

Installed Reserve Margin (IRM), Forecast Pool Requirement (FPR), and Effective Load Carrying Capability (ELCC) for 2029/2030 BRA

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Disclaimer: While materials are current at the time of publishing, applicable requirements may change. PJM Governing Documents control.

1. **Notice of Intent to Offer (NOI):**

Planned resources that submitted a Notice of Intent to Offer for the 2029/30 BRA were included in the assumed resource mix

2. **Installed Capacity Ratings (ICAP Ratings):**

ICAP Ratings reflect any 2029/30 transitional system capability awarded

3. **Announced Deactivations:**

Resources with announced deactivations scheduled to occur before June 1, 2030 were removed from the assumed resource mix

Overall increase of 5,693 MW ICAP in the 29/30 BRA versus the 28/29 BRA

- PJM recently filed with FERC a proposal to Extend Rules to Recognize Certain RMR Resources as Capacity Through the 2030/2031 Delivery Year
 - Units in question are the Brandon Shores units (1 and 2) and the Wagner units (3 and 4)
- PJM set up the 2029/30 BRA case under the assumption FERC approves the filing and therefore, **the units are included in the resource portfolio.**

Hourly load profiles for the 2029/30 BRA were derived using the 2026 PJM load forecast

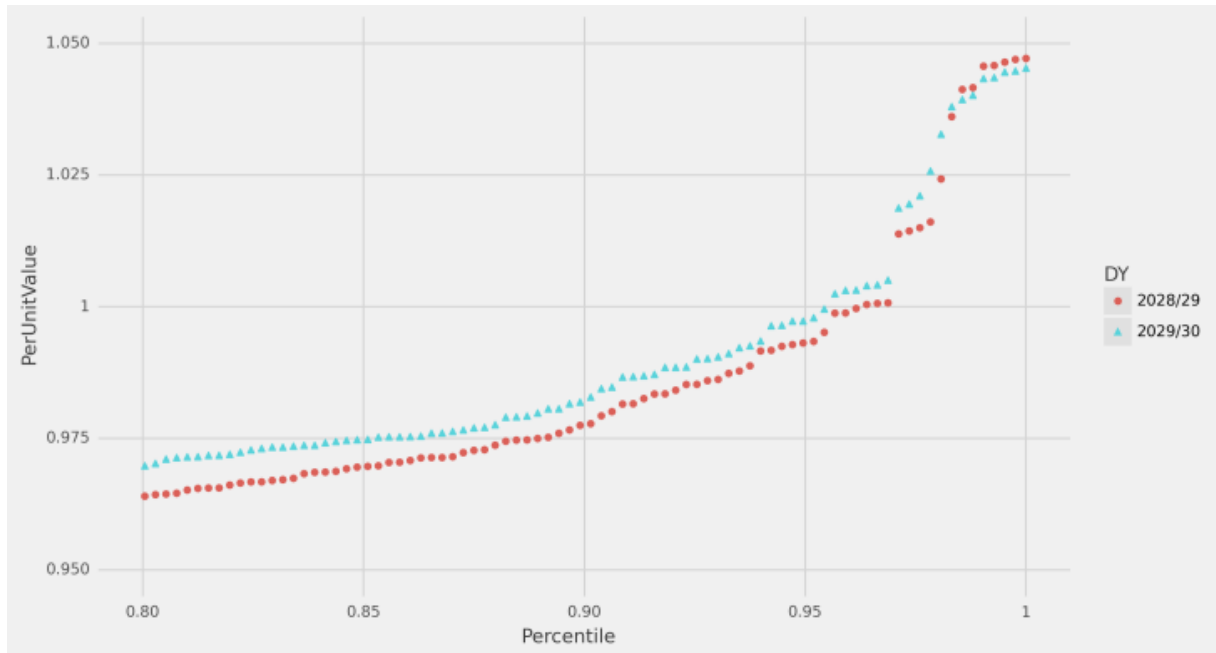
- 2028/29 BRA run also used scenarios from the 2026 PJM Load Forecast
- Summer extreme loads relative to the 50/50 annual peaks are lower for 2029/30 than those for 2028/29
- Winter extreme loads relative to the 50/50 annual peaks are higher in the for 2029/30 than those for 2028/29

2029/30 load shapes resulted in upward pressure on winter risk

Top 20th Percentile of Seasonal Peak Distributions: 28/29 BRA vs 29/30 BRA

Drivers:

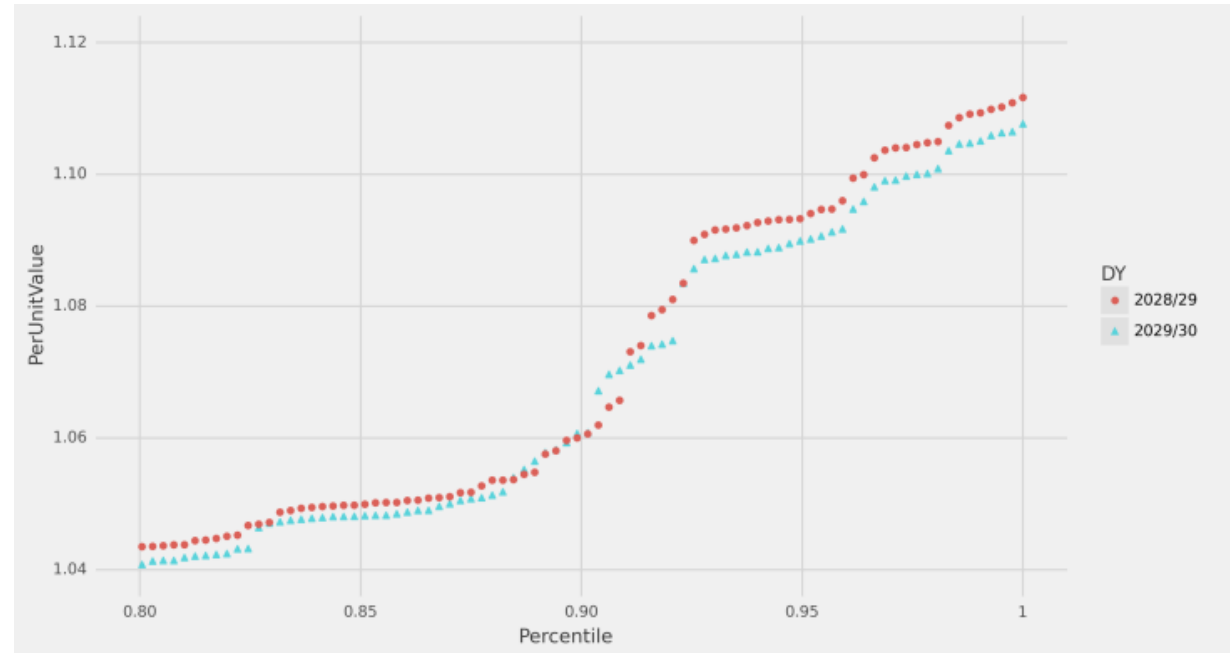
- Data Center Loads: rapid data center growth is resulting in more load in January than the preceding summer
- Forecasted trends: effects of electrification of heating on the system



Winter

Drivers:

- Rooftop Solar: growth in rooftop solar reduced summer peaks, but has minimal impact on winter peaks



Summer

2029/30 BRA Assumed Resource Portfolio

ELCC Class	Effective Nameplate (MW)	Installed Capacity (MW)
Onshore Wind	14,609 	3,599 
Offshore Wind	Small Sample Size	Small Sample Size
Solar Fixed Panel	3,136 	1,585 
Solar Tracking Panel	24,722 	14,937 
Landfill Gas Intermittent	144 	100 
Hydro Intermittent	820 	545 
4-hr Storage, 6-hr Storage,	7,144 	7,144 
8-hr Storage, 10-hr Storage		
Solar-Storage Hybrid	Small Sample Size	Small Sample Size
DR	n/a	8,711 

ELCC Class	Effective Nameplate (MW)	Installed Capacity (MW)
Nuclear	n/a	32,220 
Coal	n/a	31,304 
Gas CC (Single and Dual Fuel)	n/a	59,921 
Gas CT	n/a	11,378 
Gas CT Dual Fuel	n/a	13,728 
Diesel	n/a	328 
Steam	n/a	10,284 
Waste to Energy Steam	n/a	739 
Oil-Fired CT	n/a	2,887 
Hydro With Non-Pumped Storage	2,015 	1,945 
Other Thermal	n/a	441 

Arrow's direction is relative to values in 2028/29 BRA Portfolio.

