



PY 2020/21 Planning Reserve Margin and Local Reliability Requirement Results

LOLEWG
10/18/2019

Updated 10/18/2019

Added feedback request
slide (slide 9)

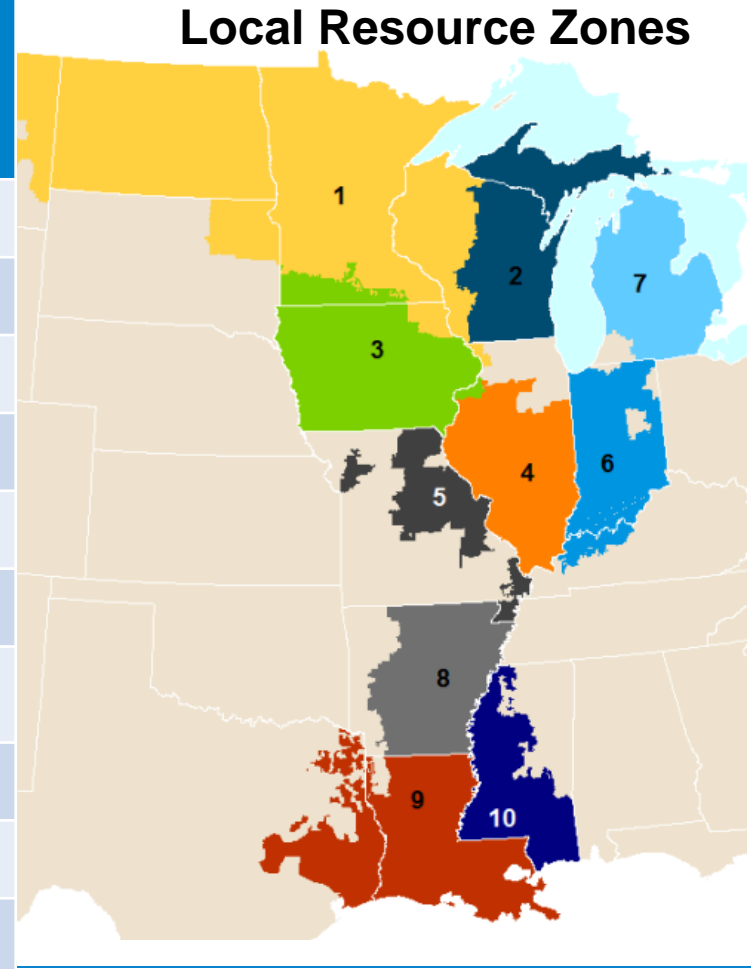
Takeaways



- Current Planning Reserve Margin (PRM) analysis results for 2020/21 Planning Year:
 - 8.9% PRM UCAP (1.0% percentage point increase)
- Drivers that resulted in changes to PRM and Local Reliability Requirements (LRR)
 - Resource mix
 - Resource performance
 - Monthly load shapes and forecasted load
 - Economic uncertainty

The zonal Local Reliability Requirements (LRR) have changed due to similar factors as the PRM

LRZ	LRR		Driver for Change
	PY 2020/21	PY 2019/20	
1	114.2%	115.1%	Decreased EFORd, resource mix
2	116.8%	116.1%	Flatter load shape
3	115.0%	115.6%	Decreased EFORd, resource mix
4	129.2%	124.4%	Forecast load, Resource mix
5	124.0%	125.1%	Decreased EFORd
6	114.9%	115.2%	Resource mix
7	119.5%	117.2%	Increased EFORd, flatter load shape
8	133.0%	135.8%	Resource mix
9	116.4%	112.7%	Increased EFORd, resource mix
10	145.9%	147.2%	Resource mix



Drivers for Zone 4 Local Reliability Requirement (LRR) changes

Forecasted Load

- MISO peak demand forecast decreased 230 MW
- The PRM is calculated as a percentage of load therefore a reduced demand forecast increases the LRR% (spreading risk over lower peak)

Resource Mix Changes

- Resource that was on suspension last year with worse the average EFORd are now available in the model
- Resources previously exporting with worse then average EFORd no longer exporting

Drivers for Zone 7 Local Reliability Requirement (LRR) changes

Load Shape

- Historic weather profiles resulted in load shapes with increased peak demand days hence increasing LRR
- In the model case that drives the majority of LOLE, the number of days above 98% of peak demand increase from 1 to 6
- Additional LSE forecasted monthly peaks further increased peak demand days

Resource Performance

- Several large resources had increases in EFORD

Drivers for Zone 9 Local Reliability Requirement (LRR) changes

Resource mix

- New large resource

Resource performance

- Several large resources with higher than average EFORd

In summary, the 2020/21 PY PRM and LRR's changed due to load and generation factors

- The PRM increased from 7.9% to 8.9% driven primarily by changes in the resource mix/performance
 - LRR values changed as a result of updated load and resources in each LRZ
- All PRM and LRR values will be finalized on or before Nov 1
- Final values will be applied to updated load forecasts for 2020/21 PRA

Questions?

