

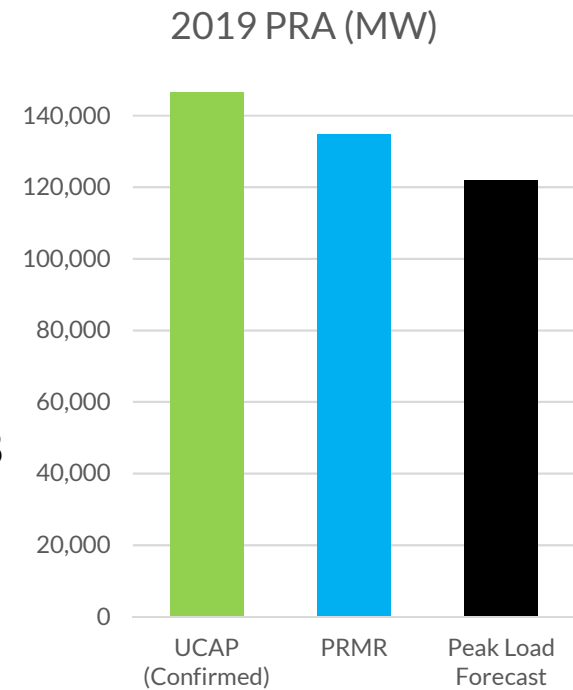


2019/2020 Planning Resource Auction (PRA) Results

April 12, 2019

Summary

- MISO Region has adequate resources to meet its Planning Reserve Margin Requirement of nearly 135,000 MW
- Footprint cleared at **\$2.99/MW-day**
- Zone 7 (MI) cleared at **\$24.30/MW-day**
- Regional generation supply consistent with the 2018 OMS-MISO Survey
- Several offers (~1.5MW) were mitigated by the Independent Market Monitor (IMM) for economic withholding, with a \$0.01/MW-day impact on Zone 7.



Background

MISO's Resource Adequacy construct combines regional and local criteria to achieve a least-cost solution for the region

Multiple options exist for Load-Serving Entities to demonstrate Resource Adequacy:

- 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

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

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

Changes Since 2018 Auction

TREATMENT OF EXTERNAL RESOURCES (ER18-2363):

In Oct. 2018, FERC approved MISO's filing to improve consistency between resources outside of MISO and resources external to a Local Resource Zone but within the footprint.

NEW REQUIREMENTS FOR LOAD MODIFYING RESOURCES (ER19-650):

In Feb. 2019, FERC approved part of MISO's Resource Availability and Need initiative related to Load Modifying Resource (LMR) availability. LMRs must now make themselves available for as much of the year as possible and with the shortest-possible notification times.

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 our [MISO Forward report](#).

