Large Load Additions
Pre-CIFP Education
September 2, 2025

Education Covered Today

- Status quo
  - RPM and Reliability Backstop
  - Operations – Manual Load Dump
  - RPM Obligations
- Load Forecast
  - Overview of process
  - Improvements in Load Forecast process

Status Quo
RPM and Reliability Backstop

RPM Impacts if Resource Inadequate

The Reliability Pricing Model (RPM) is the PJM resource adequacy construct that seeks to commit adequate Capacity Resources to provide reliable service to loads within the PJM Region

- RTO Supply is the accredited supply (ELCC) cleared in the RPM Auction for a future delivery year. Includes Internal and external (pseudo-tie) capacity and Demand Response.

- Reliability Requirement is used as basis to secure necessary future supply and is set to maintain a loss of load expectation (LOLE) on one occurrence in 10 years (1 in 10)

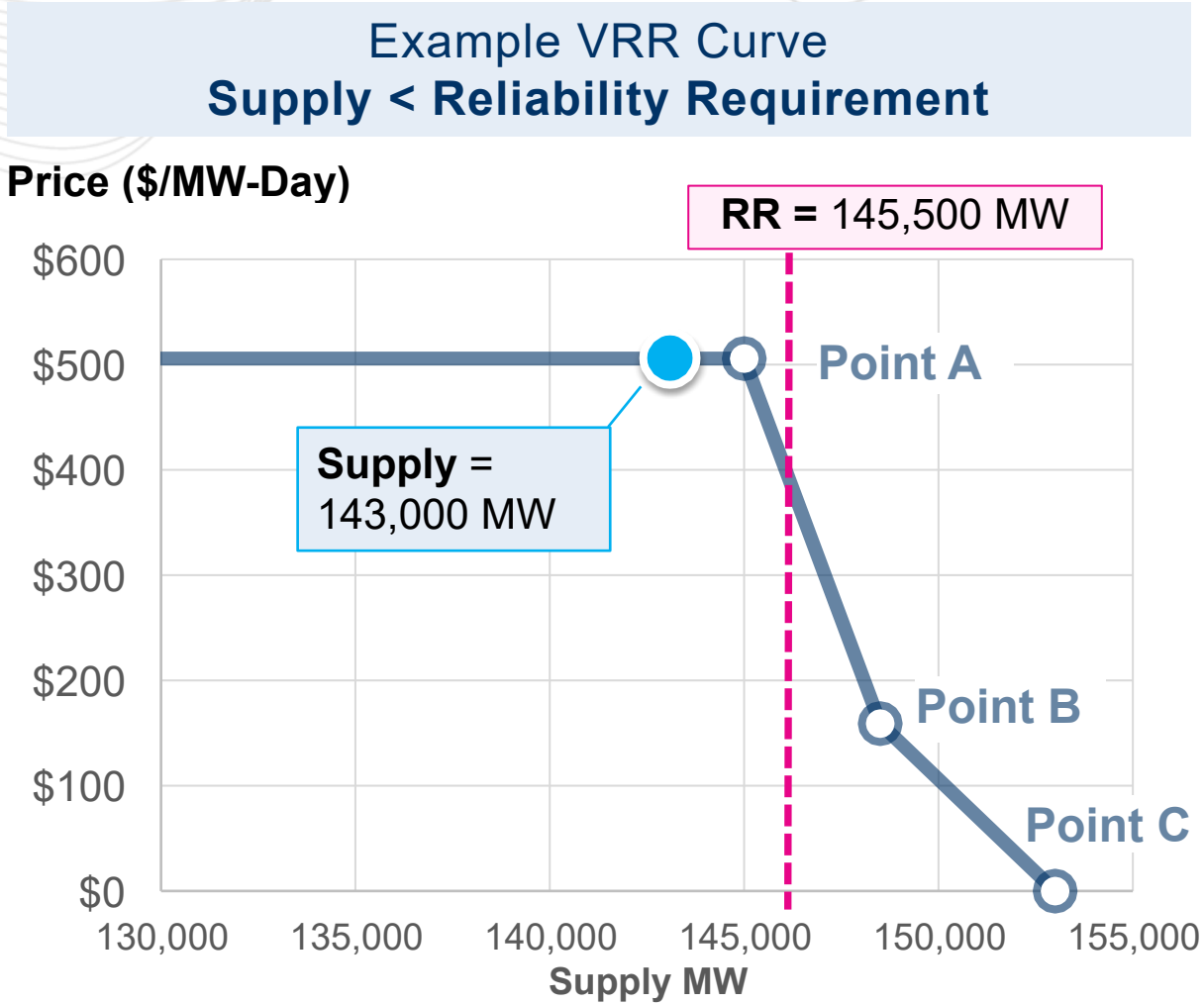
If the RPM RTO Supply < RPM RTO Reliability Requirement then PJM is forecasted to not meet its LOLE and the risk of manual load shed increases

RPM Price impact if Supply < Reliability Requirement

Variable Resource Requirement (VRR) Curve is a demand curve used in the clearing of the Base Residual Auction that defines the price for a given level of Capacity Resource commitment relative to the applicable Reliability Requirement.

