EXH. KHX-1T
DOCKETS UE-22___/UG-22___
2022 PSE GENERAL RATE CASE
WITNESS: KELLY HUI XU

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-22____** **Docket UG-22____**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

KELLY HUI XU

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF KELLY HUI XU

CONTENTS

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF KELLY HUI XU

LIST OF EXHIBITS

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF KELLY HUI XU

I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy.

A. My name is Kelly Hui Xu, and my business address is Puget Sound Energy, Inc., P.O. Box 97034, Bellevue, Washington 98009-9734. I am employed by Puget Sound Energy ("PSE") as Senior Economic Forecasting Analyst.

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exh. KHX-2.

Q. What topics are you covering in your testimony?

A. My testimony addresses PSE's electric and gas temperature adjustment methodologies and results used to develop the pro forma electric and gas sales for the test year in this proceeding, twelve months ended June 2021.

II. ELECTRIC AND GAS SALES WEATHER NORMALIZATION

Q. Generally speaking, what is weather normalization and how does PSE perform its weather normalization?

A. Weather normalization is performed to adjust the test year sales volume so that the adjusted sales represent what the test year sales volume would have been if the weather had been normal. Weather normalization modifies the test year billing determinants and revenue requirements to be more representative of the average weather conditions expected when the rates proposed in this case go into effect.

PSE first analyzes the relationship between the energy use per customer by class and temperatures for a multi-year period and develops econometric models to measure temperature sensitivity of electric and gas energy usage per customer by class. Multivariate regression analysis is used to isolate the weather effects from other factors such as type of day (e.g., weekdays, weekends or holidays) and seasonal effects not related to temperature. The estimated model coefficients of temperature variables are called "weather sensitivity coefficients."

Then, PSE uses the weather sensitivity coefficients and "normal" weather data to convert the actual test year sales to normal sales. PSE calculates the normal weather data from actual historical temperature data reported at Seattle-Tacoma International Airport ("Sea-Tac") over the most recent 30-year period, which is from 1991 through 2020 for this case.

Q. Did PSE use the same weather normalization methodology in this case as the methodology approved in its last general rate case?

A. Yes. The methodology used in this case is the same temperature adjustment methodology that was ultimately approved in PSE's 2019 general rate case, Docket UE-190529, with modification. In its rebuttal testimony, PSE accepted each of Staff's recommendations for modifying its approach, and the methodology was uncontested in the 2019 general rate case.[1] Besides the agreed-upon modification, the modeling input data period was updated from the four-year period of 2012 through 2015 to the period of July 2017 through June 2021 and the daily electric energy usage history by customer and rate schedule was collected from the samples refreshed in December 2019.

Q. Did PSE make adjustments related to COVID-19 in weather normalization?

A. Yes. A non-weather related binary variable for COVID-19 was added to the multivariate regression analysis to isolate COVID effects from weather effects.

[1] *See WUTC v. Puget Sound Energy,* Dockets UE-190529/UG-190530, Order 08 at ¶ 55 (July 8, 2020).

A. Normal Versus Actual Test Year Weather

Q. Please describe the actual weather experienced during this proceeding's test year.

A. Measured by heating degree days ("HDD") using a 65˚F base,[2] Table 1 compares actual monthly HDDs in the test year and the previous nine years with the normal weather defined by the average values calculated for the most recent thirty years of 1991-2020. The hourly temperatures recorded at Sea-Tac were used to calculate daily average temperatures. The daily average temperatures were then converted to HDDs with a base temperature of 65˚F. Monthly total HDDs were obtained by summing the daily HDD for the month. For the test year, the overall weather, as measured by the sum of monthly total HDDs in July 2020 through June 2021, was significantly milder than normal. Exceptions were February and March 2021 when they were 9.0 percent and 4.2 percent colder than normal, respectively. Total number of test year HDDs was 4,386 and was 7.5 percent smaller than the annual sum of normal HDDs, 4,743.

[2] A heating degree day is a negative deviation in average daily temperature from the base of one degree for one day. For a base of 65˚F, heating degree days equal 65 minus the average daily temperature (if the average temperature is less than 65). If the average daily temperature is greater than 65, then the HDD is 0. Thus, one day that averages 35˚F would have 30 HDDs (using a base of 65˚F). Similarly, 30 days with an average temperature of 64˚F each day would also have 30 HDDs.

