2022 OMS-MISO Survey Results

Furthering our joint commitment to regional resource adequacy, OMS and MISO are pleased to announce the results of the 2022 OMS-MISO Survey

June 10, 2022

Projections and data do not account for impacts of recent and future tariff filings, including those related to Resource Availability & Need

Given the capacity outlook for 2023 and beyond, efforts must be accelerated and reinforced to reliably manage the portfolio transition

- MISO is projected to have a capacity deficit of 2.6 GW below the 2023 PRMR. Depending on market responses to the 2022 PRA, projected capacity surplus could be as much as 2.4 GW
- Similar to the 2022 PRA results, the capacity deficit is restricted to MISO North/Central, partially offset by exports from the South region
- Capacity deficits are projected to widen in subsequent years, consistent with past surveys
- Demand growth is projected to continue post-Covid recovery in 2023 at +1 GW (+0.8% compared to 2022 PRA), but modest growth thereafter at 0.2% per year

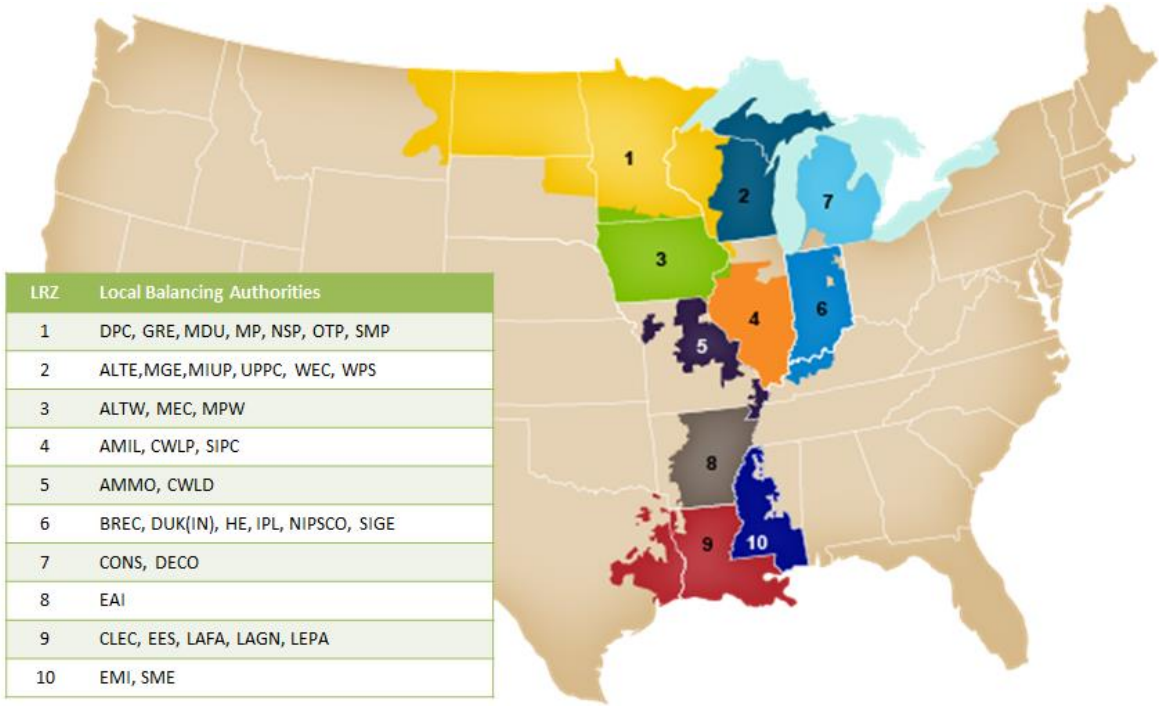
Implications: To ensure reliable operations, MISO will be increasingly reliant on emergency or non-firm resources, such as imports, which are not reflected in the survey but have historically been important and available to MISO

Note: 99% of Load participated in OMS-MISO Survey in 2022

Capacity mentioned is Unforced Capacity (UCAP) - PRMR: Planning Reserve Margin Requirement

MISO Resource Adequacy Requirements

- Load serving entities within each zone must have sufficient resources to meet load and required reserves
- Surplus resources may be shared among load serving entities with resource deficits to meet reserve requirements



LRZ	Local Balancing Authorities
1	DPC, GRE, MDU, MP, NSP, OTP, SMP
2	ALTE,MGE,MIUP, UPPC, WEC, WPS
3	ALTW, MEC, MPW
4	AMIL, CWLP, SIPC
5	AMMO, CWLD
6	BREC, DUK(IN), HE, IPL, NIPSCO, SIGE
7	CONS, DECO
8	EAI
9	CLEC, EES, LAFA, LAGN, LEPA
10	EMI, SME

The survey uses three categories to help characterize relative levels of resource certainty

Committed Capacity

- Consists of installed generation resources and projects with interconnection agreements with commercial operation dates expected during survey year
- This report assumes that these resources will be used to meet the PRMR

Potentially Unavailable Resources

- Consists of installed generation resources whose commitment to MISO is unclear
- This report assumes that these resources will NOT be used to meet the PRMR

Potential New Capacity

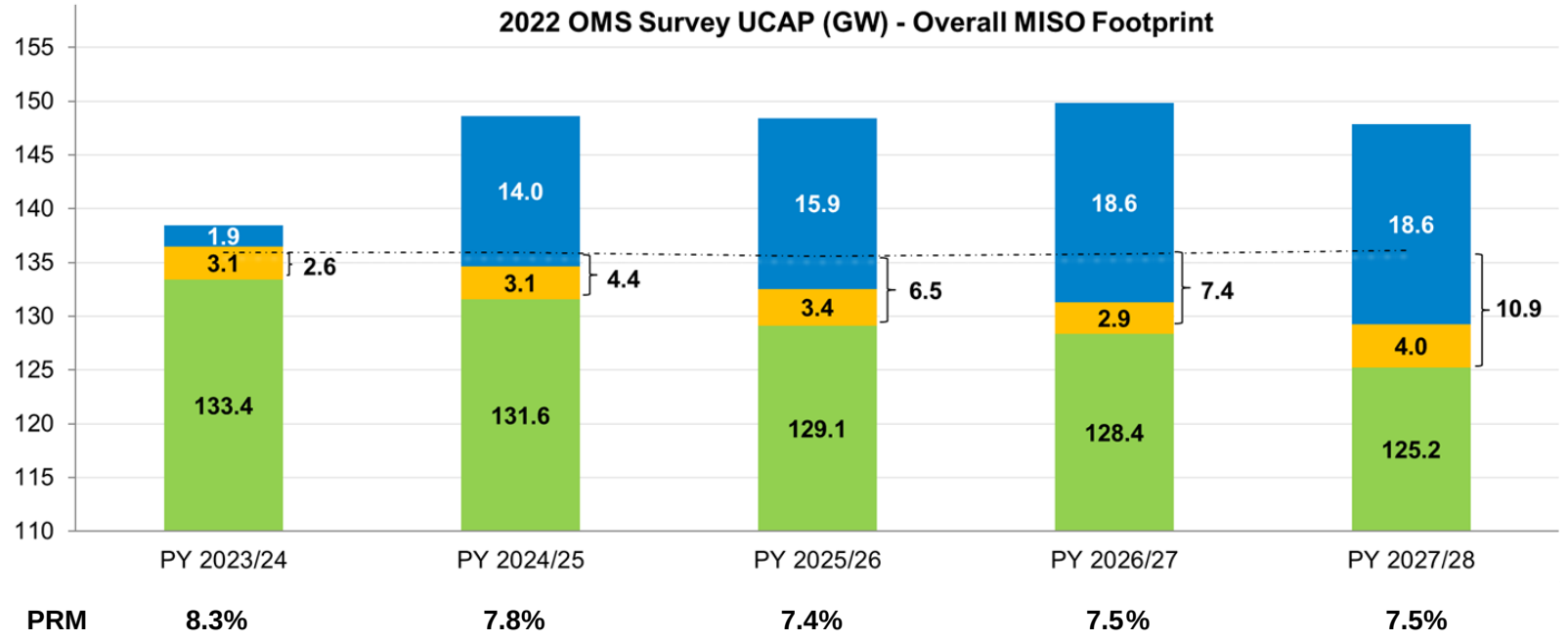
- Consists of projects in MISO's generation interconnection queue with capacity weighted consistent with past years*