Ryan Westphal

rwestphal@misoenergy.org

(651) 632-8526

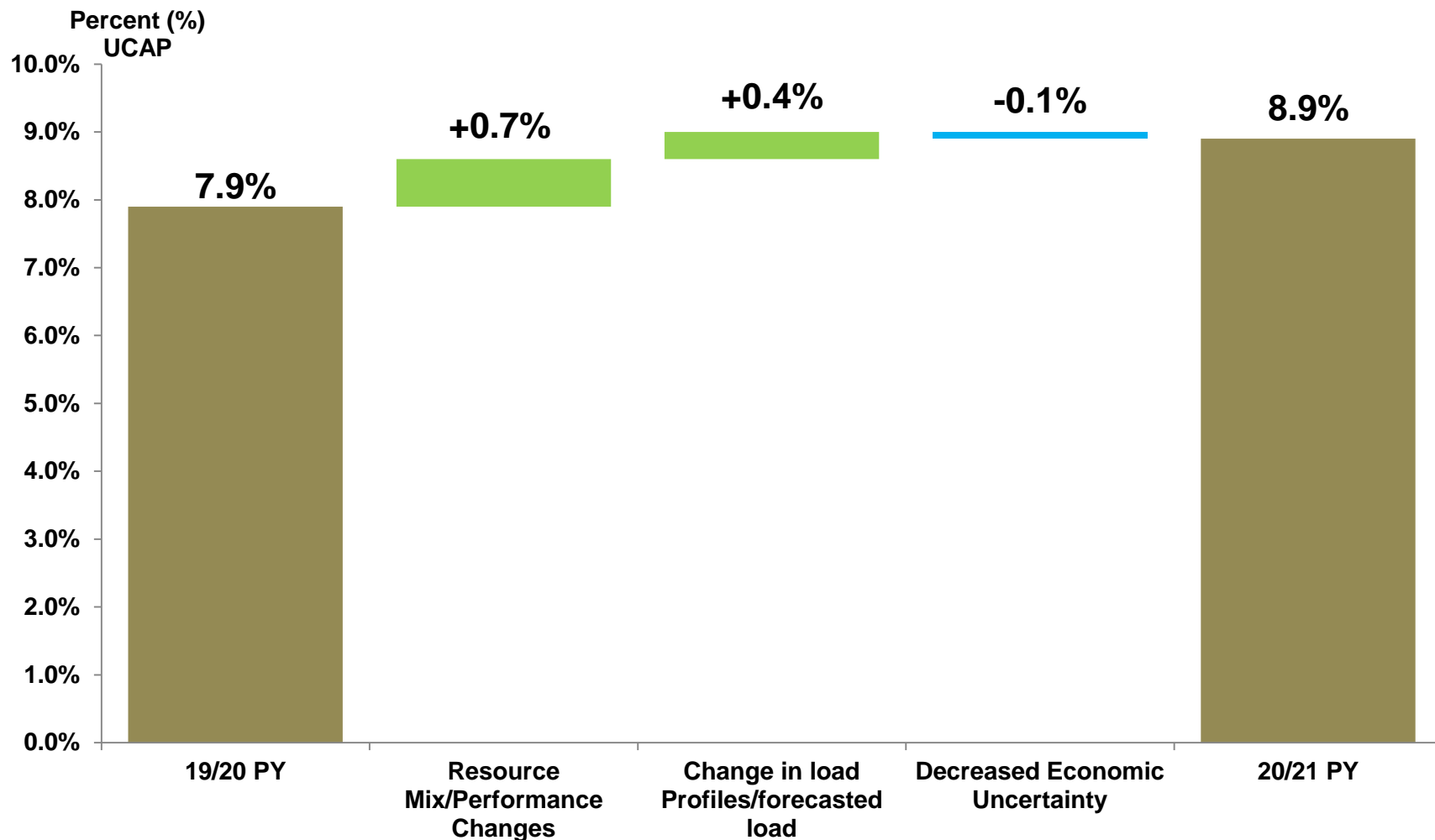
Stakeholder Feedback Request

- MISO is requesting feedback and/or redlines to the posted Draft LOLE Report by October 28
- Feedback requests and responses are managed through the Feedback Tool on the MISO website:
<https://www.misoenergy.org/stakeholder-engagement/stakeholder-feedback/>