Table 1

Monthly History of HDD65, Jan. 2011 - Dec. 2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	30-Year Normal*	% Diff from Normal (7/2020-06/2021)
Jan	716	778	828	666	629	664	846	629	626	624	656	**712**	-7.8%
Feb	726	629	581	657	457	516	672	673	795	622	671	**615**	9.0%
Mar	624	684	539	536	456	510	603	589	541	646	614	**589**	4.2%
Apr	596	436	444	405	428	290	451	419	392	398	362	**450**	-19.5%
May	406	317	235	213	213	189	258	172	180	228	285	**283**	0.5%
Jun	199	220	77	126	44	123	125	125	114	143	100	**158**	-36.8%
Jul	80	68	23	21	8	34	19	17	24	47		**54**	-12.1%
Aug	44	31	8	13	18	32	5	25	8	22		**44**	-49.8%
Sep	96	110	114	63	165	137	102	117	116	68		**135**	-49.5%
Oct	412	360	432	239	260	340	389	366	445	348		**386**	-9.9%
Nov	659	550	519	583	636	428	564	494	561	566		**581**	-2.7%
Dec	788	733	774	624	694	841	781	653	634	647		**735**	-12.0%
Total	5,346	4,916	4,573	4,145	4,007	4,105	4,813	4,278	4,436	4,359		**4,743**	
% Diff. from Normal	12.7%	3.2%	-3.6%	-12.6%	-15.5%	-13.8%	1.5%	-9.8%	-6.5%	-8.5%			

*February normal value is shown for a non-leap year. Percent differences from normal for 2008, 2012, 2016 and 2020 are based on the leap-year normal value of 4,785 HDD's.
Normal weather values are 30-year average values for 1991-2020.

The deviation from normal weather was more substantial for some months. As shown in the last column of Table 1, the summer weather in August and September 2020 and June 2021 was 49.8 percent, 49.5 percent and 36.8 percent warmer than normal, respectively. These are summer months when there are low levels of heating degree days.

B. Temperature Adjustment of Electric Sales

Q. Please describe how the electric sales temperature adjustment was calculated.

A. PSE used weather sensitivity coefficients based on actual daily usage per customer by class and actual temperature data at Sea-Tac to adjust rate schedule (classes) sales for weather. The weather sensitivity coefficients were estimated by developing econometric model equations to characterize the relationship between

the temperature variables and the daily energy use per customer by class. The temperature variable coefficients of those equations vary by rate class. The data source for this step was a large sample of daily energy readings by rate schedule from PSE's automated meter reading database. The historical data period set for modeling is four-year period of July 2017 through June 2021.

PSE's "normal" weather dataset was developed using the hourly temperature data recorded at Sea-Tac over the 30-year period from 1991 through 2020 by calculating daily HDDs and cooling degree days ("CDD")[3] using several base temperatures (45˚F and 65˚F for HDDs; 60˚F and 65˚F for CDDs).

Then PSE calculates the temperature adjustment to monthly energy use per customer for each rate schedule by taking the temperature variable coefficients from the class model equation and multiplying them by the difference between the actual and normal HDDs and CDDs for the month.

Finally the monthly adjustment to class total sales was estimated by multiplying the monthly adjustment per customer calculated in the previous step by the actual number of customers by month and rate schedule.

[3] A Cooling Degree Day is calculated in the same way as a Heating Degree Day, except that it counts number of degrees above the base temperature.

Q. Were the changes to schedule 40 reflected in the electric sales weather normalization?

A. Yes. As approved in PSE's 2019 general rate case, Schedule 40 was closed in October 2020 and exiting customers under this schedule then migrated to the schedules that best fit their usage characteristics. The pro forma revenue adjustment presented in Exh. BDJ-3 in this proceeding is an allocation of those Schedule 40 customers' historical usage during the test year to their receiving schedules. For weather normalization, those Schedule 40 customers' test year sales were adjusted to their receiving schedules and normalized using the receiving schedules' coefficients.