In the example, the Supply < Reliability Requirement and also Point A and therefore the RPM price equals the maximum price ($500 /MW-Day).

Point A establishes the upper limit for capacity prices derived from Cost of New Entry (CONE).



RPM Reliability Backstop (Resource Adequacy) OATT Attachment DD section 16.4

Purpose	The Reliability Backstop provides a mechanism to resolve reliability criteria violations caused by: (a) lack of sufficient capacity committed through the Reliability Pricing Model Auctions; or (b) near-term transmission deliverability violations identified after the Base Residual Auction is conducted. These backstop mechanisms are intended to guarantee that sufficient generation, transmission and demand response solutions will be available to preserve system reliability. The backstop mechanisms are based on specific triggers that signal a need for a targeted solution to a reliability problem that was not resolved by the long-term commitment of Capacity Resources through Self-Supply or the Reliability Pricing Model Auctions.
Actions	Corrective actions may include adjusting the Cost of New Entry to the extent determined necessary by such investigation, or addressing other barriers to entry identified by such investigation. No Reliability Backstop Auction will be conducted to address such a shortfall unless it occurs in the Base Residual Auctions for three consecutive Delivery Years.

Reliability Backstop (cont.)

RPM Reliability Backstop (Resource Adequacy)

Trigger 1	If the total Unforced Capacity of all Capacity Resources committed through Self-Supply or the Base Residual Auctions for three consecutive Delivery Years, equates to an installed reserve margin that is more than one percentage point lower than the approved PJM Region Installed Reserve Margin, the Office of the Interconnection will declare a capacity shortage and make a filing with FERC for approval to conduct a Reliability Backstop Auction.
Trigger 2	If the total Unforced Capacity of all Base Load Generation Resources committed in a Base Residual Auction for a Delivery Year is less than the forecasted minimum hourly load calculated by the Office of the Interconnection for such Delivery Year, the Office of the Interconnection will investigate the cause of shortfall. If such a shortfall occurs in the Base Residual Auctions for three consecutive Delivery Years, the Office of the Interconnection shall declare a capacity shortage and make a filing with FERC for approval to conduct a Reliability Backstop Auction.

RPM Reliability Backstop Auction

Action	The Reliability Backstop Auction shall obtain commitments of **additional** Generation Capacity Resources (or, as applicable, additional Base Load Generation Resources) for a term of up to fifteen (15) Delivery Years. If a Reliability Backstop Auction is required, the offer period for such auction shall commence no later than four months after the Base Residual Auction in which the third consecutive Capacity Resource shortfall occurs. The offer period will be open for six (6) months. PJM Settlement shall be the Counterparty to the capacity transaction resulting from committed Capacity Resources clearing the Reliability Backstop Auction.
Sell Offers	Sell Offers shall include the following: 1. Minimum price in $/MW-day required by the Capacity Market Seller to provide **additional** Unforced Capacity from a Generation Capacity Resource (or from a Base Load Generation Resource) 2. The megawatts of Unforced Capacity to be provided by such resource 3. The specific location of the proposed plant; 4. All information required from a Generation Interconnection Customer by Tariff, Part IV and the PJM Manuals; 5. General plant technical specifications, as specified in the PJM Manuals; 6. The term of cost recovery ("Backstop Period") requested, not to exceed 15 years 7. The first full Delivery Year for which such resource shall be available, which shall also be the first year of the Backstop Period.

Status Quo - Operations
Manual Load Dump Procedures

Scenarios leading to potential Load Dump

- RTO wide capacity shortage
- IROL exceedance indicating a large area capacity shortage and potential voltage collapse
- Local area transmission cascade/system collapse

PJM Capacity Alerts, Warnings and Actions

Alerts

Issued in advance of operating day/period

- Unit Startup Notification Alert
- Maximum Generation Emergency / Load Management Alert
- Primary Reserve Alert
- Voltage Reduction Alert

Warnings

Issued real-time typically, preceding Action

- Primary Reserve Warning
- Voltage Reduction Warning & Reduction of Non-Critical Plant Load
- Manual Load Dump Warning

Actions

Issued real-time requiring a response

- Pre-Emergency Load Management Reductions
- Emergency Load Management Reductions
- Maximum Generation Emergency
- Emergency Voluntary Energy Only Demand Response Reductions
- Deploy All Resources Action
- Curtailment of Non-Essential Building Load & Voltage Reduction
- **Manual Load Dump**

PJM recommends Transmission Owner's initiate public appeals for conservation if any of these procedures are issued.

PJM issues its own public appeals for conservation 12-15hrs in advance if a Voltage Reduction Alert is issued, or if a Voltage Reduction Action or Manual Load Dump Action have been initiated.

Manual Load Dump Action

Purpose

– Operating Instruction from PJM to shed firm load

Triggers

– Capacity: The PJM RTO cannot provide adequate capacity to meet the RTO load, and all other actions have been taken; or

– IROL* Exceedance: Critically overloaded transmission lines or equipment have exceeded limits and could lead to an uncontrolled system collapse (i.e. black out), and all other actions have been taken

PJM Actions

- Notify management, Members, DOE, FEMA, NERC, FERC, public/press release
- Estimate the Control Zone(s) and MW amount of load to be dumped at the Zonal level; instructs appropriate members to dump load according to EMS calculations

OA Schedule 1, Section 1.7.11 that states that "…the Office of Interconnection may not order a manual load dump in a Control Zone solely to address capacity deficiencies in another Control Zone."