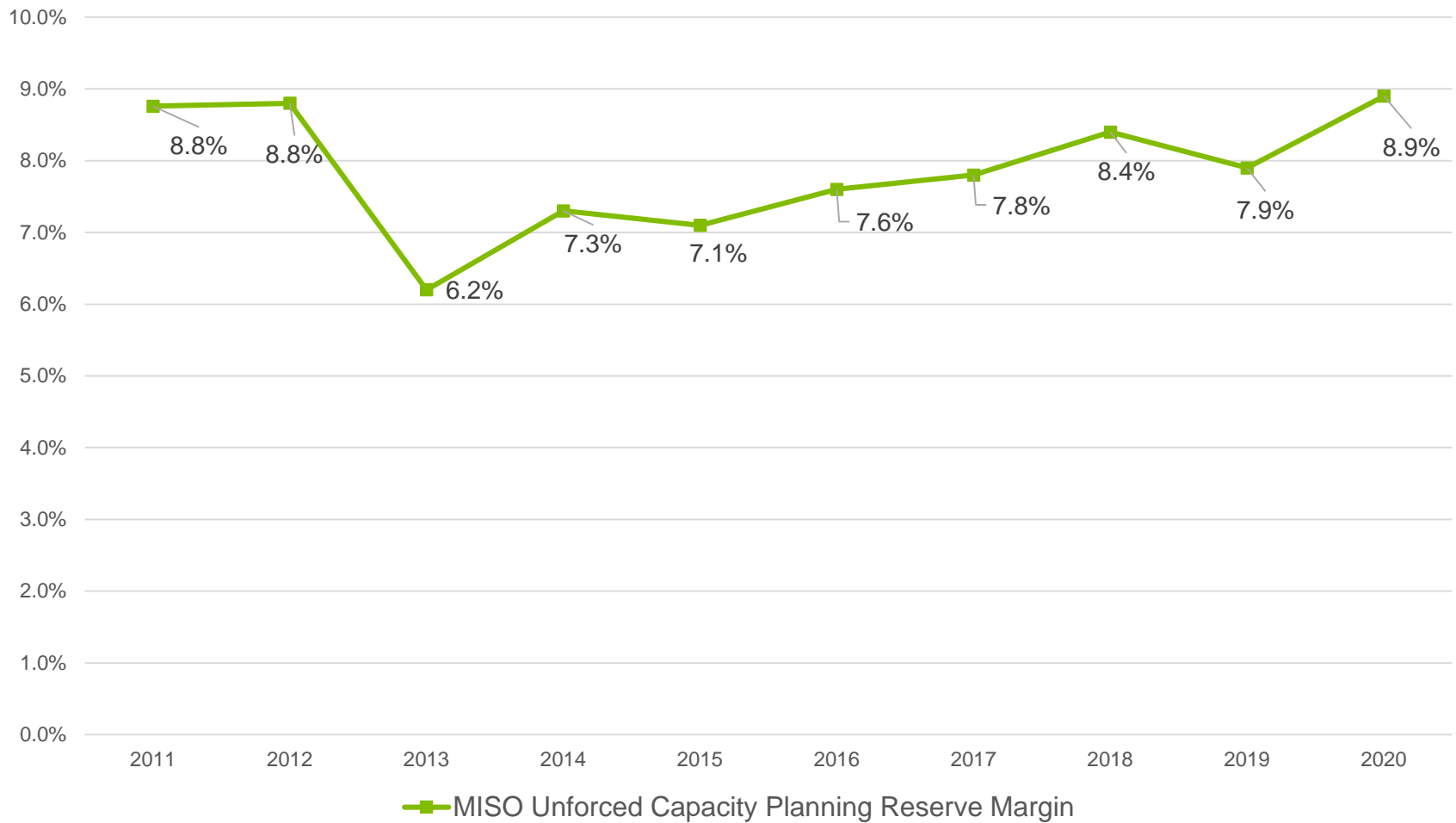


Appendix

Planning Reserve Margin increased due to changes in load and resource mix/performance



