region and the South Region
- Near to slightly below normal hurricane season
- Relatively low wind volatility but low production level can stress operating conditions
- Expected ~ 3GW in-service solar would not increase net-load ramping needs given summer afternoon peak
- Dispatchable Generation presents less risk compared to winter, but outages and derates can be expected on days with persistent heat

… But risks can easily escalate high on extreme days
How are we prepared to manage risks?

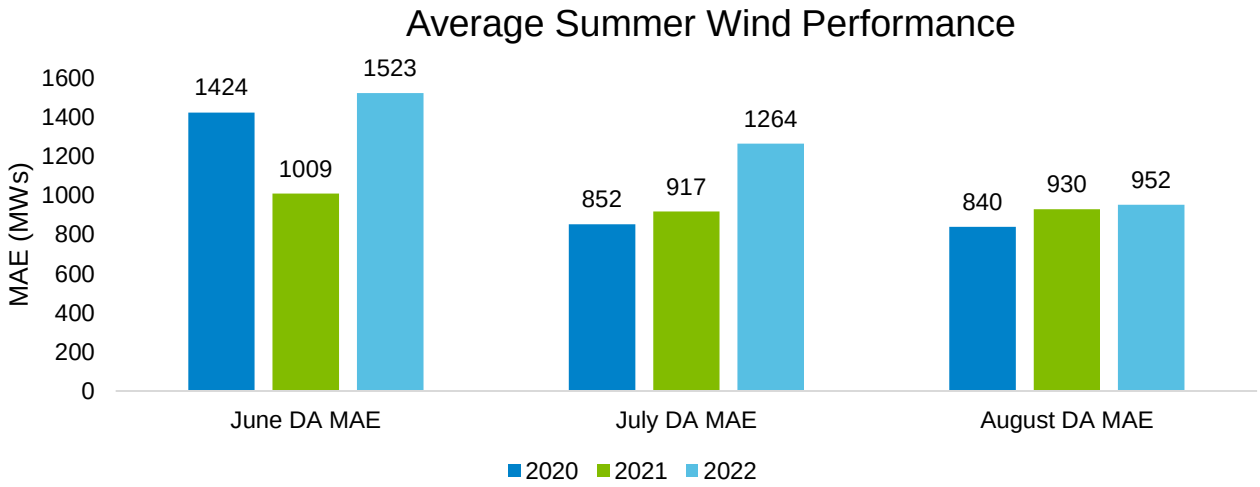
What are the vendors saying?