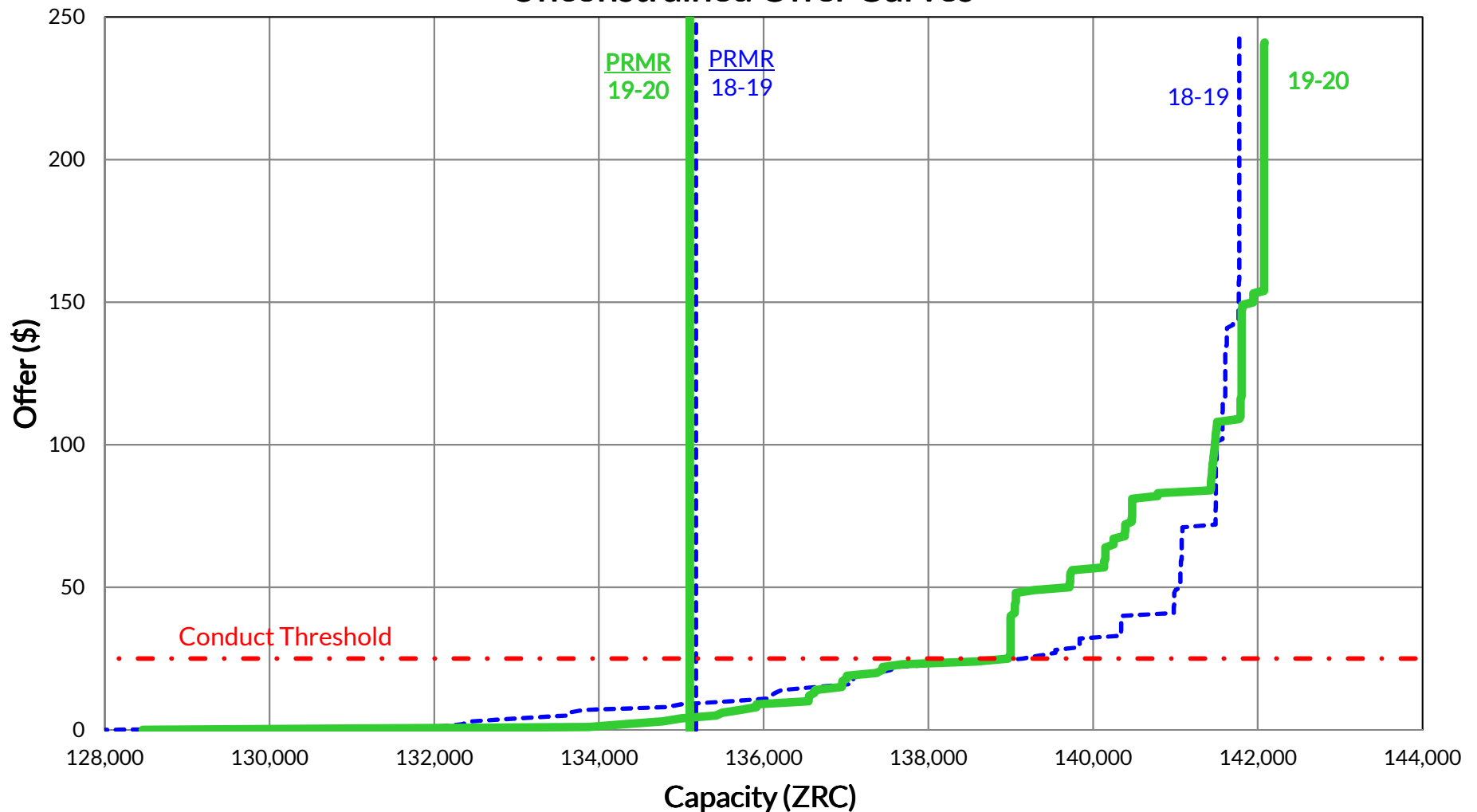
2019/2020 Auction Clearing Price Overview

Zone	Local Balancing Authorities	Price \$/MW-Day
1	DPC, GRE, MDU, MP, NSP, OTP, SMP	\$2.99
2	ALTE, MGE, UPPC, WEC, WPS, MIUP	\$2.99
3	ALTW, MEC, MPW	\$2.99
4	AMIL, CWLP, SIPC	\$2.99
5	AMMO, CWLD	\$2.99
6	BREC, CIN, HE, IPL, NIPS, SIGE	\$2.99
7	CONS, DECO	\$24.30
8	EAI	\$2.99
9	CLEC, EES, LAFA, LAGN, LEPA	\$2.99
10	EMBA, SME	\$2.99
ERZ	SPP, PJM, OVEC, LGEE, AECI, SPA, TVA	\$2.99