ELCC Class	Final Rating
Onshore Wind	37%
Offshore Wind	64%
Solar Fixed Panel	6%
Solar Tracking Panel	7%
Landfill Gas Intermittent	50%
Hydro Intermittent	35%
4-hr Storage	57%
6-hr Storage	67%
8-hr Storage	69%
10-hr Storage	77%

ELCC Class	Final Rating
DR	90%
Nuclear	96%
Coal	84%
Gas CC	75%
Gas CT	60%
Gas CT Dual Fuel	77%
Diesel	92%
Steam	75%
Waste to Energy Steam	83%
Oil-Fired CT	81%

2029/30 BRA ELCC Class Ratings vs. 2028/29 BRA Ratings

ELCC Class	BRA Rating		Change (%)
	2028/2029	2029/2030	
Onshore Wind	34%	37%	3%
Offshore Wind	60%	64%	4%
Solar Fixed Panel	7%	6%	-1%
Solar Tracking Panel	10%	7%	-3%
Landfill Gas Intermittent	50%	50%	0%
Hydro Intermittent	35%	35%	0%
4-hr Storage	59%	57%	-2%
6-hr Storage	68%	67%	-1%
8-hr Storage	71%	69%	-2%
10-hr Storage	78%	77%	-1%
DR	91%	90%	-1%
Nuclear	96%	96%	0%
Coal	85%	84%	-1%
Gas CC	78%	75%	-3%
Gas CT	67%	60%	-7%
Gas CT Dual Fuel	79%	77%	-2%
Diesel	93%	92%	-1%
Steam	75%	75%	0%
Waste to Energy Steam	84%	83%	-1%
Oil-Fired CT	83%	81%	-2%

- Majority of ELCC Classes see a decrease in rating due to higher winter risk share.
 - ELCC Classes with larger decreases are those with worse performance in winter risk hours relative to summer risk hours.
- Other factors such as CIR/ENC ratio (for Variable Resources), and class membership also impact the rating change

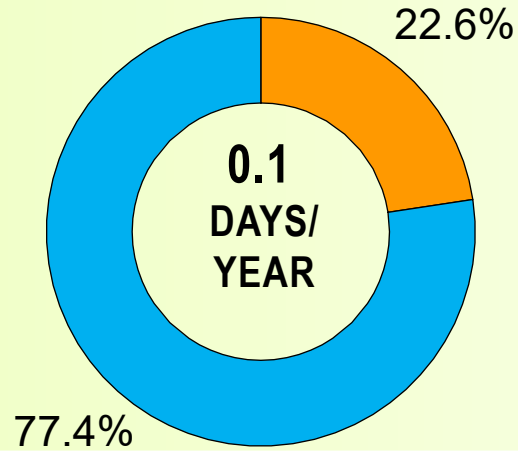
Seasonal Changes in 2029/2030 BRA vs. 2028/2029 BRA

2029/2030

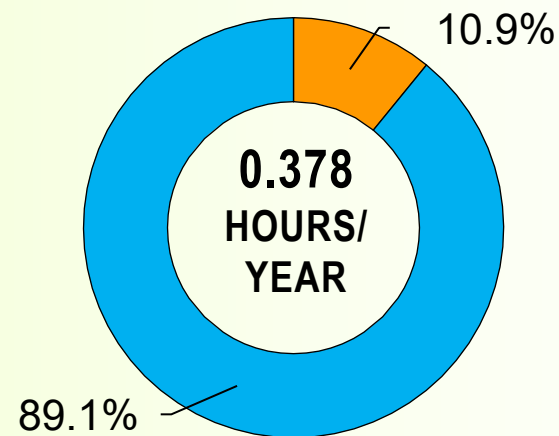
BRA

SEASONAL
SHARE OF:

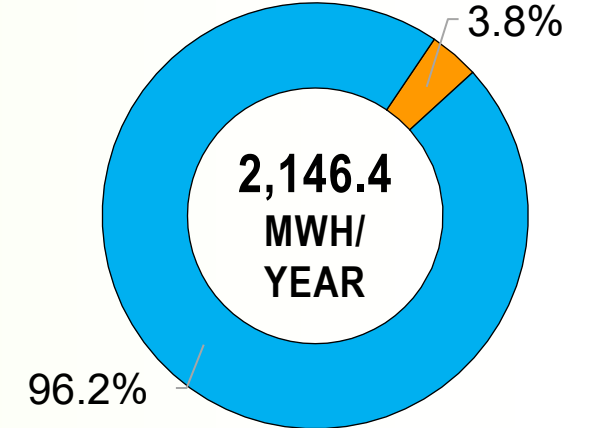
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LOLH =



