



2026 Long-Term Load Forecast Supplement

PJM Resource Adequacy Planning Department

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Introduction and Overview

This document serves as a supplement to the 2026 PJM Long-Term Load Forecast report. It is intended as a reference, to provide details of the processes used to develop the load forecast and the data and assumptions used. It describes the load forecast model that produces the forecast as well as non-model adjustments to it.

This document acts as a resource to help describe the load forecast process. For details such as parameter estimates and model outputs, additional resources are available on the PJM website:

<https://www.pjm.com/planning/resource-adequacy-planning/load-forecast-dev-process.aspx>.

This is the fourth year in which PJM has employed the use of an hourly forecast model, as a result of a multi-month engagement in 2022 with Itron. Their final report can be found here (<https://www.pjm.com/-/media/planning/res-adeq/load-forecast/pjm-model-review-final-report-from-itron.ashx>) and should be viewed in conjunction with PJM documentation.

Sector Models

Sector models are a key part of the load forecast process, providing insights into why load trends are happening. The job of a forecaster is to use models to understand what has happened such that they can make an informed judgment about the future. Looking at total peak and energy trends over time only tells us part of the story: what is happening. Sector models can give us greater insight into why things are happening.

Sector models are where we incorporate the independent assumptions on economic trends and end-use adoption and efficiency. The load forecast process considers three sectors: Residential, Commercial, and Industrial. Each sector has its own set of models and inputs.

Residential

The Residential Sector model is actually two models, a customer model and an average use model. The product of these two concepts—customers and average use—provides total residential use. Total Residential use is considered according to the three use classes of Heating, Cooling, and Other.

Customers are modeled for each zone as a function of households. Monthly customer data is obtained from the EIA 861 dataset. Households are an economic concept, with quarterly history and forecast provided by Moody's Analytics. The relationship of customers to economics is defined by the below equation.

Equation 1. Residential Customers

$$\text{customers} = B_1 * \text{households} + B_2 * y2021$$

Where

$y2021 = 1$ when year is greater than or equal to 2021 and 0 otherwise

Average use per customer is modeled as a function of Heating, Cooling, and Other. Average use data is obtained from the EIA 861 dataset. Heating, Cooling, and Other are functions of end-use concepts provided by Itron (based on

data from the EIA's Annual Energy Outlook) and economic concepts that are provided by Moody's Analytics (household size and real household income). The relationship of average use to Heating (xheat), Cooling (xcool), and Other (xother) is defined by the below equation.

Equation 2. Residential Average Use

$$use_t = B_0 * xheat_t + B_1 * xheat_{t-1} + B_2 * xcool_t + B_3 * xcool_{t-1} + B_4 * xother_t$$

The table below provides a list of residential end-uses and indicates how they are allocated to Heating, Cooling, and Other. For each end-use, data provided by Itron includes saturation (% of customers with device), efficiency (relative efficiency of device), and intensity (use per device accounting for saturation and efficiency).

Table 1. **List of Residential End-Uses and Assignment**

<u>Bucket</u>	<u>Use Type</u>	<u>Definition</u>
Heating	EFurn	Electric furnace and resistant room space heaters
Heating	HPHeat	Heat pump space heating
Heating	GHPHeat	Ground-source heat pump space heating
Heating	SecHt	Secondary heating
Cooling	CAC	Central air conditioning
Cooling	HPCool	Heat pump space cooling
Cooling	GHPCool	Ground-source heat pump space cooling
Cooling	RAC	Room air conditioners
Other	EWHeat	Electric water heating
Other	ECook	Electric cooking
Other	Ref1	Refrigerator
Other	Ref2	Second refrigerator
Other	Frz	Freezer
Other	Dish	Dishwasher
Other	CWash	Electric clothes washer
Other	EDry	Electric clothes dryer

Other	TV	TV sets
Heating	FurnFan	Furnace fans
Other	Light	Lighting
Other	Misc	Miscellaneous electric appliances ¹

Heating (xheat) is a function of heating end-uses as identified in the above table with adjustments for weather, real income per household, population per household, and building shell efficiency.

Equation 3. Residential Heating Variable (xheat)

$$xheat_t = sae_heat_t * hdd_in_t$$

Where

$$sae_heat_t = (EFurn_t + HPHeat_t + GHPHeat_t + SecHt_t + FurnFan_t) * \\ (Population_per_houeshold_t)^x * (Income_per_household_t)^y * Structural_Heating_t$$

Where x and y are elasticities provided by Itron and Structural_Heating is a measure of building size adjusted for relative building shell efficiency.

and

$$hdd_in_t = \frac{hdd_t}{hdd_{2016}}$$

Cooling (xcool) is a function of cooling end-uses as identified in the above table with adjustments for weather, income per household, population per household, and building shell efficiency.

Equation 4. Residential Cooling Variable (xcool)

$$xcool_t = sae_cool_t * cdd_in_t$$

Where

¹ Residential end-use data has always included a category referred to as Miscellaneous, which represented a catch-all of the non-named appliances listed. In 1998, Miscellaneous represented about a fifth of non-weather sensitive uses and now represents about half; a trend spurred as much by growth in Miscellaneous as declines in non-Miscellaneous end-uses. Examples include plug in loads such as televisions, game consoles, coffee makers, dehumidifiers, and exercise equipment.

$$sae_{cool_t} = (CAC_t + HPCool_t + GHPCool_t + RAC_t) * (Population_per_houeshold_t)^x * (Income_per_household_t)^y * Structural_Cooling_t$$

Where x and y are elasticities provided by Itron and Structural_Cooling is a measure of building size adjusted for relative building shell efficiency.

and

$$cdd_in_t = \frac{cdd_t}{cdd_{2016}}$$

Other (xother) is a function of other end-uses as identified in the above table with adjustments for income per household, and population per household.

Equation 5. Residential Other Variable (xother)

$$xother_t = sae_other_t * Days_Idx_t$$

Where

$$sae_{other_t} = (EWHeat_t + ECook_t + Ref1_t + Ref2_t + Frz_t + Dish_t + CWash_t + EDry_t + TV_t + Light_t + Misc_t) * (Population_per_houeshold_t)^x * (Income_per_household_t)^y$$

Where x and y are elasticities provided by Itron

and

$$Days_Idx_t = \frac{Days\ in\ Month}{30.42}$$

The results of Equation 2 (Residential Average Use) are fitted values, which includes historical weather. For comparability in heating and cooling trends over time, this then needs to be transformed to be on a consistent weather basis.

Equation 6. Formulation of HeatUse, CoolUse, and OtherUse

Heating and Cooling are adjusted to be consistent with 2016 weather for all years.

$$HeatUse_t = B_0 * norm_xheat_t + B_1 * norm_xheat_{t-1}$$

$$CoolUse_t = B_2 * norm_xcool_t + B_3 * norm_xcool_{t-1}$$

$$OtherUse_t = B_4 * xother_t$$

where B0, B1, B2, B3, and B4 are from Equation 2

and

norm_xheat and *norm_xcool* are the same as *xheat* and *xcool* but using 2016 weather

Total residential use then is the product of customers and each of these defined average use terms.

Equation 7. Total Residential Use

$$ResHeat_t = Customers_{quarter,year} * HeatUse_{quarter,year}$$

$$ResCool_t = Customers_{quarter,year} * CoolUse_{quarter,year}$$

$$ResOther_t = Customers_{quarter,year} * OtherUse_{quarter,year}$$

Commercial

The starting point for analysis is Commercial energy provided through the EIA 861 dataset. The Commercial models utilize two sets of data: economic and end-use. Economic concepts used are service sector employment, working-age population, and real services output, and are provided by Moody's Analytics. End-use concepts are provided by Itron (based on data from the EIA's Annual Energy Outlook), and are summarized in the following table.

Table 2. List of Commercial End-Uses and Assignment

<u>Bucket</u>	<u>Use Type</u>	<u>Definition</u>
Heating	Heating	Heating
Cooling	Cooling	Cooling
Other	Ventilation	Ventilation
Other	WtrHeat	Water Heating
Other	Cooking	Cooking
Other	Refrig	Refrigeration
Other	Lighting	Lighting
Other	Office	Office Equipment (PCs)
Other	Misc	Miscellaneous

Equation 8. Commercial Use

$$use_t = B_0 * xheat_t + B_1 * xheat_{t-1} + B_2 * xcool_t + B_3 * xcool_{t-1} + B_4 * xother_t$$

Where

$$xheat_t = Heat_t * ComEconVar_t * hdd_in_t$$

$$xcool_t = Cool_t * ComEconVar_t * cdd_in_t$$

$$xother_t = Other_t * ComEconVar_t$$

Heat, *Cool*, and *Other* are end-use intensities from categories in the above table. *ComEconVar* is a 30/30/40 weighed combination of services employments, real services output, and working-age population, respectively.

For comparability in heating and cooling trends over time, this then needs to be transformed to be on a consistent weather basis.

Equation 9. Formulation of HeatUse, CoolUse, and OtherUse

Heating and Cooling are adjusted to be consistent with 2016 weather for all years.

$$Com_Heat_t = B_0 * norm_xheat_t + B_1 * norm_xheat_{t-1}$$

$$Com_Cool_t = B_2 * norm_xcool_t + B_3 * norm_xcool_{t-1}$$

$$Com_Other_t = B_4 * xother_t$$

where B0, B1, B2, B3, and B4 are from Equation 8

and

norm_xheat and *norm_xcool* are the same as *xheat* and *xcool* but using 2016 weather

Industrial

The starting point for analysis is Industrial energy provided through the EIA 861 dataset. Industrial modeling utilizes two sets of data: economic and intensity. The economic concept used is real industrial output, using data from Moody's Analytics. Intensity data is pulled from national data from EIA on electricity per real output.

Real industrial output is an aggregate of output in goods-producing industries (see list below). Moody's Analytics currently only forecasts employment for these series at the metro area level, not output. However, output is available at the state level and thus output at the metro level is imputed by using state productivity (output divided by employment).

Equation 10. Metro Area Real Industrial Output

$$\begin{aligned}
& Output_{sector, metro, year} \\
& = Employment_{sector, metro, year} \\
& * Output_{sector, state, year} / Employment_{sector, state, year}
\end{aligned}$$

$$\text{Output}_{\text{metro},\text{year}} = \sum_{\text{sector}} \text{Output}_{\text{sector},\text{metro},\text{year}}$$

where metro areas are assigned to states based on location

And Sectors are defined as follows:

Natural Resources and Mining

Construction

Manufacturing – Machinery

Manufacturing - Transportation Equipment

Manufacturing - Chemicals; Energy; Plastics and Rubber

Manufacturing - Electronic and Electrical

Manufacturing - Furniture and Miscellaneous

Manufacturing - Metals and Mining

Manufacturing - Textile; Fiber and Printing

Industrial intensity is defined as industrial energy use per real output. The concept is based on national data, but is customized to zones through the availability of sector detail. Historical and forecast energy use by sector is compiled from the EIA Annual Energy Outlook (AEO) and the EIA Manufacturing Energy Consumption Survey (MECS). Economic data by sector is provided by Moody's Analytics as was described in the prior paragraph. Zonal industrial intensity series are then a weighted average of national sector indexes.

Equation 11. Zonal Industrial Intensity

$$\text{Intensity}_{\text{year}} = \sum_{\text{sector}} (\text{Output}_{\text{sector},\text{year}} / \text{Total Output}_{\text{year}}) * \text{Intensity}_{\text{sector},\text{year}}$$

Discussed above are the types of inputs considered, but as discussed in Itron's model review² it is challenging to fit all zones with a structural end-use model. Candidate models that consider the above described variables are constructed, and are evaluated on a zone-by-zone basis for goodness of fit and reasonableness. Reasonableness checks include items such as ensuring coefficients have the right sign and how the model performs on out-of-sample observations. Zonal industrial model selections are provided in supplemental posted materials. Each zone results in an Industrial Base component (*Ind_Other*) and in some cases an Industrial Cooling component (*Ind_Cooling*).

² See pages 15 and 16 for Itron's discussion of Industrial modeling: <https://www.pjm.com/-/media/planning/res-adeq/load-forecast/pjm-model-review-final-report-from-itron.ashx>

Equation 12. Industrial Cooling

$$Ind_Cooling_t = B * CDD_{2016}$$

Where B is the coefficient on the cooling term in the industrial model. Cooling is included in zones for which it has a positive coefficient, and excluded for which it does not.

Usage Indexes

Heat, Cool, and Other Usage Indexes need to be constructed using the results from the Residential, Commercial, and Industrial Sector Models. First, monthly results are rolled up into single measures.

Equation 13. Monthly Results

$$Heat_t = Res_Heating_t + Com_Heating_t$$

$$Cool_t = Res_Cooling_t + Com_Cooling_t + Ind_Cooling_t$$

$$Other_t = Res_Other_t + Com_Other_t + Ind_Other_t$$

At this point, *Other* is essentially complete and is simply converted from a monthly frequency to a daily frequency with each day's value within a month equal to the respective monthly value. *Heat* and *Cool* though at this point are still reflective of 2016 weather patterns in HDD and CDD. A 365 day moving average is taken of each to calculate *HeatIdx* and *CoolIdx*, such that these can later be interacted with hourly heating and cooling weather variables to capture weather sensitive load over time.

Weather Variables

Weather variables are defined at the zone level. Zonal weather is a weighted average of weather stations³.

Table 3. Weather Station Assignment

<u>Zone</u>	<u>Weather Station</u>	<u>Weight</u>	<u>Zone</u>	<u>Weather Station</u>	<u>Weight</u>
AE	ACY	100.0%	JCPL	ACY	25.0%
AEP	CAK	15.1%	JCPL	EWR	75.0%
AEP	CMH	23.4%	METED	ABE	50.0%
AEP	CRW	22.6%	METED	PHL	50.0%
AEP	FWA	22.7%	PECO	PHL	100.0%
AEP	ROA	16.2%	PENLC	ERI	50.0%
APS	IAD	30.0%	PENLC	IPT	50.0%

³ Weather station weights are provided by Electric Distribution Companies (EDCs).

APS	PIT	70.0%	PEPCO	DCA	100.0%
ATSI	CAK	46.5%	PL	ABE	25.0%
ATSI	CLE	30.0%	PL	AVP	25.0%
ATSI	PIT	8.5%	PL	IPT	25.0%
ATSI	TOL	15.0%	PL	MDT	25.0%
BGE	BWI	100.0%	PS	EWR	100.0%
COMED	ORD	100.0%	RECO	EWR	100.0%
DAYTON	DAY	100.0%	UGI	AVP	100.0%
DPL	ILG	70.0%	VEPCO	IAD	33.3%
DPL	WAL	30.0%	VEPCO	ORF	33.3%
DQE	PIT	100.0%	VEPCO	RIC	33.3%
DUKE	CVG	100.0%			
EKPC	CVG	25.0%			
EKPC	LEX	49.0%			
EKPC	SDF	26.0%			

Cooling and Heating Degree Variables

Temperature-Humidity Index (THI) values are translated to CD1, CD2, and CD3 in order to allow the forecast the flexibility to capture different relationships of load to weather under different conditions (a spline). The goal in defining cut points for CD2 and CD3 is to try to have it hot enough to capture any potential inflection points but not so hot such that there is limited ability to make a good statistical inference.

Equation 14. Temperature-Humidity Index and Cooling Degrees Formulas

$$THI_t = \text{temperature}_t + 0.55 * (\text{humidity}_t/100 - 4) * \max(\text{temp}_t - 58, 0)$$

Base-points are set for each hour to calculate CD1, CD2, and CD3

Hour Ending	Base Point
1	65
2	65
3	65
4	65
5	65
6	65
7	65
8	65
9	65
10	65
11	65
12	70
13	70
14	70
15	70
16	70
17	70
18	70
19	70
20	70
21	65
22	65
23	65
24	65

$$CD1_t = \max (THI_t - \text{Base_Point}_{HE}, 0)$$

$$CD2_t = \max (THI_t - (\text{BasePoint}_{HE} + 10, 0))$$

$$CD3_t = \max (THI_t - (\text{BasePoint}_{HE} + 15, 0))$$

Heating degree variables are then also used.

Equation 15. Heating Degrees

Base-points are set for each hour to calculate HD1, HD2, and HD3

Hour Ending	Base Point
1	55
2	55
3	55
4	55
5	55
6	55
7	55
8	55
9	55
10	55
11	55
12	60
13	60
14	60
15	60
16	60
17	60
18	60
19	60
20	60
21	55
22	55
23	55
24	55

$$HD1_t = \max (Base_Point_{HE} - Temp_t, 0)$$

$$HD2_t = \max (Base_Point_{HE} - 10 - Temp_t, 0)$$

$$HD3_t = \max (Base_Point_{HE} - 15 - Temp_t, 0)$$

These Cooling Degree and Heating Degree variables are used both contemporaneously as well as lagged transformations (Lag6CD, Lag24CD, Lag6HD, Lag24HD), interacted with weekend day-type (WkEndCD, WkEndHD), and interacted with seasons (SpringCD, FallCD, SpringHD, FallHD).

Additional Weather Variables

The load forecast model also includes variables to capture both wind speed and cloud cover.

Equation 16. Wind and Cloud Variables

$$WindHD_t = WSP_t * \min (HD1_t/60, 1)$$

$$WindCD_t = WSP_t * \min (CD1_t/60, 1)$$

Where WSP is a 3-period centered moving average of wind speed

$$CloudHD_t = Cloud_t * \min (HD1_t/60, 1)$$

$$CloudCD_t = Cloud_t * \min (CD1_t/60, 1)$$

Where *Cloud* is a 3-period centered moving average of cloud cover

Forecast Model

Model Specification

The load forecast is constructed using 24 hourly models for each zone. In each model, load is the dependent variable. In the historical data, we start with metered load and then re-constitute with load management addbacks, load drops associated with peak shaving programs, load related to load adjustments (where applicable), and distributed solar generation estimates.

Each regression model has the same set-up, with load modeled against input variables: Weather Variables, Calendar effects, and Economic and End-Use considerations. Variable names align with documentations in the posted statistical appendix and are grouped below based on whether they are related to non-weather (XOther), heating (XHeat), or Cooling (XCool).

Equation 17. Forecast Model Specification

$$load = \sum_{variables} B_{variable} * variable$$

Where

Calendar-type variables (Interacts with XOther)

Intercept_XOther	JanWalk	Wednesday	XMasDay
Jan	FebWalk	Thursday	NYEve
Feb	MarWalk	Friday	NYDay
Mar	AprWalk	Saturday	WkAfterNewYear
MarDST	MayWalk	MLK	WkDayBeforeHol
Apr	JunWalk	PresDay	WkDayAfterHol
May	JulWalk	GoodFri	Phase1
Jun	AugWalk	MemDay	Phase2
Jul	SepWalk	July4th	Phase3
Aug	OctWalk	LaborDay	
Sep	NovWalk	Thanks	binary1
Oct	DecWalk	FriAThanks	binary2
Nov	Monday	WkBeforeXMas	trend1
NovDST	Tuesday	XMasEve	trend2

Heating-type Variables (Interacts with XHeat)

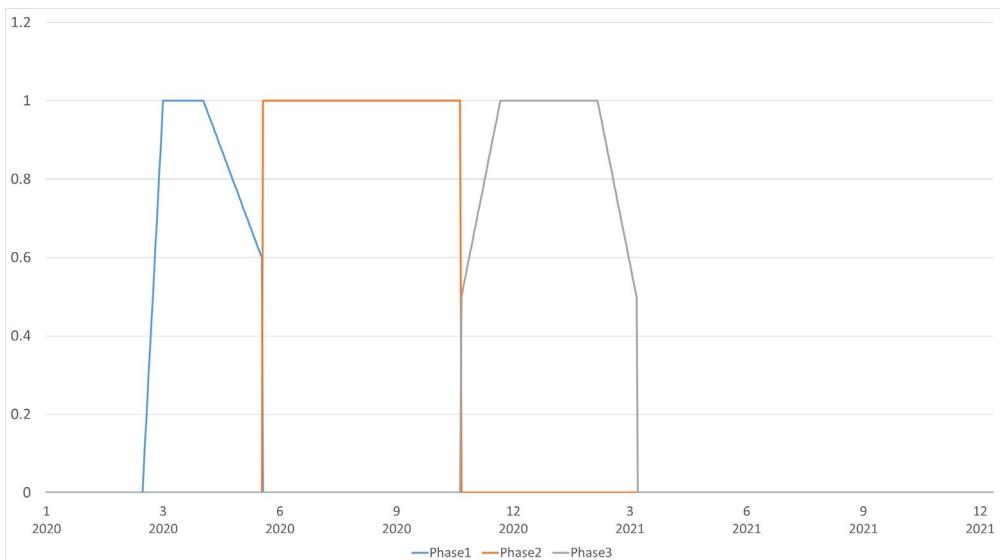
HD1	SpringHD
HD2	FallHD
HD3	WindHD
Lag6HD	CloudHD
Lag24HD	MA10_HDD
Lag24CD_HD	MA28_HDD
WkEndHD	

Cooling-type Variables ([Interacts with XCool](#))

TD1	SpringCD
TD2	FallCD
TD3	WindCD
Lag6CD	CloudCD
Lag24CD	MA10_CDD
Lag24HD_CD	MA28_CDD
WkEndCD	

Binary and Trend Variables

COVID-19 had a large impact on electricity demand. Some of this impact is captured in aspects of the model construction via the economic inputs in the sector models. Nevertheless, it is often advisable in periods such as these to provide some controls for the abnormal event. The 2026 Long-Term Load Forecast maintains the approach from the 2025 Long-Term Load Forecast where a series of binaries are used *Phase1* through *Phase3* with the *Phase3* variable ending April 2021.



