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June 26, 2018

In The Matter of the Petition of
Public Service Electric and Gas Company
to Revise its Weather Normalization Charge
for the 2018-2019 Annual Period

BPU Docket No. _____

VIA BPU E-FILING SYSTEM & OVERNIGHT MAIL

Aida Camacho-Welch, Secretary
Board of Public Utilities
44 South Clinton Avenue, 3rd Flr.
P.O. Box 350
Trenton, New Jersey 08625-0350

Dear Secretary Camacho-Welch:

Public Service Electric and Gas Company (PSE&G) submits its Petition, Testimony and Supporting Schedules in the above-referenced proceeding on the Board of Public Utilities E-Filing system.

Very truly yours,

A handwritten signature in blue ink, appearing to be the initials "JBI" or similar, written in a cursive style.

Attachment
C Attached Service List

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STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF)
PUBLIC SERVICE ELECTRIC AND GAS) PETITION
COMPANY TO REVISE ITS WEATHER) BPU Docket No. _____
NORMALIZATION CHARGE FOR THE)
2018-2019 ANNUAL PERIOD)

Public Service Electric and Gas Company (“PSE&G” or the “Company”), a corporation of the State of New Jersey, having its principal offices at 80 Park Plaza, Newark, New Jersey, respectfully petitions the New Jersey Board of Public Utilities (“Board” or “BPU”) as follows:

INTRODUCTION

1. PSE&G is a public utility engaged in the distribution of electricity and the provision of Basic Generation Service (“BGS”) and distribution of gas and the provision of Basic Gas Supply Service (“BGSS”) for residential, commercial and industrial purposes within the State of New Jersey. PSE&G provides service to approximately 2.2 million electric and 1.8 million gas customers in an area having a population in excess of six million persons and that extends from the Hudson River opposite New York City, southwest to the Delaware River at Trenton, and south to Camden, New Jersey.

2. PSE&G is subject to regulation by the Board for the purposes of setting its retail distribution rates and to assure safe, adequate, and reliable electric distribution and natural gas distribution service pursuant to N.J.S.A. 48:2-21 *et seq.*

PSE&G WEATHER NORMALIZATION CHARGE DESCRIPTION

3. This filing seeks BPU approval of PSE&G's request to recover \$14,265,094 over the 2018-2019 Winter Period (*i.e.*, October 1-May 31). The Weather Normalization Charge ("WNC") will be collected from PSE&G gas customers receiving service under Rate Schedules Residential Service (RSG), General Service (GSG), and Large Volume Gas (LVG) during the 2018-2019 Winter Period.

4. B.P.U.N.J. No. 15 Gas Tariff Sheets Nos. 45, 46, 47 ("WNC Tariff") were initially approved by the Board on July 9, 2010 as part of the Stipulation of Settlement of PSE&G's 2009-2010 base rate case. Decision and Order, *I/M/O the Petition of PSE&G for Approval of an Increase in Electric and Gas Rates and for Changes in the Tariffs for Electric and Gas Service*, Dkt. No. GR09050422 (NJBPU July 9, 2010).

5. The WNC Tariff requires PSE&G to calculate, at the end of each Winter Period, the level by which Margin Revenues differed from what would have resulted if normal weather had occurred. "Margin Revenues," which directly impact the Company's earnings, are the distribution revenues from relevant rate classes from the per therm charge. The base level of normal degree days for the 2017-2018 Winter Period is defined in PSE&G's WNC Tariff. As approved by the Board, any excess or deficiency is to be credited or recovered in the following year during the Winter Period through the WNC.

6. In accordance with the WNC Tariff, the Company is required to true-up the Degree Day Consumption Factors utilized in the determination of the proposed WNC at

the end of the Winter Period. Schedule SAW-WNC-1, included in the testimony of Stephen A. Wreschnig (Attachment 1), presents the true-up of the 2017-2018 Winter Period Degree Day Consumption Factors.

7. In addition, the revised WNC Tariff Sheets (Attachment 4) reflect updated Degree Day Consumption Factors for the 2018-2019 Winter Period.

8. Actual heating degree days for the 2017-2018 Winter Period were 22.94 degree days more than the normal heating degree days (adjusted for a ½ percent dead band). See Attachment 1, Schedule SAW-WNC-2. The 22.94 heating degree days more than the normal degree days results in a Margin Revenue over recovery of (\$8,846,178). See Attachment 1, Schedule SAW-WNC-2.

9. PSE&G has made one adjustment to the Margin Revenue excess to calculate the 2018-2019 WNC recovery request in accordance with the WNC Tariff, as described in the Testimony of Donna M. Powell, Assistant Controller, (Attachment 2) and the Testimony of Stephen Swetz, Senior Director, (Attachment 3). In Docket No. GR17060720, the Board approved the collection of \$54,738,895, of which \$31,882,242 was to be recovered over the 2017-2018 Winter Period (“Part I”) with the remaining deficiency of \$22,856,653 to be recovered over the 2018-2019 Winter Period (“Part II”). The full recovery of the \$54,738,895 was limited for the 2017-2018 Winter Period due to the application of the 3% rate cap. The Company collected \$31,627,623 of the anticipated Part I amount of \$31,882,242 resulting in a balance of \$254,619 to be carried over and

added to the Part II amount of \$22,856,653. As such, this computes to \$23,111,272 (\$254,619 plus \$22,856,653) of remaining deficiency from the 2016-2017 Winter Period to be collected from customers over the 2018-2019 Winter Period.

10. Based on the Board-approved method for calculating the WNC, the Company respectfully requests approval to recover the \$14,265,094 uncollected balance during the 2018-2019 Winter Period. (See Attachment 2, Schedule DMP-WNC-4).

11. In order to recover this under collection, PSE&G proposes a WNC of \$0.09676 without New Jersey Sales and Use Tax ("SUT") (\$0.010317 including SUT) per Balancing Therm. For the supporting calculation, see Attachment 3, Testimony of Stephen Swetz.

12. As a result of the proposed WNC for the 2018-2019 WNC Winter Period, as described in the testimony of Stephen Swetz, PSE&G's typical residential gas heating customers using 165 therms in a winter month and 1,010 therms annually would experience a decrease in their annual bill from \$879.16 to \$871.36 or \$7.80 or approximately 0.89%, based upon Delivery Rates and BGSS-RSG charges in effect on June 1, 2018, with the WNC set to the rate that was in effect for the 2017-2018 Annual Period, and assuming the customer receives commodity service from PSE&G.

13. Attached hereto and made a part of this Petition are:

- a. The testimony and supporting schedules of Stephen A. Wreschnig, Manager, Electric and Gas Sales and Revenue Forecasting (Attachment 1),

which describe and support the calculation of the therm sales subject to the WNC, the sales forecast of Balancing Therms used in determining the WNC, the normal heating degree days, and development of the proposed monthly Degree Day Consumption Factors to be used for the 2018-2019 Winter Period.

b. The testimony and supporting schedules of Donna M. Powell, Assistant Controller-PSE&G (Attachment 2), which describe and support the Company's calculation of the 2017-2018 margin revenue deferral and adjustment to the WNC balance supporting the proposed 2018-2019 Winter Period WNC rate.

c. The testimony and supporting schedule of Stephen Swetz, Senior Director-Corporate Rates and Revenue Requirements, PSEG Services Corporation (Attachment 3), which describe and support the Company's derivation of the WNC to be implemented for the 2018-2019 Winter Period and collected from the Company's RSG, GSG, and LVG customers.

d. Proposed B.P.U.N.J. No. 15 Gas Tariff Sheets Nos. 45, 46, and 47 in clean and redlined form (Attachment 4) to become effective on October 1, 2018.

e. Typical Residential Gas Bill Impacts associated with the proposed WNC (Attachment 5).

14. Notice of this filing and two copies of the Petition will be served upon the Department of Law and Public Safety, 124 Halsey Street, P.O. Box 45029, Newark, New Jersey 07101 and upon the Director, Division of Rate Counsel, 140 East Front Street, 4th Floor, Trenton, New Jersey 08625. Copies of the Petition and supporting testimony and attachments will also be sent to the persons identified on the service list provided with this filing.

COMMUNICATIONS

Communications and correspondence related to the Petition should be sent
as follows:

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CONCLUSION AND REQUESTS FOR APPROVAL

For all the foregoing reasons, PSE&G respectfully requests that the Board retain jurisdiction of this matter and review and expeditiously issue an order approving this Petition, specifically:

1. Approving the Company's request to collect \$14,265,094, to be recovered over the 2018-2019 Winter Period.

2. Finding that the proposed rates and charges set forth in the proposed tariff for Gas Service, Public Service Electric and Gas Company, B.P.U.N.J. No. 15, Gas Service, referred to herein as in Attachment 4, are just and reasonable.

3. Authorizing PSE&G to implement the rates proposed herein on or about October 1, 2018.

Respectfully submitted,

PUBLIC SERVICE ELECTRIC AND GAS COMPANY



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DATED: June 26, 2018
Newark, New Jersey

1 **PUBLIC SERVICE ELECTRIC AND GAS COMPANY**
2 **DIRECT TESTIMONY**
3 **OF**
4 **STEPHEN A. WRESCHNIG**
5 **MANAGER, ELECTRIC AND GAS SALES**
6 **AND REVENUE FORECASTING**

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

8 A. My name is Stephen A. Wreschnig. My business address is 80 Park Plaza,
9 T-8, Newark, New Jersey 07102.

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

11 A. I am Manager, Electric and Gas Sales and Revenue Forecasting for PSEG
12 Services Corporation, a subsidiary of Public Service Enterprise Group
13 Incorporated (PSEG or Enterprise). In this capacity, my major responsibility is
14 the supervision of the development of the electric and gas sales and revenue
15 forecasts for PSE&G.

16 **Q. Please summarize your professional experience in the utility industry.**

17 A. Prior to my association with PSEG, I held the position of Manager, Forecasting
18 & Economic Analysis at Duquesne Light Company from 1999 to 2007. From
19 1997 until 1999 I was a Director with PNR & Associates, later merged with
20 INDETEC International, a consulting firm specializing in providing market
21 research and forecasting for the utility industry. Prior to this experience, I

1 served in various forecasting functions at Duquesne Light, Wisconsin Electric
2 Power Company, and the Wisconsin Division of State Energy.

3 **Q. What is your educational background?**

4 A. I received a Master of Science degree in Economics from the University of
5 Wisconsin-Madison. My undergraduate degree is a B.A. in Economics from
6 Michigan State University.

7 **Q. What is the purpose of your testimony?**

8 A. The purpose of my testimony is to discuss the calculation of the margin
9 revenues subject to the Weather Normalization Charge (WNC) from the 2017-
10 2018 Winter Period (i.e., the eight consecutive calendar months from October
11 of one calendar year through May of the following calendar year). In addition,
12 I describe the sales forecast of balancing terms that is used in the
13 determination of the Weather Normalization Charge. Finally, I describe the
14 development of the proposed monthly degree day consumption factors and the
15 normal weather data to be used for the 2018-2019 Winter Period.

16 **Q. Does your testimony include any illustrative schedules?**

17 A. Yes. My testimony includes schedules that were prepared by me or under my
18 direction and supervision. The schedules are as follows:

19 (1) Schedule SAW-WNC-1 shows the true-up calculation for the residential
20 coefficients to account for the difference between the actual and the

1 projected number of customers on which the coefficients embodied in
2 the tariff were based.

3 (2) Schedule SAW-WNC-2 compares the actual calendar month degree
4 days for the 2017-2018 Winter Period to the normal calendar month
5 degree days. It also presents the calculation of the deficiency in WNC
6 margin revenues for the 2017/2018 Winter Period.

7 (3) Schedule SAW-WNC-3 presents the calculation of the average daily
8 usage of gas for the June 2018-September 2018 period used in the
9 calculation of forecasted balancing therms.

10 (4) Schedule SAW-WNC-4 summarizes the gas calendar-month sales
11 forecast for the November 2018 – March 2019 recovery period and
12 presents the calculation of the balancing therms.

13 (5) Schedule SAW-WNC-5 shows the calculation of the Residential Service
14 (RSG) rate-specific balancing therm share of delivered sales for the
15 October 2018-September 2019 period.

16 (6) Schedule SAW-WNC-6 presents the development of the proposed
17 WNC monthly Degree Day Consumption Factors to be used for the
18 2018-2019 Winter Period.

19 (7) Schedule SAW-WNC-7 contains the updated base level of normal
20 degree days for the 2018-2019 Winter Period based on the 20 year
21 period ending December 2017.

22 (8) Schedule SAW-WNC-8 contains the the Gas Sales Forecast Model
23 Documentation

1 **Q. Please describe the Weather Normalization Charge.**

2 A. The Company's WNC is a rate mechanism that, in general, mitigates the
3 financial effect of variations from the normal weather on which base rates are
4 set, on both the company and its customers receiving service under the RSG,
5 General Service (GSG), and the Large Volume Service (LVG) rate schedules.
6 Variances in actual degree days from normal for each day are measured and
7 accumulated over the calendar-month for each month in the Winter Period.
8 These monthly variances are adjusted for a degree day deadband which is ½%
9 of the normal calendar-month degree days. The resulting cumulative degree
10 day variance, along with the trued-up degree day consumption factors,
11 determines, along with any prior WNC balances, the adjustment to customers'
12 bills in the following Winter Period. This adjustment is either a surcharge to
13 collect a revenue deficiency as a result of warmer than normal weather or a
14 credit to customers to refund the excess revenues collected as a result of colder
15 than normal weather.

16 **Q. How are the trued-up monthly degree day consumption factors**
17 **developed?**

18 A. The monthly degree day consumption factors for the RSG Heating customers
19 and for the RSG Non-Heating customers are based on regression models of use
20 per customer. The consumption factor for these two customer groups are, as a
21 result, calculated by multiplying the consumption factor per customer by the

1 forecasted number of customers in each month. The trued-up consumption
2 factors for these two groups are the consumption factors embodied in the tariff
3 adjusted to reflect the actual number of customers during the months of the
4 2017-2018 Winter Period. The trued-up monthly degree day consumption
5 factors are calculated, as Schedule SAW-WNC-1 shows, by multiplying the
6 RSG Heating and the RSG Non-Heating degree day consumption factors by
7 the ratio of the actual number of customers to the forecasted number of
8 customers that were embodied in the original calculation.

9 **Q. Are the degree day consumption factors for Residential Service the only**
10 **consumption factors that are trued-up?**

11 A. Yes they are.

12 **Q. What is the result of the comparison of the actual heating degree days**
13 **experienced in the 2017-2018 Winter Period and the normal calendar-**
14 **month heating degree days?**

15 A. For the 2017-2018 Winter Period, the actual heating degree days were 39.80
16 more than the normal heating degree days. The WNC requires that the heating
17 degree day monthly variances must be adjusted for the ½% deadband in which
18 the WNC is operable. After this adjustment, the cumulative actual heating
19 degree days were 22.94 more than normal. See Schedule SAW-WNC-2.

1 **Q. What is the impact of the deadband adjusted heating degree variance on**
2 **margin revenues?**

3 A. The 22.94 heating degree days shortfall from the normal degree day total
4 results in a margin revenue surplus of \$8,846,178. The calculations of the
5 heating degree day variance and the margin revenue impact are set forth on
6 Schedule SAW-WNC-2.

7 **Q. What is the methodology used to project firm gas sales for the recovery**
8 **year in order to derive the Company's WNC rates?**

9 A. The forecast and the methodology used to project firm gas sales for the
10 recovery year in order to derive the Company's WNC rates is the same as the
11 sales forecast which supports PSE&G's Basic Gas Supply Service (BGSS)
12 filing of June 1, 2018. A summary of the forecast of normalized gas sales for
13 the five month period of November 2018 through March 2019 is set forth on
14 Schedule SAW-WNC-4.

15 **Q. How was the sales forecast summarized in Schedule SAW-WNC-4**
16 **developed?**

17 A. The sales forecast summarized in Schedule SAW-WNC-4 is for firm sales by
18 customer class and rate. This forecast was developed from a set of
19 econometric models in which the customer-class, rate specific sales, or sales
20 per customer in the case of the residential models, were regressed on a set of
21 variables including those that captured both weather and economic factors that
22 influence sales. The estimated models are then used to forecast consumption

1 under normal weather conditions with projected levels of economic and
2 demographic activity. The forecast is then adjusted for the estimated impacts
3 of New Jersey's Energy Master Plan. The forecast models and the
4 methodology employed are described in more detail in Schedule SAW-WNC-8
5 of my testimony.

6 **Q. How is the forecast of balancing therms developed?**

7 A. The projected balancing therms are calculated by subtracting the projected
8 class and rate-specific average daily usage during the billing months of June
9 2018 through September 2018 from the total delivered calendar-month sales
10 for the months of November 2018 through March 2019. The projected average
11 daily use is derived from the billing-month forecast described above divided by
12 the average number of days in the billing-month. This calculation is shown in
13 Schedule SAW-WNC-3. This average use is then multiplied by the number of
14 days in the calendar-month and subtracted from the total projected calendar-
15 month sales. This calculation is shown in Schedule SAW-WNC-4.

16 **Q. What percentage of the RSG total delivered sales is the forecasted**
17 **balancing therms that is to be used in the calculation of the RSG 3.0%**
18 **Rate Cap Limit for the 2018-2019 Winter Period?**

19 A. The projected balancing therms are estimated to be 64.56 percent of RSG
20 delivered sales. See Schedule SAW-WNC-5.

1 **Q. How are the updated monthly degree day consumption factors developed?**

2 A. Schedule SAW-WNC-6 shows the calculation of the new monthly degree day
3 consumption factors to be utilized in the 2018-2019 Winter Period. The
4 calculation is based on the estimated coefficients from the models, as described
5 above. The impact of the monthly degree days is the sum of the coefficient on
6 the heating degree day variable and the product of the coefficient and the value
7 of the economic/demographic variable of any variable and or variables that are
8 interactive with heating degree days, such as the price-heating degree day
9 interactive variable, to arrive at the total therm per heating degree day estimate.
10 In the case of the residential rates, this is multiplied by the projected number of
11 customers since the models, and as a result the coefficients, are based on sales
12 per customer – not on total customers.

13 **Q. Have the base level of normal degree days for the defined Winter Period**
14 **months been updated?**

15 A. Yes, the base level of normal degree days for the defined winter period months
16 for the 2018-2019 Winter Period have been calculated based on the 20-year
17 period ending December 2017 and are shown in Schedule SAW-WNC-7.