Potential New Capacity (Alternative Method)

- Alternative method - Historically MISO has seen 2-3 GW of new capacity energized annually (assumes average of 2.5 GW/year)

* Descriptions of Resource Categories and Queue Treatment on slides 14 - 16 in appendix
Capacity mentioned is Unforced Capacity (UCAP).

Committed capacity projections show deficit increasing over survey period. Depending on the pace of resource retirements and new capacity additions, risk can be meaningfully mitigated



Bracketed values indicate difference between Committed Capacity and projected PRMR

Legend
- Committed Capacity
- Potentially Unavailable Resources
- Potential New Capacity
- PRMR

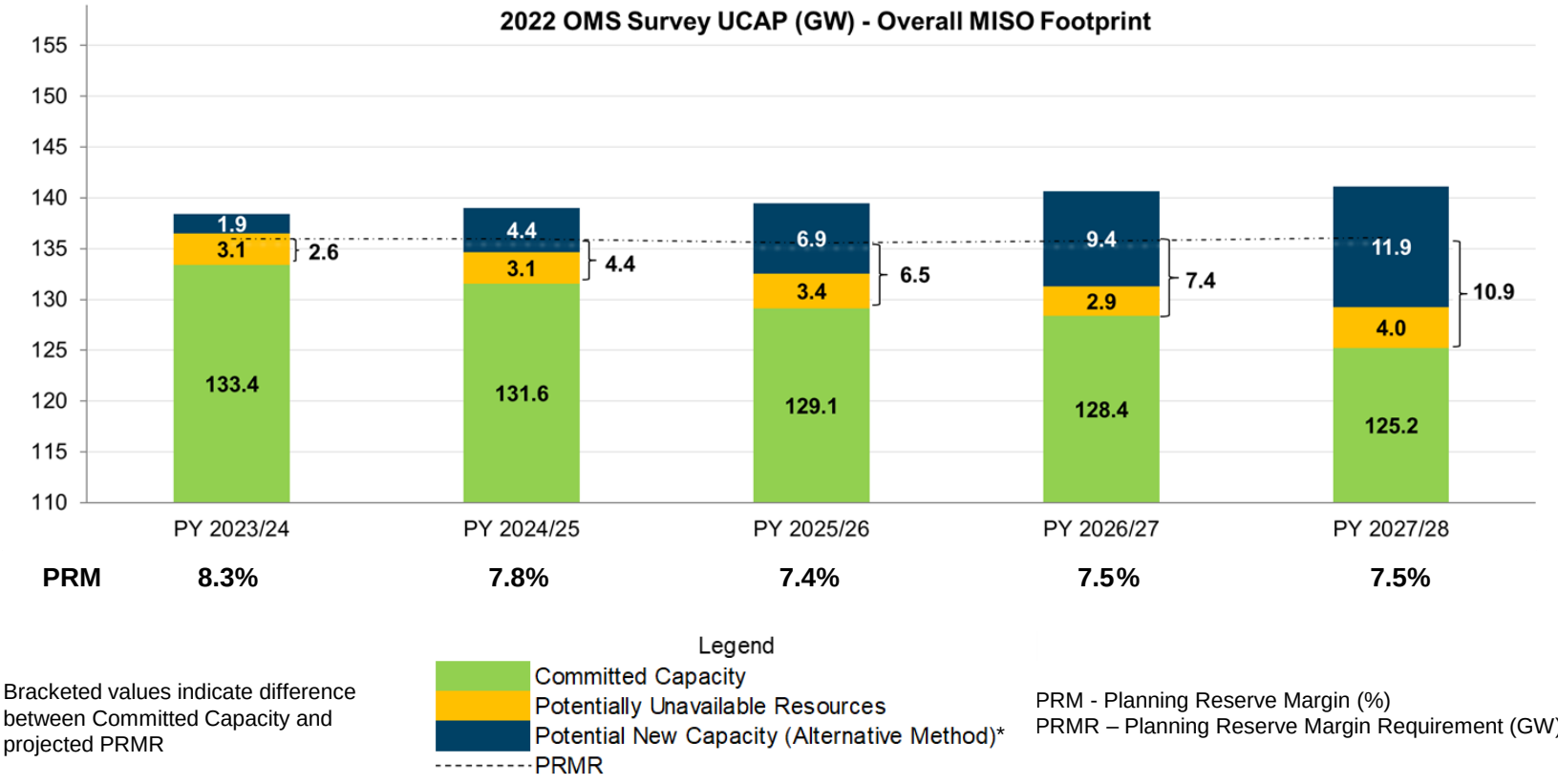
PRM - Planning Reserve Margin (%)
PRMR – Planning Reserve Margin Requirement (GW)

RDT limit of 1900 MW is reflected in this chart

Note: Potential New Capacity projected per methodology consistent with past years.