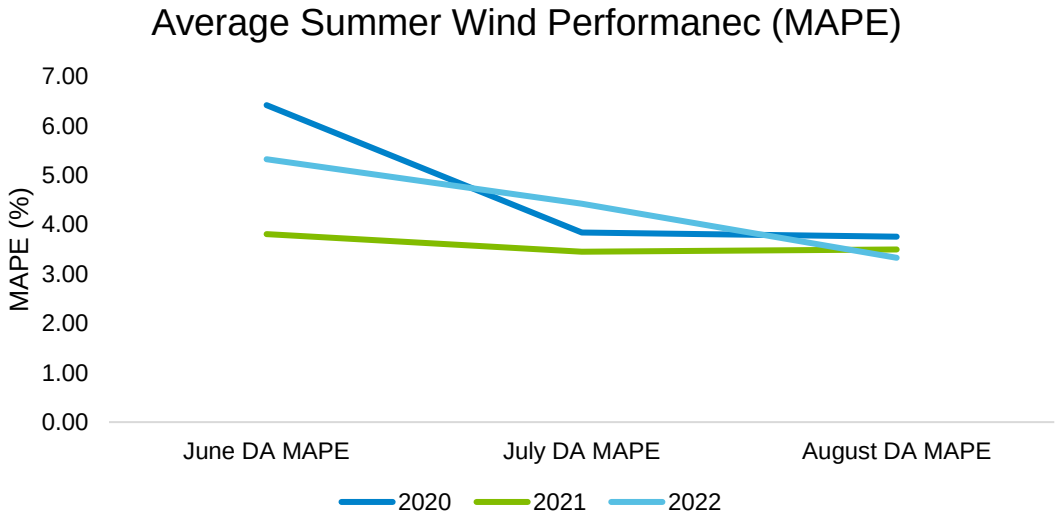


Precipitation Outlook



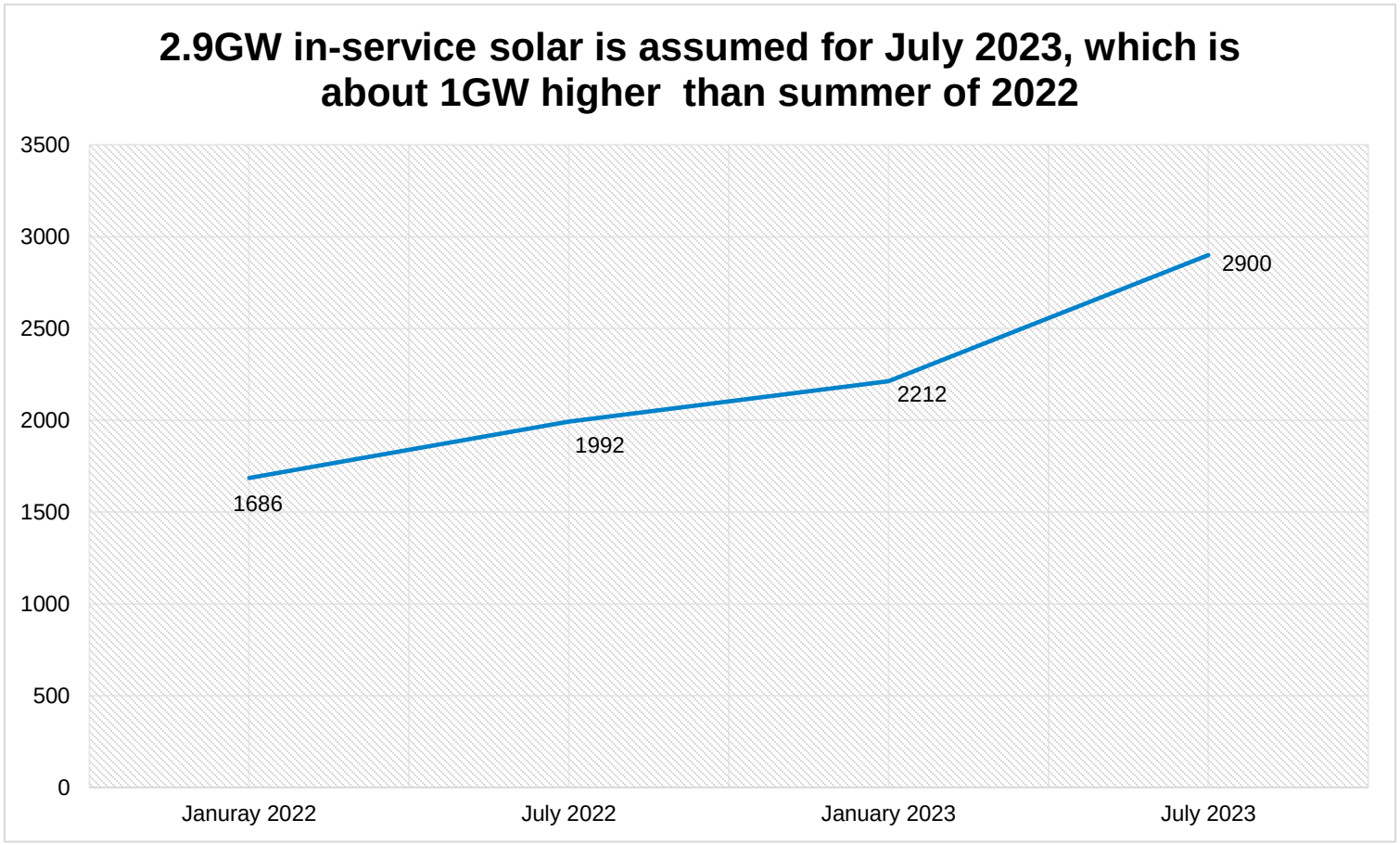
2020 - 2022
Summer Wind Forecasting Performance