18 **Q. Does this conclude your testimony?**

19 A. Yes, it does.

SCHEDULE SAW-WNC-1

Calculation of the Customer True-Up to the RSG-Residential Degree Day Consumption Factors

Month	RSG-Residential Heating					RSG-Residential Non-Heating				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			(2) / (1)		(4) x (3)			(7) / (6)		(9) x (8)
	Customers		Adjustment	Consumption	Trued-Up Consumption	Customers		Adjustment	Consumption	Trued-Up Consumption
	Forecast	Actual		Factor	Factor	Forecast	Actual		Factor	Factor
Oct-17	1,376,153	1,374,253	0.9986193	106,936	106,788	299,161	295,920	0.9891664	2,872	2,841
Nov-17	1,374,003	1,380,386	1.0046456	195,957	196,867	298,247	297,759	0.9983638	8,613	8,599
Dec-17	1,370,033	1,376,972	1.0050648	244,471	245,709	296,344	294,516	0.9938315	11,825	11,752
Jan-18	1,367,896	1,378,159	1.0075028	235,679	237,447	295,553	295,087	0.9984233	11,758	11,739
Feb-18	1,369,503	1,379,834	1.0075436	240,480	242,294	295,023	294,387	0.9978442	11,629	11,604
Mar-18	1,359,827	1,365,127	1.0038976	234,561	235,475	292,117	289,826	0.9921573	12,252	12,156
Apr-18	1,380,288	1,400,940	1.0149621	210,553	213,703	297,440	295,571	0.9937164	13,559	13,474
May-18	1,374,127	1,387,719	1.0098914	164,748	166,378	295,581	293,151	0.9917789	9,961	9,879

SCHEDULE SAW-WNC-2

Margin Revenue Deficiency/Surplus Calculation 2017-2018 Winter Period

Degree Day Consumption Factors												
RSG-Residential			Commercial			Industrial			Heating Degree Days			
Month	Heating	Non-Heating	GSG		LVG	GSG		LVG	Normal	Actual	Deadband	Variance
			Heating	Non-Heating	Heating	Non-Heating						
Oct-17	106,788	2,841	39,384	1,295	81,860	545	-	6,671	249.24	109.67	1.25	138.32
Nov-17	196,867	8,599	26,279	2,609	81,860	1,075	115	6,671	514.57	552.43	2.57	-35.29
Dec-17	245,709	11,752	42,337	3,494	81,860	1,434	183	6,671	819.31	934.33	4.10	-110.92
Jan-18	237,447	11,739	57,050	3,782	82,274	2,039	214	6,672	999.69	1040.00	5.00	-35.31
Feb-18	242,294	11,604	54,776	3,874	82,274	1,638	222	6,672	838.55	663.83	4.19	170.53
Mar-18	235,475	12,156	53,931	3,933	82,274	2,207	238	6,672	682.31	779.31	3.41	-93.59
Apr-18	213,703	13,474	43,515	4,109	82,274	1,344	219	6,672	357.52	481.21	1.79	-121.90
May-18	166,378	9,879	25,772	4,446	82,274	710	167	6,672	126.62	66.83	0.63	59.16
Total									4,587.81	4,627.61	22.94	(29.00)

Therm Deficiency/(Surplus) - HDD Variance x Degree Day Consumption Factors												
RSG-Residential			Commercial			Industrial			Margin Revenue Factors			
Month	Heating	Non-Heating	GSG		LVG	GSG		LVG	RSG	GSG	LVG	
			Heating	Non-Heating	Heating	Non-Heating						
Oct-17	14,770,916	392,967	5,447,595	179,124	11,322,875	75,384	-	922,733	\$ 0.308969	\$ 0.252488	\$ 0.040966	
Nov-17	(6,947,436)	(303,459)	(927,386)	(92,072)	(2,888,839)	(37,937)	(4,058)	(235,420)	\$ 0.308969	\$ 0.252488	\$ 0.040966	
Dec-17	(27,254,042)	(1,303,532)	(4,696,020)	(387,554)	(9,079,911)	(159,059)	(20,298)	(739,947)	\$ 0.308969	\$ 0.252488	\$ 0.040966	
Jan-18	(8,384,254)	(414,504)	(2,014,436)	(133,542)	(2,905,095)	(71,997)	(7,556)	(235,588)	\$ 0.300343	\$ 0.247071	\$ 0.039772	
Feb-18	41,318,396	1,978,830	9,340,951	660,633	14,030,185	279,328	37,858	1,137,776	\$ 0.300343	\$ 0.247071	\$ 0.039772	
Mar-18	(22,038,105)	(1,137,680)	(5,047,402)	(368,089)	(7,700,024)	(206,553)	(22,274)	(624,432)	\$ 0.300343	\$ 0.247071	\$ 0.039772	
Apr-18	(26,050,396)	(1,642,481)	(5,304,479)	(500,887)	(10,029,201)	(163,834)	(26,696)	(813,317)	\$ 0.300343	\$ 0.247071	\$ 0.039772	
May-18	9,842,922	584,442	1,524,672	263,025	4,867,330	42,004	9,880	394,716	\$ 0.300343	\$ 0.247071	\$ 0.039772	
Total	(24,741,999)	(1,845,416)	(1,676,505)	(379,362)	(2,382,680)	(242,664)	(33,146)	(193,480)				

Margin Revenue Deficiency/(Surplus) - Therm Deficiency/(Surplus) x Margin Revenue Factors												
RSG-Residential			Commercial			Industrial			Rate Total			
Month	Heating	Non-Heating	GSG		LVG	GSG		LVG	RSG	GSG	LVG	Total
			Heating	Non-Heating	Heating	Non-Heating						
Oct-17	\$ 4,563,755	\$ 121,415	\$ 1,375,452	\$ 45,227	\$ 463,853	\$ 19,034	\$ -	\$ 37,801	\$ 4,685,170	\$ 1,439,713	\$ 501,654	\$ 6,626,536
Nov-17	\$ (2,146,542)	\$ (93,759)	\$ (234,154)	\$ (23,247)	\$ (118,344)	\$ (9,579)	\$ (1,025)	\$ (9,644)	\$ (2,240,302)	\$ (268,004)	\$ (127,988)	\$ (2,636,294)
Dec-17	\$ (8,420,654)	\$ (402,751)	\$ (1,185,689)	\$ (97,853)	\$ (371,968)	\$ (40,161)	\$ (5,125)	\$ (30,313)	\$ (8,823,405)	\$ (1,328,827)	\$ (402,280)	\$ (10,554,513)
Jan-18	\$ (2,518,152)	\$ (124,493)	\$ (497,709)	\$ (32,994)	\$ (115,541)	\$ (17,788)	\$ (1,867)	\$ (9,370)	\$ (2,642,645)	\$ (550,358)	\$ (124,911)	\$ (3,317,915)
Feb-18	\$ 12,409,691	\$ 594,328	\$ 2,307,878	\$ 163,223	\$ 558,009	\$ 69,014	\$ 9,354	\$ 45,252	\$ 13,004,019	\$ 2,549,469	\$ 603,260	\$ 16,156,748
Mar-18	\$ (6,618,991)	\$ (341,694)	\$ (1,247,067)	\$ (90,944)	\$ (306,245)	\$ (51,033)	\$ (5,503)	\$ (24,835)	\$ (6,960,685)	\$ (1,394,548)	\$ (331,080)	\$ (8,686,313)
Apr-18	\$ (7,824,054)	\$ (493,308)	\$ (1,310,583)	\$ (123,755)	\$ (398,881)	\$ (40,479)	\$ (6,596)	\$ (32,347)	\$ (8,317,362)	\$ (1,481,412)	\$ (431,229)	\$ (10,230,002)
May-18	\$ 2,956,253	\$ 175,533	\$ 376,702	\$ 64,986	\$ 193,583	\$ 10,378	\$ 2,441	\$ 15,699	\$ 3,131,786	\$ 454,507	\$ 209,282	\$ 3,795,575
Total	\$ (7,598,694)	\$ (564,730)	\$ (415,168)	\$ (95,357)	\$ (95,535)	\$ (60,614)	\$ (8,321)	\$ (7,758)	\$ (8,163,424)	\$ (579,461)	\$ (103,293)	\$ (8,846,178)

SCHEDULE SAW-WNC-3

Calculation of Forecasted June 2018-September 2018 Average Daily Usage

Class	Rate	Group	Billed Therm Sales					Therms per Day
			June-18	July-18	August-18	September-18	Total	
Residential	RSG	Heating	39,878,076	29,796,606	25,621,785	27,310,795	122,607,262	1,008,916
		Non-Heating	4,236,163	3,220,270	2,680,229	2,720,884	12,857,546	105,803
Commercial	GSG	Heating	7,150,251	4,892,573	4,384,619	5,286,232	21,713,675	178,678
		Non-Heating	2,392,758	1,967,826	1,713,328	1,836,114	7,910,026	65,090
	LVG	26,359,282	19,671,444	19,846,221	19,126,858	85,003,805	699,483	
Industrial	GSG	Heating	190,535	78,109	77,700	98,652	444,996	3,662
		Non-Heating	66,006	51,665	46,709	51,907	216,287	1,780
	LVG	5,045,540	3,291,931	3,047,112	3,437,024	14,821,607	121,965	
Average Billing-Month Days			30.52	30.76	29.38	30.86	121.5238	

SCHEDULE SAW-WNC-4

Balancing Therm Use Calculation, November 2018 - March 2019
(therms)

Class	Rate	Group	Category	November-18	December-18	January-19	February-19	March-19	October-18 September-19	
Residential	RSG	Heating	Delivered Sales	147,214,124	229,289,423	263,070,834	234,194,296	192,909,019	1,396,492,742	
			less: Jun-Sep Ave x Days	30,267,480	31,276,396	31,276,396	28,249,648	31,276,396		
			equals: Balancing Use	116,946,644	198,013,027	231,794,438	205,944,648	161,632,623	914,331,380	
		Non-Heating	Delivered Sales	8,152,472	12,004,078	14,718,253	12,687,392	11,999,655	87,190,774	
			less: Jun-Sep Ave x Days	3,174,090	3,279,893	3,279,893	2,962,484	3,279,893		
			equals: Balancing Use	4,978,382	8,724,185	11,438,360	9,724,908	8,719,762	43,585,597	
Commercial	GSG	Heating	Delivered Sales	20,614,369	36,422,271	43,549,663	41,140,744	34,625,828	230,765,486	
			less: Jun-Sep Ave x Days	5,360,340	5,539,018	5,539,018	5,002,984	5,539,018		
			equals: Balancing Use	15,254,029	30,883,253	38,010,645	36,137,760	29,086,810	149,372,497	
		Non-Heating	Delivered Sales	3,370,668	5,017,654	5,737,096	5,285,561	4,966,503	39,890,525	
			less: Jun-Sep Ave x Days	1,952,700	2,017,790	2,017,790	1,822,520	2,017,790		
			equals: Balancing Use	1,417,968	2,999,864	3,719,306	3,463,041	2,948,713	14,548,892	
	LVG		Delivered Sales	56,271,355	82,146,764	100,675,058	98,201,747	88,853,252	622,776,309	
			less: Jun-Sep Ave x Days	20,984,490	21,683,973	21,683,973	19,585,524	21,683,973		
			equals: Balancing Use	35,286,865	60,462,791	78,991,085	78,616,223	67,169,279	320,526,243	
		GSG	Heating	Delivered Sales	837,118	1,511,534	1,922,692	1,735,573	1,370,276	8,839,251
				less: Jun-Sep Ave x Days	109,860	113,522	113,522	102,536	113,522	
				equals: Balancing Use	727,258	1,398,012	1,809,170	1,633,037	1,256,754	6,824,231
Non-Heating	Delivered Sales		132,196	225,385	279,290	255,731	213,794	1,565,144		
	less: Jun-Sep Ave x Days		53,400	55,180	55,180	49,840	55,180			
	equals: Balancing Use		78,796	170,205	224,110	205,891	158,614	837,616		
LVG		Delivered Sales	5,993,279	8,885,216	8,994,499	10,046,864	8,791,627	71,011,961		
		less: Jun-Sep Ave x Days	3,658,950	3,780,915	3,780,915	3,415,020	3,780,915			
		equals: Balancing Use	2,334,329	5,104,301	5,213,584	6,631,844	5,010,712	24,294,770		
Total		Delivered Sales	242,585,581	375,502,325	438,947,385	403,547,908	343,729,954	2,458,532,192		
		less: Jun-Sep Ave x Days	65,561,310	67,746,687	67,746,687	61,190,556	67,746,687	-		
		equals: Balancing Use	177,024,271	307,755,638	371,200,698	342,357,352	275,983,267	1,474,321,226		

**RSG Balancing Therm Share of Delivered Sales Calculation, October 2018-September 2019
(therms)**

Rate	Class	Group	Category	October-18	November-18	December-18	January-19	February-19	March-19	April-19	May-19	June-19	July-19	August-19	September-19	Total	Balancing Delivered (percent)	
RSG	Residential	Heating	Balancing Use	-	116,946,644	198,013,027	231,794,438	205,944,648	161,632,623	-	-	-	-	-	-	914,331,380		
			Delivered Sales	62,256,624	147,214,124	229,289,423	263,070,834	234,194,296	192,909,019	99,156,832	51,422,867	37,264,850	26,493,749	26,016,246	27,203,879	1,396,492,743		
		Non-Heating	Balancing Use	-	4,978,382	8,724,185	11,438,360	9,724,908	8,719,762	-	-	-	-	-	-	-	43,585,597	
			Delivered Sales	4,281,124	8,152,472	12,004,078	14,718,253	12,687,392	11,999,655	6,661,475	4,480,144	3,816,589	3,157,218	2,630,201	2,602,173	87,190,774		
		Total	Balancing Use	-	121,925,026	206,737,212	243,232,798	215,669,556	170,352,385	-	-	-	-	-	-	-	957,916,977	64.56%
			Delivered Sales	66,537,748	155,366,596	241,293,501	277,789,087	246,881,688	204,908,674	105,818,307	55,903,011	41,081,439	29,650,967	28,646,447	29,806,052	1,483,683,517		

Degree Day Consumption Factor Calculation

RSG Heating								RSG Non-Heating						
Month	HDD	Post-2008	HDDxWage Coefficient	HDD x Price Coefficient	Value			Degree Day Consumption Factor	HDD	HDD x Price Coefficient	Value			Degree Day Consumption Factor
					Real Price	Wage	Customers				Real Price	Wage	Customers	
Oct-18			0.001256		0.6828	64.9889	1,376,185	112,333	0.0102	-	0.8359	291,037	2,969	
Nov-18		(0.0059)	0.002360		0.6828	64.9889	1,385,127	204,207	0.0390	(0.0128)	0.8359	293,127	8,296	
Dec-18		(0.0059)	0.002880	(0.0050)	0.6828	64.9889	1,390,628	247,265	0.0528	(0.0183)	0.8359	291,347	10,926	
Jan-19	0.19548	(0.0059)			0.6999	66.8039	1,383,681	262,255	0.0559	(0.0200)	0.8475	291,037	11,336	
Feb-19	0.20422	(0.0059)		(0.0020)	0.6999	66.8039	1,383,548	272,434	0.0555	(0.0196)	0.8475	289,325	11,252	
Mar-19	0.20099	(0.0059)			0.6999	66.8039	1,389,583	271,030	0.0591	(0.0208)	0.8475	290,803	12,060	
Apr-19	0.18334	(0.0059)			0.6999	66.8039	1,389,021	246,404	0.0574	(0.0175)	0.8475	289,734	12,334	
May-19	0.12795	(0.0059)			0.6999	66.8039	1,388,121	169,357	0.0343	-	0.8475	288,549	9,897	

Commercial GSG Heating

Commercial GSG Non-Heating

Month	HDD	HDDxPrice		HDDxHouseholds		Degree Day	HDD	Degree Day
		Coefficient	Value	Coefficient	Value	Consumption		Consumption
						Factor		Factor
Oct-18				6.7330	3,252	21,899	1,382	1,382
Nov-18				8.8783	3,252	28,876	2,623	2,623
Dec-18				11.2875	3,252	36,712	3,518	3,518
Jan-19		(2,487)	0.836	13.2903	3,271	41,391	3,791	3,791
Feb-19		(10,618)	0.836	16.6471	3,271	45,573	3,897	3,897
Mar-19		(19,025)	0.836	19.2740	3,271	47,137	3,978	3,978
Apr-19		(12,154)	0.836	15.6818	3,271	41,131	4,066	4,066
May-19				9.1519	3,271	29,934	4,128	4,128

Industrial GSG Heating

Month	HDDxMfg		Degree Day
	Coefficient	Value	Consumption Factor
Oct-18	2.29	240.62	551
Nov-18	4.48	240.62	1079
Dec-18	5.70	240.62	1372
Jan-19	8.15	241.09	1965
Feb-19	6.59	241.09	1589
Mar-19	8.73	241.09	2105
Apr-19	5.55	241.09	1338
May-19	3.04	241.09	733

Industrial GSG Non-Heating

HDD	Degree Day Consumption Factor
117.62	118
184.92	185
215.05	215
224.93	225
237.31	237
211.63	212
173.23	173

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Commercial LVG

Month	HDDxCust		Degree Day
	Coefficient	Value	Consumption Factor
Oct-18	24.43613	3252.47	79,478
Nov-18	24.43613	3252.47	79,478
Dec-18	24.43613	3252.47	79,478
Jan-19	24.43613	3270.81	79,926
Feb-19	24.43613	3270.81	79,926
Mar-19	24.43613	3270.81	79,926
Apr-19	24.43613	3270.81	79,926
May-19	24.43613	3270.81	79,926

Industrial LVG

	HDDxMfg		Degree Day
	Coefficient	Value	Consumption Factor
	27.9818	240.62	6,733
	27.9818	240.62	6,733
	27.9818	240.62	6,733
	27.9818	241.09	6,746
	27.9818	241.09	6,746
	27.9818	241.09	6,746
	27.9818	241.09	6,746
	27.9818	241.09	6,746

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Normal Monthly Weather (1998-2017 Average)

Calendar Month	Degree Days
October-18	240.16
November-18	510.58
December-18	823.87
January-19	989.26
February-19	836.38
March-19	685.38
April-19	350.33
May-19	125.95

Natural Gas Sales Forecast - 2018

Public Service Electric & Gas Company

Finance Department

Electric and Gas Sales and Revenue Forecasting Group

April 2018

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Introduction

The natural gas sales forecast has a key role in both the operating and financial planning processes of Public Service Electric & Gas (PSE&G).

The volumetric and maximum day sendout projections are used in the development of strategies for optimal gas procurement by PSE&G's BGSS supplier.

The sales forecast also serves as the basis for the natural gas revenue forecast that is a key parameter in PSE&G's financial planning process. This includes not only the budgeting process but also the regulatory process.

The purpose of this document is to describe the current forecast methodology, forecast assumptions, and the 2018 gas sales forecast. The first section describes the econometric sales models. A discussion of the forecast assumptions used to develop the sales forecast follows. Section III describes the maximum daily send-out projection. An appendix contains more detailed information on the billing period to calendar month conversion, and forecast tables.

I Model Specification and Estimation

Residential Model

Residential gas sales are determined by the number of residential customers and the amount of gas that each of these customers uses. As a result, the modeling of residential sales is disaggregated into two components: the projection of the number of customers and the estimate of what, on average, each of these customers will use. While the projection of the number of residential natural gas customers can be based on historical trends and expected residential construction activity in the service area, the models utilized to develop the average use forecast are more complicated and are described below.

The demand for energy is a derived demand from the demand for the services that the energy provides. In the case of gas in the residential sector, this is a demand for the three main end-uses of gas: space heating, water heating, and cooking. Standard microeconomic theory suggests that the demand for these gas-fueled end-uses is a function of the real, i.e. inflation adjusted, price of gas, and the income of the household. In addition, since space heating and, to a lesser extent, water heating are affected by the weather, weather also needs to be included in the model specification, i.e.

$$\text{THERM/CUST} = f(\text{PRICEGAS}, \text{INCOME}, \text{WEATHER}) \quad [1]$$

where:

THERM/CUST	= Average gas sales per customer,
PRICEGAS	= Real price of gas,
INCOME	= Measure of customer income,
WEATHER	= Billing-month weather.

While information on individual appliance ownership and consumption is not available, PSE&G does segregate its Residential customer data into those customers that have gas space heating and those that do not. As a result, separate models estimating the average gas sales for space heating customers and non-space heating customers were developed.

Weather is incorporated into the models using billing-month heating degree days (HDD). To allow for the possibility of month-specific response to weather, the heating degree data was multiplied by monthly binary variables to produce month-specific HDD independent variables.

The real price of gas was defined as the annual average revenue per therm divided by the Consumers' Price Index –All Urban Consumers. However, the extreme seasonality of monthly gas consumption made the utilization of this variable directly in a linear specification impractical because it is unrealistic to

expect that a change in price would have the same impact, measured in therms, in January, a high consumption month, as in July where consumption can be only one-tenth the January volume. As a result, this variable was incorporated as an interactive variable with HDD to create the effect that a change in price will affect the magnitude of the response to weather, i.e. a small response in the summer months and a much larger response during the space heating season.

Income is defined as the total real wages and salary disbursements for New Jersey from the U.S. Department of Commerce, Bureau of Economic Analysis. This is a narrower measure than personal income, omitting for example dividends, interest and rental income, and, as a result, is assumed to more accurately reflect the economic well-being of the majority of our customers. The incorporation of this variable directly into a linear specification suffers from the same drawback as that of the price. As a result, this variable was also incorporated into the specification as an interactive variable with HDD. In the models the economic variables were lagged one year to account for the delay in the impact that these variables have on consumer behavior.

As a result, the final functional form of the model that was estimated is:

$$\text{THERM/CUST}_t = f\left(\frac{\text{MONTH} \times \text{HDD}_t \times \text{PRICEGAS}_{a-1}}{\text{MONTH} \times \text{HDD}_t \times \text{INCOME}_{a-1}, \text{MONTH} \times \text{HDD}_t}\right) \quad [2]$$

where:

THERM/CUST	= Average gas sales per customer,
PRICEGAS	= Real price of gas,
INCOME	= Real Wage and Salary Disbursements,
HDD	= Heating degree days,
MONTH	= Vector of binary variables for each heating month,
t	= Billing-month,
a	= Year associated with billing-month, t.

The models were estimated using monthly data from the 2006-2016 period (excluding data from 2009 due to distortions resulting from the implementation of a new billing system.) The results of the OLS estimation procedure are summarized in Table 1 and Figures 1 and 2.

As Figures 1 and 2 illustrate, the high values of the coefficients of determination of both the model for gas space heating customers and the model of those customers without gas heating explain an extremely high proportion of the variation from the mean values. The estimates of the individual coefficients of the RSG model estimations are what one would expect given the characteristics of residential natural gas consumption. The key predictor of gas sales to this sector is weather with the weather having a greater impact on those customers with gas space heating than those without. Price is a factor for residential customers during the winter months but, its impact is relatively small.

