

**COMMONWEALTH OF KENTUCKY**  
**BEFORE THE PUBLIC SERVICE COMMISSION**

**In the Matter of:**

<b>ELECTRONIC TARIFF FILING OF BIG RIVERS</b>	)	<b>Case No.</b>
<b>ELECTRIC CORPORATION AND KENERGY</b>	)	<b>2023-00312</b>
<b>CORP. TO REVISE THE LARGE INDUSTRIAL</b>	)	
<b>CUSTOMER STANDBY SERVICE TARIFF</b>	)	

**JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION  
AND KENERGY CORP. TO COMMISSION STAFF'S  
SECOND REQUEST FOR INFORMATION**

Big Rivers Electric Corporation (“Big Rivers”) and Kenergy Corp. (“Kenergy”), by counsel, file their joint responses to Commission Staff’s Second Request for Information, issued in the above-captioned case on November 7, 2023.

**FILED:        November 27, 2023**





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**REQUEST NO. 2-1:** *Refer to BREC's response to Commission Staff's First Request for Information (Staffs First Request), Item 3. The March 3, 2023 Order in Case No. 2021-00289 made clear that Maintenance and Backup Services were different services and that BREC should provide cost support for the different services. Eliminating a service and effectively combining the two services is not responsive to the Order. Provide cost support for the different services in response to the previous Order.*

**RESPONSE:** Big Rivers' costs for providing Backup Power during planned outages is the same as during unplanned outages. If Big Rivers were its own Balancing Authority and responsible for balancing generation with its load, there could be a cost difference. However, from Big Rivers' perspective, since being fully integrated into MISO, the service provided to back up a customer generator during scheduled outages is the same service provided to back up a customer generator during unscheduled outages. In either case, Big Rivers will secure backup energy in the MISO energy market.

Under the previous tariff, there was a single demand charge for Maintenance and Backup Power Service, which was the demand charge under Big Rivers' Standard Rate Schedule LIC tariff, less a credit equal to \$3.80/KW-month. Maintenance and Backup energy were both billed

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at the higher of the LIC tariff energy rate or market prices. Utilizing the two terms caused confusion in Case No. 2021-00289.

Under the proposed LICSS tariff, the Standby Customer would pay the higher of LMP or the LIC tariff rate during an outage, so Big Rivers would have no exposure to the timing of a generator outage because even if the outage occurs when the LMP exceeds the LIC energy rate, then the LICSS Customer would be charged LMP just like Big Rivers pays LMP. Under all scenarios, Big Rivers still needs to maintain a sufficiently robust local transmission system to meet the LICSS Customer's needs under both a scheduled outage and unscheduled outage.

Furthermore, as was stated on pages 6 and 7 of the Direct Testimony of Nathaniel A. Berry filed with the proposed LICSS Tariff:

Big Rivers recognizes that the Commission's Mar. 3, 2022 Order stated that Maintenance Power Service and Backup Power Service, as those terms are used in the current Standby Service tariff, are different, and that bundling the pricing of the two services was inappropriate. However, Big Rivers respectfully disagrees that the difference between the two services results in a difference in cost. The Commission found in the Mar. 3, 2022 Order that

up until Kimberly-Clark began self-supplying a portion of its demand, it had been paying LIC Tariffed demand charges on its entire demand. It is not fair to the other customer for it to stop paying for that capacity even though it will be utilized on a temporary and incremental basis."

The proposed Backup Power demand rate ensures that Standby Customers pay the LIC demand charges on their entire demand when their generator is on outage (less the demand credit). When a Standby Customer requests Backup Power

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Service, the Standby Customer is purchasing a service whereby Big Rivers must make available the transmission service and power needed by the Standby Customer when the customer's generator is on outage or is not otherwise operating at its full accredited capacity. Because Big Rivers must have that capability available at all times in the event of an unscheduled outage, it does not change Big Rivers' cost if the customer also schedules some of its outages. And so long as the customer is paying for that capability, it should not be charged any different amounts for scheduled outages.

In the Mar. 3, 2022 Order, the Commission noted, "In the event of an unplanned outage, regardless of when it occurs, Kimberly-Clark reverts to its historic demand level, and BREC is obligated to provide service at Kimberly-Clark's prior full demand level." This is also true of planned outages. In the event of a planned outage, Big Rivers is likewise obligated to provide service at a Standby Customer's full demand level. Thus, there are not separate costs to Big Rivers for Maintenance Power Service and Backup Power Service, as those terms are used in the existing Standby Service tariff. For that reason, the proposed tariff changes remove Maintenance Power Service and define Backup Power Service to apply in both scheduled and unscheduled outages. [Footnotes omitted.]

**Witness: Terry Wright, Jr. (Big Rivers)**

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**REQUEST NO. 2-2:** *Refer to BREC's response to Staffs First Request, Item 4,  
Attachment PSC 1-4.*

- a. Explain why Non-Member Sales do not include Nebraska.*
- b. Explain the MISO Adjusted CP to the BREC NCP w/o Losses column.*

**RESPONSE:**

- a. In the provided table, Non-Member Sales do not include sales by Big Rivers to its Nebraska customers because those customers are part of the Southwest Power Pool (SPP), not MISO. The capacity and energy to serve the Nebraska customers is procured in SPP and not sourced from Big Rivers' generation. Consequently, in demonstrating its updated net MISO capacity position, Big Rivers did not include the Nebraska loads because those loads and the capacity dedicated to serve them are not considered by MISO in determining or satisfying MISO capacity obligations.

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- b. The BREC NCP w/o Losses column reflects Big Rivers' own non-coincident peak each season without accounting for transmission losses and without reference to MISO's peak. The MISO Adjusted CP is the Big Rivers' load when MISO is peaking. These values are generally different from each other because of differences in weather patterns across the MISO footprint, and because the large industrial loads served by Big Rivers are not necessarily weather-driven.

**Witness: Terry Wright, Jr. (Big Rivers)**



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**REQUEST NO. 2-3:** *Refer to BREC's response to Staffs First Request, Item 4, Attachment PSC 1-4. Refer also to Case No. 2023-00310, Appendix A, pages 49-51.*

*a. In Appendix A, page 51, non-coincident peak (NCP) is defined as inclusive of Non-Member Sales, whereas in Item 4, NCP does not include Non-Member sales. Explain and reconcile the difference.*

*b. Using the year 2023, explain and reconcile the seasonal breakdown with the annual figures in Appendix A. for Columns BREC NCP w/o Losses, Transmission Losses (MW) and Non-Member Sales. If Nebraska data is a primary difference between the two Non-Member Sales data sets, explain why it is being treated differently.*

*c. Refer also to Case No. 2023-00102, BREC's August 18, 2023 response to Commission Staffs Third Request for Information, Item 6, page 2 of 2. Reconcile and explain the differences between BREC's MISO capacity positions in the two tables and any other discrepancies.*

*d. Between the three separate sets of data and corresponding analyses, explain which is the most up to date and which the Commission should rely upon.*

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**RESPONSE:**

a. As part of the Load Forecast Study prepared in connection with Big Rivers' 2023 Integrated Resource Plan (Case No. 2023-00310, Appendix A), the non-coincident peak information provided at page 51 reflects the total combined peak load of all customers served by Big Rivers, including both members and non-members. While similar information is presented in Big Rivers' response to Staff's First Request, Item 4, the separation of NCP from bi-lateral sales/purchases was intended for clarity in demonstrating Big Rivers' native system net capacity position.

Comparing the figures in Big Rivers' response to Item 4 to those within the Load Forecast Study reveals their substantial alignment; for example, the BREC NCP w/o Losses anticipated for Summer Planning Year 24-25 (820.3 MWs) plus the 21.0 MWs of Transmission Losses equals 841.3 MWs, which tracks closely with the 839,930 kW reported in the Load Forecast Study as the Total Annual Big River's CP (exclusive of non-member sales). The small difference between these two amounts is we had adjusted our Transmission Loss Rate.

b. Using the year 2023 presents a challenge because it would involve comparing the estimated figures contained within the Load Forecast Study to the actual volumes submitted to MISO as part of the now-complete MISO PRA Auction for Planning Year 23-24. Big Rivers included in its response to Item 4 the updated, actual figures. However, our true NCP would still

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be changing with every Load Forecast adjustment, and we just went through a complete reforecast as part of the IRP.

Looking at Planning Year 24-25 and beyond, however, it becomes clear that the Summer NCP, which includes Big Rivers' greatest peak and historically dictates its annual capacity obligations in MISO, and Transmission Losses combine to substantially equal Big Rivers' estimated coincident peak as set forth in Appendix A. Again, the small difference is related to the updated Transmission Loss Rate. The difference in Non-Member Sales is related to Nebraska; please refer to Big Rivers' response to Item 2(a) of this request.

c. The difference between Case No. 2023-00102 and PSC 1-4 is that Case No. 2023-00102 includes Bilateral Fixed Price Purchases & Sales. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

d. Big Rivers believes each of the data sets is accurate and reliable, but as explained above, each presents similar information in different ways. Specifically, Big Rivers' response to PSC 1-4 clarifies Big Rivers' total native capacity position without purchases/sales; information

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detailing Big Rivers' total capacity position, including fixed price purchases/sales, is contained in Case No. 2023-00102; and Big Rivers' total system non-coincident peak is set forth in Case No. 2023-00310, Appendix A, pages 49-51.

**Witness: Terry Wright, Jr. (Big Rivers)**

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**REQUEST NO. 2-4:** *Refer to BREC's response to Staffs First Request, Item 4, Attachment PSC 1-4 and Item 5. Explain whether the Unbridled Solar 160 MW PPA capacity is included in Attachment PSC 1-4.*

**RESPONSE:** The Unbridled Solar PPA is included in attachment PSC 1-4. It is modeled based on future projections of Effective Load Carrying Capability (ELCC) for Solar Units.

**Witness: Terry Wright, Jr. (Big Rivers)**

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**REQUEST NO. 2-5:** *Refer to BREC's response to Staff's First Request, Item 8c.*

*a. Explain how the MISO PRA PY22-23 could settle at \$236.66/MW-Day and the seasonal settlements can be significantly lower.*

*b. Under the new seasonal construct, explain whether there will still be a PRA planning year settlement price in addition to seasonal settlements and if so, what prices will be paid to committed resources.*

**RESPONSE:**

a. Attached to this response are Attachment A, MISO's "2022/2023 Planning Resource Auction (PRA) Results," dated April 14, 2022 (the "2022 Presentation"), and Attachment B, MISO's "Planning Resource Auctions Results Planning Year 2023-24," dated May 19, 2023 (the "2023 Presentation"), which detail the clearing results for Planning Year 22-23 and Planning Year 23-24, respectively and provide detailed explanation related to the results. Specifically, the 2022 Presentation at page two (2) states, in part, "The 2020-21 OMS-MISO survey projected a small surplus for planning year 2022-23, which was eroded by an increased load forecast, less capacity entering the auction as result of retirements, and the decreased accredited capacity of new resources." The 2023 Presentation at page five (5) states that "North/Central region demonstrated adequate supply driven by a combination of lower demand, new generation, delayed retirements, additional imports and higher accreditation."

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b. Under the new seasonal construct, there will no longer be a planning year settlement price and instead there will just be a seasonal settlement price. Committed resources will receive the seasonal PRA price.

**Witness: Terry Wright, Jr. (Big Rivers)**



# 2022/2023 Planning Resource Auction (PRA) Results

April 14, 2022



# Executive Summary



- The Reliability Imperative was started to address the complex challenges that accompany the evolution of the generation fleet; the 2022 PRA results reveal an acceleration of those risks as it relates to resource adequacy
- Results from MISO's 2022-23 Planning Resource Auction (PRA) indicate a capacity shortfall for the MISO North/Central Regions, thus exposing entities with net short positions to the clearing price of Cost of New Entry (CONE) for the planning year.
- The 2020-21 OMS-MISO survey projected a small surplus for planning year 2022-23, which was eroded by an increased load forecast, less capacity entering the auction as result of retirements, and the decreased accredited capacity of new resources.
- The auction results indicate that MISO North/Central Regions have a slightly increased risk of needing to implement temporary controlled load sheds.
- In addition to the Reliability Imperative work already underway, MISO will need to address the growing gap between the accredited capacity of retiring resources and that of the new resources coming online.

# Load Serving Entities have multiple options to demonstrate resource adequacy in the annual Planning Resource Auction (PRA)

## Options available:

- Submit a Fixed Resource Adequacy Plan (FRAP)
- Utilize bilateral contracts with another resource owner
- Participate in the Planning Resource Auction (PRA)

The Independent Market Monitor (IMM) reviews the auction results for physical and economic withholding

## PRA Inputs

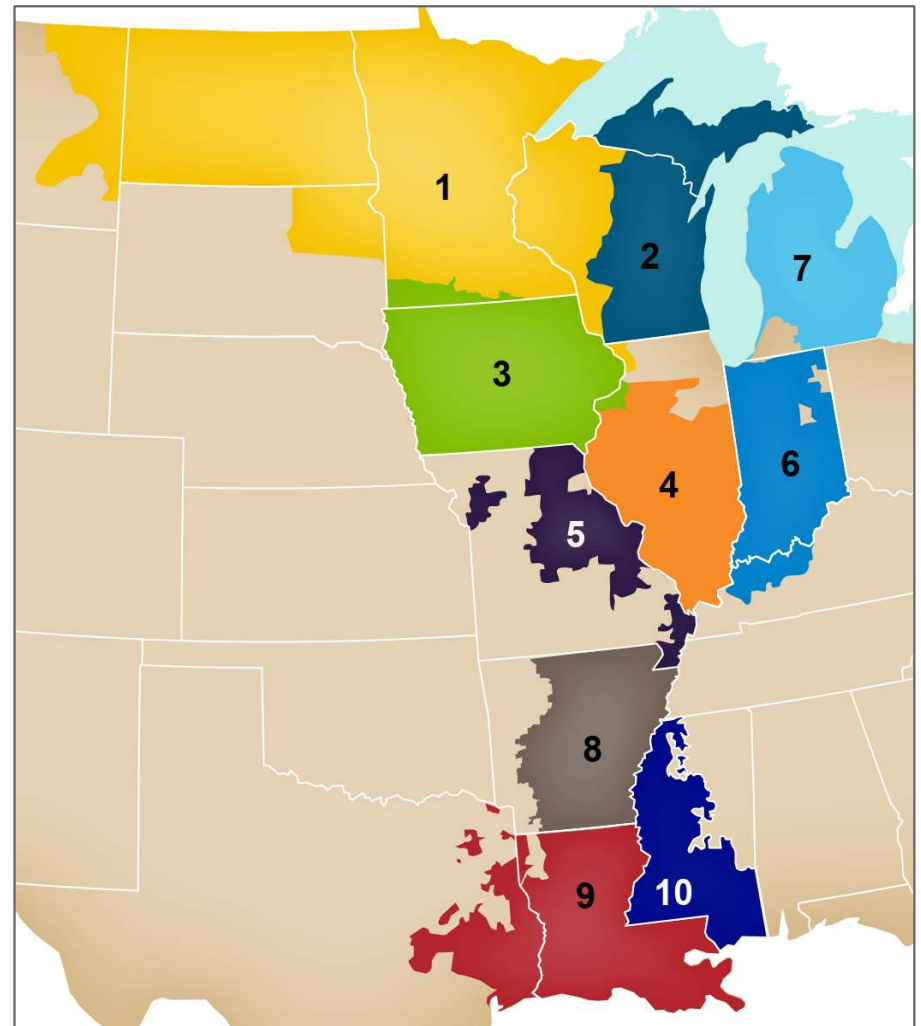
- Local Clearing Requirement (LCR) = capacity required from within each zone
- MISO-wide reserve margin requirements, which can be shared among the Zones, and Zones may import capacity to meet this requirement above LCR
- Capacity Import/Export Limits (CIL/CEL) = Zonal transmission limitations
- Sub-Regional contractual limitations such as between MISO's South and Central/North Regions

## PRA Outputs

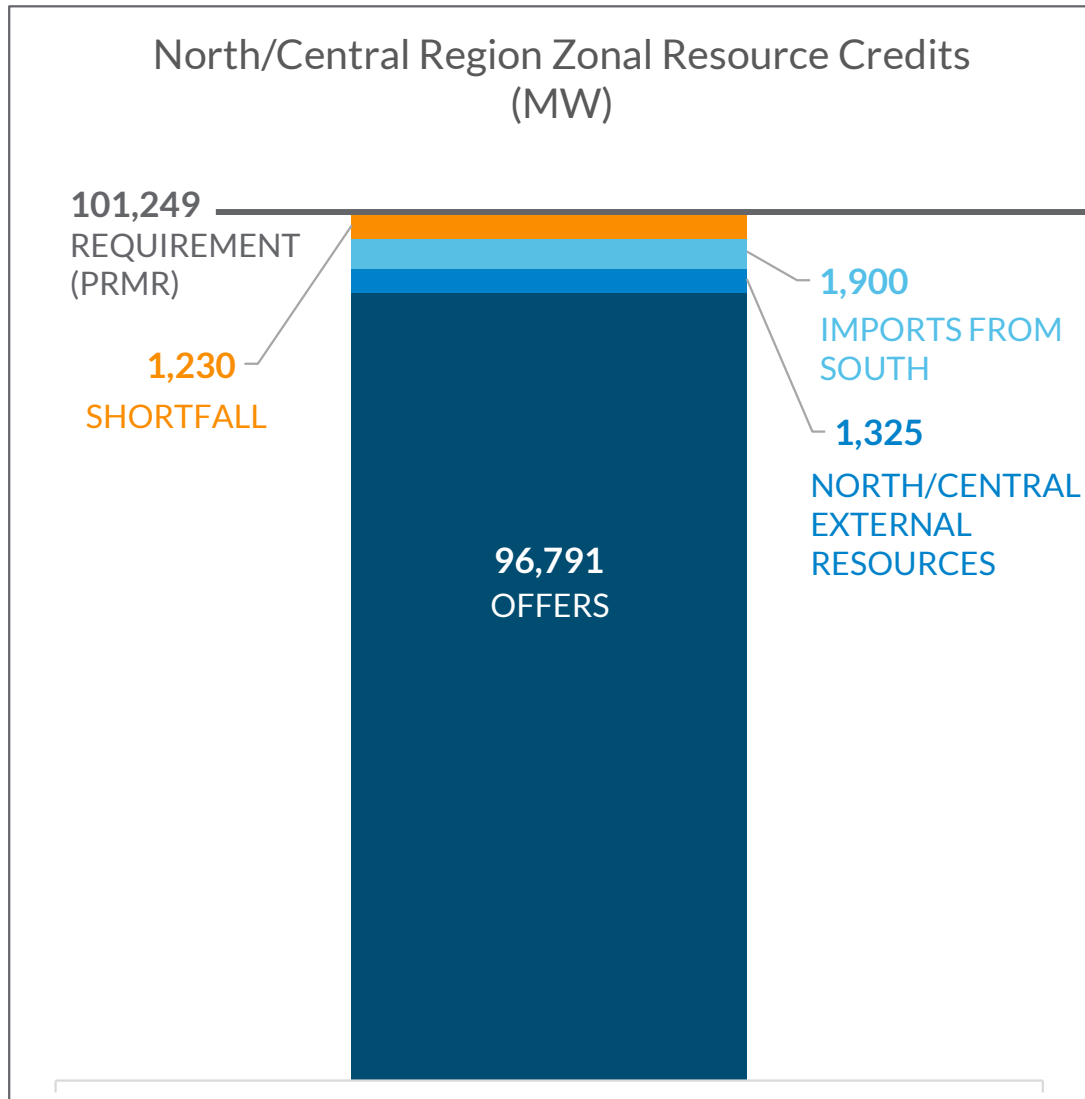
- Commitment of capacity to the MISO region, including performance obligations
- Capacity price (ACP = Auction Clearing Price) for each Zone
- ACP price drives the settlements process
- Load pays the Auction Clearing Price for the Zone in which it is physically located
- Cleared capacity is paid the Auction Clearing Price for the Zone where it is physically located

# Clearing prices from MISO's 2022-2023 PRA reflect capacity shortfalls in four zones, exposing nearly 8 GW in MISO North/Central to the Cost of New Entry

Zone	Local Balancing Authorities	Price \$/MW-Day
1	DPC, GRE, MDU, MP, NSP, OTP, SMP	\$236.66
2	ALTE, MGE, UPPC, WEC, WPS, MIUP	\$236.66
3	ALTW, MEC, MPW	\$236.66
4	AMIL, CWLP, SIPC, GLH	\$236.66
5	AMMO, CWLD	\$236.66
6	BREC, CIN, HE, IPL, NIPS, SIGE	\$236.66
7	CONS, DECO	\$236.66
8	EAI	\$2.88
9	CLEC, EES, LAFA, LAGN, LEPA	\$2.88
10	EMBA, SME	\$2.88
ERZ	KCPL, OPPD, WAUE (SPP), PJM, OVEC, LGEE, AECI, SPA, TVA	\$133.70-236.66

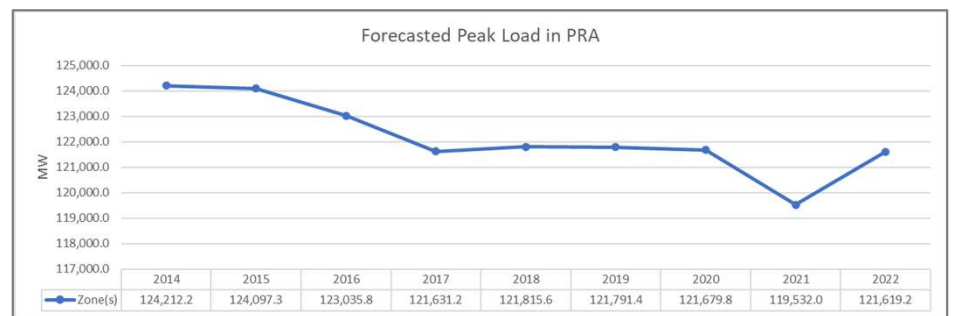
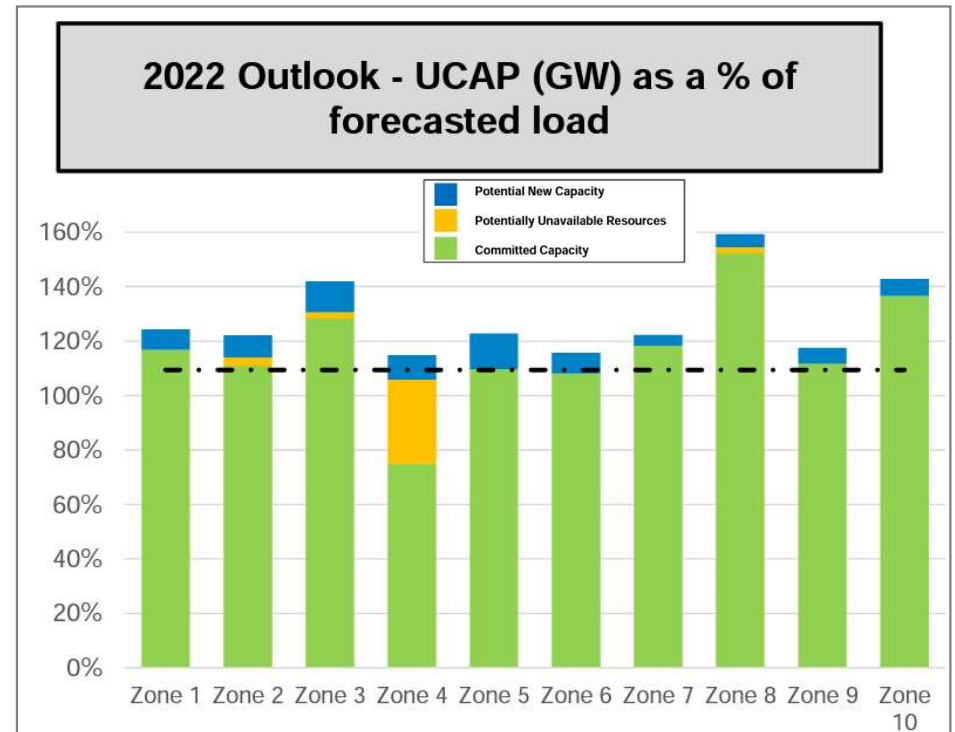


# Despite importing over of 3,000 MW, MISO's North/Central zones still experienced a shortfall against the requirement

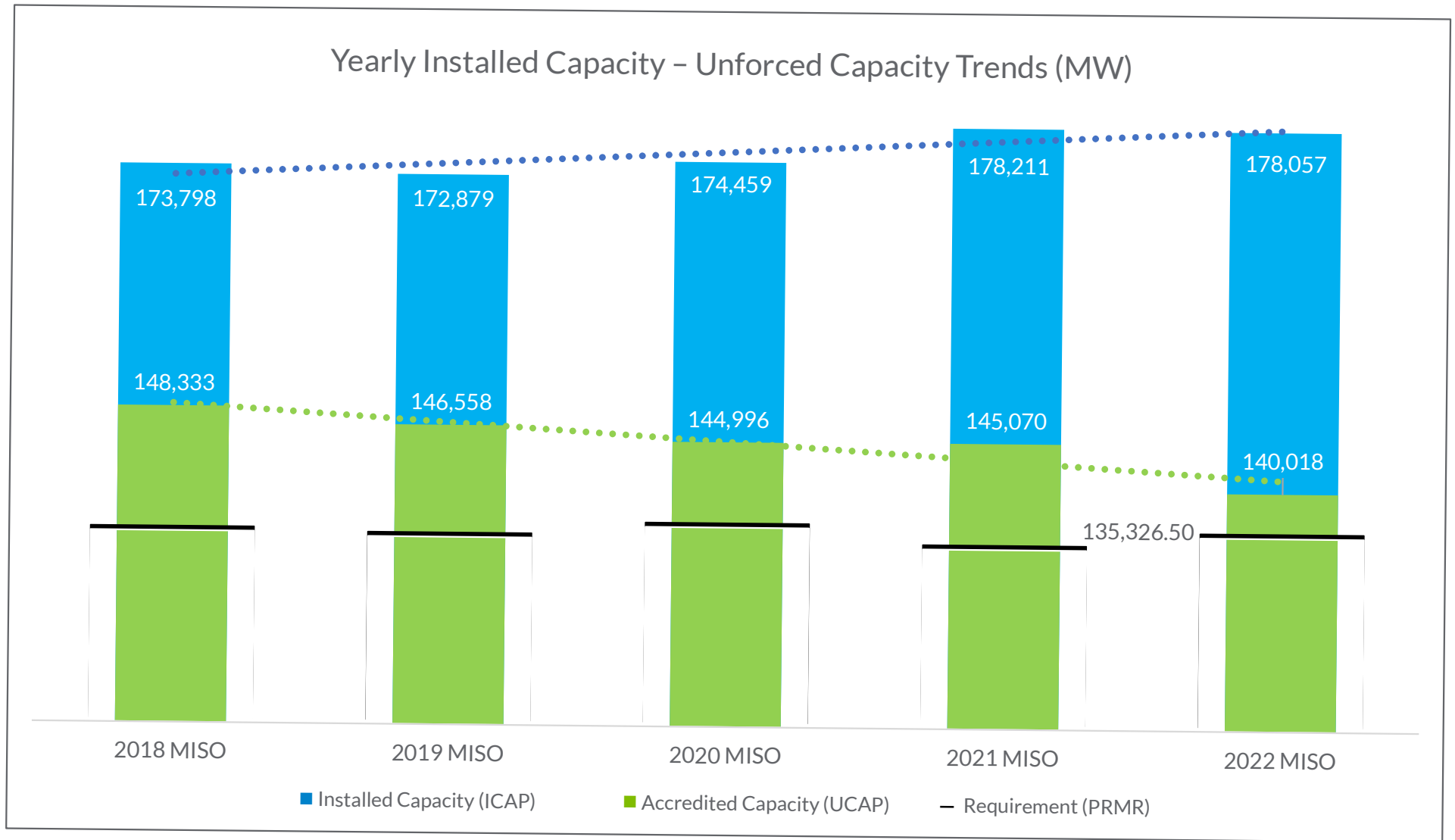


# Last year's OMS-MISO survey projected tight conditions in Zones 4-7 for 2022, and post-COVID load increases drove even higher requirements for this year's auction

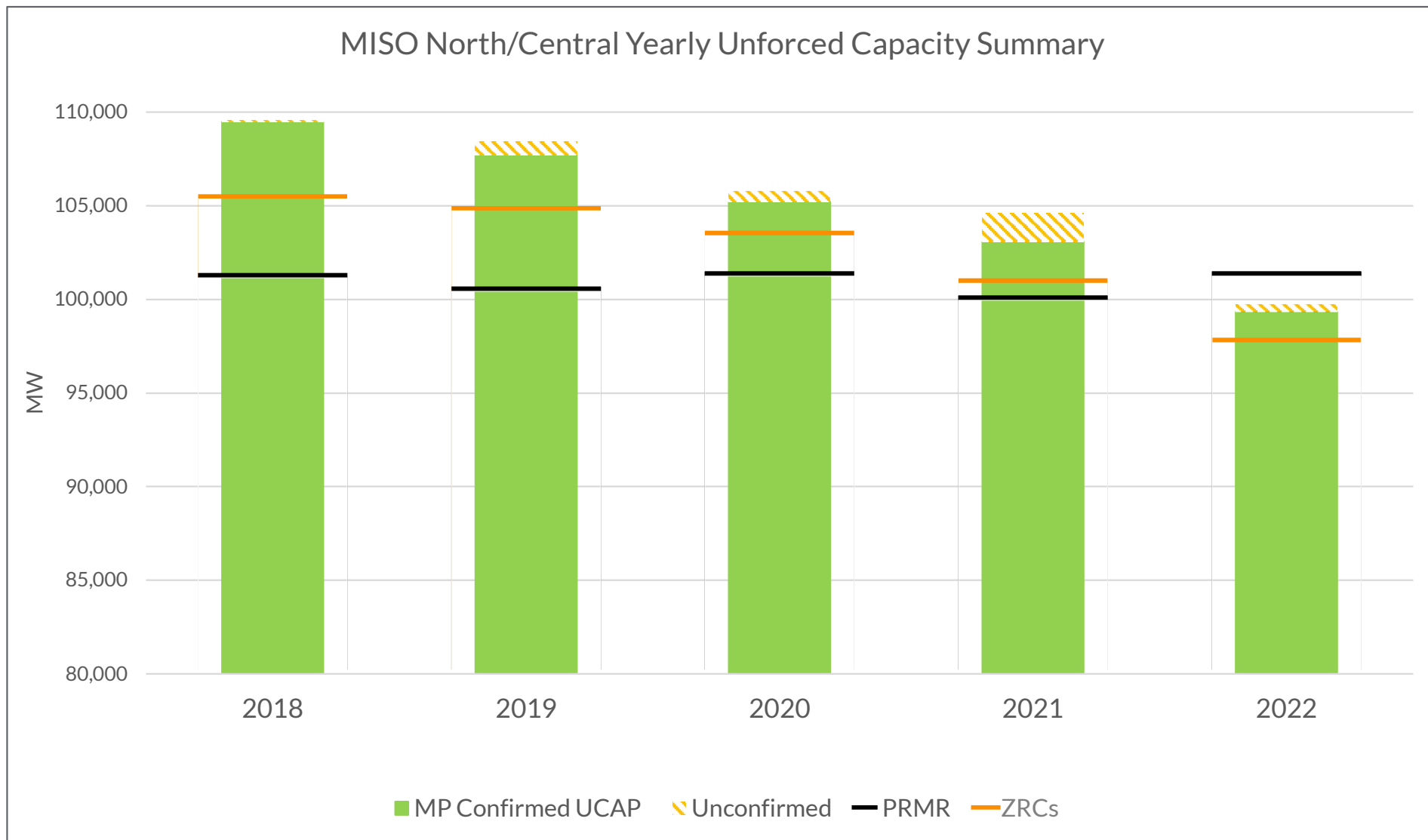
- MISO's vertical demand curve does not provide a warning signal; however, the 2021 OMS-MISO survey projected surplus capacity overall for 2022 with Zones 4-7 experiencing tight conditions.
- The OMS-MISO Survey is a "snapshot in time," and forecasts can change significantly if members modify their resource plans after submitting their survey information.
- Increased load forecasts led to a 1.4 GW increase in PRMR for 2022. Combined with reduced generation capacity, the auction resulted in an overall 1.3 GW shortfall, as opposed to the projected minimum survey surplus.



Although installed capacity has increased in the last five years, accredited capacity has decreased due to thermal retirements and the increasing transition to renewables



# Capacity in MISO North/Central fell by 3.2 GW since the last auction



# Unless more capacity is built that can supply reliable generation, shortfalls such as those highlighted in this year's auction will continue

## Reliability Impact of the 2022-23 PRA Results:

- The overall stability and reliability of the system will not be compromised, as MISO will continue to implement any actions that may be necessary to prevent uncontrolled, cascading outage
- Zones 1-7 have an increased risk of needing to implement temporary, controlled load sheds

Overall, the results of this year's PRA reflect the challenges we are addressing through the Reliability Imperative, but additional areas of focus may be needed



# Next Steps

- **April 15** – Conference call presentation of PRA results
- **May 14** – Posting of PRA masked offer data
- **May 25** – Zonal Deliverability Benefits and additional PRA analytics presented at the May RASC
- **May 25** – MISO publishes cleared LMRs to Operations tools
- **June 1** – New Planning Year starts

# Appendix

# Primary changes since 2021 Auction

## LMR RAN Filing (ER20-1846)

FERC accepted a Tariff filing on August 2020, effective this PRA, proposing enhancements to Load Modifying Resources (LMR) accreditation to help ensure increased availability during emergency conditions. This did not result in a significant difference in accreditation in this year's auction.

## Ongoing Fleet Change

The auction results reflect the industry's ongoing shift away from coal-fired generation and increasing reliance on gas-fired resources and renewables, as well as other trends discussed in the [MISO Forward report](#).