Q. Please summarize the final results of rate schedule level electric sales weather normalization.

A. Table 2 below presents the temperature adjustment of electric sales by rate schedule. Besides the extreme warm weather in June 2021, July 2020 through September 2020 were significantly warmer than normal as well. The sum of monthly CDDs calculated with the base temperature of 60˚F in these four months was 781 and it was 51.5 percent higher than the thirty-year normal value of 516. It resulted the temperature normalization to lower sales for all rate schedules. Along with the warmer-than-normal summer, the winter and shoulder months in test year were also warmer than normal with the exception of February and March 2021. Consequently, the actual residential sales were increased by 183,160 MWh when the sales were temperature normalized for the warmer-than-normal weather. In

spite of the large decrease on sales in summer months, the warmer-than-normal winter weather slightly prevailed in the test year. Temperature normalization increased the test-year actual sales by one-hundredth of a percent.

Table 2

Temperature Adjustment of Test Year Electric Sales by Rate Schedule (MWH)

	Residential (Sch. 7, 17, 27, 37 & 47)			General Service (GS) (Sch. 8 & 24)			Small Demand GS (Sch. 7A, 11 & 25)		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	714,341	708,375	(5,967)	193,980	193,059	(920)	218,764	217,808	(957)
Aug-20	726,209	710,070	(16,139)	201,937	199,446	(2,491)	224,950	222,359	(2,591)
Sep-20	739,213	705,183	(34,031)	207,636	202,378	(5,258)	232,439	226,984	(5,455)
Oct-20	736,523	753,239	16,716	197,288	198,433	1,146	222,241	222,841	600
Nov-20	925,089	938,250	13,160	206,127	207,624	1,498	224,602	225,985	1,384
Dec-20	1,189,265	1,251,634	62,369	233,463	239,939	6,476	249,049	254,651	5,601
Jan-21	1,225,130	1,269,127	43,998	228,179	233,016	4,837	226,083	230,442	4,359
Feb-21	1,184,508	1,149,090	(35,418)	240,347	236,894	(3,453)	243,987	241,154	(2,833)
Mar-21	1,180,048	1,174,716	(5,331)	231,407	231,574	167	249,026	249,648	622
Apr-21	1,011,555	1,053,265	41,711	240,614	243,753	3,139	240,486	242,398	1,912
May-21	795,032	800,238	5,207	190,172	191,028	855	216,358	217,264	907
Jun-21	740,642	675,829	(64,813)	223,347	213,335	(10,011)	236,397	226,035	(10,363)
Total	11,167,555	11,189,016	21,461	2,594,495	2,590,480	(4,015)	2,784,383	2,777,568	(6,815)

	Large Demand GS (Sch. 12 & 26)			Primary GS (Sch. 10 & 31)			Interrupt. Primary GS for Schools (Sch. 43)		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	139,877	139,349	(528)	99,510	99,279	(231)	5,141	5,108	(34)
Aug-20	155,371	153,949	(1,422)	114,919	114,294	(625)	4,742	4,651	(91)
Sep-20	155,652	152,650	(3,002)	105,060	103,743	(1,316)	5,125	4,934	(191)
Oct-20	146,849	147,013	165	108,754	108,905	152	5,986	6,224	238
Nov-20	138,706	138,842	135	101,795	102,057	263	8,237	8,511	274
Dec-20	143,658	144,685	1,026	102,997	104,091	1,094	12,894	14,099	1,205
Jan-21	135,859	136,510	651	88,983	89,825	842	10,413	11,302	888
Feb-21	144,335	143,699	(637)	107,617	107,050	(566)	11,190	10,540	(650)
Mar-21	149,792	149,549	(243)	112,830	112,910	79	14,287	14,288	1
Apr-21	141,123	141,643	520	111,180	111,622	442	13,109	13,739	630
May-21	130,020	130,651	632	100,589	100,806	217	8,996	9,023	26
Jun-21	154,609	148,930	(5,679)	122,731	120,224	(2,507)	9,664	9,304	(360)
Total	1,735,852	1,727,470	(8,381)	1,276,965	1,274,807	(2,157)	109,785	111,722	1,937