EUE =

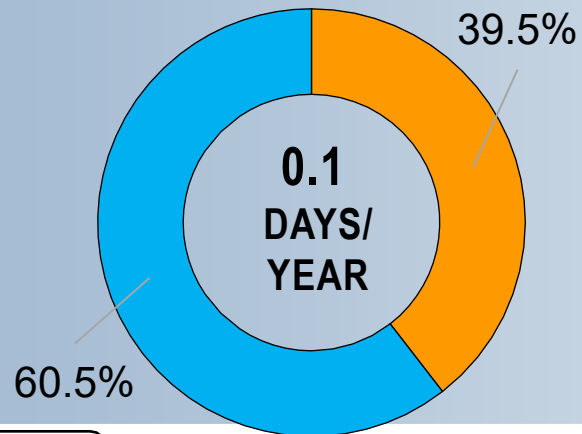


2028/2029

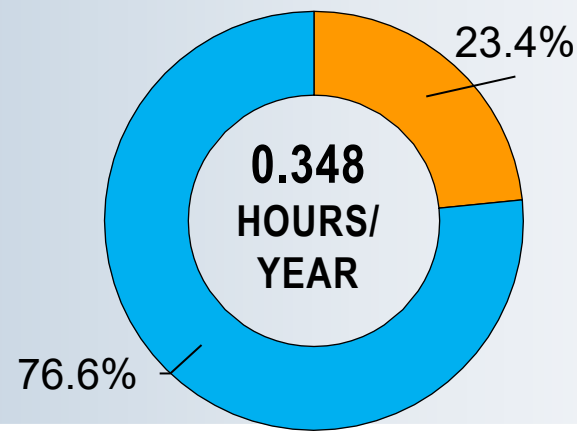
BRA

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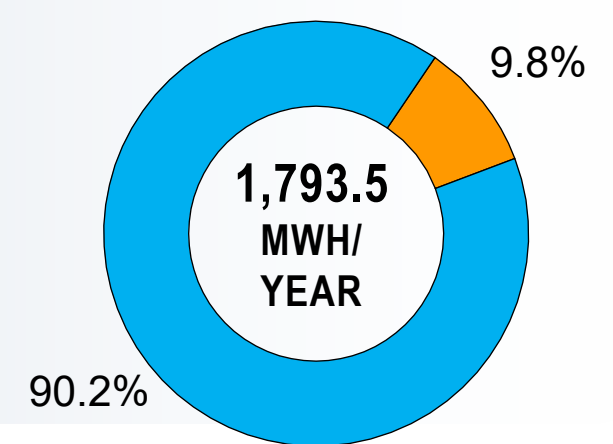
LOLE =



LOLH =



EUE =



● Winter ● Summer

- 2029/2030 BRA Installed Reserve Margin (IRM) equals **20.4%**.
- Calculation of the Accredited UCAP factor is the ratio of Unforced Capacity (UCAP) to Installed Capacity (ICAP) in the model.

*This ratio is **0.7681**.*

The FPR is then:

- $(1 + \text{IRM}) \times \text{Pool-Wide Average Accredited UCAP Factor}$
- $(1 + 0.204) \times 0.7681 = 0.9248$

2029/2030 BRA IRM and FPR vs. 2028/2029 BRA

PARAMETER	28/29 BRA Value	29/30 BRA Value	Change	Key Factors
ICAP (MW)	196,871	202,564	5,693	Net increase driven by NOIs from gas and solar resources
“Solved Load” (MW)	162,063	166,146	4,083	Higher value due to higher ICAP. However, increase is less than ICAP increase due to higher extreme winter loads
CBOT (%)	1.5%	1.5%	-	
Installed Reserve Margin (IRM)	20.0%	20.4%	0.4%	Higher extreme winter loads put upward pressure on IRM.
Accredited UCAP (MW)	154,234	155,580	1,346	Higher value due to higher ICAP. However, overall accreditation of portfolio is lower (see next row)
Pool-Wide Average UCAP Factor	0.7834	0.7681	-0.0153	Higher winter risk share
Forecast Pool Requirement (FPR)	0.9401	0.9248	-0.0153	Lower accreditation of resources

Supply/Demand Balance in 2029/30 BRA vs 2028/29 BRA cases

PARAMETER	BRA Value		Change
	28/29	29/30	
ICAP (MW)	196,871	202,564	5,693
“Solved Load” (MW)	162,063	166,146	4,083
CBOT (%)	1.5%	1.5%	-
Installed Reserve Margin (IRM)	20.0%	20.4%	0.4%
Accredited UCAP (MW)	154,234	155,580	1,346
Pool-Wide Average UCAP Factor	0.7834	0.7681	-0.0153
Forecast Pool Requirement (FPR)	0.9401	0.9248	-0.0153
Peak Load Forecast (MW)	165,567	171,530	5,963
“Reliability Requirement” (FPR x Peak Load Forecast)	155,650	158,631	2,981
UCAP Surplus (Accredited UCAP – “Reliability Requirement”)	-1,416	-3,051	-1,635

The UCAP Surplus in the 29/30 BRA case is 1,635 MW less than in the 28/29 BRA case. Therefore, the 29/30 BRA case is “tighter”.