Schedule MM-D6

Alternative method based on historical installations of 2.5 GW/year would indicate reduced 'potential new capacity'



Bracketed values indicate difference between Committed Capacity and projected PRMR

PRM - Planning Reserve Margin (%)
PRMR – Planning Reserve Margin Requirement (GW)

*Alternative method reflects historical rate of actual capacity additions in MISO
Note: RDT limit of 1900 MW is reflected in this chart

External factors can impact projected deficits or surpluses

Downside Risks

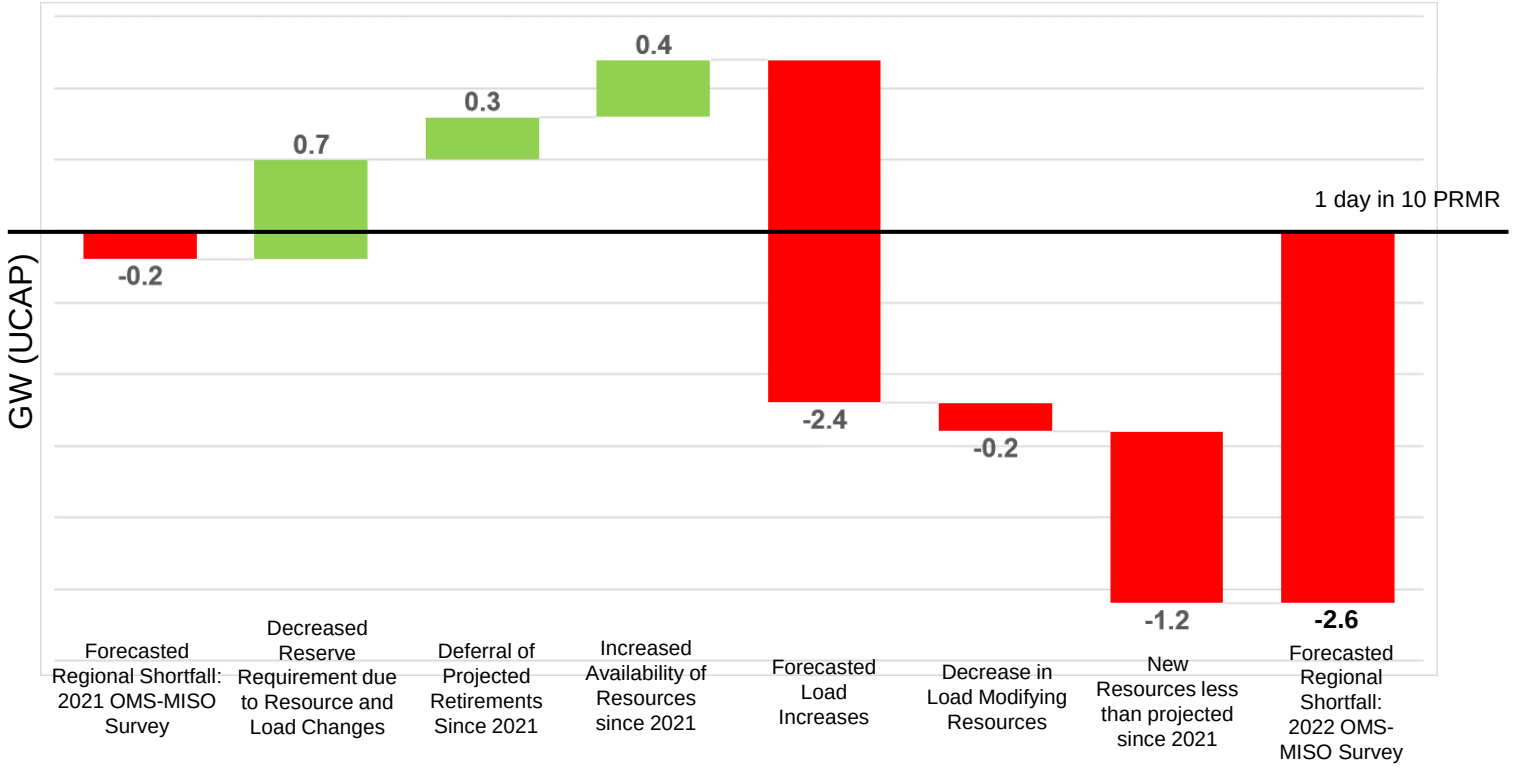
- Accelerated retirements
- Reduction in projected capacity additions
- Bulk of new resources are at lower capacity accreditations
- Delays due to solar tariff investigations & supply chain bottlenecks
- Higher load growth due to electrification

Upside Possibilities

- Lower than expected load growth
- Potential additional capacity in response to 2022 PRA outcomes
  - Return to service of suspended resources and deferred retirements
  - Additional External Resources
  - Additional LMR registrations
- Leveraging recent queue improvements

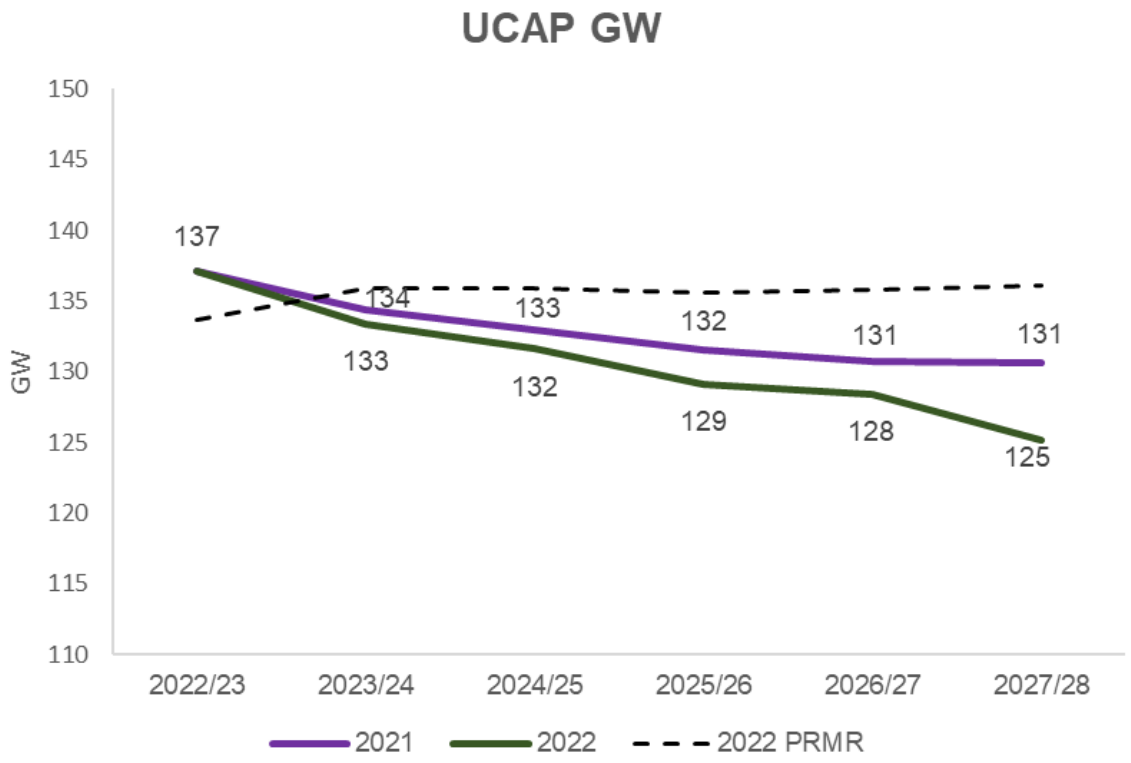
Comparison of year-over-year survey results for 2023 indicates a reduction of committed capacity with higher load growth

