

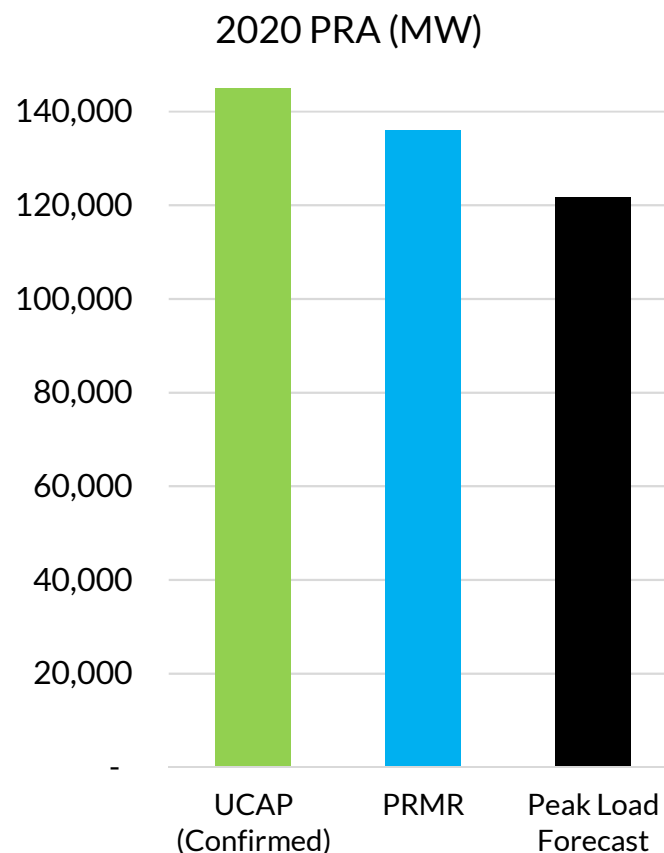


2020/2021 Planning Resource Auction (PRA) Results

April 14, 2020

MISO region has adequate reserves to meet its 136 GW Planning Reserve Requirement

- Most zones cleared \$4.75-\$6.88/MW-day
- Zone 7 (MI) cleared at Cost of New Entry of \$257.53/MW-day - insufficient zonal capacity to meet Zone 7 Local Clearing Requirement (LCR)
- South to North capacity reached limit causing price separation of \$0.25
- Regional generation supply consistent with the 2019 OMS-MISO Survey
- Cleared resources show the continued growth of gas, renewables, and demand side resources. This trend is the primary basis for Resource Availability and Need initiatives around the timely and efficient conversion of capacity into energy across all hours of the year



MISO's RA 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

Three primary changes since 2019 Auction

- **Preclude Resources on Long Term Outages from Participation in the PRA (ER20-129)**

In January 2020, FERC approved MISO's filing to limit the ability of Resources to participate in a Fixed Resource Adequacy Plan ("FRAP") and MISO's Planning Resource Auction ("PRA"), if the Resource has expected full or partial outages that last for any ninety (90) or more of the first 120 Calendar Days of the Planning Year which is consistent with the highest period of LOLE risk.