In addition to COVID treatments, *binary1/binary2* and *trend1/trend2* variables are defined for each zone. These are intended to help tune the model and capture abnormal events in the residuals after specifying the model. None of

these trends are extended into the forecast period, so their effect is on the model parameterization and not on assumptions of future trends. Contained in the supplemental materials are hourly residual plots of before and after the inclusion of these additional model variables.

Simulation

Once the load model is estimated, forecasts for each PJM transmission zone are produced by solving the hourly zonal equations, moving through the year day by day and hour by hour applying historical weather patterns (including conditions for distributed solar generation), as well as forecast adjustments (data centers and peak shaving), behind-the-meter battery storage, and electric vehicles .

To model the most likely weather conditions (often referred to as normal or peak-eliciting weather), a weather rotation technique is used to simulate a distribution of hourly load scenarios generated by historical weather observations, representing actual weather patterns that occurred across the PJM control region.

To enhance the simulation process, each yearly weather pattern is shifted by each day of the week moving forward six days and backwards six days, providing 13 different weather scenarios for each historical year. For early January and late December dates, data from the same calendar year is applied. The table below illustrates the shift of weather data across the scenarios.

Date	Weather Scenarios												
	Rotate Forward						Rotate Backward						
	A1995	B1995	C1995	D1995	E1995	F1995	G1995	H1995	I1995	J1995	K1995	L1995	M1995
1-Jan	1/1/1995	1/2/1995	1/3/1995	1/4/1995	1/5/1995	1/6/1995	1/7/1995	12/31/1995	12/30/1995	12/29/1995	12/28/1995	12/27/1995	12/26/1995
2-Jan	1/2/1995	1/3/1995	1/4/1995	1/5/1995	1/6/1995	1/7/1995	1/8/1995	1/1/1995	12/31/1995	12/30/1995	12/29/1995	12/28/1995	12/27/1995
3-Jan	1/3/1995	1/4/1995	1/5/1995	1/6/1995	1/7/1995	1/8/1995	1/9/1995	1/2/1995	1/1/1995	12/31/1995	12/30/1995	12/29/1995	12/28/1995
4-Jan	1/4/1995	1/5/1995	1/6/1995	1/7/1995	1/8/1995	1/9/1995	1/10/1995	1/3/1995	1/2/1995	1/1/1995	12/31/1995	12/30/1995	12/29/1995
5-Jan	1/5/1995	1/6/1995	1/7/1995	1/8/1995	1/9/1995	1/10/1995	1/11/1995	1/4/1995	1/3/1995	1/2/1995	1/1/1995	12/31/1995	12/30/1995
6-Jan	1/6/1995	1/7/1995	1/8/1995	1/9/1995	1/10/1995	1/11/1995	1/12/1995	1/5/1995	1/4/1995	1/3/1995	1/2/1995	1/1/1995	12/31/1995
7-Jan	1/7/1995	1/8/1995	1/9/1995	1/10/1995	1/11/1995	1/12/1995	1/13/1995	1/6/1995	1/5/1995	1/4/1995	1/3/1995	1/2/1995	1/1/1995
...
25-Dec	12/25/1995	12/26/1995	12/27/1995	12/28/1995	12/29/1995	12/30/1995	12/31/1995	12/24/1995	12/23/1995	12/22/1995	12/21/1995	12/20/1995	12/19/1995
26-Dec	12/26/1995	12/27/1995	12/28/1995	12/29/1995	12/30/1995	12/31/1995	1/1/1995	12/25/1995	12/24/1995	12/23/1995	12/22/1995	12/21/1995	12/20/1995
27-Dec	12/27/1995	12/28/1995	12/29/1995	12/30/1995	12/31/1995	1/1/1995	1/2/1995	12/26/1995	12/25/1995	12/24/1995	12/23/1995	12/22/1995	12/21/1995
28-Dec	12/28/1995	12/29/1995	12/30/1995	12/31/1995	1/1/1995	1/2/1995	1/3/1995	12/27/1995	12/26/1995	12/25/1995	12/24/1995	12/23/1995	12/22/1995
29-Dec	12/29/1995	12/30/1995	12/31/1995	1/1/1995	1/2/1995	1/3/1995	1/4/1995	12/28/1995	12/27/1995	12/26/1995	12/25/1995	12/24/1995	12/23/1995
30-Dec	12/30/1995	12/31/1995	1/1/1995	1/2/1995	1/3/1995	1/4/1995	1/5/1995	12/29/1995	12/28/1995	12/27/1995	12/26/1995	12/25/1995	12/24/1995
31-Dec	12/31/1995	1/1/1995	1/2/1995	1/3/1995	1/4/1995	1/5/1995	1/6/1995	12/30/1995	12/29/1995	12/28/1995	12/27/1995	12/26/1995	12/25/1995

This approach has two key advantages. One, by rotating the data on the calendar, peak-producing weather will be applied to peak producing days. Two, by producing scenarios over a wide range of weather conditions, the weather rotation method is able to identify both the probable and possible levels of future peak load.

The process is repeated for the remaining years of historical weather data. The 2026 Long-Term Load Forecast uses 31 years of weather history that results in 403 (31 weather years x 13 days) separate forecast simulations for each year in the forecast horizon. These simulations produce a frequency distribution of NCP demands by zone.

For each weather scenario, monthly NCPs are determined by obtaining the maximum NCP for the month. Seasonal NCPs are determined as the maximum over the summer/winter/spring/fall months. For each season, the ratio of each month's peak to the highest monthly peak is taken, and then each month's ratio is multiplied by the seasonal peak. In

this way, one of the month's peaks is the seasonal peak while still preserving the relationship between monthly peaks.

For purposes of system planning, only a couple of the values in the forecast distribution are used. After ranking the scenario forecasts from lowest to highest MW value, the median value is selected as the base (or 50/50) forecast. This is the value used for most system planning studies. The 90th percentile (or 90/10) result is used for studies where the system is assumed to be at system emergency conditions.

Coincident Peaks

Hourly results from the method described above are rolled up to the the entire PJM RTO and Locational Deliverability Areas (LDA). Weather rotation provides an additional benefit for identifying coincident peaks - the natural diversity of weather patterns that impact the PJM footprint is simulated. This is a more plausible approach to peak forecasting than traditional methods which tend to have all weather stations having peak producing weather on the same day. Using the latter approach would overstate the PJM or LDA peak forecast by minimizing diversity.

Monthly RTO/LDA peaks are determined by obtaining the maximum for each scenario for each month (403 possible peaks). Seasonal RTO/LDA peaks are determined over the summer/winter/spring/fall months by obtaining the maximum for each scenario for each season (403 possible peaks). For each season, the ratio of each month's peak to the highest monthly peak is taken, and then each month's ratio is multiplied by the seasonal peak. From this distribution, the median result is used as the base (50/50) forecast; the values at the 10th percentile and 90th percentile are assigned to the 10/90 and 90/10 weather bands.

At this point, the values of the overall RTO peaks are set, but not the contribution of each zone. To determine the final zonal RTO/LDA-coincident peak forecasts, each zone's average contribution across the peak distribution is calculated and applied to the RTO forecast.

Assumption Development

Weather

The 2026 Long-Term Load Forecast uses historical weather data from 1994 to 2024 as the basis for constructing forecasts. No explicit assumption is being made about Climate Change, and thus the assumption is that future weather will resemble past weather.

Vendor Data

The 2026 Long-Term Load Forecast relies on vendor and government sources.

For economic and demographic forecasts, PJM consults with Moody's Analytics and used their September 2025 forecast vintage. Zonal charts for concepts used have been posted with the supplemental materials. The economic data incorporates the U.S. Office of Management and Budget (OMB) revisions to metropolitan area delineations for changes in commuter flows and population size driven by 2020 Census data.

For end-use saturation/efficiency/intensity projections, PJM is a member of the Itron Energy Forecasting Group (EFG) that provides Census level history/projections for Residential/Commercial sectors. Their work derives from the Energy Information Administration's Annual Energy Outlook (AEO). The Energy Information Administration (EIA) did publish an AEO update in 2025 with revamped models and improvements to capture emerging technologies. Therefore, the 2025 update of Itron's end-use data provides the basis for appliance saturation rates, efficiency, and intensity and is consistent with the EIA's 2025 AEO.

For distributed energy resources (BtM solar and storage), S&P Global provides a BtM solar and storage additions forecast. This is combined with historical Generation Attribute Tracking System (GATS) data in order to provide cumulative nameplate capacity by zone. UL provides zonal solar production estimates, which are used in both determining historical performance and expectations of future performance.

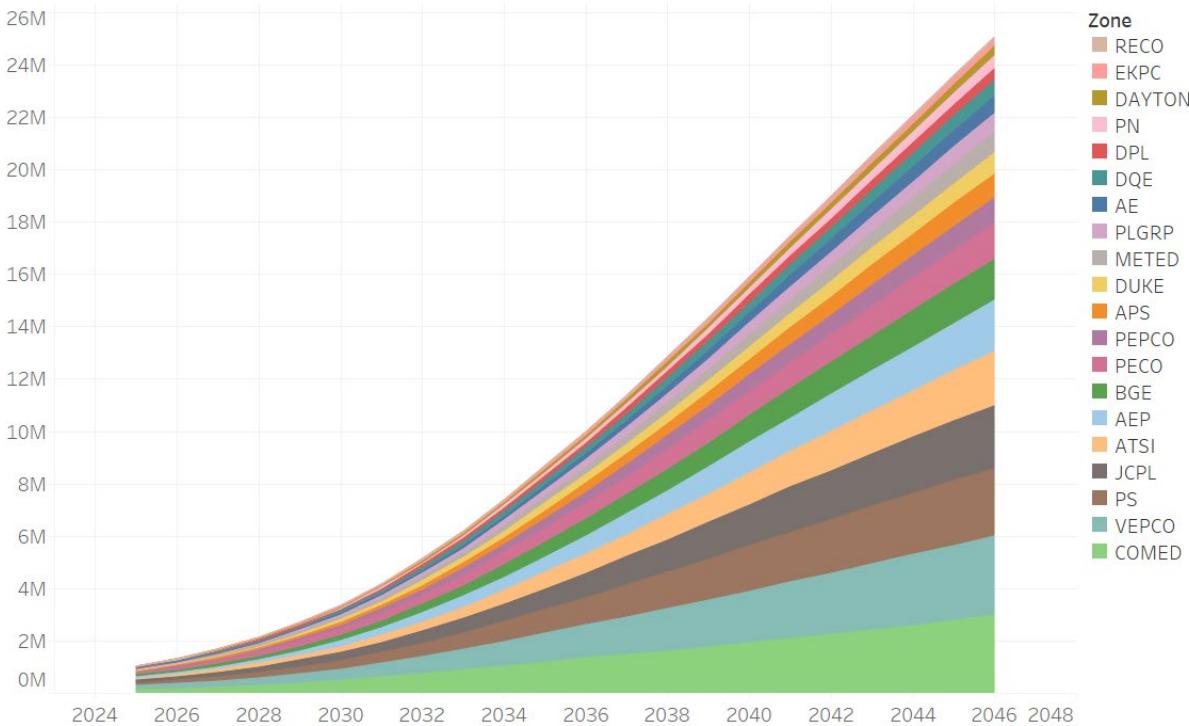
Plug-in Electric Vehicles

Forecasts of EVs were provided by S&P Global and their zonal forecasts take into account vehicle miles traveled (VMT), vehicle efficiency, and charging behavior in their hourly charging impacts. S&P Global uses federal, state, and metropolitan level data to produce their forecast. More information on the S&P Global electric vehicle forecast methodology and assumptions can be found under the October 28, 2025 Load Analysis Subcommittee materials⁴.

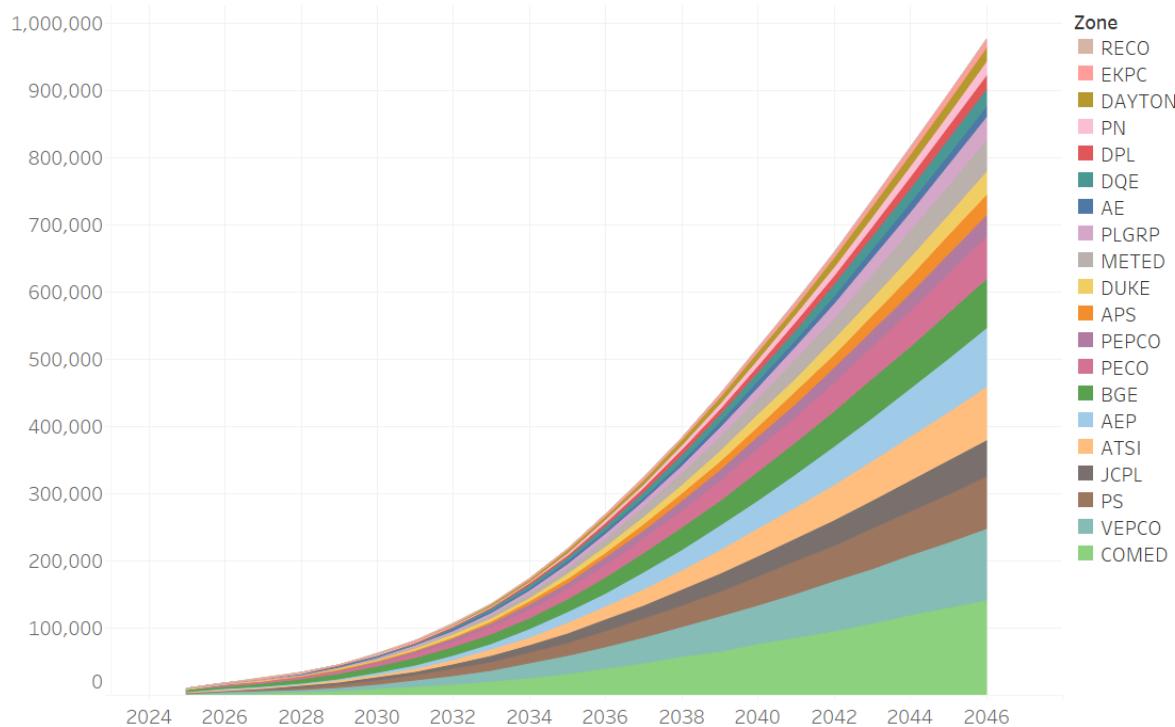
Charts below show vehicle counts for light duty electric vehicles by zone followed by medium & heavy duty electric vehicle counts by zone. The medium & heavy duty category contains delivery vans, school bus, transit bus, medium truck, short haul, and long haul vehicles.

⁴ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20251028/20251028-reference--spglobal--pjm-ev-forecast.pdf>

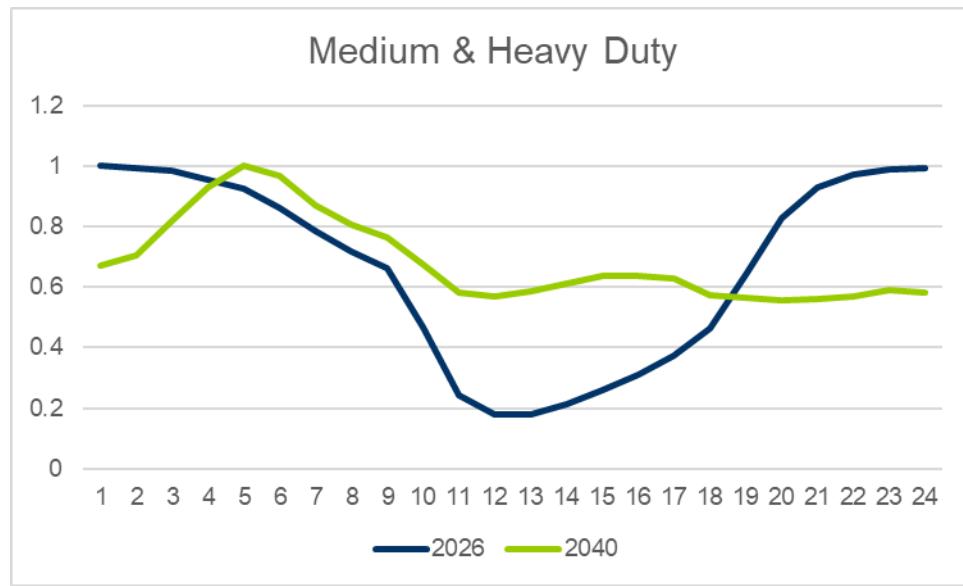
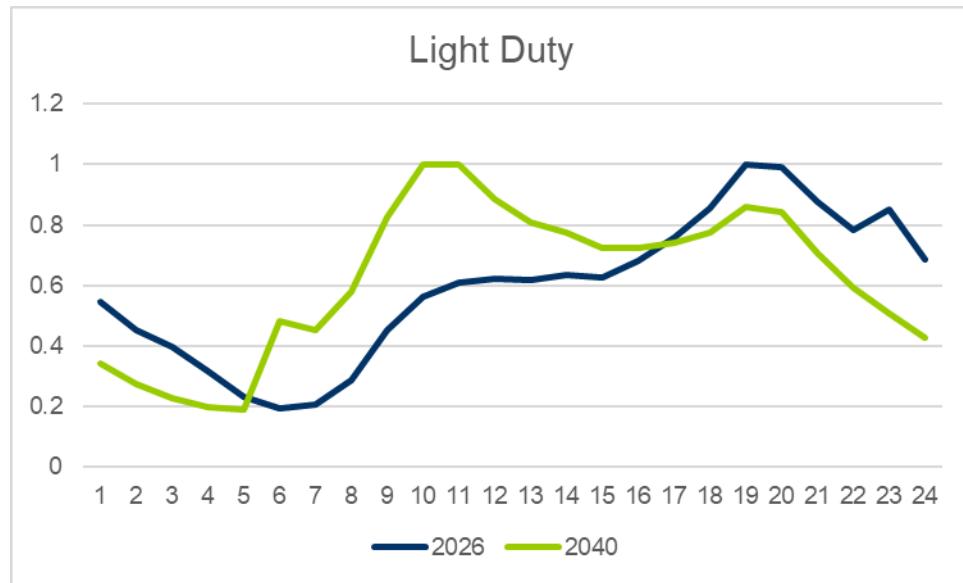
Light Duty Vehicles



Medium & Heavy Duty Vehicles



S&P Global provided an hourly charging impact for each zone throughout the forecast horizon. Below shows a total RTO average per-unitized charging shape from summer weekdays for light, medium, and heavy duty electric vehicles. The blue line for 2026 and green line for 2040 shows the per-unitized charging shapes for the labeled forecast year. For light duty electric vehicles, the 2026 charging shape shows more tendency to charge later in the day while the 2040 shows more leveled charging throughout the day. The hourly charging shape for medium & heavy duty electric vehicles is impacted by the incorporation of vehicle specific charging shapes. It shows a shift in charging behavior towards the middle of the day due to managed charging later in the forecast horizon.



Behind-the-Meter Battery Storage Operation

As indicated above, the amount of behind-the-meter battery storage is based on a forecast from S&P Global. The methodology for their forecast is based on an attachment model (storage installed with solar), and thus are assumed to be used in conjunction with distributed solar. The assumption is made that batteries available to discharge at summer peak and thus subtract from loads on the summer peak distribution.

Exogenous Factors

PJM annually solicits information from its member Electric Distribution Companies (EDC) and Load Serving Entities (LSE) for large load shifts (either positive or negative) that are known to the EDC/LSE but may be unknown to PJM. Once the request has been verified per the guidelines in Attachment B of Manual 19, PJM works towards accounting for it in its load forecast. In 2025, PJM, in collaboration with stakeholders, discussed topics such as demand versus capacity⁵, ramp rate⁶, and agreement types to help with further evaluation of submissions.

Requests for the 2026 Long-Term Load Forecast with an Electric Service Obligation⁷ or Construction Commitment⁸(ESO/CC) are considered “firm”, while others are considered “non-firm”. More information can be found under the November 24, 2025 LAS meeting.⁹ Each request is considered on a case-by-case basis, with particular caution paid to avoid double-counting anticipated load increases or decreases. With each forecast adjustment, PJM quantifies the MW impact on the forecast that is due to this request.

⁵ Capacity here refers to facility size in terms of load not to supply-side capacity.

⁶ Ramp rate in this context refers to amount of time expected for the customer to ramp up to full demand.

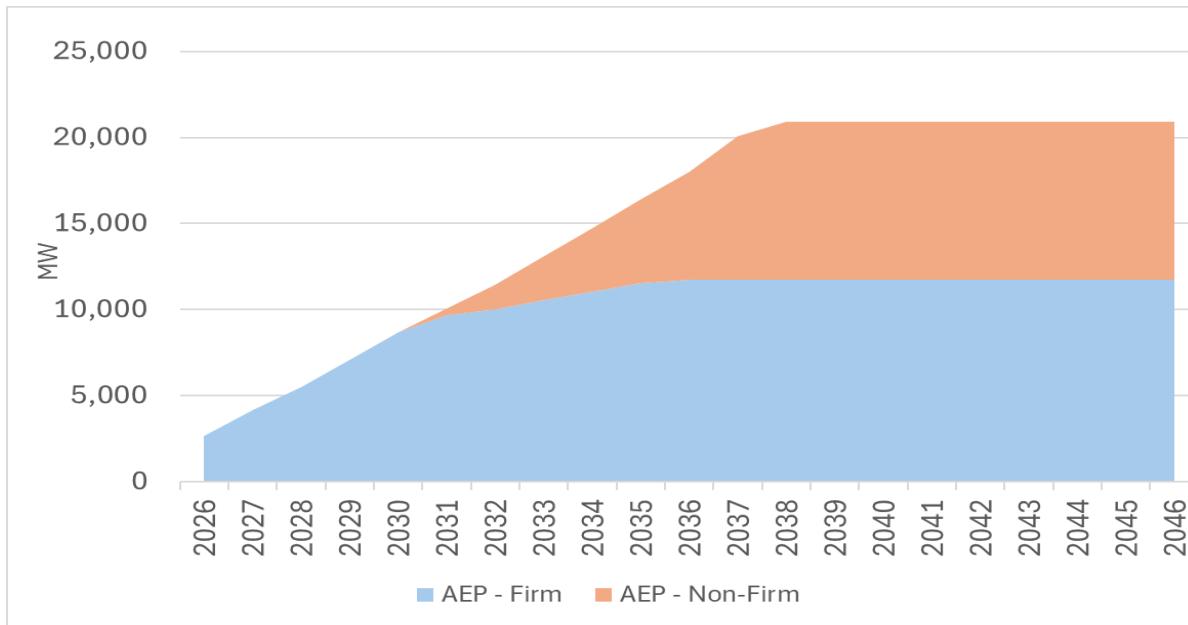
⁷ An Electric Service Obligation (ESO) reflects a binding commitment by a prospective retail customer to construct and operate facilities that will use electric services provided by the electric service provider in accordance with the forecast load. That customer obligation may be reflected in different forms, including but not limited to a contract between the customer and the EDC/LSE or in rates, terms, and conditions of service approved by a Relevant Electric Retail Regulatory Authority (RERRA) that control the relationship between an electric service provider and an end-use retail customer. The ESO should reflect a commitment to pay the charges associated with the requested load and can also outline the scope of work, fees, termination, and other relevant information.