2023 Regional Outlook
Reconciliation between 2021 & 2022 OMS MISO Survey for 2023



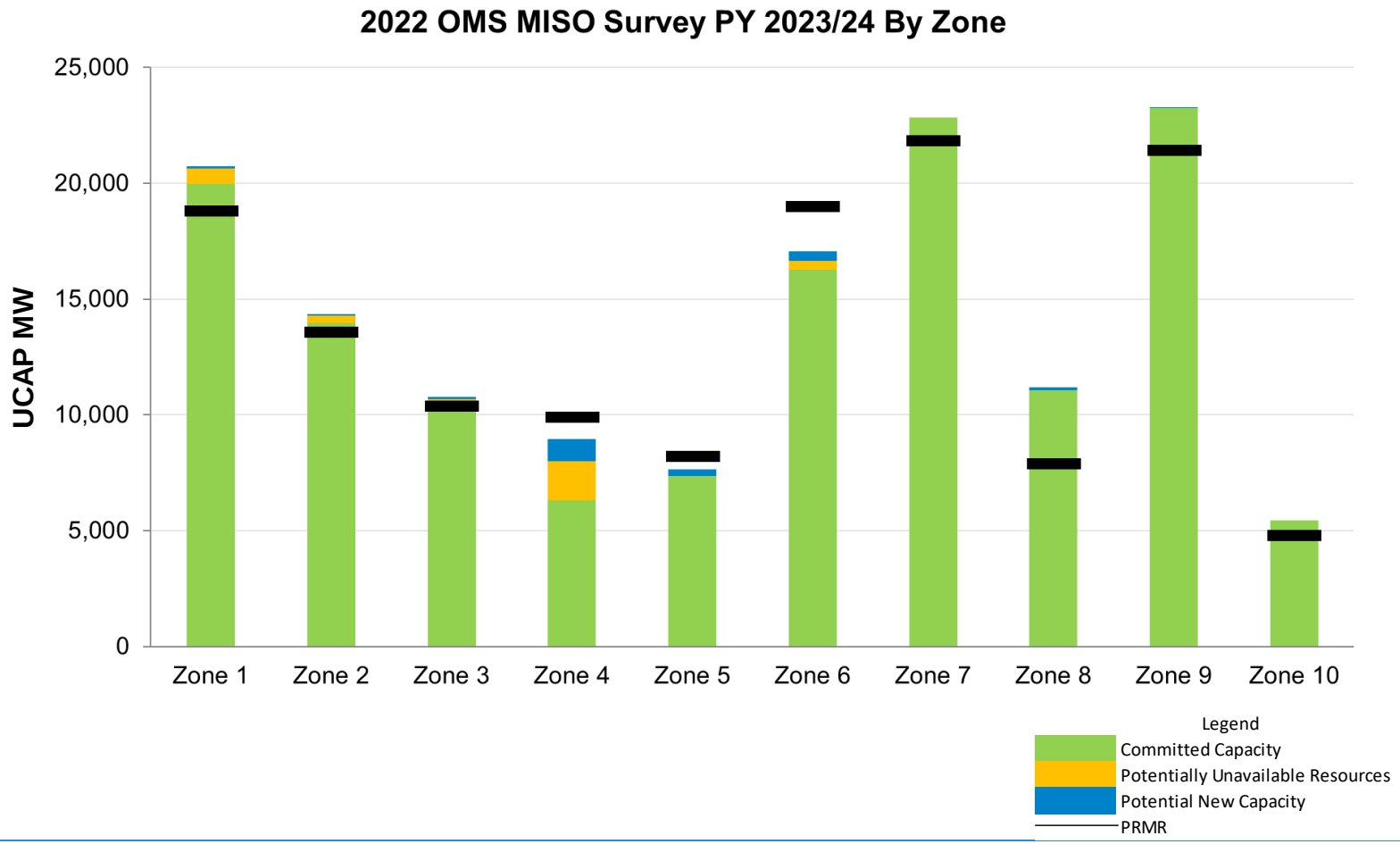
New resources include resources with newly signed Interconnection Agreements; wind at ELCC, solar at 50%
Increased availability results from potential resources from 2021 survey that are now committed resources
LMRs – Load Modifying Resources are Demand Response (DR) and Behind the Meter Generation (BTMG)

Across the five-year outlook, projected Committed Capacity has decreased in 2022 as compared to the 2021 survey