Member Actions

- Notify management and applicable others
- Shed amount of load equal to, or more than, PJM's request, and maintain that load relief until cancelled by PJM
    - Load is shed based on TO customer prioritization
- Report the amount of load curtailed / restored as appropriate

*IROL – Interconnection Reliability Operating Limit as defined in Manual 37

Capacity Shortage: PJM EMS Load Dump Allocation Display

Load Dump Allocation

Zone Energy Position									Zone Capacity Position	Zone Position		Load Dump	
Zone Name	+ Net Zone Generation	+ Load Share Ratio Gen Pseudo-Ties	+ Load Share Ratio Gen Dynamic Schedules	+ Active Zone Reserve Share Energy	+ Net Zone LSE ExSchedules	+ Load Share Ratio RTO Energy Schedules	- Net Zone Load	= Net Zone Energy Position (A)	Net Zone Capacity Position (B)	Net Zone Position (A+B)	Zone Position	Desired Load Dump	Load Dump Allocation
RTO	96251	160	884	0	56	-3329	93518	539	4110	4649		500	
Allegheny	5103	10	55	0	0	-208	5854	-895	1679	784	EXCESS	0	0
COMED	15838	18	99	0	0	-374	10507	5090	-2135	2955	EXCESS	0	0
Duquesne	1930	3	15	0	0	-55	1537	356	920	1276	EXCESS	0	0
Dominion	10272	24	133	0	0	-500	14053	-4127	-1460	-5587	SHORT	0	348
AEP	20082	26	144	0	0	-541	15197	4521	-6560	-2039	SHORT	0	127
EKPC	1204	3	15	0	56	-55	1549	-327	-77	-404	SHORT	0	25
First Energy	6687	14	75	0	0	-282	7927	-1441	4173	2732	EXCESS	0	0
Dayton	261	3	19	0	0	-72	2031	-1818	2490	672	EXCESS	0	0
Mid-Atlantic	32888	55	302	0	0	-1138	31960	168	2061	2229	EXCESS		
Duke Energy	1986	5	27	0	0	-103	2902	-988	3019	2031	EXCESS		

500MW load dump example

- The PJM EMS calculates the Energy Position for each Zone by evaluating the real time generation output and the import/export schedules vs real time load
- The PJM EMS then compares this real time Energy Position to the cleared Capacity Position from the RPM auction to determine the Zone Position
  - NOTE: A zone may have more generation than load and still be short

Capacity Shortage: Mid-Atlantic Load Shed Allocation

Winter/Summer Required Manual Load Dump PJM Mid-Atlantic Region																
			PPL Zone				PEPCO ZONE		AE		DPL Zone					
MW	PS	PE	PPL	UGI	BC	FE-East	PEPCO	SMECO	AECO	Vineland	DPL	ODEC	DEMEC	Dover	Easton	Rockland
%	17.38%	14.81%	12.63%	0.34%	11.44%	20.95%	9.29%	1.42%	4.01%	0.25%	4.55%	1.37%	0.50%	0.23%	0.09%	0.72%
500	87	74	63	2	57	105	46	7	20	1	23	7	3	1	0	4
1000	174	148	126	3	114	210	93	14	40	3	45	14	5	2	1	7
1500	261	222	190	5	172	314	139	21	60	4	68	21	8	3	1	11
2000	348	296	253	7	229	419	186	28	80	5	91	27	10	5	2	14
3000	521	444	379	10	343	629	279	43	120	8	136	41	15	7	3	22
4000	695	592	505	14	457	838	372	57	160	10	182	55	20	9	4	29
5000	869	741	632	17	572	1048	465	71	201	13	227	69	25	12	5	36

Manual Load Dump Allocation - PJM Mid-Atlantic Region

If Mid-Atlantic region is deemed “short” in the EMS Load Dump Allocation calculations, total load shed must be further broken down by the Transmission Owners using the Manual Load Dump Allocation Tables from Manual M-13, Attachment E (shown above)

Transmission System Reliability: IROL Load Dump

- Transmission system reliability may necessitate the implementation of a Manual Load Dump Action to mitigate an IROL exceedance.
- PJM determines the MW relief needed
- Transmission Owners utilize the factors in the table to determine the Load Dump obligation

The following table is used for Transmission Owners and DPs to shed load in their zones to mitigate an IROL as described in Section 5.5:

IROL Facility	East	Central	5004/05	West	AP-South	BED-BLA	AEP-DOM	CE-East	Cleveland
TO Zone	Multiplier	Multiplier	Multiplier	Multiplier	Multiplier	Multiplier	Multiplier	Multiplier	Multiplier
DPL	0.14	0.11	0.29	0.11					
DPL-Dover	0.01	0.01	0.02	0.01					
DPL-DEMEC	0.00	0.00	0.00	0.00					
DPL-Easton	0.00	0.00	0.01	0.00					
DPL-ODEC	0.04	0.03	0.09	0.03					
AE	0.13	0.11	0.25	0.11					
AE-Vineland	0.01	0.01	0.02	0.01					
PS	0.60	0.48	0.80	0.46					
RECO	0.03	0.02	0.05	0.02					
PE	0.52	0.39	0.88	0.37					
FE East-JC	0.37	0.29	0.59	0.27					
PL		0.39	0.58	0.31					
UGI		0.01	0.01	0.01					
FE East-ME		0.21	0.29	0.13					
FE East-PN									
BC			2.00	0.37	1.33	2.59	2.73		
PEP				0.63	0.69	1.41	1.74		
PEP-SMECO				0.08	0.10	0.21	0.23		
FE South									
FE South-ODEC									
DOM					2.20	7.09	3.22		
Dom-CVEC					0.01	0.04	0.02		
Dom-ODEC					0.12	0.39	0.18		
Dom-NCEMC					0.00	0.00	0.00		
NOVEC					0.17	0.56	0.25		
Dom-SEPA					0.01	0.04	0.02		
AEP-AP							1.45		
AEP Total									
DLCO									
Dayton									
FE West									2.65
CPP									0.03
AMPT									0.00
ComEd								2.38	
DEOK									
EKPC									
OVEC									
Neptune									
HTP									
Linden									
ITCI									
Silver Run									
Rock Springs									
DOE PORTS									
TransSource									
Wabash									

Load shed tables maintained in Manual 13: Attachment N

Transmission System Reliability: Local Area Load Shed

- Load shed may be initiated at the local level for any of the following:
  - **Actual Overload:** Actual flows exceeding Emergency Ratings (directive to shed load issued consistent with the time basis for the rating (i.e. 4hr, 2hr, 15 minute)
  - **Cascade Analysis:** Post contingency overload exceeding 115% of the Load Dump rating and analysis indicates an unbounded cascade (i.e. local area black out) may occur if the initial facility were to trip

- To determine the load shed MW and location, PJM issues a load distribution factor (dfax) report to the TO based on the actual or N-1 overload as dictated by system conditions, along with the pre or post contingency flow the TO must shed load to maintain

- The TO will use that report to surgically shed enough load to mitigate the emergency and avoid impacting critical loads (as determined by the TO), while also looking for opportunities to rotate outages until system conditions permit restoration of load

Load shed for a local area issue is implemented based on the nodal load impacts and dfax, not at a TO zonal level

Status Quo
RPM Obligations

RPM Locational Reliability Charge

- LSEs are charged for their Daily Unforced Capacity Obligation in a zone priced at applicable Final Zonal Capacity Price for the Delivery Year
- Charges are calculated daily and billed weekly

Daily Zonal UCAP Obligation MW

- Each zone with RPM load receives a share of the RTO-procured UCAP based on its share of forecasted peak load
- LSEs receive share of Zonal UCAP based on EDC allocation

Final Zonal Capacity Price

Weighted average price of capacity in zone (weighted by UCAP cleared in auctions):

- Marginal value of system capacity
- Locational Price Adders, if any, for zones in constrained LDAs
- Any required adjustments (e.g. make-whole payments)

Determining UCAP Obligations in RPM

Zonal UCAP Obligation MW

Total RTO-procured UCAP MW across all RPM auctions for the Delivery Year is allocated to each zone based on its share of forecasted peak load

Example (for RPM load)**:**

- RTO procured UCAP MW in RPM Auctions = 140,000 MW
- RTO forecasted peak load for Delivery Year = 150,000 MW
- Zone A forecasted peak load = 15,000 MW (10% of total)
- Zone A UCAP Obligation = 14,000 MW (140,000 MW * 10%)

LSE Share of Zonal UCAP Obligations

Zonal UCAP Obligation MW are allocated to customers and LSEs in the zone based on EDC-defined methodologies

- EDCs are responsible for allocating prior summer weather normalized peak load of zone to customers and determining obligation peak loads (typically based on 5 CPs)
  - THEO, PLC & NSPL Methodology Inventory
- EDCs are also responsible for uploading obligation peak load data into system for each LSE serving load in their zone
- Obligation peak loads are multiplied by zonal scaling factors and FPR to determine each LSE's Daily Zonal UCAP Obligation MW

Numerical Example of Capacity Payments for LSEs in Constrained LDA

Locational Reliability Charges for Zone A (constrained LDA):

- Total RTO Procured UCAP = 140,000 MW
- RTO Forecasted Peak Load = 150,000 MW
- Zone A Forecasted Peak Load = 15,000 MW (10% of total)
- Zone A UCAP Obligation = 14,000 MW
- Zone A Final Zonal Capacity Price = $200/MW-day (constrained in RPM auctions)

Locational Reliability Charges for Zone A ($/day) = **$2.8 million** (14,000 MW * $200/MW-day)

Key Takeaway: Zonal capacity charges in constrained regions are based on Locational Reliability Charges and offsetting CTR Credits, representing the economic value of imported capacity to meet the zone's UCAP obligation.