# 2022/23 PRA Results by Zone

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
PRMR	18,641.2	13,606.4	10,314.1	9,930.8	8,274.1	18,594.0	21,886.3	7,906.0	21,365.6	4,808.0	N/A	135,326.5
Offer Submitted (Including FRAP)	20,561.5	13,755.8	10,687.1	7,622.2	6,901.9	15,773.8	21,488.9	10,495.4	22,412.6	5,532.8	1,675.4	136,906.1
FRAP	15,064.3	11,346.6	4,104.3	681.4	51.4	1,502.7	1,470.9	481.7	175.1	1,420.0	93.4	36,390.5
Self Scheduled (SS)	3,323.1	2,109.7	6,210.5	5,619.3	6,295.8	9,245.9	19,992.9	9,419.5	19,880.6	3,363.7	1,323.1	86,784.1
Non-SS Offer Cleared	2,174.1	299.5	372.3	1,321.5	554.7	5,025.2	25.1	235.5	378.0	275.3	258.9	10,920.1
Committed (Offer Cleared + FRAP)	20,561.5	13,755.8	10,687.1	7,622.2	6,901.9	15,773.8	21,488.9	10,136.7	20,433.7	5,059.0	1,675.4	134,094.7
LCR	15,349.1	12,486.8	5,720.7	2,924.1	4,484.9	13,102.0	21,229.5	6,176.2	20,157.3	4,183.7	-	N/A
CIL	4,629.0	1,923.0	5,664.0	10,349.0	6,072.0	7,213.0	3,749.0	4,114.0	4,194.0	3,033.0	-	N/A
ZIA	4,627.0	1,923.0	5,561.0	9,332.0	6,072.0	6,952.0	3,749.0	3,989.0	3,389.0	3,033.0	-	N/A
Import	0.0	0.0	0.0	2,308.6	1,372.2	2,820.2	397.4	0.0	931.9	0.0	-	7,830.3
CEL	3,273.0	2,246.0	3,739.0	NLF*	NLF*	7,370.0	2,392.0	4,628.0	1,508.0	842.0	1,737.4	N/A
Export	1,920.3	149.4	373.0	0.0	0.0	0.0	0.0	2,230.7	0.0	251.0	1675.4	6,599.80
ACP (\$/MW-Day)	236.66	236.66	236.66	236.66	236.66	236.66	236.66	2.88	2.88	2.88	133.70-236.66	N/A

# Supply Offered and Cleared

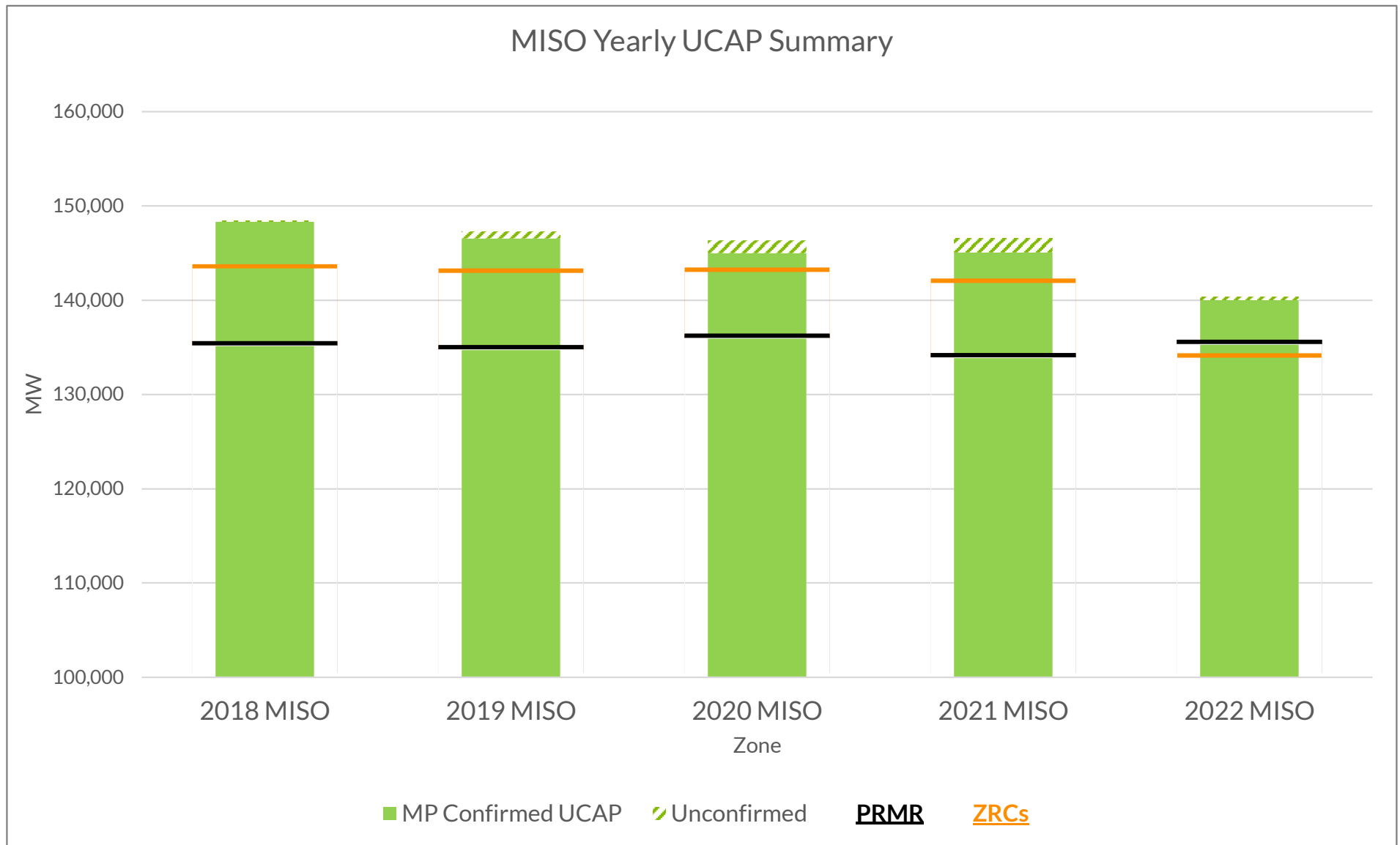
Planning Resource	Offered (ZRC)			Cleared (ZRC)		
	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Generation	125,341	125,225	121,506.5	120,143	118,884	118,745.0
External Resources	3,832	3,914	3,638.9	3,736	3,798	3,638.9
Behind the Meter Generation	3,997	4,131	4,169.3	3,892	4,068	4,169.3
Demand Resources	7,754	7,294	7,591.4	7,557	7,152	7,541.5
Energy Efficiency	650	0	0	650	0	0
<b>Total</b>	<b>141,574</b>	<b>140,564</b>	<b>136,906.1</b>	<b>135,979</b>	<b>133,903</b>	<b>134,094.7</b>

# Historical Auction Clearing Price Comparison

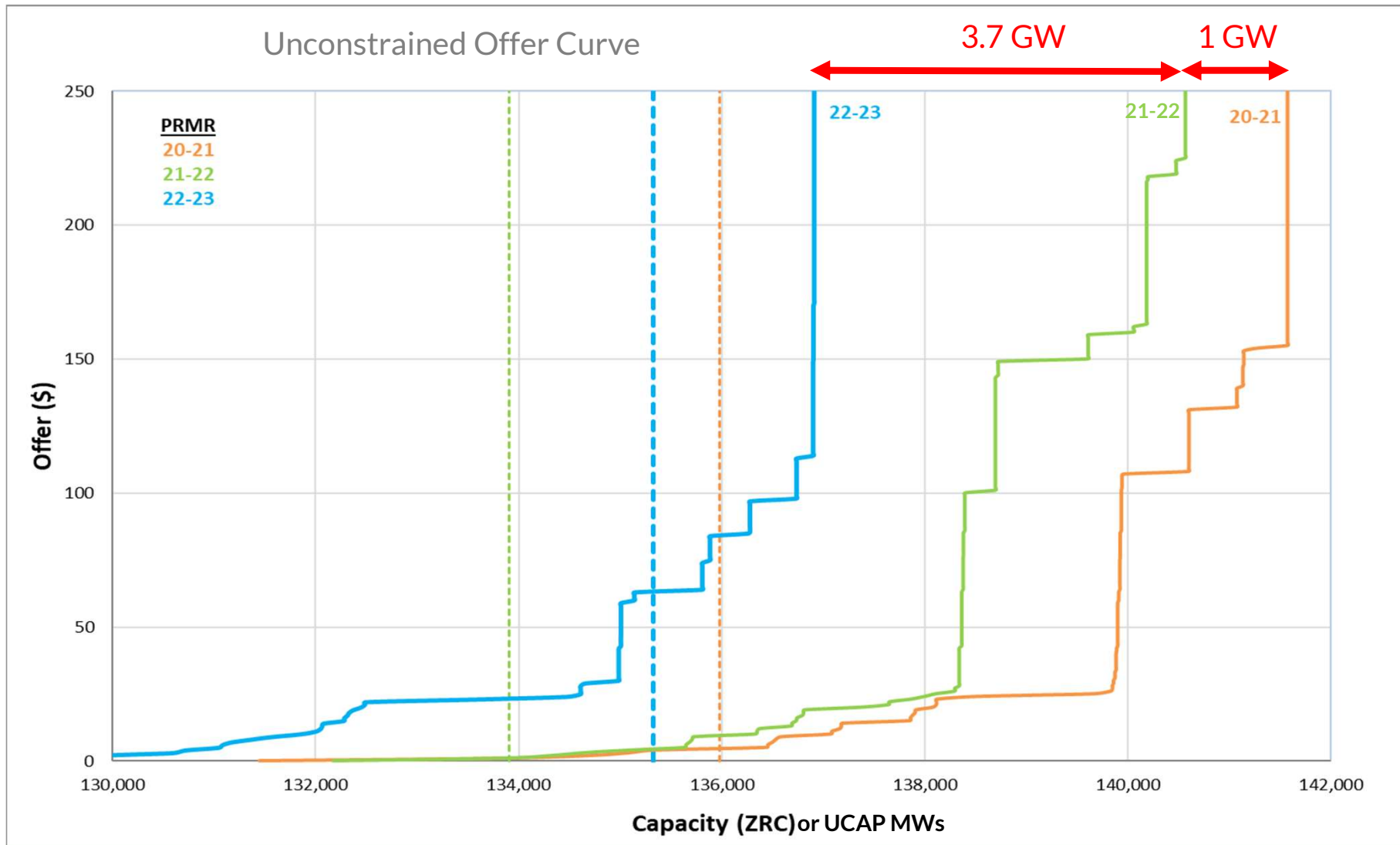
PY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	ERZs
2015-2016	\$3.48			\$150.00		\$3.48		\$3.29		N/A	N/A
2016-2017	\$19.72	\$72.00							\$2.99		N/A
2017-2018	\$1.50										N/A
2018-2019	\$1.00	\$10.00									N/A
2019-2020	\$2.99						\$24.30	\$2.99			
2020-2021	\$5.00						\$257.53	\$4.75	\$6.88	\$4.75	\$4.89- \$5.00
2021-2022	\$5.00							\$0.01			\$2.78- \$5.00
2022-2023	\$236.66							\$2.88			\$133.70- 236.66
<b>IMM Conduct Threshold</b>	25.01	24.52	23.67	24.74	26.63	24.40	25.69	23.10	22.88	22.84	26.67
<b>Cost of New Entry</b>	250.05	245.18	236.66	247.40	266.27	243.95	256.90	230.99	228.82	228.44	266.68

- Auction Clearing Prices shown in \$/MW-Day
- Conduct Threshold is 10% of Cost of New Entry (CONE)

# Year-over-year MISO Unforced Capacity (UCAP)

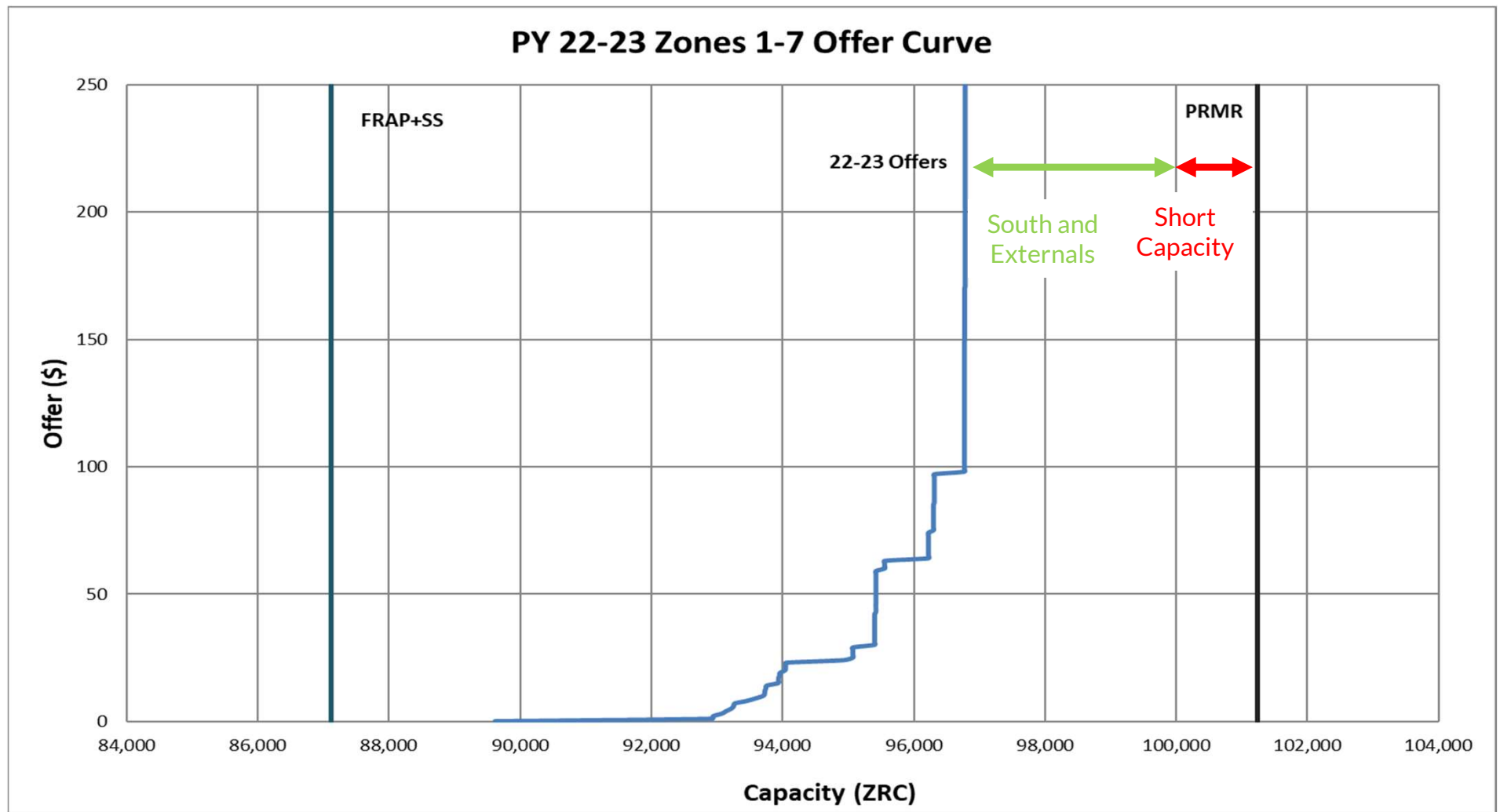


# The amount of capacity offered into the MISO PRA has been decreasing year-over-year

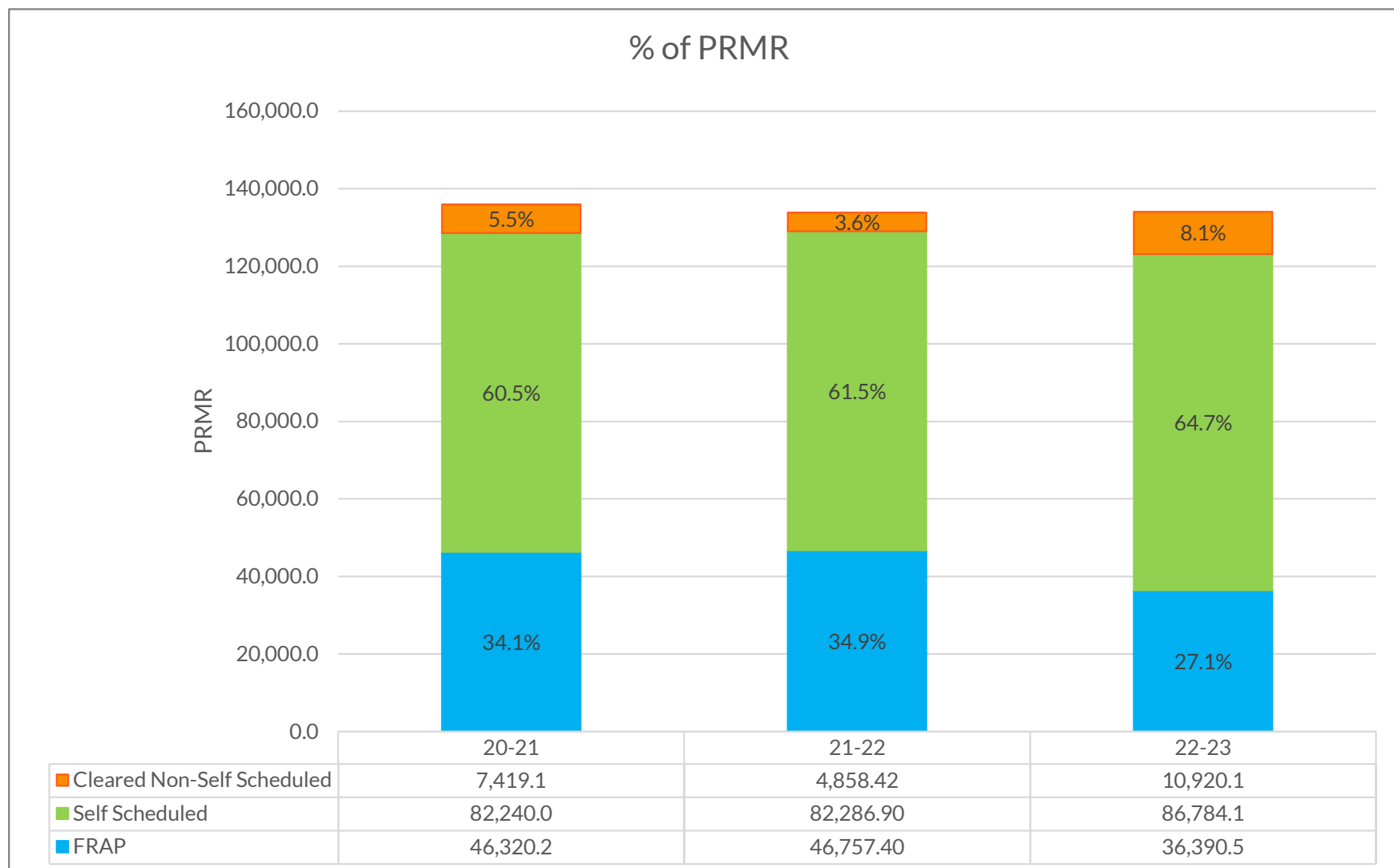




Despite capacity imports from MISO South and external zones closing the gap, capacity offers fell 1230 MW short of PRMR in the MISO North/Central zones

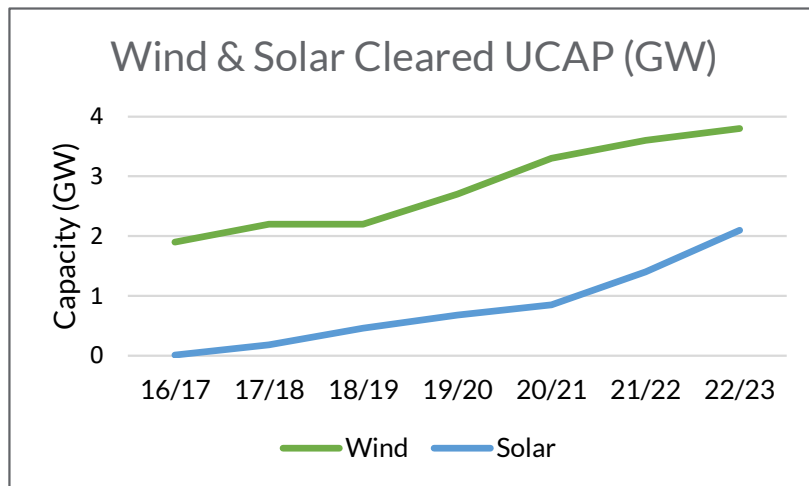
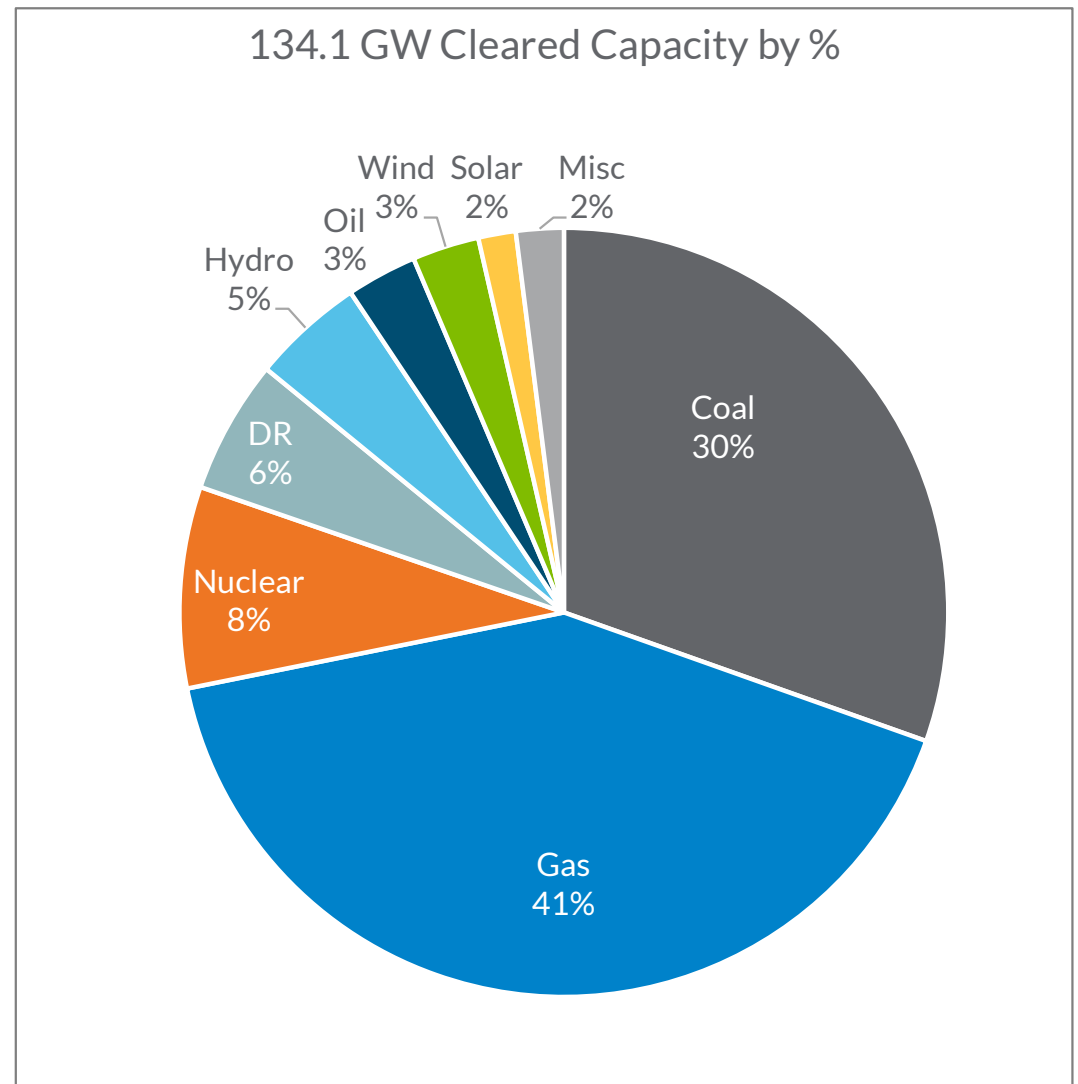


# Most members continue to meet resource adequacy requirements through fixed plans and self-scheduling, despite fixed plans decreasing by over 10,000 MW this year

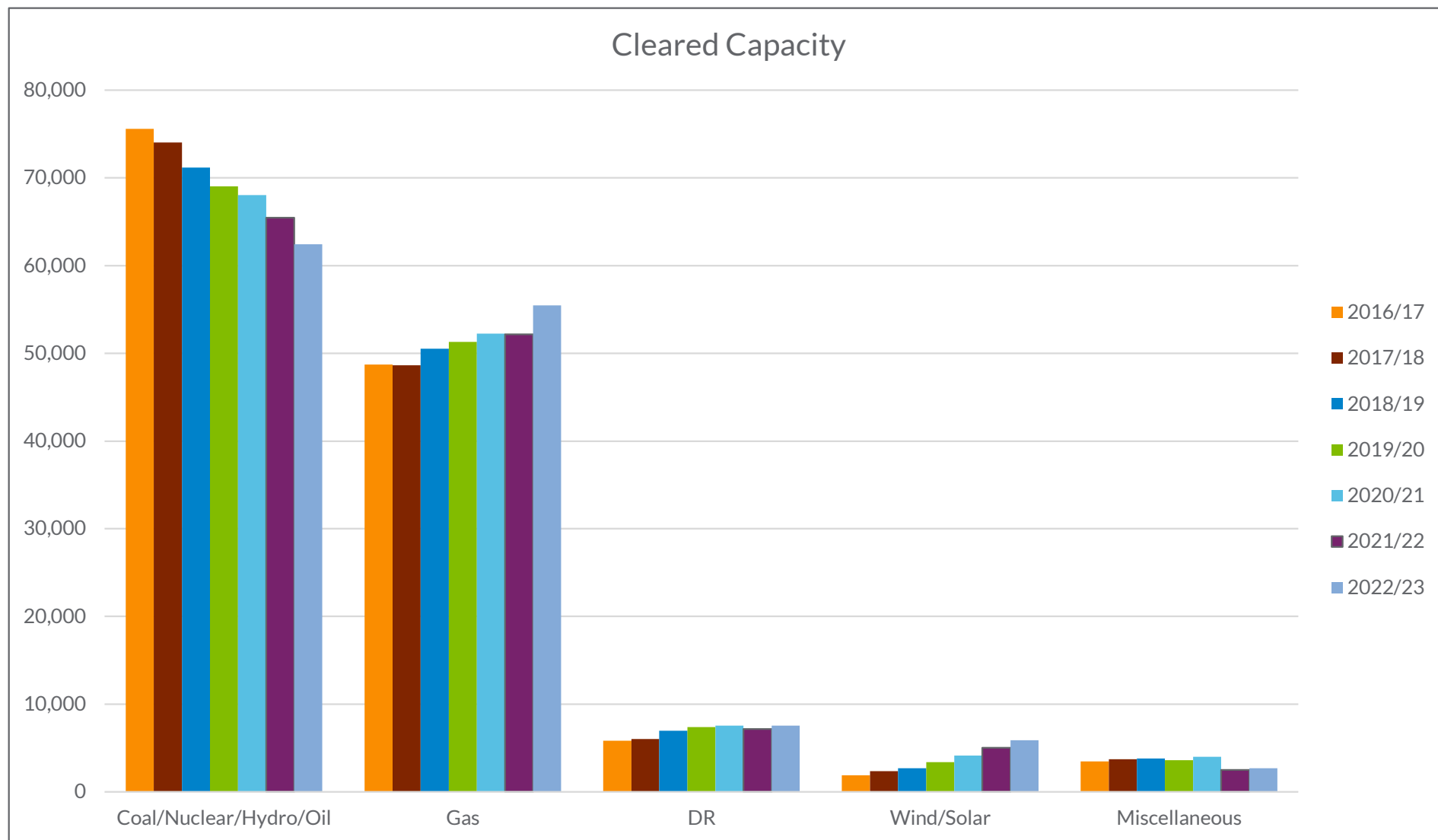


# Although conventional generation still provides the majority of capacity, wind and solar continue to grow

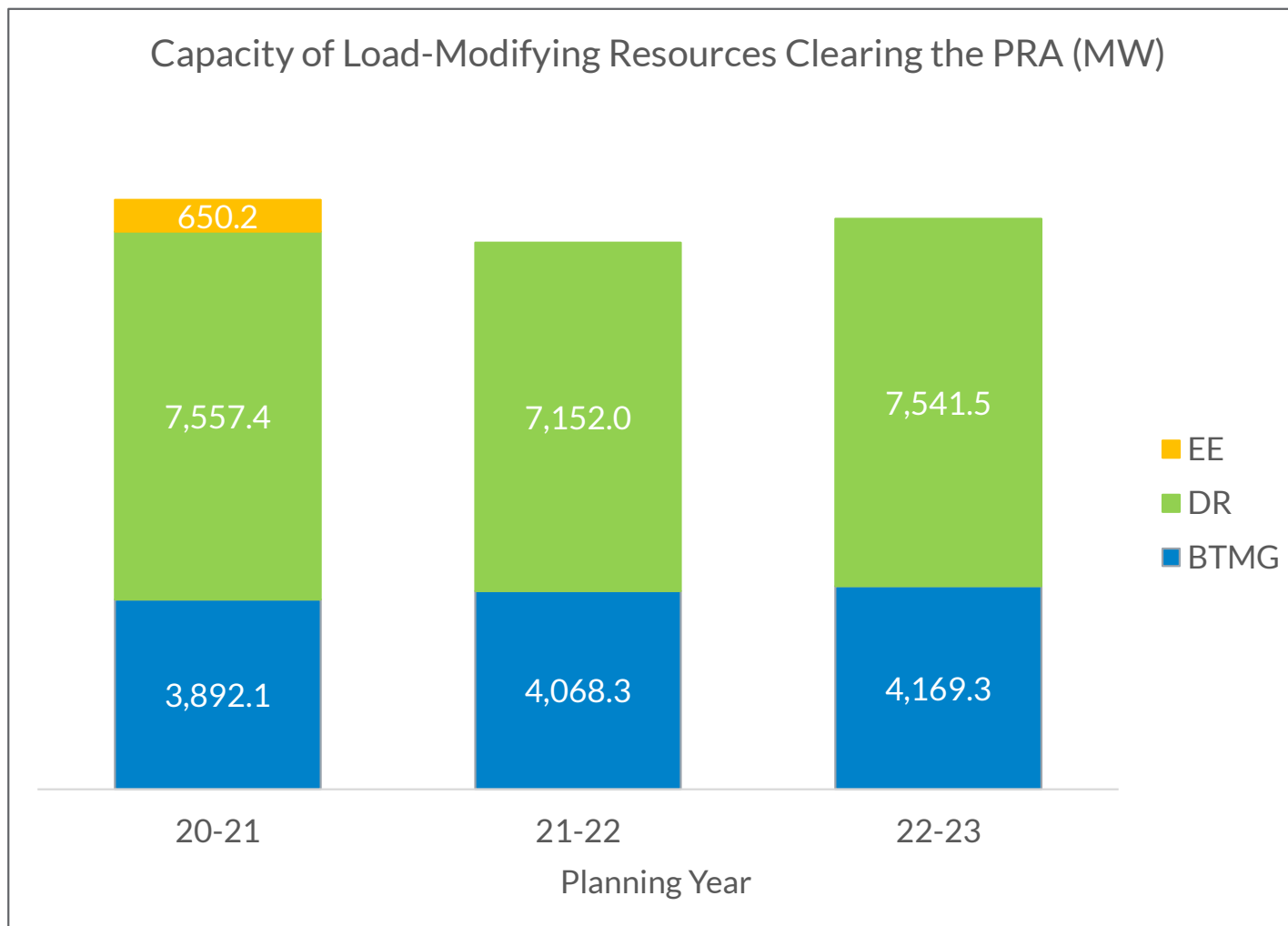
- 2.1 GW of solar cleared this year's auction—an increase of 48% from Planning Year 2021-22 (1.4 GW)
- Similarly, 3.8 GW of wind cleared this year, an increase of 5% compared to last year (3.6 GW)



# The planning resource mix shows the continuation of a multi-year trend toward less solid fuel and increased gas and non-conventional resources



# Despite recent enhancements to Load Modifying Resources (LMR) accreditation, the capacity of LMRs that cleared the PRA increased by 4.4% for planning year 2022-23



# Acronyms

ACP: Auction Clearing Price

ARC: Aggregator of Retail Customers

BTMG: Behind the Meter Generator

CIL: Capacity Import Limit

CEL: Capacity Export Limit

CONE: Cost of New Entry

DR: Demand Resource

EE: Energy Efficiency

ER: External Resource

ERZ: External Resource Zones

FRAP: Fixed Resource Adequacy Plan

ICAP: Installed Capacity

IMM: Independent Market Monitor

LCR: Local Clearing Requirement

LMR: Load Modifying Resource

LRZ: Local Resource Zone

LSE: Load Serving Entity

PRA: Planning Resource Auction

PRM: Planning Reserve Margin

PRMR: Planning Reserve Margin Requirement

RASC: Resource Adequacy Sub-Committee

SS: Self Schedule

SFT: Simultaneous Feasibility Test

UCAP: Unforced Capacity

ZIA: Zonal Import Ability

ZRC: Zonal Resource Credit

# Reports

- **LOLE Study Report**

- <https://cdn.misoenergy.org/PY%202022-23%20LOLE%20Study%20Report601325.pdf>

- **Wind & Solar Capacity Credit Report**

- <https://cdn.misoenergy.org/2022%20Wind%20and%20Solar%20Capacity%20Credit%20Report618340.pdf>



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# Planning Resource Auction

## Results for Planning Year 2023-24

May 19, 2023

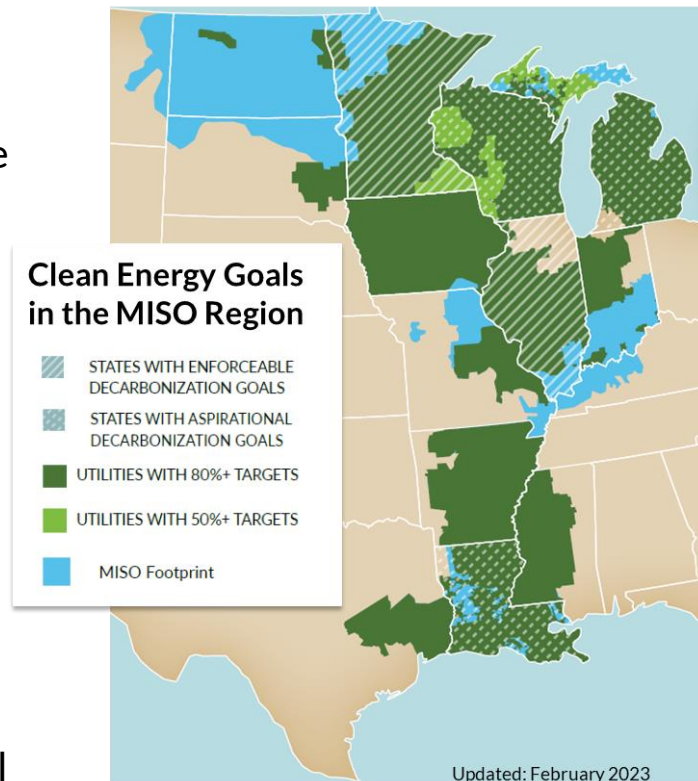
Case No. 2023-00312

Attachment No. B to Response to PSC 2-5

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# Seasonal resource adequacy construct sets the stage for several other key initiatives necessary to ensure a sustainable response to the Reliability Imperative

- The changing resource fleet driven by aggressive member decarbonization strategies continues to dramatically shift the reliability risk profile in our region.
- Coordinated reform of Resource Adequacy, Market Design and Transmission evolution is necessary to ensure continued reliability.
- Implementation of the seasonal construct is one step in the overall work needed to meet the Reliability Imperative.



21 utilities have energy goals greater than 80%

3 states have 100% clean energy goals

2 states with 100% clean energy law

# Market response to high prices from the 2022 auction helps mitigate Resource Adequacy risk for Planning Year 2023-24

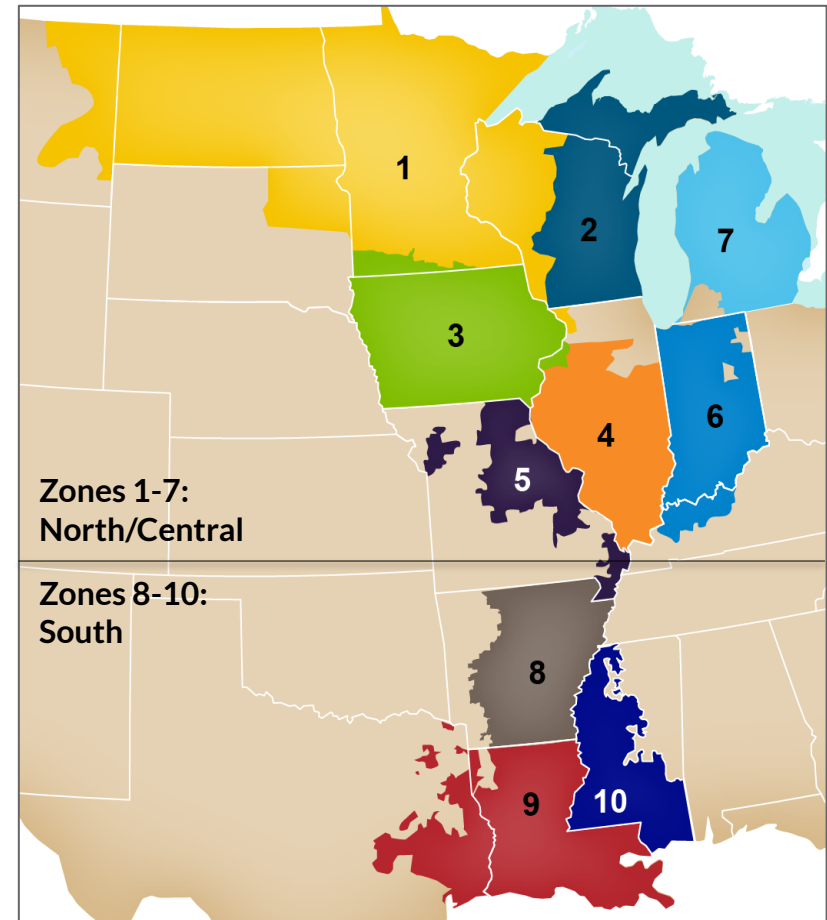
- MISO's seasonal PRA improves reliability planning by identifying requirements, resource accreditation and risks for individual seasons.
- MISO is projected to have adequate capacity to meet resource adequacy requirements for PY 2023-24 at the regional, sub-regional & zonal levels.
  - Auction Clearing Prices are flat across the region:  
Summer: \$10, Fall: \$15, Winter: \$2, Spring: \$10/MW-day
  - Exception: Zone 9 (LA/TX) with \$59 in Fall and \$19 in Winter (required higher priced supply within the zone to meet its Local Clearing Requirement).
- Actions taken by Market Participants such as delaying retirements and making additional existing capacity available to the region, resulted in adequate capacity.
- Many of these actions may not be repeatable and the residual capacity and resulting prices do not reflect the risks posed by the portfolio transition.
- MISO's response to the Reliability Imperative reinforces need for urgent reforms to MISO's resource adequacy construct and market design.