- **Load Modifying Resource (LMR) Testing Requirement Refinements (ER19-650)**

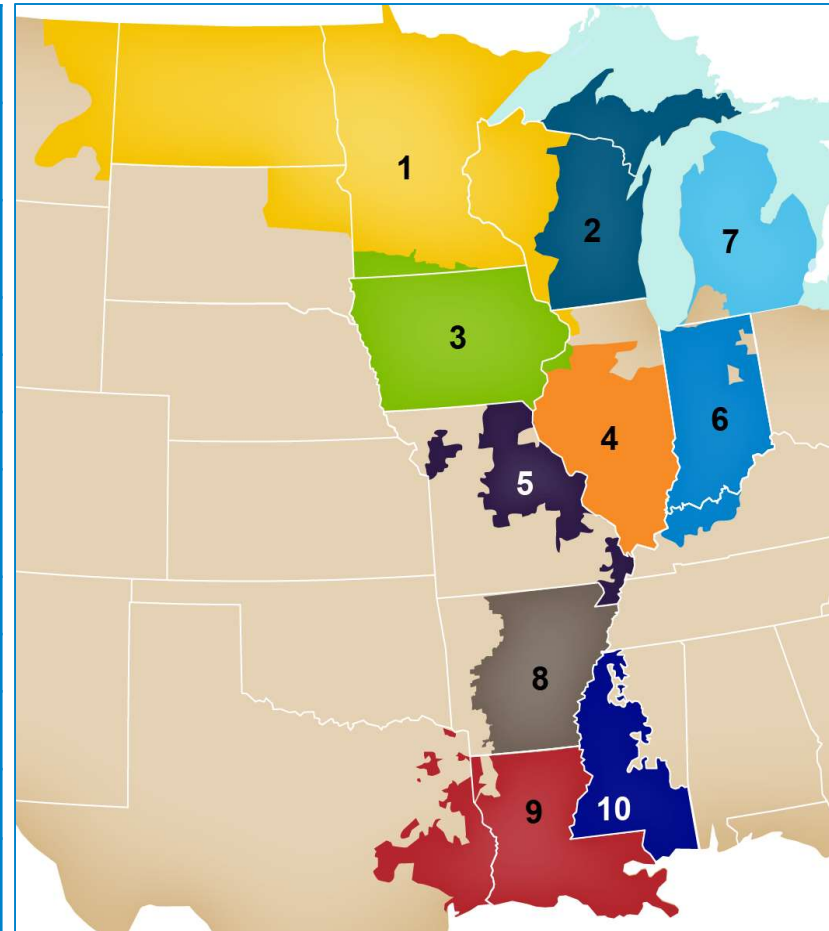
In Feb. 2019, FERC approved part of MISO's Resource Availability and Need initiative related to Load Modifying Resource (LMR) availability. Further LMR Business Practice refinements clarified that LMRs must provide power test results or performance data from a previous event to avoid a potential underperformance penalty, or be subject to a penalty if it failed to perform during an emergency event.

- **Ongoing Fleet Change**