⁸ A Construction Commitment (CC) is a legal obligation that a public utility must discharge in furtherance of its obligation to serve all load and involves constructing transmission system facilities necessary to serve both load being added by an end-use customer as well as existing load in a manner that continues to ensure safe, adequate and reliable service to all customers. Alternatively, a construction commitment could provide indication that corresponding work is in the public utility's capital project plan. It may describe what will be done, how it will be executed, and if there is any associated payment by an end-use customer.

⁹ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20251124/20251124-item-03---large-load-adjustment-requests-summary.pdf>

AEP

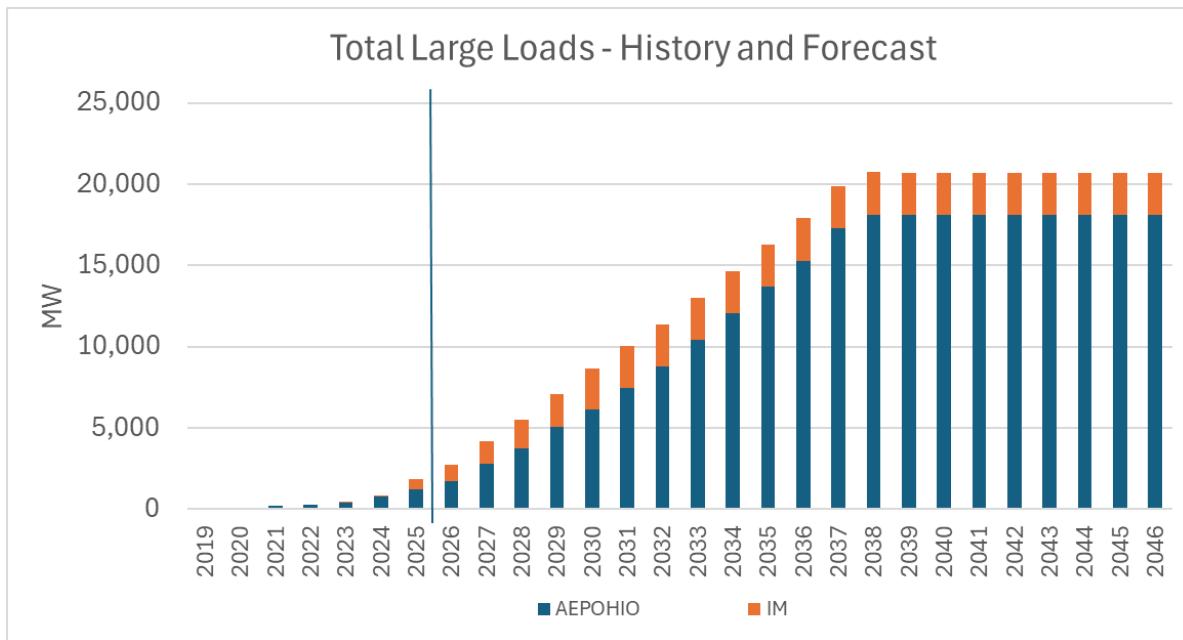
AEP requested that PJM consider load additions related to significant growth in data centers. PJM considered the below breakdown of "firm" and "non-firm" for AEP data centers.



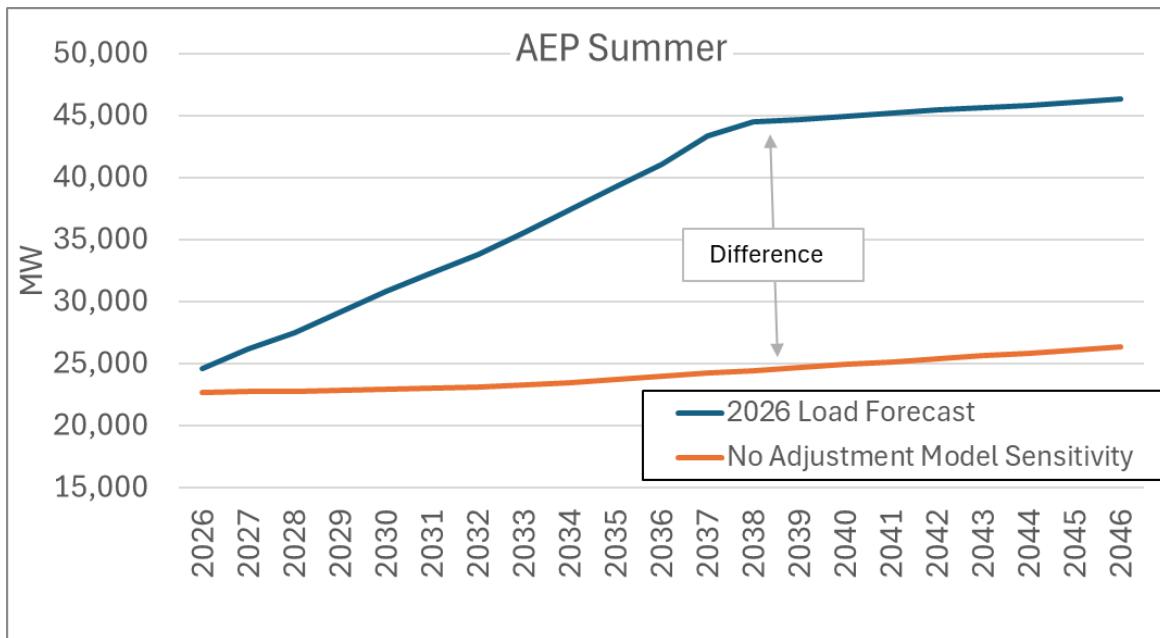
AEP also requested an adjustment for industrial load. PJM did not include these industrial loads due to overlap with economic variables used in the model.

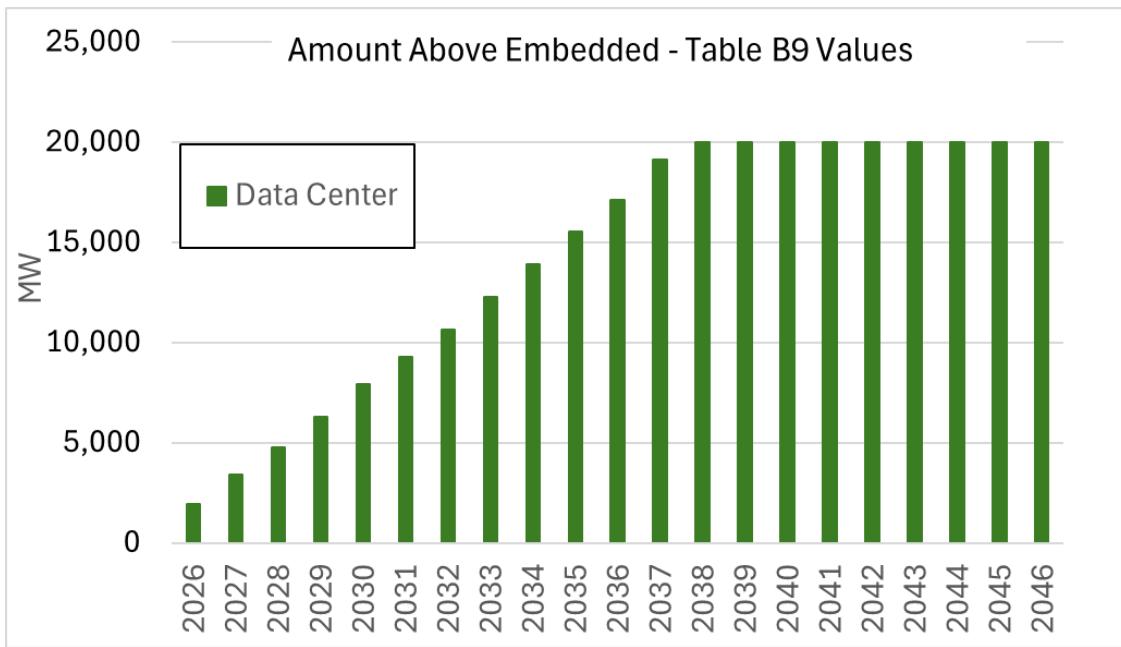
AEP provided forecasted data center additions as well as historical cumulative data center information. Hourly information related to historical data center load was included in the data provided. PJM removed monthly data center load from the commercial EIA data in an effort to remove any double counting. PJM also removed hourly data center load from our historical loads that are used in our model estimation.

The first chart below shows the total amount of large loads for summer in history and the forecast.



The next chart shows the summer AEP forecast in blue and a model sensitivity in orange that is run by leaving existing data center history in loads and not adjusting the forecast for any additional large loads. The subsequent bar chart shows the difference between the blue and orange line which depicts the amount above embedded that the large loads impact the forecast.





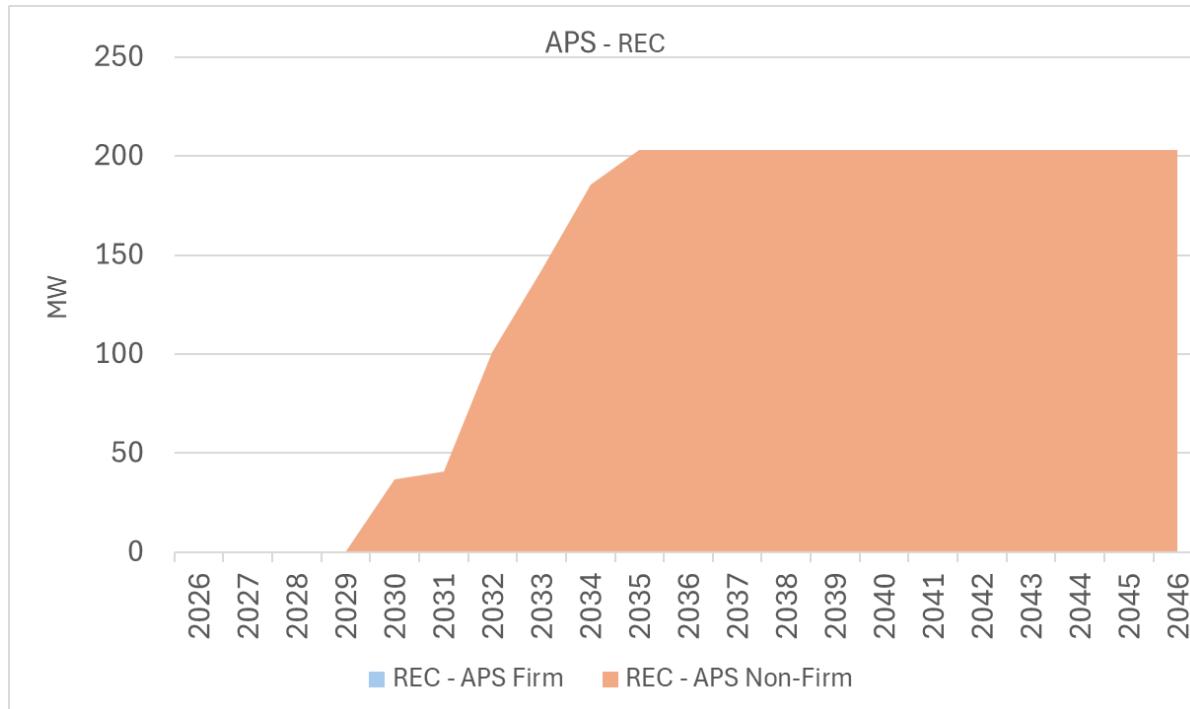
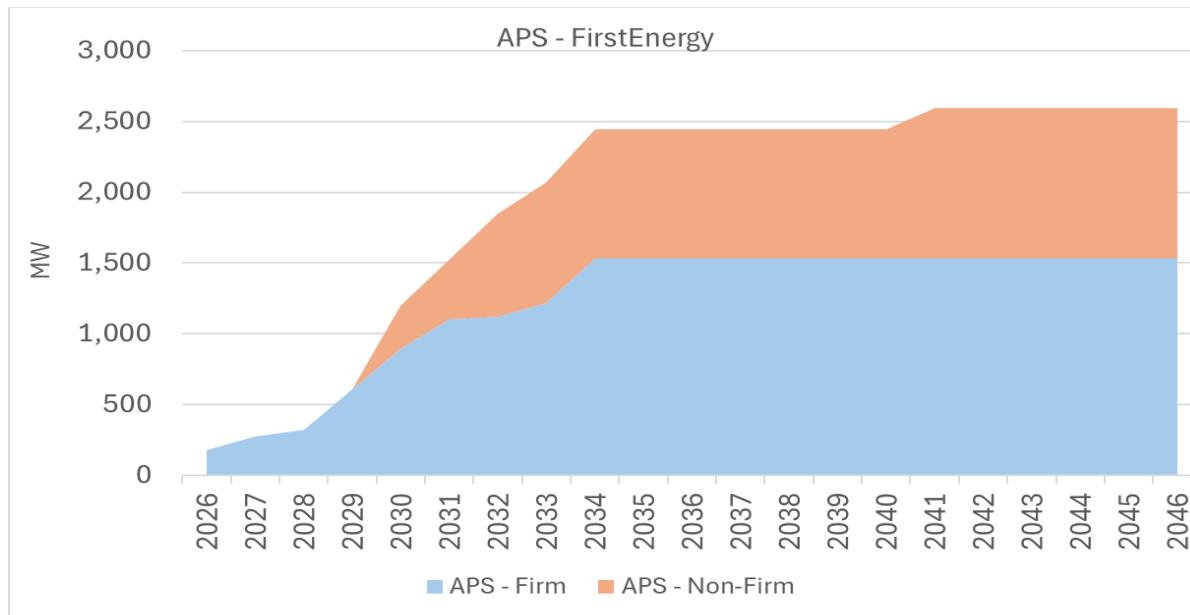
More information on AEP's request can be found under the September 16, 2025 Load Analysis Subcommittee materials¹⁰ and their posted documentation¹¹.

APS

First Energy requested that PJM consider load additions related to significant growth in data centers in their APS zone. Rappahannock Electric Cooperative (REC) also requested that PJM consider load additions related to data centers in the APS zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the APS zone.

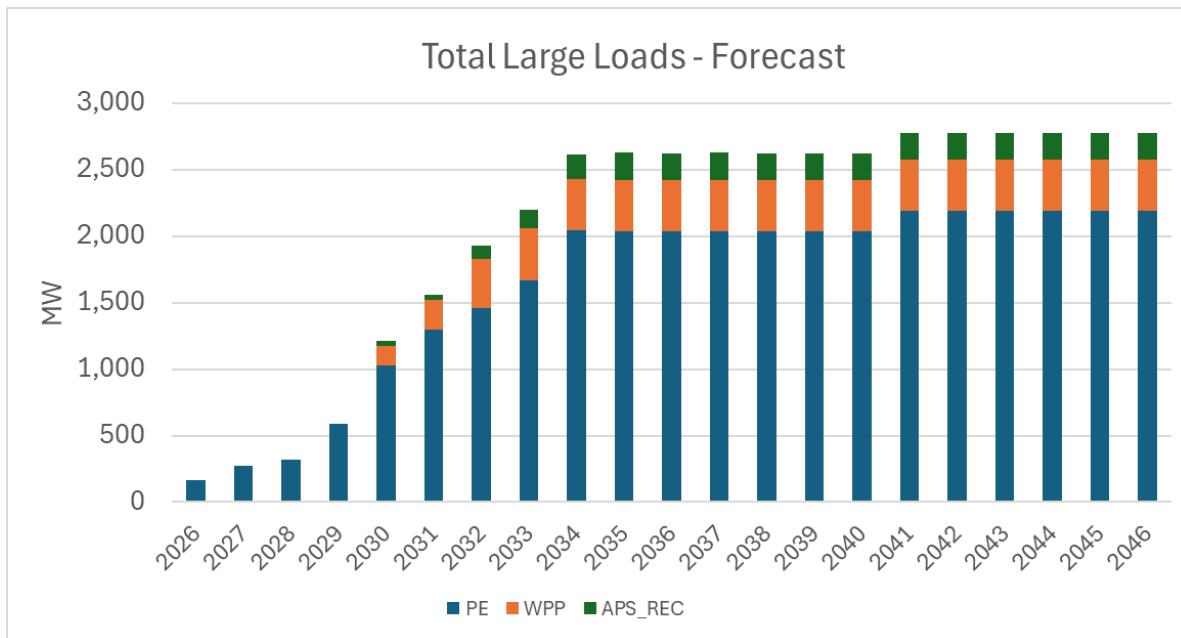
¹⁰ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04f--aep-large-load-request.pdf>

¹¹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/aep-documentation.pdf>



First Energy also requested an adjustment for industrial load in APS. PJM did not include these industrial loads due to overlap with economic variables used in model.

The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on First Energy's request can be found under the September 16, 2025 Load Analysis Subcommittee materials¹² and their posted documentation¹³.

More information on REC's request can be found under the September 16, 2025 Load Analysis Subcommittee materials¹⁴ and their posted documentation¹⁵.

ATSI

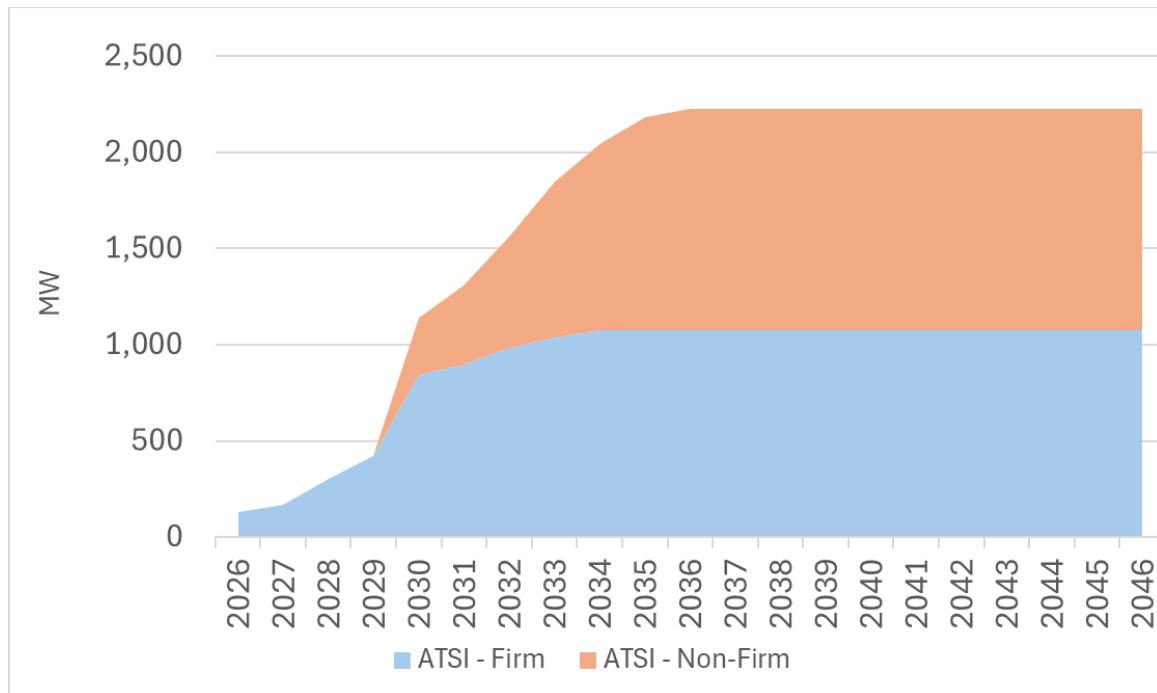
First Energy requested that PJM consider load additions related to significant growth in data centers in their ATSI zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the ATSI zone.