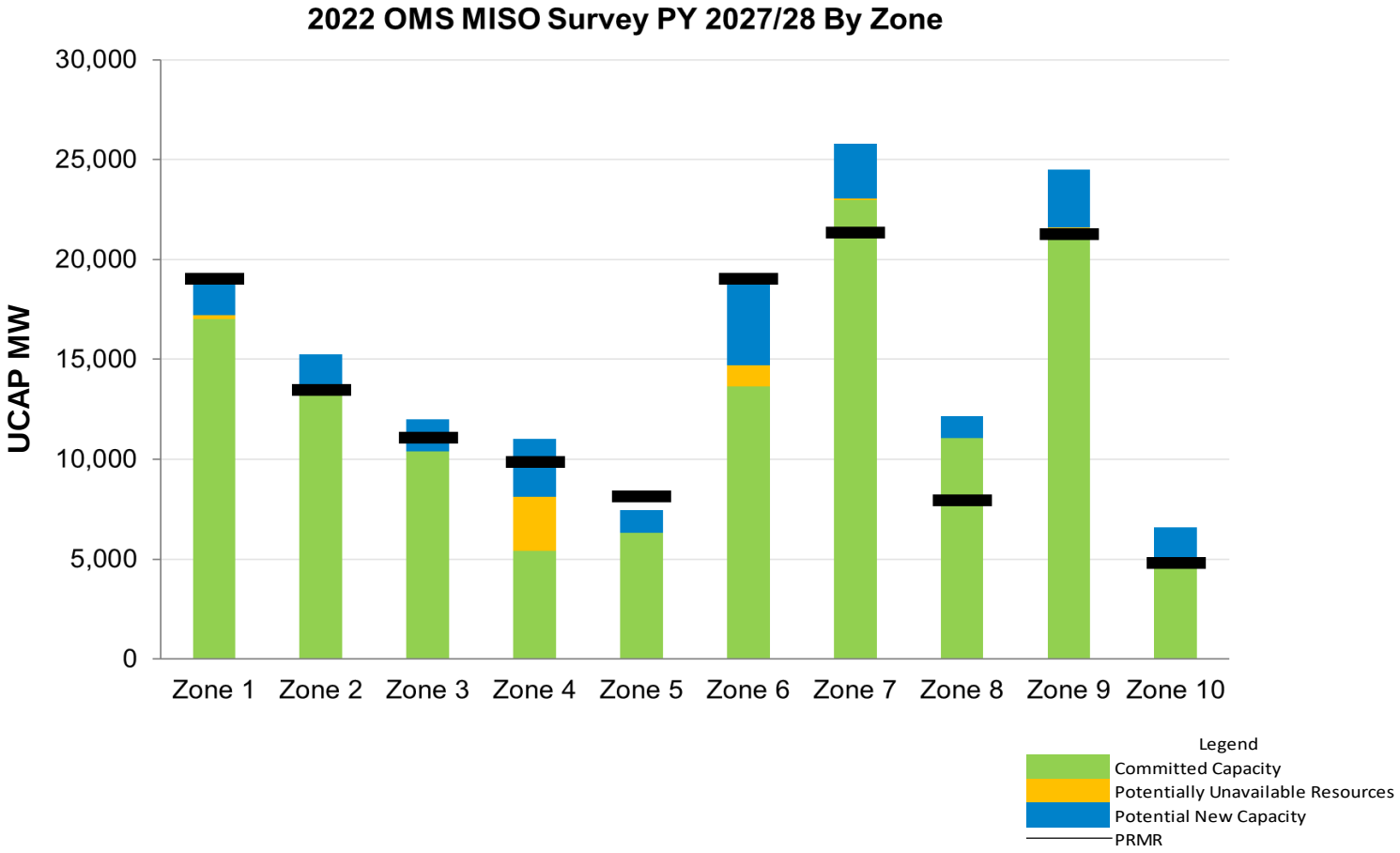
Schedule MM-D6

Capacity shortages shown in 2022 PRA are reflected in the 2023 survey zonal outlook



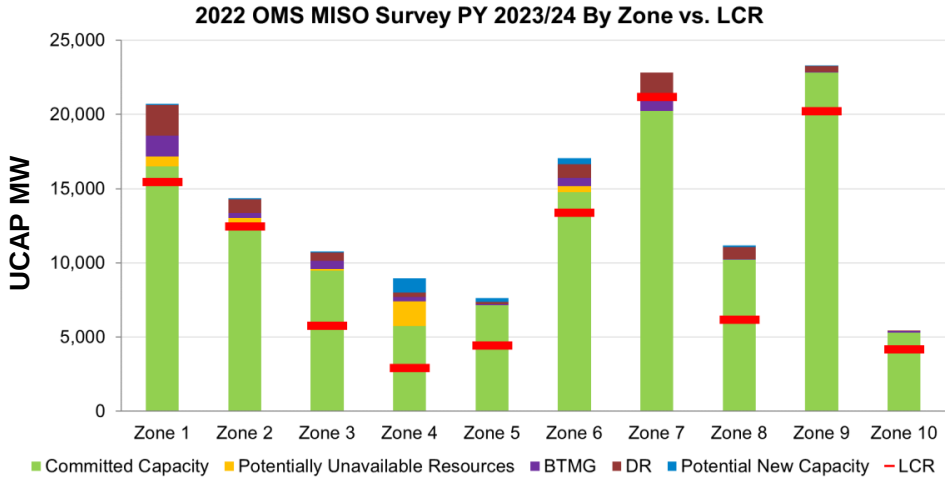
Schedule MM-D6

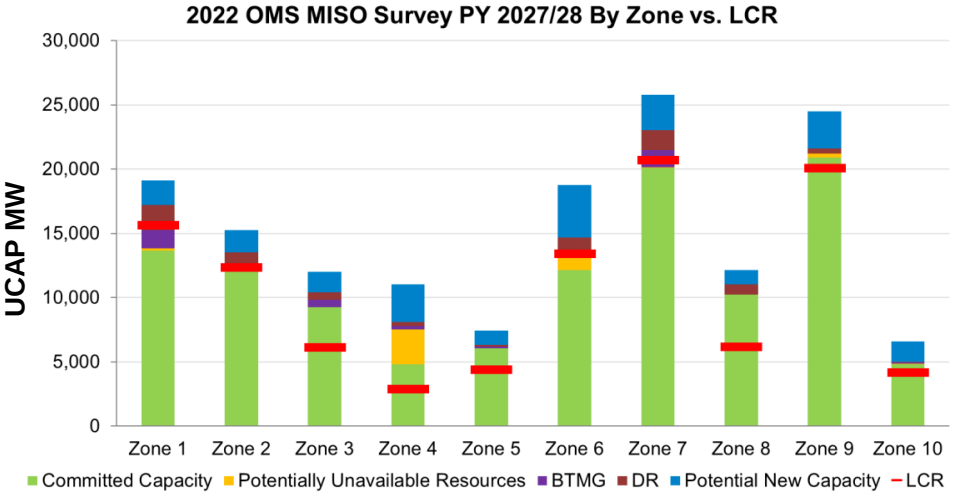
By 2027, North/Central will need completion of significant number of MISO GI projects to cover projected Committed Capacity deficit



Schedule MM-D6

New generation and load modifying resources continue to be important in meeting local resource needs