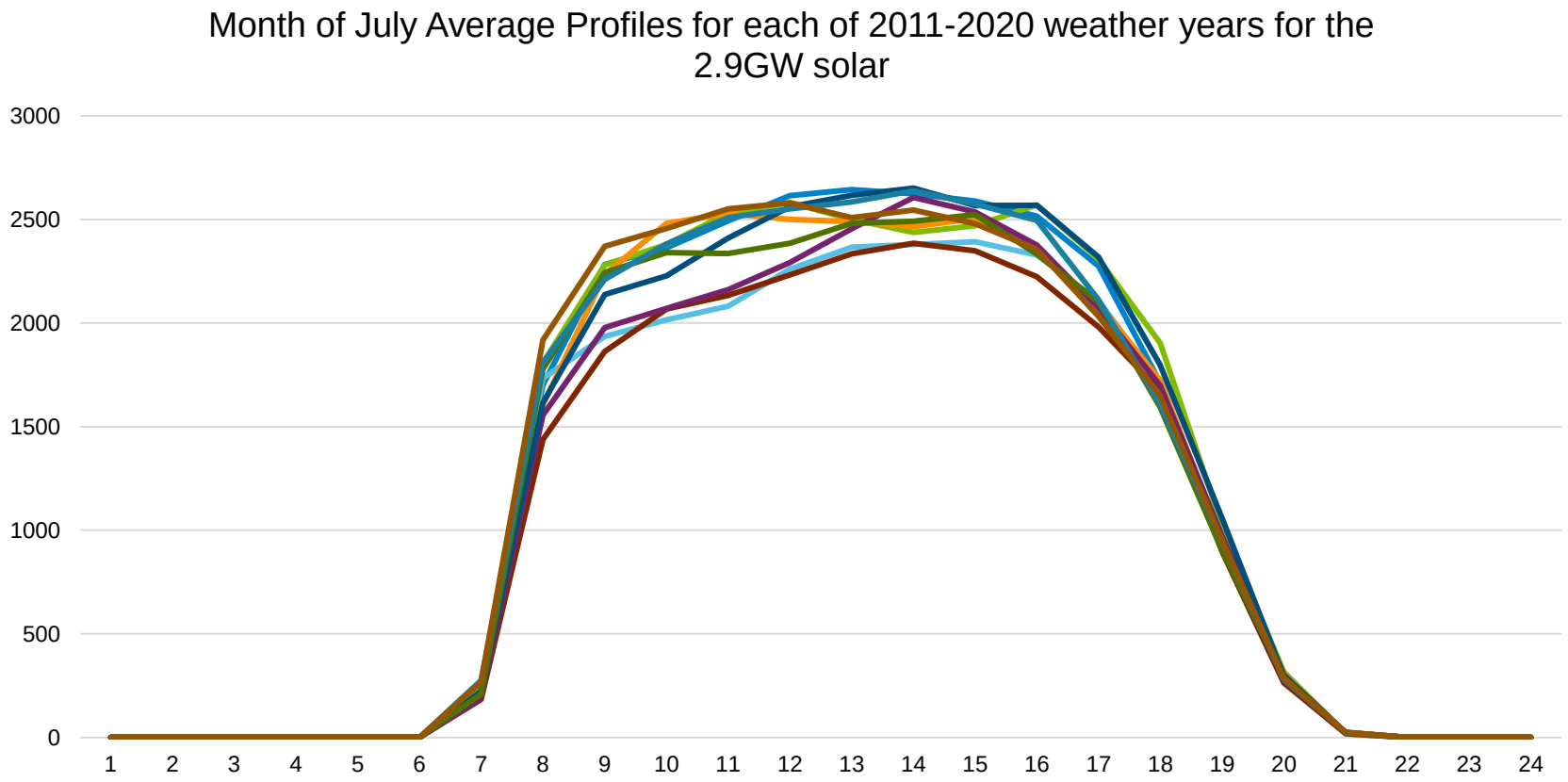
Takeaway: June tends to trend higher in terms of MAE however, overall performance is similar to yearly performance on a per month basis.