The decrease in UCAP Surplus is driven by the higher Peak Load Forecast.

CAVEAT: “Reliability Requirement” refers to the calculation $FPR \times \text{Peak Load Forecast}$ assuming that all the PJM load is in the RPM market, which is not accurate due to FRR load and other considerations. In addition, the Total Accredited UCAP value assumes that all resources included in the assumed resource portfolio count towards the available UCAP, which is not necessarily true in the actual RPM market. Hence, the comparison in the table is focused on the RRS/ELCC cases and not on potential market outcomes.

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FPR, IRM, & ELCC for 29/30 BRA



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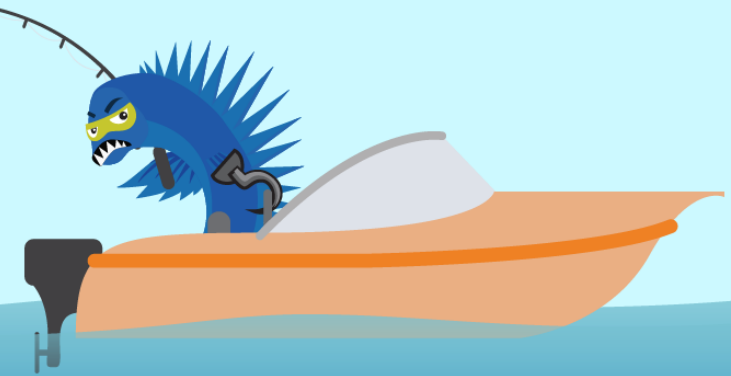
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Appendix

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Parameter Overview: 2028/29 BRA vs 2029/30 BRA

Parameter	2028/29 BRA	2029/30 BRA
Load Scenarios	2026 PJM Load Forecast	2026 PJM Load Forecast
Weather Data	June 1, 1993 through May 31, 2025	June 1, 1993 through May 31, 2025
Unlimited Resource Performance Data	June 1, 2012 through May 31, 2025	June 1, 2012 through May 31, 2025
Variable Resource Performance Data	June 1, 2012 through May 31, 2025	June 1, 2012 through May 31, 2025
DR ICAP	2026 PJM Load Forecast	2026 PJM Load Forecast



Drivers for changes between 2028/29 BRA and 2029/30 BRA

- IRM Drivers
 - The load shapes for 2029/30 put upward pressure on the IRM (about 0.4 percentage points based on sensitivity run)
 - Other inputs to the 2029/30 BRA case, particularly the updated Resource Portfolio, have negligible impact on the IRM

- Summer/Winter Risk Share Drivers
 - The load shapes for 2029/30 **put upward pressure on winter risk** (about 8 percentage points on LOLH, for example)
 - Other inputs to the 2029/30 BRA case, particularly the updated Resource Portfolio, **put downward pressure on summer risk (which results in more winter risk)**

Supply/Demand Balance in 2029/30 BRA vs 2028/29 BRA cases (if peak forecast and ICAP would not have changed in 29/30 BRA)

PARAMETER	28/29 BRA Value	"29/30 BRA Value"	Change
ICAP (MW)	196,871	196,871	-
Installed Reserve Margin (IRM)	20.0%	20.4%	0.4%
Accredited UCAP (MW)	154,234	151,217	-3,017
Pool-Wide Average UCAP Factor	0.7834	0.7681	-0.0153
Forecast Pool Requirement (FPR)	0.9401	0.9248	-0.0153
Peak Load Forecast (MW)	165,567	165,567	-
"Reliability Requirement" (FPR x Peak Load Forecast)	155,650	153,116	-2,534
UCAP Surplus (Accredited UCAP – "Reliability Requirement")	-1,416	-1,899	-483

- The IRM and FPR have a small impact on the UCAP Surplus change. We can get to that conclusion by using the 28/29 BRA values for ICAP and Peak Load Forecast (instead of the applicable 29/30 BRA values) and observing that the UCAP Surplus decreases by 483 MW in this scenario (which is a fraction of the 1635 MW shown in the previous slide)