	Resale (Sch. 5)			Total		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	391	391	-	1,372,005	1,363,369	(8,636)
Aug-20	311	311	-	1,428,438	1,405,079	(23,359)
Sep-20	291	291	-	1,445,416	1,396,163	(49,253)
Oct-20	344	356	12	1,417,983	1,437,012	19,028
Nov-20	494	501	6	1,605,050	1,621,770	16,719
Dec-20	802	834	33	1,932,129	2,009,933	77,804
Jan-21	916	938	22	1,915,563	1,971,159	55,596
Feb-21	940	921	(20)	1,932,924	1,889,347	(43,577)
Mar-21	951	944	(7)	1,938,340	1,933,629	(4,711)
Apr-21	824	852	28	1,758,891	1,807,274	48,382
May-21	632	631	(0)	1,441,799	1,449,641	7,843
Jun-21	439	439	-	1,487,830	1,394,097	(93,734)
Total	7,334	7,408	74	19,676,368	19,678,472	2,103

Q. What is the effect of weather normalization on the electric revenue in the test year?

A. The positive adjustment to electric load had the effect of increasing pro forma revenue by $1,102,955, as shown in Exh. BDJ-3.

Q. Is PSE's electric cost of service analysis and rate design study based on the weather-normalized sales?

A. Yes. Please see the testimony of Birud D. Jhaveri, Exh. BDJ-1T, for an explanation of PSE's electric cost of service analysis and electric rate design. PSE's electric cost of service analysis includes the temperature-adjusted power costs, and the electric rate design is based on the pro forma adjustment of energy sales made for the milder-than-normal winter and warmer-than-normal summer weather in the test year. In addition, the energy cost allocation factors used in PSE's electric cost of service analysis reflect the temperature-adjusted loads.

C. Temperature Adjustment of Gas Sales

Q. Please describe how the gas sales weather normalization was calculated.

A. Initially, monthly gas usage patterns by rate schedule were evaluated to identify which rate classes are weather sensitive. Monthly histories of class gas sales and HDDs were plotted for the most recent four years and the scatter grams were evaluated for any correlation between the changes in class gas sales and

temperature. This analysis revealed that the following rate classes are temperature sensitive:

- Schedule 23 (Residential);
- Schedule 31 (Commercial, Industrial);
- Schedule 41 (Commercial, Industrial, Transport Commercial);
- Schedules 85 (Interruptible Commercial, Transport Commercial);
- Schedule 86 (Interruptible Commercial);
- Schedule 87 (Interruptible Commercial, Transport Commercial), and
- Special Contracts.

Econometric model equations were developed and estimated to characterize the relationship between monthly HDDs and average use per customer for each of the above weather sensitive classes. In order to secure a sufficient number of monthly observations for modeling, the historical data period for modeling was expanded to a five-year period from July 2016 through June 2021.

Like the electric weather normalization calculation, the temperature adjustment to monthly gas use per customer for each rate schedule was derived by taking the temperature variable coefficients from the econometric model equations above and multiplying them by the difference between the actual and normal HDDs for the month. The final monthly adjustment to class total sales was estimated by multiplying the monthly adjustment per customer calculated in the previous step by the actual number of customers by month and rate schedule.

Q. Please summarize the final results of schedule-level gas sales weather normalization.

A. Table 3 below presents the temperature adjustment of sales by rate schedule. As shown in the table, applying the process described above to the test year sales to the weather sensitive rate schedules results in a total temperature adjustment of 34,500,691 therms. Because the test year winter was warmer than normal, this adjustment resulted in a pro forma delivered system load larger than actual load delivered during the test year. The residential class represented 73.7 percent of the total temperature adjustment, increasing by 25,428,963 therms.