Total in-service solar in MISO market has grown to 2.4GW* as of April 2023, with 220MW added so far this year and 500MW in testing



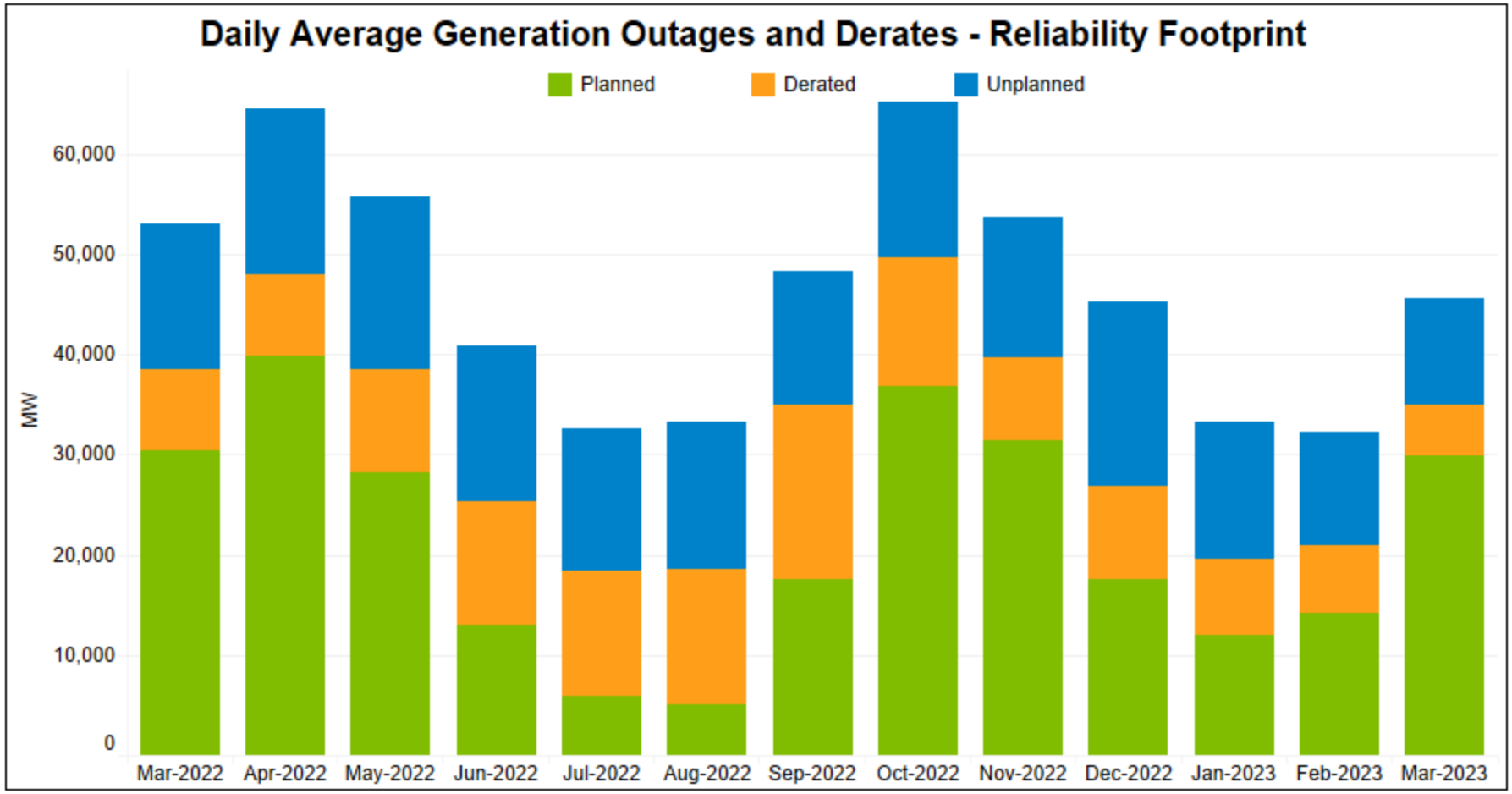
* Excluding 100MW SEARCY hybrid and 103MW BTM solar