CTR Credits for Zone A:

- Zone A Internal Cleared MW = 10,000 MW
- Zone A CTR MW = 4,000 MW (14,000 MW – 4,000 MW); Assume all CTR MW allocated to LSEs in zone
- CTR Credit Rate = $50 (RTO clearing price of $150, locational price adder for LDA of $50)

Offsetting CTR Credits for Zone A ($/day) = **$200,000** (4,000 MW * $50/MW-day)

Net Load Capacity Payments ($/day) = $2.6 million (Locational Reliability Charges net of CTR Credits)

- Effectively paying for internal cleared UCAP (10,000 MW) * constrained price ($200) + imported UCAP (4,000) * RTO price ($150)

Capacity Obligation Load Adjustment

- PJM's existing load forecast process allows an EDC or LSE to propose a Load Adjustment to improve forecast accuracy (see M19, attachment B)
  - Specifies zone/area where Load Adjustment is applied
  - All Load Adjustments incremental to embedded forecast are published in Table B-9 of the forecast report (forecast webpage)
    - Load Adjustments that modify Capacity Obligations for a zone/area are published on the webpage link above in a separate file (Load Adjustment breakdown for Capacity Obligation.xls)
- Load Adjustment process allows EDC to assign adjustment to a specific LSE's Capacity Obligations

Timeline

RPM Zonal Capacity Obligation

				A	B	C	D	E	F	G		
Zone	LDA1	LDA2	LDA3	2024 W/N Coincident Peak Load [MW]	Zonal Forecast Peak Load Scaling Factor	3rd IA 2025/2026 Zonal Peak Load Forecast [MW]	2025 RPM Load Adjustments	Obligation Peak Load Scaling Factor	Final Zonal RPM Scaling Factor	Final Zonal UCAP Obligation [MW]	Adjusted Zonal Capacity Price [$/MW-day]	Adjusted Final Zonal Capacity Price** [$/MW-day]
AE	MAAC	EMAAC		2,370.0	0.99747	2,364.0	-	1.01453	1.01196	2,249.6	$270.01	$270.43
AEP				11,683.0	0.96652	12,155.3	863.5	1.01453	0.98055	11,567.3	$270.01	$270.43
APS				8,790.0	0.97577	8,585.0	8.0	1.01453	0.98994	8,169.7	$270.01	$270.43
ATSI			ATSI	12,207.6	1.01071	12,392.0	53.6	1.01453	1.02540	11,792.5	$270.01	$270.43
BGE	MAAC	SWMAAC	BGE	6,310.0	0.99826	6,311.0	12.0	1.01453	1.01276	6,005.7	$466.62	$471.33
COMED			COMED	19,040.0	0.99270	19,091.0	190.0	1.01453	1.00712	18,167.5	$270.01	$270.43
DAYTON			DAYTON	3,190.0	0.99122	3,162.0	-	1.01453	1.00562	3,009.0	$270.01	$270.43
DEOK			DEOK	4,244.1	1.00752	4,276.0	-	1.01453	1.02215	4,069.1	$270.01	$270.43
DLCO				2,640.0	0.99470	2,626.0	-	1.01453	1.00915	2,499.0	$270.01	$270.43
DOM			DOM	22,356.1	0.93875	22,667.0	1,680.1	1.01453	0.95239	21,570.5	$446.39	$446.81
DPL	MAAC	EMAAC	DPL	3,760.0	1.00266	3,770.0	-	1.01453	1.01722	3,587.6	$270.01	$270.43
EKPC				2,369.7	1.00198	2,374.4	-	1.01453	1.01654	2,259.5	$270.01	$270.43
JCPL	MAAC	EMAAC		5,810.0	0.98916	5,747.0	-	1.01453	1.00352	5,469.0	$270.01	$270.43
METED	MAAC			2,960.0	1.01047	2,991.0	-	1.01453	1.02515	2,846.3	$270.01	$270.43
OVEC				60.0	1.00000	60.0	-	1.01453	1.01453	57.1	$270.01	$270.43
PECO	MAAC	EMAAC		8,120.0	1.00296	8,144.0	-	1.01453	1.01752	7,750.0	$270.01	$270.43
PENLC	MAAC			2,760.0	1.01449	2,800.0	-	1.01453	1.02923	2,664.6	$270.01	$270.43
PEPCO	MAAC	SWMAAC	PEPCO	5,810.0	1.00482	5,838.0	-	1.01453	1.01941	5,555.6	$270.01	$270.43
PL	MAAC		PL	7,100.0	1.00887	7,256.0	93.0	1.01453	1.02353	6,905.0	$270.01	$270.43
PS	MAAC	EMAAC	PS	9,700.0	0.99701	9,813.0	142.0	1.01453	1.01149	9,338.3	$270.01	$270.43
RECO	MAAC	EMAAC		390.0	1.00256	391.0	-	1.01453	1.01713	372.1	$270.01	$270.43

Zonal Capacity Obligation Calculations

- Zonal Peak Load Scaling Factor: B=(C-D)/A
  - Adjusts OPL by forecast, excluding RPM Load Adjustments
- Final Zonal Scaling Factor: F=B*E
  - Includes forecast and OPL Scaling Factors
  - OPL Scaling Factor scaled procurement to reported values
- Final Zonal UCAP Obligation: G=(A*F*FPR)+(D*E*FPR)
  - Scaled Peak Load + Load Adjustments