Table 3

Temperature Adjustment of Test Year Gas Sales by Rate Schedule (Therms)

	Residential (Sch.23)			General service - commercial (Sch.31)			Large volume - commercial (Sch.41)			Trans. large volume - commercial (Sch.41T)		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	15,739,605	15,739,605	-	6,876,806	6,876,806	-	2,241,498	2,241,498	-	1,046,018	1,046,018	-
Aug-20	13,893,500	13,893,500	-	6,091,317	6,091,317	-	1,580,121	1,580,121	-	981,531	981,531	-
Sep-20	16,136,642	19,813,376	3,676,734	7,198,170	7,198,170	-	2,034,958	2,296,489	261,531	1,014,592	1,014,592	-
Oct-20	41,021,289	44,148,353	3,127,064	13,285,546	13,963,578	678,032	3,928,405	4,118,410	190,005	1,136,345	1,153,372	17,027
Nov-20	71,919,611	73,547,391	1,627,779	22,639,621	23,045,009	405,388	5,398,547	5,487,481	88,934	1,118,756	1,125,164	6,408
Dec-20	86,592,280	96,256,960	9,664,680	28,511,067	31,114,565	2,603,498	6,279,529	6,798,968	519,439	1,438,237	1,480,338	42,101
Jan-21	88,202,726	94,815,502	6,612,776	26,846,287	28,652,009	1,805,721	6,166,894	6,519,616	352,723	1,280,181	1,310,074	29,892
Feb-21	90,002,730	84,137,336	(5,865,394)	29,870,426	28,288,420	(1,582,005)	6,885,549	6,575,971	(309,578)	1,337,718	1,314,162	(23,556)
Mar-21	78,439,085	75,851,894	(2,587,190)	27,474,777	26,782,350	(692,426)	6,371,953	6,225,085	(146,868)	1,114,700	1,099,994	(14,706)
Apr-21	45,018,982	52,195,262	7,176,281	15,104,228	16,801,052	1,696,824	4,596,289	5,017,411	421,121	1,169,787	1,201,441	31,654
May-21	30,506,844	30,427,304	(79,540)	11,271,481	11,256,391	(15,089)	3,156,046	3,150,571	(5,476)	1,038,782	1,038,412	(370)
Jun-21	17,934,426	20,010,200	2,075,773	8,966,227	8,966,227	-	2,569,957	2,700,690	130,733	1,044,593	1,044,593	-
Total	595,407,721	620,836,684	25,428,963	204,135,954	209,035,895	4,899,942	51,209,746	52,712,311	1,502,565	13,721,241	13,809,691	88,450

	Trans. interrupt with firm option - com (Sch.85T)			Trans. non-exclus inter w/ firm option - com (Sch.87T)			Interruptible with firm option - com (Sch.85)			Limited interrupt w/ firm option - com (Sch.86)		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	1,461,126	1,461,126	-	1,019,637	1,019,637	-	726,230	726,230	-	190,337	190,337	-
Aug-20	1,395,943	1,395,943	-	982,726	982,726	-	863,878	863,878	-	106,594	106,594	-
Sep-20	1,356,814	1,356,814	-	997,833	997,833	-	710,764	710,764	-	153,364	153,364	-
Oct-20	1,585,605	1,605,920	20,315	1,298,807	1,335,392	36,585	1,101,652	1,146,388	44,736	370,233	391,666	21,434
Nov-20	1,230,808	1,239,143	8,335	246,521	263,123	16,601	1,185,281	1,205,552	20,271	610,565	620,880	10,315
Dec-20	2,257,441	2,312,704	55,263	3,107,608	3,221,065	113,457	2,304,189	2,428,067	123,877	671,556	732,302	60,745
Jan-21	1,834,616	1,871,015	36,399	1,589,296	1,665,367	76,072	1,384,146	1,466,105	81,959	764,480	807,171	42,691
Feb-21	1,421,375	1,398,302	(23,073)	1,834,043	1,763,150	(70,894)	1,561,143	1,489,496	(71,647)	856,125	818,406	(37,718)
Mar-21	2,015,699	2,000,617	(15,082)	1,922,543	1,890,996	(31,547)	2,401,829	2,366,097	(35,732)	641,712	623,162	(18,551)
Apr-21	1,644,034	1,675,362	31,328	1,384,264	1,474,771	90,507	1,166,550	1,271,009	104,459	494,158	549,126	54,968
May-21	1,493,978	1,493,459	(518)	1,276,094	1,274,826	(1,268)	1,350,387	1,349,229	(1,157)	1,380,862	1,380,254	(608)
Jun-21	1,446,325	1,446,325	-	902,352	937,481	35,128	978,107	978,107	-	(772,939)	(772,939)	-
Total	19,143,764	19,256,730	112,966	16,561,726	16,826,367	264,641	15,734,156	16,000,923	266,767	5,467,047	5,600,324	133,276