ERZ = External Resource Zones

Offer Curve: 2018/19 vs 2019/20

Unconstrained Offer Curves



2019/20 Planning Resource Auction Results

	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
PRMR	18,374.9	13,449.9	9,882.0	9,792.3	8,297.1	18,659.8	21,976.0	7,963.5	21,350.2	4,997.3	N/A	134,743.0
Offer Submitted (Including FRAP)	20,187.3	13,575.1	11,009.4	11,428.8	7,959.7	17,946.9	22,063.2	10,611.8	21,162.4	4,593.0	1,545.0	142,082.6
FRAP	14,318.7	11,278.9	4,124.4	832.1	0.0	1,587.0	12,096.9	489.4	171.9	1,380.3	134.6	46,414.2
Self Scheduled (SS)	3,938.1	2,258.0	6,187.6	6,249.7	7,844.1	13,945.1	9,682.7	9,276.5	18,750.5	2,644.1	1,270.5	82,046.9
Non-SS Offer Cleared	404.4	0.0	79.1	1,523.7	0.0	2,069.4	32.0	443.9	1,232.7	368.9	127.8	6,281.9
Committed (Offer Cleared + FRAP)	18,661.2	13,536.9	10,391.1	8,605.5	7,844.1	17,601.5	21,811.6	10,209.8	20,155.1	4,393.3	1,532.9	134,743.0
LCR	16,588.7	13,017.5	7,960.2	6,222.1	4,860.1	13,226.1	21,811.6	6,116.3	19,525.2	3,048.8	-	N/A
CIL	3,754	1,714	2,896	6,771	5,013	7,067	3,211	4,250	3,631	3,792	-	N/A
ZIA	3,753	1,713	2,987	5,312	5,013	6,924	3,211	4,249	3,631	3,792	-	N/A
Import	0.0	0.0	0.0	1,186.8	453.0	1,058.3	164.4	0.0	1,195.1	604.0	-	4,661.6
CEL	3,373.2	978.7	4,589.7	3,770.2	2,122.0	1,434.5	1,358.0	5,263.1	2,223.6	1,721.0	-	N/A
Export	286.3	87	509.1	0	0	0	0	2,246.3	0	0	1532.9	4,661.6
ACP (\$/MW-Day)	2.99	2.99	2.99	2.99	2.99	2.99	24.30	2.99	2.99	2.99	2.99	N/A

Values displayed in MW UCAP

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	
2014-2015	\$3.29	\$16.75							\$16.44		N/A	N/A
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				

Conduct Threshold	24.24	23.88	23.95	24.22	24.65	24.05	24.34	23.23	22.37	23.12	24.65
Cost of New Entry	242.36	238.82	239.51	242.16	246.47	240.49	243.37	232.27	223.67	231.15	246.47

- Auction Clearing Prices & are displayed as \$/MW-day
- Conduct Threshold is 10% of Cost of New Entry (CONE)
- Conduct Threshold is \$0 for a generator with a Facility Specific Reference Level