System-wide solar profiles have typical diurnal patterns on average



Raw data provided by EFS

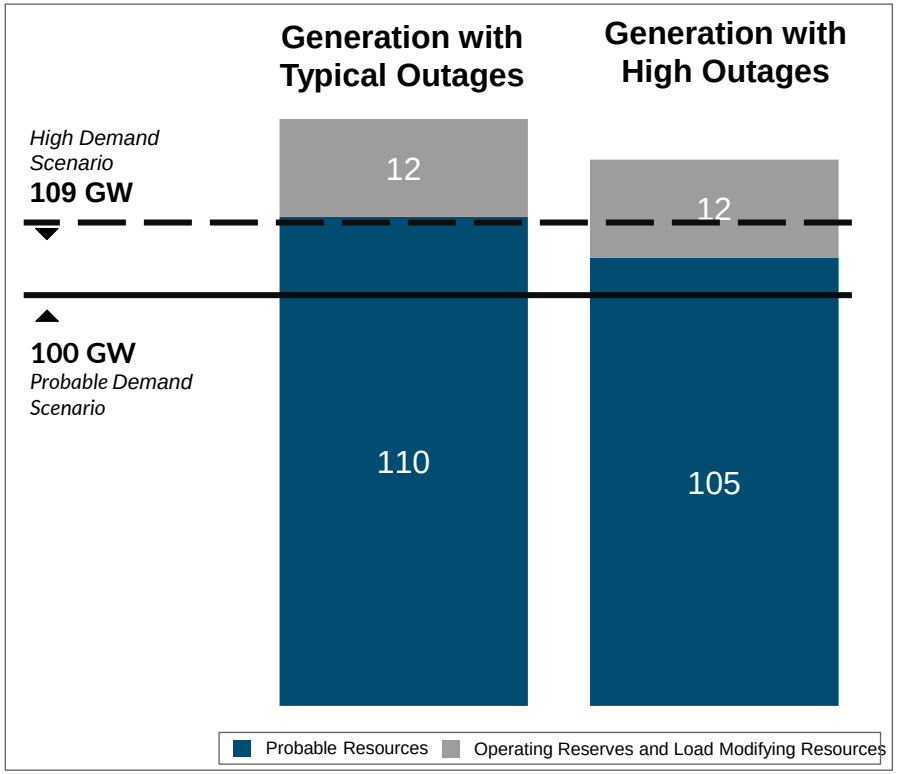
Generation Outages and Derates

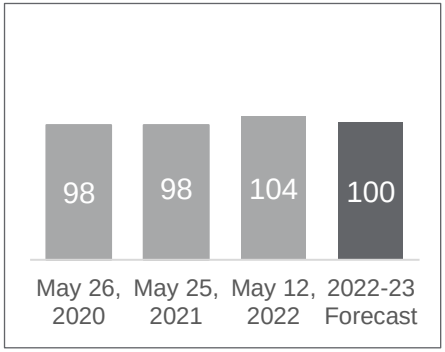


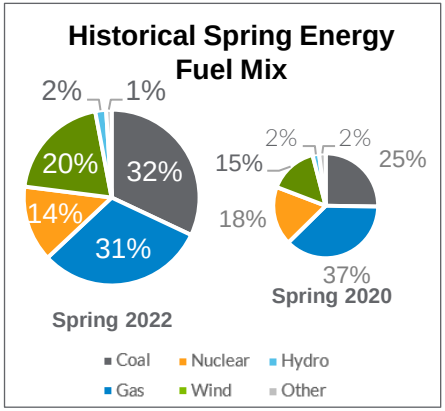
Notes:
- *Unplanned Outages include Emergency, Forced, and Urgent*
- *Planned Outages include Planned*
- *De-rates are based on limits observed in Real-Time and may not reflect normal seasonal de-rates or de-rates for maintenance or other operating conditions*

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

MISO expects sufficient supply to cover demand under typical conditions this spring and is preparing for risks that could materialize under a high-outage, high-load scenario