- The auction results reflect the industry's ongoing shift away from coal-fired generation and an increasing reliance on gas-fired resources and non-traditional resources, such as intermittent renewable resources and various demand-based resources.
- These trends are the basis for MISO's current Resource Availability and Need efforts, including an imminent filing to incentivize the improved availability of LMRs, which MISO is increasingly relying on to ensure reliable operations throughout the year.

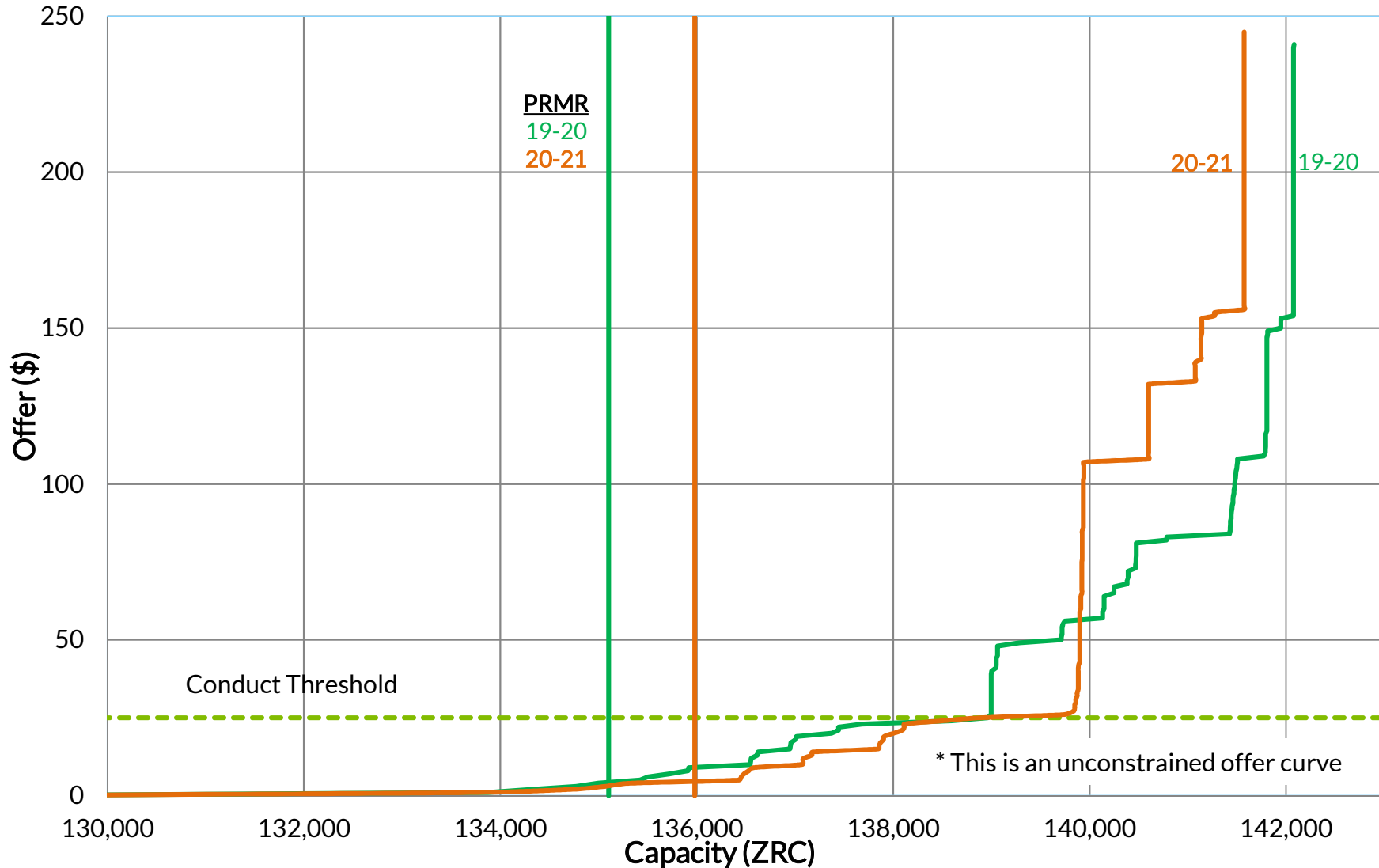
Auction Clearing Prices ~\$5/MW-day with exception of Zone 7, which cleared at CONE