¹² <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04h--first-energy-large-load-request.pdf>

¹³ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/fe-documentation.pdf>

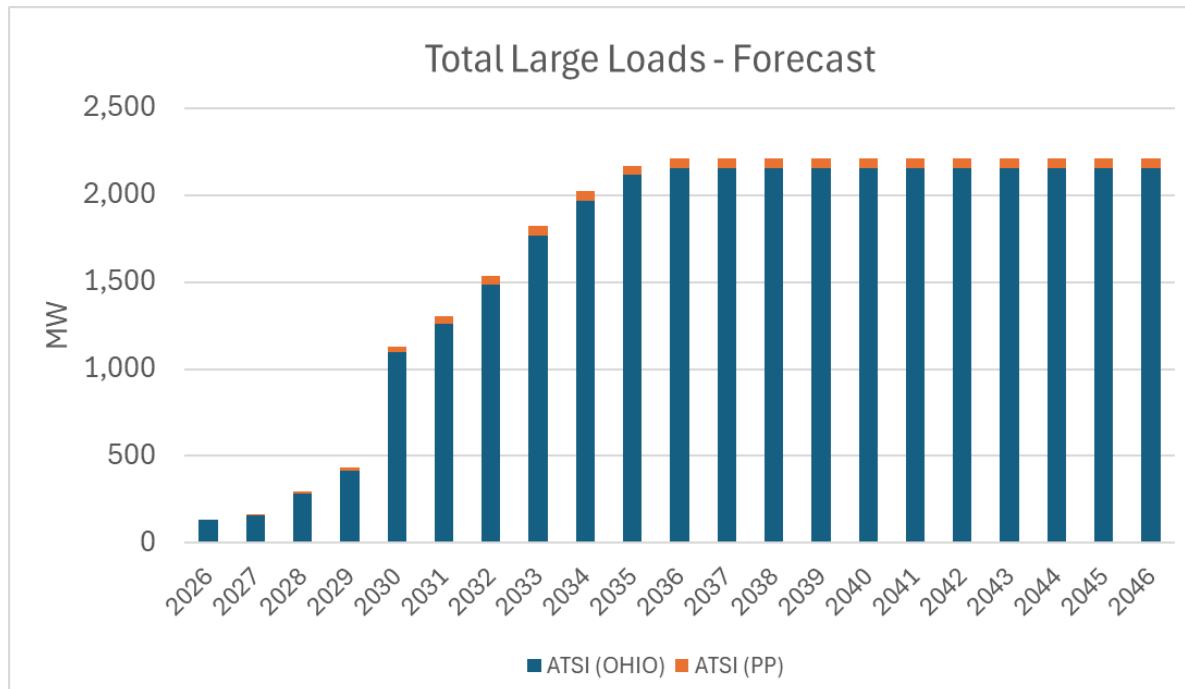
¹⁴ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04c--rec-large-load-request.pdf>

¹⁵ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/rec-documentation.pdf>



First Energy also requested an adjustment for industrial load in ATSI. PJM did not include these industrial loads due to overlap with economic variables used in model.

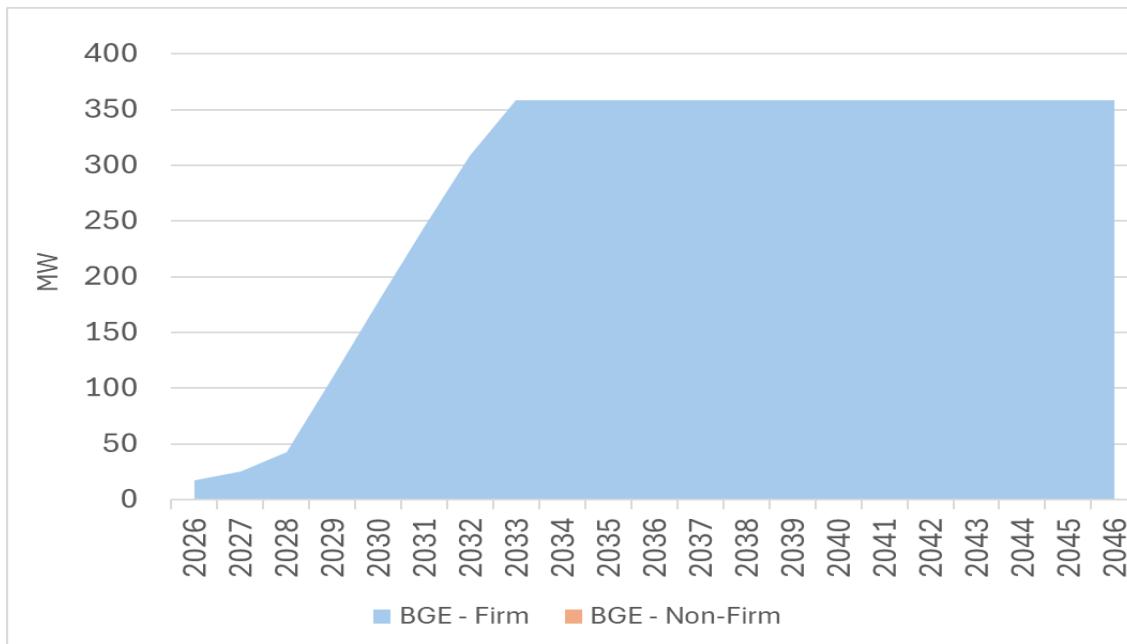
The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on First Energy's request can be found under the September 16, 2025 Load Analysis Subcommittee materials¹⁶ and their posted documentation¹⁷.

BGE

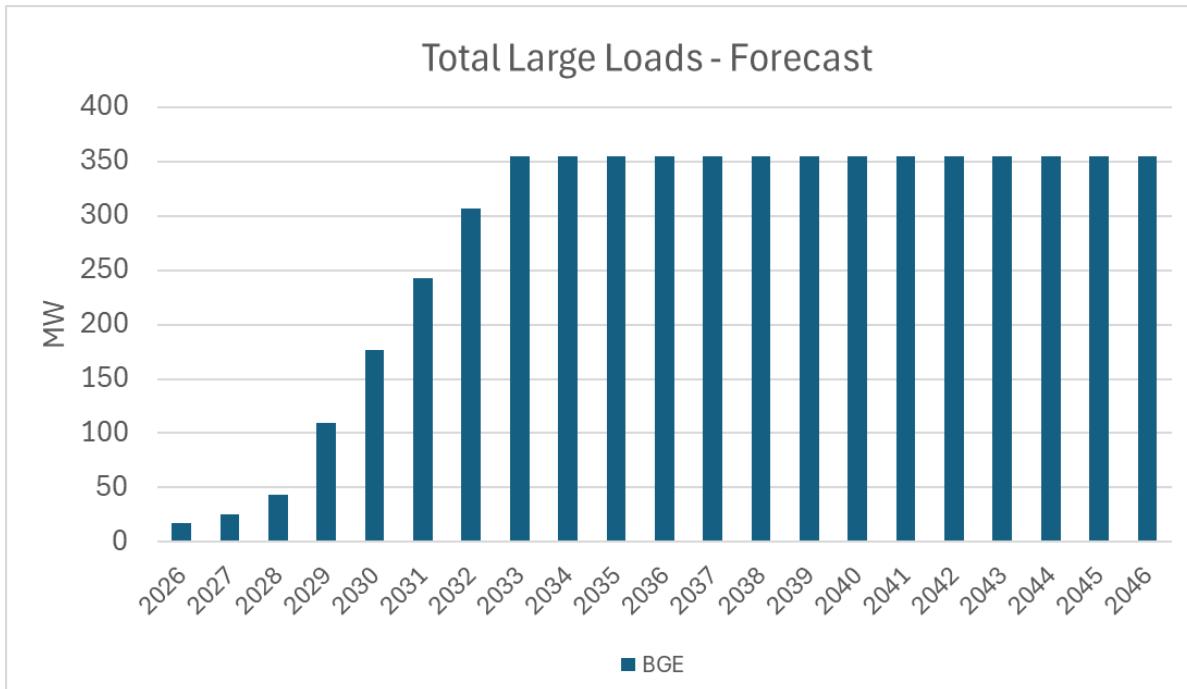
Exelon requested that PJM consider load additions related to growth in data centers in their BGE zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the BGE zone.



The chart below shows the total amount of large loads for summer in the forecast. There is only a small amount of data center load history so the total amount is equal to the amount above embedded.

¹⁶ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04h-first-energy-large-load-request.pdf>

¹⁷ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/fe-documentation.pdf>



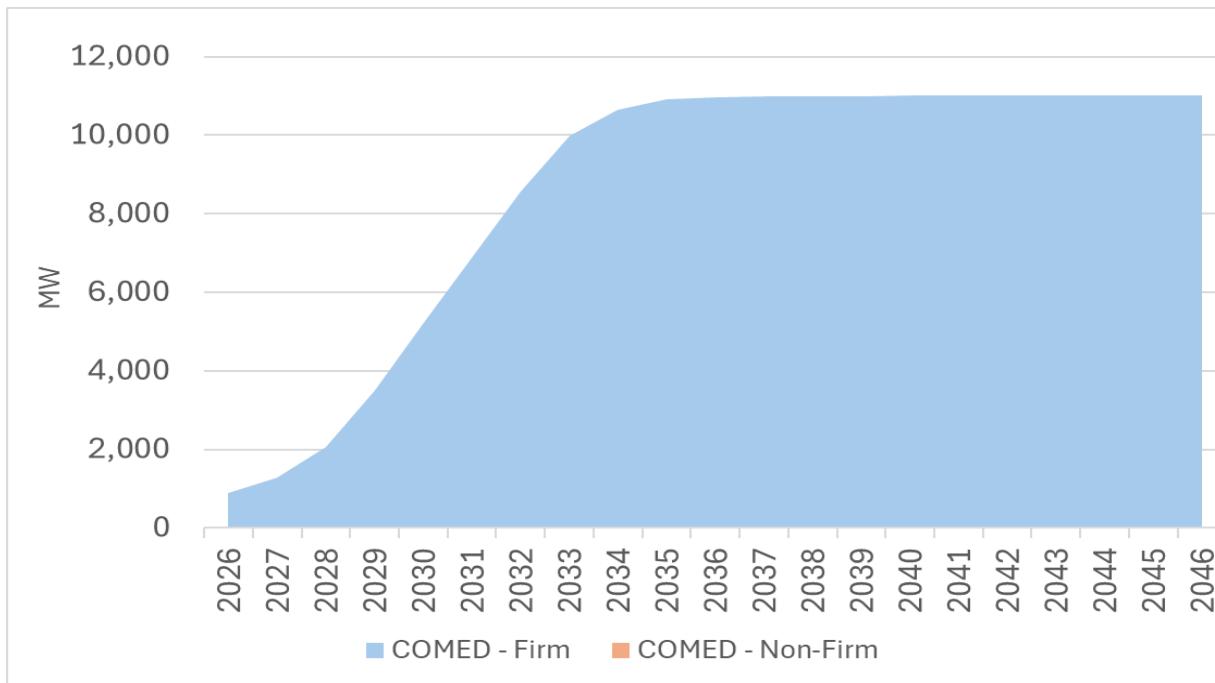
More information on Exelon's request can be found under the September 16, 2025 Load Analysis Subcommittee materials¹⁸ and their posted documentation¹⁹.

COMED

Exelon requested that PJM consider load additions related to significant growth in data centers. PJM considered the below breakdown of "firm" and "non-firm" for COMED data centers.

¹⁸ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04d-exelon-large-load-request.pdf>

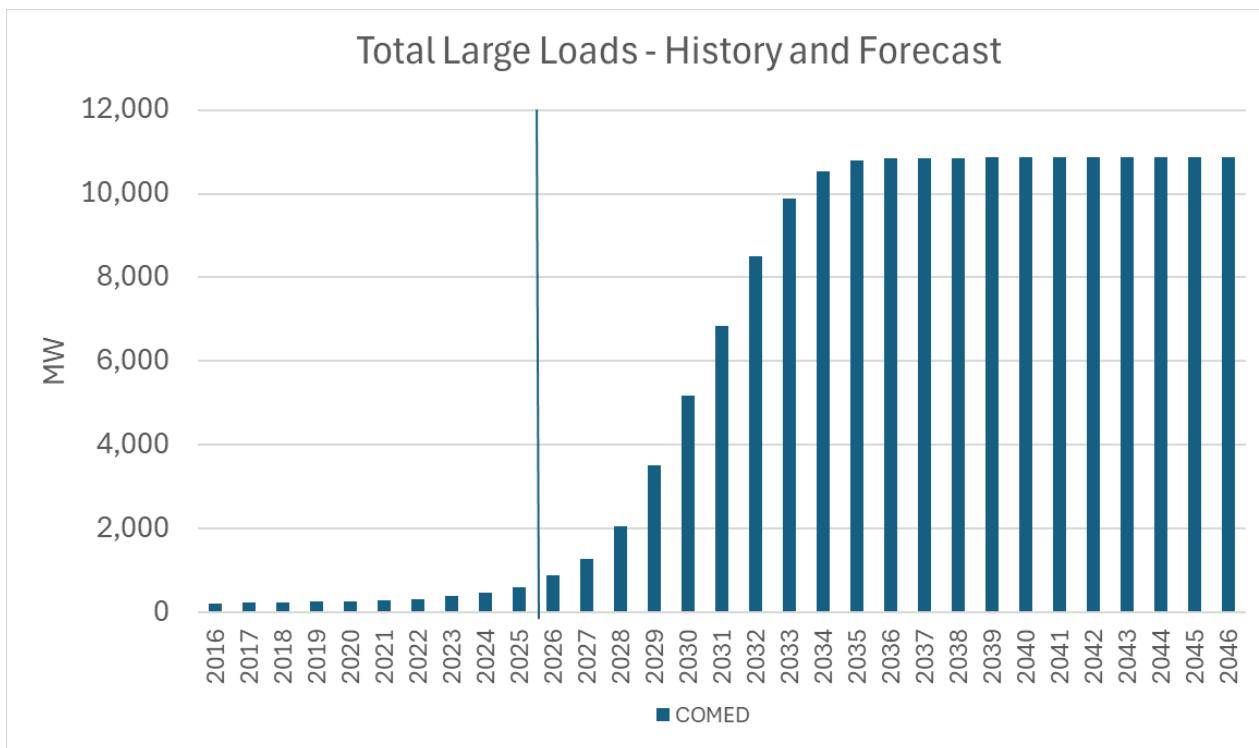
¹⁹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/exelon-documentation.pdf>



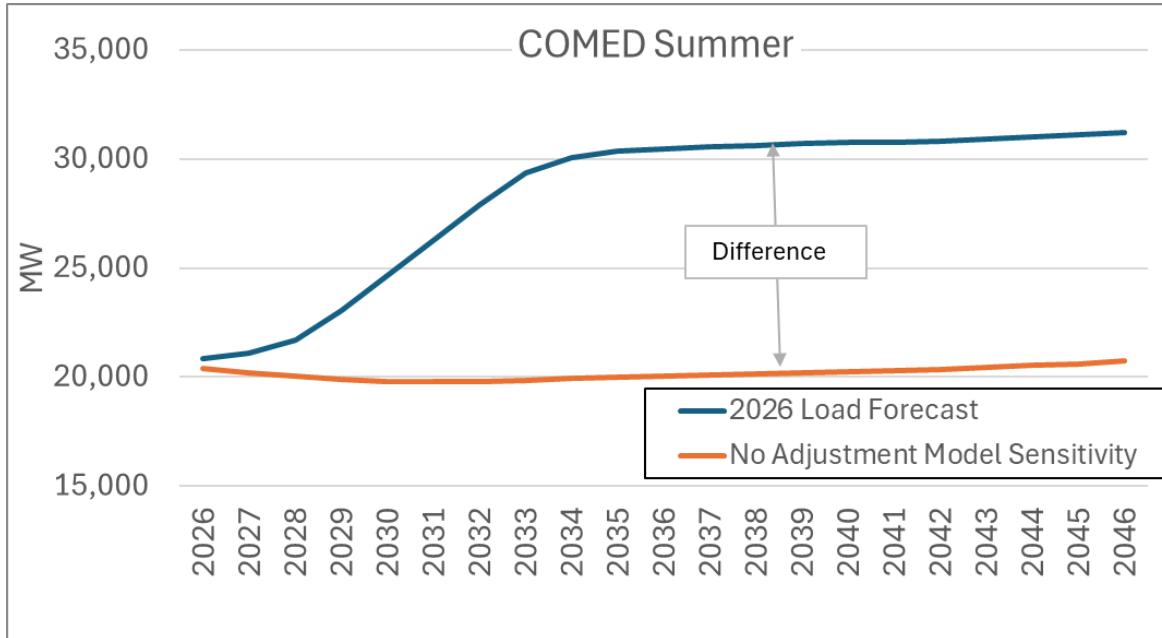
COMED also requested an adjustment for industrial load. PJM did not include these industrial loads due to overlap with economic variables used in model.

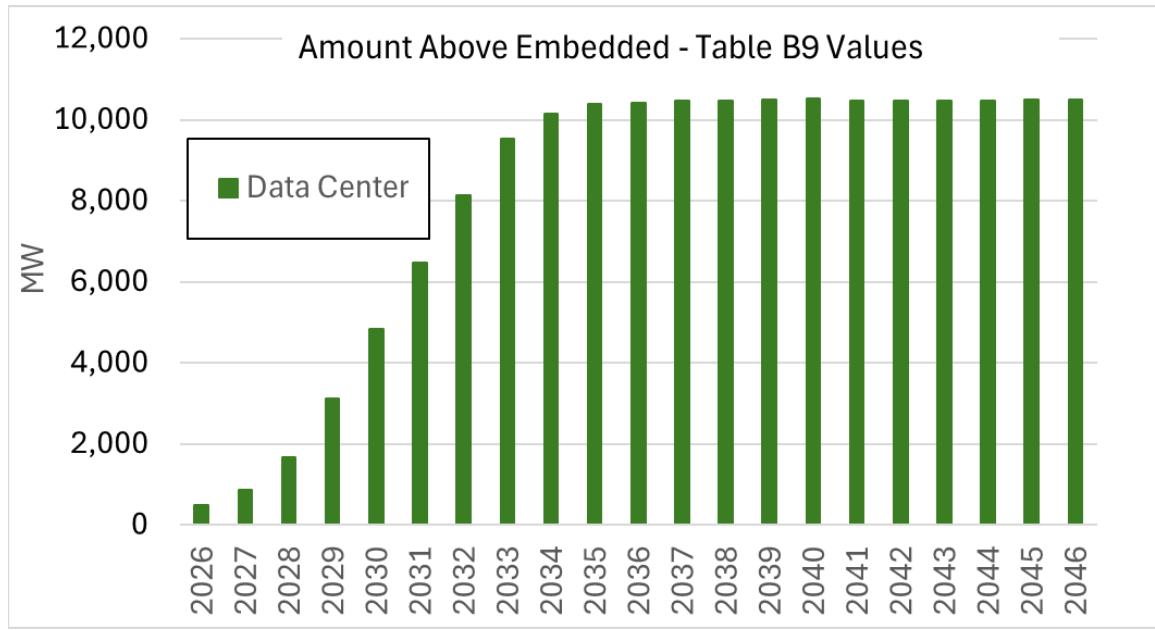
COMED provided forecasted data center additions as well as historical cumulative data center information. Hourly information related to historical data center load was included in the data provided. PJM removed monthly data center load from the commercial EIA data in an effort to remove any double counting. PJM also removed hourly data center load from our historical loads that are used in our model estimation.

The first chart below shows the total amount of large loads for summer in history and the forecast.



The next chart shows the summer COMED forecast in blue and a model sensitivity in orange that is run by leaving existing data center history in loads and not adjusting the forecast for any additional large loads. The subsequent bar chart shows the difference between the blue and orange line which depicts the amount above embedded that the large loads impact the forecast.





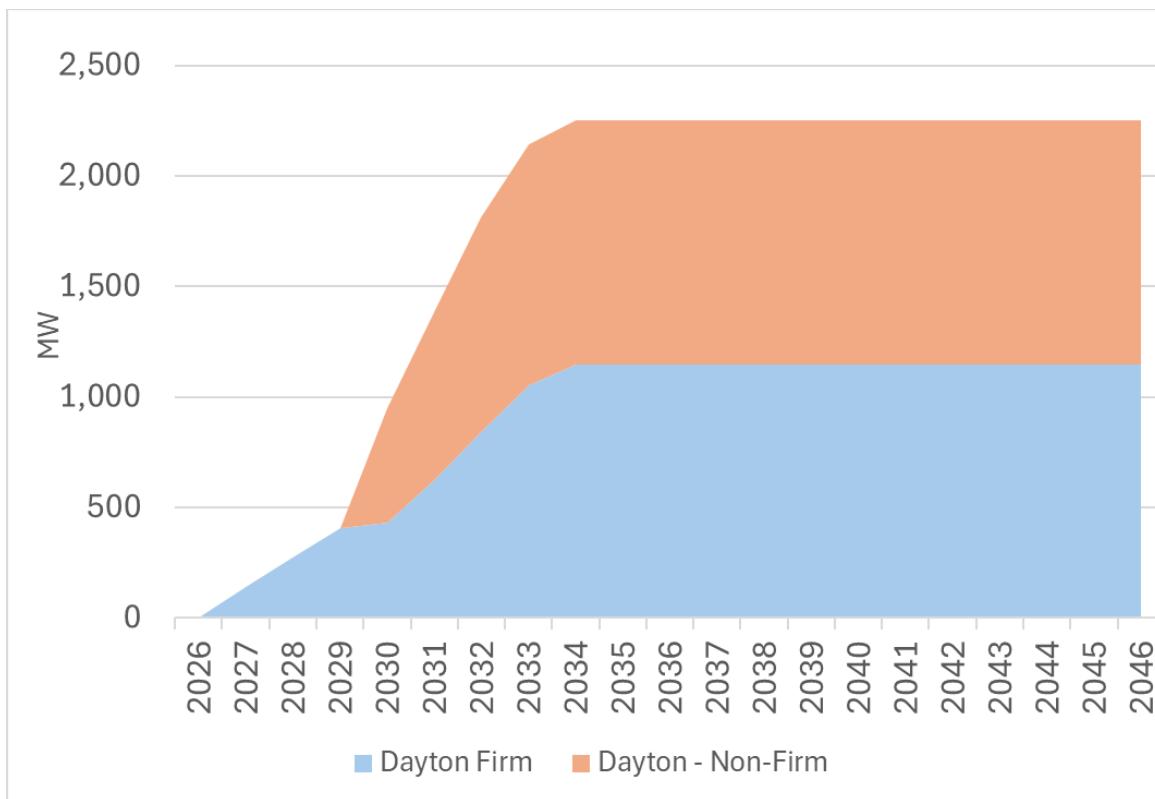
More information on COMED's request can be found under the September 16, 2025 Load Analysis Subcommittee materials²⁰ and their posted documentation²¹.