Figure 1
RSG Space Heating Model
 Actual vs. Fitted Values

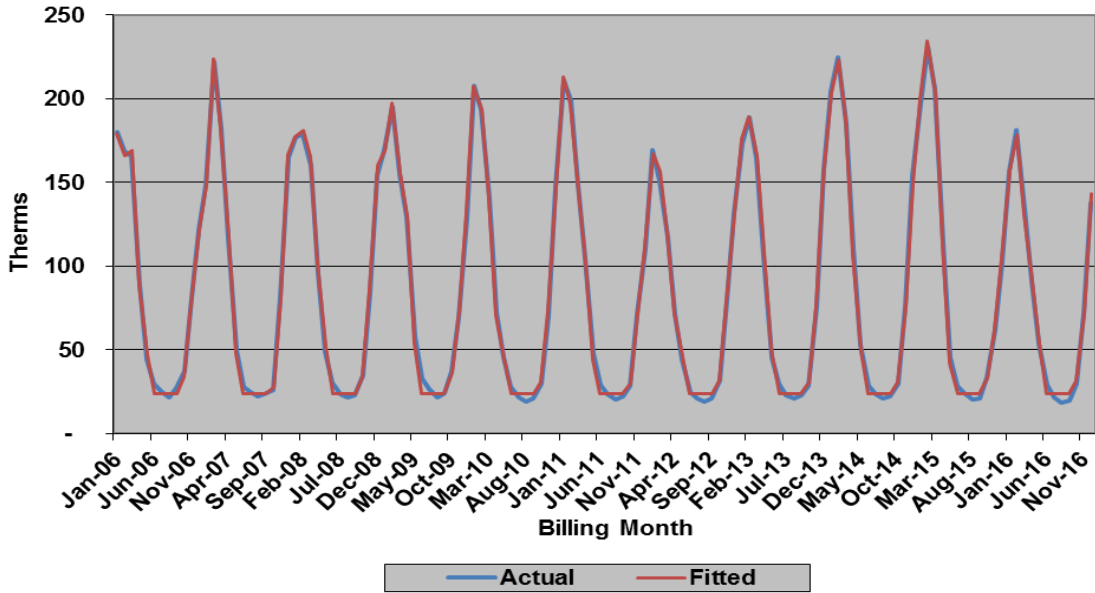
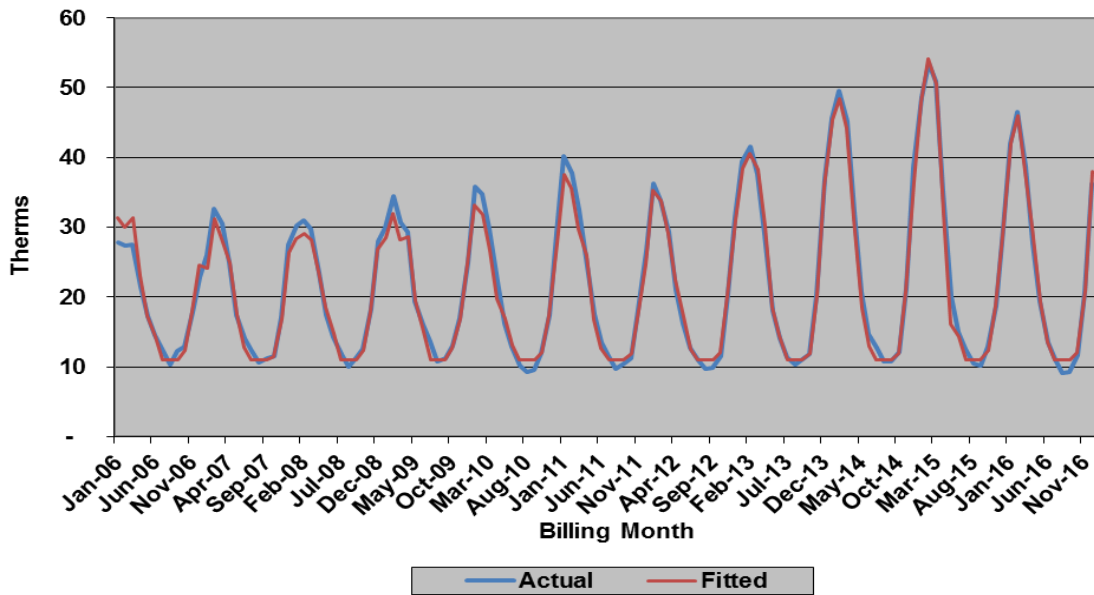


Figure 2
RSG Non-Space Heating Model
 Actual vs. Fitted Values



The price elasticity estimates were estimated to be -0.0038 and -0.23 for space heating and non-space heating customers, respectively which is lower than recent estimates but consistent with lower gas prices and the lack of a surge in consumption in response to them. The higher non-space heating elasticity is the result of a similar therm impact of price but, measured over a much smaller base usage. Income was found to have an effect on gas consumption by space heating customers in the fall. This is consistent with income changes resulting affecting when space heating equipment is turned on. The economic downturn appeared to result in a delay in turning on this equipment in the fall reducing use.

Table 1

	JAN	FEB	MAR	APR	MAY	JUNE	OCT	NOV	DEC	R2	DW	n
HEATING												
HDD	0.19548 (0.009)	0.20422 (0.009)	0.20099 (0.007)	0.18334 (0.013)	0.12795 (0.005)					0.998	1.414	132
PRICE x HDD		-0.00195 (0.003)							-0.00500 (0.005)			
WAGE x HDD							0.001256 (0.0002)	0.002360 (0.0000)	0.002880 (0.0001)			
I-POWER	-0.00595 (0.001)											
NON-HEATING												
HDD	0.05586 (0.0029)	0.05553 (0.0025)	0.05907 (0.0031)	0.05737 (0.0053)	0.03430 (0.0033)	0.06980 (0.0151)	0.01024 (0.0065)	0.03901 (0.0072)	0.05284 (0.0036)	0.973	0.638	132
PRICE x HDD	-0.020 (0.0020)	-0.020 (0.0017)	-0.021 (0.0021)	-0.017 (0.0036)				-0.013 (0.0048)	-0.018 (0.0024)			

The second key element of the residential forecast, as noted above, is the projection of the number of residential natural gas customers. This forecast is based on historical trends between customer growth and residential construction activity in the service area and is discussed in the Forecast Assumptions section.

Commercial

The demand for natural gas by the non-residential sector, as with any other factor of production, is a function of the input's price, the price of substitutes (if any) and the level of production. This implies that gas sales to the commercial sector is a function of the real price of gas and the level of "output" of the commercial sector in PSE&G's service territory, i.e. Again, since gas is primarily used for space and/or water heating, weather needs to be included in the specification resulting in the following:

$$\text{THERMS} = f(\text{PRICEGAS}, \text{OUTPUT}, \text{HDD}) \quad [3]$$

where:

THERMS	= Gas Sales,
PRICEGAS	= Real price of gas,
OUTPUT	= Commercial sector output,
HDD	= Heating degree days.

The problem with this specification is that there is not a good measure of output for the local commercial sector. However, if it is assumed that the demand for local commercial output is a function of the local economic and demographic factors, i.e., how many households there are (HSH) and how much money do they have to spend (INCOME), commercial output can then be defined as:

$$\text{OUTPUT} = f(\text{INCOME}, \text{HSH}) \quad [4]$$

Substituting [4] into [3] yields:

$$\text{THERMS} = f(\text{PRICEGAS}, \text{INCOME}, \text{HSH}, \text{HDD}) \quad [5]$$

This model was estimated for customers in the commercial sector using monthly billing data from the 2005-2016 period (again, excluding 2009). The firm delivery customers in this class whose usage does not exceed 300 Dth are served under rate GSG. These customers are further disaggregated into those with gas space heat and those that heat with other fuels. These two groups of customers are modeled separately. The larger commercial customers are served under rate LVG. These are also modeled separately.

Historical annual household estimates for New Jersey is available from the U.S. Bureau of the Census. As with the residential models, the strong seasonality associated with commercial gas sales dictates that the economic/demographic variables can be used in the model directly but, need to be used as interactive variables with HDD. In addition, in the models the economic variables were lagged one year to account for the delay in the impact that these variables have

on consumer behavior. As a result, the functional form that was estimated for each of the three groups of commercial customers is¹:

$$\text{THERMS}_t = f(\overline{\text{MONTH} \times \text{HDD}_t} \times \text{PRICEGAS}_{a-1}, \frac{\overline{\text{MONTH} \times \text{HDD}_t} \times \text{INCOME}_{a-1}}{\overline{\text{MONTH} \times \text{HDD}_t} \times \text{HSH}_{a-1}, \text{HDD}_t) \quad [6]$$

where:

THERMS	= Gas sales,
PRICEGAS	= Real price of gas,
INCOME	= Real Wage and Salary Disbursements,
HDD	= Heating degree days,
$\overline{\text{MONTH}}$	= Vector of binary variables for each heating month,
t	= Billing-month,
a	= Year associated with billing-month, t.

The results of the OLS estimation procedure, summarized in Figures 3-5, show that the commercial models also fit the historical data well.

The estimated coefficients of the three commercial models indicate that while the small commercial space heating are sensitive to price, with an estimated elasticity of -0.10 the non-space heating customers and the large LVG, customers are not. In addition, while the coefficients on households, the economic indicator in the models, are highly statistically significant, this does not imply large sales increases given the anticipated slow growth in the number of households.

¹ It was not necessary to incorporate month-specific HDD specification since the LVG sales are less sensitive to the weather.

Figure 3
GSG Commercial Space Heating Model
Actual vs. Fitted Values

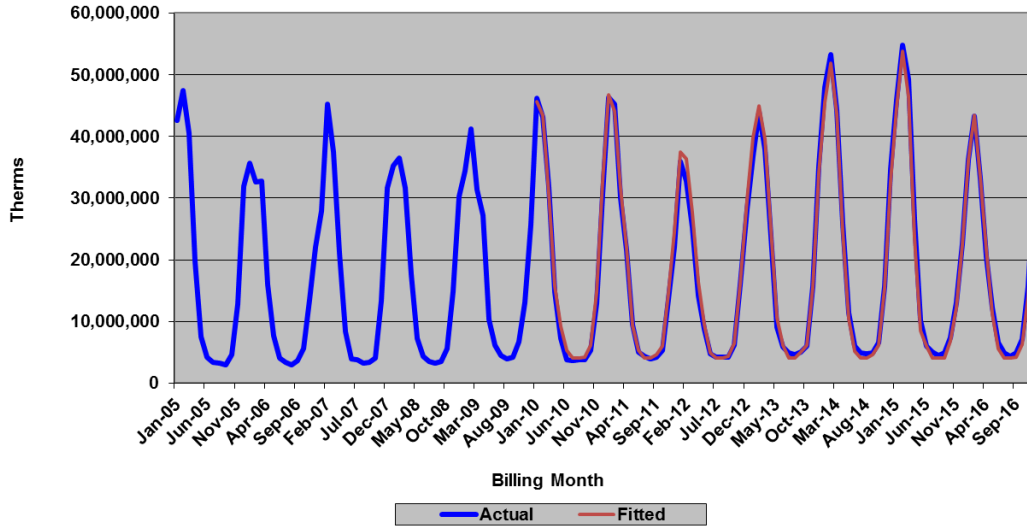


Figure 4
GSG Commercial Non-Space Heating Model
Actual vs. Fitted Values

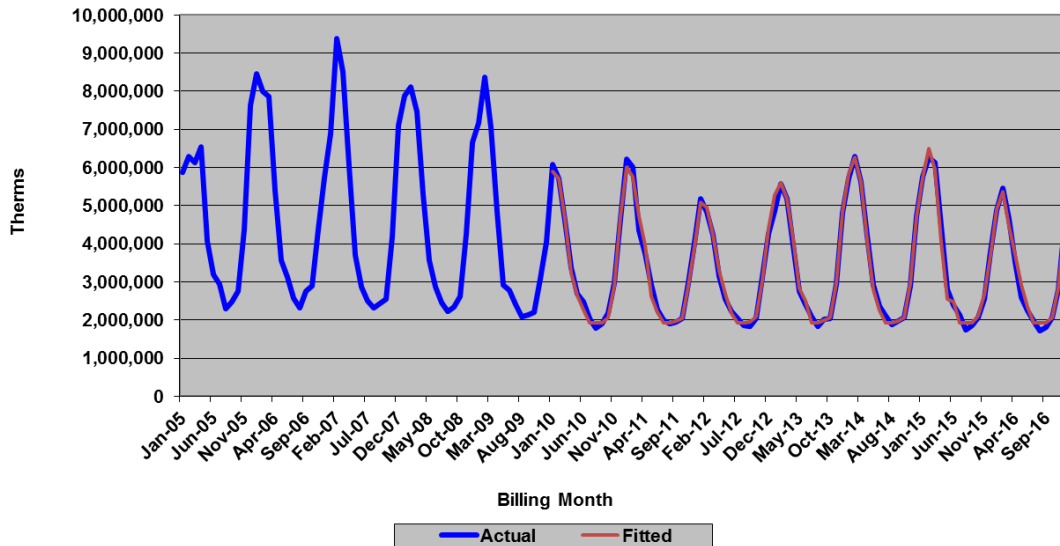


Figure 5
LVG Commercial Model
Actual vs. Fitted Values

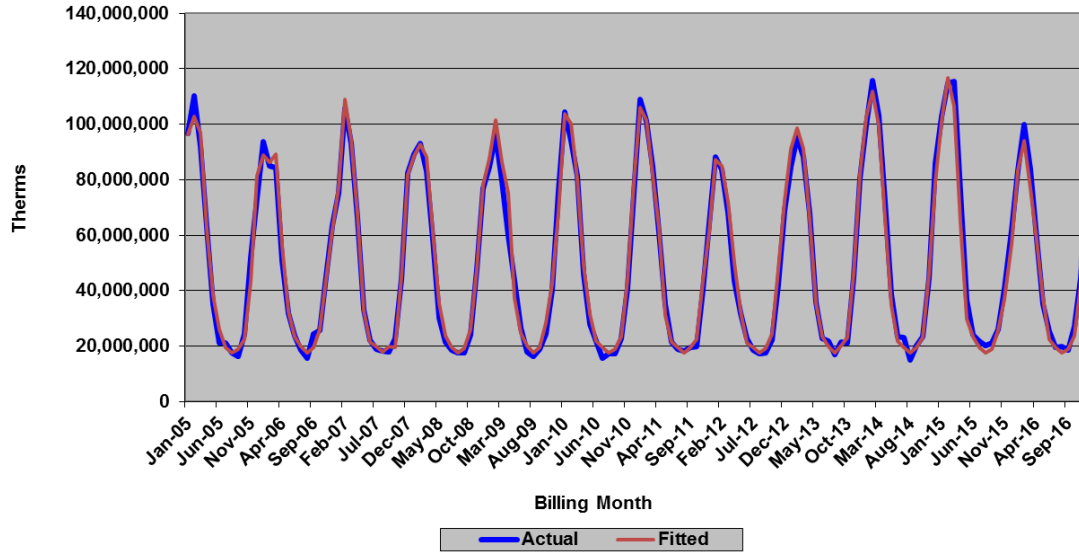


Table 2

Estimated Coefficients of the
GSG Commercial Gas Sales Models
(standard errors in parentheses)

	JAN	FEB	MAR	APR	MAY	JUN	SEP	OCT	NOV	DEC	R2	DW	n
HEATING													
PRICE x HDD	-2487 (4,933)	-10618 (4,840)	-19025 (6,625)	-12154 (10,390)							0.994	0.588	84
CUST x HDD	13.29 (1.68)	16.65 (1.62)	19.27 (2.20)	15.68 (3.42)	9.15 (0.98)	12.34 (5.37)	14.70 (19.64)	6.73 (1.88)	8.88 (0.51)	11.29 (0.27)			
NON-HEATING													
HDD	3791 (70.75)	3897 (68.73)	3978 (86.63)	4066 (145.79)	4128 (348.09)	11551 (1,916.59)	3328 (7,055.80)	1382 (674.98)	2623 (182.33)	3518 (95.69)	0.990	1.662	84

Table 3

**Estimated Coefficients of the
LVG Commercial Gas Sales Models**
(standard errors in parentheses)

	HDD x CUST	R2	DW	n
CUST x HDD	24.44	0.989	1.549	132
	(1.28)			

Industrial

While gas sales to the commercial sector are correlated with commercial output because output tends to be correlated with commercial space-heated floor space, sales to the PSE&G rate GSG and rate LVG gas customers in the industrial sector are not correlated with the industrial output because gas, for the most part, is not used for process heat. It is used to heat employee workspaces and the number of employees has been declining while industrial output has been increasing. Therefore, rather than used the traditional function for the demand for a factor of production such as [3], the following specification is used:

$$\text{THERMS} = f(\text{PRICEGAS}, \text{EMP}, \text{HDD}) \quad [7]$$

where:

$$\text{EMP} = \text{Manufacturing employment.}$$

Since gas is used primarily for space heating the economic variables need to be used as interactive variables with HDD to account for the extreme seasonality of the data. As a result, the functional forma that was estimated is:

$$\text{THERMS}_t = f(\text{HDD}_t \times \text{PRICEGAS}_{a-1}, \text{HDD}_t \times \text{EMP}_{a-1}, \text{HDD}_t) \quad [8]$$

where:

- THERMS = Gas sales,
- PRICEGAS = Real price of gas,
- HDD = Heating degree days,
- t = Billing-month,
- a = Year associated with billing-month, t.

The results of the OLS estimation procedure, summarized in Figures 6-8, show that the industrial models for customers in the two space heating segments fit the historical data well. The data for industrial GSG non-heating customers, however, seems to indicate the presence of out of period adjustments in the billing data which the model doesn't, and can't be expected to, account for. These were addressed with binary variables.

Like the small and medium commercial models, the estimated coefficients of the three industrial models indicate that sensitivity to price is small. The small industrial customers, rate GSG & LVG, did not show any statistically significant response to price. Small response of the industrial sector to gas prices is attributed to the fact that gas, since it is not used for process heat, is a relatively small proportion of the total costs of production.

Figure 6
GSG Industrial Space Heating Model
Actual vs. Fitted Values

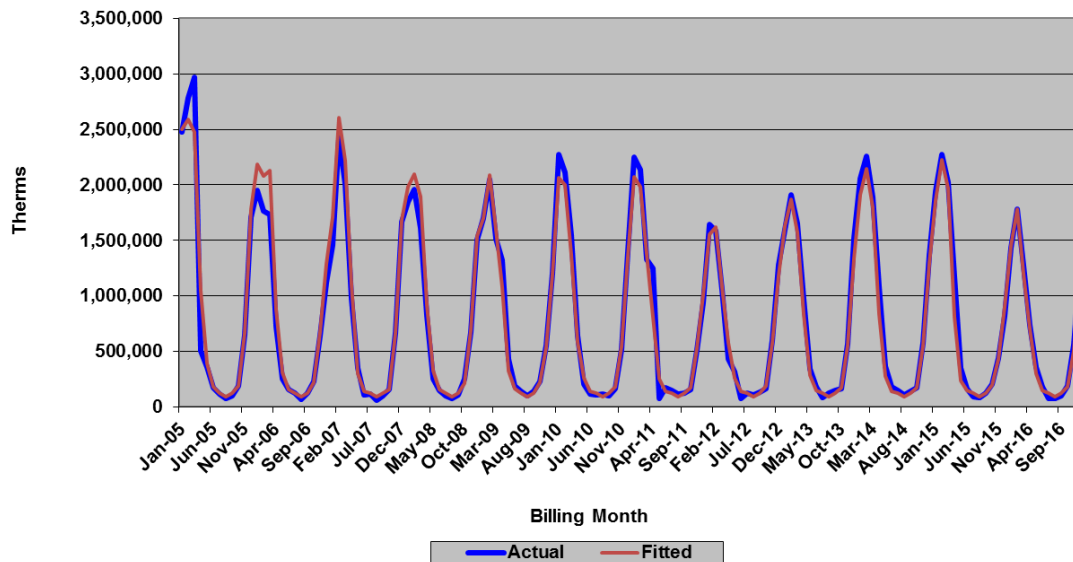


Figure 7
GSG Industrial Non-Space Heating Model
Actual vs. Fitted Values

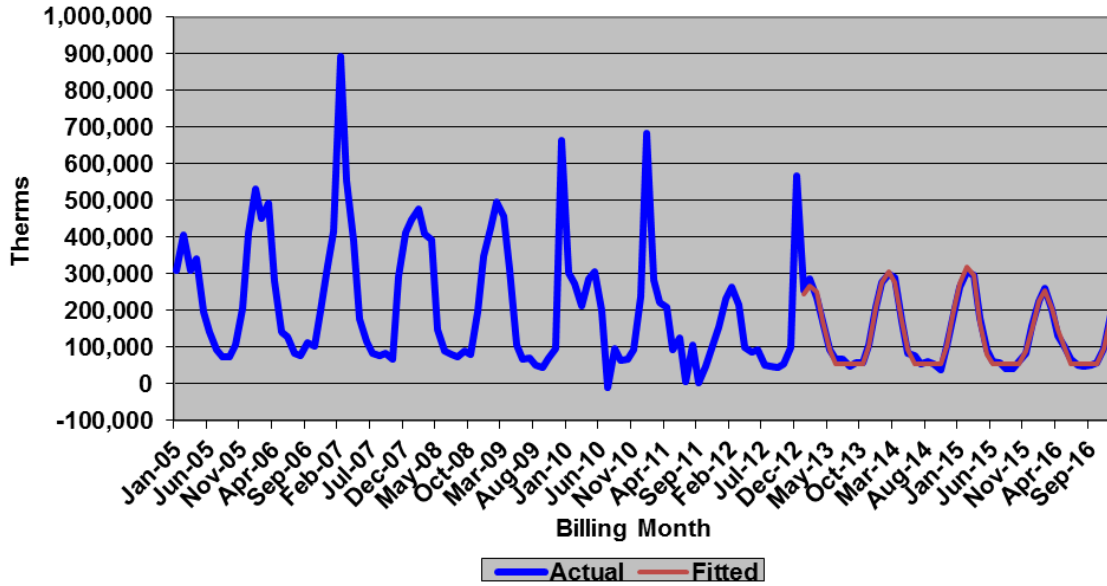


Figure 8
LVG Industrial Heating Model
Actual vs. Fitted Values

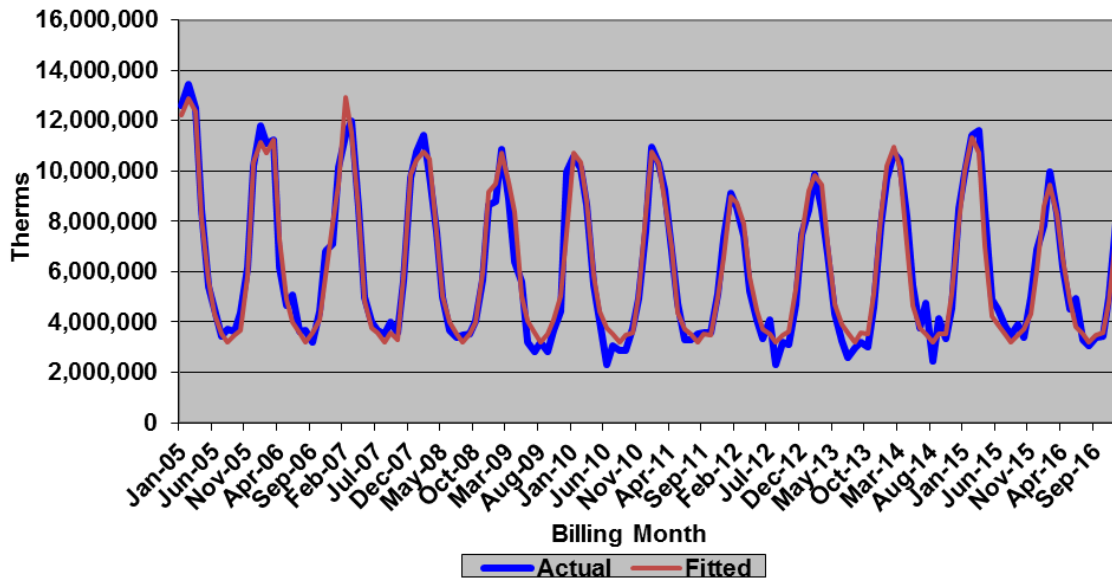


Table 4

**Estimated Coefficients of the
GSG Industrial Gas Sales Models
(standard errors in parentheses)**

	JAN	FEB	MAR	APR	MAY	JUN	OCT	NOV	DEC	R2	DW	n
HEATING												
EMP x HDD	8.15 (1.11)	6.59 (0.91)	8.73 (0.81)	5.55 (0.36)	3.04 (0.85)	2.15 (3.64)	2.29 (1.69)	4.48 (0.46)	5.70 (0.90)	0.974	1.482	132
NON-HEATING												
HDD	215.05 (5.79)	224.93 (5.21)	237.31 (6.26)	211.63 (10.59)	173.23 (25.85)			117.62 (14.99)	184.92 (7.51)	0.990	1.881	48