Zone	Local Balancing Authorities	Price \$/MW-Day
1	DPC, GRE, MDU, MP, NSP, OTP, SMP	\$5.00
2	ALTE, MGE, UPPC, WEC, WPS, MIUP	\$5.00
3	ALTW, MEC, MPW	\$5.00
4	AMIL, CWLP, SIPC	\$5.00
5	AMMO, CWLD	\$5.00
6	BREC, CIN, HE, IPL, NIPS, SIGE	\$5.00
7	CONS, DECO	\$257.53
8	EAI	\$4.75
9	CLEC, EES, LAFA, LAGN, LEPA	\$6.88
10	EMBA, SME	\$4.75
ERZ	KCPL, OPPD, WAUE (SPP), PJM, OVEC, LGEE, AECI, SPA, TVA	\$4.89-5.00



ERZ = External Resource Zones

2020-21 Offer Curve* generally similar to 2019-20



2020/21 PRA Results by Zone

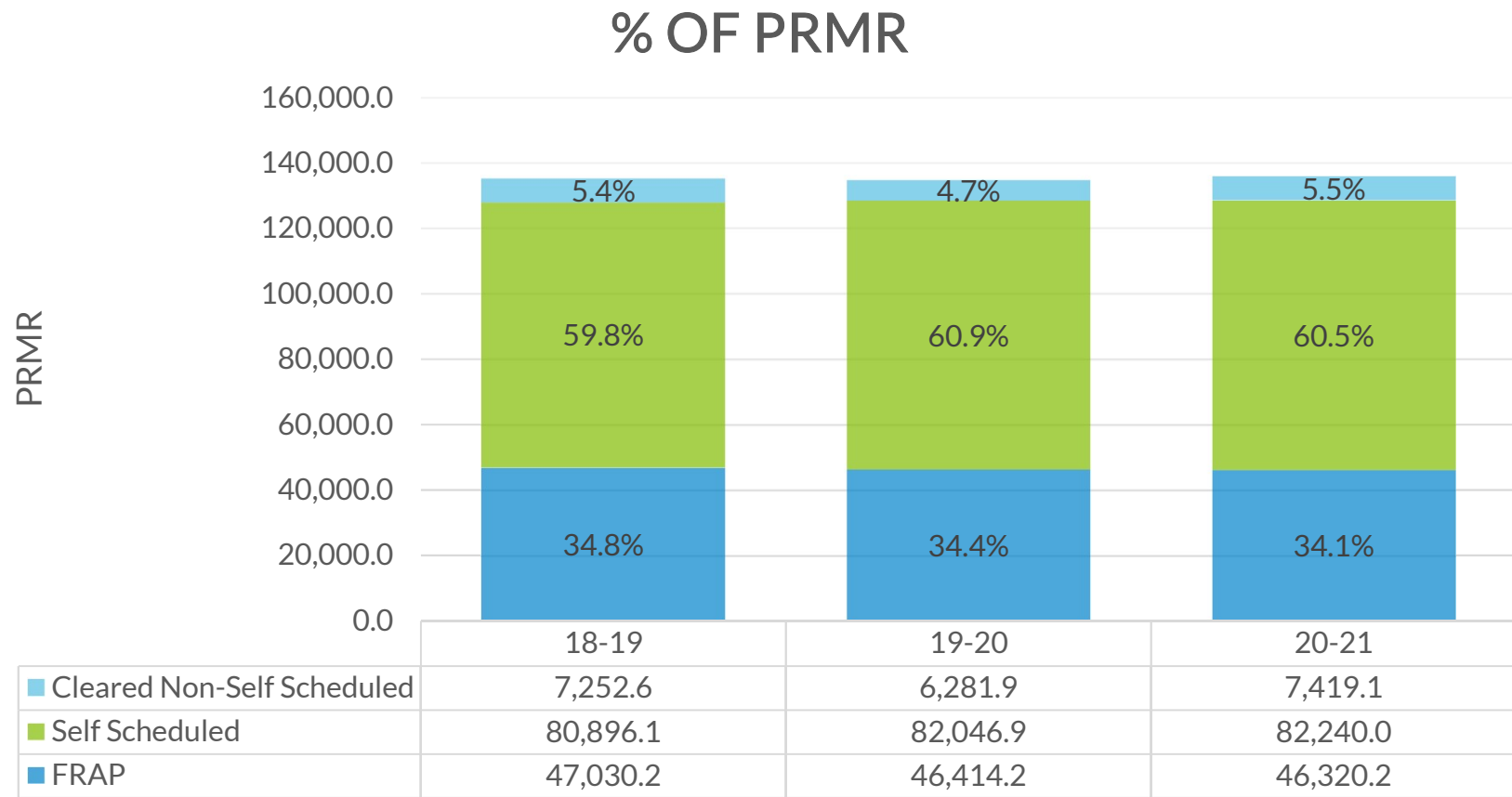
	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Z9	Z10	ERZ	System
PRMR	18,476.0	13,728.2	10,129.1	9,794.6	8,456.3	18,720.6	21,945.3	7,986.9	21,711.7	5,030.6	N/A	135,979.3
Offer Submitted (Including FRAP)	20,296.4	14,056.1	10,822.0	10,281.4	7,952.8	17,134.6	21,727.5	10,573.5	21,800.7	5,300.2	1,629.0	141,574.2
FRAP	14,198.3	11,473.4	4,143.6	705.1	0.0	1,515.4	12,034.4	501.4	174.0	1,402.7	171.9	46,320.2
Self Scheduled (SS)	3,800.1	2,116.5	6,031.5	6,005.9	7,952.8	13,563.9	9,619.9	9,255.0	19,123.9	3,454.5	1,316.0	82,240.0
Non-SS Offer Cleared	743.6	0.1	375.9	1,751.1	0.0	1,975.3	73.2	426.7	1,595.8	387.0	90.4	7,419.1
Committed (Offer Cleared + FRAP)	18,742.0	13,590.0	10,551.0	8,462.1	7,952.8	17,054.6	21,727.5	10,183.1	20,893.7	5,244.2	1,578.3	135,979.3
LCR	17,058.9	13,331.9	7,671.9	6,744.2	4,453.3	12,778.3	21,850.7	6,243.1	20,893.7	3,688.3	-	N/A
CIL	2,902	1,603	3,284	6,003	5,424	7,326	3,200	3,824	3,410	3,160	-	N/A
ZIA	2,900	1,603	3,171	5,085	5,424	7,041	3,200	3,776	3,410	3,160	-	N/A
Import	0.0	138.2	0.0	1,332.5	503.5	1,666.0	217.8	0.0	818.0	0.0	-	4,676.0
CEL	4,101	-	-	3,859	-	4,622	-	-	1,918	1,658	-	N/A
Export	266.0	0.0	421.9	0.0	0.0	0.0	0.0	2,196.2	0.0	213.6	1,578.3	4,676.0
ACP (\$/MW-Day)	5.00	5.00	5.00	5.00	5.00	5.00	257.53	4.75	6.88	4.75	4.90*	N/A