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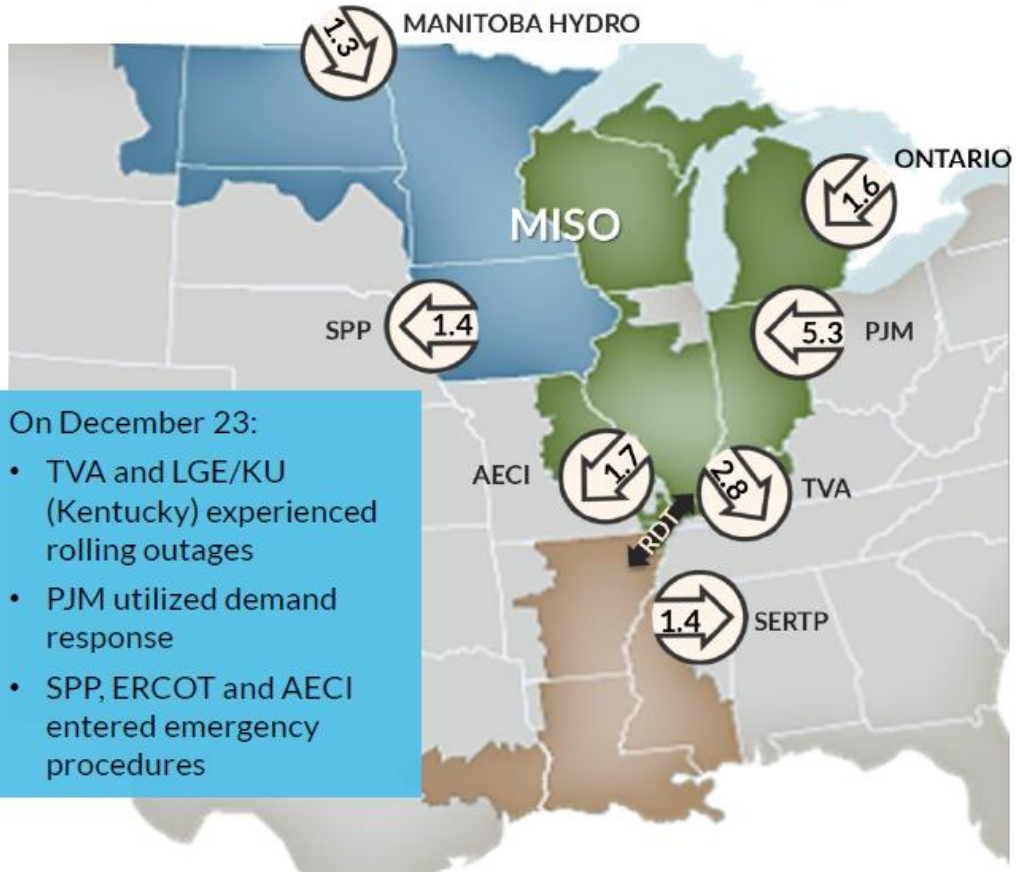
Appendix

MISO consistently exported power to southern neighbors including the sale of emergency energy to TVA, while also complying with a request to reduce North to South transfers by 1500 MW

Net Scheduled Interchange (GW) December 23, 2022



On December 23:

- TVA and LGE/KU (Kentucky) experienced rolling outages
- PJM utilized demand response
- SPP, ERCOT and AECI entered emergency procedures

- MISO took reliability actions to support its neighbors during extenuating circumstances
  - Because MISO's load was not at risk, not all exports were curtailed that could have been per procedures
  - This action was also deemed appropriate to keep the interconnect within operating limits
  - Questions remain on the impact of this action on MISO market outcomes and expectations for future reciprocating actions and the operating philosophy for all entities
- MISO is also working with the Joint Parties to understand the drivers for reduction in North to South transfers

Values within arrows represent maximum flows into or out of MISO December 23, 2022
Values include transfers through MISO, sourced and synced outside of MISO

RDT = Regional Directional Transfer, which has a North-South limit of 3.0 GW and South-North limit of 2.5 GW
AECI= Associated Electric Cooperative Incorporated, *SERTP = Southeastern Regional Transmission Planning Region*