Table 5

**Estimated Coefficients of the
LVG Industrial Gas Sales Models
(standard errors in parentheses)**

HDD x EMP	R2	DW	n
27.98 (1.77)	0.968	1.751	132

II Forecast Assumptions

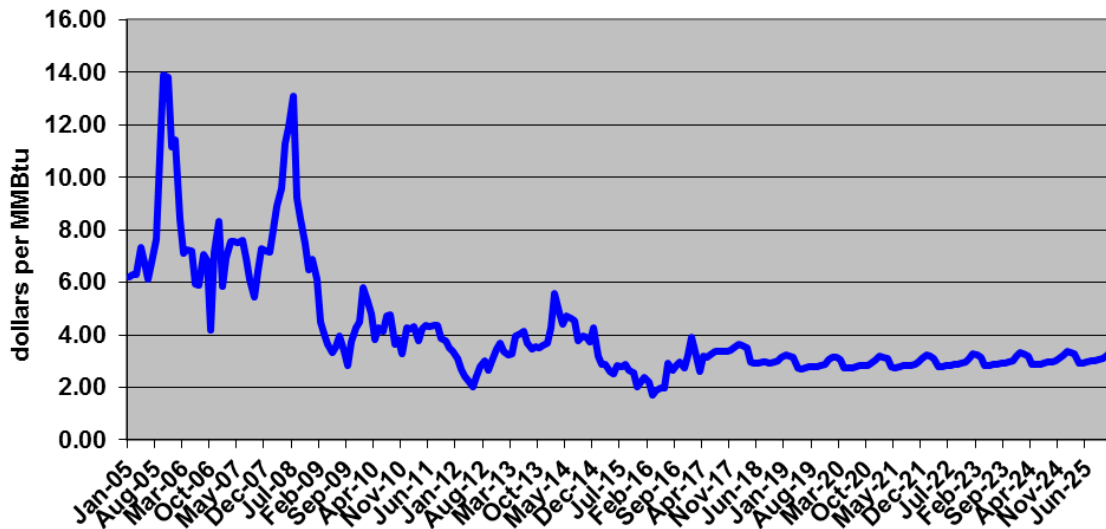
The models described above, in concert with assumptions about future prices and local economic and demographic parameters, were utilized to produce a forecast of billed natural gas delivered sales by rate for the residential, commercial, and industrial customer classes. The assumptions and the forecasts are described in more detail below.

Natural Gas Prices

The main driver of retail natural gas prices is the wholesale cost of gas which changes monthly. While these costs are passed through to commercial and industrial customers on monthly basis, the gas cost under- or over-collection of the residential customers is addressed in October where the rate is adjusted to collect or return the imbalance over the following twelve months. For the purpose of the forecast, the wholesale natural gas price was assumed to follow the NYMEX future prices as of April 20, 2016. As figure 9 shows, the wholesale price of gas is projected to stay relatively stable during the 2015-2021 periods.

Figure 9

NYMEX Natural Gas Futures Prices, April 28, 2017 (\$/MMBtu)



This price projection was used in the ER&T Gas cost model which generated commodity gas costs by rate. The residential costs, along with the actual imbalance in the residential gas supply cost and the revenue collection to offset this cost was utilized in the Cognos residential model to produce a stream of residential prices assuming that every October the imbalance was trued-up over the following 12 months. These projected commodity costs, combined with delivery tariff assumptions results in projected retail prices that are summarized below.

Table 6
Historic and Projected Retail Gas Prices
(dollars per therm)

Year	RSG		Commercial			Industrial		
	Heating	Non-Heating	GSG		LVG	GSG		LVG
			Heating	Non-Heating		Heating	Non-Heating	
2005	1.13	1.31	1.37	1.38	1.24	1.37	1.37	1.21
2006	1.39	1.58	1.41	1.30	1.23	1.43	1.33	1.22
2007	1.35	1.54	1.31	1.27	1.17	1.32	1.24	1.13
2008	1.40	1.57	1.42	1.42	1.29	1.41	1.40	1.25
2009	1.40	1.56	1.09	1.05	0.94	1.09	1.06	0.92
2010	1.24	1.43	1.10	1.07	0.97	1.11	1.06	0.92
2011	1.09	1.26	1.06	1.04	0.92	1.05	1.05	0.87
2012	1.00	1.18	0.95	0.93	0.80	0.95	0.98	0.75
2013	0.94	1.09	1.00	0.99	0.84	1.00	1.01	0.80
2014	0.80	0.94	1.06	1.04	0.91	1.10	1.08	0.90
2015	0.64	0.80	0.86	0.85	0.74	0.86	0.88	0.74
2016	0.71	0.87	0.83	0.83	0.69	0.83	0.86	0.70
2017	0.70	0.86	0.88	0.88	0.73	0.88	0.91	0.74
2018	0.73	0.89	0.87	0.87	0.72	0.87	0.90	0.74
2019	0.74	0.89	0.86	0.86	0.70	0.86	0.89	0.71
2020	0.74	0.89	0.86	0.86	0.70	0.86	0.89	0.71
2021	0.75	0.90	0.86	0.86	0.70	0.86	0.89	0.71
2022	0.78	0.94	0.87	0.87	0.71	0.87	0.90	0.72
2023	0.85	1.00	0.87	0.87	0.71	0.87	0.89	0.72
2024	0.74	0.89	0.64	0.65	0.49	0.64	0.67	0.49
2025	0.74	0.89	0.64	0.65	0.49	0.64	0.67	0.49

Economic Projections

Economic and demographic forecast assumptions for the nation and New Jersey are from Global Insight's March 2016 forecast. This forecast assumes that, nationally, the economy continues to recover at a slow but steady rate. This national forecast is expected to be reflected in New Jersey's economic outlook that is also expected to be at a slow pace. The forecast is summarized in Table 7.

Weather during the forecast period is assumed to be "normal" as defined by the average daily weather during the twenty-year period ending December 31, 2015.

Table 7

National and New Jersey Economic Forecast Assumptions

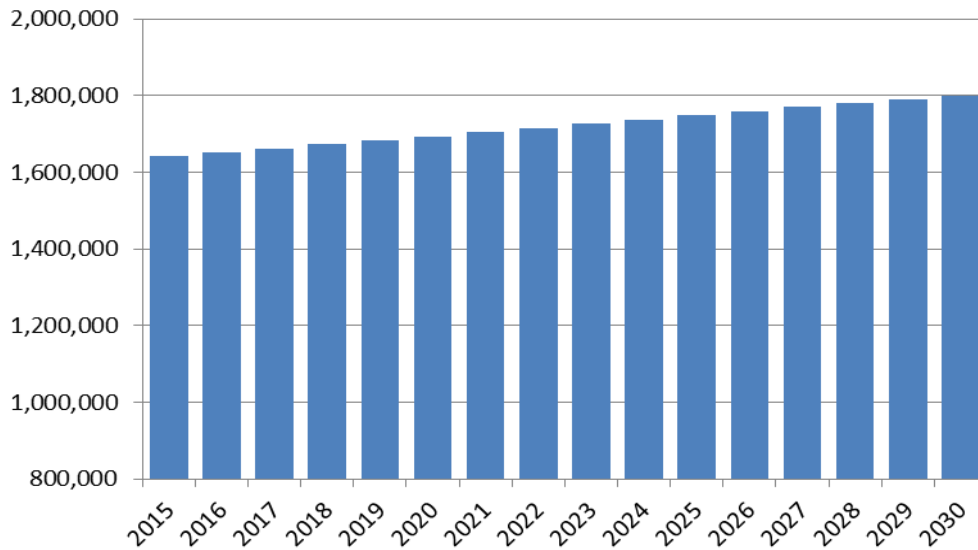
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
United States												
Real Gross Domestic Product (Bil-\$)	15,982	16,397	16,660	17,039	17,482	17,876	18,276	18,683	19,085	19,479	19,862	20,250
Industrial Production (%.saar)	2.9	0.3	(0.9)	1.9	2.9	2.2	2.2	2.0	1.7	1.6	1.3	1.2
Personal Income (%.saar)	5.2	4.4	3.6	4.5	5.1	5.2	5.0	4.8	4.8	4.8	4.7	4.7
Payroll Employment (%.saar)	1.9	2.1	1.8	1.6	1.3	1.0	0.9	0.7	0.8	0.8	0.7	0.7
Unemployment Rate (%)	6.2	5.3	4.9	4.6	4.2	4.1	4.2	4.3	4.4	4.4	4.5	4.5
Consumers' Price Index(% AAR)	1.6	0.1	1.3	2.5	1.9	2.4	2.8	2.7	2.7	2.7	2.6	2.6
3-Month Treasury Bill Rate (%)	0.0	0.1	0.3	0.9	1.6	2.5	2.8	2.8	2.8	2.8	2.8	2.8
30-Year Fixed Mortgage Rate (%)	4.2	3.9	3.6	4.5	5.0	5.8	6.1	6.1	6.1	6.1	6.1	6.1
New Jersey												
Real Personal Income (mil-\$)	413,465	428,599	438,093	449,582	464,239	476,423	486,353	495,792	505,799	515,709	525,507	535,241
Total Employment (thous SA)	3,968	4,023	4,076	4,109	4,144	4,167	4,181	4,194	4,212	4,228	4,240	4,251
Manufacturing (thous. SA)	239	238	240	241	241	241	240	238	237	235	233	231
Nonmanufacturing (thous. SA)	3,729	3,785	3,835	3,868	3,903	3,926	3,941	3,956	3,975	3,993	4,007	4,020
Unemployment Rate (% SA)	6.7	5.6	4.9	4.6	4.3	4.1	4.2	4.2	4.3	4.4	4.5	4.5
Population (thous.)	8,925.3	8,936.5	8,946.0	8,959.8	8,980.6	9,007.9	9,039.1	9,070.7	9,102.0	9,132.7	9,162.7	9,191.8
Households (thous.)	3,234.1	3,233.4	3,244.4	3,252.5	3,270.8	3,294.6	3,316.4	3,337.4	3,358.8	3,379.9	3,399.9	3,420.0
Single-Family Housing Starts (thous.)	10.5	10.9	10.9	11.6	11.6	12.0	12.3	12.7	12.7	12.7	12.9	12.4

Customer Forecasts

The number of residential customers with and without natural gas space heat is based on historical trends and expected residential construction activity in the service area. Residential non-heating customers have been steadily declining at an average annual rate of 0.8 percent and this is expected to continue. Furthermore it is assumed that these customers are converting to gas heat. The number of gas heating customers is also expected to increase as new residential construction occurs. The number of gas customers is assumed to reflect the current decline seen in new single family housing construction. As a result, as the figure below shows, the number of residential customers is expected to remain relatively stable.

Figure 10

Annual Gas Residential Customers



BGSS Share

The share of delivered sales that are BGSS supplied is assumed to follow recent trends where their shares have stabilized at their current levels across the broad range of customer classes.

III Maximum Daily Sendout Forecast

Introduction

Distribution facilities are designed to meet the estimated maximum hour demand on a day with a mean temperature of 0°F and an assumed average wind velocity of 15 m.p.h. with Newark Airport as the measuring base. Gas supplies are designed to meet the estimated maximum daily as well as maximum hourly demand. The maximum daily sendout forecast process consists of:

- Estimating the relationship between weather and firm daily sendout,
- Extrapolating that relationship to determine the current level of daily sendout at 0 degrees if no day that cold appeared in the model estimation data,
- Forecasting future maximum daily sendout levels based on the current estimated level

The remainder of this section describes each of these steps in turn.

Daily Firm Sendout Model Estimation

There are two major issues in modeling maximum firm daily sendout. First, the diversity of the customer base needs to be controlled for. Second, the model has to be designed to be extrapolated rather than interpolated. Each of these issues is discussed below.

The firm sendout number accounts for gas deliveries to a diverse set of customers ranging from residential homes to large industrial sites. Since sales to different types of customers respond to weather differently, customer mix must be controlled for in any modeling effort. In addition, the behavior of this diverse group of customers will change differently over time as prices and other economic parameters change over time. As a result, these changes also need to be accounted for. Unfortunately, the firm sendout number is not available by rate. As a result, the only way to control for changes in customer mix and changes in the behavior over time by these customers is to limit the time period of data that is used in the model estimation.

The second issue, of extrapolation, is addressed in a similar way. The relationship between sendout and weather is fairly linear. In reality, it is probably not perfectly linear. This is not an issue when estimating a model and using the results to interpolate values with the range of the estimation data. However, when extrapolating the data outside the range of the estimation data the

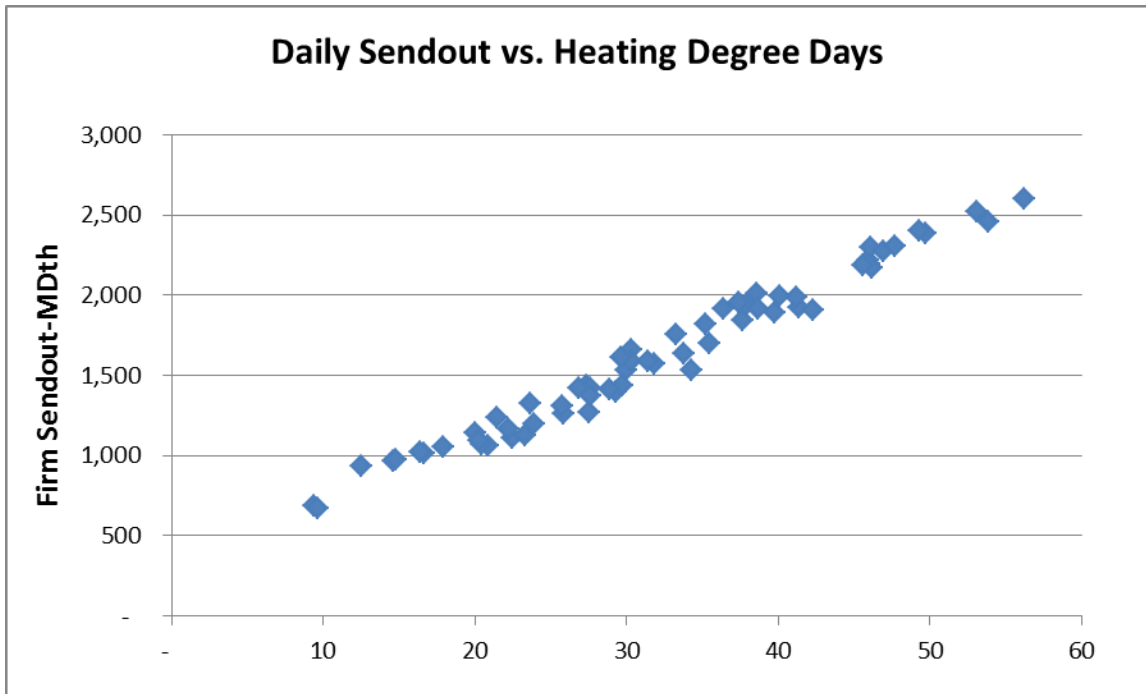
imprecision increases. The way to minimize this imprecision is to limit the observations to the lower temperature data so as to get a linear estimation of that portion of a non-linear curve that is closest to the ultimate extrapolation value.

To address both of these forecasting issues, the data used in estimating the relationship between daily sendout and weather was limited to the months of December 2018 and January 2018. Customer class mix will not change significantly in this short period and it contains the two coldest months when the maximum sendout would most likely occur. Analysis of the data for these two months indicates two things.

First, the data confirms the general responsiveness of firm sendout to the weather, as Figure 11 shows. Second, the relationship appears linear

Figure 11

December 2017 and January 2018



To refine the impact of the day-type on sendout, the regression model from previous years was enhanced to allow for not only an intercept change from the day-type but, also a HDD response change.

The regression model that modeled daily sendout, SENDOUT, is specified as:

$$\text{SENDOUT}_t = f(\text{HDD}_t, \text{WEEKDAY}_t, \text{HOLIDAY}_t, \text{SNOW}_t) \quad [9]$$

Where:

HDD	=	Heating degree days on gas day t,
WEEKDAY	=	Interactive variable that takes the value of HDD on weekdays, otherwise 0,
HOLIDAY	=	Interactive variable that takes the value of HDD on Sundays or Holidays, otherwise 0,
SNOW	=	Binary variable that takes the value of 1 when reported snowstorm accumulation in any portion of the service area is 6 inches or more, 0 otherwise.

The estimation results are shown in Table 8 and Figure 12 below.

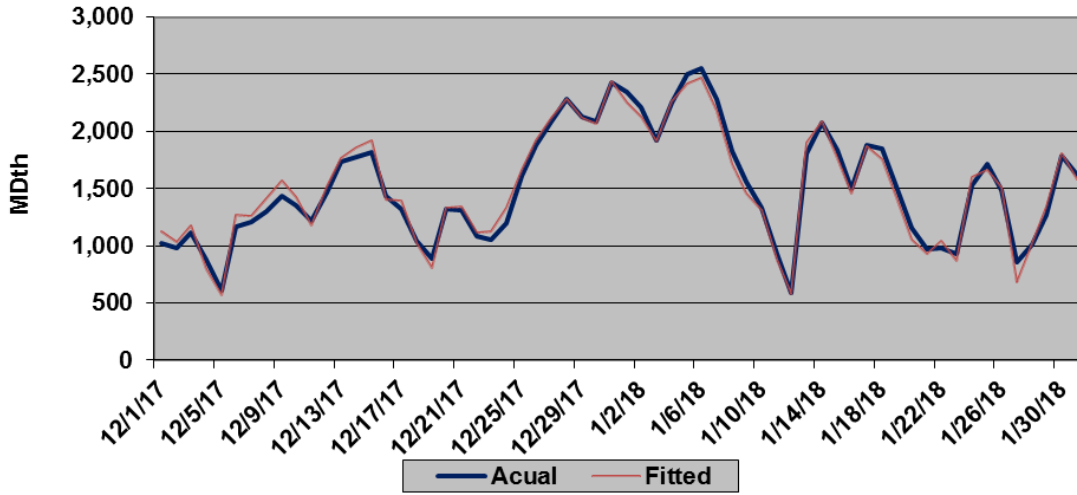
Table 8

Estimated Coefficients of the Daily Sendout Model
(standard errors in parentheses)

Intercept	HDD	HOLIDAY	WEEKDAY	SNOW	R2	DW	n
175.30	40.87	1.17	1.43	99.57	0.979	1.206	62
(28.23)	(1.04)	(.92)	(.80)	(54.98)			

Figure 12

Daily Sendout Model Actual vs. Fitted Values



The estimated coefficients of the model suggest that the estimated maximum daily peak would occur on a weekday. The model predicts that the maximum peak daily sendout would be 2,924.6 MDth.

A. Calendar-Month Sales Calculation

Introduction

Utilities have traditionally had a disconnection in the timing of their revenues and their costs. Revenues from retail sales are a revenue stream from meter readings and the resulting bills to their customers that occur on a daily basis throughout the month. The bills issued from meter reads in the current month's meter reading schedule are all recorded as billing-month revenue. Billing-month revenue will include revenue from electricity or gas delivered during the previous month while excluding deliveries of electricity or gas delivered during the current month that occurred after the meters were read. Expenses, on the other hand, such as wages, fuel, depreciation, etc., have been recorded on a calendar-month basis. This inconsistency in the revenue and expense streams can be tolerated if there are no major changes in the revenue and/or expense streams. If major changes are occurring, such as a rapid increase in fossil fuel prices or a high seasonality in sales, a comparison of the billing-month revenue and the calendar-month expenses can give a false view of a utility's financials. To remedy this situation, the sales and revenue accrual calculation, the estimation of calendar-month sales and revenue from billed sales and revenue and the estimation of unbilled sales and revenue was developed.

Section II will discuss how, in theory, the billed sales and the unbilled estimates are used to calculate calendar-month sales using a simple example and introduce the notation that will serve as the basis of the analysis. A description of the theory's specific application to PSE&G's meter reading schedule, that can have a single billing month encompass up to four calendar-months, follows.

Section III will describe the implementation of the estimation of the calendar-month sales and revenue process at PSE&G.