Allocation prior and during the Delivery Year

1. Obligation Peak Load (OPL)

Zone	Area	Load Responsible Party	Allocation MW	Scaled LA MW	Total OPL
Z	A	Q	100	0	100
Z	B	Q	120	20	140
Z	C	R	140	10	150
Z	D	S	150	0	150

2. Peak Load Summary (PLC)

LSE	Area	Zone	Upload MW	Scaling Factor	OPL MW
1	B	Z	40	1.1667	46.66667
2	B	Z	40	1.1667	46.66667
3	B	Z	40	1.1667	46.66667
			120		140

3. Daily UCAP Obligation

LSE	Zone	Area	OPL	Daily UCAP Obligation
1	Z	B	46.667	42.90255
2	Z	B	46.667	42.90255
3	Z	B	46.667	42.90255

1. Obligation Peak Load
   - New column in Capacity Exchange – Scaled LA MW
   - Located in Load & Obligations->Wholesale Area Load
   - OPL associated with Load Adjustments assigned to zone/area
   - Adjusted OPL=(LLAMW/Final Zonal Scaling Factor) + OPL

2. PLCs are entered by EDC prior to DY (and updated daily, as necessary) and Scaling Factor calculated for each zone/area
   - Scaling Factor = Total OPL/Upload MW
   - OPL MW = Upload MW * Scaling Factor
   - Captures impact of LA on OPL of specific zone/area through the Scaling Factor
   - EDC may allocate LA to specific LSE, otherwise LA is allocated pro-rata across all LSEs in zone/area (as shown in example)

3. Daily UCAP Obligation calculated from OPL in Step 2
   - Daily UCAP Obligation = OPL * FPR * RPM Zonal Scaling Factor

Load Forecast

How does Load interconnect onto the PJM System?

Typically a 5-year process

PJM does not have a Load interconnection process.

Retail customer (Large load)
Not a PJM Member

Load interconnection request

This function is performed outside of PJM

Utility is the Electrical Distribution Company (EDC) or Load Serving Entity (LSE)
PJM Member

Local Utility/TO Studies

Local Load interconnection analysis performed by Transmission Owner (TO) and supplemental project submitted to PJM (Attachment M-3 process) if necessary.
This function is performed outside of PJM.

PJM Planning includes submitted large loads in the load forecast and Regional Transmission Expansion Process (RTEP).
Load included in RPM.

PJM Role

Interconnection “do no harm study” performed by PJM only for supplemental transmission projects submitted by TO.

Local Utility coordinates with load and TO for when load can interconnect.

Go-Live

Load interconnects after necessary transmission upgrades complete or allowed by TO

Electric Distribution Companies (EDCs) and Load Serving Entities (LSEs) are encouraged to provide PJM with information about large changes that may not be captured in the forecast process.

The Process

Manual 19: **Attachment B**	Provides guidelines to ensure that any adjustments made to PJM's load forecast model are properly identified, estimated, and reviewed prior to incorporation into the forecast.

Large Load Adjustments Timeline 2026 Load Forecast

Official request sent July 1st to Planning Committee and Load Analysis Subcommittee

July
PJM requests information on potential load adjustments

Early September
PJM receives information on load adjustments and begins evaluation

September 5

Mid September
EDC/LSEs present on load adjustments to Load Analysis Subcommittee

September 16

October/ November
PJM continues evaluation and presents preliminary accepted requests to Load Analysis Subcommittee

January
PJM presents and posts official PJM Load Forecast

Incorporating Data Center into Load Forecast

Historical Loads

−

Existing Data Center Load History

=

Net Forecast (excluding data center history)

Net Forecast (excluding data center history)