Values displayed in MW UCAP

04/14/2020: MISO Planning Resource Auction (PRA) for Planning Year 2020-2021 Results Posting



Members continue to utilize FRAP and Self Schedule to meet Resource Adequacy Requirements



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					
2020-2021	\$5.00					\$257.53	\$4.75	\$6.88	\$4.75	\$4.89- \$5.00		
IMM Conduct Threshold	25.61	25.17	25.02	25.46	26.08	25.49	25.75	24.56	23.66	24.50	26.08	
Cost of New Entry	256.08	251.67	250.22	254.68	260.79	254.88	257.53	245.64	236.58	244.96	260.79	

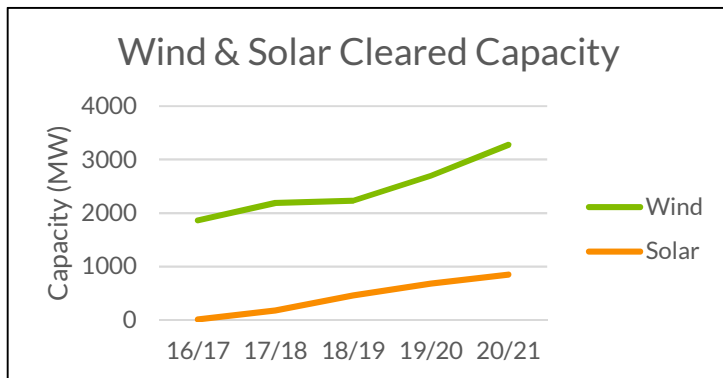
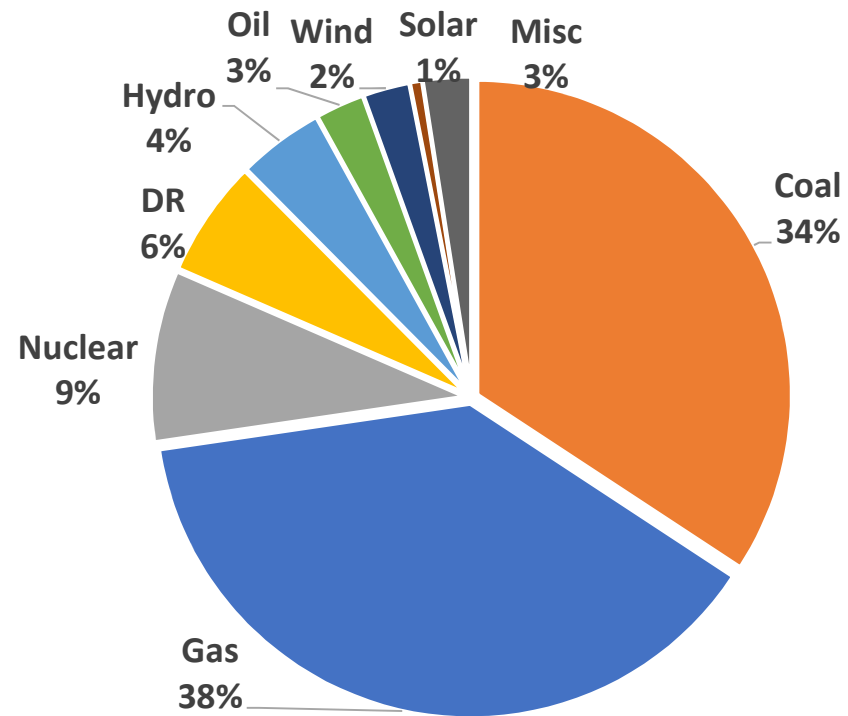
- Auction Clearing Prices shown in \$/MW-day
- Conduct Threshold is 10% of Cost of New Entry (CONE)

