

**STATE OF NEW JERSEY  
BOARD OF PUBLIC UTILITIES**

---

**IN THE MATTER OF THE PETITION OF  
PUBLIC SERVICE ELECTRIC AND GAS  
COMPANY FOR A DETERMINATION  
PURSUANT TO THE PROVISIONS OF  
N.J.S.A. 40:55D-19** : **BPU DOCKET**

**(SUSQUEHANNA-ROSELAND)** :

---

**TO THE HONORABLE COMMISSIONERS OF THE  
NEW JERSEY BOARD OF PUBLIC UTILITIES:**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17

**PRE-FILED DIRECT TESTIMONY OF JOHN M. REYNOLDS  
ON BEHALF OF PUBLIC SERVICE ELECTRIC AND GAS  
COMPANY IN SUPPORT OF SUSQUEHANNA-ROSELAND  
TRANSMISSION LINE PROJECT**

**I. BACKGROUND**

**Q. Please state your name and business address.**

**A.** My name is John M. Reynolds, and my business address is 955 Jefferson Avenue,  
Valley Forge Corporate Center, Norristown, Pennsylvania 19403-2497.

**II. PURPOSE OF TESTIMONY**

**Q. Please describe the purpose of your testimony.**

**A.** The purpose of my testimony is to describe PJM's long-term load forecasting  
process and its relation to the PLGrp and PS transmission zones,<sup>1</sup> as well as to  
support the 2007 PJM Load Forecast Report which was used in the analysis that  
led to selecting the Susquehanna-Roseland Project in the RTEP. In addition, I

---

<sup>1</sup> See *supra* at 9 and 10 for a detailed description of the PLGrp and PS transmission zones.

1 will also address how Demand Side Management and Energy Efficiency are  
2 incorporated into the forecast process.

3 **III. RESPONSIBILITIES, EXPERIENCE AND EDUCATION**

4 **Q. By whom are you employed and in what capacity?**

5 **A.** I am employed by PJM as a Senior Economic Analyst in the Capacity Adequacy  
6 Planning Department.

7 **Q. Please describe your current responsibilities.**

8 **A.** My responsibilities include analysis of historical loads and development of the  
9 long-term load forecast for the PJM region, and support of the PJM capacity  
10 markets and Load Management programs. I serve as chairman of the PJM Load  
11 Analysis Subcommittee.

12 **Q. Please describe your professional experience and educational background.**

13 **A.** I have been employed by PJM since June 1998 as a Senior Economic Analyst in  
14 the Capacity Adequacy Planning Department.

15 In addition to my work for PJM, I contribute to the activities of the North  
16 American Electric Reliability Corporation (formerly the North American  
17 Reliability Council) (“NERC”), as a member of the NERC Load Forecasting  
18 Working Group (formerly serving as Chairman), and I am a member of the  
19 Electric Utility Forecasters’ Forum (formerly serving as President) and the Edison  
20 Electric Institute’s Load Forecasting Group. I have testified previously on  
21 ratemaking matters and transmission need in proceedings before state  
22 commissions.

1           Prior to joining PJM, I was employed by the Delmarva Power & Light  
2 Company for twelve years in load research and load forecasting functions. Prior  
3 to that, I worked for Chase Econometric Associates for four years as an  
4 automotive market analyst. In that position, I developed forecasts of passenger  
5 car and light truck production.

6           I hold a Bachelor of Arts in Economics and a Master of Arts in  
7 Economics, both from the University of Delaware.

8  
9 **IV. EXHIBITS**

10 **Q. Please identify and briefly describe the exhibits to your testimony and**  
11 **summarize the contents of those exhibits.**

12 **A.** I am sponsoring the following exhibits with my direct testimony: PJM  
13 Load/Energy Forecasting Model White Paper (Exhibit JMR-1); PJM Manual 19:  
14 Load Forecasting and Analysis (Exhibit JMR-2); The Brattle Group's review of  
15 the PJM load forecasting model (Exhibit JMR-3); and the 2007 PJM Load  
16 Forecast Report (Exhibit JMR-4).

17  
18 **V. THE PJM LOAD FORECASTING PROCESS**

19 **Q. Please explain your involvement in the preparation of the PJM Load/Energy**  
20 **Forecasting Model White Paper and the 2007 PJM Load Forecast Report,**  
21 **and in the preparation of subsequently-issued PJM Load Forecast Reports.**

22 **A.** I was the primary author of the PJM Load/Energy Forecasting Model White  
23 Paper. I am a member of the team that has prepared the Load Forecast Reports

1 from 2006 to the present and was responsible for sponsoring the reports before  
2 PJM stakeholders.

3 **Q. What do the PJM Load/Energy Forecasting Model White Paper and PJM**  
4 **Manual 19 contain?**

5 **A.** The white paper describes PJM’s prior load forecast methodology and the reasons  
6 why PJM came to develop an independent forecast function. It traces the  
7 development of the forecast methodology through the publication of the first  
8 forecast and outlines ongoing enhancements to the model. PJM Manual 19: Load  
9 Forecasting and Analysis, contains sections describing PJM’s methods for  
10 developing historical load data, weather-normalized peaks and coincident peaks  
11 (5CP). Section 3 of the Manual describes the current load forecast model process  
12 in detail.