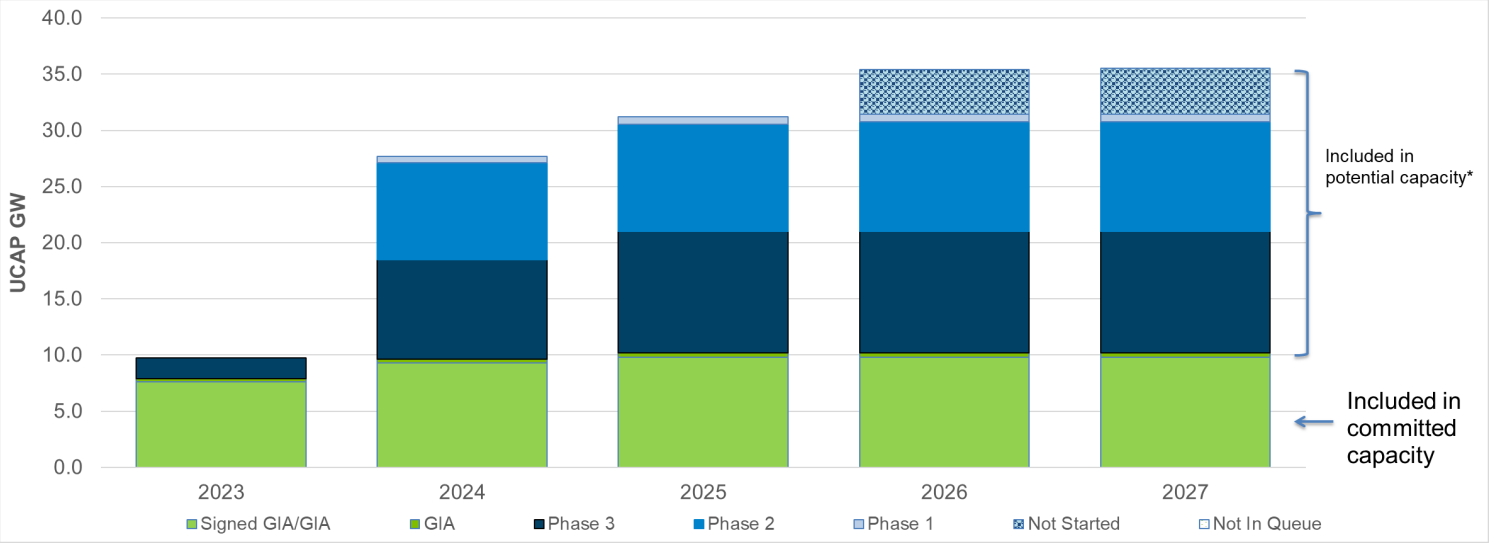
- Includes only projected capacity resources within the zone, i.e. does not include imports and interzonal transfers
- Potential Capacity includes both new generation and potential retirements
- Load Modifying Resources include Demand Response (DR) and Behind the Meter Generation (BTMG)

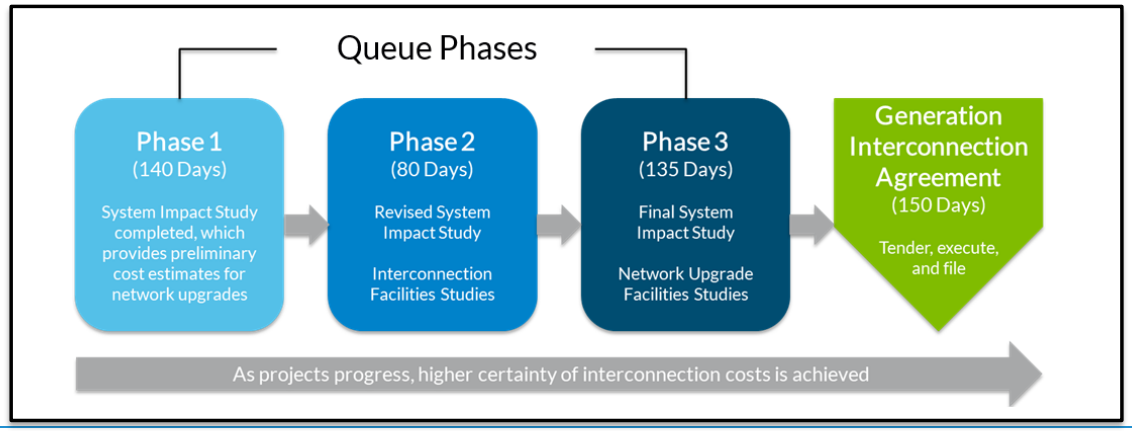
Appendix

Understanding Resource Categories

- **Committed Capacity** - resources committed to serving MISO load
  - Resources within MISO utilities' rate base
  - New generators with signed interconnection agreements
  - External resources with firm contracts to MISO load
  - Non-rate base units without announced retirements or commitments to non-MISO load
- **Potentially Unavailable Resources** - resources that may be available to serve MISO load but may not have firm commitments to do so
  - Indicated as Low Certainty in survey results by Market Participants
  - Includes potential retirements or suspensions
- **Potential New Capacity** - UCAP for new resource projects in the MISO Generator Interconnection Queue accredited at the current (2022) new resource capacity credit levels and adjusted for projected queue certainty factors
- **Unavailable resources** are not included in the survey totals
  - Resources with firm commitments to non-MISO load
  - Resources with finalized retirements or suspensions
  - Potential new generation which **<u>are not currently</u>** in the MISO Generator Interconnection Queue

Future resource ranges will shift as planned generation interconnections are firmed up