Supply Offered & Cleared

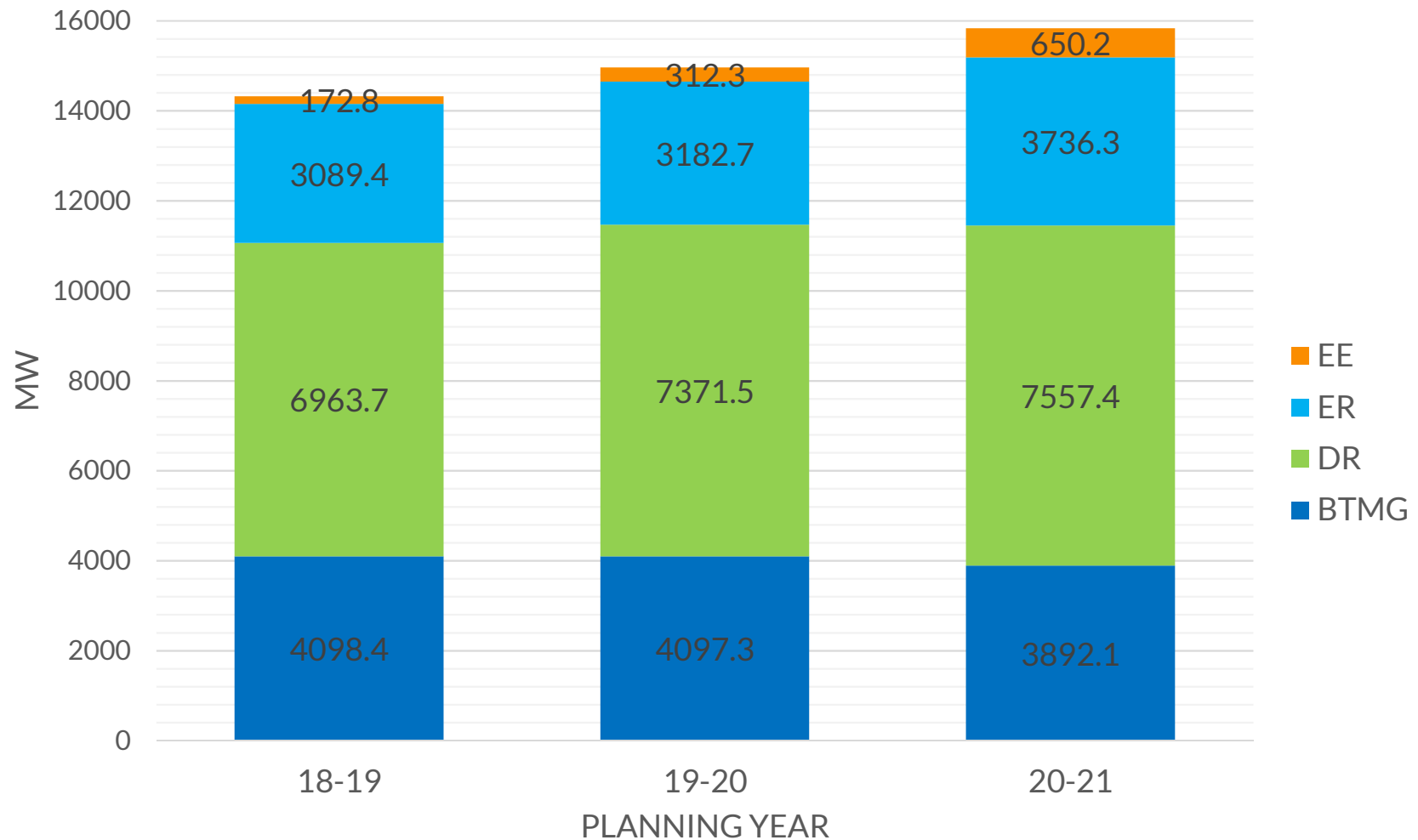
Planning Resource	Offered (ZRC)			Cleared (ZRC)		
	2018-19	2019-20	2020-21	2018-19	2019-20	2020-21
Generation	126,159	125,290	125,341	120,855	119,779	120,143
External Resources	3,903	4,402	3,832	3,089	3,183	3,736
Behind the Meter Generation	4,176	4,202	3,997	4,098	4,097	3,892
Demand Resources	7,370	7,876	7,754	6,964	7,372	7,557
Energy Efficiency	173	312	650	173	312	650
Total	141,781	142,082	141,574	135,179	134,743	135,979

While conventional generation provides 80% of resources, wind and solar are growing...