13 **Q. Please describe the PJM load forecasting model.**

14 **A.** The model produces estimates of the monthly unrestricted peak loads of each of  
15 the eighteen PJM zones, selected Locational Deliverability Areas (“LDAs”) and  
16 the total RTO. Unrestricted load is the load prior to any downward adjustments  
17 for load management or voltage reduction. Forecasts are developed for each  
18 zone’s non-coincident peak and the zone’s share of the RTO peak. The  
19 econometric models are supplemented with a Monte Carlo estimation process to  
20 derive a distribution of forecasts over a wide range of possible weather  
21 conditions. PJM issues a load forecast annually.

22 **Q. What are the primary drivers of the forecast?**

1 **A.** The models are driven by calendar effects (day of week, month, minutes of  
2 daylight, etc.), anticipated economic conditions in the region and weather  
3 conditions.

4 **Q. What does the 2007 Load Forecast Report contain?**

5 **A.** The load forecast report presents the results of PJM’s forecasting model for the  
6 years 2007 through 2022. For each PJM zone, region and the RTO, three years of  
7 monthly peaks are presented. Fifteen years of forecasted annual summer and  
8 winter peaks are presented, as well as estimates of load management delegated to  
9 PJM for dispatch. Seasonal peaks are presented for selected combinations of  
10 zones.

11 **Q. Has there been any independent validation of the PJM load forecasting  
12 methodology?**

13 **A.** Through the Load Analysis Subcommittee, PJM Members had input into the  
14 development process, and the final model was endorsed by the Planning  
15 Committee. Subsequent to the adoption of the forecast, The Brattle Group  
16 (“TBG”) was commissioned by PJM to conduct an independent evaluation of  
17 PJM’s load forecasting methodology. TBG substantially endorsed the PJM load  
18 forecasting methodology while suggesting some refinements for PJM’s  
19 consideration.

20 **Q. The TBG report suggested technical improvements to PJM’s methodology.  
21 Are these technical improvements incorporated into PJM’s load projection  
22 processes?**

1    **A.**    PJM adopted many of the recommendations made by TBG for the 2007 PJM  
2           Load Forecast Report. The adopted recommendations included the following:

- 3           •    Seasonal or Monthly Models – PJM increased the seasonality of the  
4                independent variables in the model.
- 5
- 6           •    Consider alternative weather variables – PJM developed separate weather  
7                measures for summer, winter, and shoulder months.
- 8
- 9           •    Correlating diversity with weather conditions – the processing of results of  
10               the model were revised to model electrical diversity such that it is now  
11               greater at mild weather conditions and declines as weather becomes more  
12               extreme.
- 13
- 14          •    Using seasonal data to develop annual peak forecasts – the PJM model now  
15               aggregates data over the summer season instead of relying on the month of  
16               July.
- 17

18                 Additionally, PJM’s 2008 Load Forecast Report incorporated the TBG  
19           recommendation regarding consistency between energy and peak load forecasting  
20           by adding a PJM energy forecast for each transmission zone and the PJM RTO.

21    **Q.**    **Have any other enhancements been made to the PJM load forecasting**  
22           **methodology?**

23    **A.**    Yes. In addition to those suggested by TBG, PJM has implemented the following  
24           changes:

- 25          •    To enhance consistency between historical and forecasted loads, the weather  
26               normalization of seasonal peaks was incorporated into the forecast model  
27               beginning with Summer 2007 loads.
- 28
- 29          •    For the 2009 PJM Load Forecast Report, a binary variable has been added to  
30               selected zonal models to account for major load shifts or significant price  
31               increases.
- 32
- 33          •    For the 2009 PJM Load Forecast Report, forecasts for Locational  
34               Deliverability Areas are directly modeled, and no longer represent  
35               diversified sums of the constituent zone forecasts.
- 36

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26

- For the 2009 PJM Load Forecast Report, forecasts for Load Management and Energy Efficiency are significantly revised to incorporate resources that have been cleared in Reliability Pricing Model auctions.

**Q. Do any external areas or agencies rely upon the PJM load forecast?**

**A.** Yes. PJM supplies the load forecast to the two NERC regions that include PJM zones, ReliabilityFirst and the SERC Reliability Corporation. ReliabilityFirst and SERC use the PJM forecast to develop their forecasts and reliability assessments submitted to NERC.

**Q. How were considerations of Demand Side Management and Energy Efficiency handled in the 2007 PJM Load Forecast Report?**

**A.** Demand Side Management was treated as an explicit adjustment to the unrestricted load forecast. As shown in Table B-7 of JMR-4, PJM included load management that was expected to be delegated to PJM for dispatch at times of system emergency with mandatory compliance. For planning purposes, PJM assumed it would have available load management resources equal to the amount that was registered in 2007. Energy Efficiency gains were included in the PJM load forecasting methodology to the extent that they impacted the rate of historic load growth.