# 2023 PRA demonstrated sufficient capacity at regional, sub-regional and zonal level to meet PRMRs and LCRs

## 2023 PRA Results

Zone	Local Balancing Authorities	Price \$/MW-Day			
		Summer	Fall	Winter	Spring
1	DPC, GRE, MDU, MP, NSP, OTP, SMP	\$10.00	\$15.00	\$2.00	\$10.00
2	ALTE, MGE, UPPC, WEC, WPS, MIUP	\$10.00	\$15.00	\$2.00	\$10.00
3	ALTW, MEC, MPW	\$10.00	\$15.00	\$2.00	\$10.00
4	AMIL, CWLP, SIPC, GLH	\$10.00	\$15.00	\$2.00	\$10.00
5	AMMO, CWLD	\$10.00	\$15.00	\$2.00	\$10.00
6	BREC, CIN, HE, IPL, NIPS, SIGE	\$10.00	\$15.00	\$2.00	\$10.00
7	CONS, DECO	\$10.00	\$15.00	\$2.00	\$10.00
8	EAI	\$10.00	\$15.00	\$2.00	\$10.00
9	CLEC, EES, LAFA, LAGN, LEPA	\$10.00	\$59.21	\$18.88	\$10.00
10	EMBA, SME	\$10.00	\$15.00	\$2.00	\$10.00
ERZ	KCPL, OPPD, WAUE (SPP), PJM, OVEC, LGEE, AECI, SPA, TVA	\$10.00	\$15.00	\$2.00	\$10.00

## MISO Resource Adequacy Zones



PRMR: Planning Reserve Margin Requirement

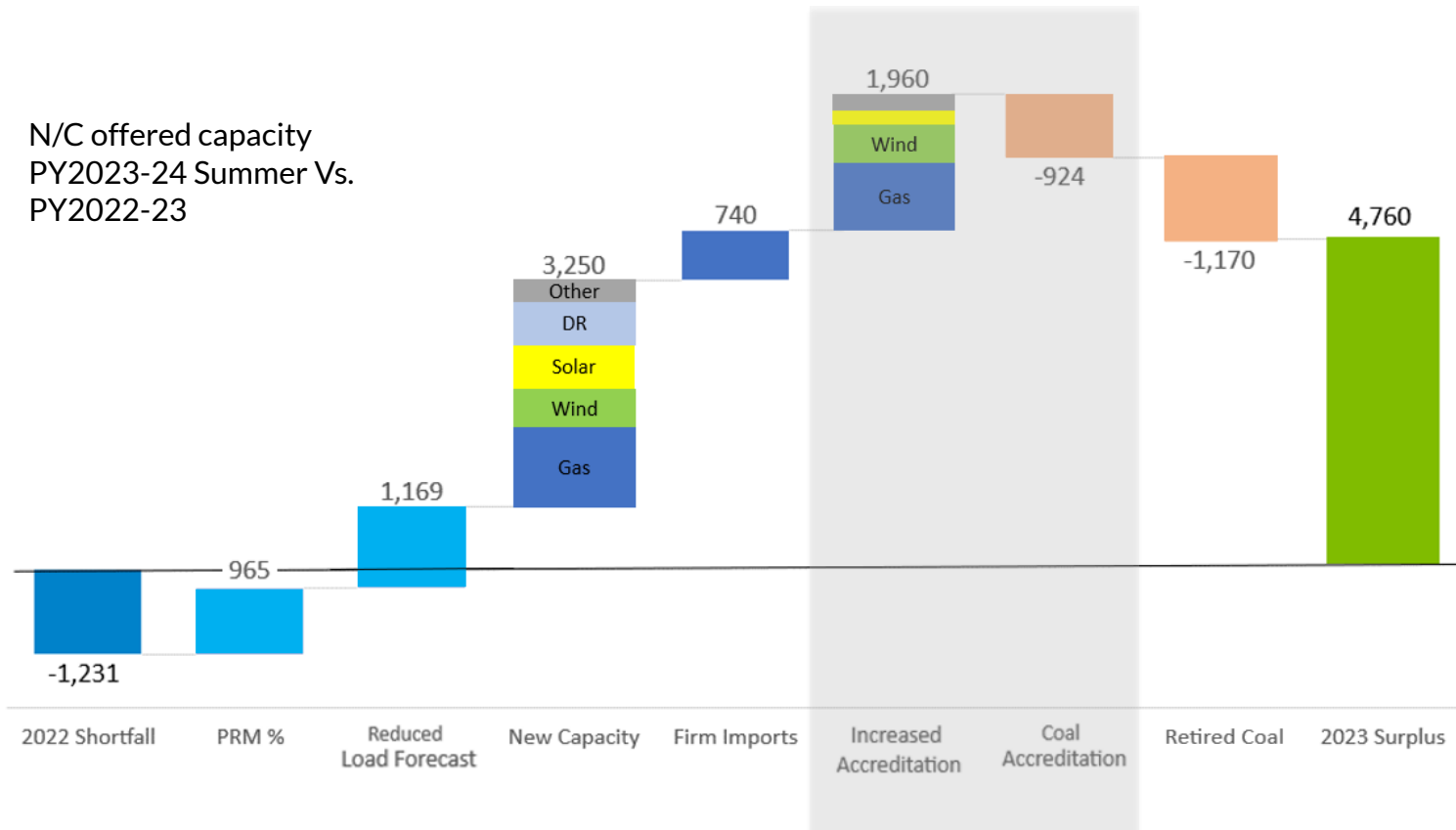
LCR: Local Clearing Requirements

ERZ: External Resource Zone

4 Highlighted prices show price separation for the zone/season.

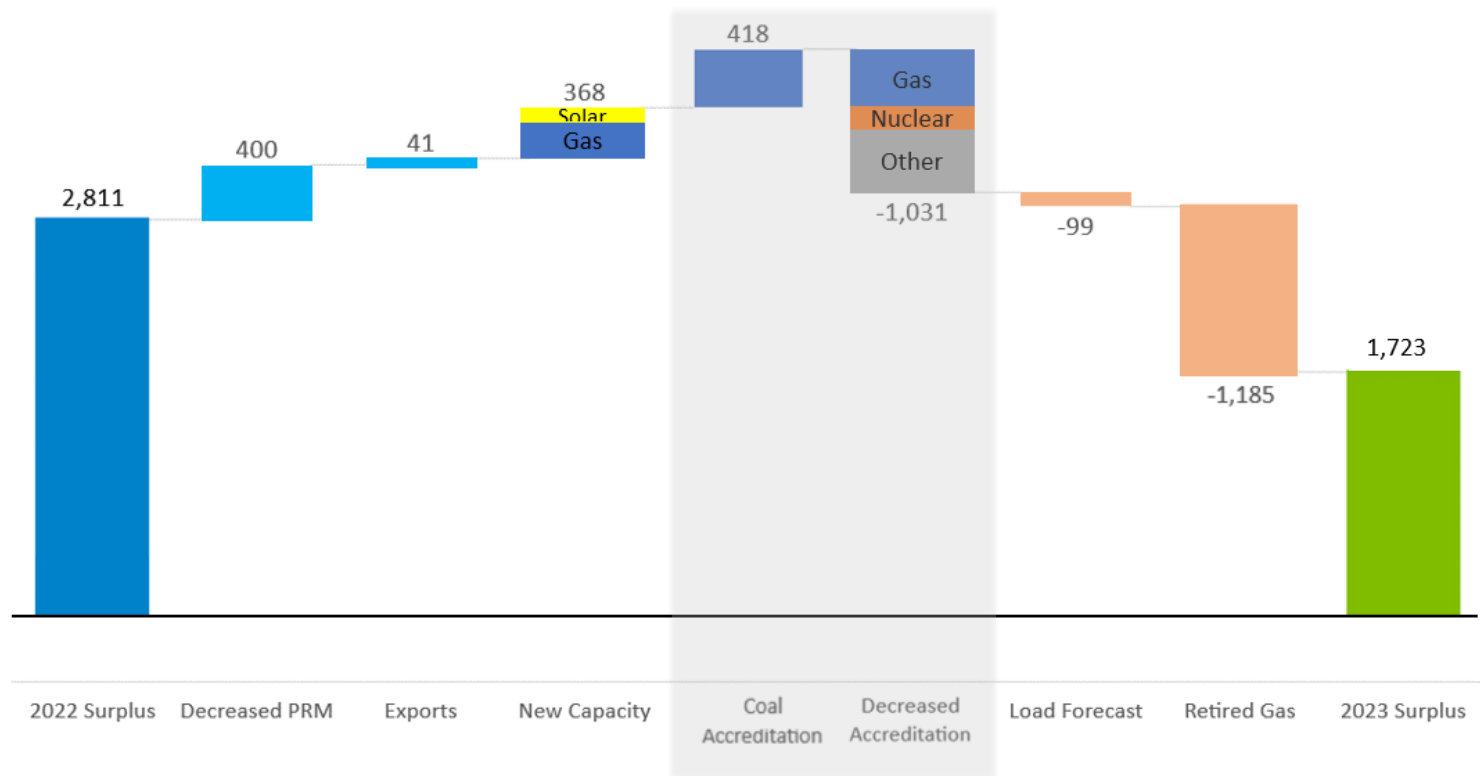
# North/Central region demonstrated adequate supply driven by a combination of lower demand, new generation, delayed retirements, additional imports and higher accreditation

Capacity offered in N/C exceeds requirements by 4,760 MW (4.7%)



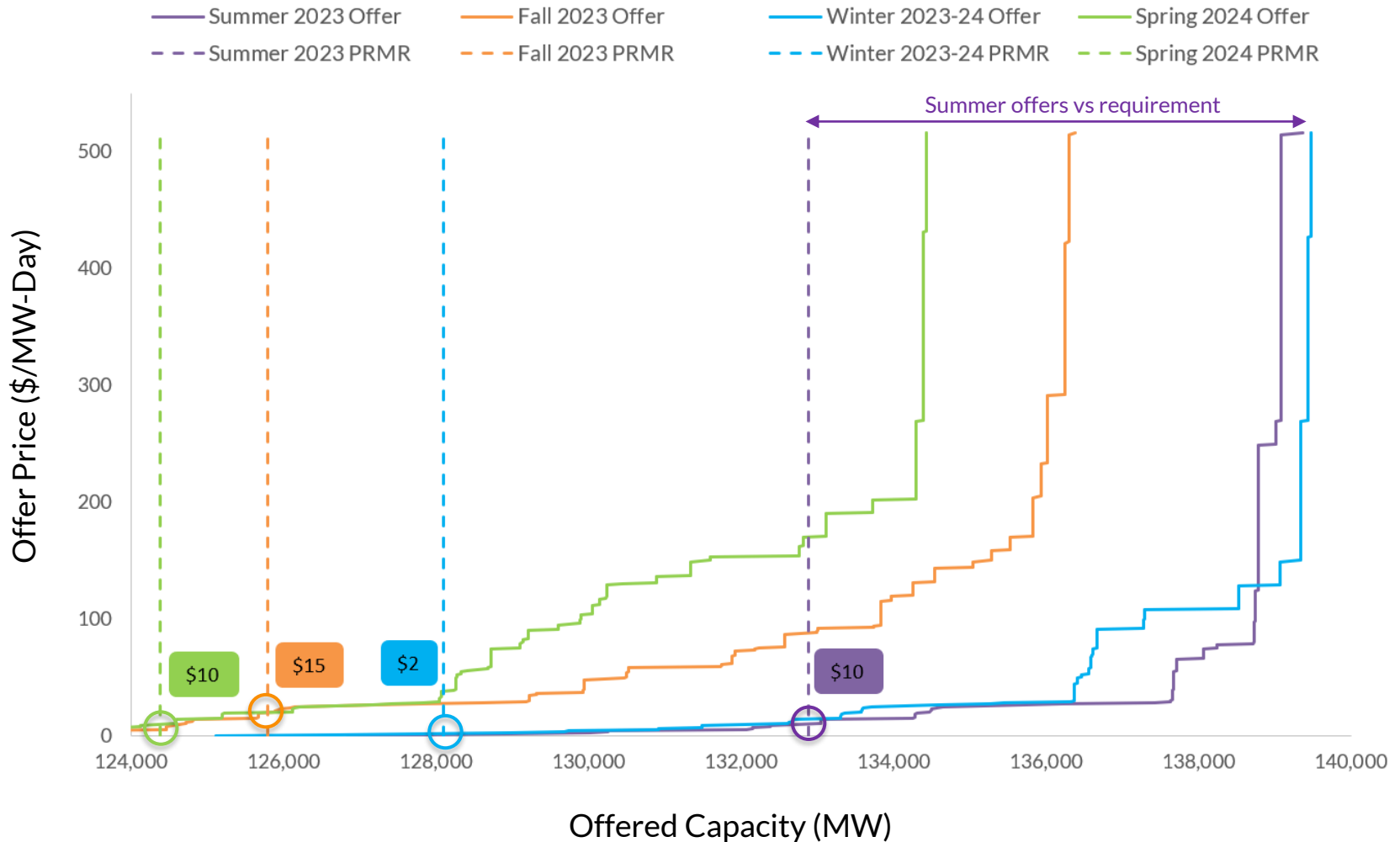
# South region continues to remain adequate in PY 2023-24 however offered capacity shows decline driven largely by retirements.

Capacity offered in South exceeds requirements by 1,723 MW (5.1%)

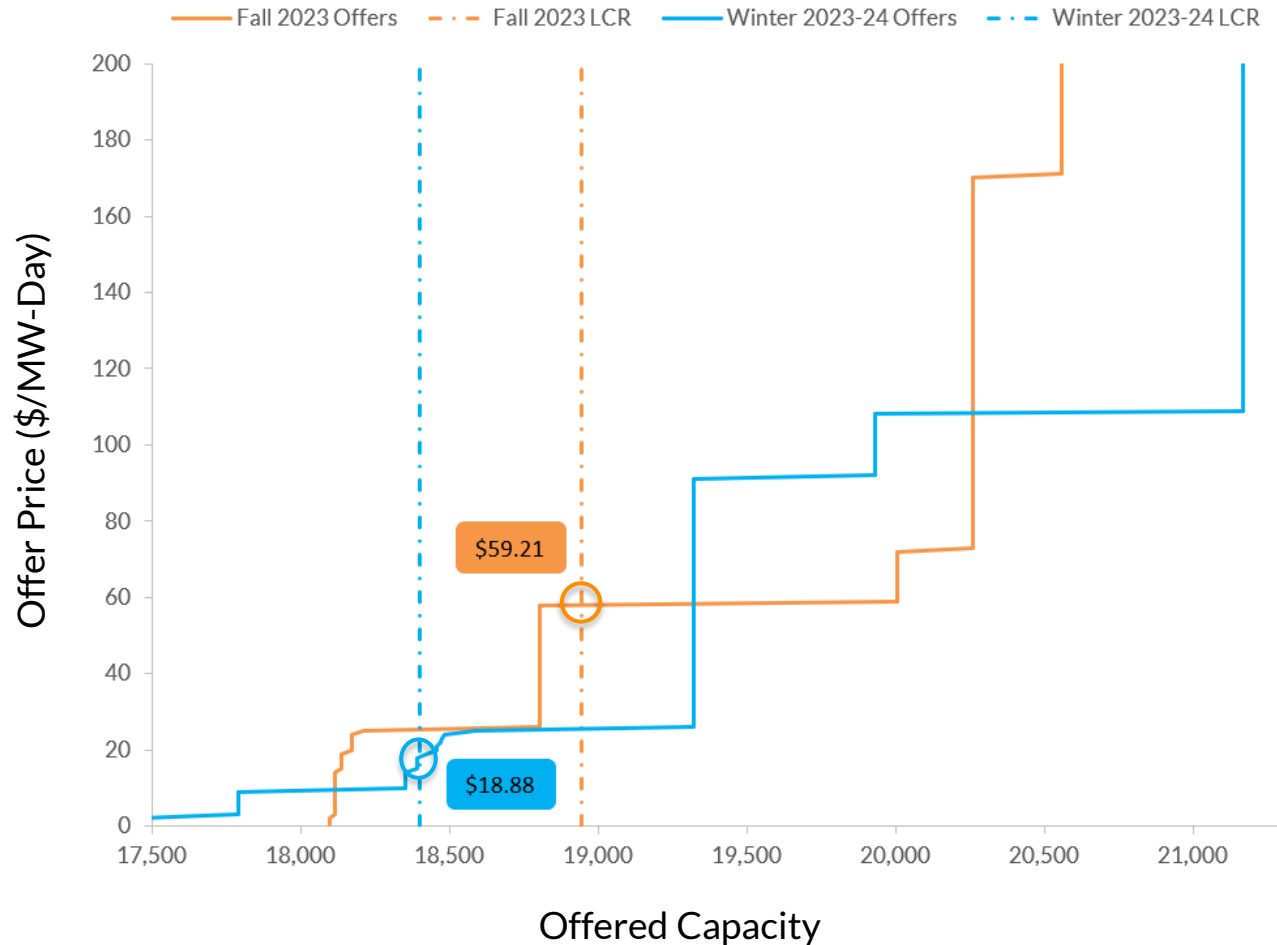


South offered capacity PY2023-24 Summer Vs. PY2022-23

# Adequate supply resulted in flat auction clearing prices across the footprint for all seasons, with the exception of Zone 9



# In Fall and Winter, LRZ9 required higher priced supply within the zone to meet its local clearing requirement

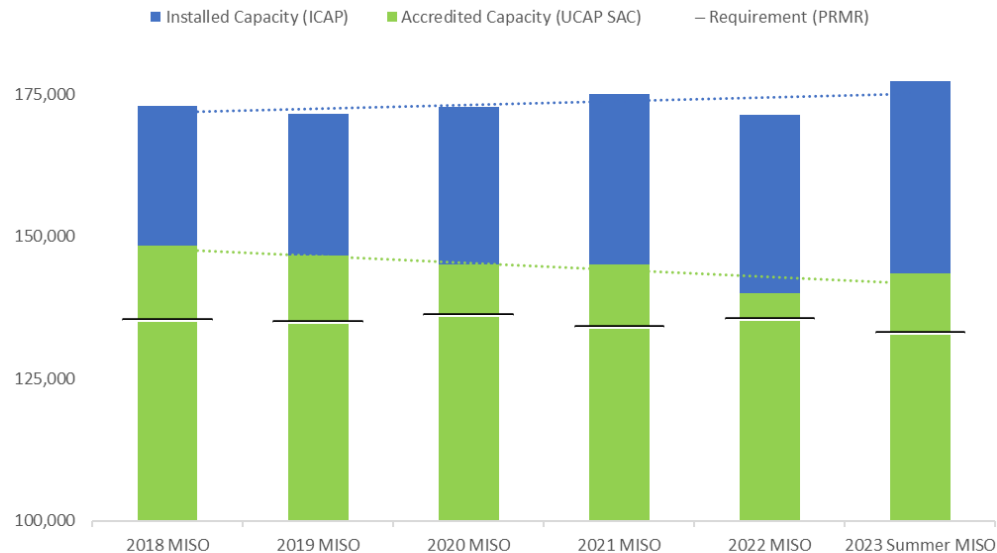


Note: Generation used to meet the Summer and Spring LCR was priced at or lower than MISO South region Auction Clearing Price.



# Adequate supply this summer and the resulting prices do not reflect the continued risks posed by the portfolio transition

- Impacts of the seasonal construct such as reduced summer PRM and seasonal accounting of retirements contributed to the surplus capacity.
- Reduced load forecasts and actions taken by members such as delayed retirements and increased imports may not be repeatable.
- Historic trends and projections based on member-announced plans\* show a continued decline in accredited capacity even as installed capacity increases.



*Urgent reforms to MISO's resource adequacy and market design are necessary to ensure continued reliability.*

# MISO's workplan includes the work needed to evolve our plans and processes to meet the Reliability Imperative

Issue	Challenges	Mitigation
Fleet Change	Declining accredited capacity, declining reserve margins, and changing risk profile	<ul style="list-style-type: none"> <li>• Continue developing attributes criteria and improved accreditation for resources</li> </ul>
Reliability Planning	Reliability is not a yes/no criteria, it's a continuum that considers numerous factors and range or risk tolerance	<ul style="list-style-type: none"> <li>• Update loss-of-load assessments</li> <li>• Develop Reliability Based Demand Curve</li> <li>• Ensure alignment of market and reliability procedures during extreme events</li> </ul>
Forecasting	Load and intermittent generation forecasting needs to be more accurate	<ul style="list-style-type: none"> <li>• Improve forecasting data and methods, including uncertainty forecasting.</li> <li>• Enhance control room automation</li> </ul>
Intraregional and Interregional Support	<p>Increased reliance on geographic scope</p> <p>Increased reliance on gas industry performance during critical events</p>	<ul style="list-style-type: none"> <li>• Continue developing transmission (JTIQ and LRTP Tranche 2)</li> <li>• Improved agreements with neighbors for emergency scenarios</li> <li>• Improve gas/electric coordination</li> </ul>

# Next Steps

- **May 19** – Conference call presentation of PRA results
- **May 23**
  - Zonal Deliverability Benefits presented at the May RASC
  - MISO publishes cleared LMRs to Operations tools
- **June 1** – New Planning Year starts
- **June 19** – Posting of PRA masked offer data per Module E 69.A.7.4



<https://help.misoenergy.org/support/>

# Appendix

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- Historical Auction Clearing Price Comparison
- 2023-2024 Seasonal Auction Clearing Price Comparison
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- South Offer Curves 22-23 and Summer 2023
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- Fuel Mix charts – Summer 2023, Winter 2023-24 and Summer 2023, Fall 2023 and Spring 2024, and historical trend
- LMRs (DR, EE and BTMG) cleared in the PRA - Historical and Seasonal trends
- Study Reports

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ARC: Aggregator of Retail Customers

BTMG: Behind the Meter Generator

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PRMR: Planning Reserve Margin Requirement

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SAC: Seasonal Accredited Capacity

SS: Self Schedule

SFT: Simultaneous Feasibility Test

UCAP: Unforced Capacity

ZIA: Zonal Import Ability

ZRC: Zonal Resource Credit



# Summer 2023 PRA Results by Zone

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
<b>PRMR</b>	18,234.4	13,371.2	10,491.9	9,559.5	8,115.3	18,107.7	21,232.8	7,915.8	21,234.3	4,628.3	N/A	132,891.2
<b>Offer Submitted (Including FRAP)</b>	21,293.8	14,191.9	11,323.8	8,482.5	7,392.0	15,473.9	21,730.0	11,083.2	21,198.7	4,755.5	2,448.6	139,373.9
<b>FRAP</b>	14,042.9	11,237.4	4,245.7	537.4	0.0	949.7	1,457.5	535.2	166.2	1,315.6	309.1	34,796.7
<b>Self Scheduled (SS)</b>	5,302.9	2,431.7	6,557.7	5,673.2	7,372.0	9,940.7	19,918.7	9,777.1	19,359.6	3,071.6	1,569.6	90,974.8
<b>Non-SS Offer Cleared</b>	168.9	443.5	517.4	1,312.0	20.0	3,423.1	4.4	449.4	331.5	321.7	127.8	7,119.7
<b>Committed (Offer Cleared + FRAP)</b>	19,514.7	14,112.6	11,320.8	7,522.6	7,392.0	14,313.5	21,380.6	10,761.7	19,857.3	4,708.9	2,006.5	132,891.2
<b>LCR</b>	15,076.1	10,552.0	6,806.3	2,935.0	6,529.5	11,567.6	18,785.5	7,134.5	18,931.4	3,690.0	-	N/A
<b>CIL</b>	5,301	3,477	6,108	7,884	3,576	8,492	5,087	4,139	5,268	3,064	-	N/A
<b>ZIA</b>	5,299	3,477	6,043	6,992	3,576	8,092	5,087	4,091	4,456	3,064	-	N/A
<b>Import</b>	0.0	0.0	0.0	2,036.9	723.3	3,794.2	0.0	0.0	1,377.0	0.0	-	7,931.4
<b>CEL</b>	3,959	2,550	4,310	NLF*	NLF*	2,703	3,953	5,503	1,574	1,794	-	N/A
<b>Export</b>	1,280.3	741.4	828.9	0.0	0.0	0.0	147.8	2,845.9	0.0	80.6	2,006.5	7,931.4
<b>ACP (\$/MW-Day)</b>	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	N/A

Values displayed in MW UCAP \*NLF = No Limit Found: Tier 1 & 2 source capacity is less than the study transfer limit

# Fall 2023 PRA Results by Zone

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
<b>PRMR</b>	16,789.4	12,181.8	9,979.6	8,811.7	7,645.6	17,237.2	19,760.9	7,580.1	21,082.1	4,727.0	N/A	125,795.4
<b>Offer Submitted (Including FRAP)</b>	20,783.4	14,173.2	11,628.6	8,303.0	6,793.8	15,298.0	20,849.7	10,546.1	20,848.3	5,087.3	2,070.8	136,382.2
<b>FRAP</b>	12,864.0	10,064.9	3,936.7	428.5	0.0	926.5	1,410.5	469.8	164.4	1,354.3	169.8	31,789.4
<b>Self Scheduled (SS)</b>	4,950.8	2,858.9	6,104.5	5,850.8	6,740.3	9,203.7	18,745.0	8,815.1	17,527.4	3,307.5	1,528.5	85,632.5
<b>Non-SS Offer Cleared</b>	691.0	580.0	689.7	1,211.5	0.0	3,160.7	4.5	157.9	1,250.9	370.6	256.7	8,373.5
<b>Committed (Offer Cleared + FRAP)</b>	18,505.8	13,503.8	10,730.9	7,490.8	6,740.3	13,290.9	20,160.0	9,442.8	18,942.7	5,032.4	1,955.0	125,795.4
<b>LCR</b>	13,064.2	8,764.3	0.0	4,552.3	4,358.7	13,290.9	20,059.0	5,608.2	18,942.7	4,307.8	-	N/A
<b>CIL</b>	6,528	4,411	14,375	5,173	5,380	6,070	4,285	4,705	6,045	2,425	-	N/A
<b>ZIA</b>	6,526	4,411	14,310	4,281	5,380	5,670	4,285	4,657	5,233	2,425	-	N/A
<b>Import</b>	0.0	0.0	0.0	1,320.9	905.3	3,946.3	0.0	0.0	2,139.4	0.0	-	8,311.9
<b>CEL</b>	3,804	3,577	4,354	NLF*	1,992	1,701	3,990	5,080	1,526	2,878	-	N/A
<b>Export</b>	1,716.4	1,322.0	751.3	0.0	0.0	0.0	399.1	1,862.7	0.0	305.4	1,955.0	8,311.9
<b>ACP (\$/MW-Day)</b>	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	59.21	15.00	15.00	N/A

# Winter2023/24 PRA Results by Zone

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
<b>PRMR</b>	18,245.5	11,708.9	10,215.4	9,093.9	8,231.1	18,290.9	16,927.7	8,518.6	22,110.4	4,761.8	N/A	128,104.2
<b>Offer Submitted (Including FRAP)</b>	22,178.0	13,934.4	13,349.6	7,738.9	6,906.5	14,999.3	21,569.9	10,042.5	21,215.3	5,058.7	2,489.4	139,482.5
<b>FRAP</b>	13,361.7	9,638.1	4,464.0	459.1	0.0	854.0	1,316.7	396.9	149.3	1,788.9	299.5	32,728.2
<b>Self Scheduled (SS)</b>	7,639.4	2,649.7	6,626.9	6,286.2	6,906.5	10,182.7	19,356.0	9,642.9	17,283.8	3,145.6	1,817.7	91,537.4
<b>Non-SS Offer Cleared</b>	64.7	1,024.6	379.3	645.2	0.0	710.3	4.3	0.0	965.0	29.1	16.1	3,838.6
<b>Committed (Offer Cleared + FRAP)</b>	21,065.8	13,312.4	11,470.2	7,390.5	6,906.5	11,747.0	20,677.0	10,039.8	18,398.1	4,963.6	2,133.3	128,104.2
<b>LCR</b>	15,797.1	8,596.5	3,628.8	6,009.0	6,022.8	10,854.4	15,693.1	5,691.3	18,398.1	4,519.4	-	N/A
<b>CIL</b>	4,937	4,905	11,039	3,928	3,811	8,818	6,340	4,729	6,080	2,396	-	N/A
<b>ZIA</b>	4,935	4,905	10,974	3,036	3,811	8,418	6,340	4,681	5,268	2,396	-	N/A
<b>Import</b>	0.0	0.0	0.0	1,703.4	1,324.6	6,543.9	0.0	0.0	3,712.3	0.0	-	13,284.2
<b>CEL</b>	3,501	4,198	7,002	NLF*	6,348	1,242	4,350	5,351	877	1,980	-	N/A
<b>Export</b>	2,820.3	1,603.5	1,254.8	0.0	0.0	0.0	3,749.3	1,521.2	0.0	201.8	2,133.3	13,284.2
<b>ACP (\$/MW-Day)</b>	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	18.66	2.00	2.00	N/A

# Spring 2024 PRA Results by Zone

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
<b>PRMR</b>	17,304.2	12,009.8	9,590.0	8,033.5	7,392.2	17,552.4	19,038.9	7,678.5	21,272.9	4,516.7	N/A	124,389.1
<b>Offer Submitted (Including FRAP)</b>	19,822.1	14,216.1	11,399.5	8,082.2	7,180.0	14,991.5	19,772.5	10,728.6	20,962.5	4,931.4	2,351.8	134,438.2
<b>FRAP</b>	12,916.5	10,051.5	3,934.4	411.2	0.0	892.0	1,320.2	362.7	151.0	1,388.7	307.4	31,735.6
<b>Self Scheduled (SS)</b>	5,624.3	2,842.2	6,037.4	5,762.5	6,014.5	9,298.6	17,395.3	9,377.4	18,162.1	3,125.0	1,540.1	85,179.4
<b>Non-SS Offer Cleared</b>	54.9	1,031.4	888.5	1,325.8	0.0	2,742.4	104.0	413.7	714.9	79.2	119.3	7,474.1
<b>Committed (Offer Cleared + FRAP)</b>	18,595.7	13,925.1	10,860.3	7,499.5	6,014.5	12,933.0	18,819.5	10,153.8	19,028.0	4,592.9	1,966.8	124,389.1
<b>LCR</b>	13,171.6	8,039.5	5,175.3	3,539.5	5,829.2	10,978.3	15,654.3	5,907.1	18,105.2	4,303.5	-	N/A
<b>CIL</b>	6,185	4,454	7,675	5,906	3,881	8,162	5,559	4,606	6,250	2,144	-	N/A
<b>ZIA</b>	6,183	4,454	7,610	5,014	3,881	7,762	5,559	4,558	5,438	2,144	-	N/A
<b>Import</b>	0.0	0.0	0.0	534.0	1,377.7	4,619.4	219.4	0.0	2,244.9	0.0	-	8,995.4
<b>CEL</b>	4,321	3,679	6,173	NLF*	3,724	2,344	4,413	5,472	2,240	2,720	-	N/A
<b>Export</b>	1,291.5	1,915.3	1,270.3	0.0	0.0	0.0	0.0	2,475.3	0.0	76.2	1,966.8	8,995.4
<b>ACP (\$/MW-Day)</b>	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	N/A

# Supply Offered and Cleared Comparison Trend

Planning Resource	Offered (ZRC)			Cleared (ZRC)		
	2021-22	2022-23	Summer 23-24	2021-22	2022-23	Summer 23-24
Generation	125,225	121,506.5	122,375.6	118,884	118,745.0	116,989.7
External Resources	3,914	3,638.9	4,514.6	3,798	3,638.9	4,072.5
Behind the Meter Generation	4,131	4,169.3	4,175.2	4,068	4,169.3	4,129.4
Demand Resources	7,294	7,591.4	8,303.5	7,152	7,541.5	7,694.6
Energy Efficiency	0.0	0.0	5.0	0.0	0.0	5.0
<b>Total</b>	<b>140,564</b>	<b>136,906.1</b>	<b>139,373.9</b>	<b>133,903</b>	<b>134,094.7</b>	<b>132,891.2</b>

# 2023-2024 Seasonal Supply Offered and Cleared

Planning Resource	Offered (ZRC)				Cleared (ZRC)			
	Summer 2023	Fall 2023	Winter 2023-2024	Spring 2024	Summer 2023	Fall 2023	Winter 2023-2024	Spring 2024
Generation	122,375.6	121,403.5	122,375.6	121,403.5	116,989.7	111,713.8	116,989.7	110,195.8
External Resources	4,514.6	4,095.4	4,514.6	4,095.4	4,072.5	3,979.6	4,072.5	3,409.1
Behind the Meter Generation	4,175.2	3,874.2	4,175.2	3,874.2	4,129.4	3,842.8	4,129.4	4,058.9
Demand Resources	8,303.5	7,004.2	8,303.5	7,004.2	7,694.6	6,254.4	7,694.6	6,720.0
Energy Efficiency	5.0	4.9	5.0	4.9	5.0	4.8	5.0	5.3
<b>Total</b>	<b>139,373.9</b>	<b>136,382.2</b>	<b>139,373.9</b>	<b>136,382.2</b>	<b>132,891.2</b>	<b>125,795.4</b>	<b>132,891.2</b>	<b>124,389.1</b>

# Historical Auction Clearing Price Comparison

PY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	ERZs	
2015-2016	\$3.48			\$150.00		\$3.48		\$3.29		N/A	N/A	
2016-2017	\$19.72	\$72.00							\$2.99			N/A
2017-2018	\$1.50										N/A	
2018-2019	\$1.00						\$10.00				N/A	
2019-2020	\$2.99						\$24.30	\$2.99				
2020-2021						\$5.00		\$257.53	\$4.75	\$6.88	\$4.75	\$4.89- \$5.00
2021-2022						\$5.00			\$0.01			\$2.78- \$5.00
2022-2023						\$236.66			\$2.88			\$2.88- 236.66
Summer 2023- 2024	\$10.00											

- Auction Clearing Prices shown in \$/MW-Day

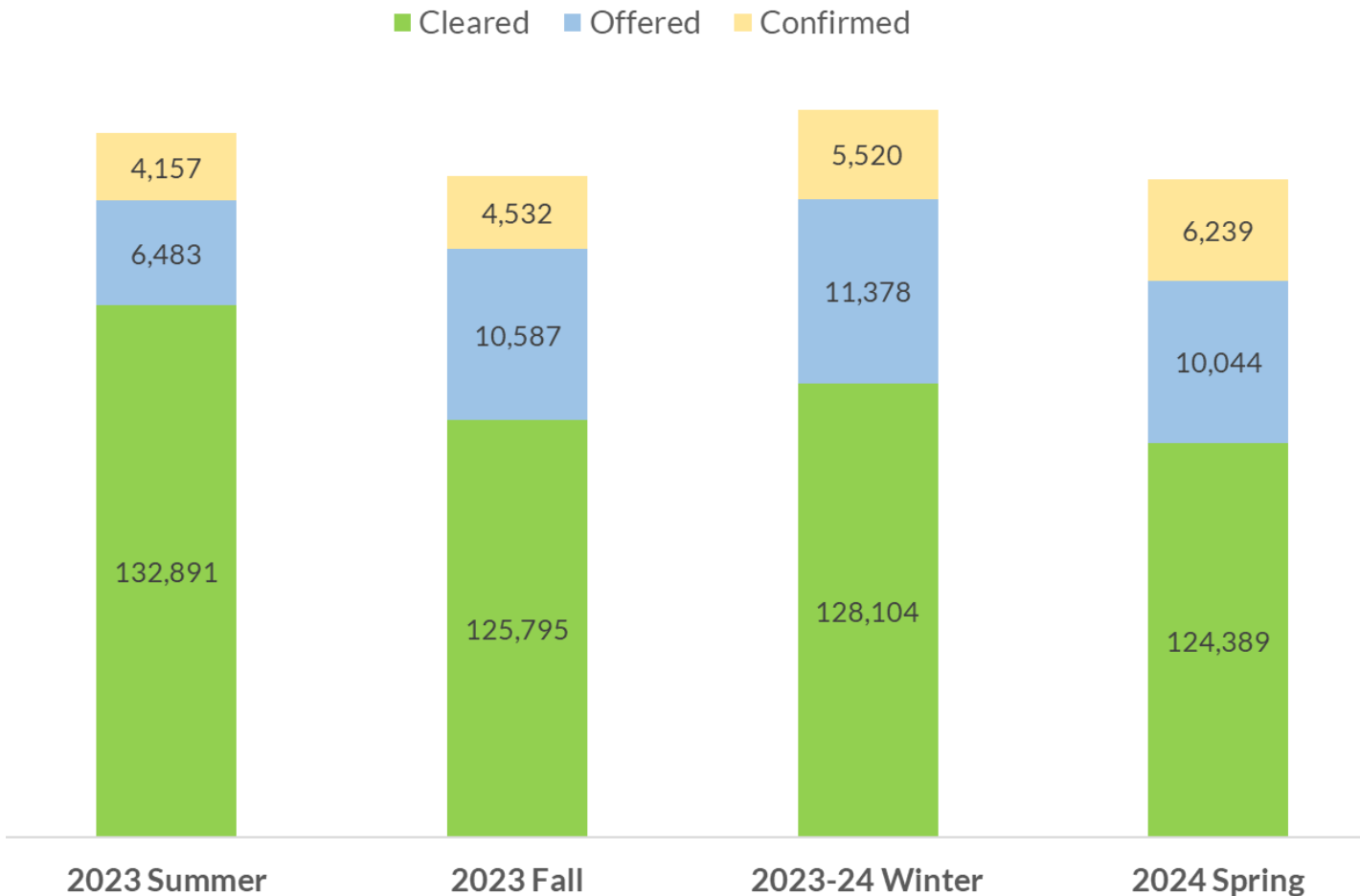
# 2023-2024 Seasonal Auction Clearing Price Comparison

PY	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	ERZs
Summer	\$10.00										
Fall	\$15.00								\$59.21	\$15.00	
Winter	\$2.00								\$18.88	\$2.00	
Spring	\$10.00										
IMM Conduct Threshold	28.54	28.01	27.01	28.00	30.02	27.01	29.02	26.00	25.78	25.70	30.02
Cost of New Entry (Daily)	285.40	280.11	270.11	280.00	300.22	270.11	290.16	259.97	257.75	257.04	300.22
Cost of New Entry (Annual)	104,170	102,240	98,590	102,200	109,580	98,590	105,910	94,890	94,080	93,820	109,580

- There was price separation in the Fall and Winter for Zone 9 since it required higher priced supply within the zone to meet its local clearing requirement.
- Auction Clearing Prices shown in \$/MW-Day
- Conduct Threshold is 10% of Cost of New Entry (CONE)



# 2023-2024 MISO-wide Seasonal Capacity



- Offered and confirmed capacity values are incremental
- PRMR equals cleared capacity
- Surplus is offered capacity in excess of PRMR

## Summer 2023 – Offered Capacity & PRMR (MW)

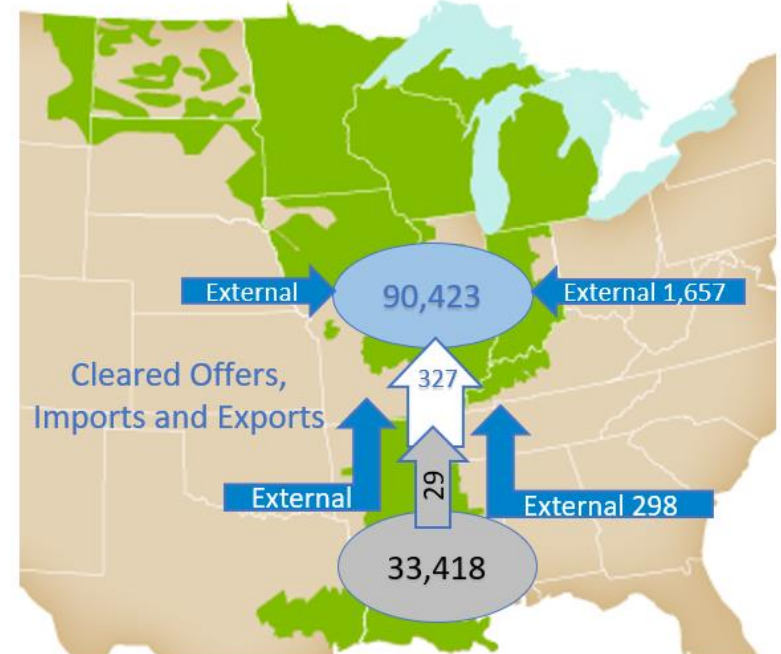
## Summer 2023 – Cleared Capacity, Imports & Exports (MW)



## Fall 2023 – Offered Capacity & PRMR (MW)



## Fall 2023 – Cleared Capacity, Imports & Exports (MW)



# Winter 2023/24 – Offered Capacity & PRMR (MW)

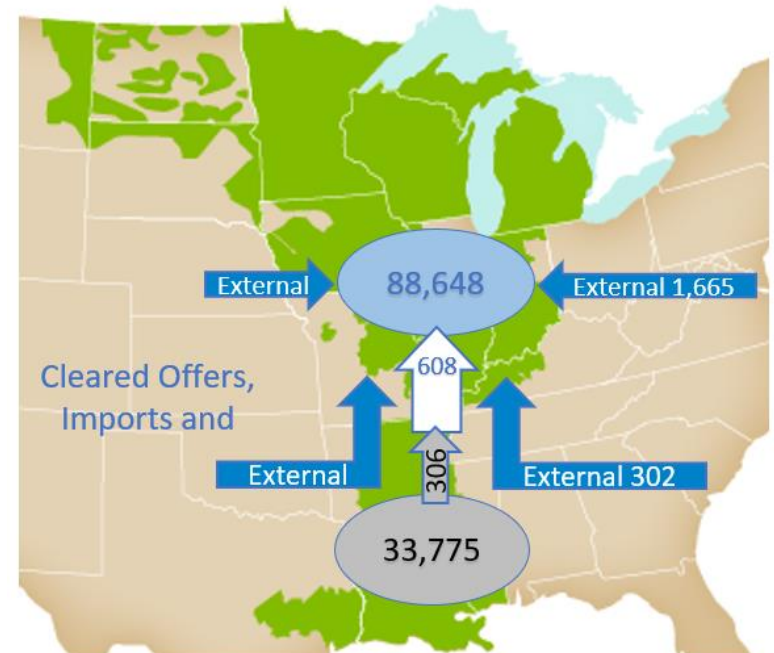
# Winter 2023/24 – Cleared Capacity, Imports & Exports (MW)



## Spring 2024 – Offered Capacity & PRMR (MW)



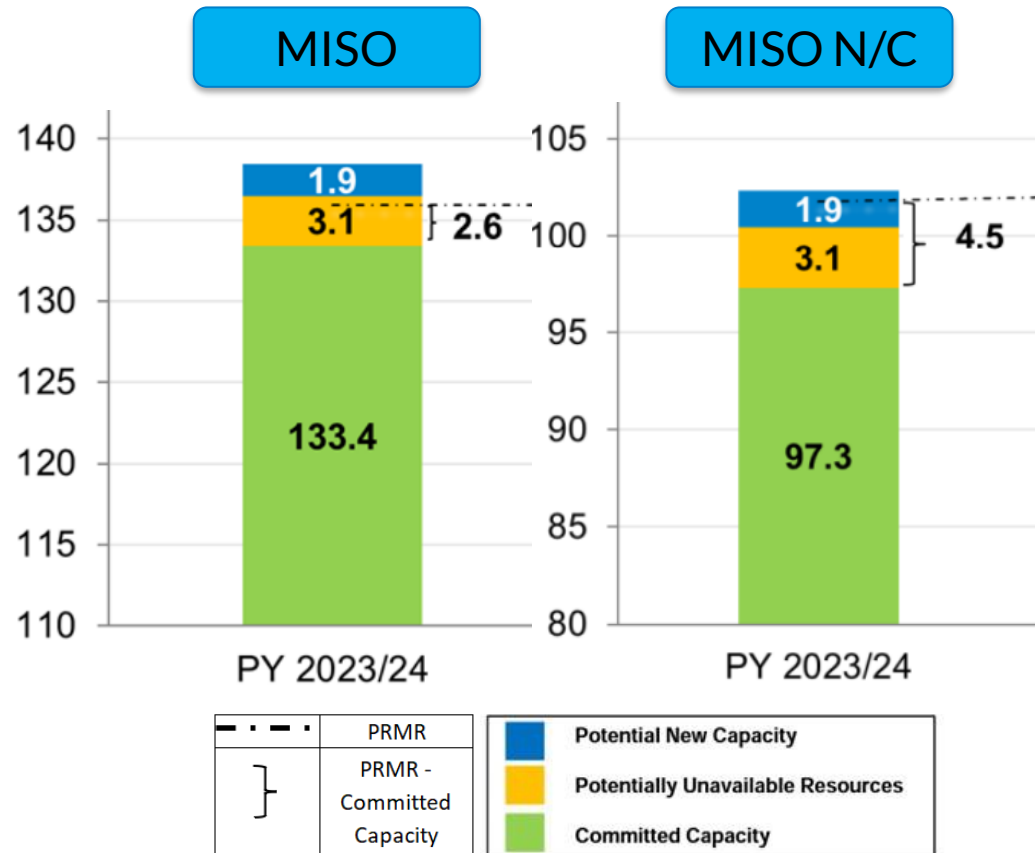
## Spring 2024 – Cleared Capacity, Imports & Exports (MW)



# 2022 OMS-MISO survey projected deficit in MISO and MISO N/C. Decreased PRMR, participation of potentially unavailable resources, increased imports and accreditation bridged the gap.