Dayton

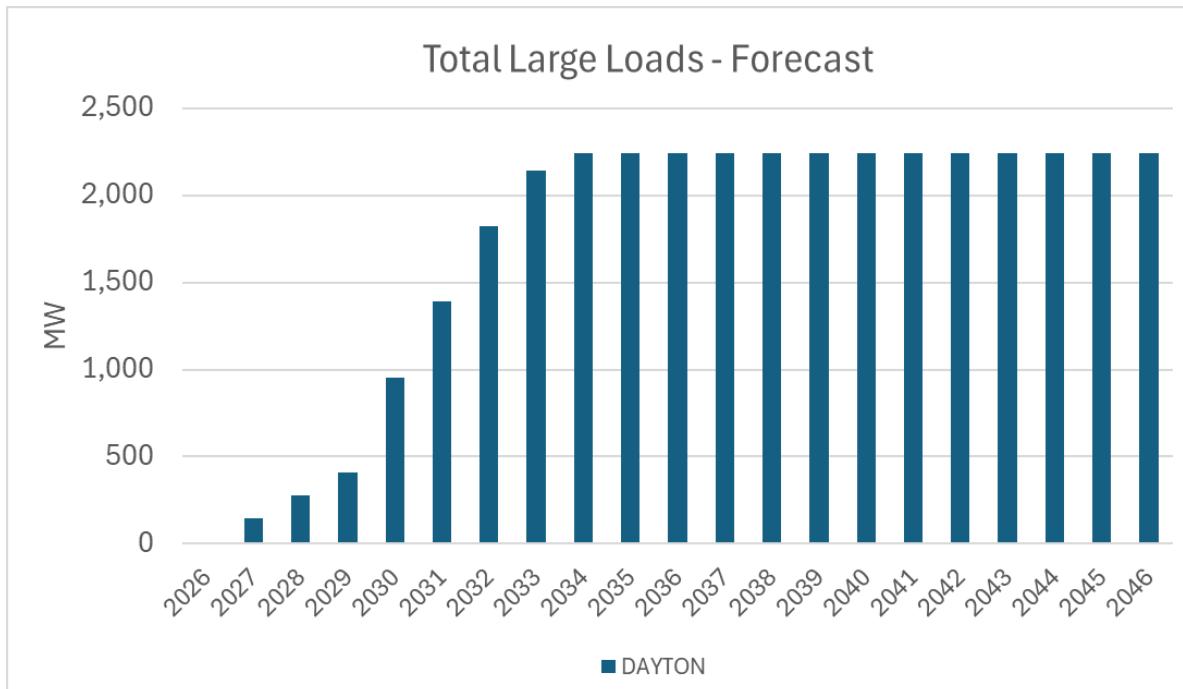
Dayton requested that PJM consider load additions related to growth in data centers in their DAYTON zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the DAYTON zone.

²⁰ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04d-exelon-large-load-request.pdf>

²¹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/exelon-documentation.pdf>



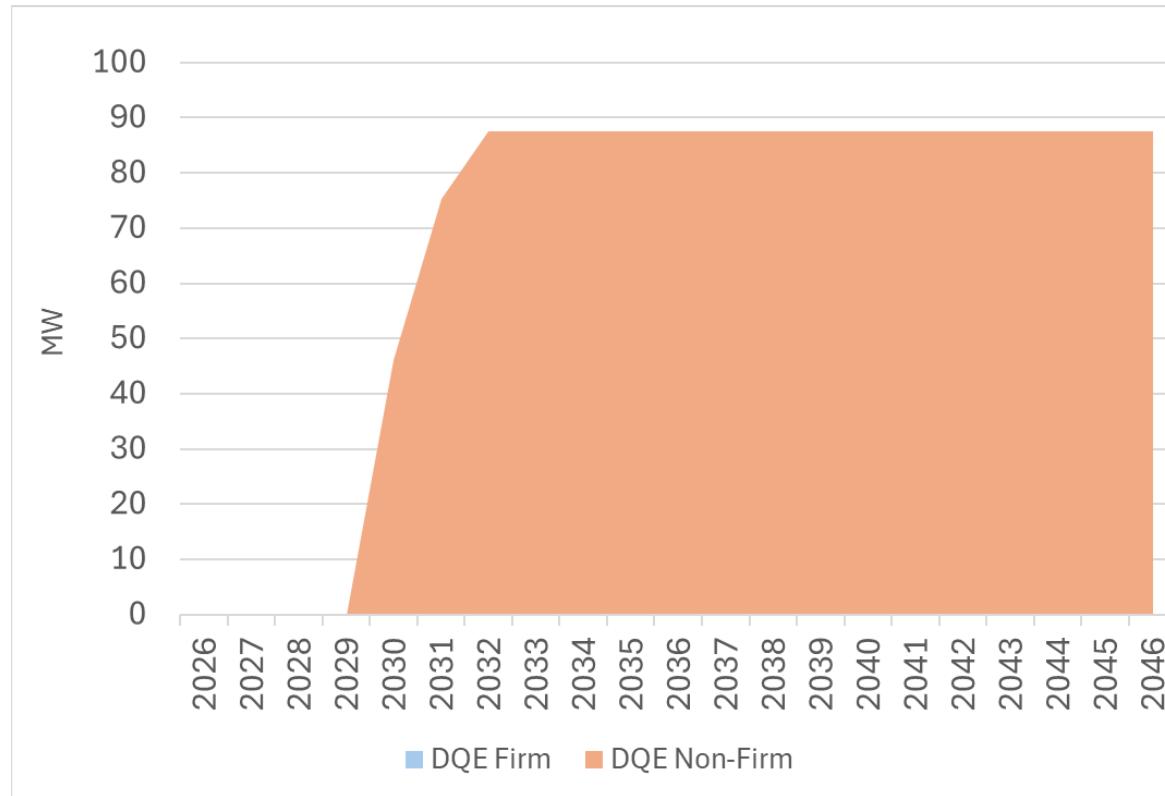
The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on Dayton's request can be found under the September 16, 2025 Load Analysis Subcommittee materials²² and their posted documentation²³.

DLCO

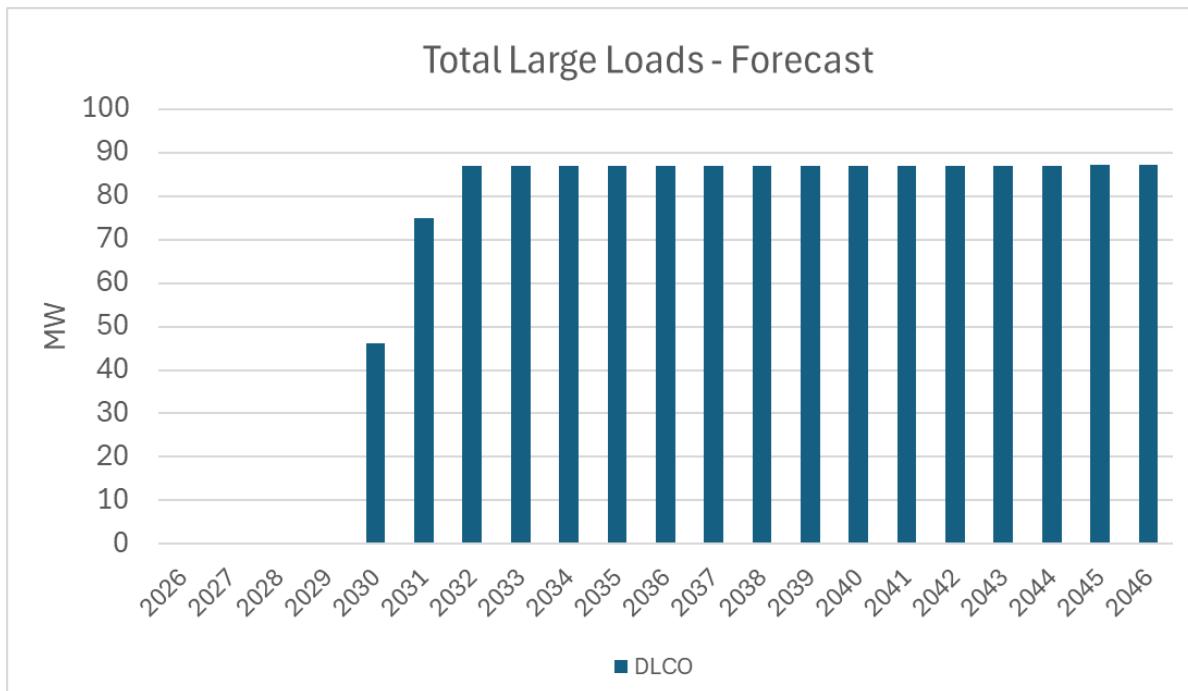
Duquesne requested that PJM consider load additions related to growth in data centers in their DLCO zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the DLCO zone.



The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.

²² <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04k-day-aes-large-load-request.pdf>

²³ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/dayton-documentation.pdf>



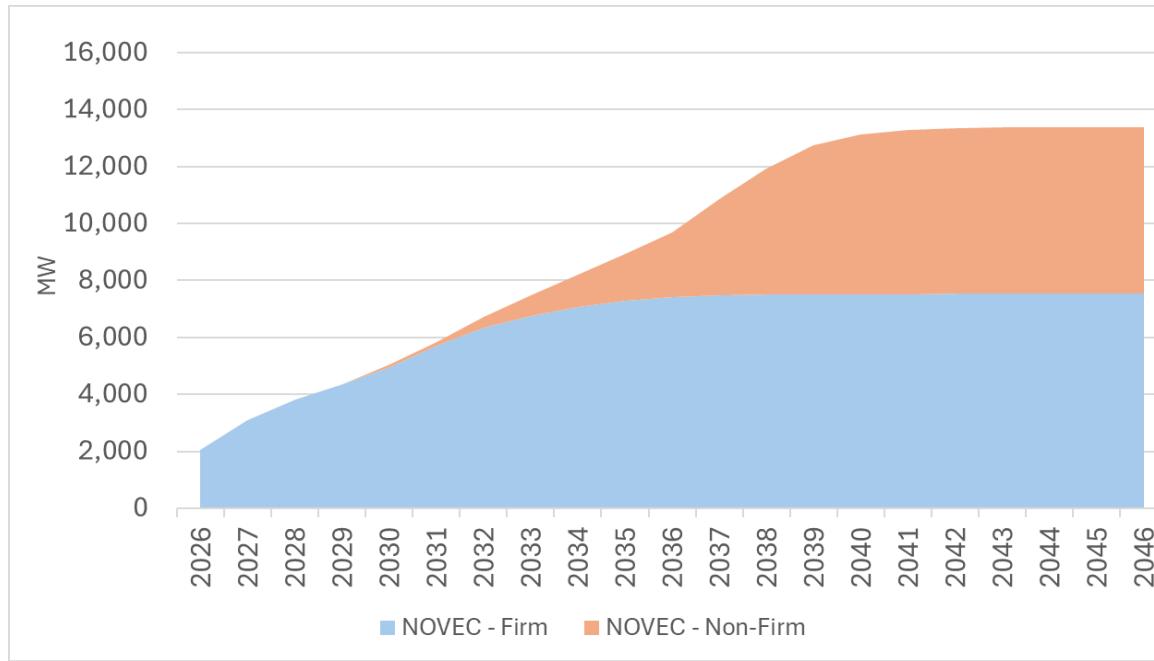
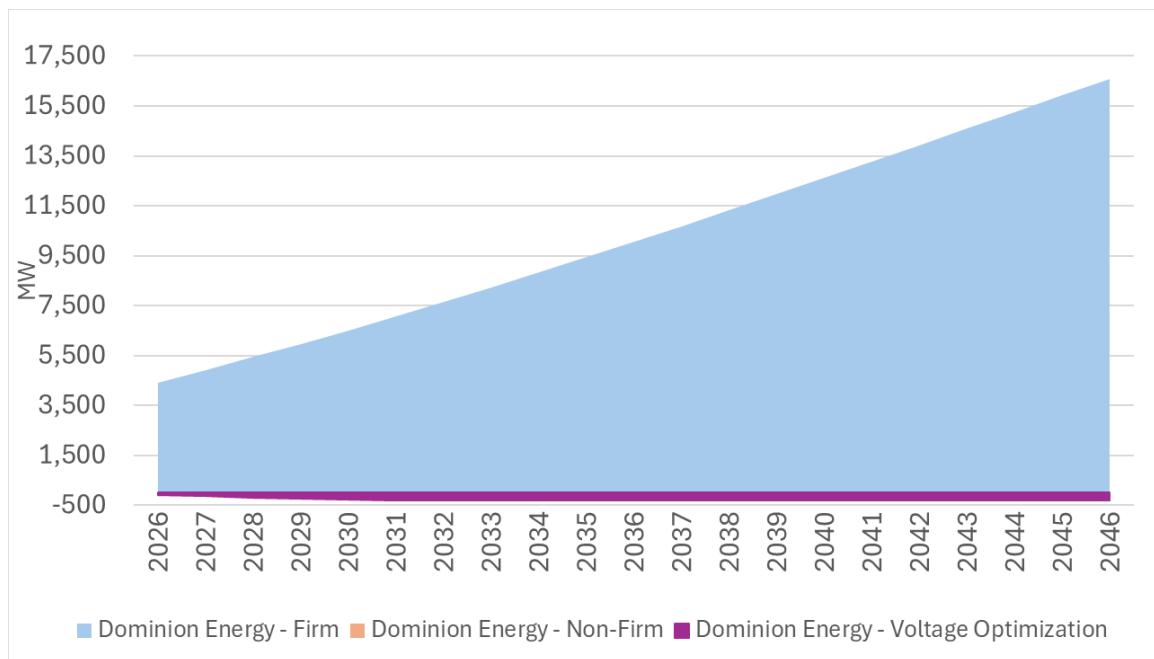
More information on Duquesne's request can be found under the September 16, 2025 Load Analysis Subcommittee materials²⁴ and their posted documentation²⁵.

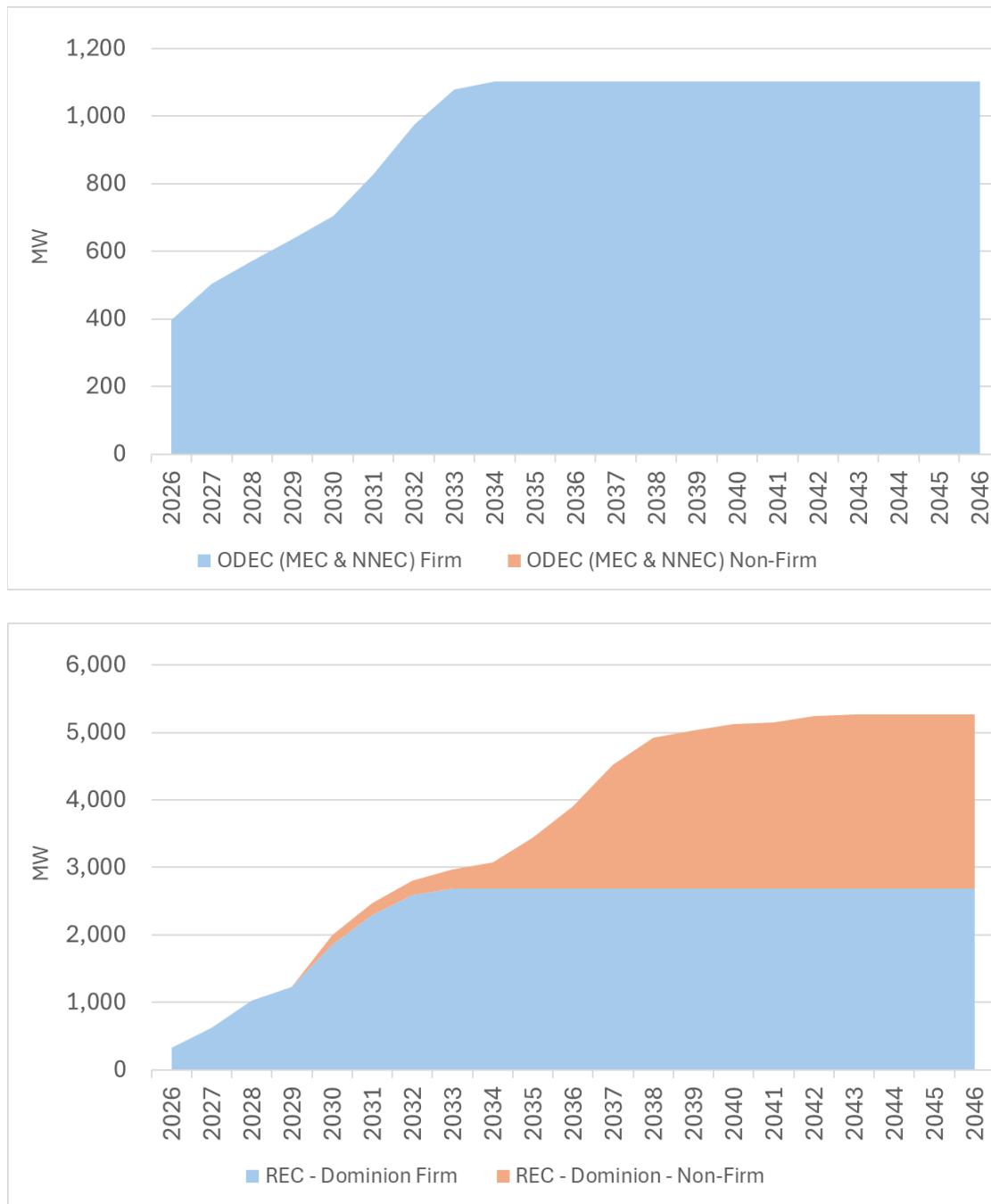
Dominion

Dominion Energy requested that PJM consider a forecast adjustment to account for the growth of data centers in the Dominion zone. This adjustment has been in place in some form since the 2014 Load Forecast Report. Dominion, Northern Virginia Electric Cooperative (NOVEC), Old Dominion Electric Cooperative (ODEC), and Rappahannock Electric Cooperative (REC) provided PJM with historical hourly information as well as forecasted peak information for the next twenty years. PJM removed monthly data center load from the commercial EIA data in an effort to remove any double counting. PJM also removed hourly data center load from our historical loads that are used in our model estimation. In addition to the request for data center load, Dominion requested a reduction due to a voltage optimization program. PJM considered the below breakdown of "firm" and "non-firm" for Dominion data centers.