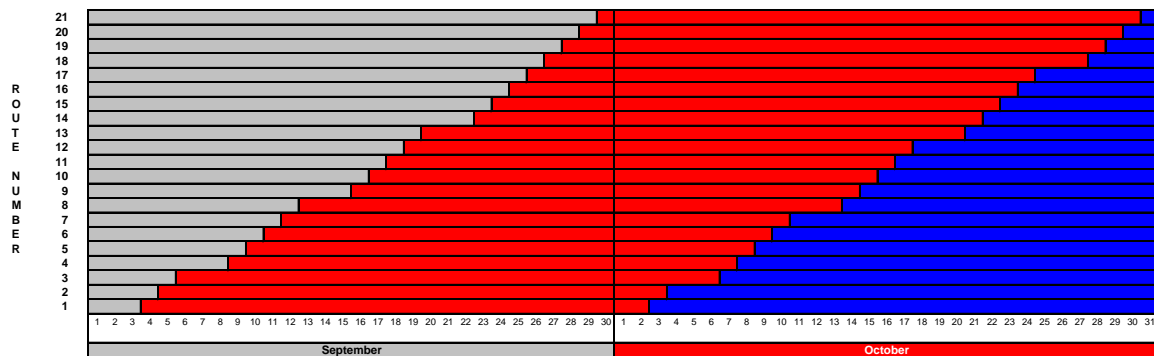
The Unbilled and Calendar-Month Estimation

A Simple Example

Utilities generally read all of their meters every month on 21 workdays. Figure 1, below shows a hypothetical October billing-month (in red) as determined by the September and October meter reading schedules. In the chart, each row represents a Route Number or a group of meters that are always read on the same day (although the day when they are all read may vary from month to month). The bottom row is red on all the days after the September read date, September 3rd until the October read date, October 2nd. If it is assumed that the customers' meters are read at noon, the October bill to these customers will reflect 28.5 days of service in September and only 1.5 days in October². The second row from the bottom represents Route 2 whose customers' meters were read on September 4th and October 3rd. The October bill to these customers will reflect 27.5 days of service in September and only 2.5 days in October. This continues until the top row, Route 21, that had meter reading days of September 29th and October 30th. The October bills to these customers represent only 1.5 days of September service and 29.5 days of October service.

Figure 1

Hypothetical October 2008 Billing-Month



From the red portion of the diagram, it can be seen that the October billing-month consists of September sales that are billed in October that, to facilitate discussion, will be referred to as $\boxed{\text{SEP B} > \text{OCT}}$ and October sales that are billed in October i.e., $\boxed{\text{OCT B} > \text{OCT}}$. The calendar-month sales are defined as the red and blue rectangle defined by the month of October and the 21 read-cycles. This consists of $\boxed{\text{OCT B} > \text{OCT}}$ sales and the October unbilled sales, $\boxed{\text{OCT B} > \text{NOV}}$, the October sales that will be billed in November.

² Or, more realistically, if the meter reads for all the Route 1 customers are evenly distributed throughout an 8:00 AM to 4:00 PM workday, the reads, on average, would represent a half day's sales on the read day.

The relationship between billed, unbilled, and calendar-month sales can be derived from these identities from the steps below.

$$\text{October Calendar} = \boxed{\text{OCT B} > \text{OCT}} + \boxed{\text{OCT B} > \text{NOV}} = \boxed{\begin{array}{l} \text{OCT B} > \text{OCT} \\ \text{OCT B} > \text{NOV} \end{array}} \quad [1]$$

Adding and subtracting $\boxed{\text{SEP B} > \text{OCT}}$ to the r.h.s. of [1] yields:

$$\text{October Calendar} = \boxed{\begin{array}{l} \text{OCT B} > \text{OCT} \\ \text{OCT B} > \text{NOV} \end{array}} + \boxed{\text{SEP B} > \text{OCT}} - \boxed{\text{SEP B} > \text{OCT}} \quad [2]$$

Rearranging the r.h.s. of [2] yields:

$$\text{October Calendar} = \boxed{\begin{array}{l} \text{OCT B} > \text{OCT} \\ \text{SEP B} > \text{OCT} \end{array}} + \boxed{\text{OCT B} > \text{NOV}} - \boxed{\text{SEP B} > \text{OCT}} \quad [3]$$

Substituting [1] into the l.h.s. of [3] yields:

$$\boxed{\begin{array}{l} \text{OCT B} > \text{OCT} \\ \text{OCT B} > \text{NOV} \end{array}} = \boxed{\begin{array}{l} \text{OCT B} > \text{OCT} \\ \text{SEP B} > \text{OCT} \end{array}} + \boxed{\text{OCT B} > \text{NOV}} - \boxed{\text{SEP B} > \text{OCT}} \quad [4]$$

This is the familiar:

$$\text{October Calendar} = \text{October Billed} + \text{October Unbilled} - \text{September Unbilled}^3 \quad [5]$$

This formula for the accrual of calendar-month sales and revenues is preferred to any direct estimation of calendar-month sales because any error in the unbilled estimate is “reversed out” in the following month. The advantage of this is that, as the calendar time period extends, the potential error resulting from unbilled estimates is reduced. This can be seen by summing up [5] over the 2008 calendar-year as:

$$\text{Calendar-Year 2008} = \sum_{i=\text{JAN08}}^{\text{DEC08}} \text{Billed}_i + \sum_{i=\text{JAN08}}^{\text{DEC08}} \text{Unbilled}_i - \sum_{i=\text{DEC07}}^{\text{NOV08}} \text{Unbilled}_i \quad [6]$$

³ The difference between the current month’s unbilled and the previous month’s is often referred to as the “net unbilled”.

Where:

Billed_i = Billing-month sales in month i,
 Unbilled_i = Unbilled sales in month i.

That simplifies to:

$$\text{Calendar-Year 2008} = \sum_{i=\text{JAN08}}^{\text{DEC08}} \text{Billed}_i + \text{Unbilled}_{\text{DEC08}} - \text{Unbilled}_{\text{DEC07}} \quad [7]$$

The key result from [7] is that the annual calendar-year sales are the annual billed sales, a very large real number, and the difference between two monthly unbilled estimates. Since the error that can be expected in the difference between the two monthly unbilled estimates can be assumed to be quite small compared to the annual billed total, the calendar-year estimate, as a result, can be expected to be very accurate.

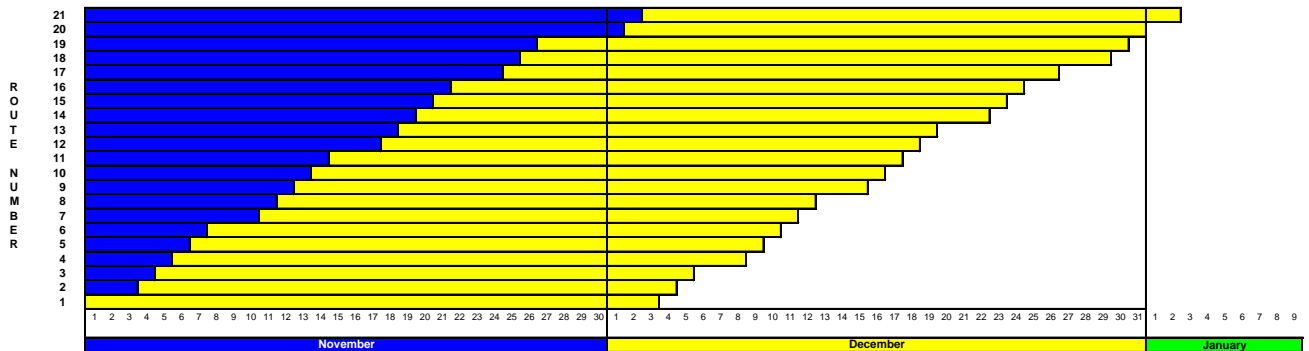
The same general results described in this simple example apply to PSE&G's more complicated meter reading schedule that is described below.

A More General Example

Unlike the hypothetical October billing-month, discussed above, that spanned two months, September and October, the PSE&G billing-month can encompass as many as four months. For example, the December 2008 PSE&G billing month, illustrated in Figure 2, has meter reading dates ranging from October 31st to January 2nd. As a result, it spans four months, October, November, December, and January⁴.

⁴ This is the original PSE&G December 2008 meter reading schedule. It has since been "compressed" to accommodate the implementation of iPower, the new billing and customer information system.

Figure 2
PSE&G December 2008 Billing-Month



Therefore, to develop a general algorithm applicable to PSE&G, the definition of billed, unbilled, and calendar sales must be expanded to include the potential of having sales from two additional calendar months reflected in a billing-month. December 2008 billing month, for example, is defined as:

$$\text{December Billed} = \begin{matrix} \text{OCT B} > \text{DEC} \\ \text{NOV B} > \text{DEC} \\ \text{DEC B} > \text{DEC} \\ \text{JAN B} > \text{DEC} \end{matrix} \quad [8]$$

Given the additional components of the billed, $\text{OCT B} > \text{DEC}$, i.e. the “under billed” sales, and $\text{JAN B} > \text{DEC}$, the “excess billed” sales, the addition of the current unbilled and subtraction of the previous month’s unbilled to the December billed, as defined in the simple example above, will overstate December calendar-month sales by the sum of under billed and excess billed sales. As a result, the December unbilled needs to be redefined as:

$$\text{December Unbilled} = \begin{matrix} \text{DEC B} > \text{JAN} \\ \text{DEC B} > \text{FEB} \end{matrix} + \text{NOV B} > \text{JAN} - \text{JAN B} > \text{DEC} \quad [9]$$

$$\text{December Unbilled} = \text{December Unbilled} + \text{January Underbilled} - \text{December Excess Billed} [10]$$

December calendar can then be defined as December billed plus the new

December unbilled less the equivalent November unbilled or:

$$\begin{array}{r}
 \boxed{\begin{array}{l} \text{DEC B> OCT} \\ \text{DEC B> NOV} \\ \text{DEC B> DEC} \\ \text{DEC B> JAN} \end{array}} \\
 = \\
 \boxed{\begin{array}{l} \text{OCT B> DEC} \\ \text{NOV B> DEC} \\ \text{DEC B> DEC} \\ \text{JAN B> DEC} \end{array}} \\
 + \\
 \boxed{\begin{array}{l} \text{DEC B> JAN} \\ \text{DEC B> FEB} \end{array}} + \boxed{\text{NOV B> JAN}} - \boxed{\text{JAN B> DEC}} \\
 - \\
 \boxed{\begin{array}{l} \text{NOV B> DEC} \\ \text{NOV B> JAN} \end{array}} - \boxed{\text{OCT B> DEC}} + \boxed{\text{DEC B> NOV}}
 \end{array} \quad [11]$$

or, in words:

$$\begin{array}{r}
 \text{December Calendar} \\
 = \text{December Billed} \\
 + \text{December Unbilled} \\
 - \text{November Unbilled}
 \end{array} \quad [12]$$

This is the general formula that is used to calculate unbilled sales at PSE&G.

The PSE&G Gas Calendar-Month Estimation

The estimation of calendar-month gas sales at PSE&G is based on the notion that gas sales can be divided into two components: a weather sensitive component and a non-weather sensitive component. The weather sensitive component is affected by the winter weather as measured by heating degree days (HDD). The non-weather component is simply a function of the number of days in the sales period. As a result, sales during the unbilled periods can be estimated based on the HDD and number of days during the unbilled periods and the estimates of the weather-sensitive sales per HDD and non-weather sensitive sales per day.

The estimate of the weather-sensitive sales per HDD for each rate, the HDD coefficient, is the sum of the coefficients associated with its model's independent variables that have a HDD component divided by the number of days in the billing period. In the case of RSG that, unlike the other rates, is modeled on a use per customer basis, this result is multiplied by the number of customers.

The estimate of the non-weather sensitive sales per day for each rate, the base coefficient, is the value of the model equation with all of the coefficients associated with HDD set to zero and divided by the number of days in the billing period. As in the case of the HDD coefficient, the RSG result is multiplied by the number of customers.

Given the structure of the models, these coefficients will vary by month and by year. The current estimates for 2008 and 2009 are shown in Table 1 below.⁵

Table 1

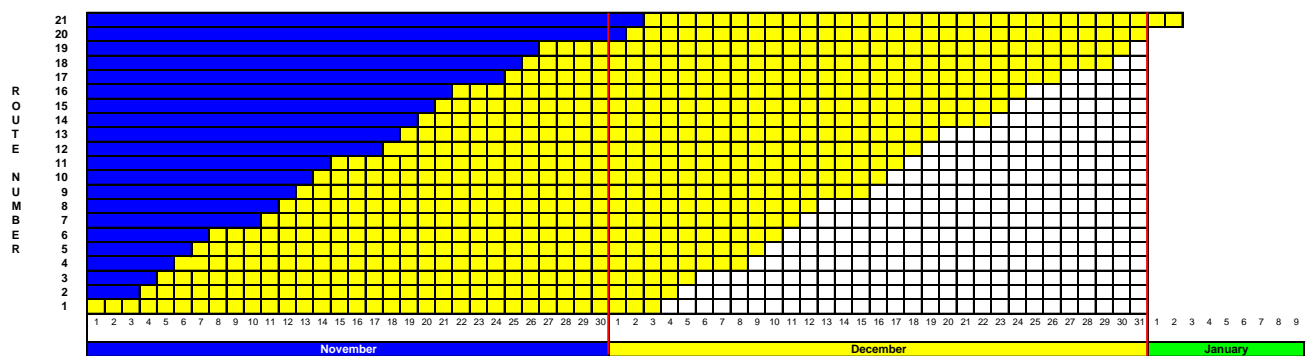
Unbilled Weather and Base Coefficients, 2008-2009

Billing Month	RSG				GSG-Commercial				GSG-Industrial				LVG - Non Vehicle			
	Heating		Non-heating		Heating		Non-heating		Heating		Non-heating		Commercial		Industrial	
	Base	HDD	Base	HDD	Base	HDD	Base	HDD	Base	HDD	Base	HDD	Base	HDD	Base	HDD
Jan-08	1,477,624	246,082	218,393	4,689	56,941	45,607	168,133	3,942	(15,873)	3,333	2,978	501	1,047,971	79,608	145,023	8,767
Feb-08	1,554,914	253,674	234,372	4,811	69,746	45,607	175,674	3,942	(15,256)	3,333	3,786	501	1,172,070	79,608	167,056	8,767
Mar-08	1,343,904	249,936	236,373	4,737	25,553	45,607	158,654	3,942	(16,832)	3,333	2,893	501	1,053,237	79,608	138,433	8,767
Apr-08	1,337,980	248,305	190,526	4,692	13,895	45,607	150,129	3,942	(15,769)	3,333	5,681	501	1,076,058	79,608	159,387	8,767
May-08	1,267,108	251,443	164,912	4,741	146,976	45,607	117,463	3,942	332	3,333	4,166	501	838,647	79,608	137,277	8,767
Jun-08	1,086,639	250,233	135,407	4,714	126,187	45,607	95,849	3,942	2,561	3,333	3,704	501	708,324	79,608	129,981	8,767
Jul-08	984,641	248,954	116,905	4,704	135,270	45,607	94,660	3,942	3,907	3,333	2,680	501	610,707	79,608	119,171	8,767
Aug-08	912,999	249,456	104,709	4,666	103,926	45,607	80,601	3,942	2,045	3,333	2,578	501	613,535	79,608	119,770	8,767
Sep-08	940,487	252,748	111,693	4,746	108,515	45,607	84,252	3,942	2,953	3,333	2,730	501	581,470	79,608	129,852	8,767
Oct-08	809,244	249,439	113,383	4,671	115,541	45,607	90,002	3,942	3,184	3,333	1,932	501	728,815	79,608	116,580	8,767
Nov-08	1,076,293	250,792	138,927	4,687	(9,962)	45,607	107,114	3,942	(7,929)	3,333	5,262	501	769,823	79,608	112,495	8,767
Dec-08	1,191,333	252,604	187,367	4,690	(9,608)	45,607	130,211	3,942	(18,805)	3,333	2,214	501	902,036	79,608	120,543	8,767
Jan-09	1,481,212	248,163	214,955	4,643	56,601	45,745	153,926	3,711	(15,827)	3,259	2,952	490	1,041,705	79,850	144,156	8,190
Feb-09	1,548,542	252,236	228,920	4,692	69,856	45,745	171,980	3,711	(15,254)	3,259	3,796	490	1,173,921	79,850	167,320	8,190
Mar-09	1,393,454	253,517	239,084	4,687	26,121	45,745	168,175	3,711	(17,054)	3,259	2,980	490	1,076,642	79,850	141,509	8,190
Apr-09	1,331,091	250,149	185,138	4,617	13,721	45,745	148,255	3,711	(15,497)	3,259	5,622	490	1,062,628	79,850	157,398	8,190
May-09	1,266,433	253,309	160,992	4,665	145,815	45,745	116,535	3,711	352	3,259	4,136	490	832,022	79,850	136,193	8,190
Jun-09	1,094,707	252,091	133,240	4,638	126,187	45,745	95,849	3,711	2,565	3,259	3,704	490	708,324	79,850	129,981	8,190
Jul-09	987,359	250,802	114,502	4,629	134,644	45,745	94,222	3,711	3,889	3,259	2,668	490	607,880	79,850	118,620	8,190
Aug-09	925,740	251,308	103,701	4,591	104,600	45,745	81,124	3,711	2,058	3,259	2,595	490	617,512	79,850	120,546	8,190
Sep-09	953,382	254,625	110,592	4,670	109,193	45,745	84,778	3,711	2,971	3,259	2,747	490	585,098	79,850	130,662	8,190
Oct-09	808,699	251,291	110,672	4,596	114,612	45,745	89,279	3,711	3,169	3,259	1,918	490	722,957	79,850	115,643	8,190
Nov-09	1,077,388	252,654	135,835	4,612	(9,899)	45,745	106,433	3,711	(7,834)	3,259	5,235	490	764,927	79,850	111,779	8,190
Dec-09	1,203,734	254,479	184,915	4,615	(9,637)	45,745	130,597	3,711	(18,750)	3,259	2,238	490	904,708	79,850	120,900	8,190

⁵ While the coefficient is called the "base" coefficient, it really does not measure base use per day. Rather it is the intercept term in a simple regression. As a result, it can be negative reflecting the intercept of a regression that is outside of the relevant range.

The billed, unbilled, excess billed, and underbilled days and heating degree days are derived from the meter reading schedule and daily weather data. The measure used is the Average Route Days (ARD). The ARD are defined as the number of days across all routes for a given period divided by 21, the total number of routes. This concept is illustrated in Figure 3, a slightly different version of the December 2008 billing-month, shown below.

Figure 3
PSE&G December 2008 Billing-Month



Each square represents an ARD.⁶ The total yellow blocks in each row represent the number of days in that particular route during the December billing-month. The sum of all the yellow blocks, 677, divided by 21 represent the average number of days in the December billing-month, i.e., the average number of days across the 21 routes or 32.24.

The number of excess billed days, $\boxed{\text{JAN B} > \text{DEC}}$, is:

$$1.5 \text{ (January 1}^{\text{st}} \text{ and half of January 2}^{\text{nd}}) / 21 = 0.07 \quad [13]$$

HDD for each period are a weighted sum of the daily HDD where the weight is the ARD associated with that day. For example, from the diagram it can be seen that on December 21st, the sales to 8 routes, routes 14-21, will be in the

⁶ Well, not exactly. Remember that it is assumed that the meters are read at noon. As a result the last yellow block to the right of each row counts as a half day. On the other hand, the last blue block on the right of each row also counts as a half day in the December billing-month so, the math works for the billing-month but, the half needs to be taken into account when discussing portions of the unbilled and billed periods. For a clearer discussion, however, the half days will be, for the most part, ignored.

December billing-month while sales to the first thirteen routes will be in the January billing-month. As a result , 8/21 or 38 percent of the HDD on December 20th will be assigned to the December billing month and 62 percent will be assigned to the January billing month.

HDD for underbilled and excess billed periods are assigned in a similar manner.

From Table 2 below that shows the normal monthly billed an unbilled HDD and days by type, it can be seen that underbilled days and HDD occur rarely while excess billed days are quite common.

Table 2

**Billed and Unbilled Days and Weather
2008-2009**

Billing Month	Heating Degree Days				Days			
	Billed	Unbilled	Excess Billed	Under Billed	Billed	Unbilled	Excess Billed	Under Billed
Jan-08	795.06	322.08	0.59	-	31.67	12.76	0.02	0.00
Feb-08	786.44	283.76	5.90	-	30.19	11.83	0.29	0.00
Mar-08	643.82	187.74	2.62	-	30.67	12.10	0.21	0.00
Apr-08	360.41	73.05	0.20	-	30.14	11.83	0.10	0.00
May-08	108.21	13.78	0.05	-	29.90	13.05	0.21	0.00
Jun-08	15.47	0.14	-	-	30.33	12.60	0.10	0.00
Jul-08	0.14	-	-	-	30.71	12.81	0.02	0.00
Aug-08	0.01	0.03	-	-	29.57	14.29	0.07	0.00
Sep-08	1.87	7.02	0.04	-	30.71	13.52	0.02	0.00
Oct-08	60.34	87.80	-	-	29.38	15.12	0.00	0.00
Nov-08	255.88	213.78	1.65	-	29.76	15.43	0.10	0.00
Dec-08	578.34	338.40	1.75	0.17	32.24	14.19	0.07	0.02
Jan-09	797.36	361.02	1.75	-	31.86	13.33	0.07	0.00
Feb-09	786.19	277.80	7.41	-	30.14	11.48	0.36	0.00
Mar-09	634.56	188.08	1.17	-	30.00	12.21	0.10	0.00
Apr-09	361.92	73.58	0.46	-	30.52	11.79	0.19	0.00
May-09	108.91	13.36	0.05	-	30.14	12.67	0.21	0.00
Jun-09	15.07	0.12	-	-	30.33	12.21	0.10	0.00
Jul-09	0.12	-	-	-	30.86	12.38	0.12	0.00
Aug-09	0.01	0.03	-	-	29.38	13.90	0.02	0.00
Sep-09	1.97	6.92	0.04	-	30.52	13.38	0.02	0.00
Oct-09	61.71	86.34	-	-	29.62	14.74	0.00	0.00
Nov-09	261.34	207.03	1.65	-	29.95	14.88	0.10	0.00
Dec-09	582.57	329.38	3.90	-	32.14	13.81	0.17	0.00

On a monthly basis, the necessary coefficient, weather, and day data are transmitted to PSE&G accounting services each month. They are used to calculate the actual current month unbilled sales, UnbilledTherms, using:

$$\text{UnbilledTherms} = \text{UnbilledDays} \times \text{BASECoef} + \text{UnbilledHDD} \times \text{HDDCoef} \quad [14]$$

Where:

- as
- UnbilledDays = the number of route days in the unbilled period defined by [9],
 - Unbilled HDD = the number of HDD in the unbilled period as defined by [9],
 - BASECoef = the Base coefficient,
 - HDDCoef = the HDD coefficient.