## 2022 OMS-Survey Results vs. Summer 2023 PRA outcomes

- Delayed retirements – 3.54 GW
  - 2.7 of the 3.1GW of Potentially Unavailable Resources offered into the 2023 Summer PRA
  - 443 MW reported as 0 in the 2022 OMS-MISO Survey participated in the 2023 Summer PRA
  - Additionally 400MW of resources participated in the 2023 Summer PRA that did not in 22-23 or the 2022 survey
- 3GW lower PRMR in 2023 Summer PRA vs. Survey comprised of lower PRM% and lower demand forecast
- 700MW new firm imports
- 750MW footprint wide accreditation increase for wind resources



MISO-wide, there was 2.6 GW more of ZRCs offered in the Summer 2023 than in 2022. Coal retirements offset by new gas, capacity addition from renewables and LMRs

Offers (GW)	2022	Summer 2023	Change
Gas	58.5	59.9	1.4
Wind	3.8	5.0	1.2
Solar	2.1	3.0	0.9
Water	6.3	6.6	0.3
Nuclear	11.3	11.3	0.0
Coal	40.4	38.9	-1.5
Other Fuels	6.7	6.3	-0.5
DR	7.6	8.3	0.7
<b>Total Offers</b>	<b>136.8</b>	<b>139.4</b>	<b>2.6</b>

Offers (GW)	2022	Summer 2023	Change
Gen	121.5	122.4	0.9
BTMG	4.2	4.2	0.0
ER	3.6	4.5	1.0
DR	7.6	8.3	0.7
<b>Total Offers</b>	<b>136.8</b>	<b>139.4</b>	<b>2.6</b>

There was 3.4 GW more of Confirmed ICAP in the Summer 2023 than in 2022. Coal retirements offset by new gas, capacity addition from renewables and LMRs

ICAP (GW)	2022	Summer 2023	Change
Gas	64.5	66.3	1.8
Wind	25.8	28.5	2.7
Solar	2.7	4.1	1.4
Water	6.7	6.9	0.2
Nuclear	12.0	12.0	0.0
Coal	47.7	45.4	-2.3
Other Fuels	7.5	7.4	-0.1
DR	7.1	7.5	0.5
<b>Total Offers</b>	<b>173.9</b>	<b>178.1</b>	<b>4.3</b>

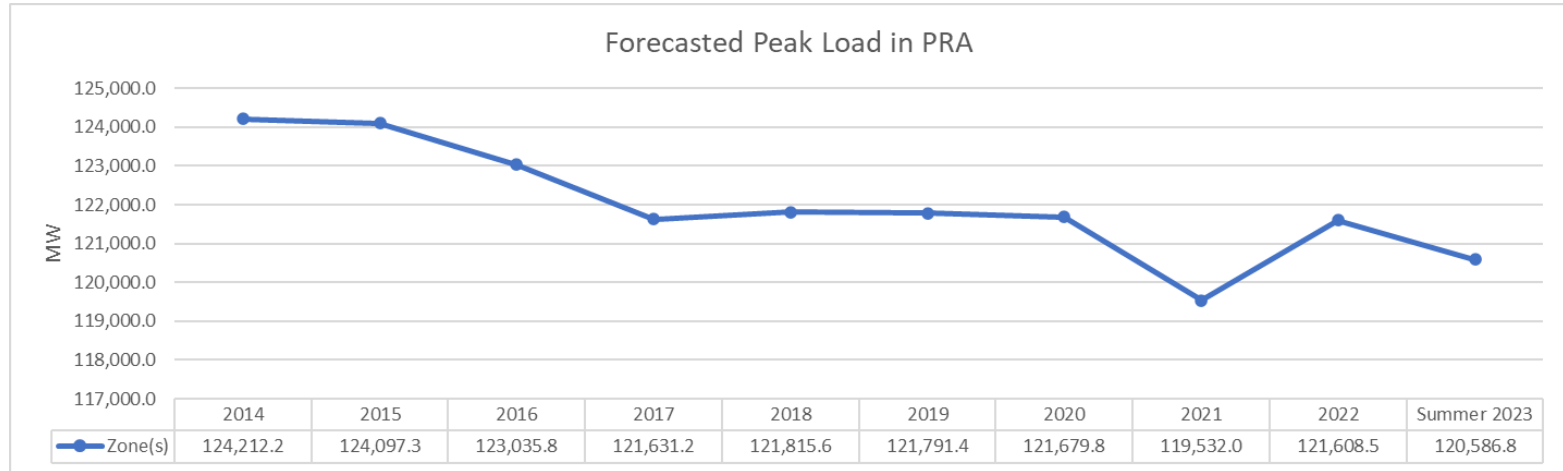
ICAP (GW)	2022	Summer 2023	Change
Gen	158.6	161.2	2.6
BTMG	4.5	4.6	0.1
ER	3.7	4.7	1.1
DR	7.1	7.5	0.5
<b>Total Offers</b>	<b>173.9</b>	<b>178.1</b>	<b>4.3</b>

Coal retirements offset by new gas, surplus created with renewables and LMRs

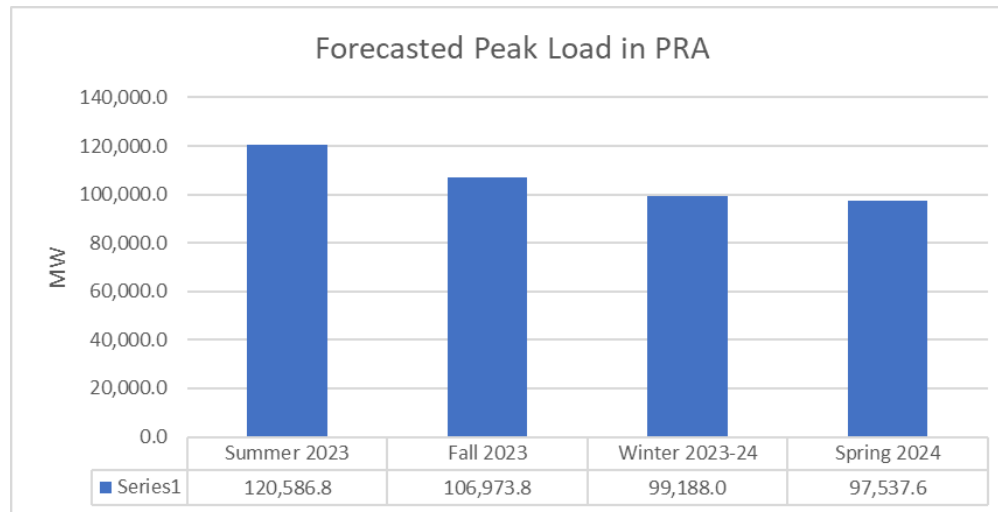


# Forecasted Peak Load (CPF)

Year over year the summer CPF (-1.0 GW), PRM (-1.3%) and PRMR (2.44 GW) are lower.



## 2023-2024 Seasonal Forecasted Peak



# Planning Reserve Margin (%)

## Historic PRM Trend

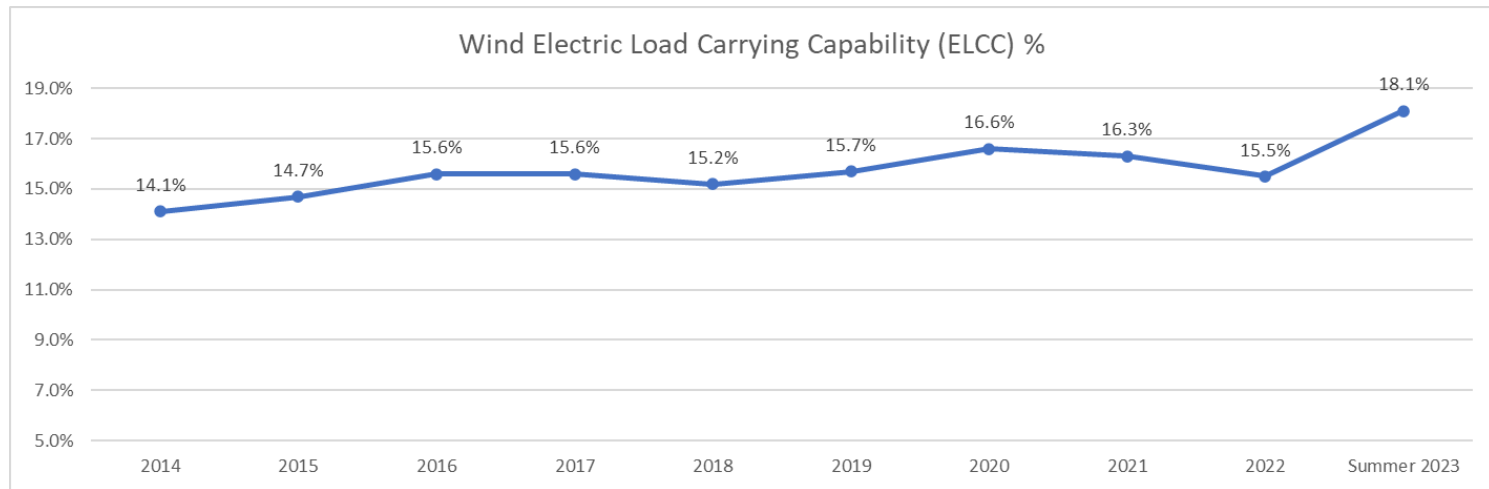


## 2023-2024 Seasonal PRM

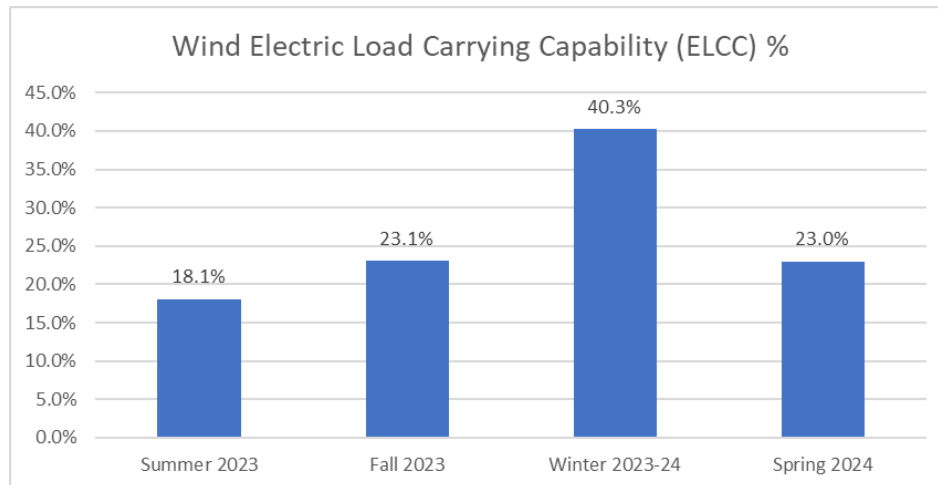


# Wind Effective Load Carrying Capacity (%)

## Historic ELCC Trend

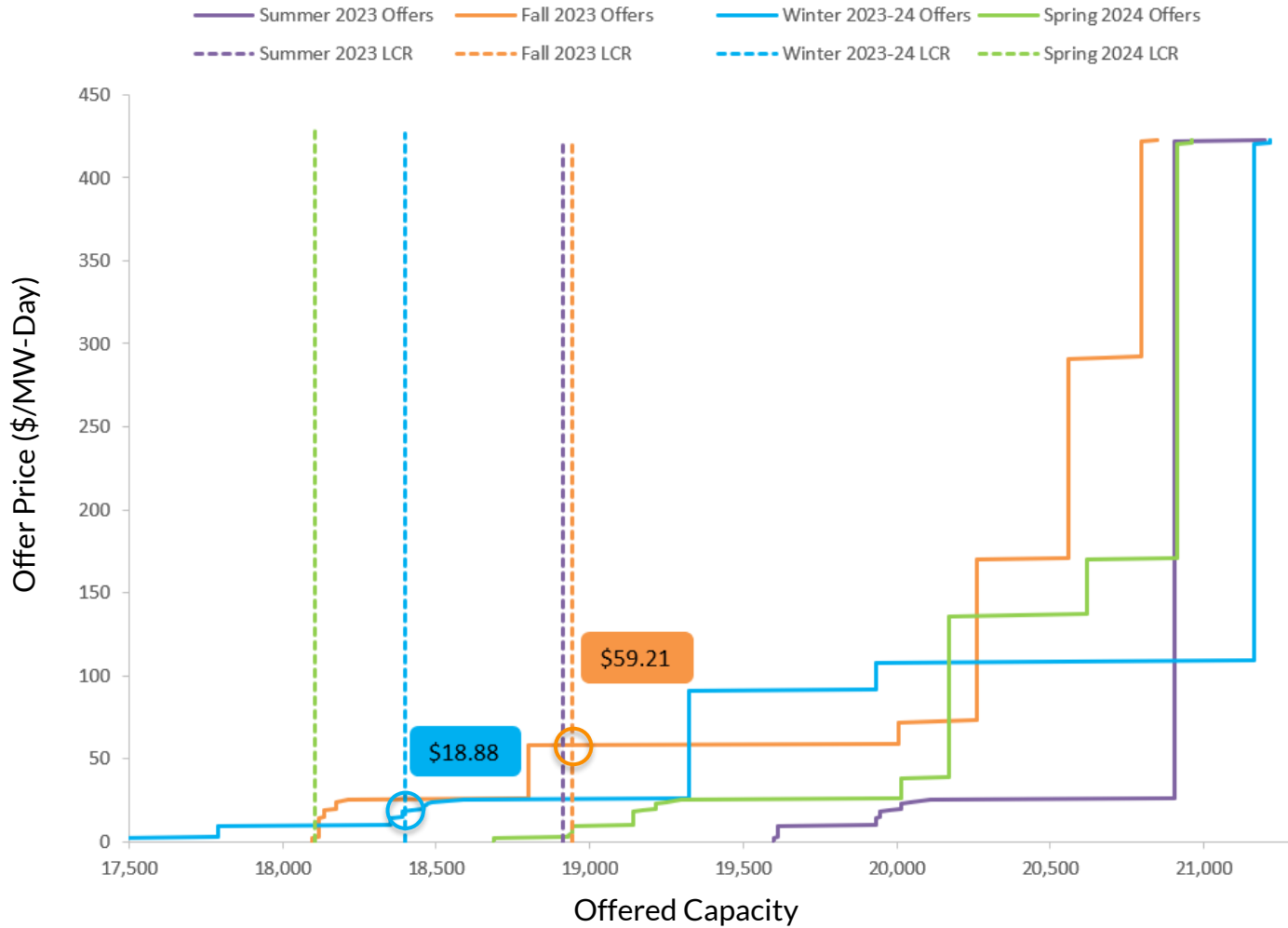


## 2023-24 ELCC Seasonal

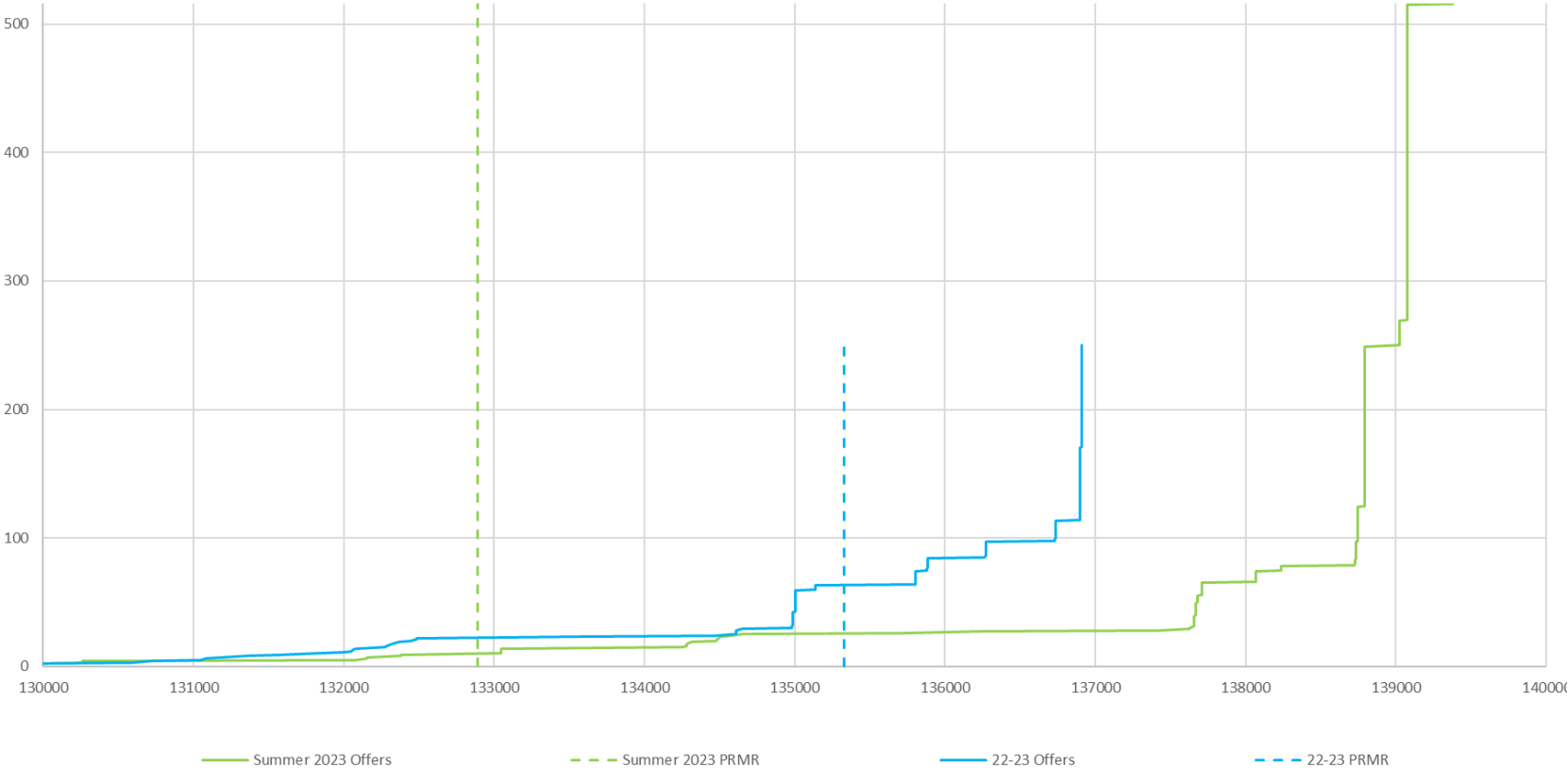


- No change to wind or solar accreditation methodology from previous years
- Methodology applied on a seasonal basis
- Wind ELCC and new solar capacity is established in the LOLE Study
- New solar
  - Summer, Fall, Spring 50%
  - Winter 5%

# LRZ9 seasonal offer curves and local clearing requirements

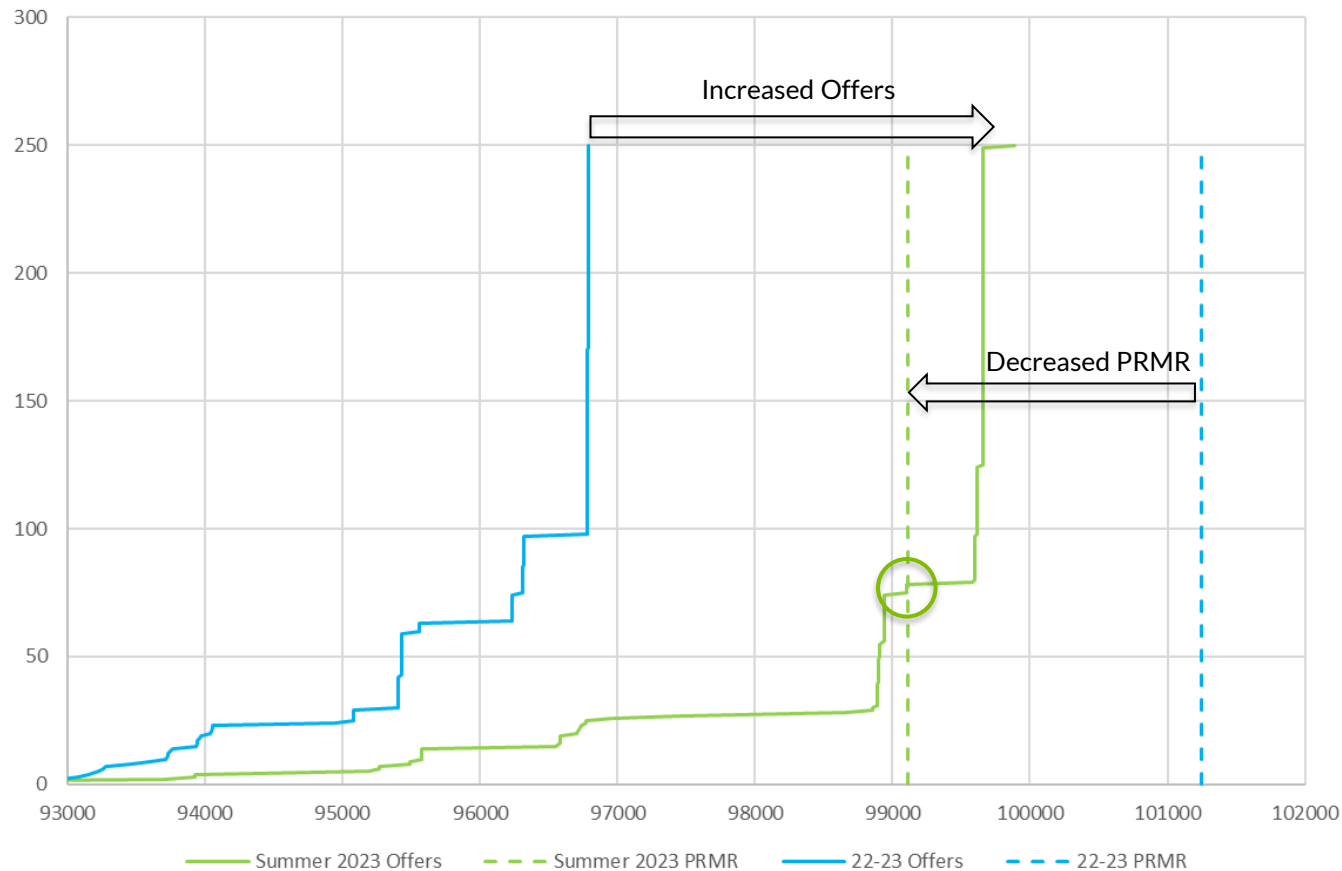


# MISO PRMR and Supply curves Summer 2023 vs. 2022-23PY



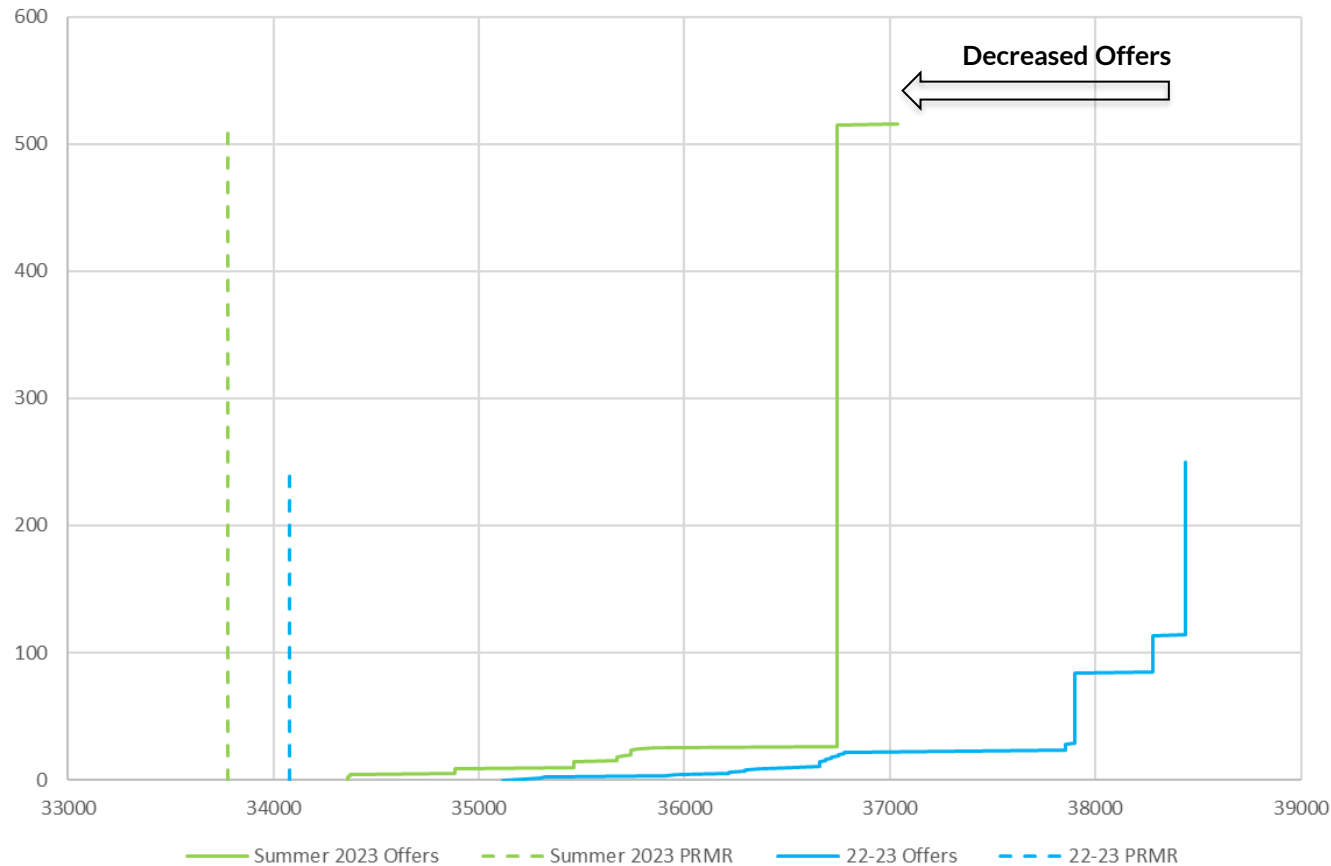
# North/Central had sufficient capacity to meet PRMR (\$79) without imports unlike PY 22-23 but utilized cheaper imports from MISO South and Externals

MISO N/C Only 22-23 vs. Summer 2023



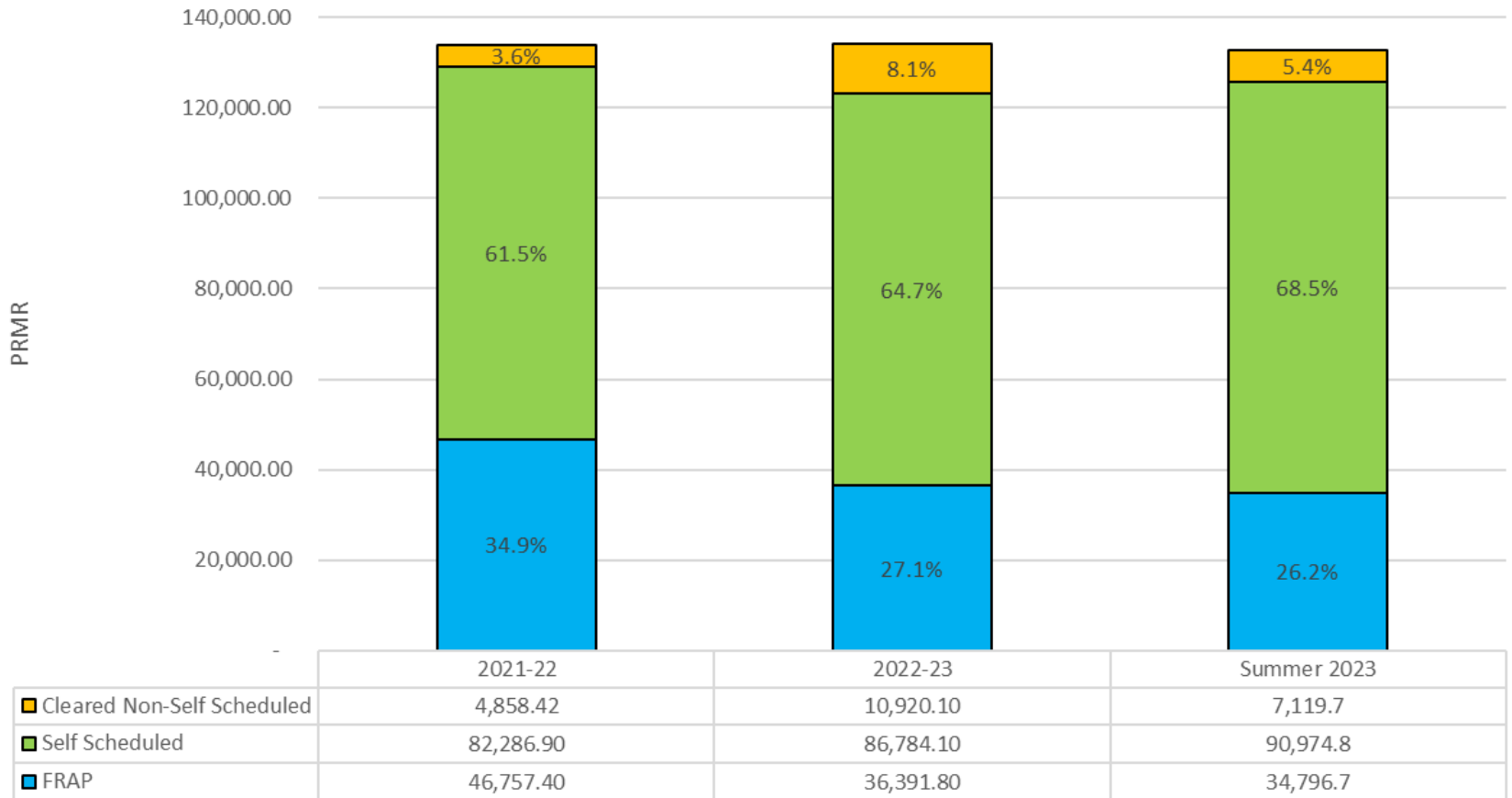
# MISO South has capacity beyond the region's PRMR and exported to N/C but the offered capacity has decreased since last year

MISO S 22-23 vs. Summer2023



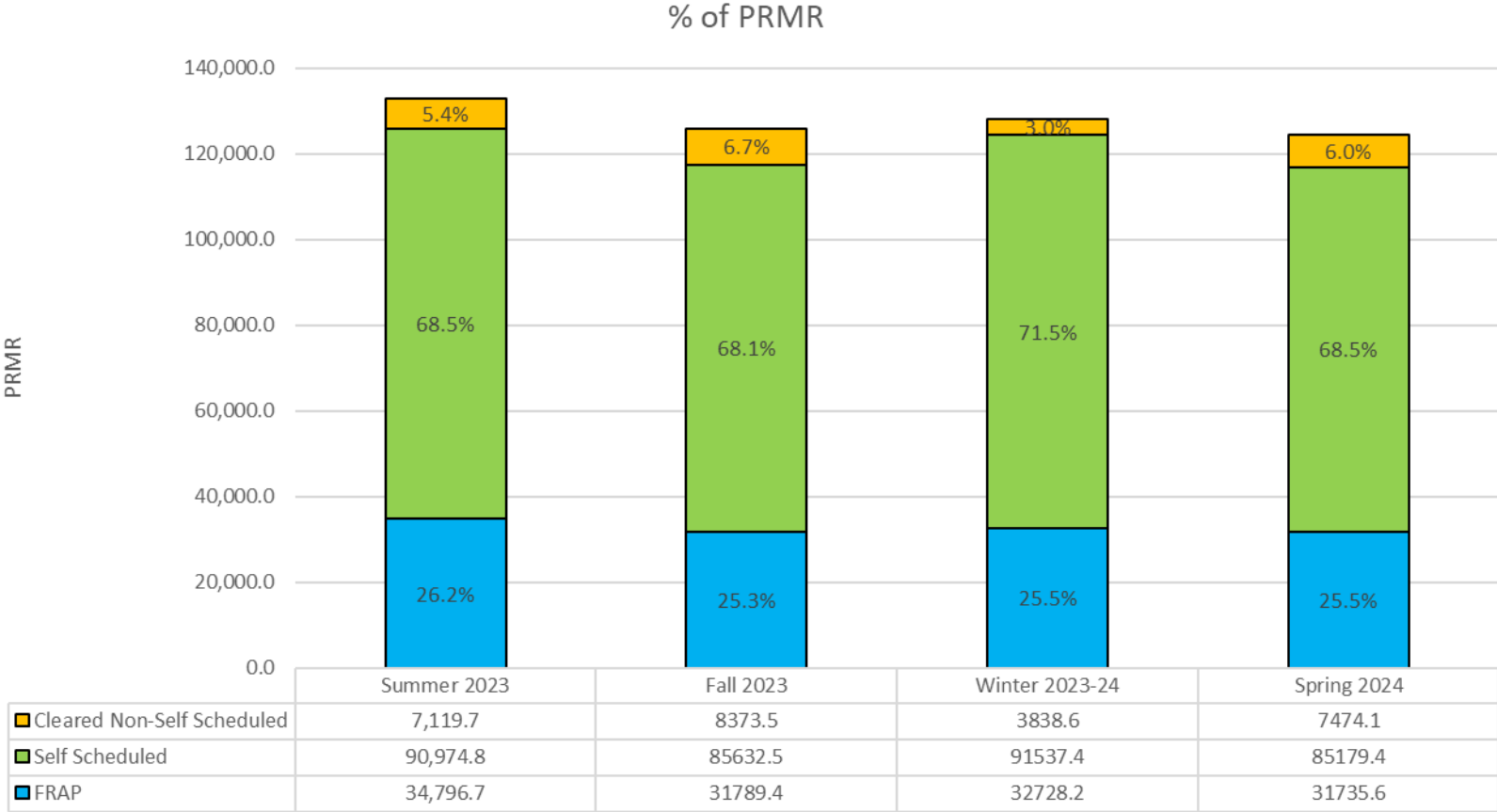
# Most members continue to meet resource adequacy requirements through fixed plans and self-scheduling