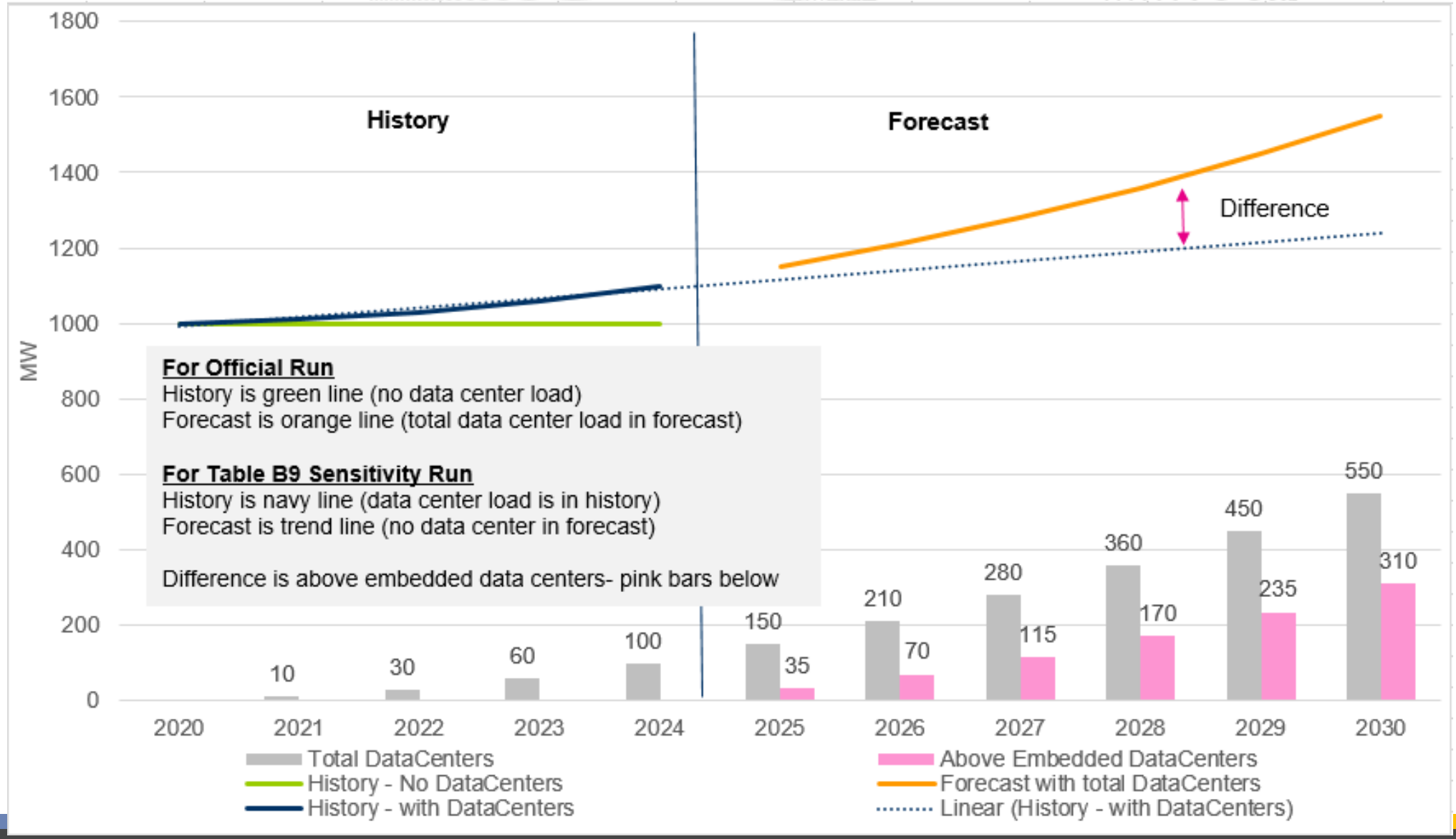
+

Total Data Center Load (history and forecast)