	Non-excl interrupt w/ firm option - com (Sch.87)			General service - industrial (Sch.31)			Large volume - industrial (Sch.41)			Special contracts - ind (Sch.SC)		
Month	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.	Actual	Normalized	Adj.
Jul-20	204,786	204,786	-	394,257	394,257	-	747,783	747,783	-	1,644,229	1,644,229	-
Aug-20	2,315,405	2,315,405	-	341,801	341,801	-	648,669	648,669	-	1,677,139	1,677,139	-
Sep-20	955,361	955,361	-	366,845	429,284	62,438	656,550	656,550	-	1,705,150	1,820,976	115,826
Oct-20	1,276,821	1,332,643	55,822	770,810	826,204	55,394	690,449	704,318	13,869	2,611,229	2,726,834	115,605
Nov-20	4,053,113	4,079,299	26,185	1,709,724	1,740,643	30,920	773,236	778,878	5,642	2,596,754	2,645,519	48,764
Dec-20	(301,277)	(138,472)	162,805	1,523,946	1,716,866	192,921	1,077,706	1,109,278	31,572	4,182,145	4,470,082	287,937
Jan-21	2,892,078	2,998,651	106,573	1,756,485	1,892,421	135,936	850,124	874,799	24,675	3,508,399	3,702,215	193,816
Feb-21	4,721,983	4,620,974	(101,010)	1,837,702	1,716,960	(120,742)	965,519	945,884	(19,634)	3,190,680	3,005,271	(185,408)
Mar-21	(181,552)	(230,183)	(48,631)	1,802,247	1,748,740	(53,507)	983,659	973,126	(10,533)	3,877,055	3,795,529	(81,527)
Apr-21	2,566,338	2,722,329	155,991	928,884	1,065,843	136,959	825,034	849,934	24,901	2,533,678	2,768,410	234,732
May-21	1,248,601	1,246,700	(1,901)	637,170	635,783	(1,388)	705,043	704,719	(324)	2,102,404	2,099,083	(3,321)
Jun-21	1,656,698	1,711,966	55,267	591,467	622,216	30,749	811,742	811,742	0	1,673,445	1,799,192	125,747
Total	21,408,354	21,819,456	411,102	12,661,336	13,131,017	469,680	9,735,512	9,805,680	70,168	31,302,307	32,154,479	852,172

Total weather normalized portion of volume

Month	Actual	Normalized	Adj.
Jul-20	32,292,311	32,292,311	-
Aug-20	30,878,624	30,878,624	-
Sep-20	33,287,045	37,403,574	4,116,529
Oct-20	69,077,190	73,453,078	4,375,888
Nov-20	113,482,538	115,778,081	2,295,543
Dec-20	137,644,427	151,502,722	13,858,295
Jan-21	137,075,710	146,574,944	9,499,233
Feb-21	144,484,993	136,074,332	(8,410,660)
Mar-21	126,863,706	123,127,407	(3,736,299)
Apr-21	77,432,226	87,591,952	10,159,726
May-21	56,167,692	56,056,731	(110,961)
Jun-21	37,802,402	40,255,800	2,453,398
Total	996,488,865	1,030,989,556	34,500,691

Q. What is the effect of the temperature adjustment on the gas revenue for the test year in this proceeding?

A. The positive adjustment to volume had the effect of increasing pro forma revenue by $13,049,925, as shown in Exh. JDT-3.

Q. Is PSE's gas cost of service analysis and rate design study based on the weather-normalized sales?

A. Yes. Please see the testimony of John D. Taylor, Exh. JDT-1T, for a description of PSE's gas cost of service analysis and rate design study. PSE's gas cost of service and rate design are based on the pro forma adjustment of gas sales made for the milder than normal test year weather. In addition, the gas energy cost allocation factors used in PSE's cost of service analysis reflect the temperature-adjusted loads.

III. CONCLUSION

Q. Does that conclude your prefiled direct testimony?

A. Yes, it does.