% of PRMR



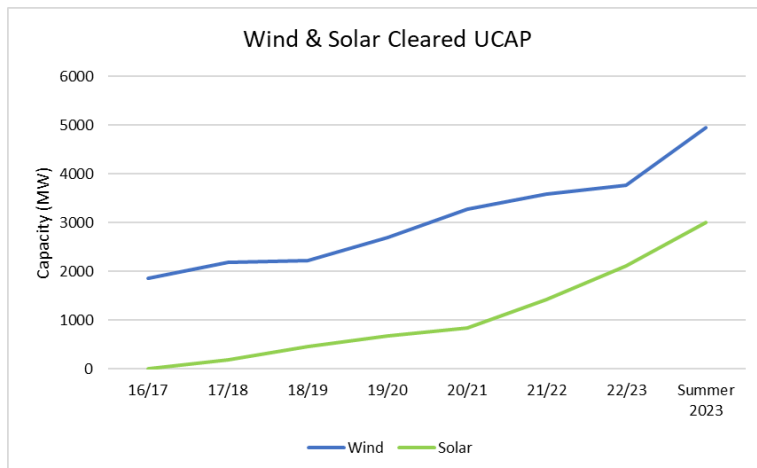
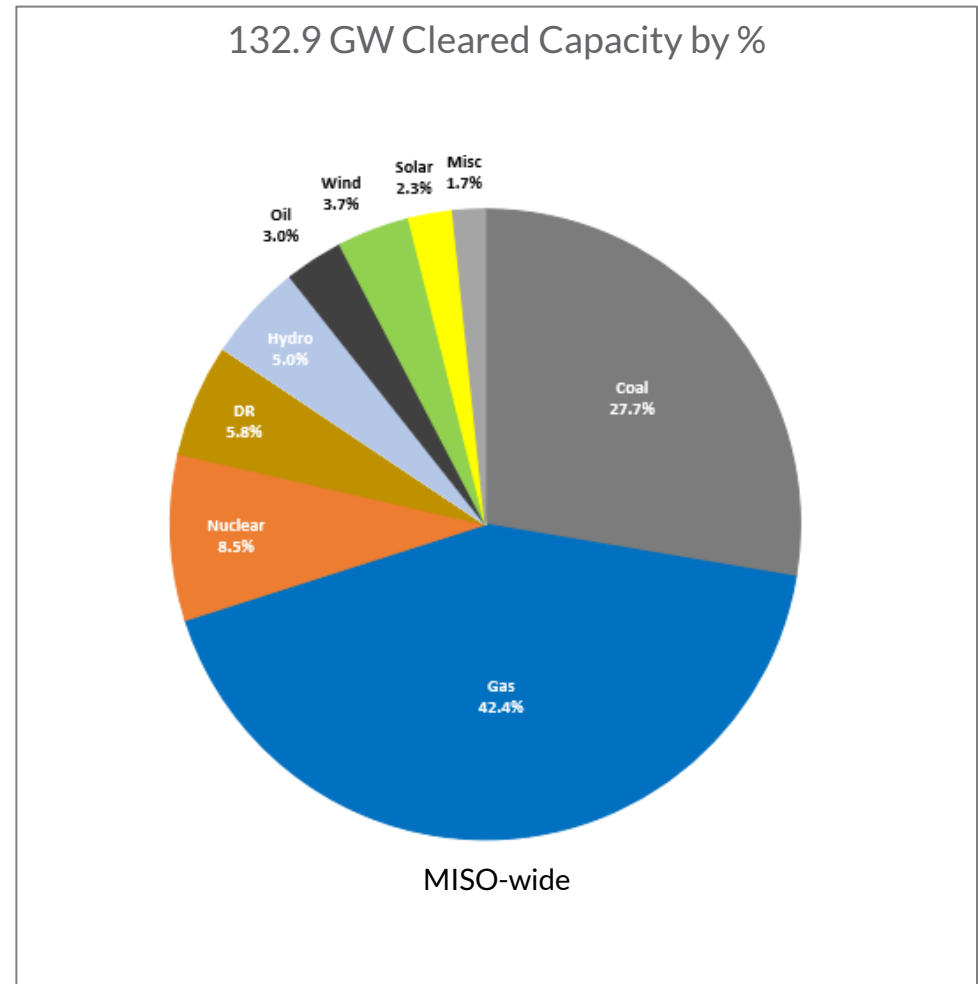


# 2023-2024 Seasonal Resource Adequacy Requirements are fulfilled similarly across all four seasons

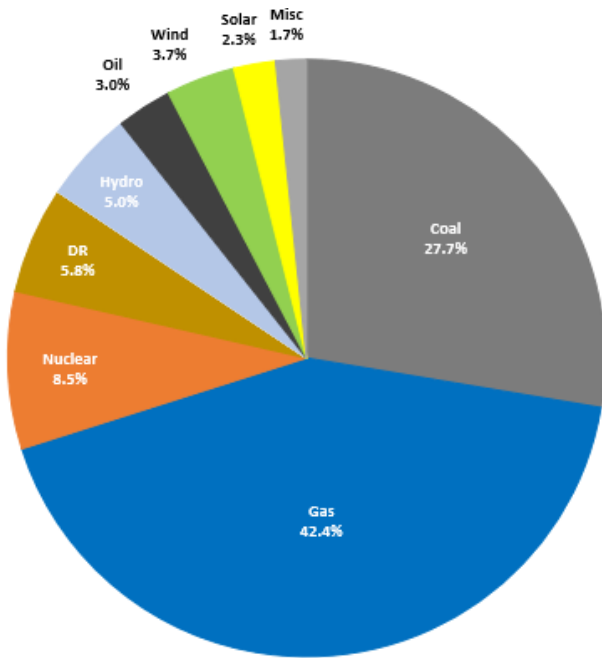


# For the Summer 2023, although conventional generation still provides most of the capacity, wind and solar continue to grow

- 3.0 GW of solar cleared this year's auction—an increase of 42% from Planning Year 2022-23 (2.1 GW)
- Similarly, 5.0 GW of wind cleared this year, an increase of 32% compared to last year (3.8 GW)



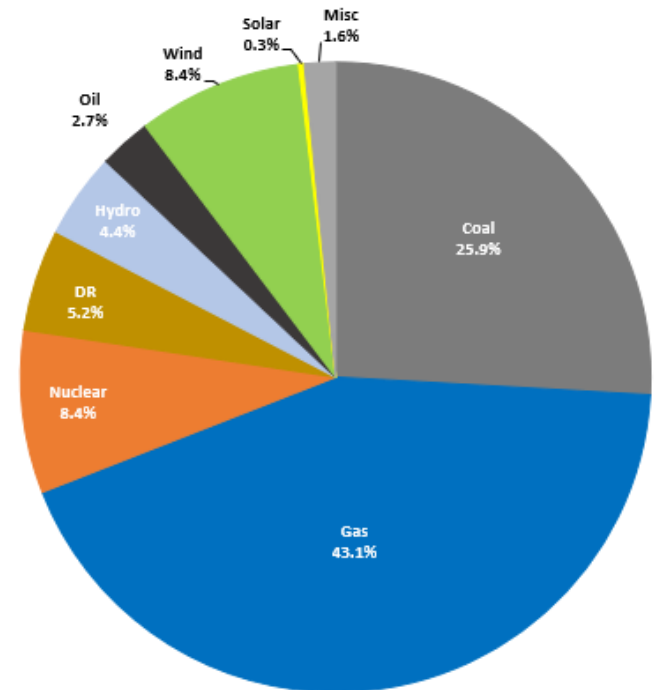
Winter PRMR is 4.8 GW (3.6%) lower than the summer. There were less thermal, hydro and solar resources and significantly more wind to meet PRMR in the Winter versus the Summer.



Summer 2023  
Cleared Capacity

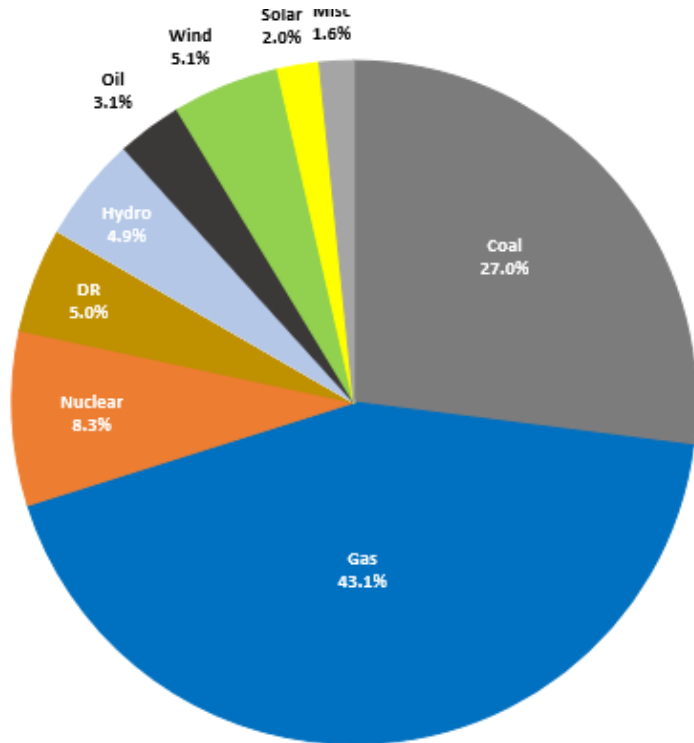
MISO-wide

Cleared ZRCs	Summer 2023	Winter 2023-24	Difference
Coal	36,749.7	33,177.9	3,571.8
Gas	56,384.1	55,276.0	1,108.1
Nuclear	11,317.7	10,708.4	609.3
DR	7,694.6	6,702.4	992.2
EE	5.0	6.7	-1.7
Hydro	6,604.1	5,599.4	1,004.7
Oil	3,980.1	3,423.6	556.5
Wind	4,952.2	10,800.2	-5,848.0
Solar	3,008.2	371.8	2,636.4
Misc	2,195.5	2,037.8	157.7
PRMR	132,891.2	128,104.2	4,787.0



Winter 2023-24  
Cleared Capacity

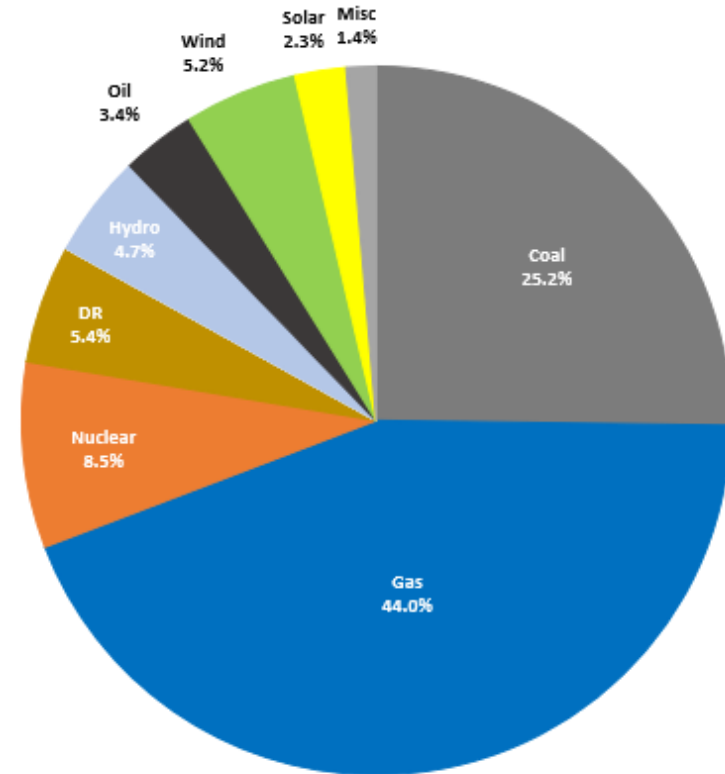
# Fall 2023 and Spring 2024 - Cleared ZRCs and PRMR



Fall 2023  
Cleared Capacity

MISO-wide

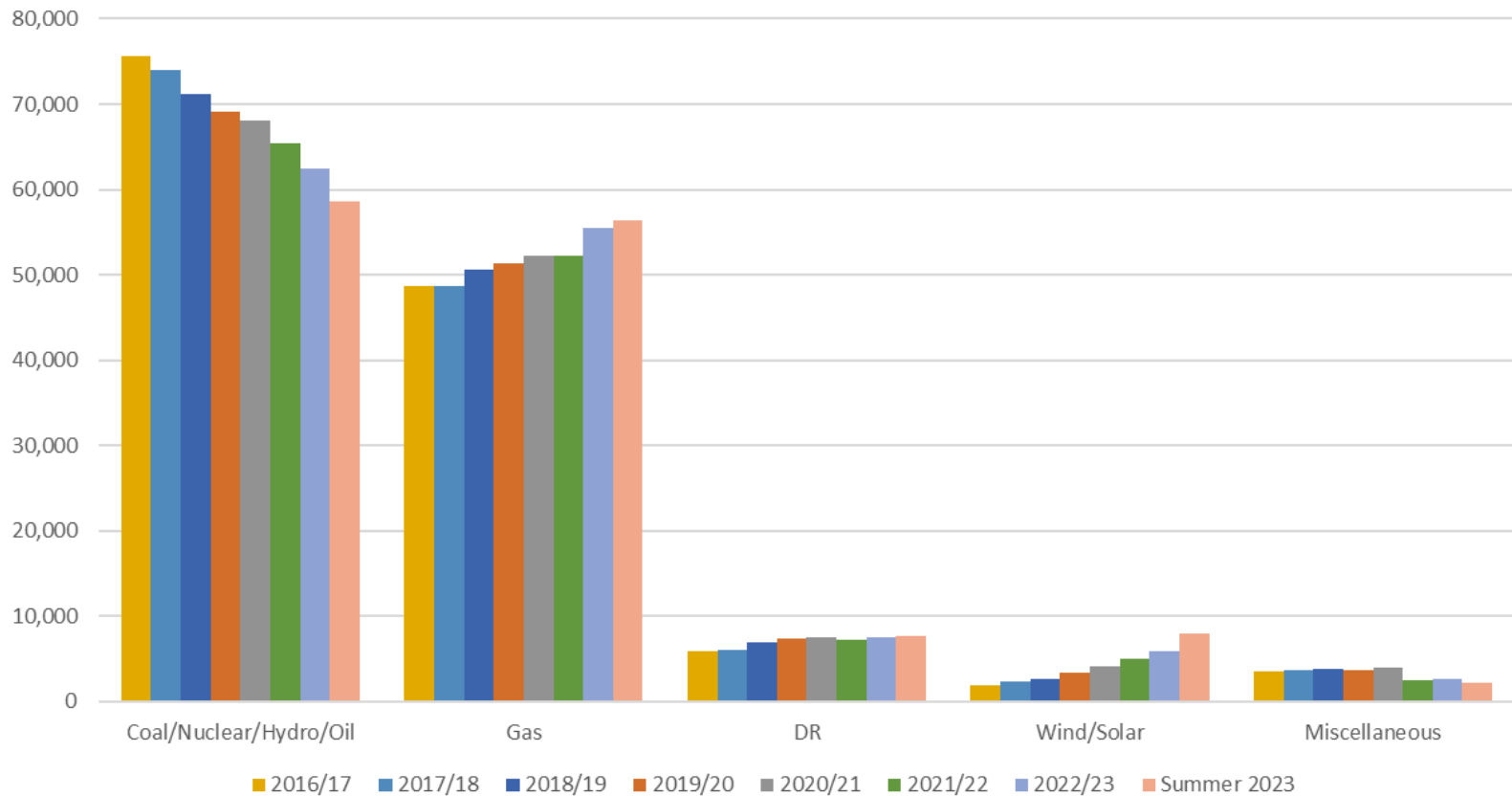
Cleared ZRCs	Fall 2023	Spring 2024
Coal	33,978.5	31,366.6
Gas	54,243.2	54,701.3
Nuclear	10,382.2	10,539.4
DR	6,254.4	6,720.0
EE	4.8	5.3
Hydro	6,223.3	5,850.4
Oil	3,837.9	4,207.9
Wind	6,357.1	6,413.1
Solar	2,485.8	2,903.8
Misc	2,028.2	1,681.3
PRMR	125,795.4	124,389.1



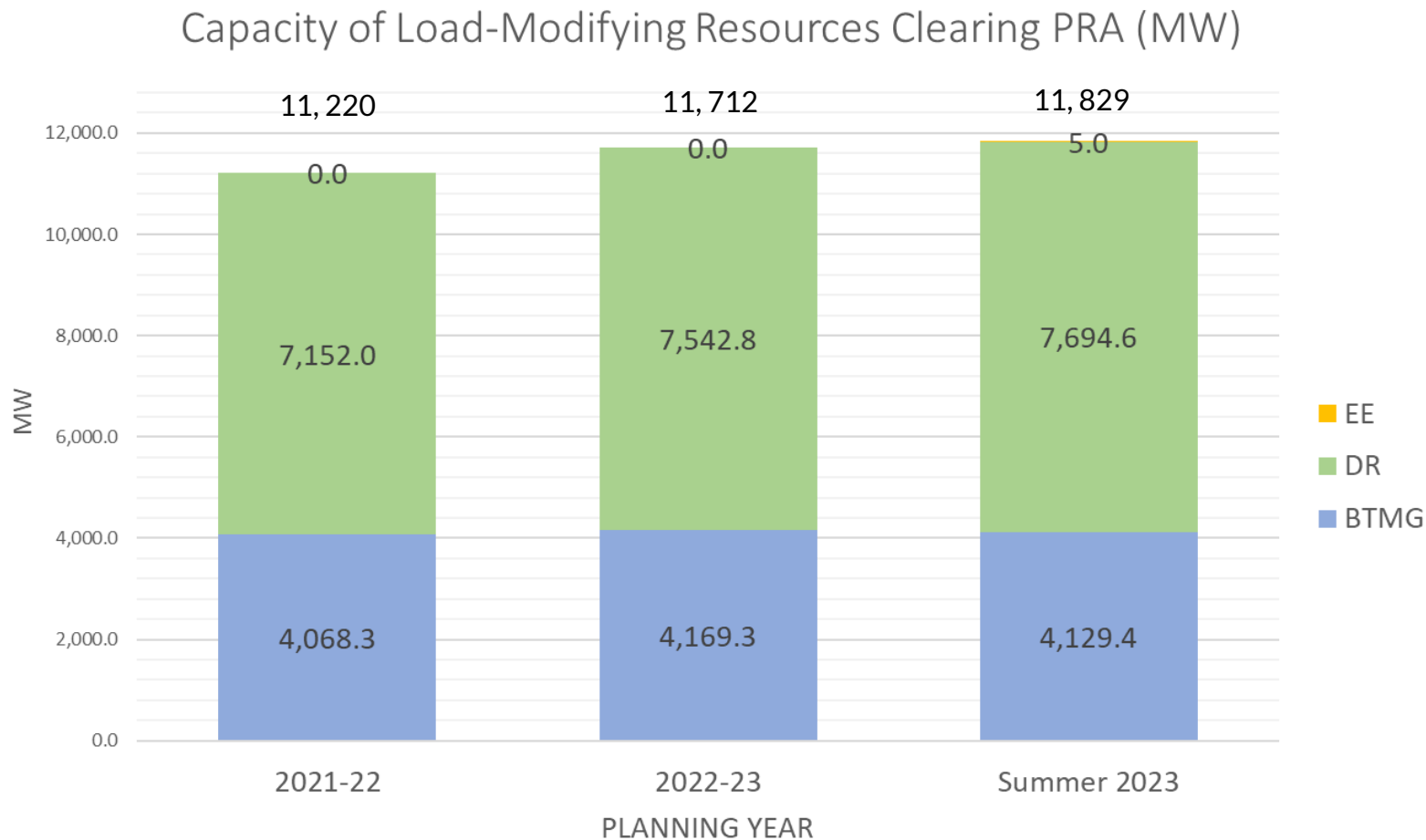
Spring 2024  
Cleared Capacity

The planning resource mix shows the continuation of a multi-year trend toward less coal/nuclear/hydro/oil and increased gas and non-conventional resources

### Cleared Capacity (MW)



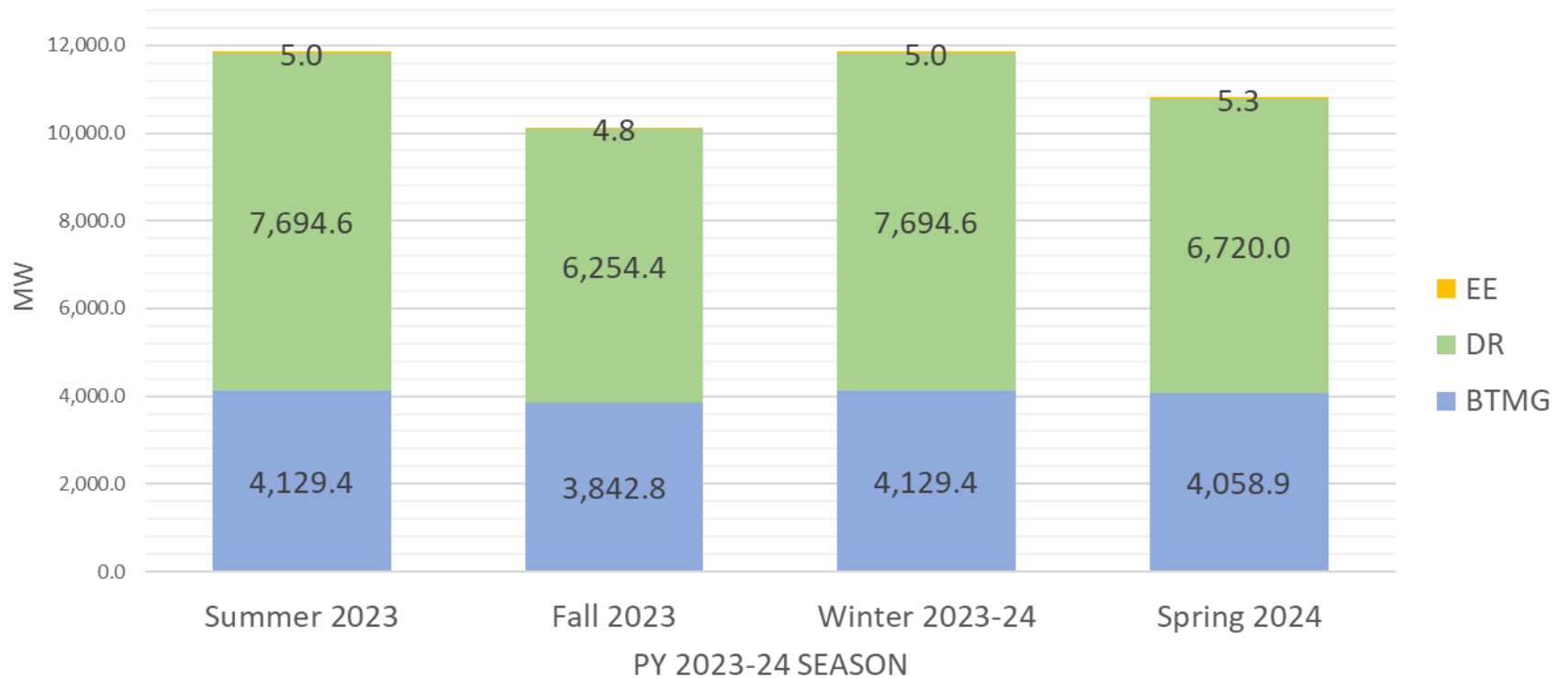
# Historical trend for LMRs (DR, EE and BTMG) cleared in the PRA



Around 600 additional DRs were offered in for the 2023-24 PRA that did not clear the auction.

# 2023-2024 Seasonally Cleared LMR Comparison

## Capacity of Load-Modifying Resources Clearing PRA (MW)



# Study Reports

- **LOLE Study Report**

- <https://cdn.misoenergy.org/PY%202023%202024%20LOLE%20Study%20Report626798.pdf>

- **Wind & Solar Capacity Credit Report**

- <https://cdn.misoenergy.org/2023%20Wind%20and%20Solar%20Capacity%20Credit%20Report628118.pdf>

- **CIL/CEL**

- [https://cdn.misoenergy.org/20221003%20LOLEWG%20Item%2004%20PY%202023-24%20Final%20CIL-CEL%20Results\\_Updated626464.pdf](https://cdn.misoenergy.org/20221003%20LOLEWG%20Item%2004%20PY%202023-24%20Final%20CIL-CEL%20Results_Updated626464.pdf)

- **SRIC/SREC**

- [https://cdn.misoenergy.org/SRIC\\_SREC%20Posting%20for%202023\\_24%20PRA628233.pdf](https://cdn.misoenergy.org/SRIC_SREC%20Posting%20for%202023_24%20PRA628233.pdf)





<https://help.misoenergy.org/support/>

IN THE MATTER OF:  
ELECTRONIC TARIFF FILING OF BIG RIVERS ELECTRIC CORPORATION  
AND KENERGY CORP. TO REVISE THE  
LARGE INDUSTRIAL CUSTOMER STANDBY SERVICE TARIFF  
CASE NO. 2023-00312

JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

**REQUEST NO. 2-6: Refer to BREC's response to Staff's First Request, Item 10.**

a. Explain whether BREC is aware of either Domtar or Kimberley-Clark have registering as a Load Modifying Resource — Behind the Meter Generator (LMR-BTMG) resource or registering / committing their generation resources to participate in the annual PRA. Include in the response if either Domtar or Kimberley-Clark has indicated that they do not wish or intend to register their generation resources with MISO.

b. Explain whether MISO registered LMR-BTMG resources are subject to non-performance penalties in the same manner as BREC.

**RESPONSE:**

a. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Big Rivers is not aware of whether Domtar or Kimberly-Clark intends to register its generation resource with MISO in the future.

b. Big Rivers is not technically charged non-performance penalties on its traditional resources, but MISO market charges are in essence doing the same thing as the non-performance

IN THE MATTER OF:  
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TO COMMISSION STAFF’S SECOND REQUEST FOR INFORMATION

charge that is assigned to LMR-BTMGs. Please see Module E of the MISO Tariff, Section 69A.3.9, which shows that LMR-BTMGs are charged a penalty equivalent to the “specified Demand reduction not achieved and the Hourly Real-Time Ex Post LMP at the CP Node, plus any applicable Revenue Sufficiency Guarantee Charges.”<sup>1</sup> If Big Rivers informs MISO that a unit is available Day-Ahead (DA) but that unit is not able to perform or can only produce at lower volume, then Big Rivers incurs Real-time (RT) Asset Energy charges, which would be the difference between Big Rivers’ DA Volume and RT Output and the associated RT LMP. Big Rivers would also be assigned RT Revenue Sufficiency Guarantee Distribution Charges for the shortfall.

**Witness: Terry Wright, Jr. (Big Rivers)**

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<sup>1</sup> <https://www.misoenergy.org/legal/tariff/>

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AND KENERGY CORP. TO REVISE THE  
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CASE NO. 2023-00312

JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

**REQUEST NO. 2-7:** *Refer to BREC's response to Staffs First Request, Item 11. Under the existing tariff, explain why BREC acknowledged and required a separation between services tailored to customers' scheduled and unscheduled outages, but now has determined that is not reasonable. Include in the response when Maintenance Power Service and Backup Power Service or similar services named differently were first implemented.*

**RESPONSE:** In the existing LICSS tariff, Big Rivers utilized the term Maintenance Power Service to describe service to back up a customer generator during scheduled outages, and we utilized the term Backup Power Service to describe service to back up a customer generator during unscheduled outages. These terms were utilized because they are familiar terms used in the industry. However, from Big Rivers' perspective, the service provided to back up a customer generator during scheduled outages is the same service provide to back up a customer generator during unscheduled outages. In either case, Big Rivers will secure backup energy in the MISO energy market. Also, whether the customer generator incurs scheduled outages, unscheduled outages, no outages, or both scheduled and unscheduled outages during a month, Big Rivers must maintain at all times during that month the capability to provide the amount of backup power requested by a customer. Thus, Big Rivers incurs the same cost whether the customer generator's outages are scheduled or unscheduled. Because the two terms amount to a distinction without a difference, and because utilizing those two terms caused confusion in Case No. 2021-00289, Big

IN THE MATTER OF:  
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JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

Rivers decided to use a single term to describe backup service during both scheduled and unscheduled outages.

Until Kimberly-Clark installed its own generator in 2021, Domtar was the only Large Industrial customer that requested backup power service. Domtar's predecessor in interest (Willamette Industries) installed its generator in or around 2001. Willamette's April 4, 2001, Amended and Restated Agreement for Retail Electric Service used the term Backup Power Service to describe backup service provided during both scheduled and unscheduled outages. Domtar inherited that contract. That contract was amended on January 21, 2011, through Domtar's Second Amended and Restated Agreement for Retail Electric Service, which continued to utilize the term Backup Power Service to describe backup service provided during both scheduled and unscheduled outages.

Big Rivers first utilized the term Maintenance Power to describe backup service provided during scheduled outages for Large Industrial customers in the existing LICSS tariff. For Rural customers, Big Rivers has used the terms Maintenance Power for backup service during scheduled outages and Backup Power for backup service during unscheduled outages since at least 2009, when the Commission approved Big Rivers' QFS tariff on March 6, 2009, in Case No. 2007-00455. This was prior to December 2010 when Big Rivers was fully integrated into MISO.

**Witness:     John Wolfram**

IN THE MATTER OF:  
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CASE NO. 2023-00312

JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

**REQUEST NO. 2-8:** *Refer to BREC's response to Staff's First Request, Item 14.*

- a. *If not answered above, confirm that MISO requires customers who self-supply a portion of their energy needs to have their self-supply capacity accredited.*
- b. *If MISO does not require accreditation, explain why it is reasonable to require it now when it was not required previously.*

**RESPONSE:**

- a. MISO does not require a behind-the-meter generator to register in the MISO market and receive capacity accreditation.
- b. Big Rivers believes that it is reasonable to require these resources to register in order to ensure Big Rivers accurately reports load values to MISO and that its LICSS tariff correctly passes through both credits and charges incurred as result of the LICSS customer's generation. As explained below, registration of the customer's resource permits Big Rivers to avoid the risk associated with the unit's continued operation.

MISO is the central authority that ensures that the power grid has adequate resources to meet its load requirements, not Big Rivers. When a behind-the-meter resource does not register with MISO, Big Rivers is forced to attempt to provide its own accreditation of the resource by submitting a lower total load value than would otherwise be submitted to MISO. For example, if Big Rivers' load were 700 MWs and the capacity of the customer's resource is 50 MWs, Big

IN THE MATTER OF:  
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LARGE INDUSTRIAL CUSTOMER STANDBY SERVICE TARIFF  
CASE NO. 2023-00312

JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

Rivers could consider reducing its load submission by 50 MWs, to 650 MWs. One of the first problems encountered is the 50 MW reduction does not assume any Forced Outage Rate, so by default, it is over-accredited at 50 MWs. The second problem is that any load reduction is amplified when the MISO PRM (%) is applied. For Planning Year 23-24, the MISO PRM (%) for the Winter Season was 25.5%, so a 50 MW resource would reduce Big Rivers' PRMR Requirement by 62.75 MWs (50 MWs \* 1.255). This is a higher amount than the customer's resource can produce. Had the resource been a traditional resource, it would have received an accreditation less than 50 MWs, which implies that Big Rivers would be over-accrediting the resource by at least 12.75 MWs. While this does not seem like a lot of MWs, there are many BTMG facilities across MISO's footprint; consequently, MISO could be at risk of underestimating its load due to the over-accreditation of these resources. As MISO becomes more and more capacity constrained due to base-load thermal units retiring and being replaced with intermittent wind and solar resources, capacity accreditation is becoming more important in MISO. In the past, there was significant excess capacity available across the footprint, while it is now becoming a tighter market with MISO predicting capacity shortfalls starting in Planning Year 25-26.

Attached to this response is a copy of MISO's "2023 OMS-MISO Survey Results" dated July 14, 2023 for information on these forecasted shortfalls.

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JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

**Witness: Terry Wright, Jr. (Big Rivers)**





# 2023 OMS-MISO Survey Results

Furthering our joint commitment to regional resource adequacy, OMS and MISO are pleased to announce the results of the 2023 OMS-MISO Survey

**July 14, 2023**

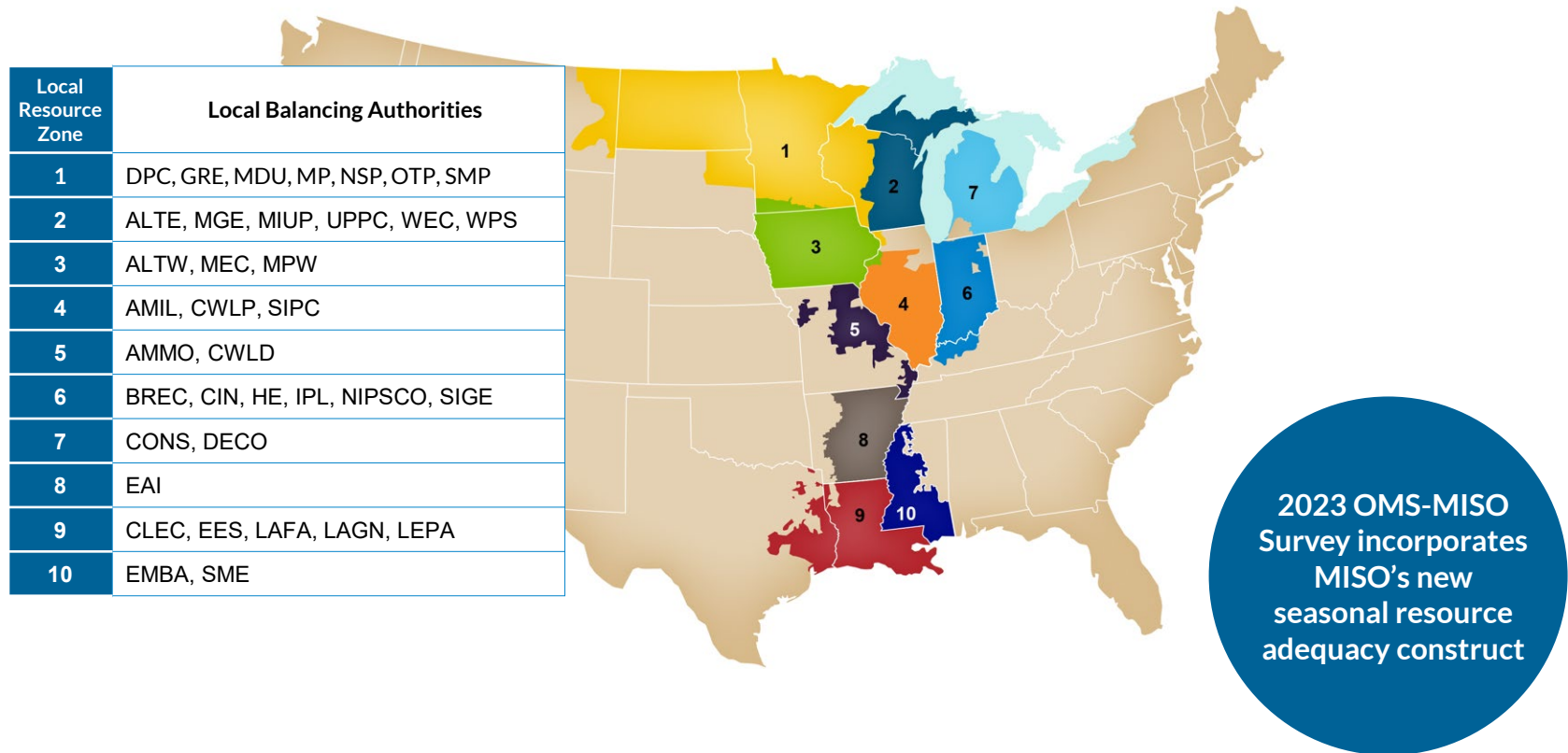
# Results of the 2023 OMS-MISO survey reinforce the need for continued reforms to MISO's resource adequacy construct to reliably manage portfolio transition

- Survey responses reflect market actions such as delayed retirements and capacity additions resulting in 1.5 GW of residual capacity for Planning Year (PY) 2024/25.
- Without continuation of such actions, a capacity deficit of 2.1 GW is projected for the summer of 2025/26 which grows in subsequent years.
- Non-summer seasons indicate sufficient, yet declining capacity over the survey horizon.
- The North/Central subregion shows potential capacity deficits starting in summer of PY 2025/26, while the South subregion shows increasing tightness and a potential deficit starting in winter 2027/28.
- Demand growth is projected to continue for five years across all four seasons at 0.8 GW or 0.68% per year on average.

All presentation references to capacity indicate seasonal accredited capacity (SAC)

# The OMS-MISO Survey provides a resource adequacy view over a five-year horizon based on currently available information

- 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



# The survey uses different categories to 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 horizon.\*
- Survey assumes that these resources will be used to meet the Planning Reserve Margin Requirement (PRMR) in the zone and region they are physically located.

## Signed GIA Capacity-Alternative estimate

- Consists of projects with signed interconnection agreements with commercial operation dates expected during survey horizon.
- Cumulative capacity added from signed GIA projects assumed to be 2.5 GW/year based on historical trend of 2-3 GW energized annually.

## Potentially Unavailable Resources

- Consists of installed generation resources with unclear commitment to MISO.
- Survey assumes that these resources will NOT be used to meet the PRMR.