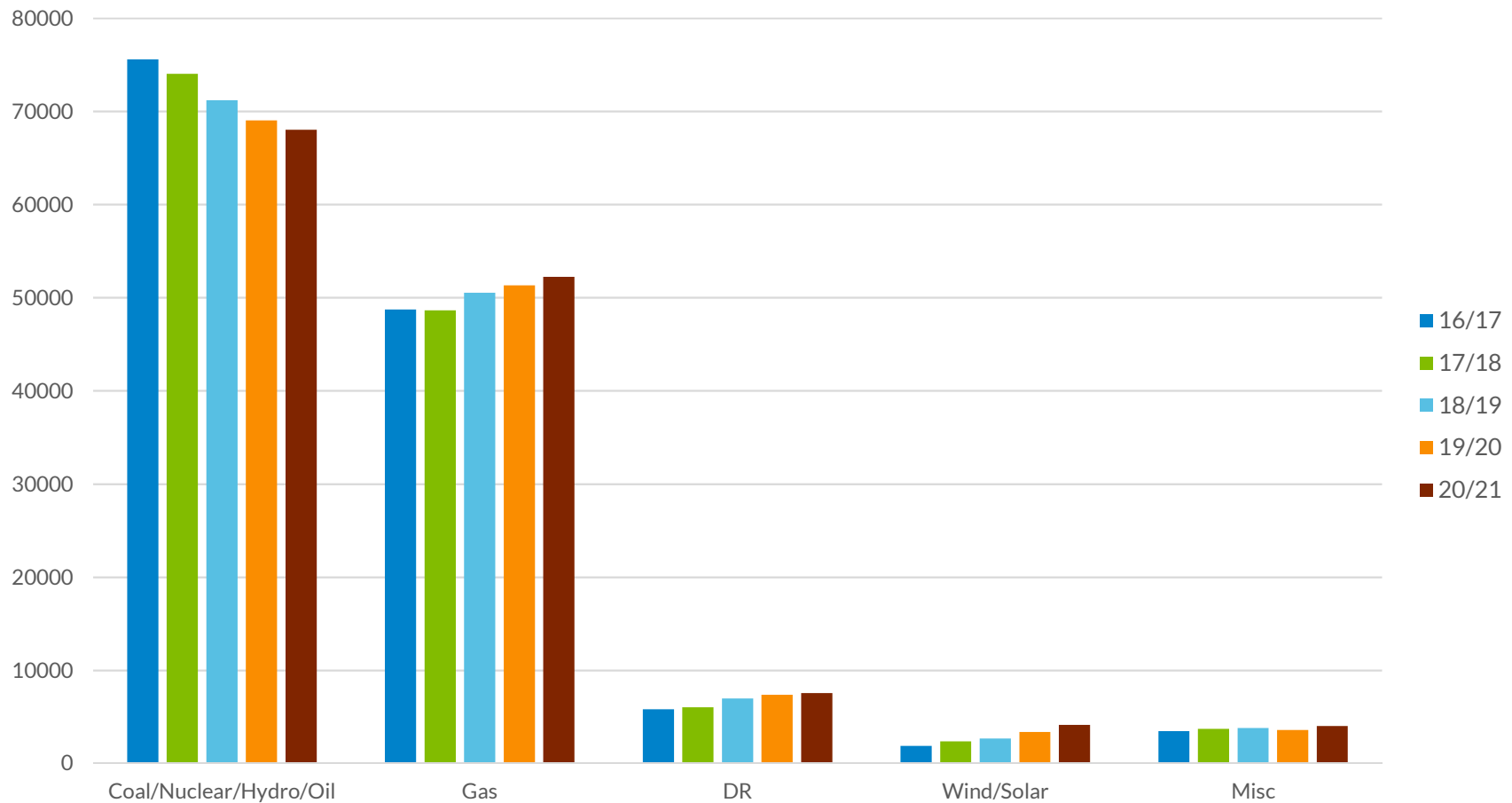
- 850MW of solar cleared this year's auction—an increase of 25% from PY 2019-20 (680 MW).
- Similarly, 3,275 MW of wind cleared this year, an increase of 21% compared to last year (2,697 MW).



...as have demand-based resources...



...which continues trend of non-conventional resource gains over the past 5 years, and a primary driver for our pursuit of Resource Availability and Need initiatives



Next Steps

- APR 15 – Conference call presentation of PRA results
- MAY 6 – Detailed results review at RASC
- MAY 15 – Posting of PRA masked offer data
- MAY 25 – MISO published cleared LMRs to the MCS
- MAY 29 – 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



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