²⁴ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04e-duquesne-large-load-request.pdf>

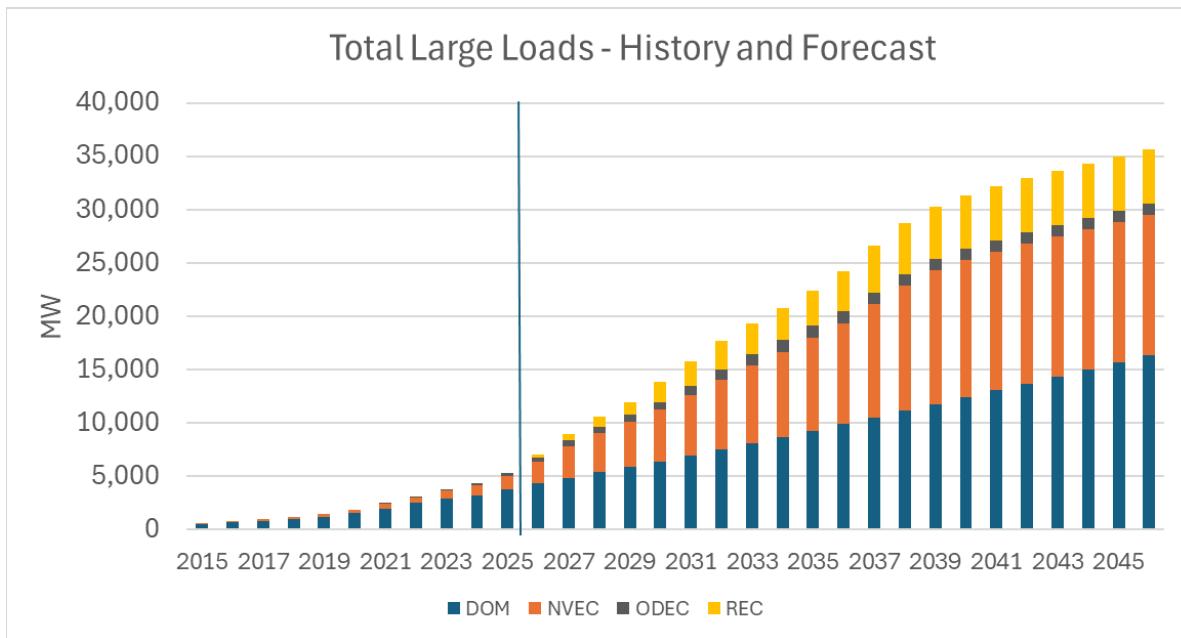
²⁵ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/dlco-documentation.pdf>



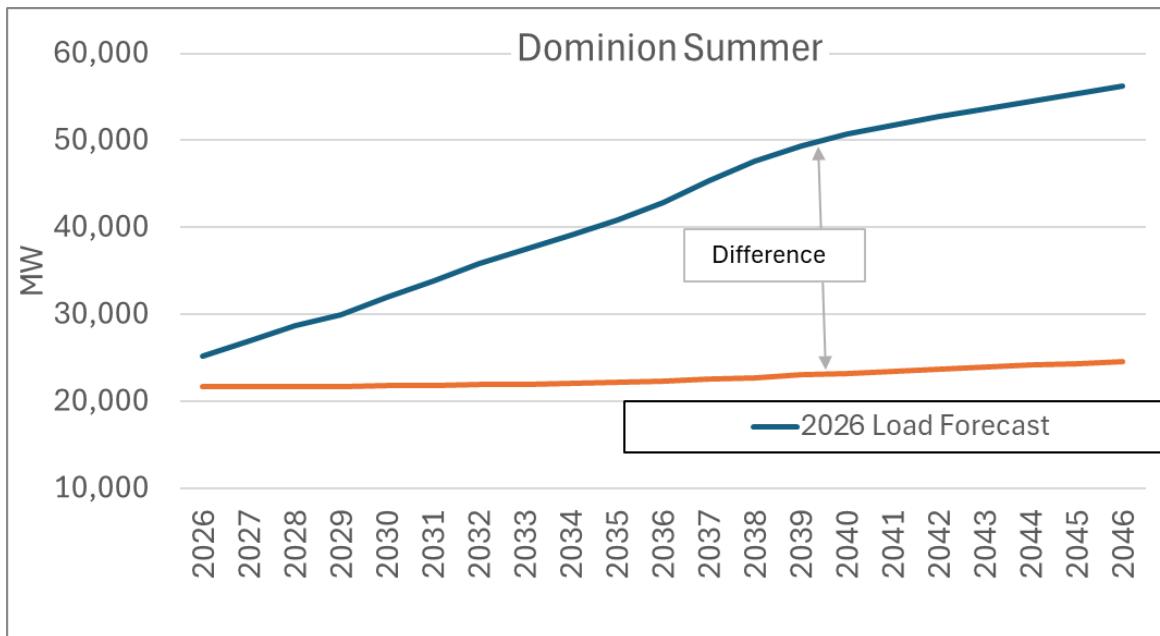


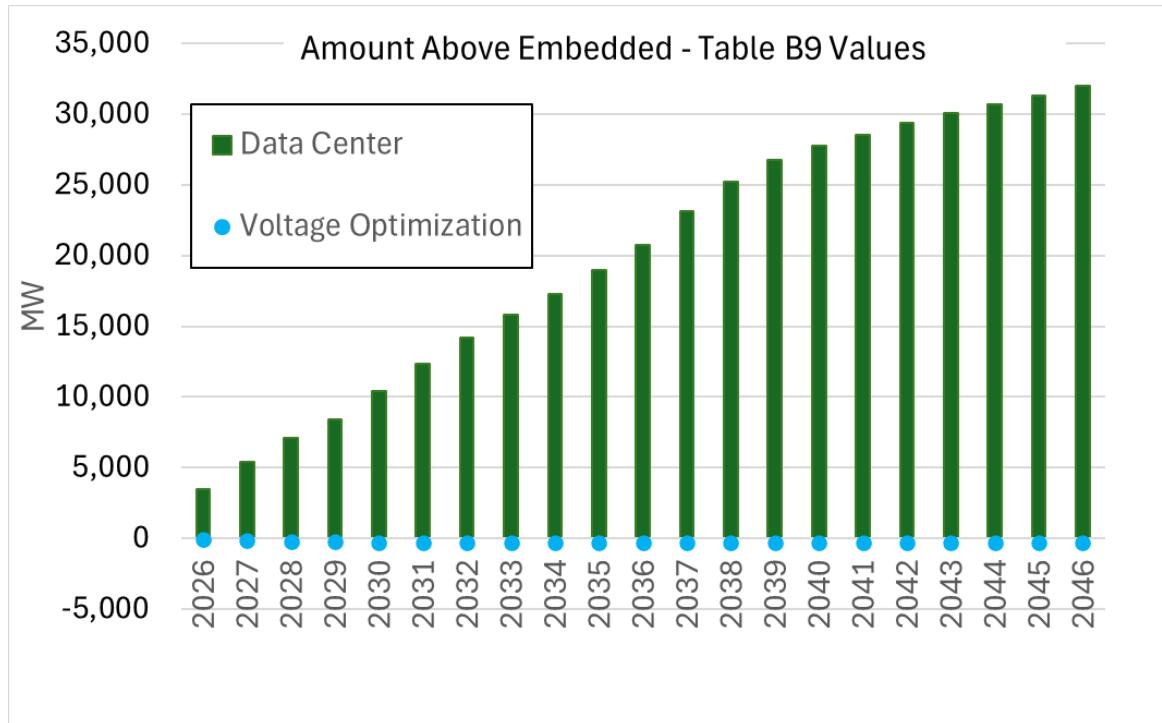
Dominion Energy, NOVEC, and ODEC provided forecasted data center additions as well as historical aggregate data center information. Hourly information related to historical data center load was included in the data provided. PJM removed monthly data center load from the commercial EIA data in an effort to remove any double counting. PJM also removed hourly data center load from our historical loads that are used in our model estimation.

The first chart below shows the total amount of large loads for summer in history and the forecast.



The next chart shows the summer Dominion forecast in blue and a model sensitivity in orange that is run by leaving existing data center history in loads and not adjusting the forecast for any additional large loads. The subsequent bar chart shows the difference between the blue and orange line which depicts the amount above embedded that the large loads impact the forecast.





More information on Dominion Energy's requests can be found under the September 16, 2025 Load Analysis Subcommittee materials²⁶²⁷ and their posted documentation²⁸²⁹. More information on NOVEC's request can be found under the September 16, 2025 Load Analysis Subcommittee materials³⁰ and their posted documentation³¹. More information on ODEC's request can be found under the September 16, 2025 Load Analysis Subcommittee

²⁶ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04ai---dominion-data-center-large-load-request.pdf>

²⁷ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04aii---dominion-voltage-optimization.pdf>

²⁸ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/dominion-documentation.pdf>

²⁹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/dominion-vo-documentation.pdf>

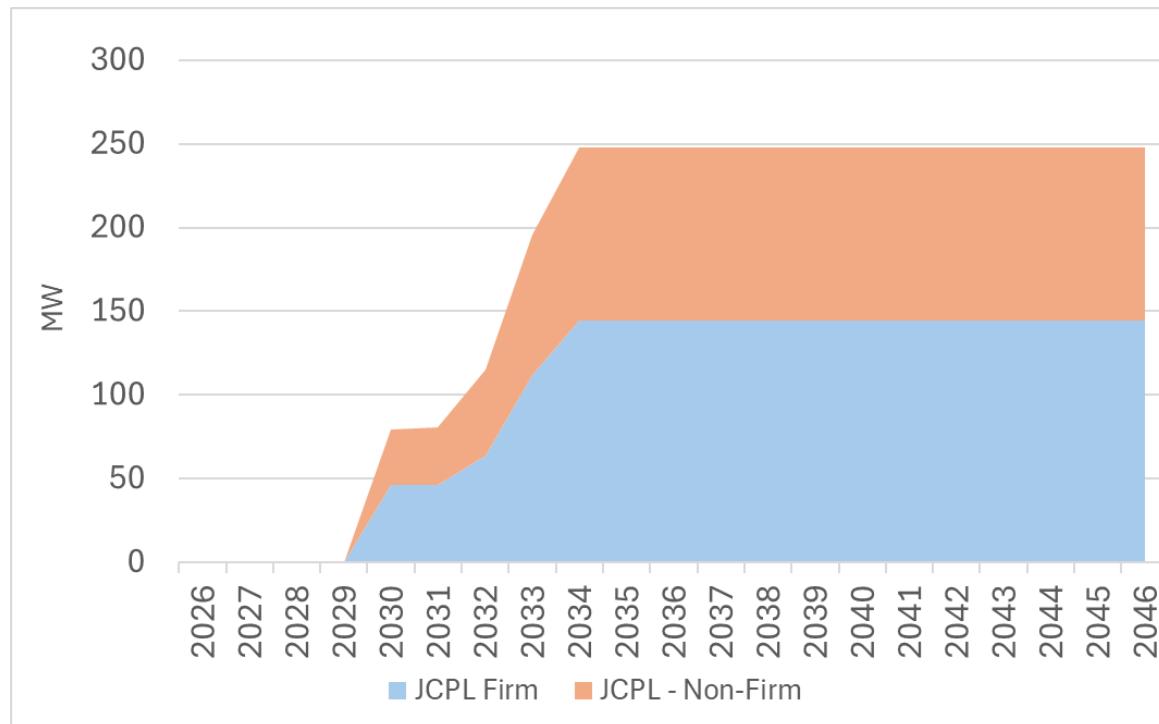
³⁰ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04b---novec-large-load-request.pdf>

³¹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/novec-documentation.pdf>

materials³² and their posted documentation³³. More information on REC's request can be found under the September 16, 2025 Load Analysis Subcommittee materials³⁴ and their posted documentation³⁵.

JCPL

First Energy requested that PJM consider load additions related to growth in data centers in their JCPL zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the JCPL zone.



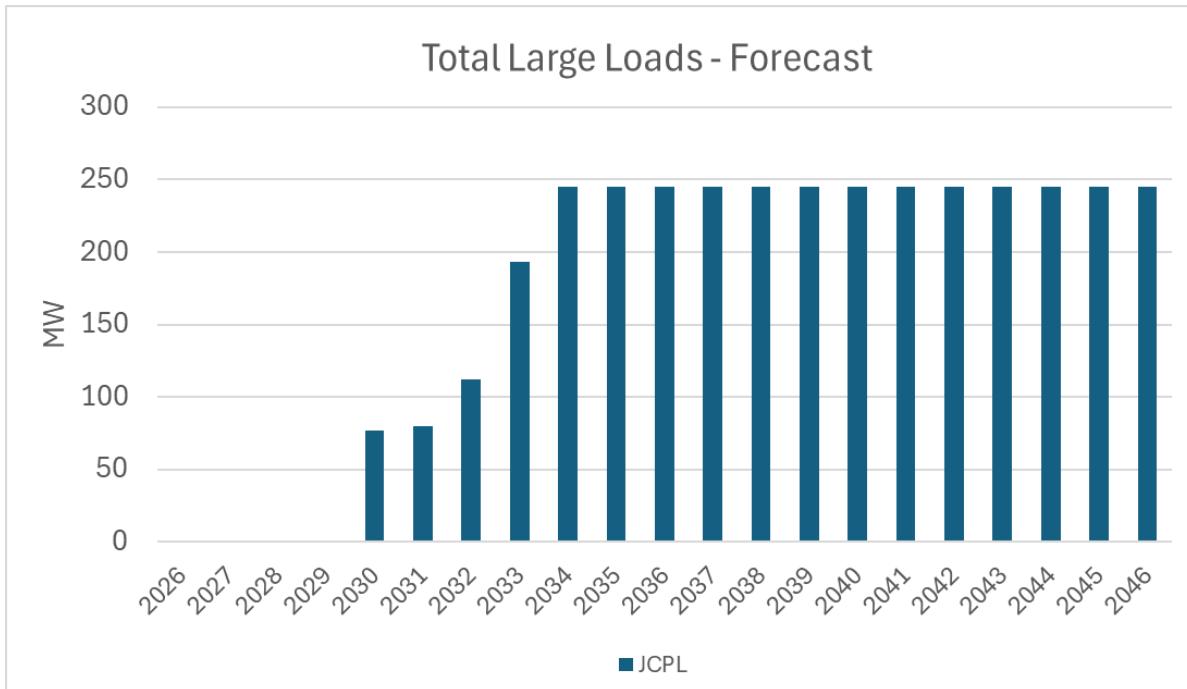
This chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.

³² <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04j---odec-large-load-request.pdf>

³³ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/odec-documentation.pdf>

³⁴ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04c---rec-large-load-request.pdf>

³⁵ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/rec-documentation.pdf>



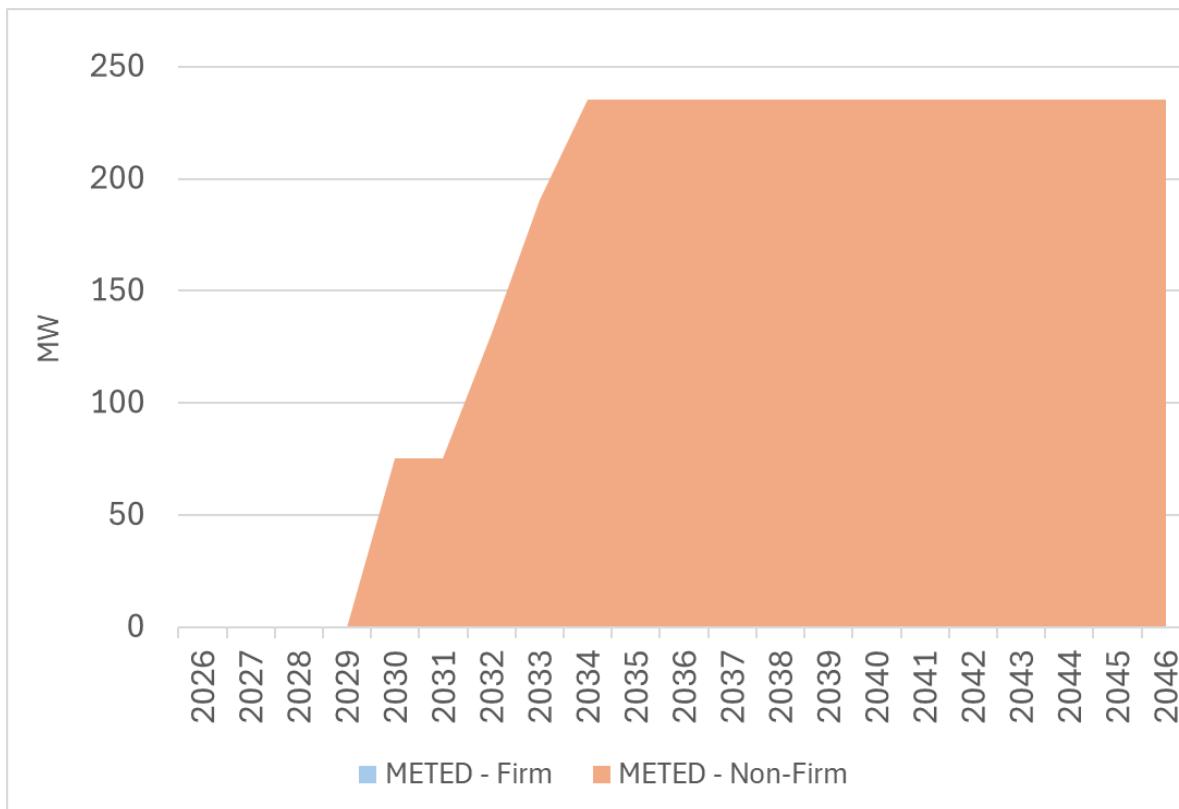
More information on First Energy's request can be found under the September 16, 2025 Load Analysis Subcommittee materials³⁶ and their posted documentation³⁷.

METED

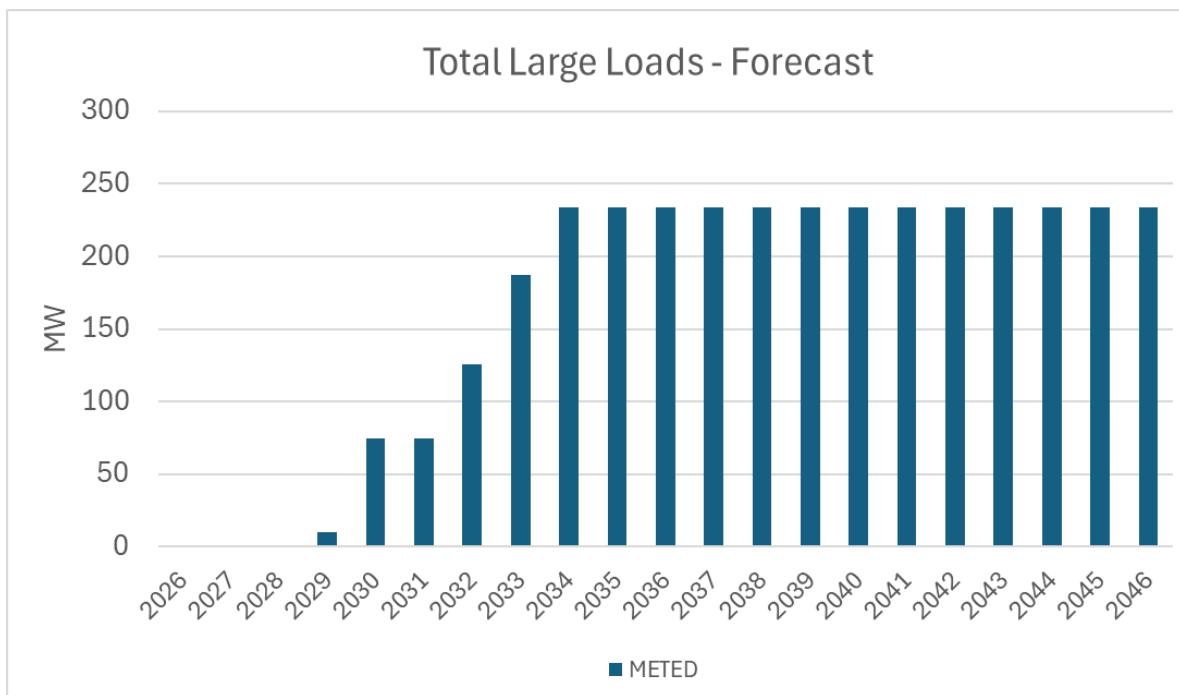
First Energy requested that PJM consider load additions related to growth in data centers in their METED zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the METED zone.

³⁶ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04h-first-energy-large-load-request.pdf>

³⁷ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/fe-documentation.pdf>



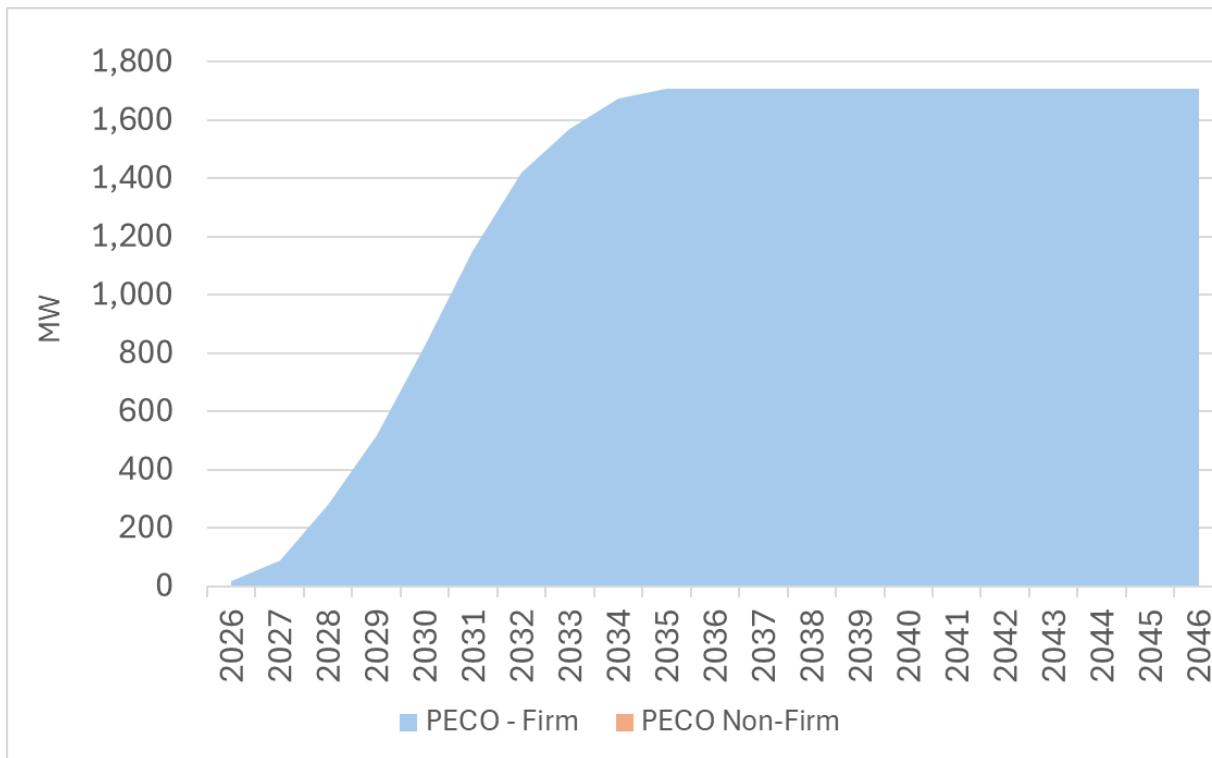
The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on First Energy's request can be found under the September 16, 2025 Load Analysis Subcommittee materials³⁸ and their posted documentation³⁹.