## Potential New Capacity

- Consists of projects in MISO's generation interconnection queue that do not have a GIA, with capacity weighted to reflect progress through the queue\*

# External factors can impact projected deficits or surpluses that are observed in the survey

## Downside Risks

- Higher load growth due to electrification
- Accelerated retirements
- Continued queue challenges
- Delays in capacity addition due to continued supply chain bottlenecks
- Reduction in imported capacity
- Bulk of new resources are at lower capacity accreditations

## Upside Possibilities

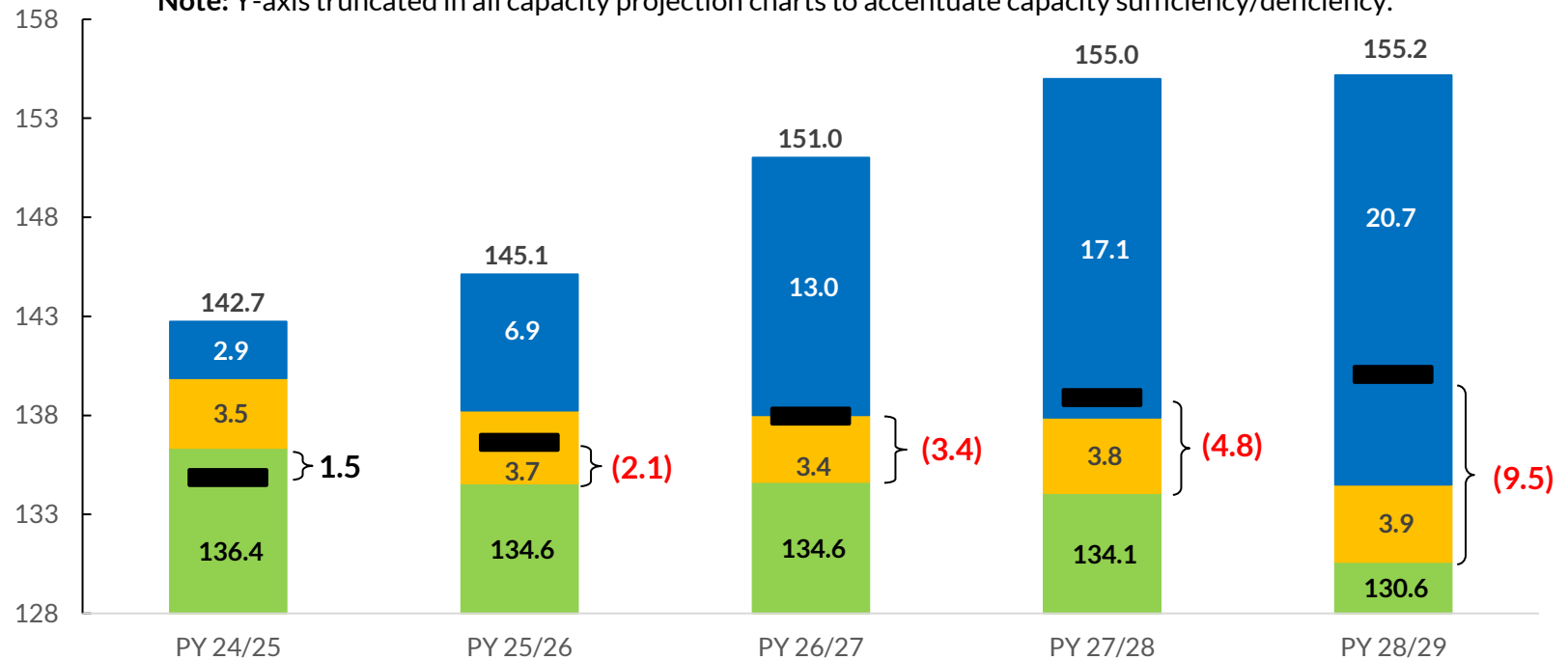
- Lower than expected load growth
- Sustained market responses from 2022 Planning Resource Auction (PRA)
  - Deferred retirements and return to service of suspended resources
  - Additional External Resources
  - Additional LMR registrations
- Higher accreditation due to improved availability and performance in times of need
- Continued queue improvements
- Easing of supply chain bottlenecks enabling substantial new capacity
- Lower planning reserve margins than currently projected

# Committed Capacity shows declines over survey window with potential resource deficits starting in PY 2025/26

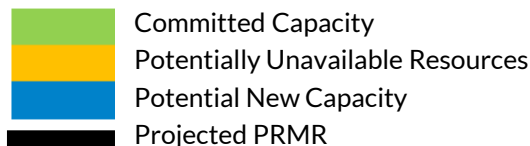
## Summer Seasonal Accredited Capacity Projections (GW)

2023 OMS-MISO Survey

**Note:** Y-axis truncated in all capacity projection charts to accentuate capacity sufficiency/deficiency.



**Projected Planning Reserve Margin (PRM)**

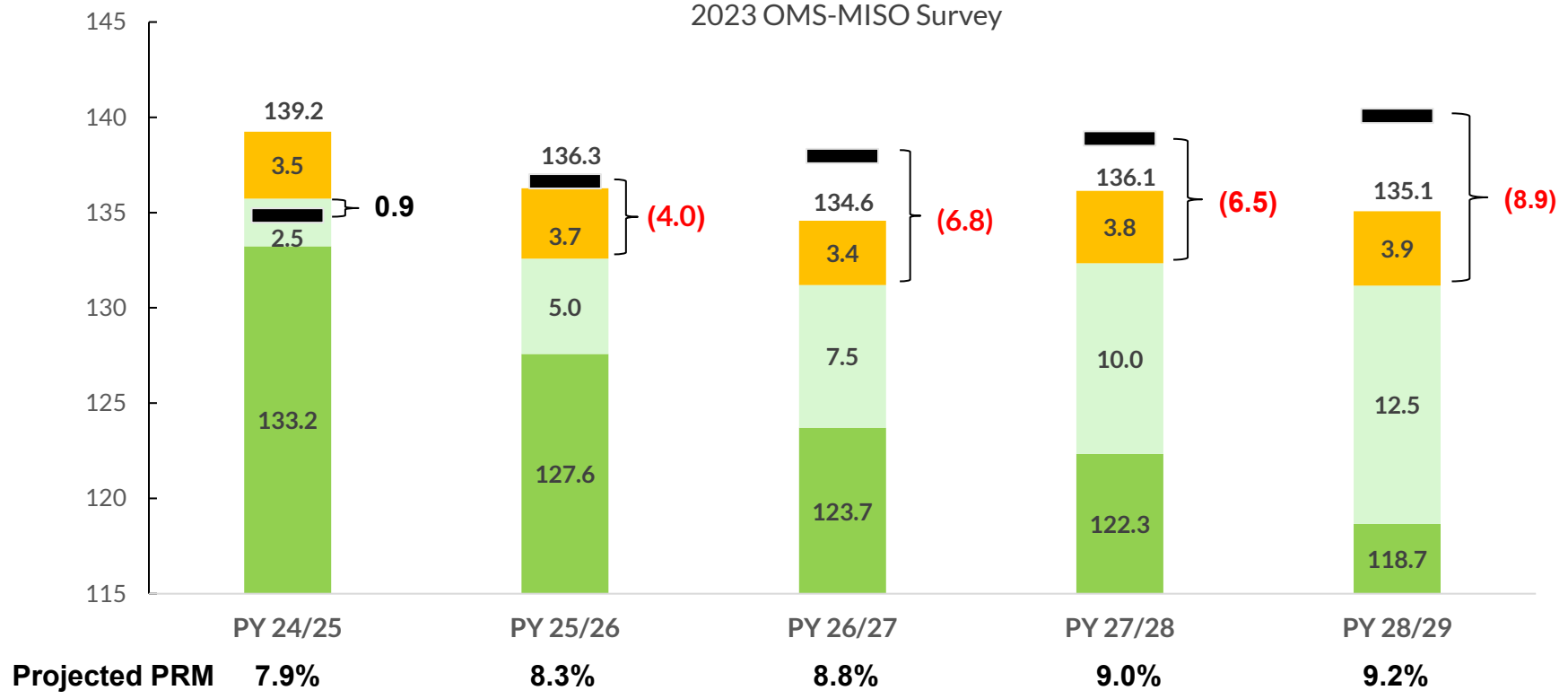


Bracketed values indicate difference between Committed Capacity and projected PRMR. Committed Capacity includes signed GIA projects shown on slide 19. Capacity accreditation values and PRM projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. Regional Directional Transfer (RDT) limit of 1900 MW is reflected in this chart

# Alternative capacity projections based on historical additions of 2.5 GW/year indicate higher resource adequacy risk from PY 2025/26

## Summer SAC Projections: Alternative View (GW)

2023 OMS-MISO Survey



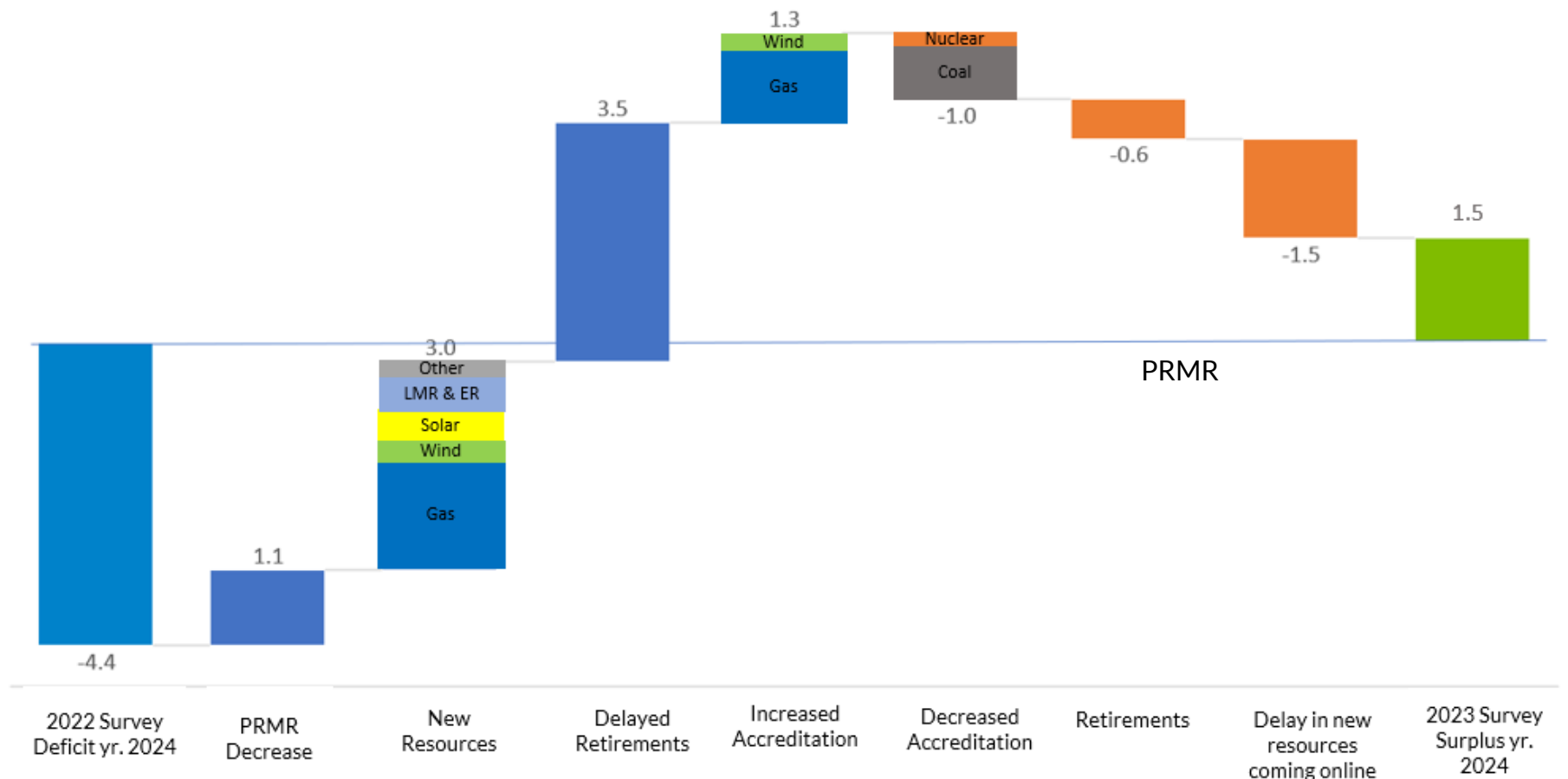
Committed Capacity  
 Signed GIA Capacity- Alt. Estimate  
 Potentially Unavailable Resources  
 Projected PRMR

Bracketed values indicate difference between Committed Capacity and projected PRMR. Committed capacity includes installed generation but does **not** include resources with GIA that are not online. Signed GIA Capacity additions assumed to be 2.5GW/year based on historical trend. Capacity accreditation values and PRM projections based on current practices.

# Year-over-year survey results for 2024 show a change from deficit to adequate supply due to delayed retirements, new resources and lower load forecast

## MISO 2024 SAC Projection (GW)

Reconciliation between 2022 & 2023 Summer OMS-MISO Survey for year 2024

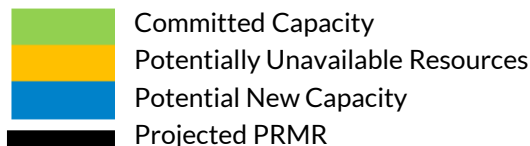
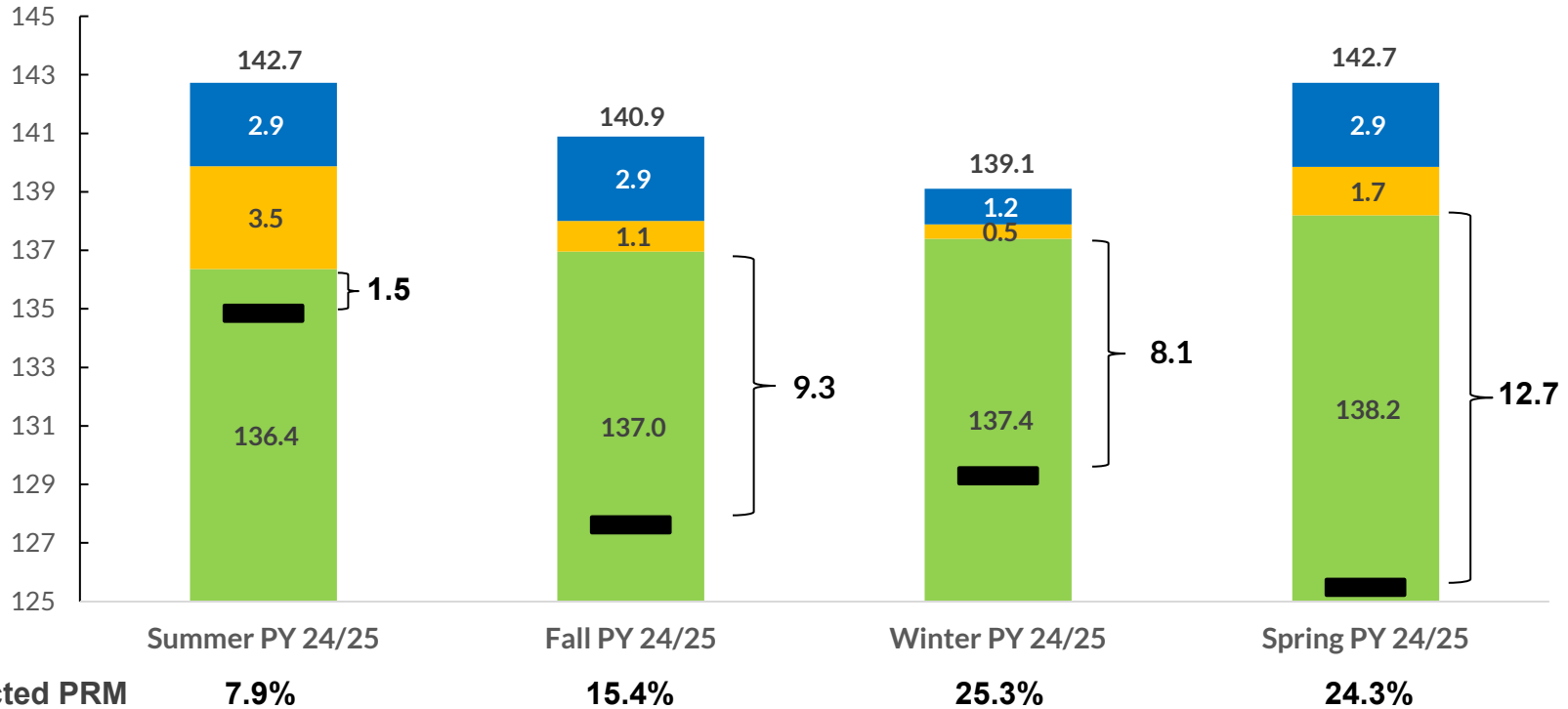




# 2024/2025 seasonal projections show adequate margins with summer having the tightest margins

## 2024/25 SAC Projections (GW)

2023 OMS-MISO Survey

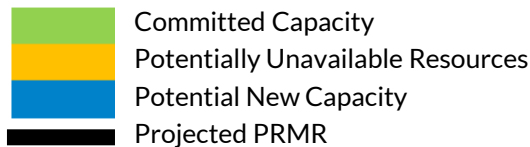
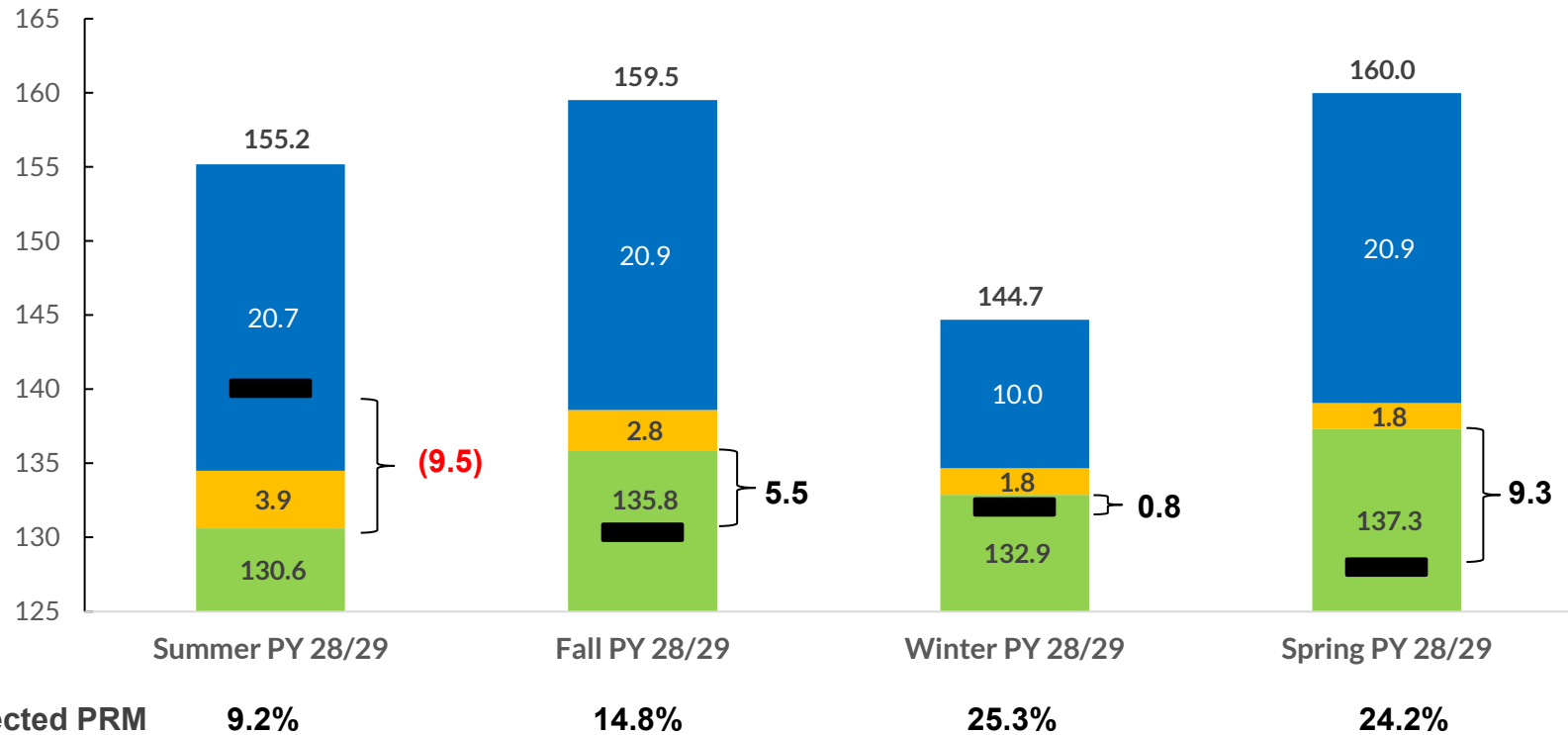


Bracketed values indicate difference between Committed Capacity and projected PRMR. Capacity accreditation values and PRM projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. RDT limit of 1900 MW is reflected in this chart.

# 2028/2029 projections show tighter conditions and increased reliance on new resources to meet PRMR

## 2028/29 SAC Projections (GW)

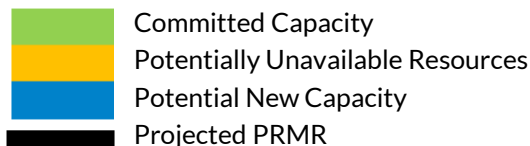
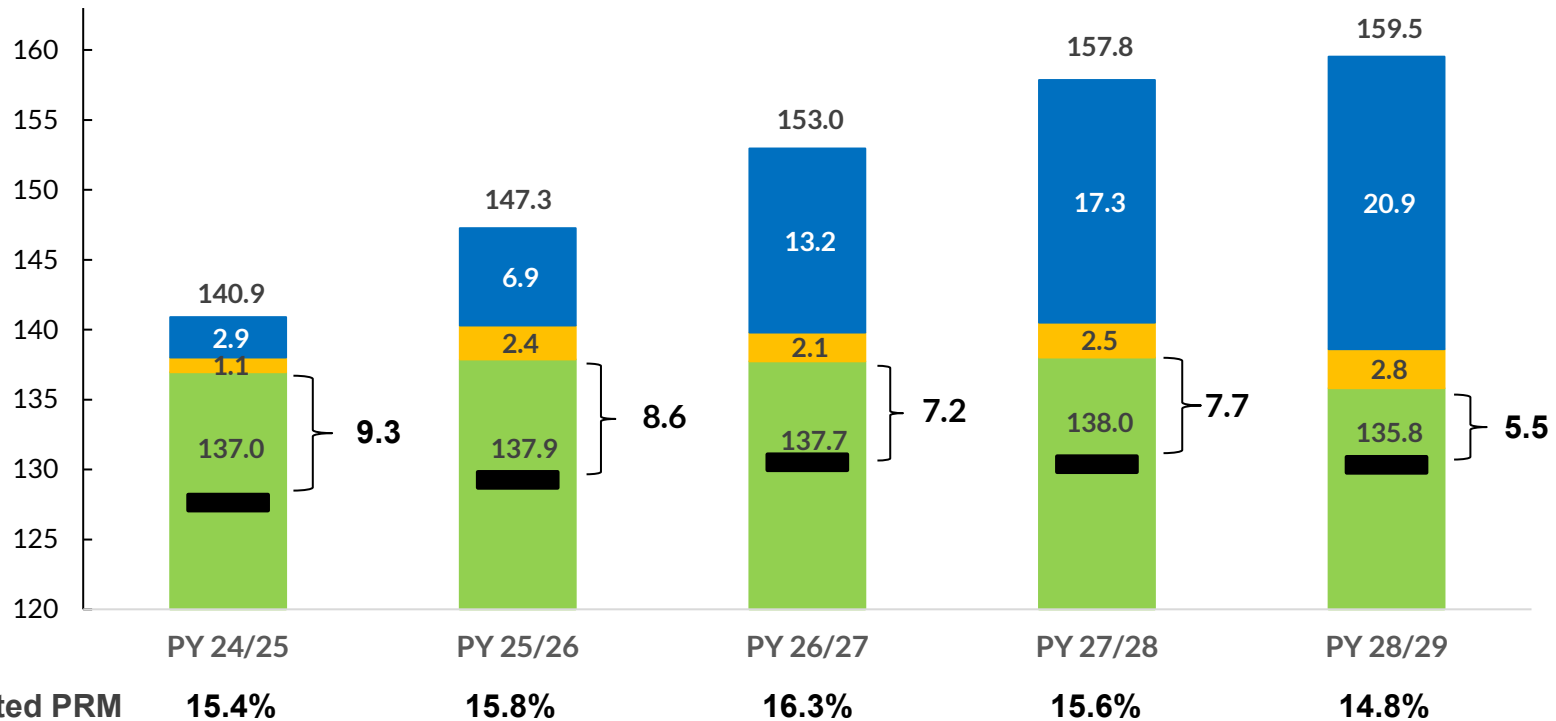
2023 OMS-MISO Survey



Bracketed values indicate difference between Committed Capacity and projected PRMR. Capacity accreditation values and PRM projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. RDT limit of 1900 MW is reflected in this chart.

# Fall season projections indicate sufficient capacity but show decrease in committed capacity in future years

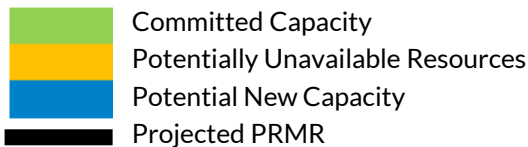
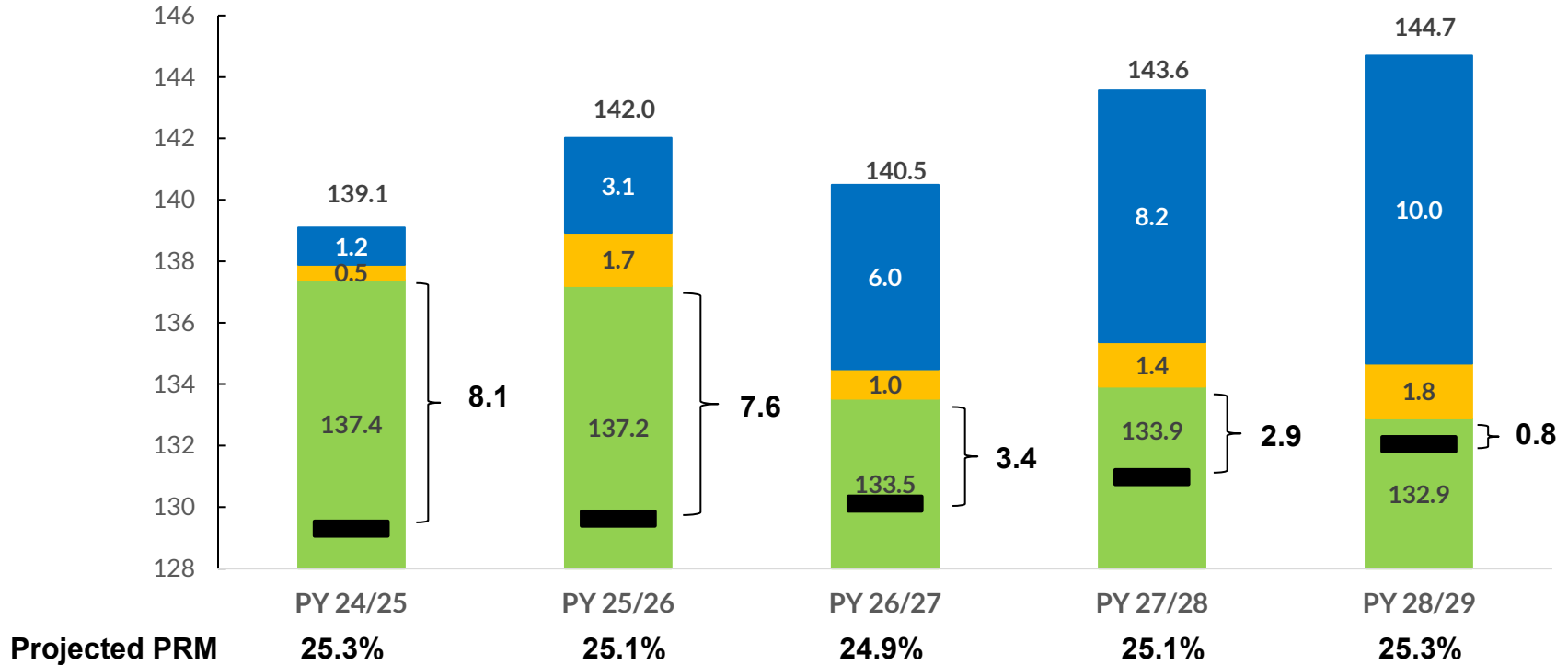
**Fall SAC Projections (GW)**  
2023 OMS-MISO Survey



Bracketed values indicate difference between Committed Capacity and projected PRMR. Capacity accreditation values and PRMR projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. RDT limit of 1900 MW is reflected in this chart.

# Winter season projections indicate sufficient capacity in the near term but tight conditions by PY2028/29

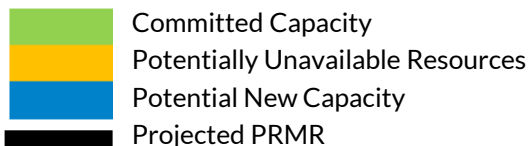
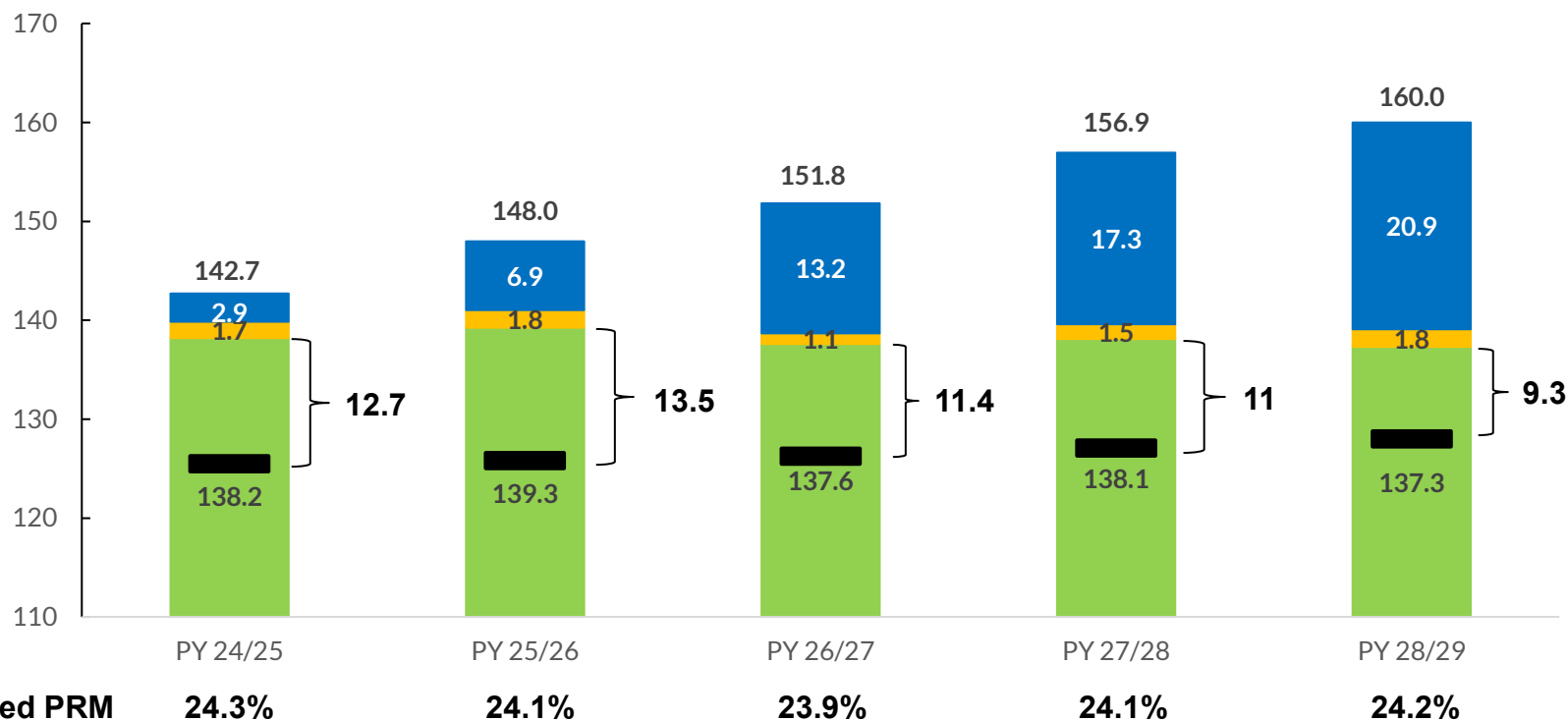
**Winter SAC Projections (GW)**  
2023 OMS-MISO Survey



Bracketed values indicate difference between Committed Capacity and projected PRMR. Capacity accreditation values and PRM projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. RDT limit of 1900 MW is reflected in this chart.

# Spring season projections indicate sufficient capacity over the survey horizon

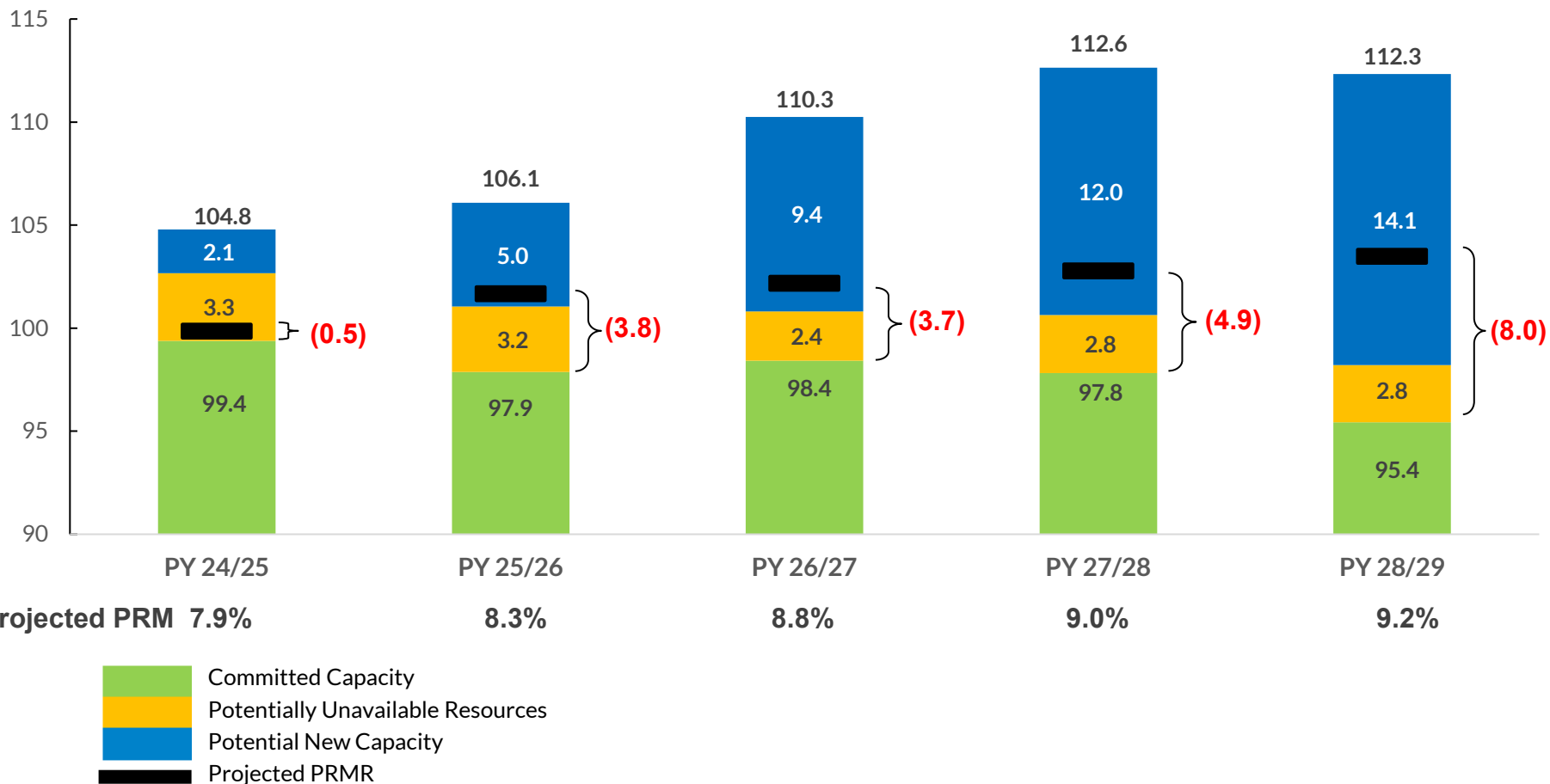
## Spring SAC Projections (GW) 2023 OMS-MISO Survey



Bracketed values indicate difference between Committed Capacity and projected PRMR. Capacity accreditation values and PRM projections based on current practices. Timing/GW of potential New Capacity projected per methodology noted in Oct 2022 RASC. RDT limit of 1900 MW is reflected in this chart.