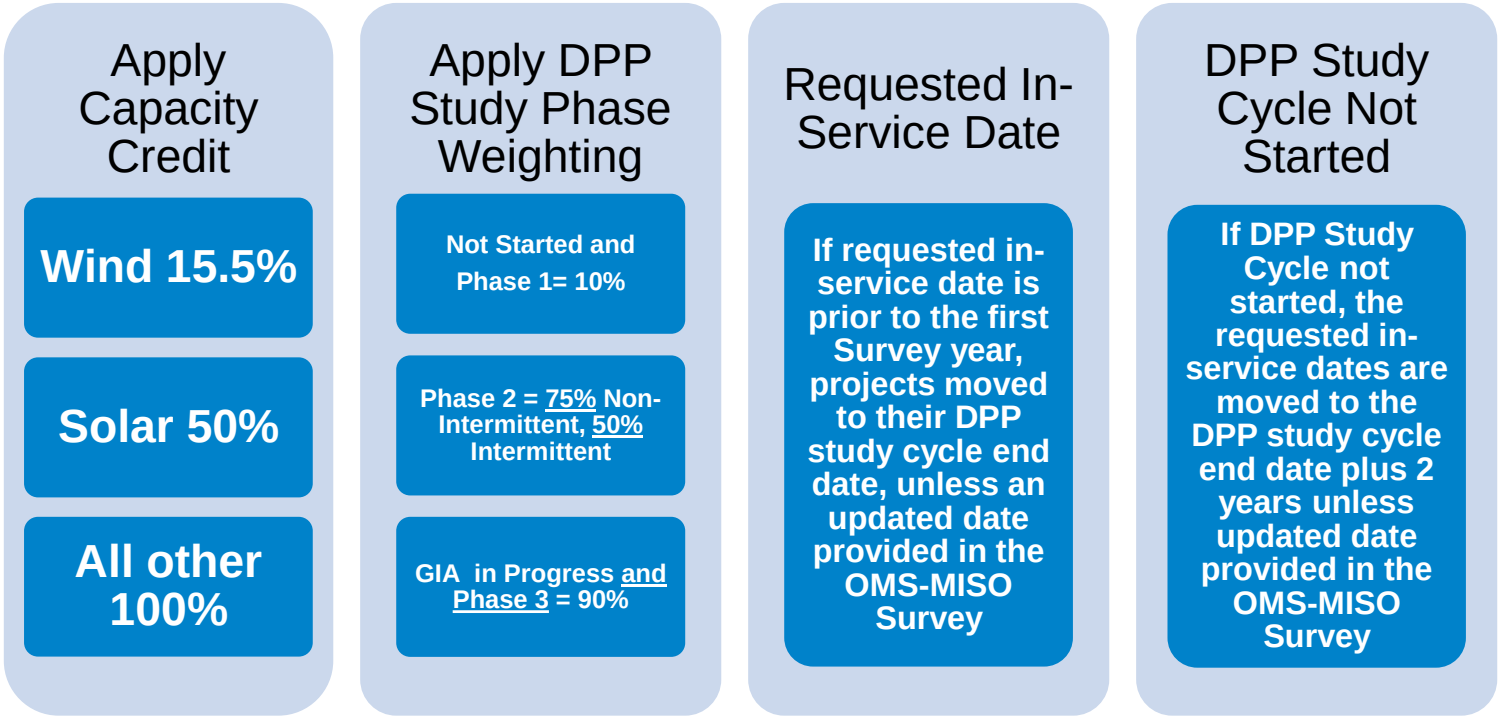




**"Potential capacity" values shown here are higher than amounts shown on slide 4 because they do not factor in RDT limitations.*

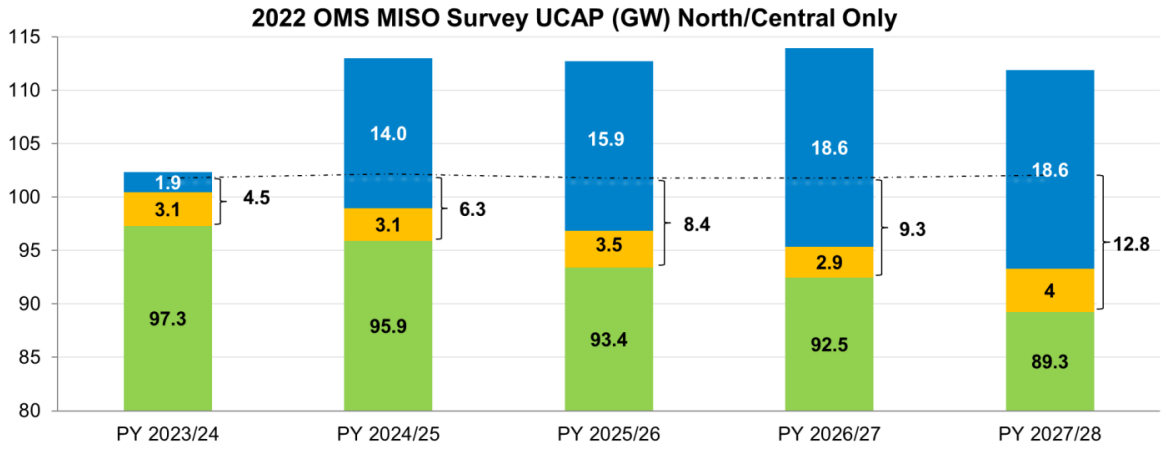
- Potential New Capacity represents capacity in the MISO Generator Interconnection Queue at projected queue certainty factors as of April 28, 2022. Wind and solar resource UCAP values are accounted for at current new resource capacity credit values (15.5% ELCC for Wind, 50% for solar).

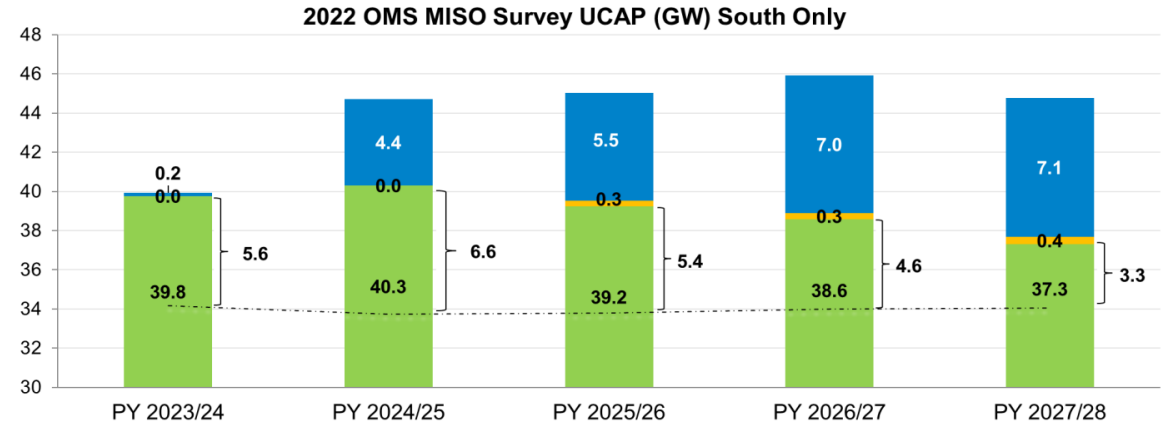
2022 OMS-MISO Survey Queue Treatment



- DPP Study Phase Weighting is applied to recognize that as projects move through the queue process, the likelihood of completion generally becomes more certain.
- In-service date adjusted if the DPP Study Cycle phase is “Not Started” to recognize that a project likely can’t get capacity credit until at least the end of the DPP study cycle **and an additional 2 years** to to reflect expected GIA dates and construction timelines.

Similar to the 2022 PRA results, North/Central is projected to have a shortage while the South sub-region has a surplus





Bracketed values indicate difference between Committed Capacity and projected PRMR