PECO

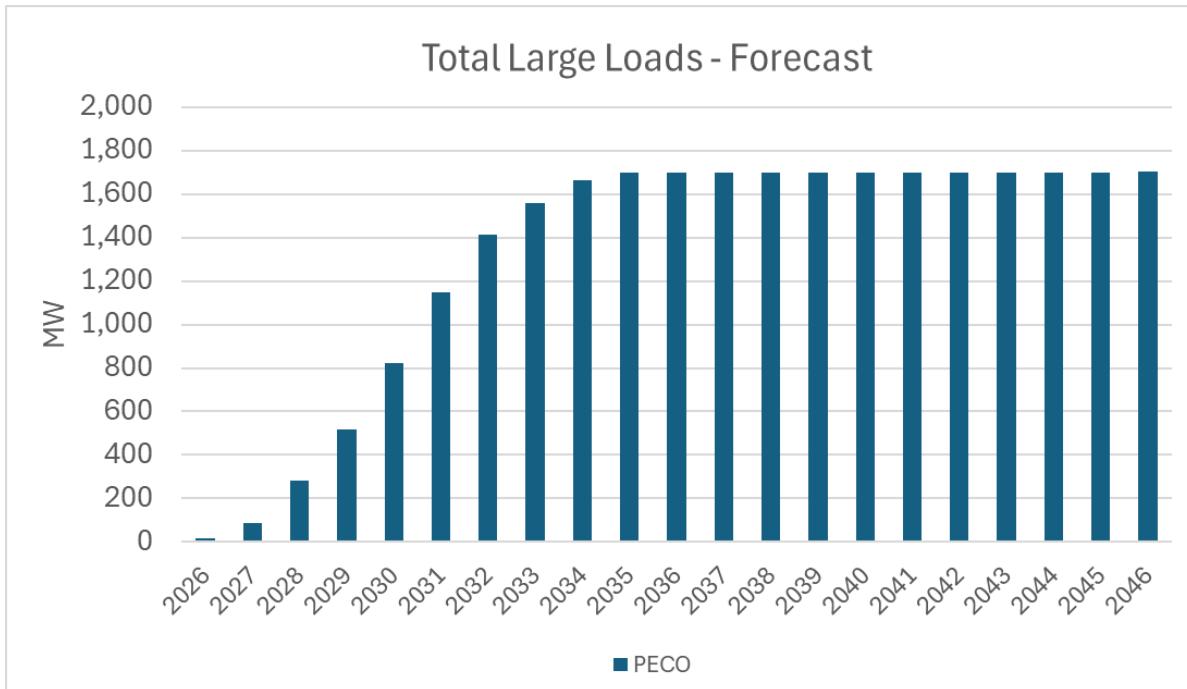
Exelon requested that PJM consider load additions related to growth in data centers in their PECO zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the PECO zone.



This chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.

³⁸ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04h-first-energy-large-load-request.pdf>

³⁹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/fe-documentation.pdf>



More information on Exelon's request can be found under the September 16, 2025 Load Analysis Subcommittee materials⁴⁰ and their posted documentation⁴¹.

PEPCO

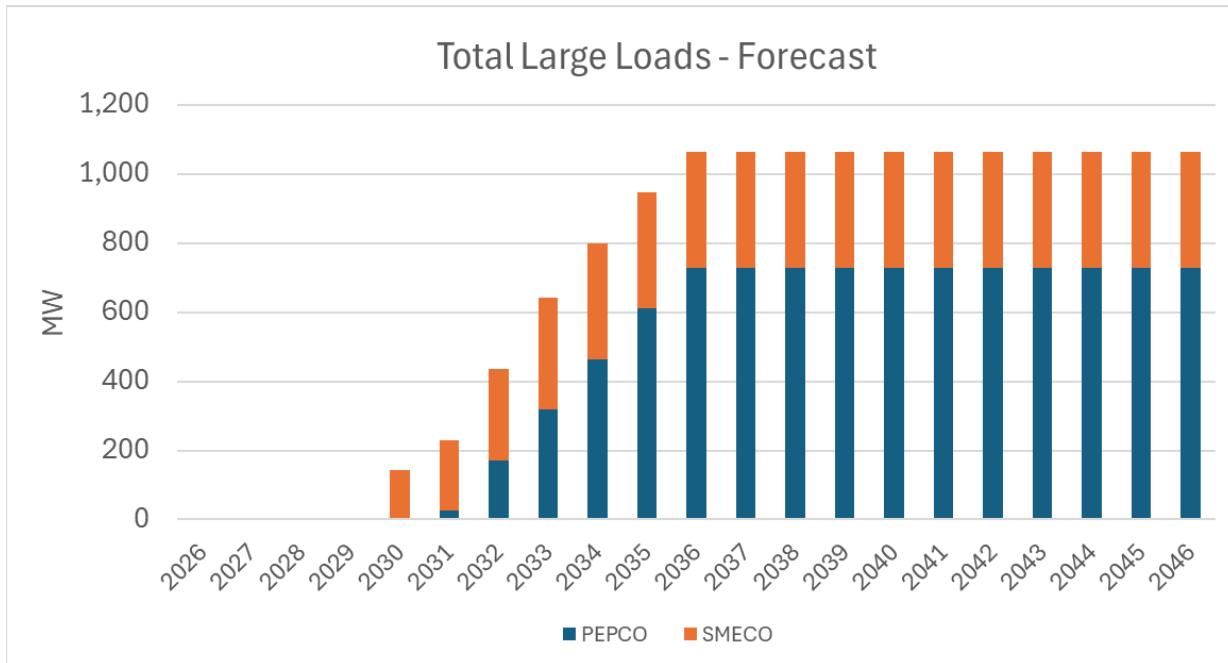
Exelon requested that PJM consider load additions related to significant growth in data centers in their PEPCO zone. Southern Maryland Electric Cooperative (SMECO) also requested that PJM consider load additions related to data centers in the PEPCO zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the PEPCO zone.

⁴⁰ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04d-exelon-large-load-request.pdf>

⁴¹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/exelon-documentation.pdf>



The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on Exelon's request can be found under the September 16, 2025 Load Analysis Subcommittee materials⁴² and their posted documentation⁴³.

More information on SMECO's request can be found under the September 16, 2025 Load Analysis Subcommittee materials⁴⁴ and their posted documentation⁴⁵.

PL

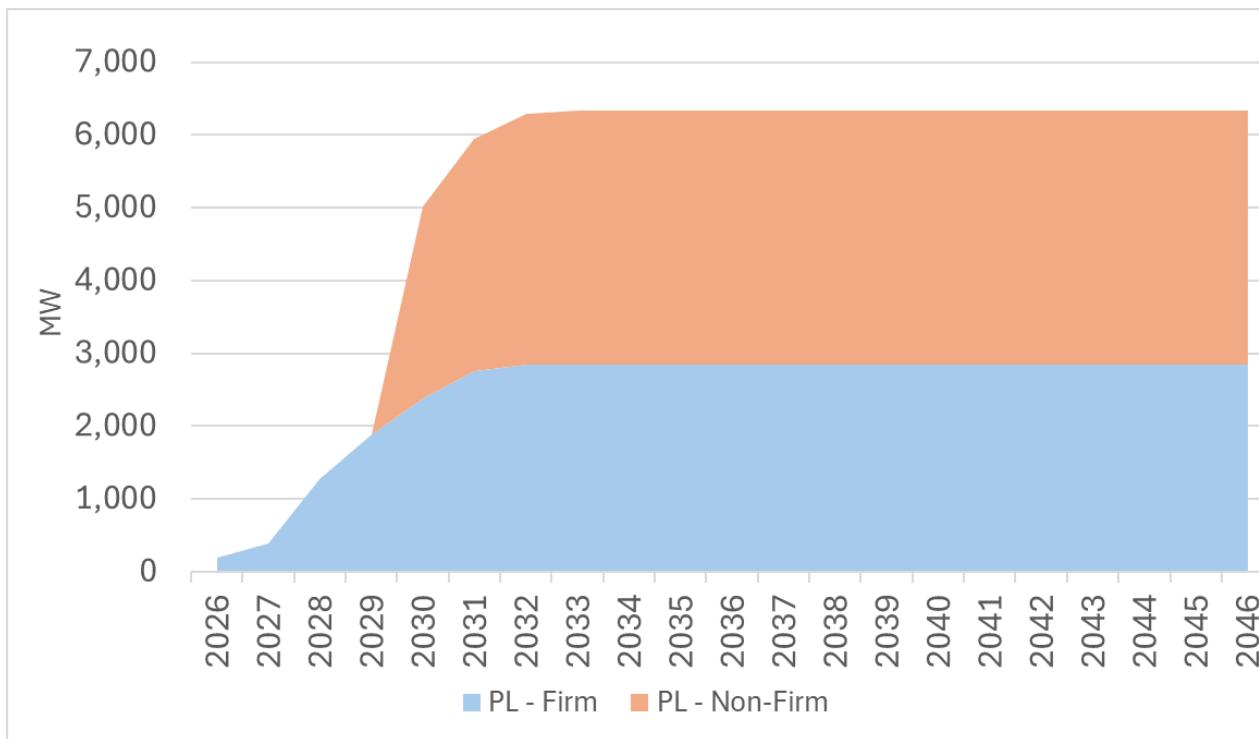
PL requested that PJM consider load additions related to growth in data centers in their PL zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers in the PL zone.

⁴² <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04d--exelon-large-load-request.pdf>

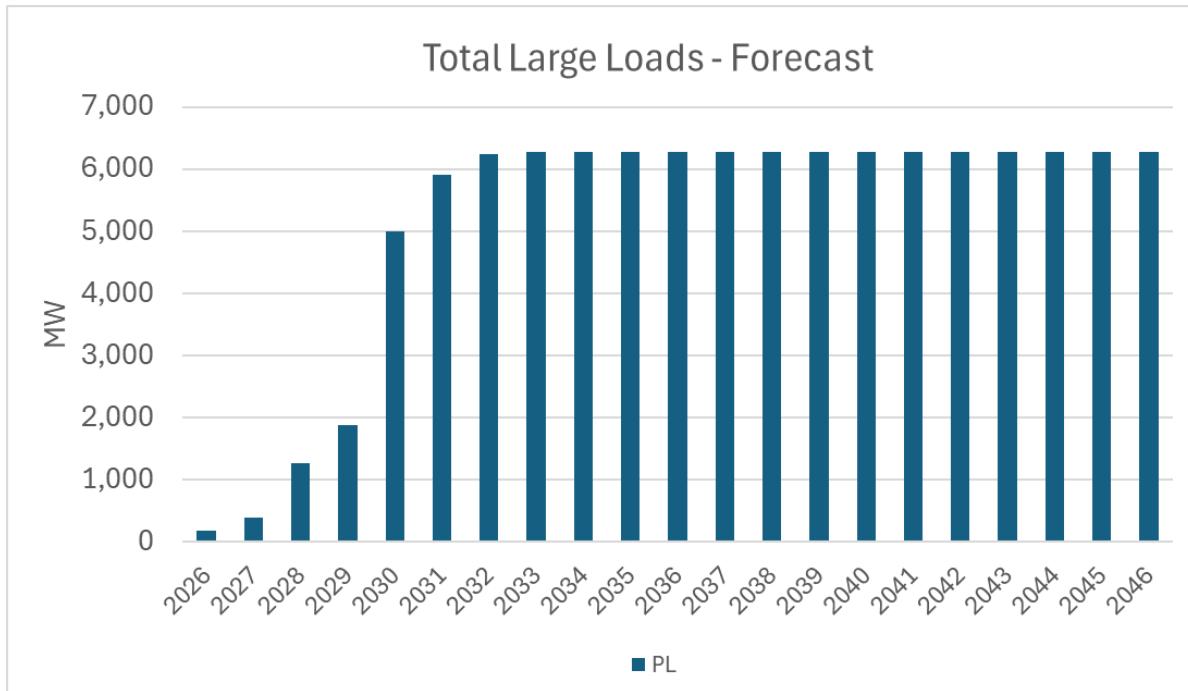
⁴³ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/exelon-documentation.pdf>

⁴⁴ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04i--smeco-large-load-request.pdf>

⁴⁵ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/smeco-documentation.pdf>



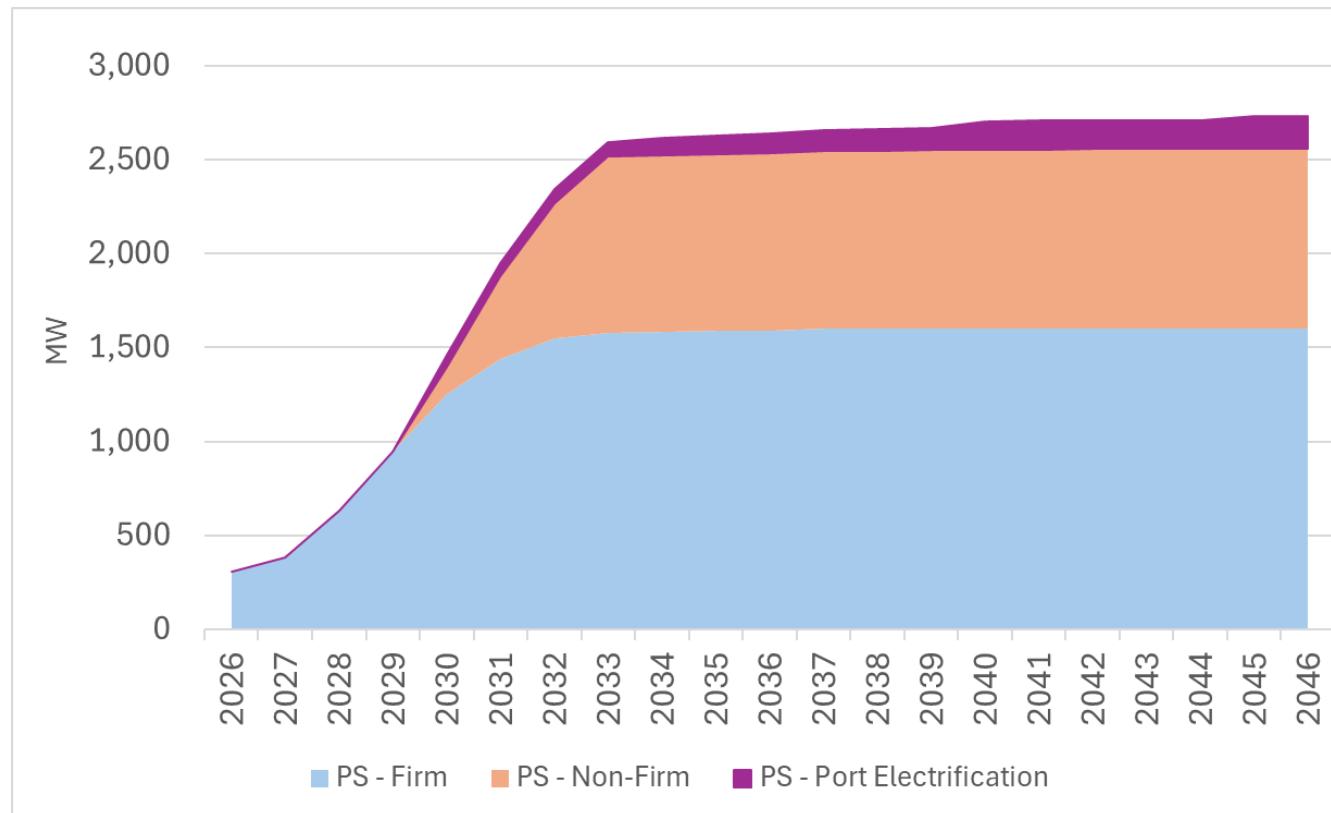
The chart below shows the total amount of large loads for summer in the forecast. There is no data center load history so the total amount is equal to the amount above embedded.



More information on PL's request can be found under the September 16, 2025 Load Analysis Subcommittee materials⁴⁶ and their posted documentation⁴⁷.

PS

PS requested that PJM consider load additions related to growth in data centers and port electrification in their PS zone. PJM considered the below breakdown of "firm" and "non-firm" for data centers and port electrification in the PS zone.

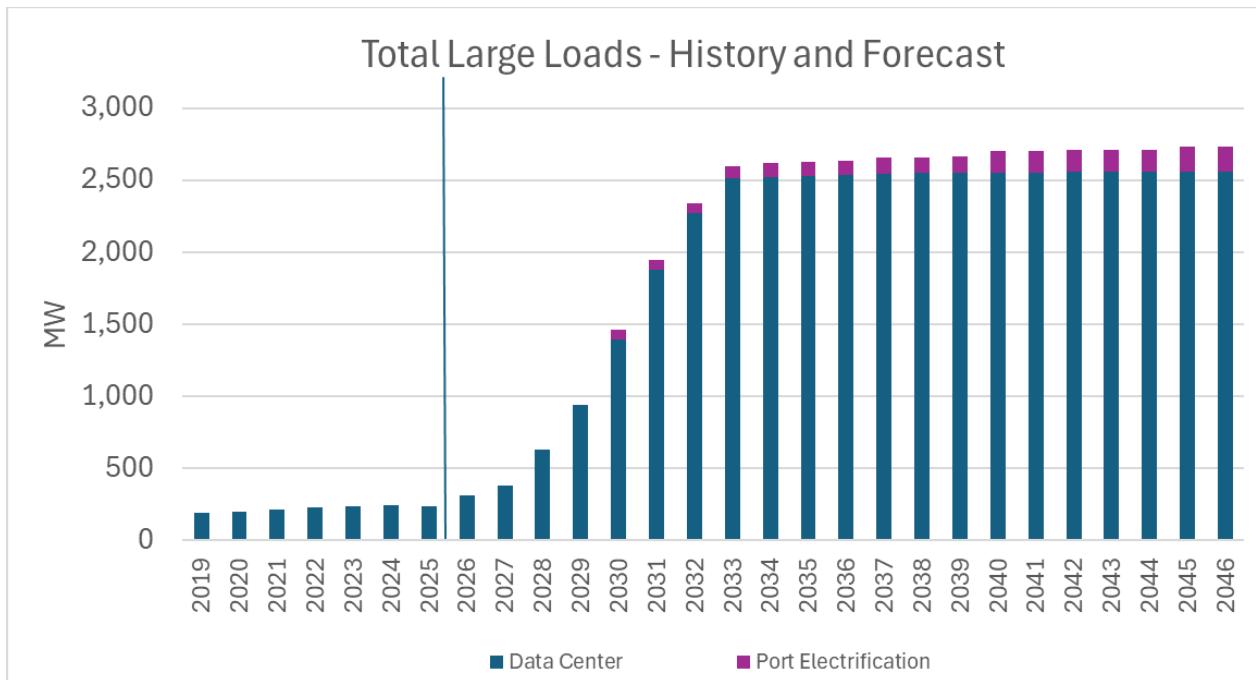


PS provided forecasted data center additions as well as historical cumulative data center information. Hourly information related to historical data center load was included in the data provided. PJM removed monthly data center load from the commercial EIA data in an effort to remove any double counting. PJM also removed hourly data center load from our historical loads that are used in our model estimation.

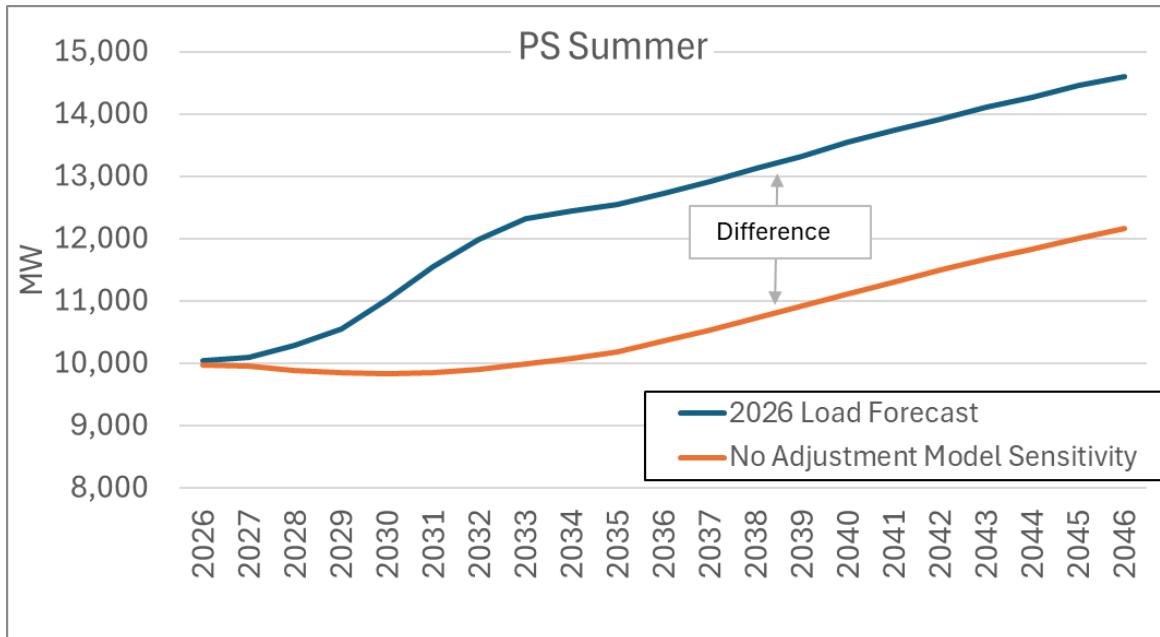
The first chart below shows the total amount of large loads for summer in history and the forecast.