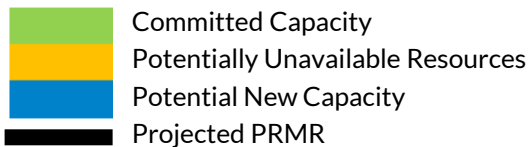
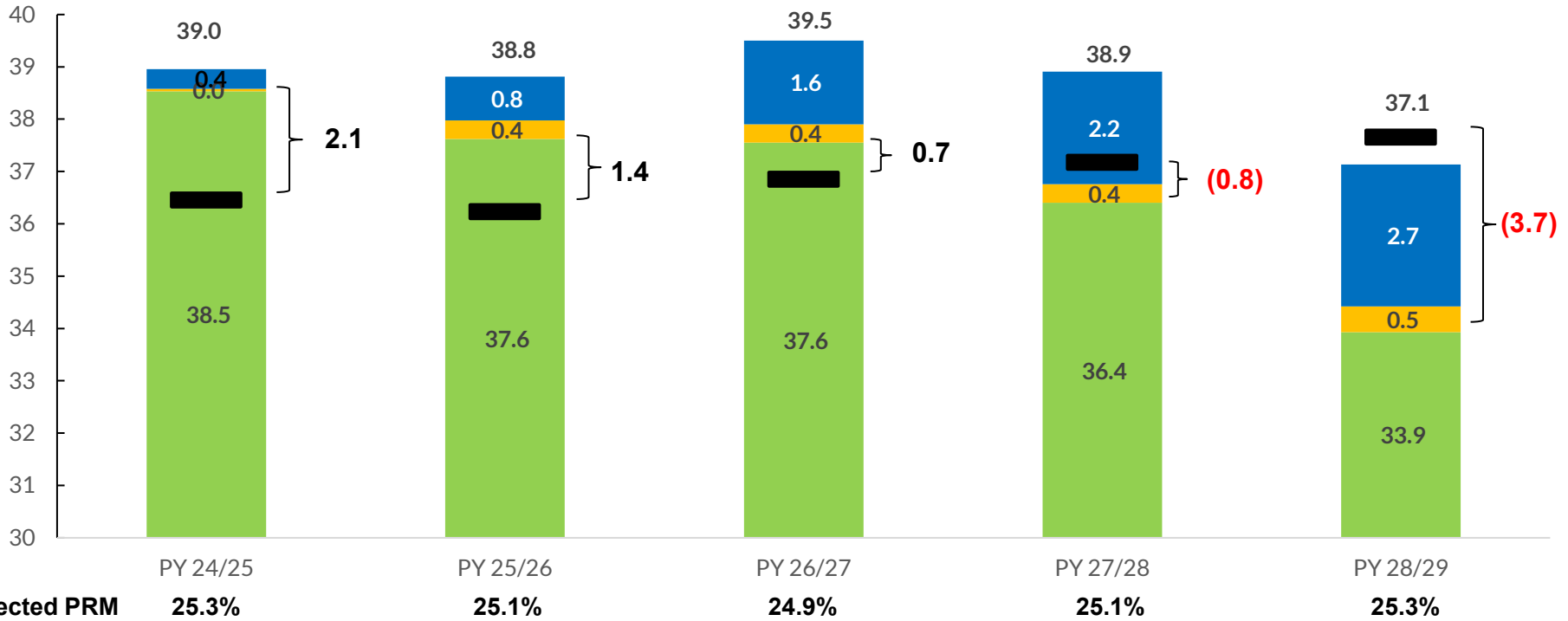
# Sub-regional projections show an increasing gap in summer in North/Central and...

Summer SAC projections for North/Central (GW)  
2023 OMS MISO Survey



# ... a similar outcome in Winter for South

## Winter SAC projections for South (GW) 2023 OMS MISO Survey



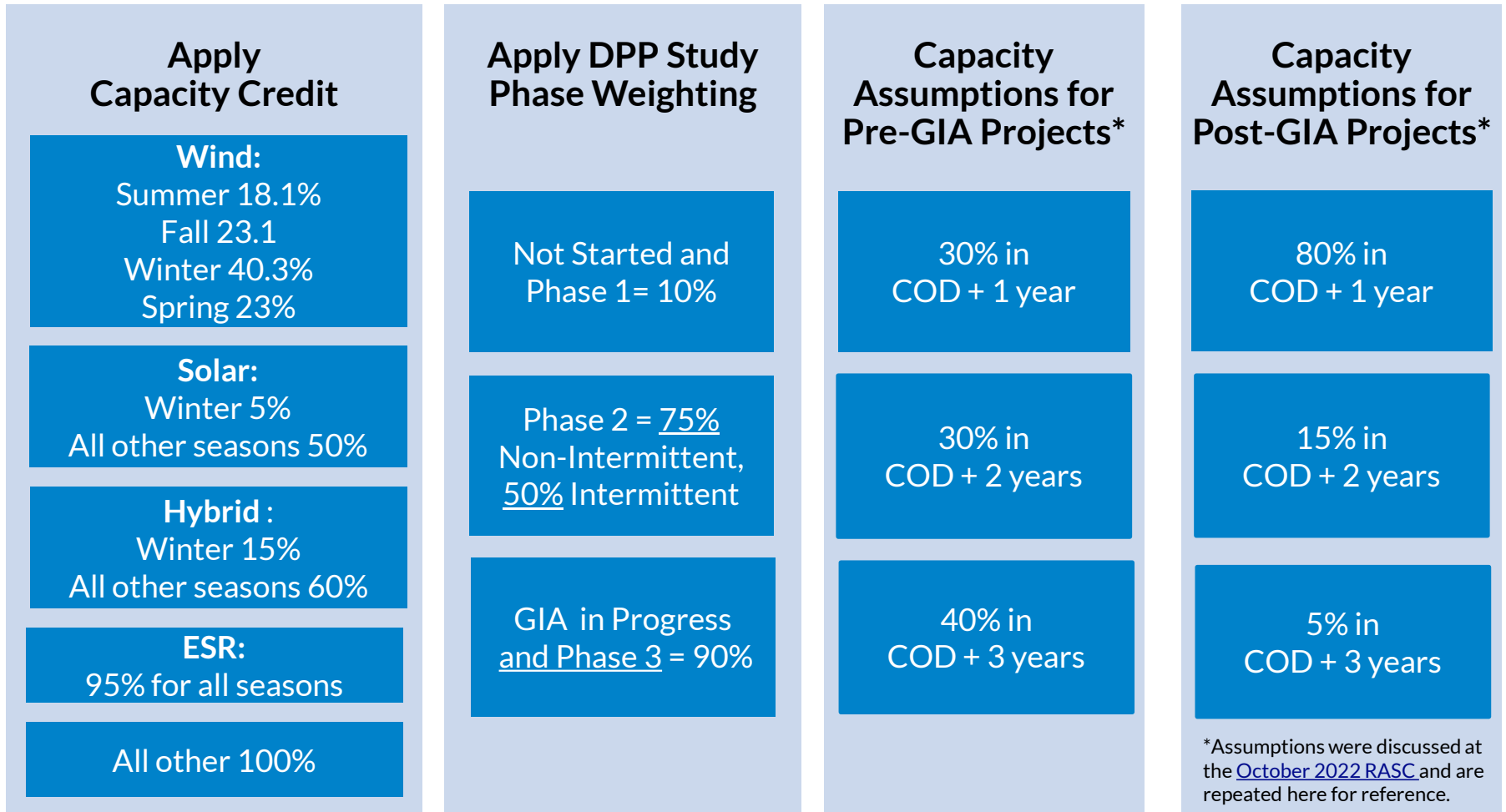
# Appendix



# Understanding Resource Categories

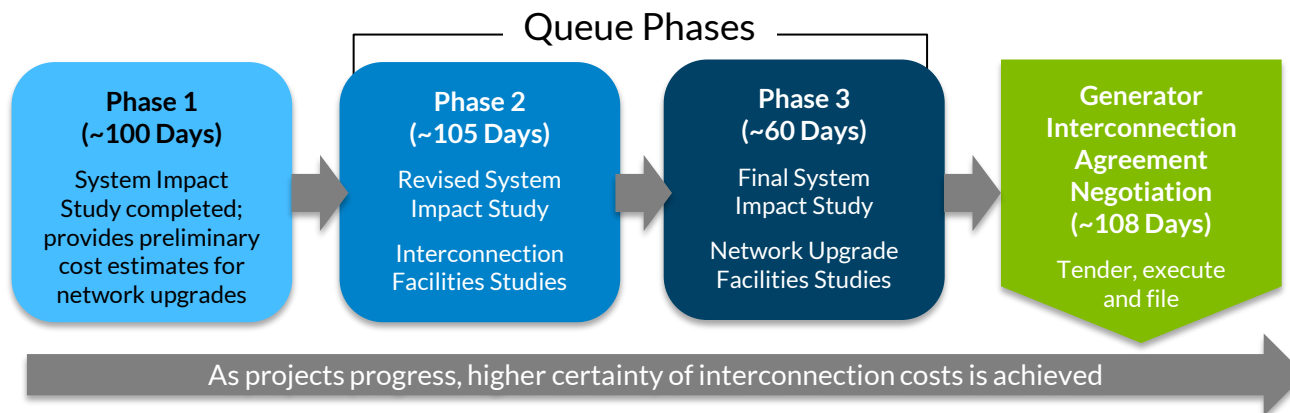
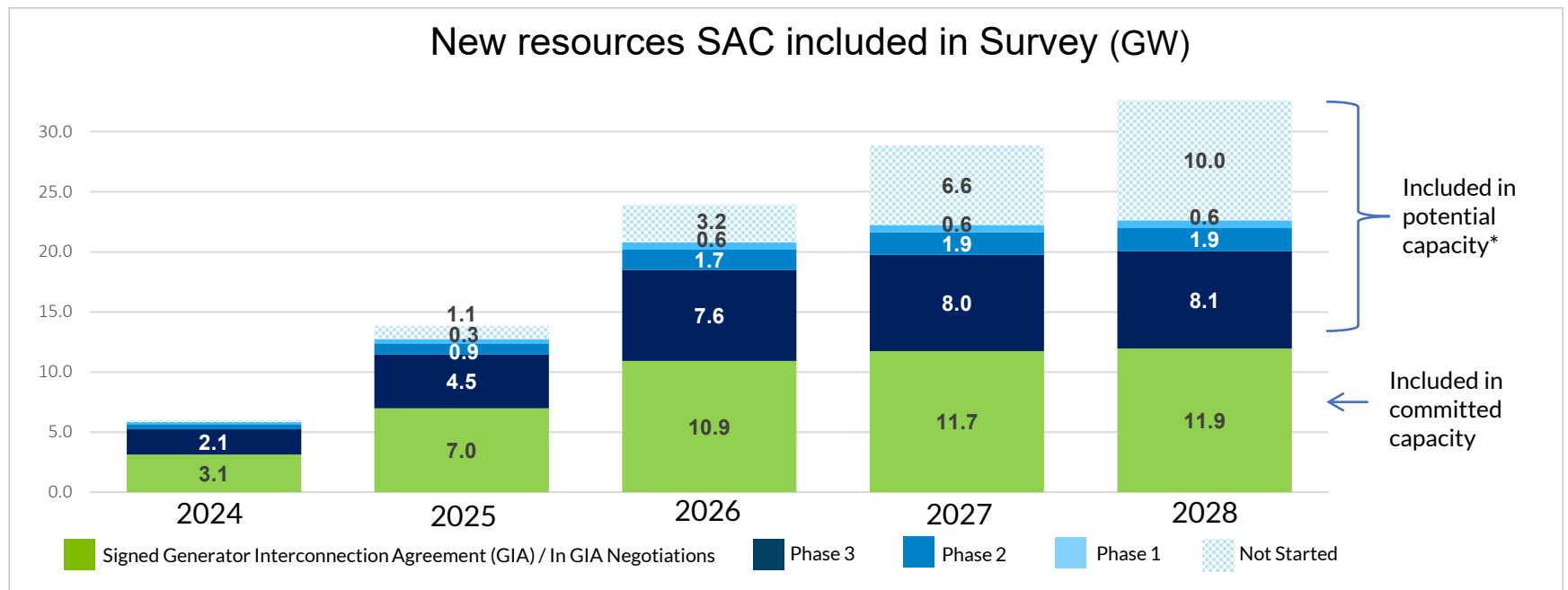
- **Committed Capacity** - resources committed to serving MISO load
  - Resources within MISO utilities' rate base
  - External resources with firm contracts to MISO load
  - Non-rate base units without announced retirements or commitments to non-MISO load
  - New generators with signed interconnection agreements not yet in service
- **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** – New 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 are not currently in the MISO Generator Interconnection Queue

# 2023 OMS-MISO Survey Queue Treatment



Definitive Planning Phase (DPP) Study Phase Weighting is applied to recognize that as projects move through the queue process, the likelihood of completion generally becomes more certain. Pre-GIA projects use Application Commercial Operation Date (COD). Post-GIA projects use negotiated COD.

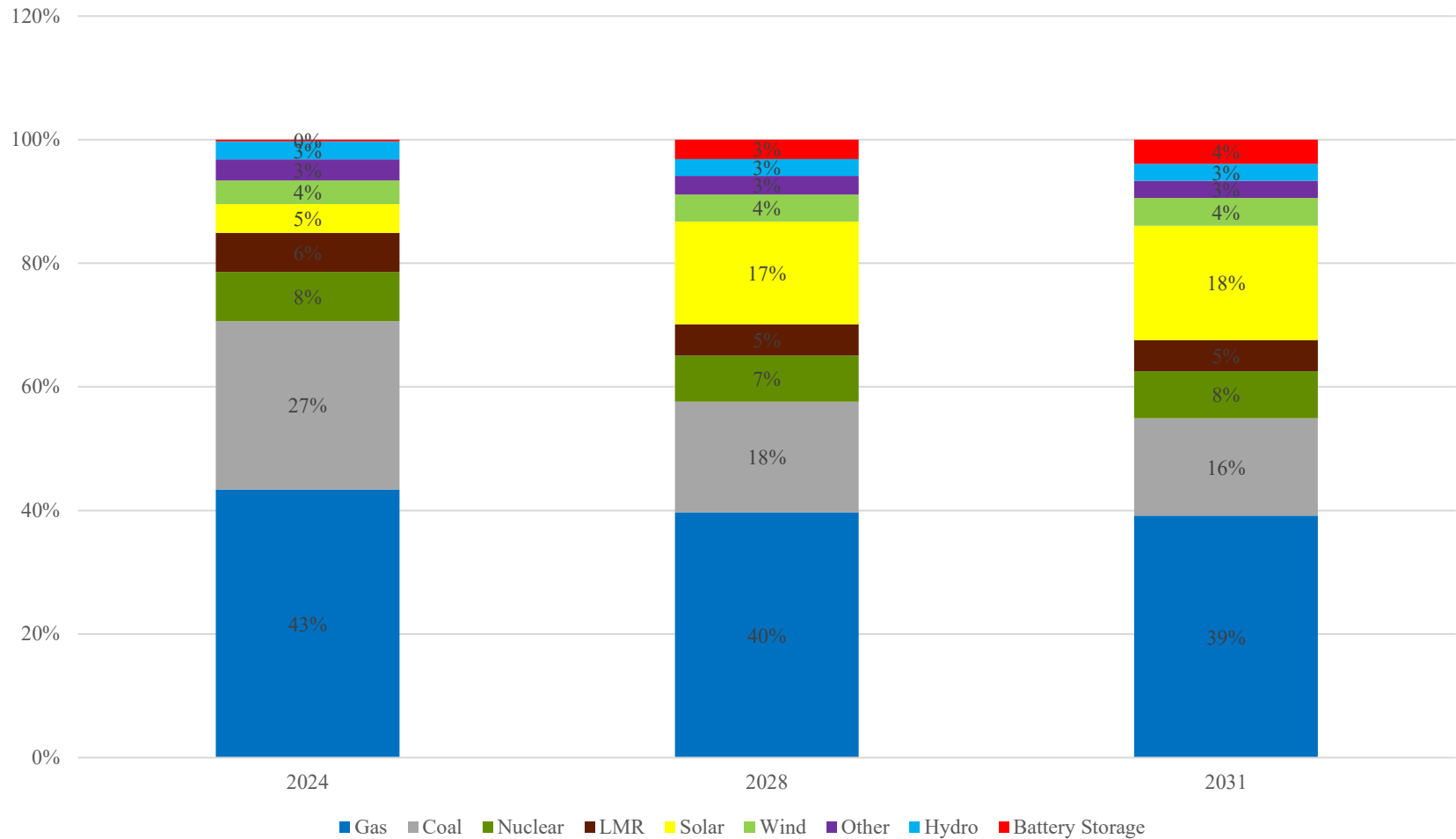
# Future summer resource ranges will shift as planned generation interconnections are firmed up



*\*\*“Potential capacity” values shown here do not factor in RDT limitations.*

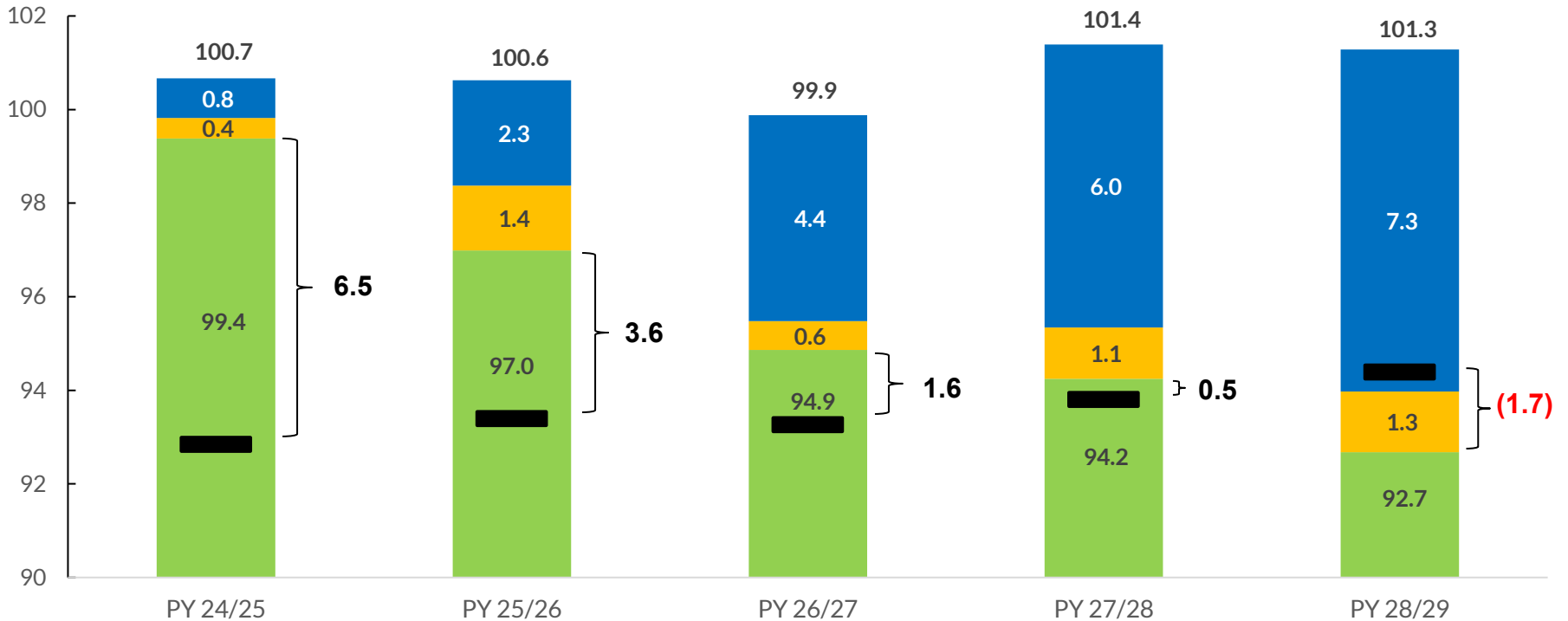
# Interconnection Queue shows a significant increase in solar penetration

## MISO Fleet UCAP Resource Mix Projection



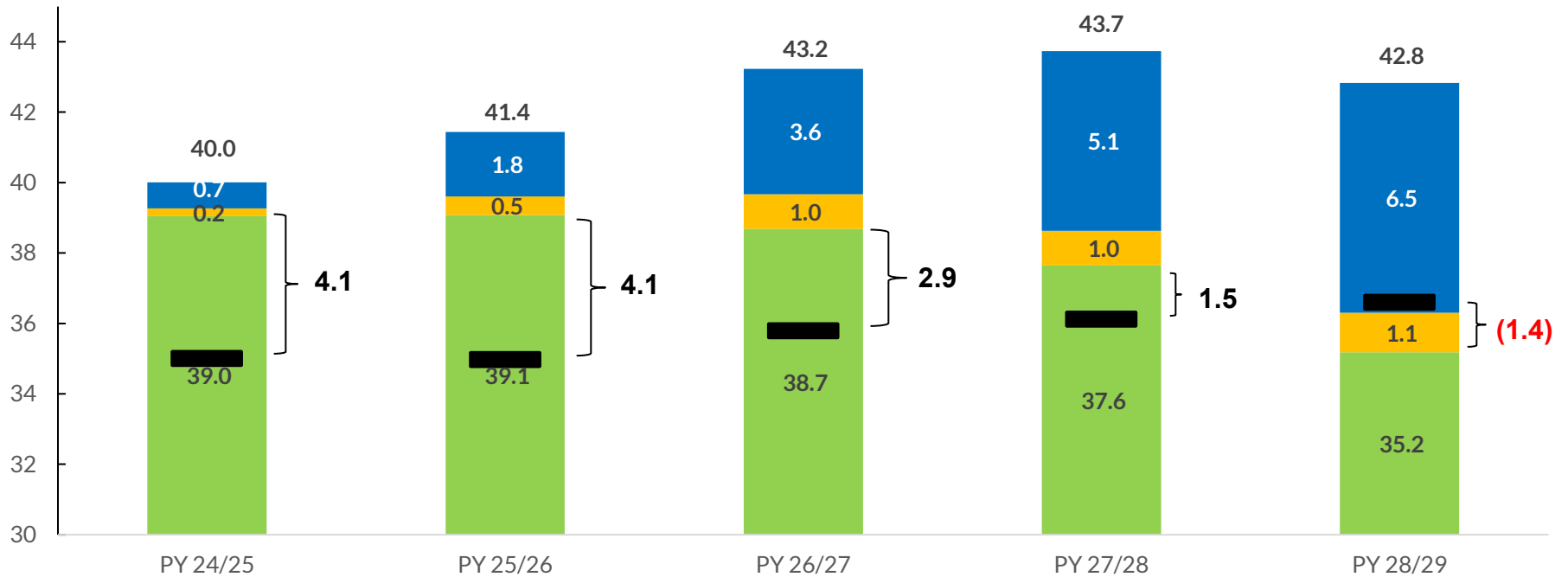
For Winter, North/Central increasingly trends towards reduced surpluses over five years, with 2028/29 winter showing a deficit

Seasonal Accredited Capacity – North/Central Winter (GW)  
2023 OMS MISO Survey



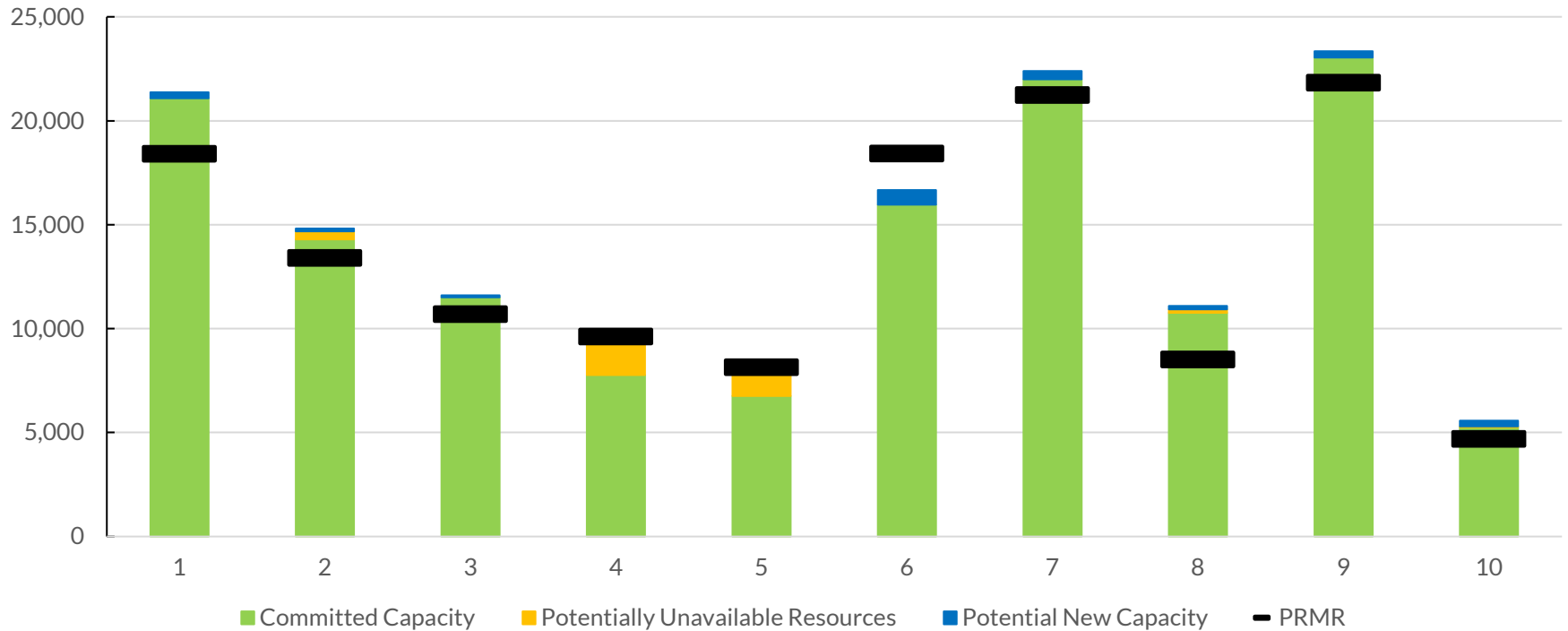
# For Summer, South does not show a deficit until PY 2028/29

Seasonal Accredited Capacity – South Summer (GW)  
2023 OMS MISO Survey



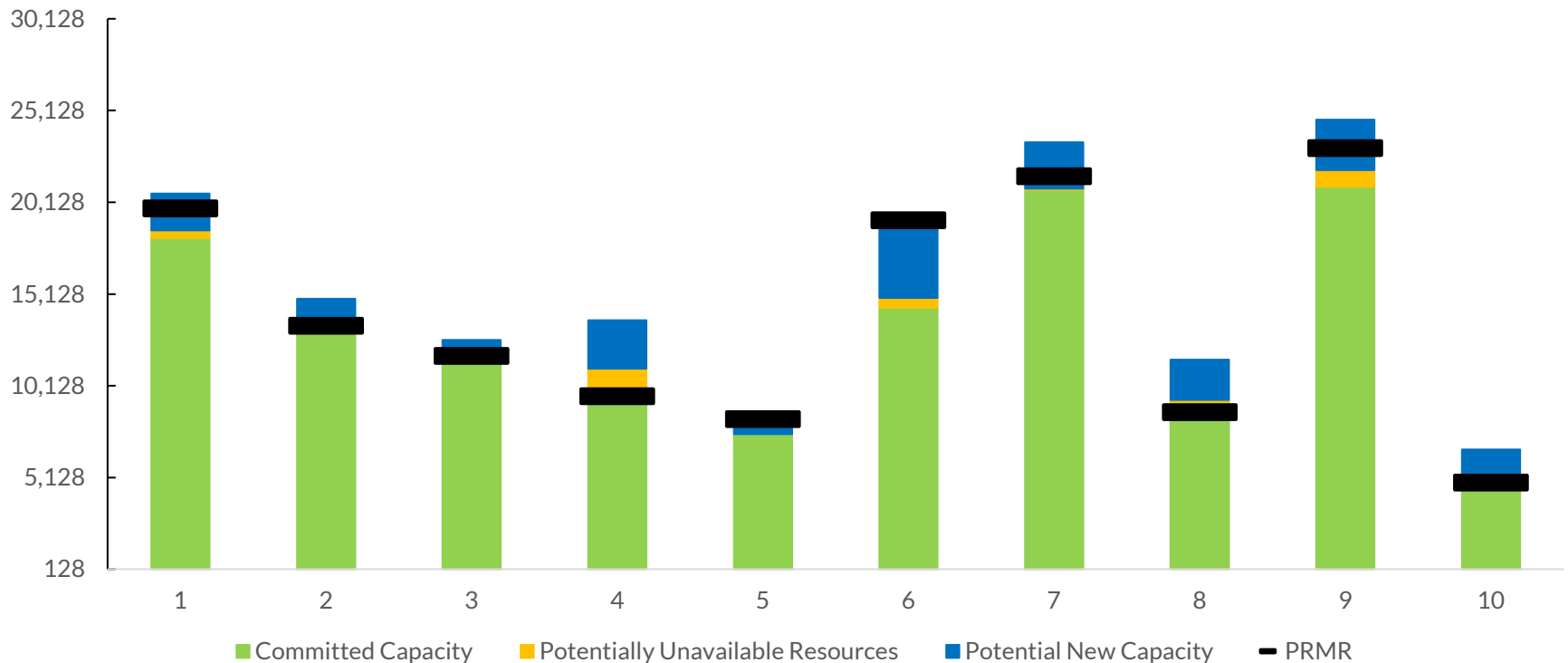
# Zonal view for Summer 2024/25 shows that most zonal PRMRs can be met with resources located within respective zones

## PY 2024/25 Summer By Zone (MW)



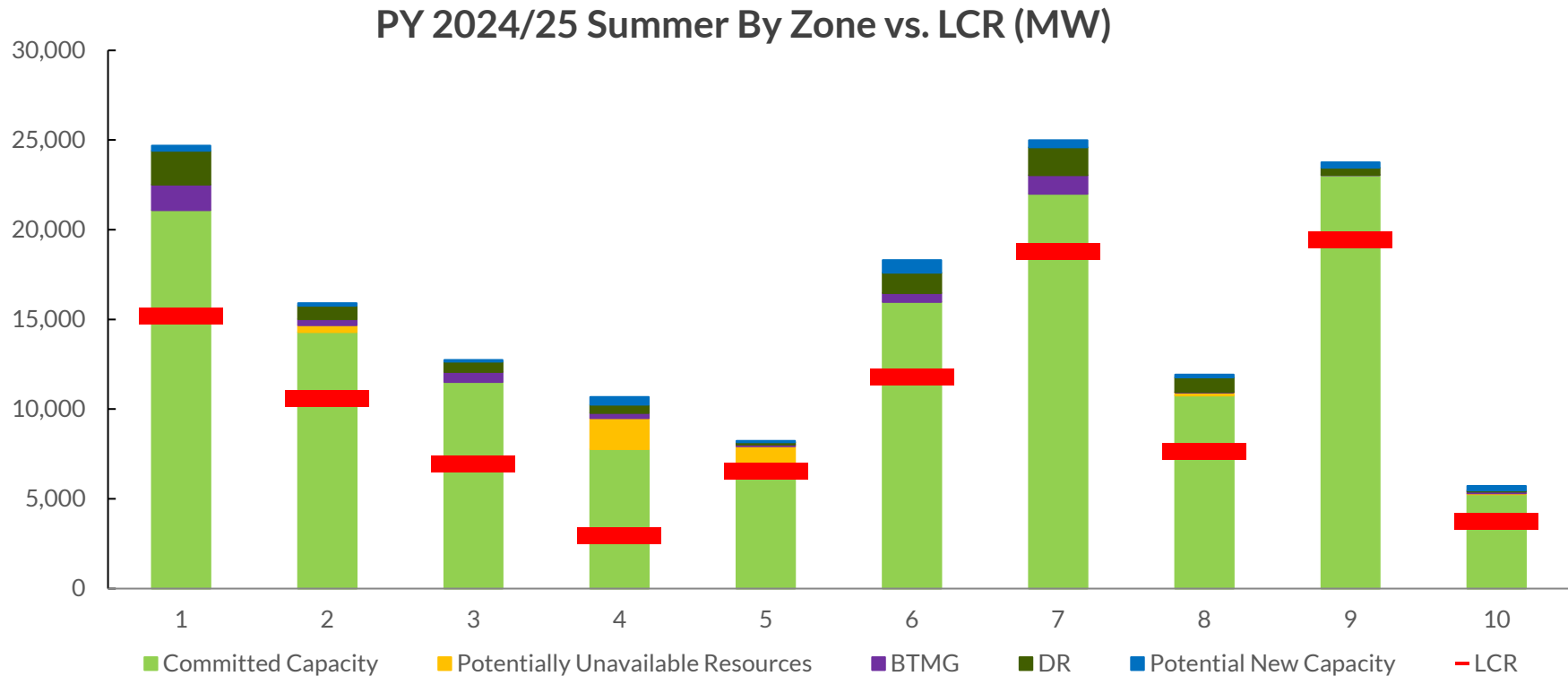
# Looking out, 2028/29 zonal view shows the necessity of new capacity to meet PRMRs

## PY 2028/29 Summer By Zone (MW)

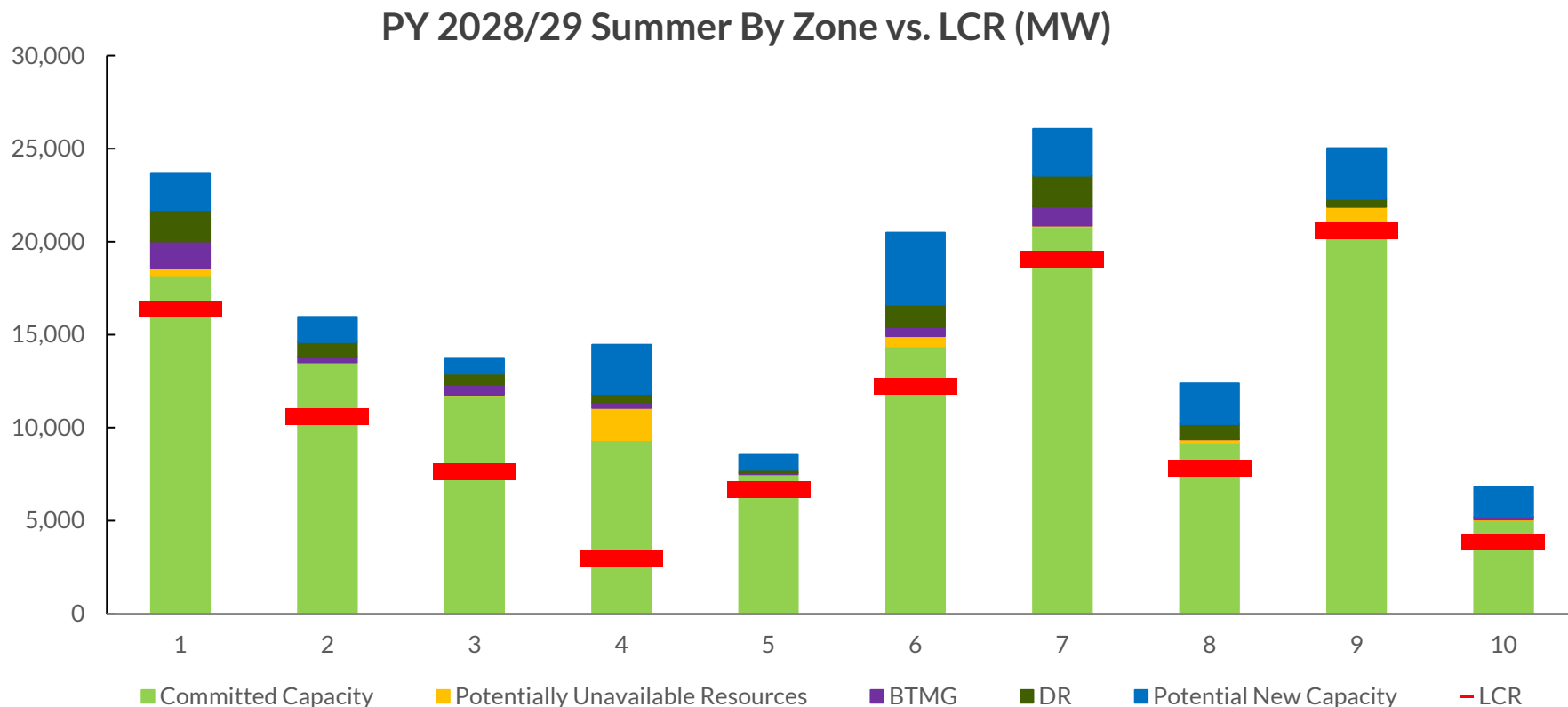




# For Summer 2024/25, there is adequate capacity to meet Local Clearing Requirements (LCRs)

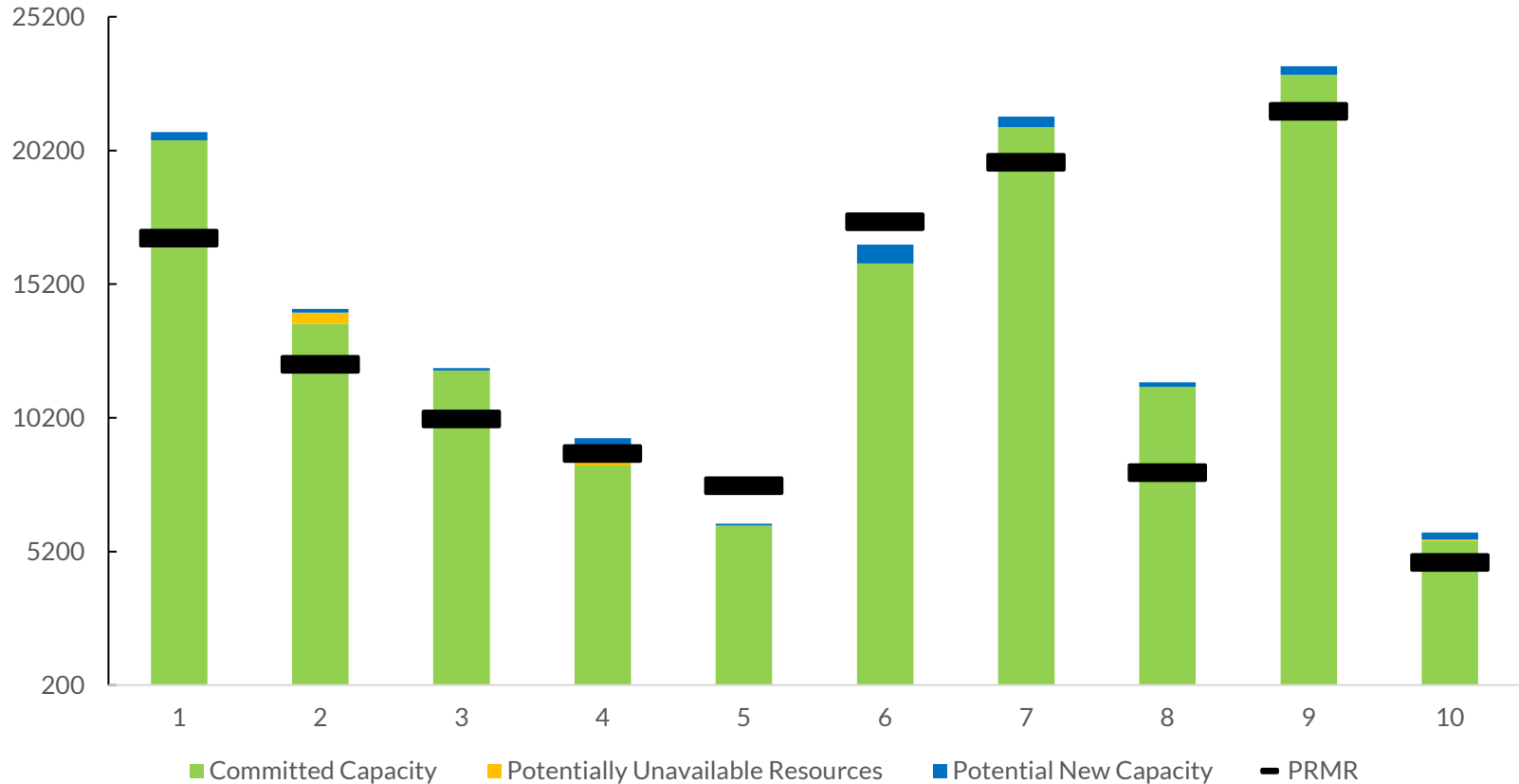


# For Summer 2028/29, some zones show reduced residual capacity to meet LCRs



# Zonal view for Fall 2024/25 shows that most zonal PRMRs can be met with resources located within respective zones

PY 2024/25 Fall By Zone (MW)

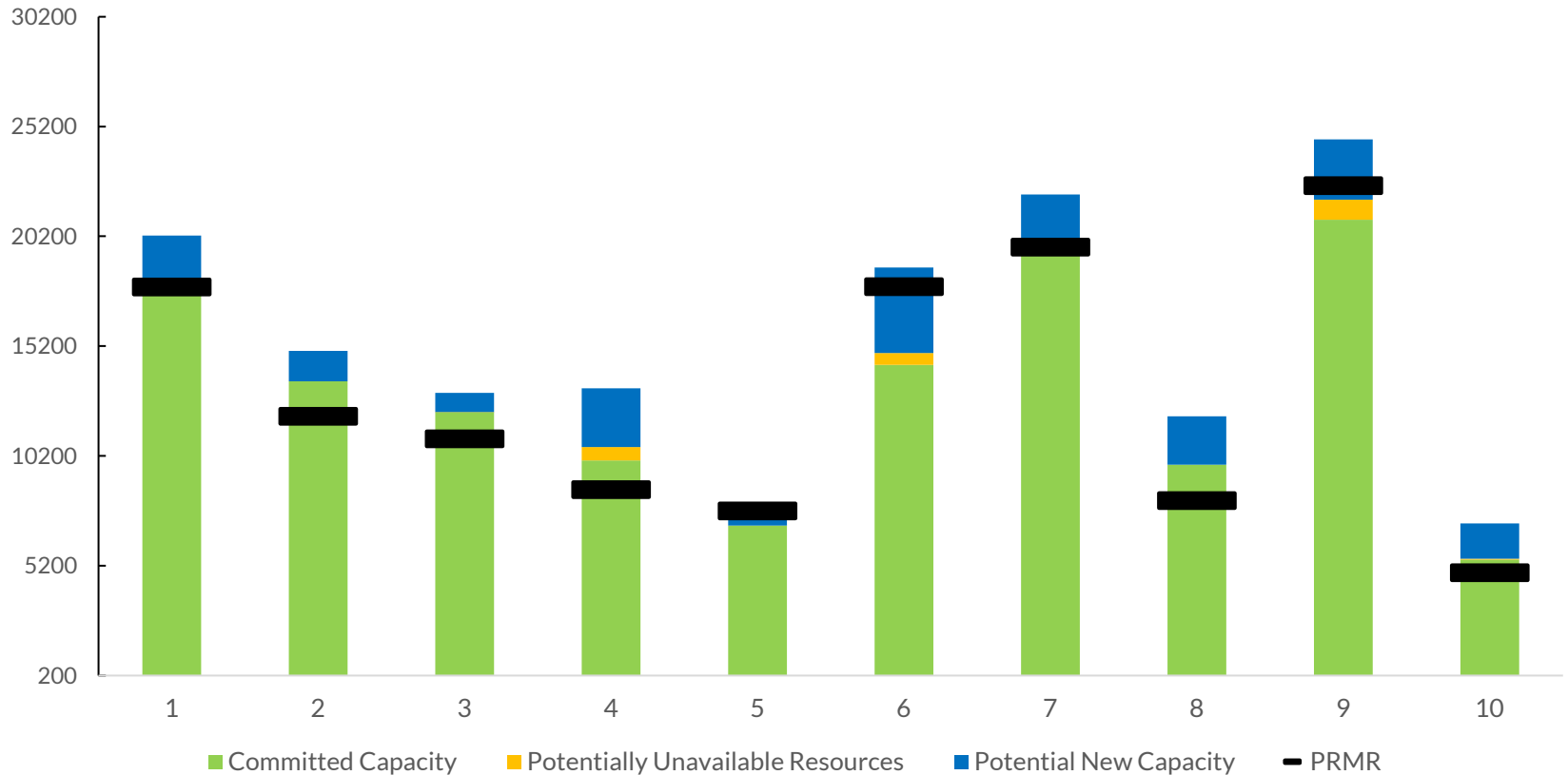


**Note:** Survey assumes that only resources physically located within the zone will be used to meet the zonal PRMR.

Fall Demand and therefore PRMR is calculated by using Summer Demand Forecast percent change seen year over year since out year non-coincident peak forecast is not submitted for out years for Fall and Spring.