The results of this calculation, with the previous month’s unbilled results, are used to calculate calendar-month sales.

Unbilled, and as a consequence, calendar-month revenue is calculated by pricing the unbilled therms at the projected tariff rates. Adding the net unbilled revenue to the billing-month revenues results in the estimate of calendar-month revenue.

B. Summary Tables

Delivered Gas Sales As Billed 2015-2026 (MDth)

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	143,469	125,945	138,594	139,827	140,686	140,458	141,740	143,256	147,699	149,326	151,498	153,436
		Non-Heating	9,598	8,549	8,864	8,830	8,705	8,654	8,613	8,542	8,432	8,274	8,427	8,375
	Total	153,067	134,494	147,458	148,658	149,392	149,112	150,354	151,799	156,131	157,601	159,924	161,811	
Commercial	GSG	Heating	24,044	21,075	23,155	23,022	23,124	23,362	23,584	23,706	23,872	24,024	24,813	24,957
		Non-Heating	4,193	3,819	4,002	3,996	3,995	3,996	3,998	3,992	3,991	3,991	3,993	3,990
		Total	28,237	24,894	27,156	27,019	27,119	27,358	27,582	27,698	27,863	28,016	28,805	28,947
	LVG	65,580	58,437	62,260	62,261	62,420	62,626	62,925	63,064	63,327	63,450	63,732	63,932	
	TSG	Firm	1,066	945	921	921	921	921	921	921	921	921	921	921
		Non-Firm	17,324	16,683	13,596	13,596	13,596	13,596	13,596	13,596	13,596	13,596	13,596	13,596
	Total	18,390	17,628	14,518	14,518	14,518	14,518	14,518	14,518	14,518	14,518	14,518	14,518	
	CIG	3,724	3,242	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	
	CSG	15,922	16,728	-	-	-	-	-	-	-	-	-	-	
	Total	131,852	120,930	107,461	107,324	107,584	108,028	108,551	108,807	109,235	109,510	110,582	110,923	
Industrial	GSG	Heating	969	803	886	887	885	882	878	872	867	861	856	852
		Non-Heating	164	148	157	157	157	157	157	157	157	157	157	157
		Total	1,133	950	1,043	1,043	1,042	1,038	1,035	1,029	1,024	1,018	1,013	1,009
	LVG	7,731	6,788	7,110	7,112	7,111	7,094	7,079	7,054	7,035	7,004	6,988	6,968	
	TSG	Firm	1,522	1,415	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464
		Non-Firm	19,899	20,937	23,633	23,633	23,633	23,633	23,633	23,633	23,633	23,633	23,633	23,633
	Total	21,421	22,351	25,097	25,097	25,097	25,097	25,097	25,097	25,097	25,097	25,097	25,097	
	CIG	1,119	688	589	589	589	589	589	589	589	589	589	589	
	CSG	125,946	113,324	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624	
	Contract	36,053	25,237	-	-	-	-	-	-	-	-	-	-	
Total	193,403	169,339	160,464	160,466	160,464	160,443	160,425	160,393	160,369	160,332	160,311	160,288		
Lighting	SLG	68	64	64	64	64	64	64	64	64	64	64		
Total	478,323	424,763	415,384	416,448	417,440	417,583	419,330	420,999	425,735	427,443	430,818	433,022		
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
	GSG		29,370	25,844	28,200	28,062	28,161	28,397	28,617	28,727	28,887	29,033	29,818	29,955
	LVG		73,311	65,225	69,370	69,373	69,532	69,719	70,004	70,118	70,362	70,454	70,720	70,900
	TSG		2,587	2,359	2,385	2,385	2,385	2,385	2,385	2,385	2,385	2,385	2,385	2,385
			37,223	37,620	37,230	37,230	37,230	37,230	37,230	37,230	37,230	37,230	37,230	37,230

Supplied Gas Sales As Billed 2015-2026 (MDth)

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	134,729	119,460	132,751	133,931	134,755	134,536	135,764	137,216	141,473	143,032	145,112	146,969
		Non-Heating	8,995	8,064	8,466	8,434	8,315	8,266	8,227	8,159	8,053	7,903	8,048	7,999
	Total		143,724	127,524	141,217	142,365	143,069	142,802	143,991	145,375	149,526	150,935	153,160	154,968
Commercial	GSG	Heating	18,565	16,082	17,688	17,587	17,666	17,849	18,021	18,114	18,243	18,361	18,969	19,081
		Non-Heating	3,035	2,757	2,885	2,882	2,880	2,882	2,883	2,879	2,878	2,878	2,879	2,877
		Total	21,600	18,839	20,574	20,469	20,547	20,731	20,904	20,993	21,121	21,239	21,848	21,958
	LVG		27,301	21,264	24,689	22,724	24,751	22,868	24,964	23,028	25,122	23,182	25,299	23,360
	TSG	Firm	-	-	-	-	-	-	-	-	-	-	-	-
		Non-Firm	919	723	897	897	897	897	897	897	897	897	897	897
	Total		919	723	897	897	897	897	897	897	897	897	897	897
	CIG		3,724	3,242	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527
	CSG		-	-	-	-	-	-	-	-	-	-	-	-
	Total		53,544	44,068	49,686	47,617	49,721	48,023	50,292	48,445	50,668	48,845	51,571	49,742
Industrial	GSG	Heating	778	639	703	703	702	699	696	691	687	682	678	675
		Non-Heating	123	108	117	117	117	117	117	117	117	117	117	117
		Total	902	747	820	820	819	816	814	808	804	799	796	792
	LVG		2,013	1,637	1,902	1,903	1,903	1,899	1,894	1,884	1,879	1,870	1,864	1,858
	TSG	Firm	-	-	-	-	-	-	-	-	-	-	-	-
		Non-Firm	55	151	222	222	222	222	222	222	222	222	222	222
	Total		55	151	222	222	222	222	222	222	222	222	222	222
	CIG		1,119	688	589	589	589	589	589	589	589	589	589	589
	CSG		-	-	-	-	-	-	-	-	-	-	-	-
	Contract		2,590	2,114	-	-	-	-	-	-	-	-	-	-
Total		6,679	5,337	3,533	3,534	3,533	3,526	3,518	3,503	3,494	3,480	3,471	3,462	
Lighting	SLG		28	26	25	25	25	25	25	25	25	25	25	
Total			203,947	176,930	194,437	193,516	196,324	194,350	197,802	197,323	203,688	203,260	208,202	208,172

**Supplied Share of Delivered Gas Sales As Billed
2015-2026
(percent)**

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	94%	95%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
		Non-Heating	94%	94%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
	Total		94%	95%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Commercial	GSG	Heating	77%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%
		Non-Heating	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%	72%
		Total	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%
	LVG		42%	36%	40%	36%	40%	37%	40%	37%	40%	37%	40%	37%
	TSG	Firm	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Non-Firm	5%	4%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
		Total	5%	4%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
	CIG		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	CSG		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Total		41%	36%	46%	44%	46%	44%	46%	45%	46%	45%	47%	45%
Industrial	GSG	Heating	80%	80%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
		Non-Heating	75%	73%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
		Total	80%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
	LVG		26%	24%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%
	TSG	Firm	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Non-Firm	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
		Total	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	CIG		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	CSG		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Contract		7%	8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total		3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
Lighting	SLG		41%	41%	39%	39%	39%	39%	39%	39%	39%	39%	39%	
Total		43%	42%	47%	46%	47%	47%	47%	47%	47%	48%	48%	48%	

Delivered Gas Sales Calendar-Year 2015-2026 (MDth)

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	140,336	130,626	137,515	139,837	140,652	141,067	141,458	143,278	147,689	150,168	151,356	153,249
		Non-Heating	9,413	8,788	8,755	8,817	8,682	8,676	8,590	8,530	8,408	8,290	8,423	8,356
	Total		149,749	139,414	146,270	148,655	149,335	149,743	150,048	151,809	156,097	158,458	159,779	161,604
Commercial	GSG	Heating	23,418	21,873	23,008	22,979	23,082	23,442	23,523	23,681	23,822	24,114	24,763	24,906
		Non-Heating	4,114	3,914	3,990	3,991	3,987	4,006	3,989	3,989	3,984	4,002	3,986	3,983
		Total	27,532	25,786	26,999	26,970	27,069	27,448	27,512	27,670	27,806	28,116	28,748	28,888
	LVG		63,808	60,401	61,799	62,167	62,321	62,816	62,780	63,009	63,210	63,660	63,615	63,811
	TSG	Firm	1,038	958	889	921	921	921	921	921	921	921	921	921
		Non-Firm	14,957	15,183	13,415	13,596	13,596	13,596	13,596	13,596	13,596	13,596	13,596	13,596
		Total	15,995	16,141	14,305	14,518	14,518	14,518	14,518	14,518	14,518	14,518	14,518	14,518
	CIG		3,651	3,166	3,505	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527
	CSG		11,685	13,634	-	-	-	-	-	-	-	-	-	-
	Total		122,671	119,128	106,607	107,182	107,434	108,309	108,337	108,723	109,060	109,820	110,409	110,745
Industrial	GSG	Heating	952	823	882	885	883	884	875	871	865	864	854	850
		Non-Heating	144	152	157	157	156	157	156	156	156	157	156	156
		Total	1,096	975	1,039	1,042	1,040	1,042	1,032	1,027	1,021	1,021	1,010	1,006
	LVG		7,526	6,995	7,090	7,103	7,099	7,111	7,061	7,046	7,020	7,021	6,973	6,954
	TSG	Firm	1,505	1,393	1,504	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464	1,464
		Non-Firm	19,620	21,872	24,180	23,633	23,633	23,633	23,633	23,633	23,633	23,633	23,633	23,633
		Total	21,125	23,265	25,684	25,097	25,097	25,097	25,097	25,097	25,097	25,097	25,097	25,097
	CIG		1,164	687	571	589	589	589	589	589	589	589	589	589
	CSG		118,452	108,304	126,851	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624
	Contract		35,878	25,913	-	-	-	-	-	-	-	-	-	-
Total		185,242	166,140	161,235	160,455	160,449	160,463	160,403	160,383	160,352	160,352	160,294	160,270	
Lighting	SLG		68	64	64	64	64	64	64	64	64	64	64	
Total		457,662	424,682	414,112	416,291	417,218	418,515	418,787	420,915	425,509	428,630	430,481	432,619	
			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
	GSG		28,628	26,762	28,037	28,012	28,109	28,490	28,544	28,697	28,827	29,137	29,759	29,894
	LVG		71,334	67,396	68,889	69,270	69,419	69,927	69,841	70,054	70,230	70,681	70,589	70,765
	TSG		2,543	2,351	2,393	2,385	2,385	2,385	2,385	2,385	2,385	2,385	2,385	2,385
			34,578	37,055	37,595	37,230	37,230	37,230	37,230	37,230	37,230	37,230	37,230	37,230
	CIG		4,815	3,853	4,076	4,116	4,116	4,116	4,116	4,116	4,116	4,116	4,116	4,116
	CSG		130,137	121,938	126,851	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624	126,624
	Contract		35,878	25,913	-	-	-	-	-	-	-	-	-	-

Supplied Gas Sales Calendar-Year 2015-2026 (MDth)

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	132,140	124,069	131,400	133,941	134,722	135,120	135,493	137,237	141,463	143,839	144,976	146,789
		Non-Heating	8,837	8,297	8,340	8,421	8,292	8,286	8,204	8,147	8,030	7,918	8,045	7,980
	Total		140,977	132,367	139,740	142,362	143,015	143,407	143,698	145,385	149,493	151,756	153,021	154,770
Commercial	GSG	Heating	18,146	16,764	17,416	17,554	17,634	17,911	17,974	18,095	18,205	18,430	18,931	19,042
		Non-Heating	2,995	2,833	2,852	2,878	2,875	2,889	2,876	2,876	2,873	2,886	2,874	2,872
		Total	21,142	19,597	20,267	20,432	20,509	20,799	20,850	20,971	21,078	21,316	21,805	21,914
	LVG		26,549	21,882	24,419	22,687	24,712	22,942	24,909	23,007	25,077	23,263	25,254	23,314
	TSG	Firm	-	-	-	-	-	-	-	-	-	-	-	-
		Non-Firm	910	789	867	897	897	897	897	897	897	897	897	897
	Total		910	789	867	897	897	897	897	897	897	897	897	897
	CIG		3,651	3,166	3,505	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527	3,527
	CSG		-	-	-	-	-	-	-	-	-	-	-	-
	Total		52,251	45,434	49,058	47,543	49,645	48,165	50,183	48,402	50,579	49,002	51,483	49,652
Industrial	GSG	Heating	768	656	695	701	700	701	694	690	685	684	677	673
		Non-Heating	108	112	116	117	117	118	117	117	117	118	117	117
		Total	875	768	811	818	817	818	811	807	802	802	794	790
	LVG		1,928	1,677	1,925	1,900	1,899	1,904	1,888	1,881	1,874	1,876	1,860	1,854
	TSG	Firm	-	-	-	-	-	-	-	-	-	-	-	-
		Non-Firm	55	196	201	222	222	222	222	222	222	222	222	222
	Total		55	196	201	222	222	222	222	222	222	222	222	222
	CIG		1,164	687	571	589	589	589	589	589	589	589	589	589
	CSG		-	-	-	-	-	-	-	-	-	-	-	-
	Contract		2,712	2,585	-	-	-	-	-	-	-	-	-	-
Total		6,735	5,913	3,508	3,530	3,527	3,533	3,510	3,499	3,487	3,488	3,464	3,455	
Lighting	SLG		28	26	25	25	25	25	25	25	25	25	25	
Total			199,964	183,714	192,305	193,435	196,187	195,105	197,391	197,286	203,559	204,247	207,968	207,876

**Supplied Share of Delivered Gas Sales Calendar Year
2015-2026
(percent)**

Class	Rate	Category	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Residential	RSG	Heating	94%	95%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
		Non-Heating	94%	94%	95%	96%	96%	96%	96%	96%	96%	96%	96%	96%
	Total	94%	95%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Commercial	GSG	Heating	77%	77%	76%	76%	76%	76%	76%	76%	76%	76%	76%	76%
		Non-Heating	73%	72%	71%	72%	72%	72%	72%	72%	72%	72%	72%	72%
		Total	77%	76%	75%	76%	76%	76%	76%	76%	76%	76%	76%	76%
	LVG	42%	36%	40%	36%	40%	37%	40%	37%	40%	37%	40%	37%	
	TSG	Firm	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Non-Firm	6%	5%	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%
		Total	6%	5%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
	CIG	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	CSG	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Total	43%	38%	46%	44%	46%	44%	46%	45%	46%	45%	47%	45%	
Industrial	GSG	Heating	81%	80%	79%	79%	79%	79%	79%	79%	79%	79%	79%	79%
		Non-Heating	75%	74%	74%	75%	75%	75%	75%	75%	75%	75%	75%	75%
		Total	80%	79%	78%	79%	79%	79%	79%	79%	79%	79%	79%	79%
	LVG	26%	24%	27%	27%	27%	27%	27%	27%	27%	27%	27%	27%	
	TSG	Firm	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Non-Firm	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
		Total	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	CIG	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	CSG	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
	Contract	8%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Total	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%		
Lighting	SLG	41%	41%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	
Total		44%	43%	46%	46%	47%	47%	47%	47%	48%	48%	48%	48%	

1 **PUBLIC SERVICE ELECTRIC AND GAS COMPANY**
2 **DIRECT TESTIMONY**
3 **OF**
4 **DONNA M. POWELL**
5 **ASSISTANT CONTROLLER - PSE&G**

6 **Q. Please state your name and address for the record.**

7 A. My name is Donna M. Powell. My business address is 80 Park Plaza, Newark,
8 New Jersey, 07102.

9 **Q. In what capacity are you employed?**

10 A. I am employed by PSEG Services Corporation (PSEG Services), a subsidiary
11 of Public Service Enterprise Group Incorporated (PSEG or Enterprise), as
12 Assistant Controller-PSE&G. I am responsible for all accounting matters for
13 PSE&G.

14 **Q. Please describe your employment experience and educational background.**

15 A. I hold a B.S in Accounting from Villanova University and I am a Certified
16 Public Accountant. I have been employed by PSEG Services since 2012,
17 serving as Assistant Controller-PSE&G. In my role as Assistant Controller –
18 PSE&G, I am responsible for all accounting matters for PSE&G and I direct
19 the utility accounting functions including regulatory compliance thereon. I
20 have previously testified on behalf of PSE&G to the BPU.

21 Prior to joining PSEG, I was employed by New Jersey American Water
22 Company from 2007 to 2012 as Vice-President of Finance where I was

1 responsible for all of the financial aspects of that company, including business
2 planning, regulatory strategy and rate support, and all financial, statutory and
3 management reporting. From 1998 to 2007, I worked in various financial
4 capacities at Pepco Holdings, Inc. (formerly Conectiv, Inc. and Atlantic City
5 Electric Company), including testifying before the New Jersey Board of Public
6 Utilities in 1998 in support of Atlantic City Electric Company's request for
7 stranded cost recovery as a result of deregulation. I also worked for nine years
8 with Deloitte & Touche in various capacities from entry level auditor through
9 Senior Manager, where, in that role, I worked primarily in the utility sector and
10 was a designated utility industry accounting and auditing expert.

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

12 A. The purpose of this testimony is to describe the Weather Normalization Charge
13 (WNC) to be implemented by PSE&G for the Annual Period (October 1, 2018
14 to September 30, 2019) and recovered from customers taking service on the
15 Company's Residential Service (RSG), General Service (GSG) and Large
16 Volume Service (LVG) rate schedules during the Winter Period of October 1,
17 2018 through May 31, 2019. As part of this discussion, I will describe the
18 calculation of the WNC made in accordance with the WNC Tariff and which
19 supports the request by PSE&G to recognize \$14,265,094 in deficiency

1 revenues which will be recovered over the 2018-2019 Winter Period. The total
2 deficiency of \$14,265,094 is comprised of two components:

- 3 • \$(8,846,178) of margin revenue excess resulting from the 2017-2018
4 Winter Period, net of
- 5 • \$23,111,272 which represents the remaining under-collection from the
6 2016-2017 Winter Period approved for collection over the 2017-2018 and
7 2018-2019 Winter Periods. A total of \$54,738,895 in deficiency revenues
8 was approved for future collection as a result of the 2016-2017 Winter
9 Period. The \$23,111,272 remaining balance represents the remaining
10 balance to be collected as detailed below.

11 **Q. Please describe the schedules you are sponsoring for this proceeding.**

12 A. I am sponsoring the following Schedules:

- 13 • Schedule DMP-WNC-1: 2017-2018 Winter Period Weather
14 Normalization Calculation;
- 15 • Schedules DMP-WNC-2a and DMP-WNC-2b: (*Reserved for Future*
16 *Use*). Schedules DMP-WNC-2a and DMP-WNC-2b are not included
17 herein and are reserved for future use for the Weather Normalization
18 Earnings Test and the Supporting Schedule of Gas Jurisdictional Net
19 Income, respectively. These schedules are only applicable when a
20 margin revenue deficiency has resulted from the Winter Period. The

1 2017-2018 Winter Period resulted in a margin revenue excess of
2 \$(8,846,178) to be refunded to customers, therefore these schedules are
3 not applicable;

- 4 • Schedule DMP-WNC-3: Collection Schedule for the 2016-2017 WNC
5 margin revenue deficiency (under collection) during the 2017-2018
6 Winter Period; and
- 7 • Schedule DMP-WNC-4: Summary Schedule of WNC Calculation for
8 the Annual Period October 1, 2017 to September 30, 2018.

9 **Q. Has PSE&G provided an earnings test as part of this Petition?**

10 A. No. The purpose of the earnings test is to ensure that the WNC does not
11 permit the Company to recover any portion of a margin revenue deficiency that
12 would cause the Gas Utility to earn in excess of its allowed rate of return on
13 common equity for the Annual Period.

14 The test of earnings described in PSE&G's WNC Tariff is unnecessary when
15 the calculated margin revenues for the Annual Period result in an excess to be
16 refunded to the customers, as is the case for the 2017-2018 Winter Period.