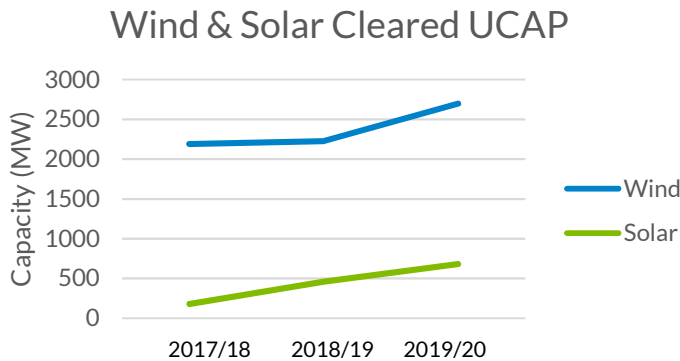
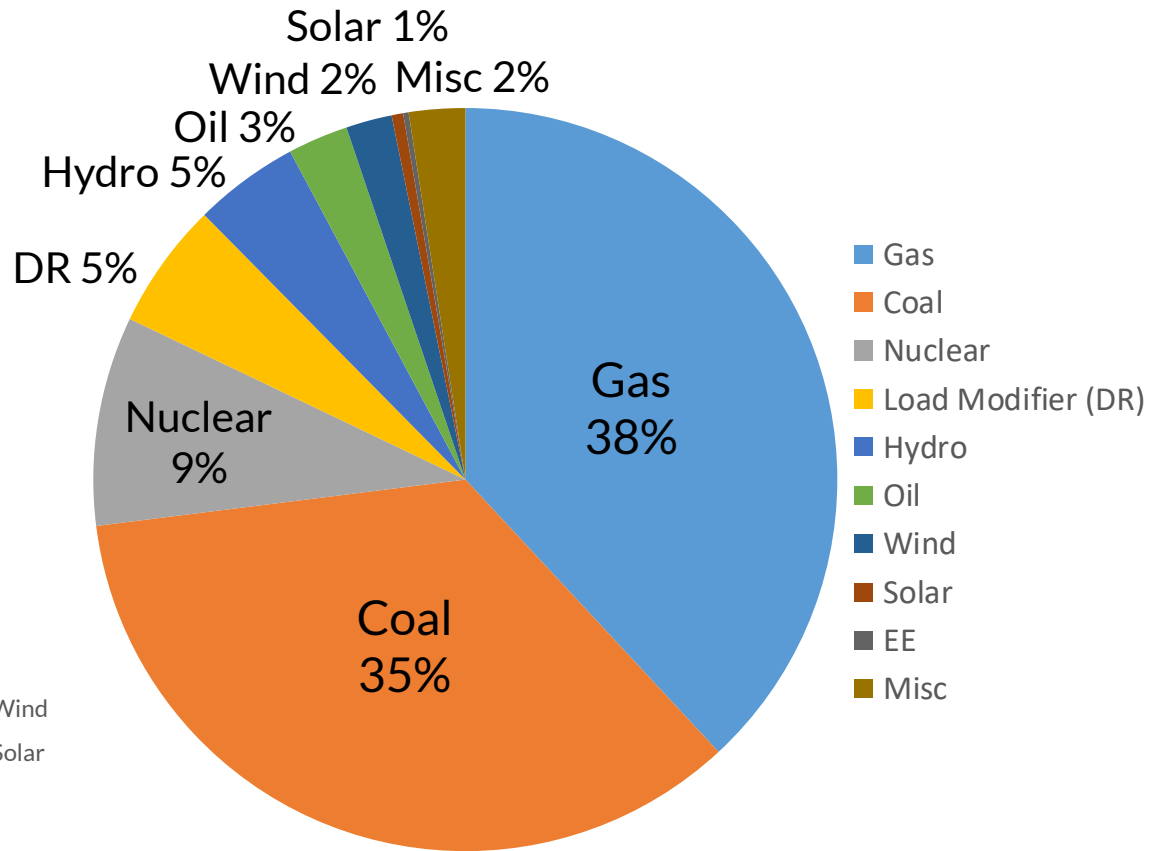
Supply Offered & Cleared

Planning Resource Type	2018-2019 Offered	2019-2020 Offered	2018-2019 Cleared	2019-2020 Cleared
Generation	126,159	125,290	120,855	119,779
External Resources	3,903	4,402	3,089	3,183
Behind the Meter Generation	4,176	4,202	4,098	4,097
Demand Resources	7,370	7,876	6,964	7,372
Energy Efficiency	173	312	173	312
Total	141,781	142,082	135,179	134,743