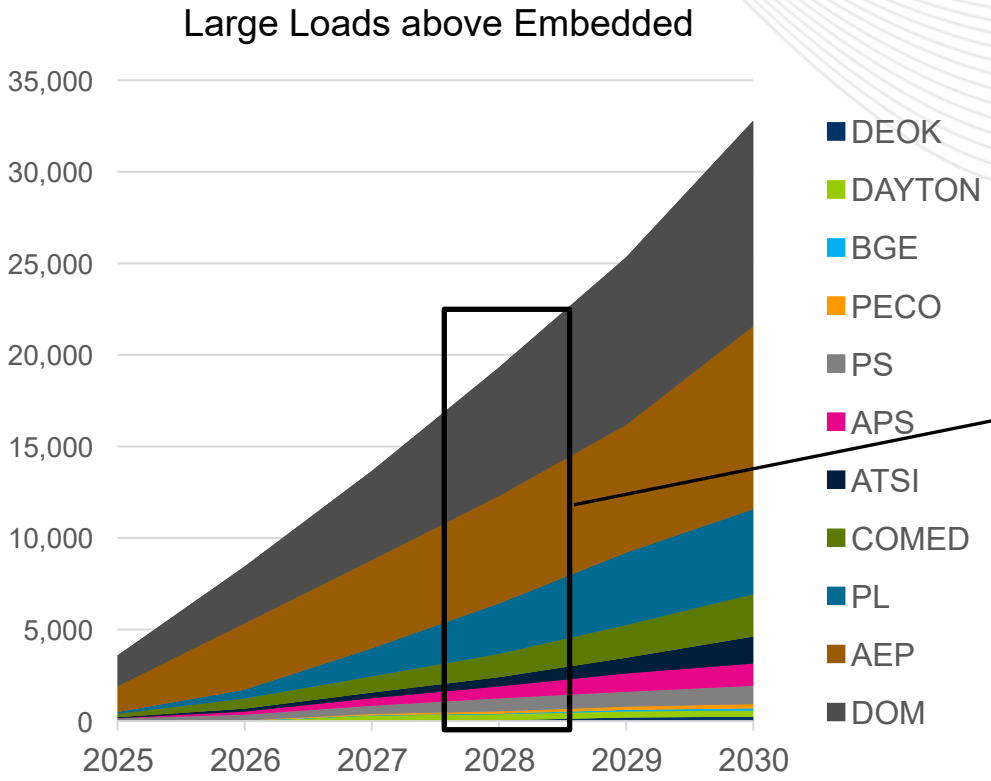
=

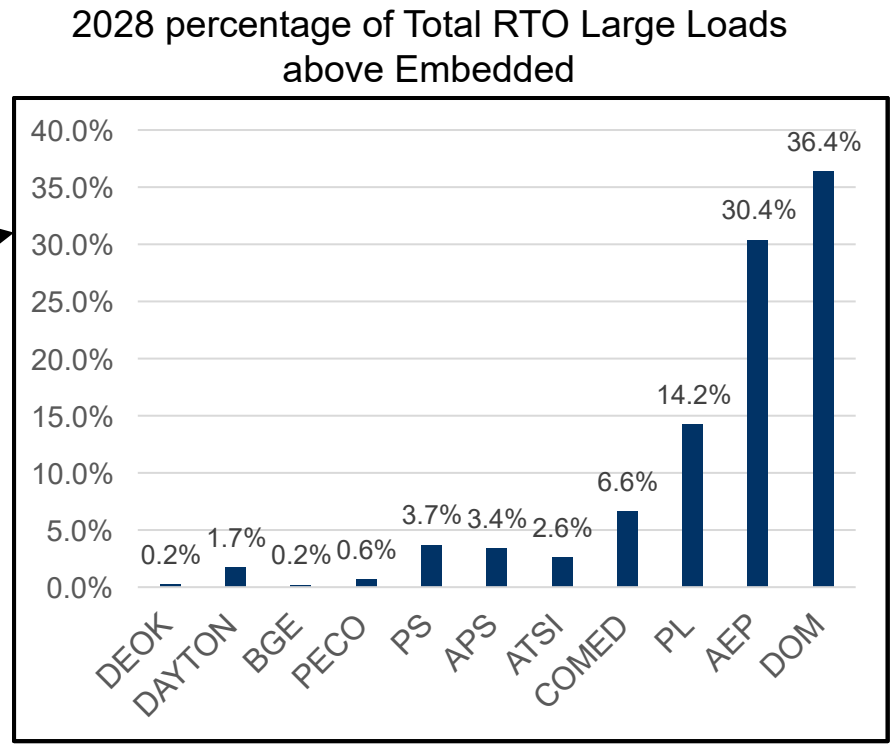
Final Forecast Load

Table B9 – Process Example



Forecast Adjustments – Above Embedded





- COLA table located here: https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/2025-load-adjustment-breakdown-for-capacity-obligations.xlsx

Improvements in LLA process

2023 Improvements	• Manual 19 Attachment B updates to reflect more transparency in data needs and documentation from requesting EDCs/LSEs.
2024 Improvements	• Added template to report large load adjustment request data.
2025 Improvements	• Collaborated with stakeholders to create implementation document

Implementation Document – Transparency Enhancement

- Expected Demand vs Capacity Request
- Financial commitment
- Commitment Types
- Ramp Structure
- Links to TEAC Supplemental Projects

https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/postings/load-adjustment-request-implementation.pdf

Implementation Document – Certainty Example

	Electric Service Obligation	Construction Commitment	Other **with** EDC/LSE Supplied Probability Factor**	Other **without** EDC/LSE Supplied Probability Factor***		
EDC/LSE Submitted - Total Capacity						
Near Term (< = 3 years)	300	200				
Mid-Range (4 - 8 years)		100	300	200		
Long-Range (> 8 years)			500	1000		
	300	**300**	**800**	**1200**	**2600**	**Total Requested Capacity**
PJM Capacity - After Probablility Applied						
Near Term (< = 3 years)	300	200				
Mid-Range (4 - 8 years)		100	225	100		
Long-Range (> 8 years)			375	500		
	300	**300**	**600**	**600**	**1800**	**Total Capacity (After Probability Applied)**
			** 75% EDC/LSE supplied probabilty	*** 50% PJM default probability		
PJM Demand						
Capacity to Demand Factor of 70%* applied	**210**	**210**	**420**	**420**	**1260**	**Total Demand**

NOTE: All percentages other than the default are for illustrative purposes only

Appendix A
Cascade Analysis Overview
Operations

NERC Standard PRC-023 R1.2 and R1.11

- Transmission line relays and transformer overload protection relays are set so they do not operate at or below 115% of the facility's highest emergency rating

PJM's highest rating for facilities is the **Load Dump** rating

- PJM will perform the following analysis for any facility that reaches or exceeds 115% of its Load Dump limit
- Study the loss of the contingency element and the overloaded facility

Cascade Analysis Procedure

PCLLRW is issued after:

- All other means of transmission constraint control have been exhausted, or
- Until sufficient generation is on-line to control the constraint within designated limits and timelines

If post-contingency flow were to exceed the 15-minute Load Dump rating, the facility may trip before actions can be taken to reduce the flow within limits

To prepare for this potential N-2 (initial contingency plus the overloaded facility) and prevent a cascade:

- PJM will perform up to an N-5 on facilities over 115% of their 15-minute Load Dump rating

Cascade Analysis Procedure

If the study results indicate that:

- No additional facilities will be overloaded over 115% of their Load Dump limit:
  - This is a localized event, and no additional pre-contingency actions will be taken
- Additional facility(s) over 115% of its Load Dump rating, the operator will continue the analysis to also trip the additional circuits:
  - Analysis will be performed, tripping a maximum of 5 facilities
- Either a non-converged case, or continues to show facilities exceeding 115% of their Load Dump limits:
  - This will be considered a potential cascade situation
  - The PJM operator will review the results with the Transmission Owner and direct pre-contingency Load Shed.