1 **Q. Please describe the Weather Normalization Charge.**

2 A. The Company's WNC is a rate mechanism that, in general, mitigates the
3 financial effect of variations from the normal weather on which base rates are
4 set, on both the company and its customers receiving service under the RSG,
5 GSG, and LVG rate schedules. Variances in actual degree days from normal
6 for each day are measured and accumulated over the calendar-month for each
7 month in the Winter Period. These monthly variances are adjusted for a degree
8 day dead band which is ½% of the normal calendar-month degree days. The
9 resulting cumulative degree day variance, along with the trued-up degree day
10 consumption factors, determines, along with any prior WNC balances, the
11 adjustment to customers' bills in the following Winter Period. This adjustment
12 is either a surcharge to collect a revenue deficiency as a result of warmer than
13 normal weather or a credit to customers to refund the excess revenues collected
14 as a result of colder than normal weather.

15 In accordance with B.P.U.N.J. No. 15 Gas Tariff Sheets Nos. 45, 46, 47
16 (WNC Tariff), the Company has updated the number of base customers and
17 therms per degree day by rate class, and calculated the margin revenue used in
18 determining the (excess) or deficient margin revenues for the 2017-2018 Winter
19 Period.

1 **Q. How is the 2017-2018 WNC excess calculated?**

2 A. In accordance with the WNC Tariff, the Company has calculated the level by
3 which margin revenues differed from what would have resulted if normal
4 weather occurred for the 2017-2018 Winter Period. The normalized degree day
5 variance produced a margin revenue excess of \$(8,846,178) during the 2017-
6 2018 Winter Period due to overall colder than normal weather. This calculation
7 is set forth on Schedule DMP-WNC-1.

8 There are three (3) steps to this process as shown in Schedule DMP-
9 WNC-1. These are:

- 10 • Step 1: Determination of the degree day variance after the ½% dead band
11 adjustment.
- 12 • Step 2: Determination of the normalized volumes by rate class, by
13 multiplying the (excess)/deficient degree day variance by the
14 trued-up consumption factors to determine the (excess)/deficient
15 volumes.
- 16 • Step 3: Calculation of the Margin Revenue Deferral prior to application of
17 the earnings test, by multiplying the (excess)/deficient volumes by
18 the Margin Revenue Factor in effect for each of the rate classes,
19 for each month from October through May.

20 In addition, if the calculation above results in a margin revenue deficiency, the
21 Company would apply the WNC Earnings Test.

1 In applying the Margin Revenue Factor in Step 3, the factor changed effective
2 January 1, 2018 due to the BPU's approved roll-in of GSMP. In addition, we
3 reduced the Margin Revenue Factor effective on January 1, 2018 to incorporate
4 the reduction of the federal income tax rate from 35% to 21% as a result of the
5 Tax Cuts and Jobs Act of 2017. Although the actual tariff rates did not change
6 until approved effective April 1, 2018, the Company is required to refund the
7 over-collection of rates from January 1, 2018 through March 31, 2018, the
8 method of which will be determined in PSE&G's current base rate case. By
9 applying the pro forma reduction to the Margin Revenue Factor effective
10 January 1, 2018, we effectively consider the rate reduction in this calculation.

11 **Q. Are there any other adjustments necessary for the calculation of the 2017-**
12 **2018 WNC deferral and recovery request?**

13 A. Yes, PSE&G has made one (1) other adjustment to the 2017-2018 Winter
14 Period margin revenue excess in order to calculate the amount to be collected
15 from ratepayers over the 2018-2018 Winter Period.

1 **Q. Please describe the adjustment required to calculate the total 2017-2018**
2 **WNC.**

3 A. In Docket No. GR17060720, the Board approved the collection of
4 \$54,738,895, of which \$31,882,242 was to be recovered over the 2017-2018
5 Winter Period (“Part I”) with the remaining deficiency of \$22,856,653 to be
6 recovered over the 2018-2019 Winter Period (“Part II”). The full recovery of
7 the \$54,738,895 was limited for the 2017-2018 Winter Period due to the
8 application of the 3% rate cap. The Company collected \$31,627,623 of the
9 anticipated Part I amount of \$31,882,242 resulting in a balance of \$254,619 to
10 be carried over and added to the Part II amount of \$22,856,653. As such, this
11 computes to \$23,111,272 (\$254,619 plus \$22,856,653) of remaining deficiency
12 from the 2016-2017 Winter Period to be collected from customers over the
13 2018-2019 Winter Period. Please refer to DMP-WNC-3 for a schedule of the
14 monthly collection of the prior years’ WNC deficiency margin during the
15 2017-2018 Period. This remaining deficiency will offset the 2017-2018
16 revenue margin excess of (\$8,846,178). Therefore, the net total to be collected
17 from customers during the 2018-2019 Winter Period amounts to \$14,265,094
18 (sum of \$23,111,272 less \$8,846,178). This calculation is summarized on
19 DMP-WNC-4.

1 **Q. Please summarize the results of your calculations and adjustments.**

2 A. Based on the Board-approved method for calculating the WNC, the Company
3 respectfully requests approval to recover \$14,265,094, which will be recovered
4 over the 2018-2019 Winter Period. The specific rate impacts and calculations
5 relative to the 2018-2019 Winter Period will be discussed in the testimony of
6 Stephen Swetz.

7 **Q. Does this conclude your testimony in this matter?**

8 A. Yes.

PSE&G
Weather Normalization
2017-2018 Winter Period

Step 1: Determine the degree day variance from the dead band.

	Normal Degree Days	0.50% Dead Band	Dead Band		Actual Degree Days	Normalization Amount (1)
			Low End	High End		
October	249	1	248	250	110	138
November	515	3	512	517	552	(35)
December	819	4	815	823	934	(111)
January	1,000	5	995	1,005	1,040	(35)
February	839	4	834	843	664	171
March	682	3	679	686	779	(94)
April	358	2	356	359	481	(122)
May	127	1	126	127	67	59

Step 2: Determine the normalized volumes by rate class.

	Therms Per Degree Day (2)			Normalization Volumes (3)		
	RSG	GSG	LVG	RSG	GSG	LVG
October	109,808	41,224	88,531	15,188,643	5,702,104	12,245,608
November	204,570	30,078	88,531	(7,219,275)	(1,061,453)	(3,124,259)
December	256,296	47,448	88,531	(28,428,352)	(5,262,932)	(9,819,859)
January	247,437	63,085	88,946	(8,737,000)	(2,227,531)	(3,140,683)
February	252,109	60,510	88,946	42,992,148	10,318,770	15,167,961
March	246,813	60,309	88,946	(23,099,229)	(5,644,319)	(8,324,456)
April	224,112	49,187	88,946	(27,319,253)	(5,995,895)	(10,842,517)
May	174,709	31,095	88,946	10,335,784	1,839,580	5,262,045

Step 3: Calculate the margin revenue to be deferred.

Margin Revenue Deferral (4) and (5)

Margin Revenue Factor:	RSG	GSG	LVG	
October 2017- December 2017	0.308969	0.252488	0.040966	
January 2018 - May 2018	0.300343	0.247071	0.039772	Total
October	\$ 4,685,170	\$ 1,439,713	\$ 501,654	\$ 6,626,536
November	\$ (2,240,302)	\$ (268,004)	\$ (127,988)	\$ (2,636,294)
December	\$ (8,823,405)	\$ (1,328,827)	\$ (402,280)	\$ (10,554,513)
January	\$ (2,642,645)	\$ (550,358)	\$ (124,911)	\$ (3,317,915)
February	\$ 13,004,019	\$ 2,549,469	\$ 603,260	\$ 16,156,748
March	\$ (6,960,685)	\$ (1,394,548)	\$ (331,080)	\$ (8,686,313)
April	\$ (8,317,362)	\$ (1,481,412)	\$ (431,229)	\$ (10,230,002)
May	\$ 3,131,786	\$ 454,507	\$ 209,282	\$ 3,795,575
Winter Period Total	\$ (8,071,456)	\$ (579,461)	\$ (103,293)	\$ (8,846,178)

Step 3: Calculate the margin revenue to be deferred.

Recovery of any amount that would cause the company to earn in excess of the allowed ROE (10.3%) is prohibited.

(1) Amount above or below the Dead Band

(2) Consumption factors to be true-up at the end of the Winter Period for actual # of customers.

(3) Normalization degree days x Therms Per Degree Day

(4) Normalization Volumes x Margin Revenue Factor

(5) Effective January 1, 2018, the Margin Revenue Factor was updated to include the lower Federal Tax Rate and the

Not Applicable

PSE&G
Collection Schedule for Prior Years' Winter Period Undercollections
Effective for the period June 1, 2017 to September 30, 2018

	\$	
2016 -2017 Deficiency allowed for recovery in the 2017-2018 Winter Period due to application of 3% rate cap	(a) \$ 31,882,242	
Approved Carryover Deficiency to 2018-2019 Winter Period	<u>\$ 22,856,653</u>	
Under-collected beginning balance	<u>\$ 54,738,895</u>	Approved Per BPU Docket No. GR17060720
Amounts refunded to/(collected from) customers per month:	3,199.02	
Jun-17	(5,261.12)	
Jul-17	(312.62)	
Aug-17	193.93	
Sep-17	1,476.78	
Oct-17	(2,204,420.03)	
Nov-17	(5,915,558.74)	
Dec-17	(9,960,429.10)	
Jan-18	(7,106,994.76)	
Feb-18	(6,129,276.86)	
Mar-18	(311,564.55)	
Apr-18	1,324.82	
May-18	\$0	
Jun-18	\$0	
Jul-18	\$0	
Aug-18	\$0	
Sep-18	\$0	
	<u>(b) (\$31,627,623)</u>	
Remaining amount to be collected for the 2017- 2018 Winter Period	(c) \$254,619	(a) plus (b)
Approved 2016 - 2017 Carryover Deficiency to 2018-2019 Winter Period	(d) \$22,856,653	
Remaining amount to be collected from customers	<u>\$23,111,272</u>	(c) plus (d)
	<u>To Schedule DMP-WNC-4</u>	

PSE&G
Weather Normalization Summary Schedule
Annual Period October 1, 2017 to September 30, 2018

Schedule Reference

2017-2018 Winter Period Total WNC Revenue Excess	\$ (8,846,178) (a)	DMP-WNC-1
Remaining balance from the 2016-2017 WNC, to be collected during 2018-2019 Winter Period	<u>\$23,111,272 (b)</u>	DMP-WNC-3
Total WNC Balance to be Collected	<u>\$ 14,265,094 (c)</u>	(a) + (b)

1 **PUBLIC SERVICE ELECTRIC AND GAS COMPANY**
2 **DIRECT TESTIMONY**
3 **OF**
4 **STEPHEN SWETZ**
5 **SENIOR DIRECTOR - CORPORATE RATES AND REVENUES**
6 **REQUIREMENTS**
7

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

9 A. My name is Stephen Swetz. My business address is 80 Park Plaza, T-8,
10 Newark, New Jersey 07102.

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

12 A. I am the Senior Director - Corporate Rates and Revenues Requirements, PSEG
13 Services Corporation. My credentials are set forth in the attached Schedule
14 SS-WNC-1.

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to discuss Public Service Electric and Gas
17 Company's (PSE&G, the Company) derivation of the Weather Normalization
18 Charge (WNC) to be applied during the Winter Period of October 1, 2018
19 through May 31, 2019 to the Company's Residential Service (RSG), General
20 Service (GSG) and Large Volume Service (LVG) rate schedules.

1 **Q. Does your testimony include any schedules?**

2 A. Yes. My testimony includes Schedule SS-WNC-1, which contains my
3 qualifications. Schedule SS-WNC-2 details the calculation of the 3% WNC
4 rate cap limit based upon the RSG total per therm rate.

5 **Q. Please describe the WNC mechanism.**

6 A. As set forth in the Testimony of PSE&G Witness Stephen A. Wreschnig, the
7 Company's WNC is a rate mechanism that, in general, mitigates the financial
8 effect of variations from the normal weather on which rates are set on both the
9 Company and its customers in RSG, GSG and LVG Rate Schedules.
10 Variances in actual degree days from normal for each day are accumulated for
11 each month of the Winter Period (October through May). These variances are
12 adjusted for a degree day dead band, which is 1/2% of the normal calendar
13 month degree days. The resulting cumulative degree day variance, along with
14 the trued-up Degree Day Consumption Factors and Margin Revenue Factors,
15 determine the Margin Revenue Deferral. This Margin Revenue Deferral is
16 either a charge to collect a revenue deficiency as a result of warmer than
17 normal weather or a credit to customers to refund the excess revenues collected
18 as a result of colder than normal weather.

1 As shown in Donna M. Powell's Testimony, Schedule DMP-WNC-1, the
2 Margin Revenue calculation indicates a margin excess for the 2017-2018
3 Winter Period of (\$8,846,178).

4 **Q. Are there any other calculations necessary for the determination of the**
5 **2018-2019 WNC recovery request?**

6 A. As shown in Donna M. Powell's Testimony, Schedule DMP-WNC-3 and
7 Schedule DMP-WNC-4, the margin excess from this 2017-2018 Winter Period
8 is offset by a 2016-2017 carryover deficiency of \$22,856,653 and the remaining
9 amount to be collected for the 2017-2018 Winter Period of \$254,619. The total
10 WNC balance to be collected after these adjustments is \$14,265,094 as shown
11 in Schedule DMP-WNC-4.

12 **Q. Are there any other limitations on the setting of the WNC?**

13 A. As stated in Section II of the Company's proposed WNC Tariff Sheet 47
14 (Attachement 4), "the Weather Normalization Charge will at no time exceed
15 three (3%) percent of the then applicable RSG total per therm rate, including
16 BGSS - RSG charges and 64.56 % of the Balancing Charge." As a result of this
17 years excess deferral and the addition of the remaining balance from the 2016-
18 2017 WNC, there is no 3% cap application since the result is a rate lower than a
19 WNC of \$0.023729 with SUT per therm (\$0.022255 per therm without SUT)
20 rate as shown in Schedule SS-WNC-2.

1 **Q. How is the 3% WNC rate cap limit calculated?**

2 A. As shown in Schedule SS-WNC-2, the total per therm rate after applying the
 3 effective annualized balancing charge equates to \$0.790979 (with SUT) per
 4 therm. The 3% rate cap limit results in a WNC \$0.023729 per therm with SUT
 5 (\$0.022255 per therm without SUT). As a result of this years excess deferral and
 6 the addition of the remaining balance from the 2016-2017 WNC, there is no 3%
 7 cap application since the result is a rate lower than the proposed WNC.

8 **Q. Please show the WNC calculation.**

9 A. The WNC calculation is shown below:

1	Recovery Request for 2017-2018 Winter Period (Schedule SS-WNC-2)	\$14,265,094
2	Forecasted Balancing Therms (Schedule SAW-WNC-4)	1,474,321,226
3=1/2	Weather Normalization Charge (per Balancing Therm)	\$0.009676
4=3*1.06625	Weather Normalization Charge (Including Sales and Use Tax (SUT))	\$0.010317

10 **Q. Please define the PSE&G proposal to implement the WNC for the 2018-2019**
 11 **annual period.**

12 A. As a result of these calculations, PSE&G proposes a WNC of \$0.009676
 13 without SUT (\$0.010317 with SUT) per balancing therm applicable to Rate
 14 Schedules RSG, GSG and LVG for the 2018-2019 Winter Period.

15 **Q. Does this conclude your testimony?**

16 A. Yes.

1 contributed to other filings including unbundling electric rates and Off-Tariff Rate
2 Agreements. I have had a leadership role in various economic analyses, asset valuations,
3 rate design, pricing efforts and cost of service studies.

4 I am an active member of the American Gas Association's Rate and
5 Strategic Issues Committee, the Edison Electric Institute's Rates and Regulatory Affairs
6 Committee and the New Jersey Utility Association (NJUA) Finance and Regulatory
7 Committee.

8 **EDUCATIONAL BACKGROUND**

9 I hold a B.S. in Mechanical Engineering from Worcester Polytechnic
10 Institute and an MBA from Fairleigh Dickinson University.

LIST OF PRIOR TESTIMONIES

Company	Utility	Docket	Testimony	Date	Case / Topic
Public Service Electric & Gas Company	E/G	EO18060629 - GO18060630	written	Jun-18	Energy Strong II / Revenue Requirements & Rate Design
Public Service Electric & Gas Company	G	GR18060605	written	Jun-18	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER18030231	written	Mar-18	Tax Cuts and Job Acts of 2017
Public Service Electric & Gas Company	E/G	GR18020093	written	Feb-18	Remediation Adjustment Charge-RAC 25
Public Service Electric & Gas Company	E/G	ER18010029 and GR18010030	written	Jan-18	Base Rate Proceeding / Cost of Service & Rate Design
Public Service Electric & Gas Company	E	ER17101027	written	Sep-17	Energy Strong / Revenue Requirements & Rate Design
Public Service Electric & Gas Company	G	GR17070776	written	Jul-17	Gas System Modernization Program II (GSMP II)
Public Service Electric & Gas Company	G	GR17070775	written	Jul-17	Gas System Modernization Program (GSMP) - Second Roll-In
Public Service Electric & Gas Company	G	GR17060720	written	Jul-17	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER17070724 - GR17070725	written	Jul-17	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, S4AEXT II, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER17070723	written	Jul-17	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR17060593	written	Jun-17	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER17030324 - GR17030325	written	Mar-17	Energy Strong / Revenue Requirements & Rate Design - Sixth Roll-in
Public Service Electric & Gas Company	E/G	EO14080897	written	Mar-17	Energy Efficiency 2017 Program
Public Service Electric & Gas Company	E	ER17020136	written	Feb-17	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E/G	GR16111064	written	Nov-16	Remediation Adjustment Charge-RAC 24
Public Service Electric & Gas Company	E	ER16090918	written	Sep-16	Energy Strong / Revenue Requirements & Rate Design - Fifth Roll-in
Public Service Electric & Gas Company	E	EO16080788	written	Aug-16	Construction of Mason St Substation
Public Service Electric & Gas Company	E	ER16080785	written	Aug-16	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	G	GR16070711	written	Jul-16	Gas System Modernization Program (GSMP) - First Roll-In
Public Service Electric & Gas Company	G	GR16070617	written	Jul-16	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER16070613 - GR16070614	written	Jul-16	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER16070616	written	Jul-16	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR16060484	written	Jun-16	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E	EO16050412	written	May-16	Solar 4 All Extension II (S4AllExt II) / Revenue Requirements & Rate Design
Public Service Electric & Gas Company	E/G	ER16030272 - GR16030273	written	Mar-16	Energy Strong / Revenue Requirements & Rate Design - Fourth Roll-in
Public Service Electric & Gas Company	E/G	GR15111294	written	Nov-15	Remediation Adjustment Charge-RAC 23
Public Service Electric & Gas Company	E	ER15101180	written	Sep-15	Energy Strong / Revenue Requirements & Rate Design - Third Roll-in
Public Service Electric & Gas Company	E/G	ER15070757-GR15070758	written	Jul-15	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER15060754	written	Jul-15	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR15060748	written	Jul-15	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	G	GR15060646	written	Jun-15	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER15050558	written	May-15	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER15050558	written	May-15	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER15030389-GR15030390	written	Mar-15	Energy Strong / Revenue Requirements & Rate Design - Second Roll-in
Public Service Electric & Gas Company	G	GR15030272	written	Feb-15	Gas System Modernization Program (GSMP)
Public Service Electric & Gas Company	E/G	GR14121411	written	Dec-14	Remediation Adjustment Charge-RAC 22
Public Service Electric & Gas Company	E/G	ER14091074	written	Sep-14	Energy Strong / Revenue Requirements & Rate Design - First Roll-in
Public Service Electric & Gas Company	E/G	EO14080897	written	Aug-14	EEE Ext II
Public Service Electric & Gas Company	G	ER14070656	written	Jul-14	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER14070651-GR14070652	written	Jul-14	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER14070650	written	Jul-14	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR14050511	written	May-14	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	GR14040375	written	Apr-14	Remediation Adjustment Charge-RAC 21
Public Service Electric & Gas Company	E/G	ER13070603-GR13070604	written	Jun-13	Green Programs Recovery Charge (GPRC)-Including DR, EEE, EEE Ext, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E	ER13070605	written	Jul-13	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR13070615	written	Jun-13	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	G	GR13060445	written	May-13	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	EO13020155-GO13020156	written/oral	Mar-13	Energy Strong / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GO12030188	written/oral	Mar-13	Appliance Service / Tariff Support
Public Service Electric & Gas Company	E	ER12070599	written	Jul-12	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER12070606-GR12070605	written	Jul-12	RRGI Recovery Charges (RRC)-Including DR, EEE, EEE Ext, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E	EO12080721	written/oral	Jul-12	Solar Loan III (SLIII) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO12080721	written/oral	Jul-12	Solar 4 All Extension(S4AllExt) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GR12060489	written	Jun-12	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	G	GR12060583	written	Jun-12	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER12030207	written	Mar-12	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER12030207	written	Mar-12	Non-Utility Generation Charge (NGC) / Cost Recovery

LIST OF PRIOR TESTIMONIES

Company	Utility	Docket	Testimony	Date	Case / Topic
Public Service Electric & Gas Company	G	GR11060338	written	Jun-11	Margin Adjustment Charge (MAC) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GR11060395	written	Jun-11	Weather Normalization Charge / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO11010030	written	Jan-11	Economic Energy Efficiency Extension (EEEext) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	ER10100737	written	Oct-10	RGGI Recovery Charges (RRC)-Including DR, EEE, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E/G	ER10080550	written	Aug-10	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER10080550	written	Aug-10	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	E/G	GR09050422	written/oral	Mar-10	Base Rate Proceeding / Cost of Service & Rate Design
Public Service Electric & Gas Company	E	ER10030220	written	Mar-10	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	E	EO09030249	written	Mar-09	Solar Loan II(SLII) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	EO09010056	written	Feb-09	Economic Energy Efficiency(EEE) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO09020125	written	Feb-09	Solar 4 All (S4All) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO08080544	written	Aug-08	Demand Response (DR) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	ER10100737	written	Jun-08	Carbon Abatement (CA) / Revenue Requirements & Rate Design - Program Approval

Weather Normalization Clause
2018-2019 WNC Rate Cap Calculation

<u>Residential Service (RSG)</u>	Service Chg with SUT	Per Therm Charges as of 6/01/18 with SUT
Service Charge	\$5.82	
Distribution Charge		\$0.320241
Societal Benefits Charge (SBC)		\$0.044485
Green Programs Recovery Charge (GPRC)		\$0.005932
Margin Adjustment Charge (MAC)		-\$0.006758
Capital Adjustment Charge (CAC)		
Service Charge	\$0.00	
Distribution Charge		\$0.000000
Margin Adjustment Charge (MAC)		\$0.000000
BGSS-RSG		<u>\$0.368938</u>
Subtotal	\$5.82	<u>\$0.732838</u>
(1) Effective Annualize Balancing Charge		<u>\$0.058141</u>
Total per therm rate		<u>\$0.790979</u>
Weather Normalization Charge Cap %		3.00%
Weather Normalization Charge Cap with SUT		<u>\$0.023729</u>
Weather Normalization Charge Cap without SUT		<u>\$0.022255</u>
Total Forecasted Balancing Therms Per 2018 Schedule SAW-WNC-4		1,474,321,226
Amount allowed to recover in 2018-2019 Winter Period based on 3% WNC Rate Cap and Forecasted Balancing Therms		<u>\$32,811,019</u>
(1) Balancing Charge Ratio From 2018 SAW-WNC-5	Balancing Charge w SUT	Effective Annualized Balancing Charge
64.56%	\$0.090052	<u>\$0.058141</u>

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

XXX Revised Sheet No. 45

B.P.U.N.J. No. 15 GAS

**Superseding
XXX Revised Sheet No. 45**

WEATHER NORMALIZATION CHARGE

**CHARGE APPLICABLE TO
RATE SCHEDULES RSG, GSG, LVG
(Per Balancing Therm)**

	Weather Normalization Charge	Weather Normalization Charge including SUT
October 1, 2018 through May 31, 2019	\$0.009676	\$0.010317
June 1, 2019 through September 30, 2019	\$0.000000	\$0.000000

Weather Normalization Charge

This charge shall be applicable to the rate schedules listed above. The weather normalization charge applied in each Winter Period shall be based on the differences between actual and normal weather during the preceding winter period. The weather normalization charge shall be determined as follows:

I. DEFINITION OF TERMS AS USED HEREIN

1. Degree Days (DD)

- the difference between 65°F and the mean daily temperature for the day. The mean daily temperature is the simple average of the 24 hourly temperature observations for a day.