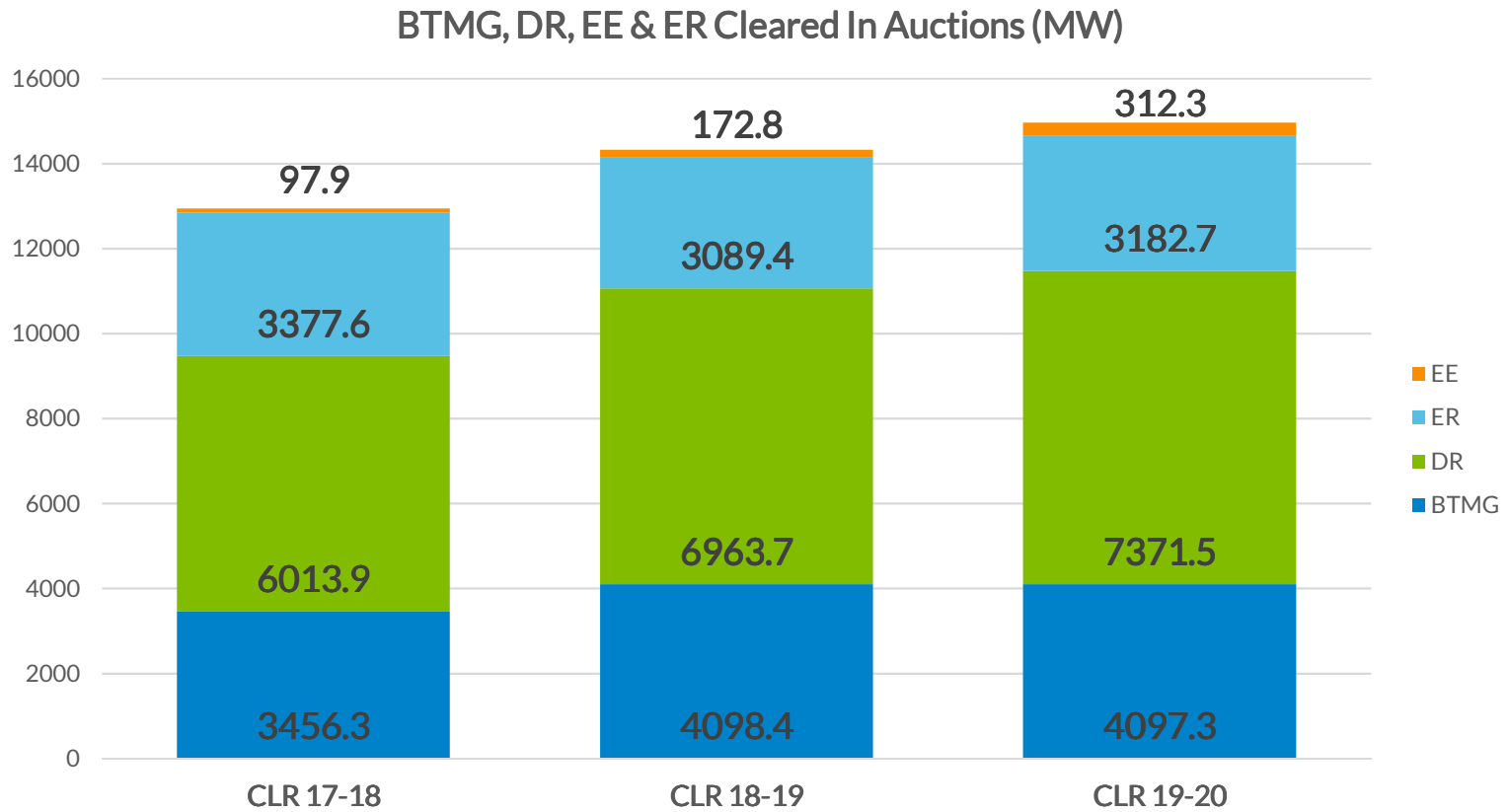
2019 Cleared Fuel Type

While solar still comprises a relatively small percentage of the region's total capacity, 680 MW of solar cleared this year's auction—an increase of 47% over last year's mark of 461 MW.

Similarly, 2,698 MW of wind cleared this year, an increase of 21%, or 469 MW, compared to last year.



Non Traditional Resources



Next Steps

- APR 15 – Conference call presentation of PRA results
- MAY 8 – Detailed results review at RASC
- MAY 13 – Posting of PRA offer data
- MAY 31 – LSE submit ICAP Deferral info
- JUN 1 – New Planning Year starts

Appendix

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



RAdequacy@misoenergy.org