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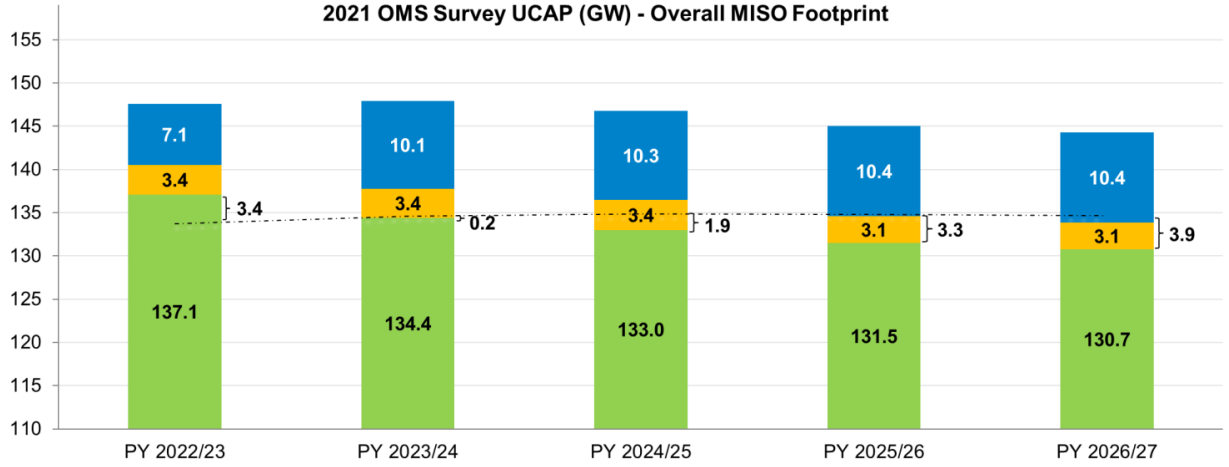
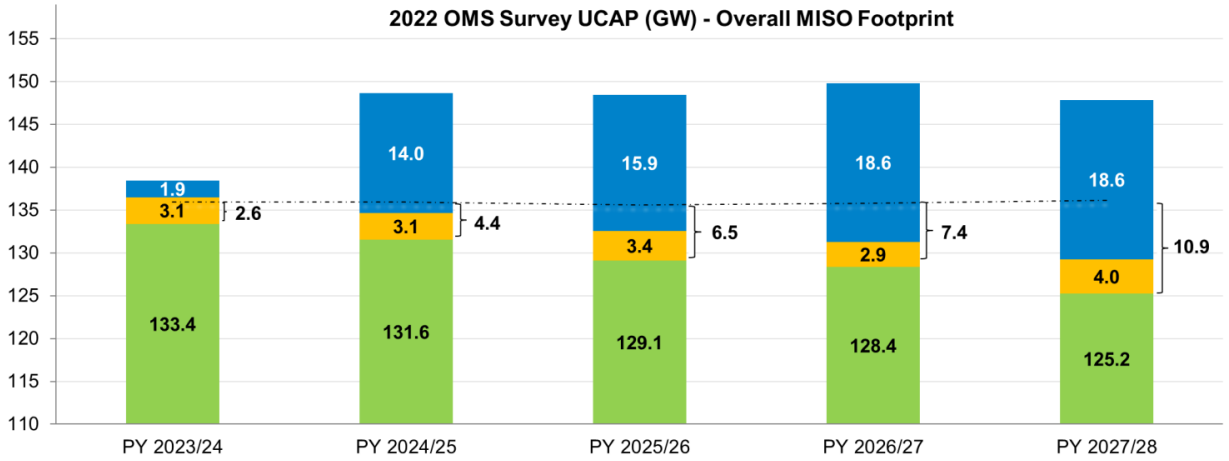
While RDT is not reflected in these charts the limit is currently 1900 MW in Resource Adequacy

Projected Capacity GW → Committed Capacity has decreased as compared to 2021 survey across the five-year outlook





Bracketed values indicate difference between Committed Capacity and projected PRMR

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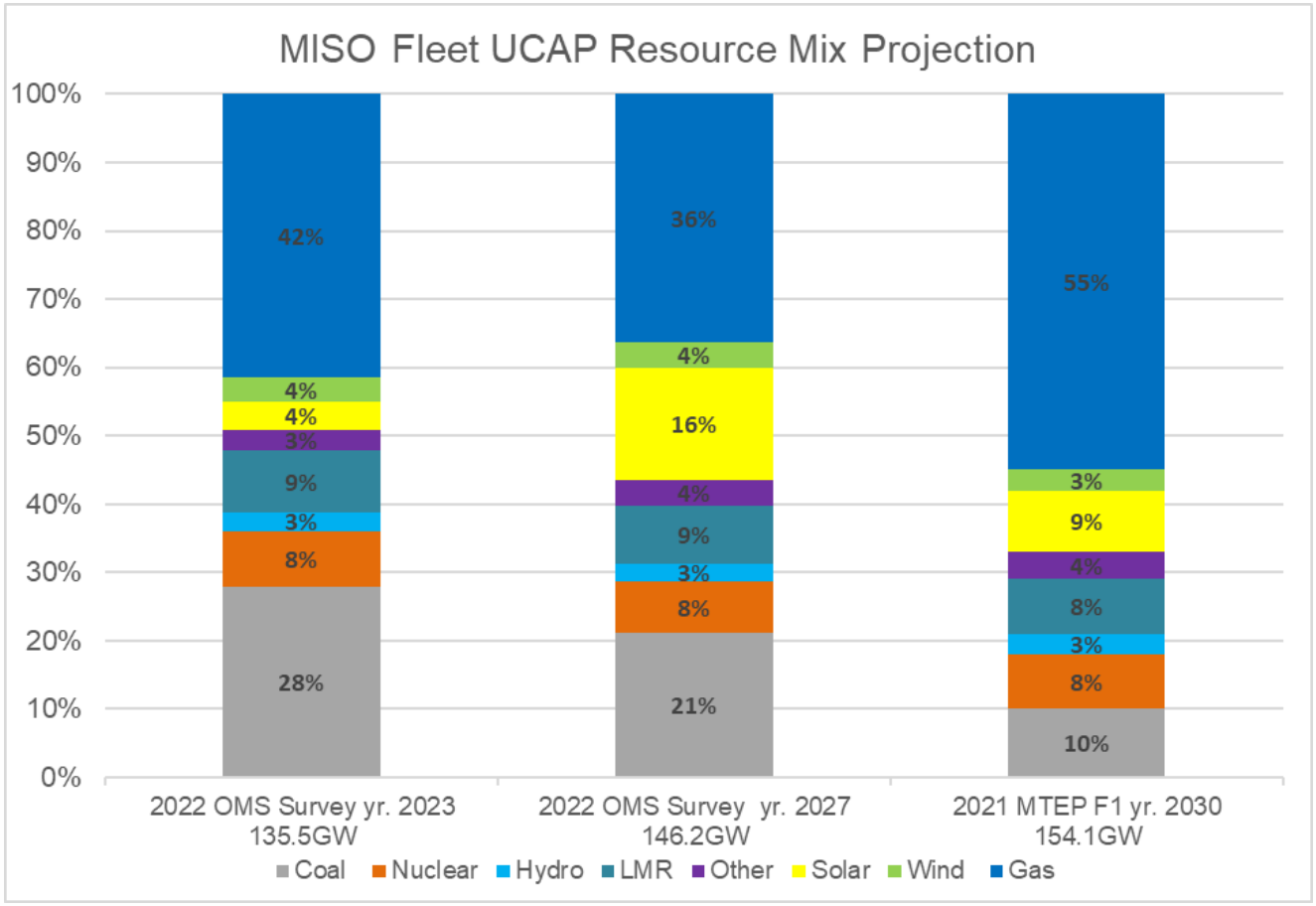
Forecasted resource mix continues to show increasing reliance on gas and renewables



- Wind and solar resources shown at current new resource capacity credit accreditation (15.5% ELCC for Wind, 50% for solar)
- Hybrid resources combined in solar category in OMS survey ~2.5GW in 2027