2. Actual Calendar Month Degree Days

- the accumulation of the actual Degree Days for each day of a calendar month.

3. Normal Calendar Month Degree Days

- the level of calendar month degree days to which this clause applies.

The normal calendar month Degree Days used in this clause will be the twenty-year average of the National Oceanic and Atmospheric Administration (NOAA) First Order Weather Observation Station at the Newark airport and will be updated annually in the Weather Normalization Clause (WNC) proceeding. The base level of normal degree days for the defined winter period months for the 2018-2019 Winter Period are set forth in the table below:

Normal Degree Days	
Oct - 18	240.16
Nov - 18	510.58
Dec - 18	823.87
Jan - 19	989.26
Feb - 19	836.38
Mar - 19	685.38
Apr - 19	350.33
May - 19	125.95

4. Winter Period

- shall be the eight consecutive calendar months from October of one calendar year through May of the following calendar year.

Date of Issue:

Issued by SCOTT S. JENNINGS, Vice President Finance – PSE&G
80 Park Plaza, Newark, New Jersey 07102
Filed pursuant to Order of Board of Public Utilities dated
in Docket No.

Effective:

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

XXX Revised Sheet No. 46

B.P.U.N.J. No. 15 GAS

**Superseding
XXX Revised Sheet No. 46**

**WEATHER NORMALIZATION CHARGE
(Continued)**

5. Degree Day Dead Band

- shall be one-half (1/2 %) percent of the sum of the cumulative Normal Calendar Month Degree Days for the Winter Period and shall be allocated to each winter month in the same proportion as the ratio of the normal degree days for that month to the total normal degree days.

6. Degree Day Consumption Factors

- the use per degree day component of the gas sales equations by month used in forecasting firm gas sales for the applicable rate schedules. These factors will be updated annually in the WNC proceeding. Degree day Consumption Factors for the 2018-2019 Winter Period are set forth below and presented as therms per degree day:

Month	RSG-Residential		Commercial			Industrial		
	Heating	Non-Heating	GSG		LVG	GSG		LVG
			Heating	Non-Heating		Heating	Non-Heating	
Oct.-18	112,333	2,969	21,899	1,382	79,478	551	-	6,733
Nov.-18	204,207	8,296	28,876	2,623	79,478	1,079	118	6,733
Dec.-18	247,265	10,926	36,712	3,518	79,478	1,372	185	6,733
Jan.-19	262,255	11,336	41,391	3,791	79,926	1,965	215	6,746
Feb.-19	272,434	11,252	45,573	3,897	79,926	1,589	225	6,746
Mar.-19	271,030	12,060	47,137	3,978	79,926	2,105	237	6,746
Apr.-19	246,404	12,334	41,131	4,066	79,926	1,338	212	6,746
May-19	169,357	9,897	29,934	4,128	79,926	733	173	6,746

The consumption factors established in advance of each Winter Period shall be based on the forecast number of customers by rate schedule. These factors shall be trued-up at the end of the Winter Period for which the factors apply in order to reflect the actual average number of customers by rate schedule.

7. Margin Revenue Factor

- the weighted average of the Distribution Charges as quoted in the individual rate schedules to which this clause applies net of applicable taxes. The weighted average shall be determined by multiplying the margin revenue component of the Distribution Charges of each rate schedule to which this clause applies by each rate schedule's percentage of total consumption of all the rate schedules to which this clause applies for the winter period and summing this result for all the rate schedules to which this clause applies. The Margin Revenue Factors shall be redetermined each time new base rates are put into effect.

Margin Revenue Factors:

Rate Schedule RSG	\$0.300343
Rate Schedule GSG	\$0.247071
Rate Schedule LVG	\$0.039772

8. Annual Period

- shall be the 12 consecutive months from October 1 of one calendar year through September 30 of the following calendar year.

9. Average 13 Month Common Equity Balance

- shall be calculated by adding the Net Gas Utility Plant in Service (Gas Plant in Service less Accumulated Depreciation Reserve) at the beginning of the Annual Period (i.e., October 1) and the month ending balances for each of the twelve months in the Annual Period divided by thirteen (13), and multiplying by 40.88% (ratio of equity component of the Company's capital structure to net plant in service from most recent base rate case).

Date of Issue:

Issued by SCOTT S. JENNINGS, Vice President Finance – PSE&G
80 Park Plaza, Newark, New Jersey 07102
Filed pursuant to Order of Board of Public Utilities dated
in Docket No.

Effective:

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

B.P.U.N.J. No. 15 GAS

XXX Revised Sheet No. 47

Superseding

XXX Revised Sheet No. 47

**WEATHER NORMALIZATION CHARGE
(Continued)**

II. DETERMINATION OF THE WEATHER NORMALIZATION RATE

At the end of the Winter Period during the Annual Period, a calculation shall be made that determines for all months of the Winter Period the level by which margin revenues differed from what would have resulted if normal weather (as determined by reference to the Degree Day Dead Band) occurred. This calculation is made by multiplying the monthly Degree Day Consumption Factor by the difference between Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, and Actual Calendar Month Degree Days and, in turn, multiplying the result by the Margin Revenue Factor. To the extent the Actual Calendar Month Degree Days exceeds Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, an excess of margin revenues exist. To the extent Actual Calendar Month Degree Days were less than Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, a deficiency of marginal revenue exists. The sum of the monthly calculations represents the total revenue excess or deficiency for the Winter Period. If, at the end of the Winter Period of the Annual Period, the degree day variation from normal weather is less than the Degree Day Dead Band, the weather normalization clause will not be in effect.

The WNC shall not operate to permit the Company to recover any portion of a margin revenue deficiency that will cause the Gas Utility to earn in excess of its allowed rate of return on common equity of 10.3% for the Annual Period; any portion which is not recovered shall not be deferred. For purposes of this section, the Gas Utility's rate of return on common equity shall be calculated by dividing the Gas Utility's regulated jurisdictional net income for the Annual Period by the Gas Utility's average 13 month common equity balance for such Annual Period. The Gas Utility's regulated jurisdictional net income shall be calculated by subtracting from total net income of the Gas Utility net income derived from clause mechanisms (Green Programs Recovery Charge, Capital Adjustment Charge, etc) that provide for a return on investment outside of base rates.

The total WNC balance at September 30 of the Annual Period shall be divided by the estimated applicable balancing therm sales from the rate schedules subject to this clause for the Annual Period over which this rate will be in effect, multiplied by a factor to adjust for increases in taxes and assessments. The product of this calculation shall be the Weather Normalization Charge. However, the Weather Normalization Charge will at no time exceed three (3%) percent of the then applicable RSG total per therm rate, including RSG-BGSS charges and 64.56% of the Balancing Charge. To the extent that the effect of this rate cap precludes the Company from fully recovering the WNC balance for the Annual Period, the unrecovered balance will be added to the WNC balance used to calculate the weather normalization rate for the next Winter Period. The Weather Normalization Charge, so calculated, will be in effect for the immediately following Annual Period.

III. TRACKING THE OPERATION OF THE WEATHER NORMALIZATION CLAUSE

The revenues billed, or credits applied, net of taxes and assessments, through the application of the Weather Normalization Charge shall be accumulated for each month of the Winter Period when this charge is in effect and applied against the margin revenue excess or deficiency from the immediately preceding Winter Period and any cumulative balances remaining from prior Winter Periods.

The annual filing for the adjustment to the weather normalization charge will be filed by July 1 of each year.

Date of Issue:

Issued by SCOTT S. JENNINGS, Vice President Finance – PSE&G
80 Park Plaza, Newark, New Jersey 07102
Filed pursuant to Order of Board of Public Utilities dated
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Effective:

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

XXX Revised Sheet No. 45

B.P.U.N.J. No. 15 GAS

Superseding
XXX Revised Sheet No. 45

WEATHER NORMALIZATION CHARGE

**CHARGE APPLICABLE TO
RATE SCHEDULES RSG, GSG, LVG
(Per Balancing Therm)**

	Weather Normalization Charge	Weather Normalization Charge including SUT
October 1, 2017 2018 through May 31, 2018 2019	\$0.021647 0.009676	\$0.023081 0.010317
June 1, 2018 2019 through September 30, 2018 2019	\$0.000000	\$0.000000

Weather Normalization Charge

This charge shall be applicable to the rate schedules listed above. The weather normalization charge applied in each Winter Period shall be based on the differences between actual and normal weather during the preceding winter period. The weather normalization charge shall be determined as follows:

I. DEFINITION OF TERMS AS USED HEREIN

1. Degree Days (DD)

- the difference between 65°F and the mean daily temperature for the day. The mean daily temperature is the simple average of the 24 hourly temperature observations for a day.

2. Actual Calendar Month Degree Days

- the accumulation of the actual Degree Days for each day of a calendar month.

3. Normal Calendar Month Degree Days

- the level of calendar month degree days to which this clause applies.

The normal calendar month Degree Days used in this clause will be the twenty-year average of the National Oceanic and Atmospheric Administration (NOAA) First Order Weather Observation Station at the Newark airport and will be updated annually in the Weather Normalization Clause (WNC) proceeding. The base level of normal degree days for the defined winter period months for the ~~2017~~~~2018~~-~~2018~~-~~2019~~ Winter Period are set forth in the table below:

	<u>Normal</u>	<u>Degree Days</u>
Oct - 4718	249.24	240.16
Nov - 4718	544.57	510.58
Dec - 4718	849.31	823.87
Jan - 4819	999.69	989.26
Feb - 4819	838.55	836.38
Mar - 4819	682.31	685.38
Apr - 4819	357.52	350.33
May - 4819	126.62	125.95

4. Winter Period

- shall be the eight consecutive calendar months from October of one calendar year through May of the following calendar year.

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**Superseding
XXX Revised Sheet No. 46**

**WEATHER NORMALIZATION CHARGE
(Continued)**

5. Degree Day Dead Band

- shall be one-half (1/2 %) percent of the sum of the cumulative Normal Calendar Month Degree Days for the Winter Period and shall be allocated to each winter month in the same proportion as the ratio of the normal degree days for that month to the total normal degree days.

6. Degree Day Consumption Factors

- the use per degree day component of the gas sales equations by month used in forecasting firm gas sales for the applicable rate schedules. These factors will be updated annually in the WNC proceeding. Degree day Consumption Factors for the 2017-2018-2018-2019 Winter Period are set forth below and presented as therms per degree day:

Month	RSG-Residential		Commercial			Industrial		
	Heating	Non-Heating	GSG		LVG	GSG		LVG
			Heating	Non-Heating		Heating	Non-Heating	
Oct.- <u>1718</u>	-406,936 <u>112,333</u>	2,872 <u>2,969</u>	39,384 <u>21,899</u>	1,295 <u>1,382</u>	81,860 <u>79,478</u>	545 <u>551</u>	-	-6,674 <u>6,733</u>
Nov.- <u>1718</u>	-195,957 <u>204,207</u>	8,613 <u>8,296</u>	26,279 <u>28,876</u>	2,609 <u>2,623</u>	81,860 <u>79,478</u>	1,075 <u>1,079</u>	115 <u>118</u>	6,674 <u>6,733</u>
Dec.- <u>1718</u>	-244,471 <u>247,265</u>	-11,825 <u>10,926</u>	42,337 <u>36,712</u>	3,494 <u>3,518</u>	81,860 <u>79,478</u>	1,434 <u>1,372</u>	183 <u>185</u>	-6,674 <u>6,733</u>
Jan.- <u>1819</u>	235,679 <u>262,255</u>	11,758 <u>11,336</u>	57,050 <u>41,391</u>	3,782 <u>3,791</u>	82,274 <u>79,926</u>	2,039 <u>1,965</u>	244 <u>215</u>	6,672 <u>6,746</u>
Feb.- <u>1819</u>	240,480 <u>272,434</u>	11,629 <u>11,252</u>	54,776 <u>45,573</u>	3,874 <u>3,897</u>	82,274 <u>79,926</u>	1,638 <u>1,589</u>	222 <u>225</u>	-6,672 <u>6,746</u>
Mar.- <u>1819</u>	234,561 <u>271,030</u>	12,252 <u>12,060</u>	53,931 <u>47,137</u>	3,933 <u>3,978</u>	82,274 <u>79,926</u>	2,207 <u>2,105</u>	238 <u>237</u>	6,672 <u>6,746</u>
Apr.- <u>1819</u>	-210,553 <u>246,404</u>	13,559 <u>12,334</u>	43,545 <u>41,131</u>	4,109 <u>4,066</u>	-82,274 <u>79,926</u>	1,344 <u>1,338</u>	219 <u>212</u>	6,672 <u>6,746</u>
May- <u>1819</u>	164,748 <u>169,357</u>	9,961 <u>9,897</u>	25,772 <u>29,934</u>	4,446 <u>4,128</u>	82,274 <u>79,926</u>	710 <u>733</u>	167 <u>173</u>	6,672 <u>6,746</u>

The consumption factors established in advance of each Winter Period shall be based on the forecast number of customers by rate schedule. These factors shall be trued-up at the end of the Winter Period for which the factors apply in order to reflect the actual average number of customers by rate schedule.

7. Margin Revenue Factor

- the weighted average of the Distribution Charges as quoted in the individual rate schedules to which this clause applies net of applicable taxes. The weighted average shall be determined by multiplying the margin revenue component of the Distribution Charges of each rate schedule to which this clause applies by each rate schedule's percentage of total consumption of all the rate schedules to which this clause applies for the winter period and summing this result for all the rate schedules to which this clause applies. The Margin Revenue Factors shall be redetermined each time new base rates are put into effect.

Margin Revenue Factors:

Rate Schedule RSG	\$0.300343
Rate Schedule GSG	\$0.247071
Rate Schedule LVG	\$0.039772

8. Annual Period

- shall be the 12 consecutive months from October 1 of one calendar year through September 30 of the following calendar year.

9. Average 13 Month Common Equity Balance

- shall be calculated by adding the Net Gas Utility Plant in Service (Gas Plant in Service less Accumulated Depreciation Reserve) at the beginning of the Annual Period (i.e., October 1) and the month ending balances for each of the twelve months in the Annual Period divided by thirteen (13), and multiplying by 40.88% (ratio of equity component of the Company's capital structure to net plant in service from most recent base rate case).

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PUBLIC SERVICE ELECTRIC AND GAS COMPANY

B.P.U.N.J. No. 15 GAS

XXX Revised Sheet No. 47

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XXX Revised Sheet No. 47

**WEATHER NORMALIZATION CHARGE
(Continued)**

II. DETERMINATION OF THE WEATHER NORMALIZATION RATE

At the end of the Winter Period during the Annual Period, a calculation shall be made that determines for all months of the Winter Period the level by which margin revenues differed from what would have resulted if normal weather (as determined by reference to the Degree Day Dead Band) occurred. This calculation is made by multiplying the monthly Degree Day Consumption Factor by the difference between Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, and Actual Calendar Month Degree Days and, in turn, multiplying the result by the Margin Revenue Factor. To the extent the Actual Calendar Month Degree Days exceeds Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, an excess of margin revenues exist. To the extent Actual Calendar Month Degree Days were less than Normal Calendar Month Degree Days as adjusted for the Degree Day Dead Band, a deficiency of marginal revenue exists. The sum of the monthly calculations represents the total revenue excess or deficiency for the Winter Period. If, at the end of the Winter Period of the Annual Period, the degree day variation from normal weather is less than the Degree Day Dead Band, the weather normalization clause will not be in effect.

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The total WNC balance at September 30 of the Annual Period shall be divided by the estimated applicable balancing therm sales from the rate schedules subject to this clause for the Annual Period over which this rate will be in effect, multiplied by a factor to adjust for increases in taxes and assessments. The product of this calculation shall be the Weather Normalization Charge. However, the Weather Normalization Charge will at no time exceed three (3%) percent of the then applicable RSG total per therm rate, including RSG-BGSS charges and ~~63.5464.56~~ % of the Balancing Charge. To the extent that the effect of this rate cap precludes the Company from fully recovering the WNC balance for the Annual Period, the unrecovered balance will be added to the WNC balance used to calculate the weather normalization rate for the next Winter Period. The Weather Normalization Charge, so calculated, will be in effect for the immediately following Annual Period.

III. TRACKING THE OPERATION OF THE WEATHER NORMALIZATION CLAUSE

The revenues billed, or credits applied, net of taxes and assessments, through the application of the Weather Normalization Charge shall be accumulated for each month of the Winter Period when this charge is in effect and applied against the margin revenue excess or deficiency from the immediately preceding Winter Period and any cumulative balances remaining from prior Winter Periods.

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TYPICAL RESIDENTIAL GAS BILL IMPACTS

The effect of the proposed changes in the Weather Normalization Charge (WNC) on typical residential gas bills, if approved by the Board, is illustrated below:

Residential Gas Service					
If Your Monthly Winter Therm Use Is:	And Your Annual Therm Use Is:	Then Your Present Annual Bill (1) Would Be:	And Your Proposed Annual Bill (2) Would Be:	Your Annual Bill Change Would Be:	And Your Percent Change Would Be:
25	180	\$210.34	\$209.40	(\$0.94)	(0.45)%
50	360	350.73	348.81	(1.92)	(0.55)
100	610	558.56	553.85	(4.71)	(0.84)
159	1,000	870.44	862.79	(7.65)	(0.88)
165	1,010	879.16	871.36	(7.80)	(0.89)
200	1,224	1,050.55	1,041.10	(9.45)	(0.90)
300	1,836	1,540.92	1,526.75	(14.17)	(0.92)

- (1) Based upon Delivery Rates and Basic Gas Supply Service (BGSS-RSG) charges in effect June 1, 2018 (with WNC set at the rate that was in effect for the 2017-2018 Annual Period and assumes that the customer receives commodity service from Public Service.
- (2) Same as (1) except includes the proposed Weather Normalization Charge proposed to be in effect for the 2018-2019 Annual Period.

Residential Gas Service					
If Your Annual Therm Use Is:	And Your Monthly Winter Therm Use Is:	Then Your Present Monthly Winter Bill (3) Would Be:	And Your Proposed Monthly Winter Bill (4) Would Be:	Your Monthly Winter Bill Change Would Be:	And Your Percent Change Would Be:
180	25	\$26.06	\$25.85	(\$0.21)	(0.81)%
360	50	46.30	45.87	(0.43)	(0.93)
610	100	88.48	87.42	(1.06)	(1.20)
1,010	165	142.23	140.48	(1.75)	(1.23)
1,224	200	171.18	169.06	(2.12)	(1.24)
1,836	300	253.84	250.66	(3.18)	(1.25)

- (3) Based upon Delivery Rates and Basic Gas Supply Service (BGSS-RSG) charges in effect June 1, 2018 (with WNC set at the rate that was in effect for the 2017-2018 Annual Period) and assumes that the customer receives commodity service from Public Service.
- (4) Same as (3) except includes proposed Weather Normalization Charge proposed to be in effect for the 2018-2019 Annual Period.