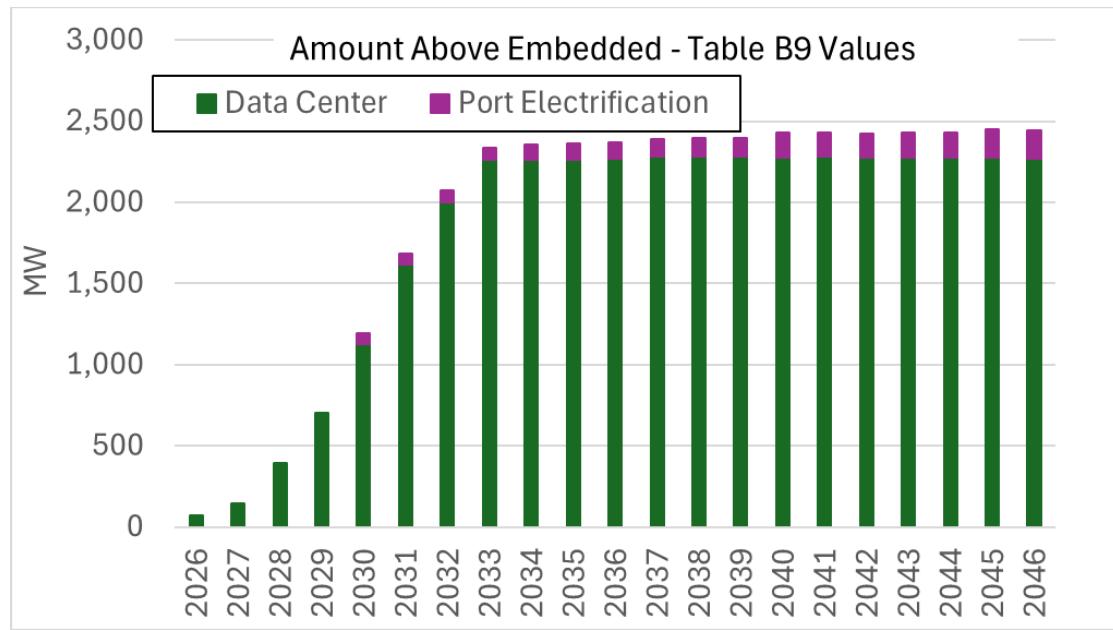
⁴⁶ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04g-ppl-large-load-request.pdf>

⁴⁷ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/ppl-documentation.pdf>



The next chart shows the summer PS forecast in blue and a model sensitivity shown in orange that is run by leaving existing data center history in loads and not adjusting the forecast for any additional large loads. The subsequent bar chart shows the difference between the blue and orange line which depicts the amount above embedded that the large loads impact the forecast.





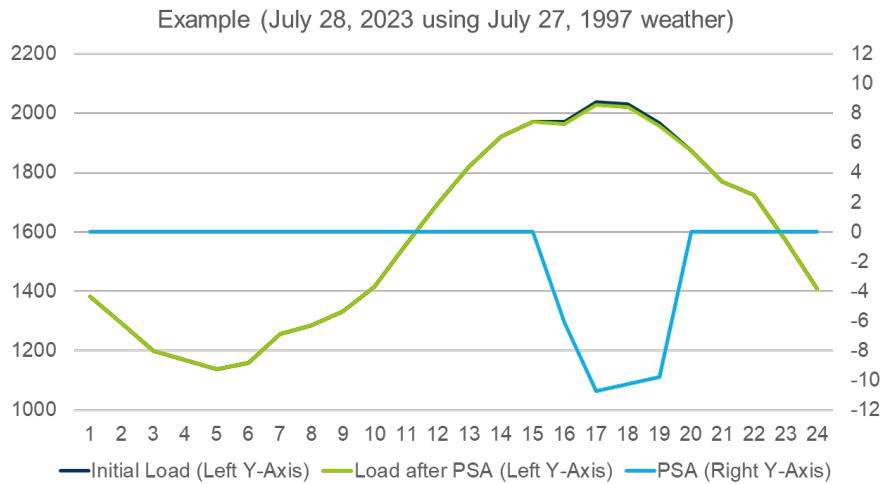
More information on PS's request can be found under the September 16, 2025 Load Analysis Subcommittee materials⁴⁸ and their posted documentation⁴⁹.

EKPC – Peak Shaving Adjustment

EKPC requested a peak shaving adjustment that began with the 2023 Delivery Year. EKPC provides PJM with weather triggers as well as program response matrixes for their three programs (smart thermostats, air conditioning switches, and water heater switches). In the forecast simulation process, on days that exceed the trigger, the programs are enacted. The chart below shows an example of program implementation in the forecast. On this day in the forecast, the program is triggered and reduces load in HE16 through HE19 resulting in a peak reduction of 10MW.

⁴⁸ <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2025/20250916/20250916-item-04m---pseq-large-load-request.pdf>

⁴⁹ <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/pseq-documentation.pdf>



After summer 2025, PJM evaluated actual performance against expected performance and used this performance rating⁵⁰ in the 2026 Long-Term Load Forecast.

State Policy

PJM annually contracts with a vendor to provide projections of future additions of behind-the-meter solar and storage resources. The outlook for public policy is a key driver of those projections such as renewable portfolio standards and solar carve-outs. The forecast of electric vehicles is also provided by a vendor. The assumptions from our vendors are circulated to stakeholders (particularly state agencies) for review and comment.

PJM did not include any additional electrification policies in the 2026 Long-Term Load Forecast above what is included in the 2025 Energy Information Agency Annual Energy Outlook.

Additional Model Detail

Calendar Variables

The forecast model includes a number of variables to capture calendar effects, represented primarily as either binary variables or fuzzy binary variables. Binary variables take a value of 1 or 0, whereas fuzzy binary variables have values ranging from 0 to 1. There is also a graduated variable to take into account the effect of the week leading up to Christmas and the week after the New Year.

Day of Week (=1 when that day, 0 otherwise)

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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⁵⁰ <https://www.pjm.com/-/media/documents/manuals/m19.ashx> Attachment D

Month (=1 when that month, 0 otherwise) and DST variables:

Jan	Feb	Mar	MarDST	Apr	May	Jun
Jul	Aug	Sep	Oct	Nov	NovDST	

Holiday variables are coded such that they have values for more than one day, and for some holidays, these values can differ year to year depending on the day of the week the holiday is observed. These variables are included because generally these days would be expected to have lower than normal loads.

MLK	PresDay	MemDay	LaborDay
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MLK (Martin Luther King Day), *PresDay* (Presidents' Day), *MemDay* (Memorial Day), and *LaborDay* (Labor Day)

	Value
Day before Holiday	0.2
On Holiday	1
All other days	0

GoodFri	Thanks
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GoodFri (Good Friday) and *Thanks* (Thanksgiving Day)

	Value
On Holiday	1
All other days	0

July4th

July4th (Independence Day)

	Value by Day of Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
July 2	0.10	0.00	0.00	0.15	0.15	0.10	0.15
July 3	0.70	0.25	0.15	0.20	0.80	0.20	0.20
July 4	1.00	1.00	0.80	1.00	1.00	0.40	0.30
July 5	0.80	0.15	0.15	0.25	0.70	0.30	0.15
July 6	0.00	0.00	0.00	0.00	0.10	0.20	0.00
All other days	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FriAThanks
FriAThanks (After Thanksgiving Day)

	Value
On Holiday	1
Day After	0.2
All other days	0

WkBeforeXMas
WkAfterNewYear
WkBeforeXMas (If day is weekday before Christmas Day) WkAfterNewYear (If day is weekday after New Year)

	Value if Weekday
December 18	0.14
December 19	0.29
December 20	0.43
December 21	0.57
December 22	0.71
December 23	0.86
December 24	1
All other days	0

	Value
January 1	1.14
January 2	1.00
January 3	0.86
January 4	0.71
January 5	0.57
January 6	0.43
January 7	0.29
January 8	0.14
All other days	0

XMasEve
XmasEve (Christmas Eve)

	Value by Day of Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
December 24	1.00	1.00	0.80	0.67	1.00	0.50	0.33
All other days	0.00	0.00	0.00	0.00	0.00	0.00	0.00

XMasDay
XMasDay (Christmas Day)

	Value by Day of Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
December 25	1.00	1.00	1.00	1.00	1.00	0.50	0.50

All other days	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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NYEve

NYEve (New Year's Eve)

	Value by Day of Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
December 31	0.8	0.8	0.8	0.8	1.0	0.4	0.4
All other days	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NYDay

NYDay (New Year's Day)

	Value by Day of Week						
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
January 1	1.0	1.0	1.0	1.0	1.0	0.5	0.4
All other days	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WkDayBeforeHol **WkDayAfterHol**

WkDayBeforeHol (weekday before Holiday)

	Value (if Weekday)
Day Before Holiday	1.00
All other days	0.00

WkDayAfterHol(weekday after Holiday)

	Value (if Weekday)
Day After Holiday	1.00
All other days	0.00

Monthly Walk variables are graduated variables that start at 1 on the first day of the month and increase by 1 each day until the last day of the month to capture any potential inter-month trends.

JanWalk	FebWalk	MarWalk	AprWalk	MayWalk	JunWalk
JulWalk	AugWalk	SepWalk	OctWalk	NovWalk	DecWalk

Zonal End-Use Variable Calibration

The Energy Information Administration's (EIA) 2025 Annual Energy Outlook Reference Case is the starting point for data on residential end-uses. Residential end-uses fall into categories, which are then grouped according to weather and non-weather sensitive use types (i.e. Heating, Cooling, and Other). These categories are expressed as

saturation rates (% of customers), efficiency metrics (use per year or efficiency term like Seasonal Energy Efficiency Ratio), and intensities (kWh per customer per year). Categories and groupings are as follows:

- Heating
 - Electric furnace and resistant room space heaters
 - Heat pump space heating
 - Ground-source heat pump space heating
 - Secondary heating
 - Furnace fans
- Cooling
 - Central air conditioning
 - Heat pump space cooling
 - Ground-source heat pump space cooling
 - Room air conditioners
- Other
 - Electric water heating
 - Electric cooking
 - Refrigerator
 - Second refrigerator
 - Freezer
 - Dishwasher
 - Electric clothes washer
 - Electric clothes dryer
 - TV sets
 - Lighting
 - Miscellaneous electric appliances

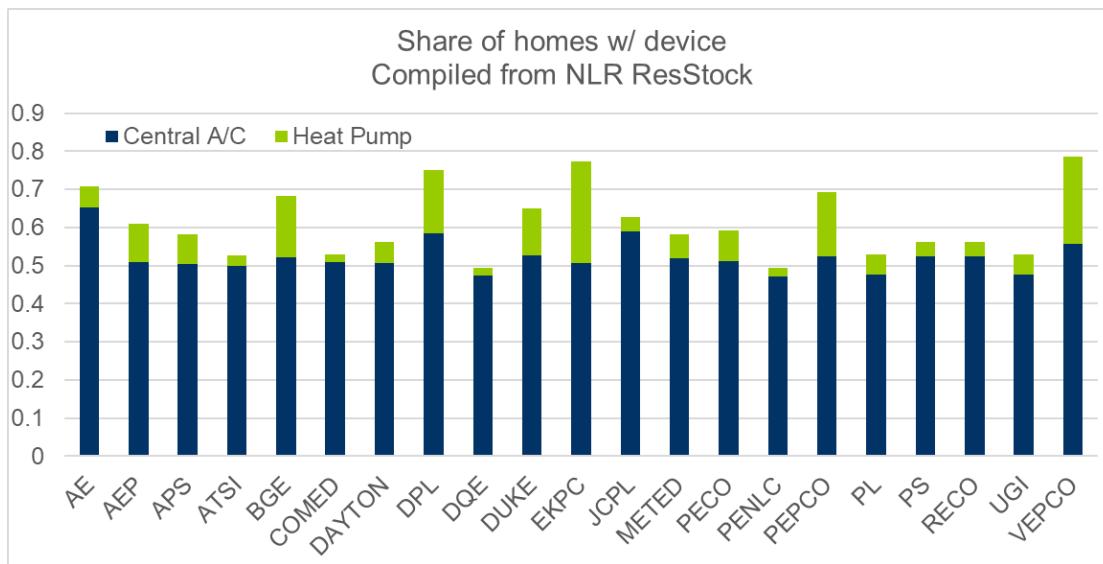
PJM receives this data at the Census division level through membership in Itron's Energy Forecasting Group. PJM then supplements this with two pieces of information:

- Zonal saturation and intensity data from National Laboratory of the Rockies (NLR) ResStock⁵¹
- Zonal saturation estimates from:
 - American Electric Power – all appliance categories through 2021
 - Allegheny Power – all appliance categories through 2016
 - American Transmission Systems, Inc. – all appliance categories through 2016
 - Commonwealth Edison – all appliance categories for 2019
 - Duke Energy Ohio and Kentucky – all appliance categories through 2014
 - East Kentucky Power Cooperative – Heat Pumps for Heating and Cooling, Electric Furnaces, Secondary Heating (Room Heating), Central A/C, Room Air Conditioners, and Water Heaters through 2013
 - Jersey Central Power & Light – all appliance categories through 2016
 - Metropolitan Edison – all appliance categories through 2016
 - Pennsylvania Electric – all appliance categories through 2016

⁵¹ <https://resstock.nrel.gov/>

- Dominion Virginia Power – Heat Pumps for Cooling, Central A/C and Room Air Conditioners through 2014

Data from NLR ResStock is used to calibrate zones for 2018 to help provide granularity across PJM. Zones are mapped to counties, and then PJM uses the ResStock database to provide customized data at the zonal level on appliance saturations, appliance intensities, and average home sizes⁵². The below chart displays some of the information gleaned from this exercise on central cooling.

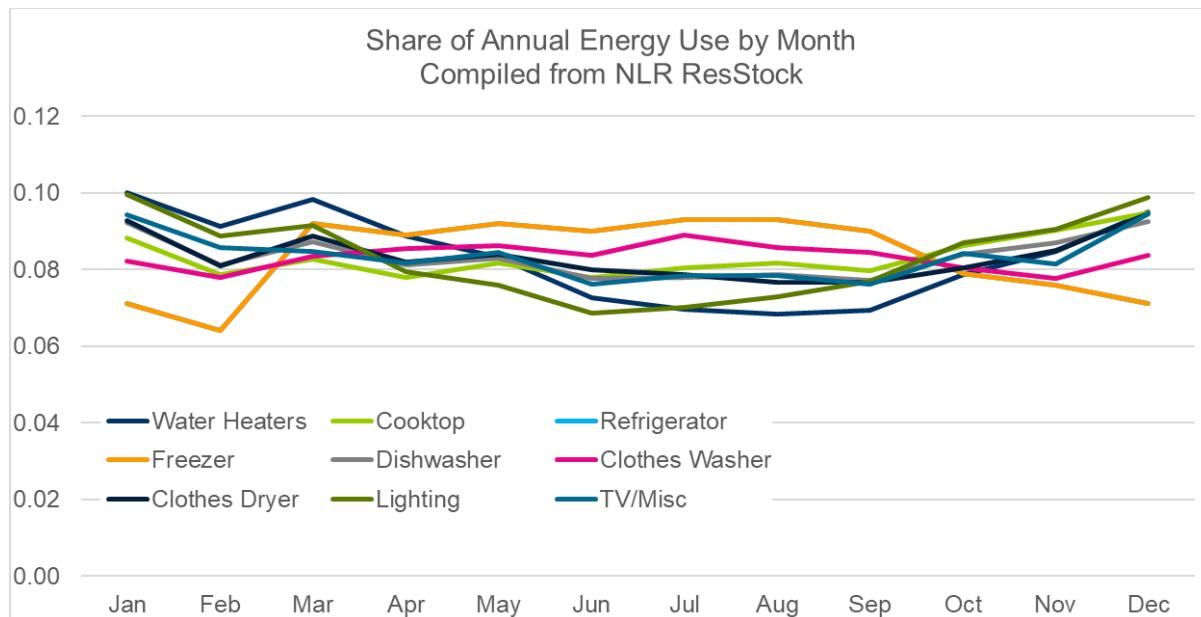


Resulting data is then aligned with zonal-supplied historical appliance saturation rates. Zones are subsequently assigned to Census Divisions for driving the forecasts. This process allows the forecast to be influenced by the historical relative mix of appliances. The below table shows the mapping of Zones to Census Divisions.

⁵² In the case of RECO and UGI, this exercise yielded an insufficient sample size according to guidelines laid out by NLR for using their data. PS and PL were used, respectively, in this case.

Zone	Census Division
AE	Middle Atlantic
AEP	East North Central
APS	South Atlantic
ATSI	East North Central
BGE	South Atlantic
COMED	East North Central
DAYTON	East North Central
DPL	South Atlantic
DQE	Middle Atlantic
DUKE	East North Central
EKPC	East South Central
JCPL	Middle Atlantic
METED	Middle Atlantic
PECO	Middle Atlantic
PENLC	Middle Atlantic
PEPCO	Middle Atlantic
PL	Middle Atlantic
PS	Middle Atlantic
RECO	Middle Atlantic
UGI	Middle Atlantic
VEPCO	South Atlantic

Finally, monthly non-weather sensitive shapes are calculated from the NLR ResStock data as well. These are used to shape the end-use intensity variables used in the monthly Residential Average Use model. These can be seen below.

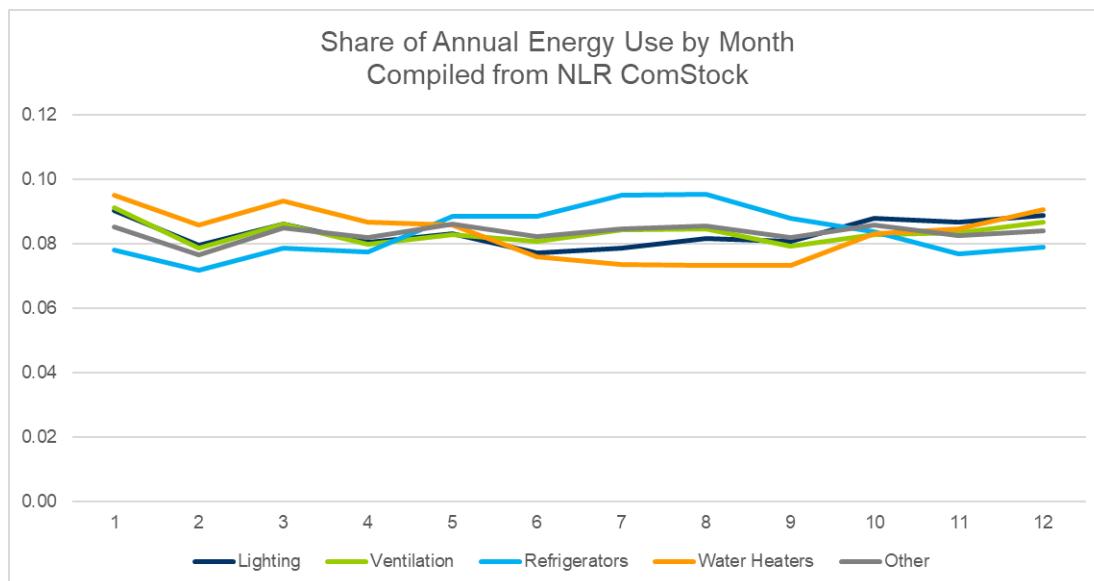


Commercial

The EIA's 2025 Annual Energy Outlook Reference Case is the starting point for data on commercial end-uses. Commercial end-uses fall into categories, which are then grouped according to weather and non-weather sensitive use types (i.e., Heating, Cooling, and Other). These categories are expressed as intensities (kWh per square foot per year). These categories and groupings are as follows:

- Heating
- Cooling
- Other
 - Ventilation
 - Water Heating
 - Cooking
 - Refrigeration
 - Lighting
 - Office Equipment
 - Miscellaneous

PJM receives this data at the Census Division level through membership in Itron's Energy Forecasting Group, and zones are assigned to Census Divisions using the same mapping as used for Residential end-uses. Like with Residential, NLR has also developed ComStock⁵³. Monthly non-weather sensitive shapes are calculated from the NLR ComStock data. These are used to shape the end-use intensity variables used in the monthly Commercial Use model. These can be seen below.



⁵³ <https://comstock.nrel.gov/>

Economics Zonal Geographic Assignment

Economic variables come from Moody's Analytics and geographical areas are assigned to zones per the table below.

Zone	Metro Area Name(s) or State
AE	Atlantic City- Hammonton NJ, Vineland-Bridgeton NJ, Lakewood-New Brunswick, NJ
AEP	Elkhart-Goshen IN, Fort Wayne IN, Muncie IN, Huntington-Ashland WV-KY-OH, Roanoke VA, Blacksburg-Christiansburg-Radford VA, Lynchburg VA, Kingsport-Bristol-Bristol TN-VA, Beckley WV, Charleston WV, Columbus OH, Weirton-Steubenville WV-OH, Canton-Massillon OH, South Bend-Mishawaka IN-MI, Niles-Benton Harbor MI
APS	State College PA, Chambersburg-Waynesboro PA, Hagerstown-Martinsburg MD-WV, Winchester VA-WV, Parkersburg-Vienna WV, Morgantown WV
ATSI	Pittsburgh PA, Cleveland OH, Sandusky OH, Springfield OH, Toledo OH, Akron OH, Youngstown-Warren OH, Mansfield OH
BGE	Baltimore-Columbia-Towson MD
COMED	Rockford IL, Chicago-Naperville-Schaumburg IL, Elgin IL, Kankakee IL, Lake County IL
DAY	Dayton-Kettering-Beavercreek OH
DEOK	Cincinnati OH-KY-IN
DLCO	Pittsburgh PA
DOM	Virginia
DPL	Wilmington DE-MD-NJ, Dover DE, Salisbury MD
EKPC	Cincinnati OH-KY-IN, Lexington-Fayette KY, Louisville/Jefferson County KY-IN, Huntington-Ashland WV-KY-OH, Bowling Green KY, Elizabethtown KY
JCPL	Newark NJ, Lakewood-New Brunswick NJ, Camden NJ, Trenton NJ
METED	Lebanon PA, York-Hanover PA, Gettysburg PA, Reading PA, Allentown-Bethlehem-Easton PA-NJ
PECO	Montgomery County-Bucks County-Chester County PA, Philadelphia PA
PENLC	Johnstown PA, Erie PA, Altoona PA
PEPCO	Washington DC-MD, Lexington Park MD
PL	Harrisburg-Carlisle PA, Lancaster PA, Williamsport PA, Allentown-Bethlehem-Easton PA-NJ, Scranton--Wilkes-Barre-Hazleton PA
PS	Lakewood-New Brunswick NJ, Newark NJ, Camden NJ, Trenton NJ
RECO	Newark NJ
UGI	Scranton--Wilkes-Barre--Hazleton PA