Planning Reserve Margin has been trending up



MISO Out-Year Planning Reserve Margin

MISO Planning Reserve Margin (PRM)	2020/2021 PY	2023/2024 PY	2025/2026 PY	Formula Key
MISO System Peak Demand (MW)	124,625	125,308	125,600	[A]
Installed Capacity (ICAP) (MW)	156,426	160,125	161,228	[B]
Unforced Capacity (UCAP) (MW)	144,456	148,152	148,922	[C]
Firm External Support ICAP (MW)	1,626	1,626	1,626	[D]
Firm External Support UCAP (MW)	1,572	1,572	1,572	[E]
Adjustment to ICAP {1d in 10yr} (MW)	(7,950)	(11,000)	(11,360)	[F]
Adjustment to UCAP {1d in 10yr} (MW)	(7,950)	(11,000)	(11,360)	[G]
ICAP PRM Requirement (PRMR) (MW)	150,102	150,751	151,494	[H] = [B]+[D]+[F]
UCAP PRM Requirement (PRMR) (MW)	138,079	138,724	139,135	[I] = [C]+[E]+[G]
MISO PRM ICAP	20.4%	20.3%	20.6%	[J]=[H]-[A]/[A]
MISO PRM UCAP	10.8%	10.7%	10.8%	[K]=[I]-[A]/[A]
External Non-Firm Support ICAP (MW)	2,987	2,987	2,987	[L]
External Non-Firm Support UCAP (MW)	2,331	2,331	2,331	[M]
With External Support ICAP PRM Requirement (MW)	147,115	147,764	148,507	[N]=[B]+[D]+[F]-[L]
With External Support UCAP PRM Requirement (MW)	135,748	136,393	136,804	[O]=[C]+[E]+[G]-[M]
With External Support MISO PRM ICAP	18.0%	17.9%	18.2%	[P]=([N]-[A])/[A]
With External Support MISO PRM UCAP	8.9%	8.8%	8.9%	[Q]=([O]-[A])/[A]

Out-Year Local Resource Zone Results

Local Resource Zone (LRZ)	LRZ-1 MN/ND	LRZ-2 WI	LRZ-3 IA	LRZ-4 IL	LRZ-5 MO	LRZ-6 IN	LRZ-7 MI	LRZ-8 AR	LRZ-9 LA/TX	LRZ-10 MS	Formula Key
2020-2021 Planning Year											
Unforced Capacity (UCAP)	20,332	14,252	11,371	12,128	7,860	17,846	22,111	10,876	23,091	4,600	[A]
Adjustment to UCAP	19	610	-380	-260	1,847	2,356	3,258	-655	1,227	2,218	[B]
Peak Demand (MW)	17,815	12,728	9,558	9,185	7,830	17,585	21,226	7,685	20,885	4,673	[C]
LRR UCAP per-unit of LRZ Peak Demand	114.2%	116.8%	115.0%	129.2%	124.0%	114.9%	119.5%	133.0%	116.4%	145.9%	$[D]=([A]+[B]-[C])/[C]$

Local Resource Zone (LRZ)	LRZ-1 MN/ND	LRZ-2 WI	LRZ-3 IA	LRZ-4 IL	LRZ-5 MO	LRZ-6 IN	LRZ-7 MI	LRZ-8 AR	LRZ-9 LA/TX	LRZ-10 MS	Formula Key
2023-2024 Planning Year											
Unforced Capacity (UCAP)	20,854	14,392	11,612	12,372	7,878	18,694	21,757	11,026	24,783	4,794	[A]
Adjustment to UCAP	181	467	-450	-285	1,774	1,688	3,204	-680	-95	2,241	[B]
Peak Demand (MW)	18,472	12,726	9,755	8,926	7,767	17,721	20,931	7,838	21,030	4,749	[C]
LRR UCAP per-unit of LRZ Peak Demand	113.9%	116.8%	114.4%	135.4%	124.3%	115.0%	119.3%	132.0%	117.4%	148.1%	$[D]=([A]+[B]-[C])/[C]$

Local Resource Zone (LRZ)	LRZ-1 MN/ND	LRZ-2 WI	LRZ-3 IA	LRZ-4 IL	LRZ-5 MO	LRZ-6 IN	LRZ-7 MI	LRZ-8 AR	LRZ-9 LA/TX	LRZ-10 MS	Formula Key
2025-2026 Planning Year											
Unforced Capacity (UCAP)	20,854	14,392	11,612	12,372	7,878	18,694	22,527	11,026	24,783	4,794	[A]
Adjustment to UCAP	410	554	-336	-507	1,774	1,774	2,241	-580	-100	2,283	[B]
Peak Demand (MW)	18,707	12,797	9,874	8,711	7,779	17,810	20,693	7,883	21,187	4,798	[C]
LRR UCAP per-unit of LRZ Peak Demand	113.7%	116.8%	114.2%	136.2%	124.1%	114.9%	119.7%	132.5%	116.5%	147.5%	$[D]=([A]+[B]-[C])/[C]$