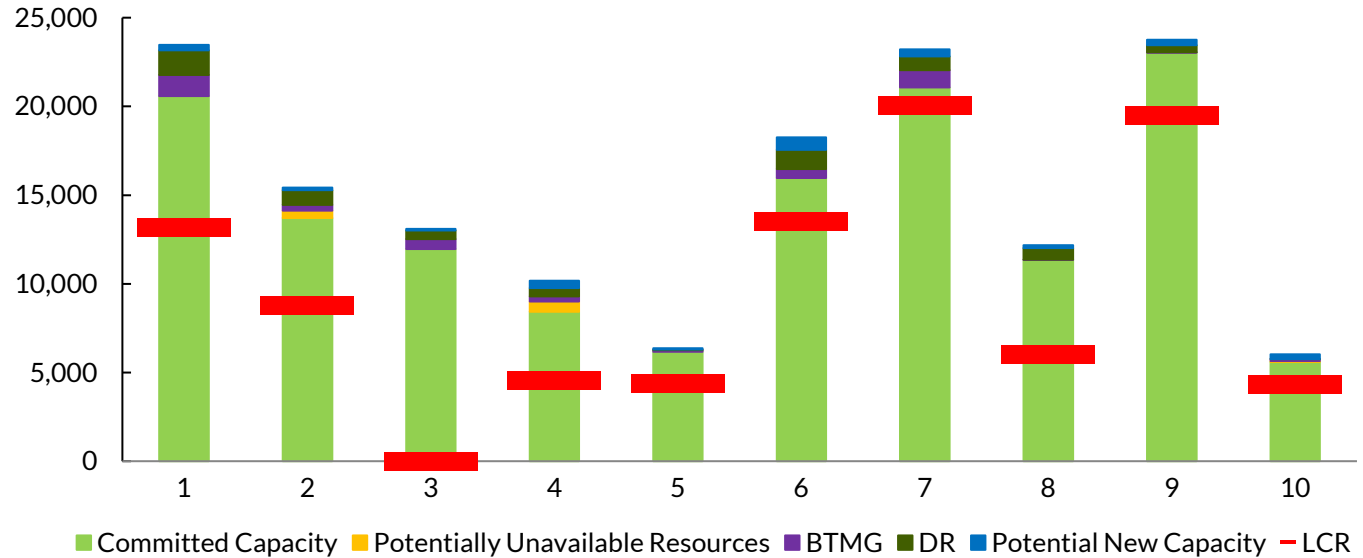
# Looking out to Fall season for PY 2028/29, multiple zones rely on potential new capacity

PY 2028/29 Fall By Zone (MW)

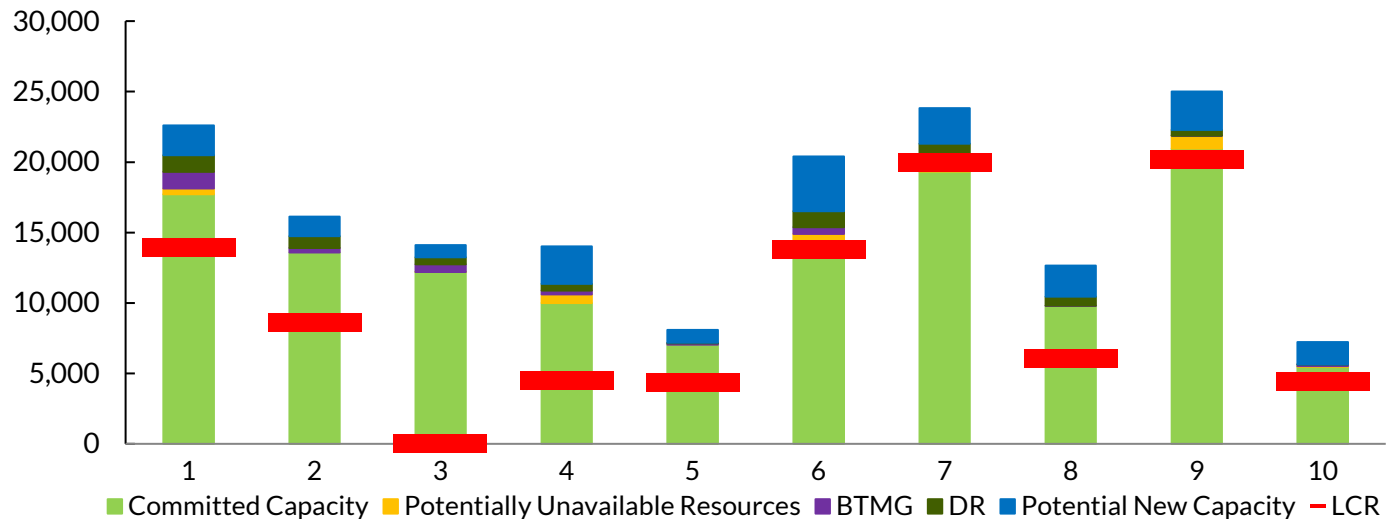


# Fall is sufficient in the near-term, but PY 2028/29 may require new capacity addition to meet LCRs

PY 2024/25 Fall  
By Zone vs. LCR (MW)

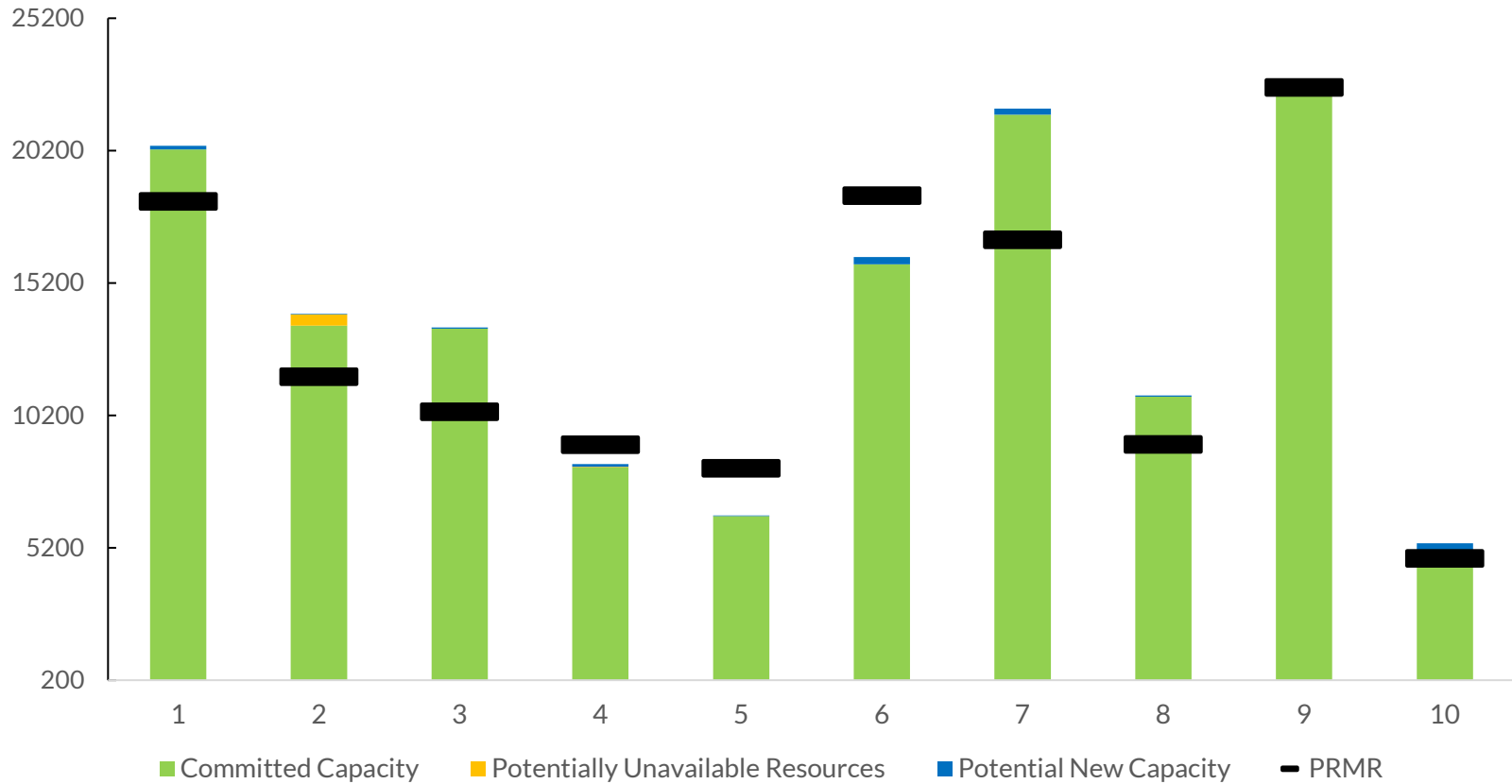


PY 2028/29 Fall  
By Zone vs. LCR (MW)



# Zonal view for Winter 2024/25 shows that some zonal PRMRs cannot be met with resources located within respective zones

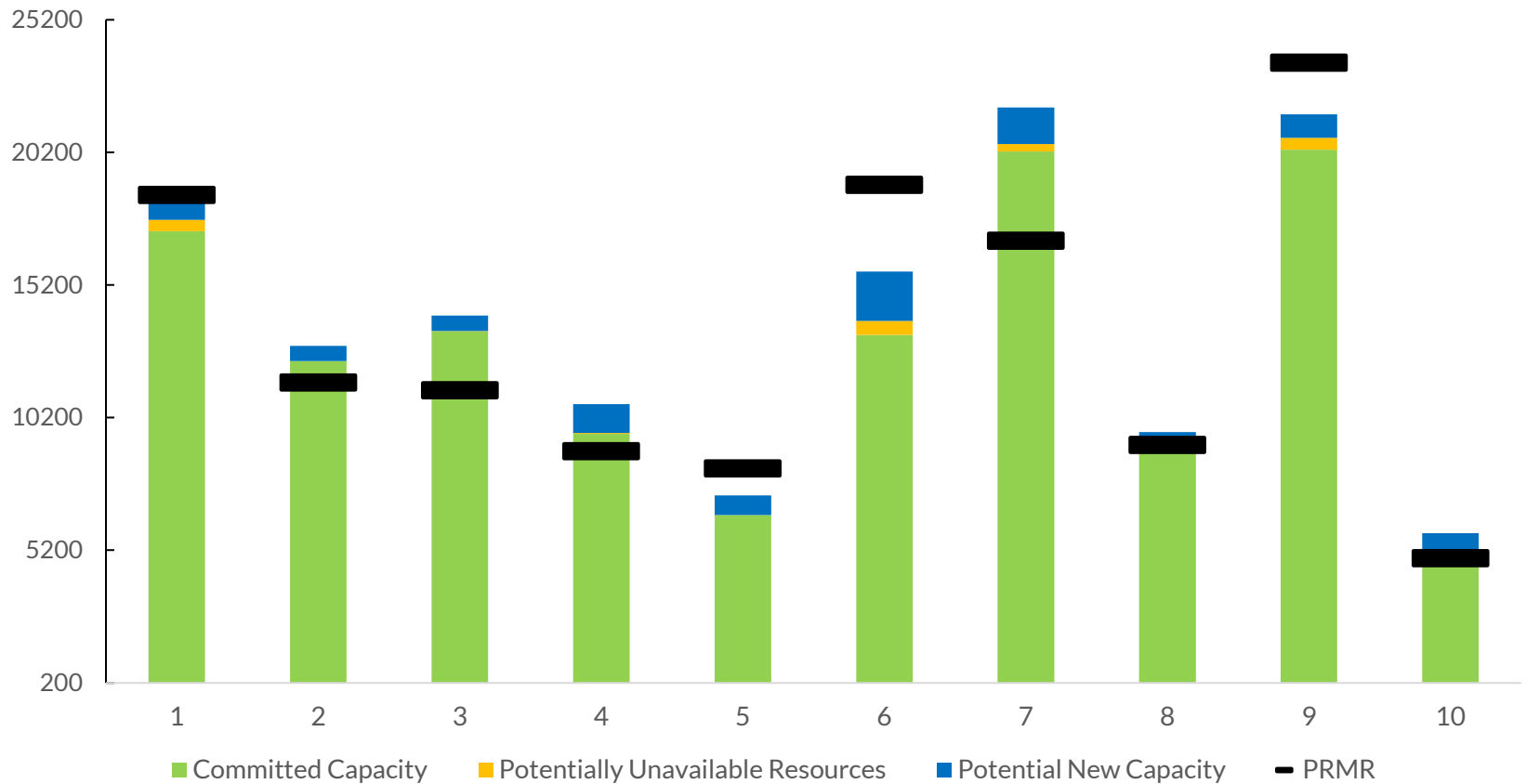
PY 2024/25 Winter By Zone (MW)



**Note:** Survey assumes that only resources physically located within the zone will be used to meet the zonal PRMR.

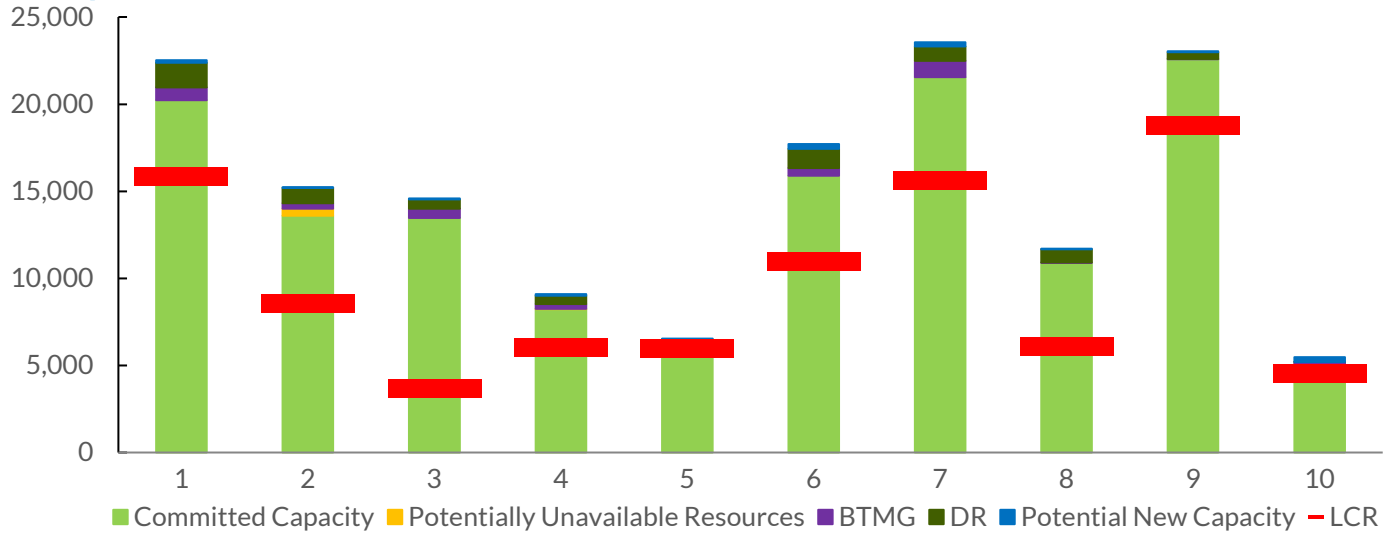
# Looking out, Winter 2028/29 zonal view shows the necessity of new capacity to meet PRMRs

PY 2028/29 Winter By Zone (MW)

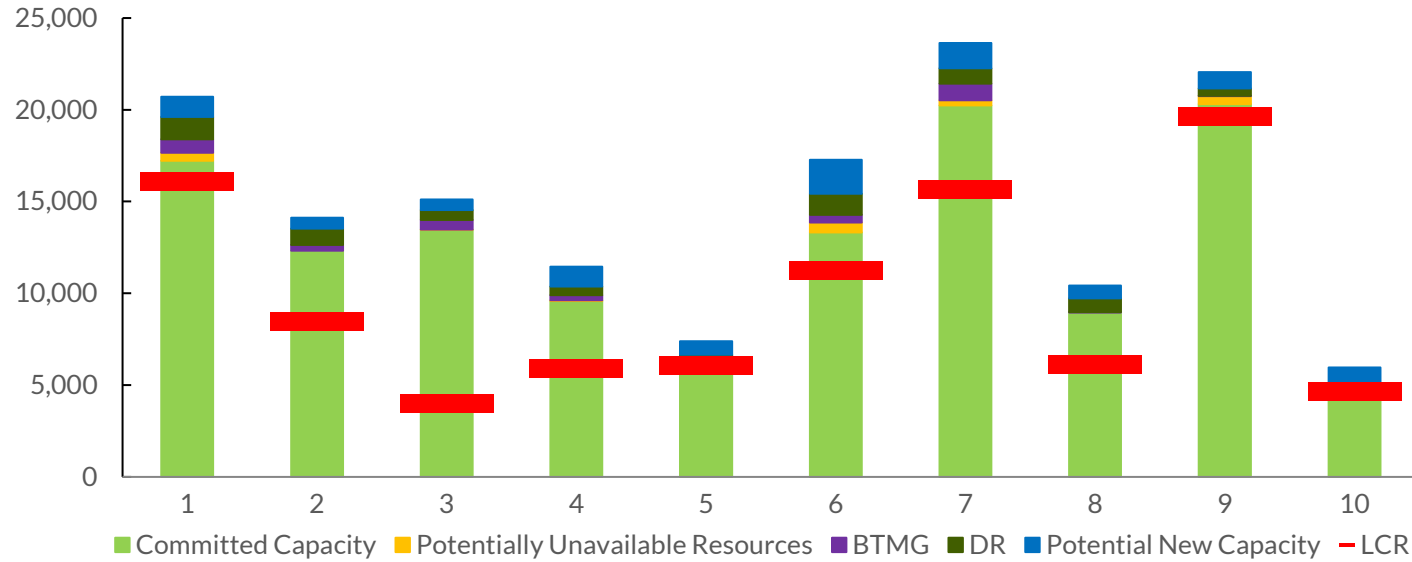


# Winter is sufficient in the near-term, but some zones may require capacity additions by 2028/29 to meet LCRs

PY 2024/25 Winter  
By Zone vs. LCR (MW)



PY 2028/29 Winter  
By Zone vs. LCR (MW)

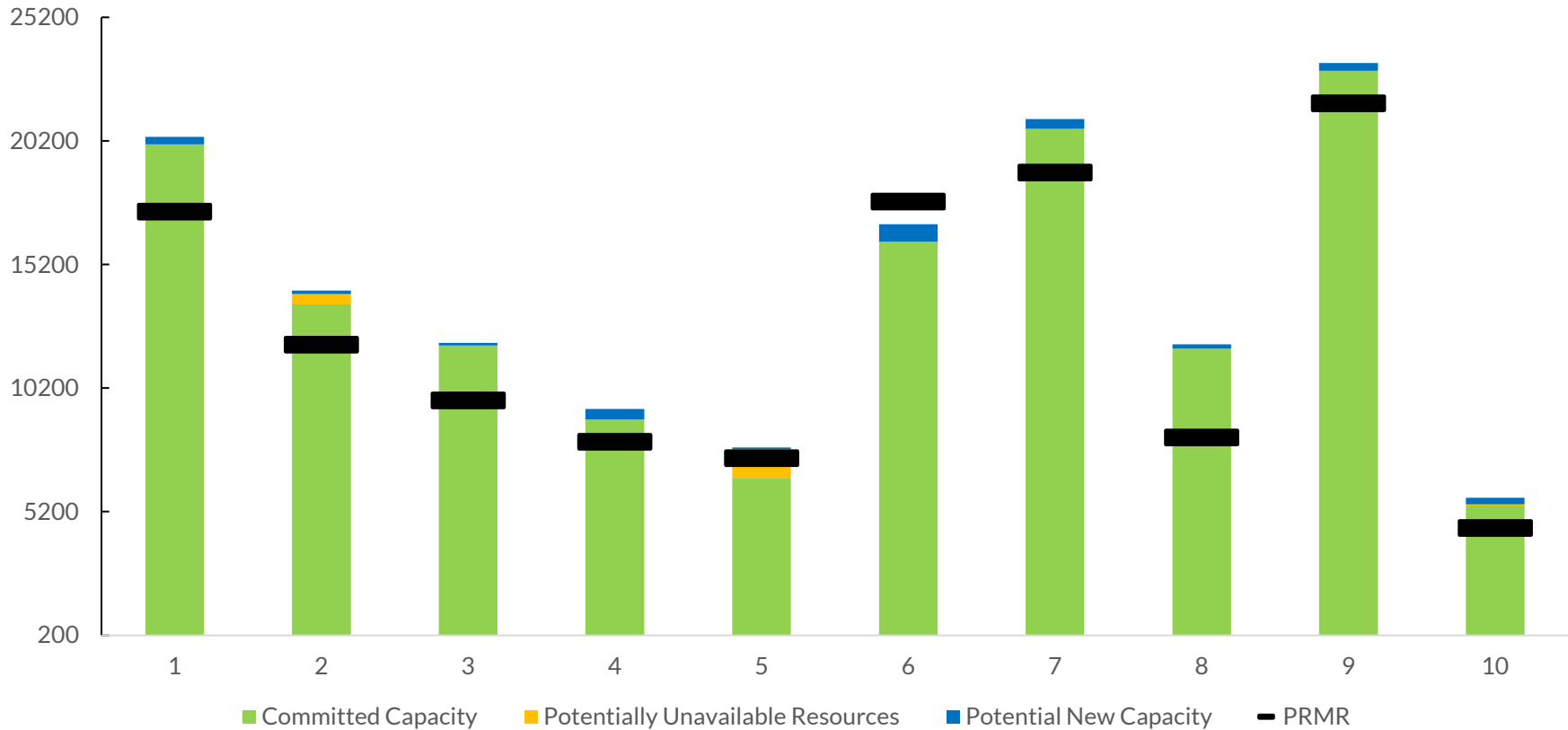


Includes only projected capacity resources within the zone, i.e., does not include imports and interzonal transfers. Potential Capacity includes both new generation and potential retirements. Load Modifying Resources include Demand Response (DR) and Behind the Meter Generation (BTMG).



# Zonal view for Spring 2024/25 shows that most zonal PRMRs can be met with resources located within respective zones

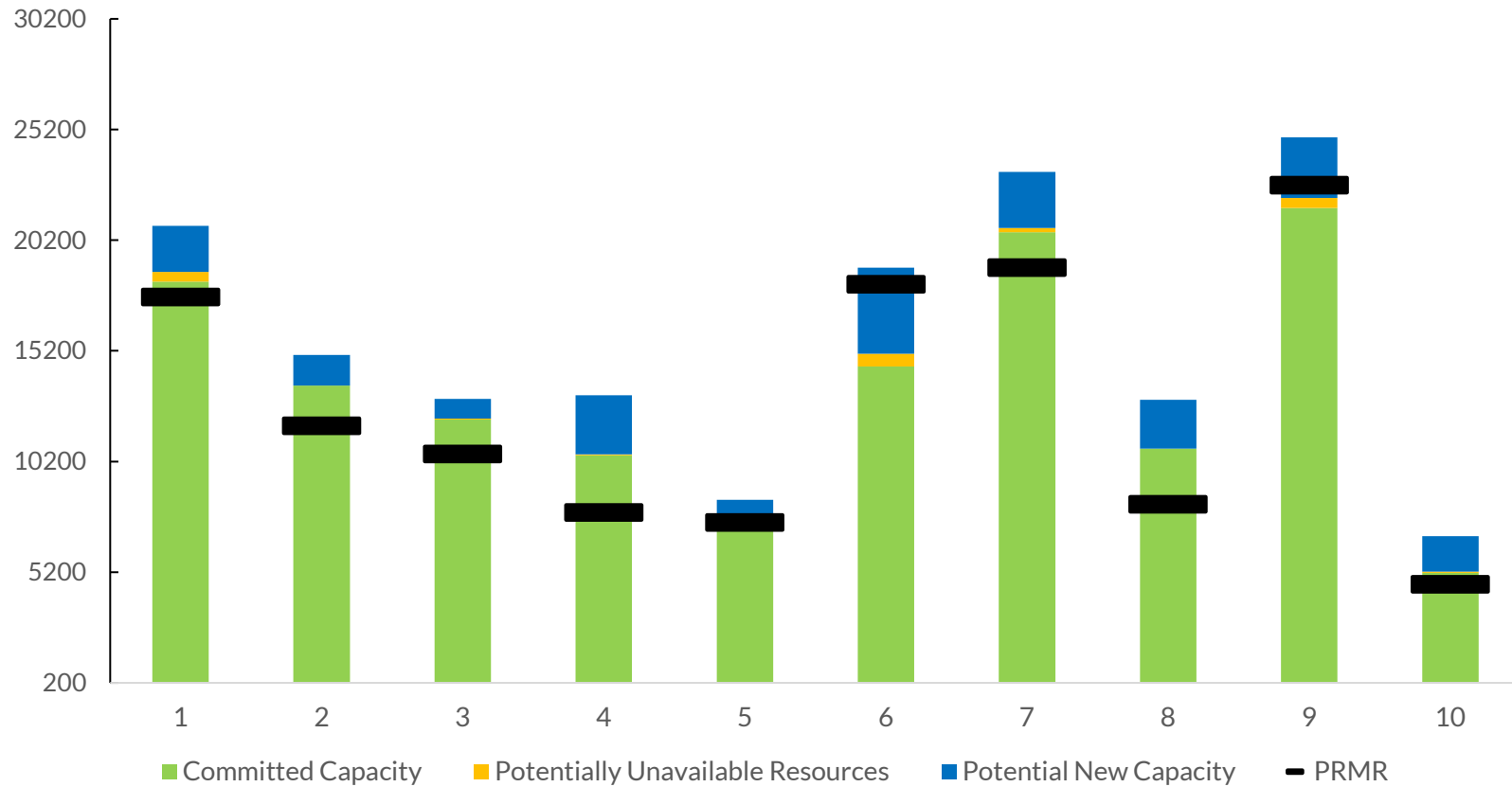
PY 2024/25 Spring By Zone (MW)



**Note:** Survey assumes that only resources physically located within the zone will be used to meet the zonal PRMR.

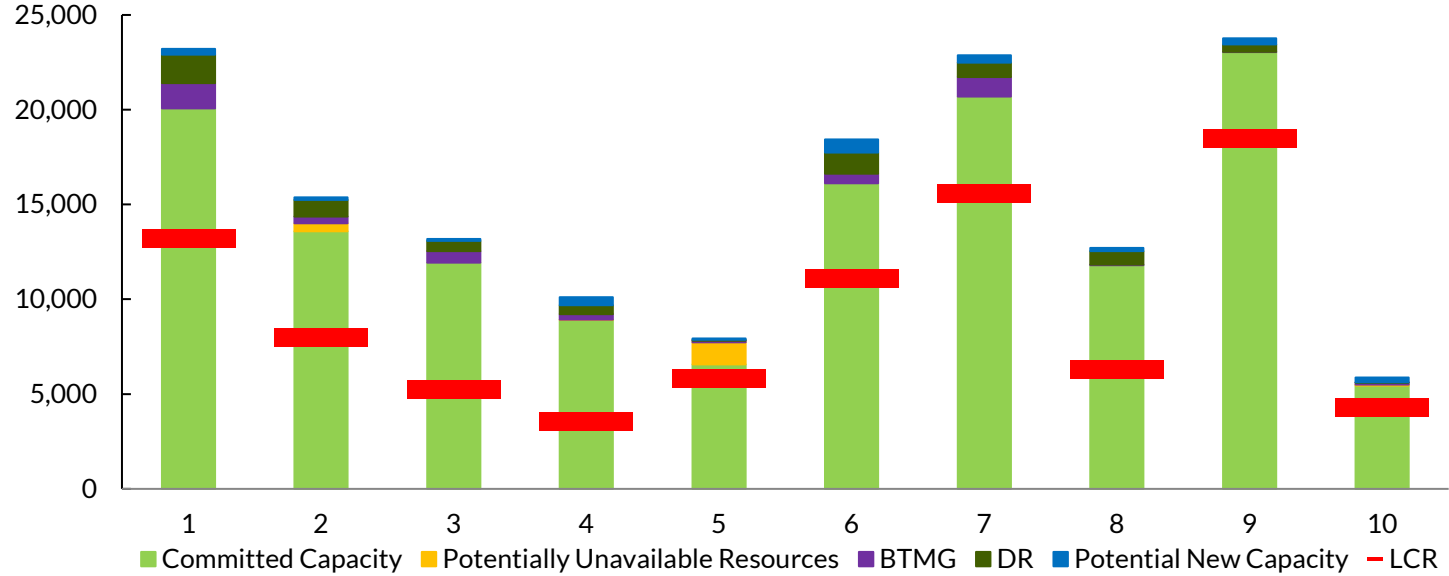
# Looking out to Spring season for PY 2028/29, some zones rely on potential new capacity

## PY 2028/29 Spring By Zone (MW)

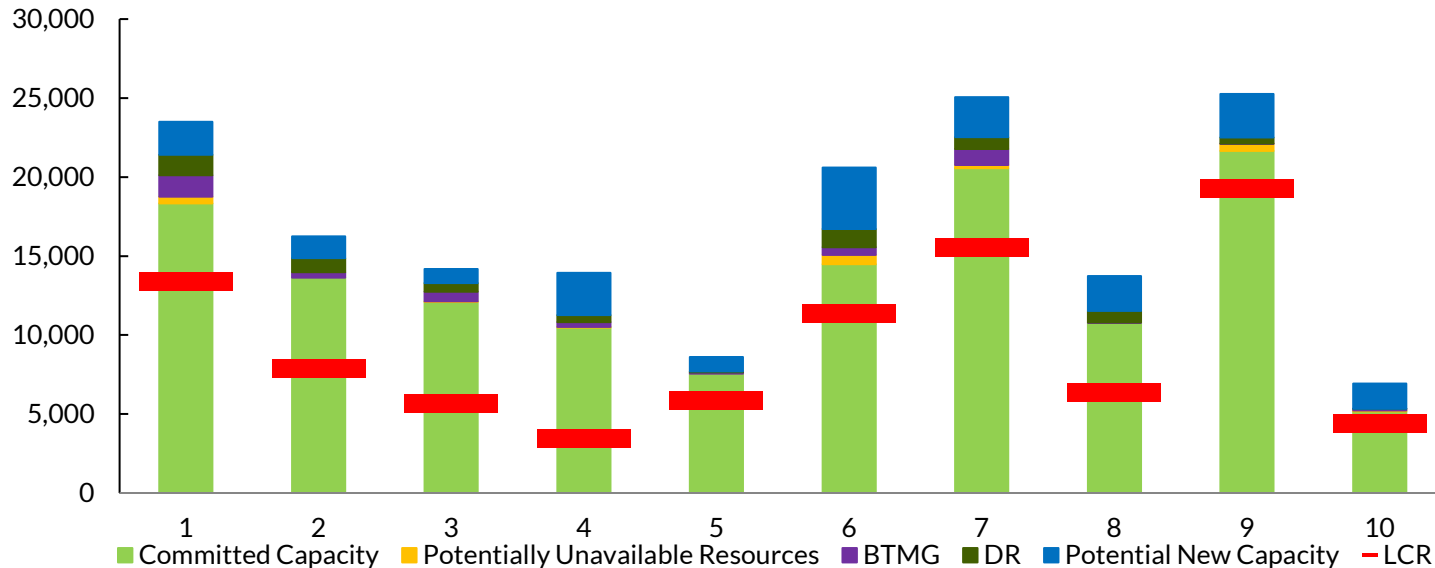


# Spring is sufficient over the survey horizon, however there is increased tightness by 2028/29 to meet LCRs

**PY 2024/25 Spring  
By Zone vs. LCR (MW)**  
2023 OMS MISO Survey



**PY 2028/29 Spring  
By Zone vs. LCR (MW)**  
2023 OMS MISO Survey



IN THE MATTER OF:  
ELECTRONIC TARIFF FILING OF BIG RIVERS ELECTRIC CORPORATION  
AND KENERGY CORP. TO REVISE THE  
LARGE INDUSTRIAL CUSTOMER STANDBY SERVICE TARIFF  
CASE NO. 2023-00312

JOINT RESPONSE OF BIG RIVERS ELECTRIC CORPORATION AND KENERGY CORP.  
TO COMMISSION STAFF'S SECOND REQUEST FOR INFORMATION

**REQUEST NO. 2-9:** *Refer to BREC's response to Staffs First Request, Item 15. Explain whether BREC has evidence that its Standby customers were scheduling Maintenance outages so as to maximize the value of the Standby Customers Self Supply Capacity. Include in the response how the Standby Customer would schedule outages to maximize the value if [sic] its self-supply capacity.*

**RESPONSE:** Kimberly-Clark is the only retail customer who has taken service under Kenergy's Standby Service tariff. Big Rivers is not aware if Kimberly-Clark has scheduled outages to maximize the value of the Self Supply Capacity and reduce the total cost of LMP purchases. In the current construct, certain seasons could be valued lower than other seasons, so there could be a financial incentive to schedule during certain seasons. Additionally, some months have lower LMPs than other months, so it could be beneficial to schedule outages during lower price periods to avoid higher priced LMPs.

**Witness: Terry Wright, Jr. (Big Rivers)**