**Q. Have any changes been made to the treatment of Demand Side Management and Energy Efficiency since the 2007 PJM Load Forecast Report?**

**A.** Yes. With the 2009 PJM Load Forecast Report, PJM will include as an explicit adjustment to the load forecast any energy efficiency programs that will have cleared in an RPM auction.

1

2 **Q. Will this include the impact of the demand side and conservation initiatives**  
3 **of the various PJM states?**

4 **A.** Yes, these demand side and conservation initiatives will be included in PJM's  
5 planning process to the extent that the programs have been developed and PJM  
6 can determine to a degree of specificity and certainty that the impacts can be  
7 achieved.

8 **Q. Please describe the load forecast for the PLGrp Transmission zone.**

9 **A.** The PLGrp zone forecast includes all load connected to the transmission system,  
10 which includes the retail loads of PPL-Electric Utilities and UGI Energy Services,  
11 as well as the load of all municipal and cooperative systems located in the  
12 territory. In the 2007 PJM Load Forecast Report, the PLGrp zone is projected to  
13 have summer peak growth of 1.5% per year, growing from 7,387 MW in 2007 to  
14 8,551 MW in 2017. The PLGrp zone's winter peak forecast is projected to grow  
15 at 0.8% per year, from 7,360 MW in 2006/07 to 8,008 MW in 2016/17.

16 **Q. Did the 2008 PJM load forecast result in a significantly different load**  
17 **forecast for the PLGrp Transmission zone?**

18 **A.** No. The PLGrp zone summer peak forecast for the study year 2012 in the 2007  
19 PJM Load Forecast Report was 7,972 MW. In the 2008 PJM Load Forecast  
20 Report, the 2012 PLGrp summer peak forecast was 7,932 MW, 50 MW, or 0.6%,  
21 lower.

22 **Q. Please describe the load forecast for the PS Transmission zone.**

1   **A.**    The PS zone forecast includes all load connected to the transmission system,  
2            which includes the retail loads of Public Service Electric and Gas Company  
3            (“PSE&G”), as well as the load of all municipal and cooperative systems located  
4            in the territory. In the 2007 PJM Load Forecast Report, the PS zone is projected  
5            to have summer peak growth of 1.4% per year, growing from 10,801 MW in 2007  
6            to 12,451 MW in 2017. The PS zone’s winter peak forecast is projected to grow  
7            at 1.2% per year, from 7,048 MW in 2006/07 to 7,967 MW in 2016/17.

8   **Q.**    **Did the 2008 PJM load forecast result in a significantly different load**  
9            **forecast for the PS Transmission zone?**

10   **A.**    No. The PS zone summer peak forecast for the study year 2012 in the 2007 PJM  
11            Load Forecast Report was 11,625 MW. In the 2008 PJM Load Forecast Report,  
12            the 2012 PS zone summer peak forecast was 11,642 MW, 17 MW (0.1%) higher

13   **Q.**    **Did the 2008 PJM load forecast result in a significantly different load**  
14            **forecast for the Mid-Atlantic locational deliverability area?**

15   **A.**    No. The Mid-Atlantic summer peak forecast for the study year 2012 in the 2007  
16            PJM Load Forecast Report was 64,639 MW. In the 2008 PJM Load Forecast  
17            Report, the 2012 Mid-Atlantic summer peak forecast was 64,748 MW, 109 MW  
18            (0.2%) higher.

19   **Q.**    **Will the 2009 PJM load forecast result in a different load forecast for any of**  
20            **the zones or locational deliverable areas mentioned earlier?**

21   **A.**    Based on the current economic outlook, PJM expects the 2009 PJM Load  
22            Forecast Report, currently in draft form, to show lower summer peak loads for all  
23            Zones and LDAs for the years 2009 through 2011. PJM expects summer peak

1 loads to rebound to levels that are approximately one to two percent lower than  
2 the loads in the 2008 Load Forecast Report for the years 2012 through 2016. PJM  
3 expects summer peak loads for the PS zone to be approximately one percent  
4 lower and the PLGrp zone to be three to four percent lower in those years,  
5 compared to the 2008 Load Forecast Report.

6 **Q. What input do Transmission Owners have into the load forecast results?**

7 **A.** PJM asks the Transmission Owners for input related to large load changes that are  
8 known to the Transmission Owners but not to PJM. PJM applies its professional  
9 judgment to determine if a forecast adjustment is warranted.

10 **Q. Were any adjustments applied to the forecasts of either the PLGrp or PS**  
11 **transmission zones in either the 2007 Load Forecast Report or the 2008 Load**  
12 **Forecast Report?**

13 **A.** No.

14 **Q. Does PJM produce forecasts for areas within the zones?**

15 **A.** No. The forecasts are only at the zone level. Distribution companies use the PJM  
16 zone forecasts to develop load studies down to the level of load buses.

17 **Q. Does this conclude your direct testimony?**

18 **A.** Yes, it does.