EXHIBIT NO. ___(LIM-1T)
DOCKET NO. UE-09___/UG-09___
2009 PSE GENERAL RATE CASE
WITNESS: LORIN I. MOLANDER

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-09____** **Docket No. UG-09____**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF LORIN I. MOLANDER ON BEHALF OF PUGET SOUND ENERGY, INC.

MAY 8, 2009

PUGET SOUND ENERGY, INC.

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PUGET SOUND ENERGY, INC.

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF LORIN I. MOLANDER

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Lorin I. Molander, and my business address is 10885 N.E. Fourth Street, Bellevue, Washington 98004. I am employed by Puget Sound Energy ("PSE" or "the Company") as a Regulatory Consultant in Pricing and Cost of Service.

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

A. Yes, I have. It is Exhibit No. ___(LIM-2).

Q. What is the purpose of your testimony?

A. My testimony presents the Company's electric and gas temperature adjustment methodology and results used to develop the pro forma electric and gas loads for the test year January 2008 through December 2008. I also present the effects of the Company's proposed electric and gas residential rate increase on residential customers' bills.

Q. Please summarize your testimony.

A. Because the test period was colder than normal, the Company's weather normalization calculation resulted in a decrease in load. If customers in PSE's service territory had experienced normal temperatures, PSE's total electric and gas loads would have been 215,347 MWh and 47,583,582 therms lower, respectively. The methodology used in this case is based on the Company's temperature adjustment methodology presented in its 2006 general rate case, Docket Nos. UE-060266 and UG-060267 ("2006 GRC"), with several minor modifications to both the electric and gas models. The impact of the Company's temperature adjustment on normalized gas revenues is discussed in the Prefiled Direct Testimony of Janet Phelps, Exhibit No.___(JKP-1T). The impact of the Company's temperature adjustment on normalized electric revenues and power costs is discussed in the Prefiled Direct Testimony of John H. Story, Exhibit No. ___(JHS-01T).

In addition to the weather normalization methodology, I also present the impacts of the Company's requested change in revenues on residential electric Schedule 7 and residential gas Schedule 23 customers' bills.

II. TEMPERATURE ADJUSTMENT

A. <u>Background Regarding Temperature Adjustment</u>

Q. What is the purpose of weather normalization in a rate case?

A. Weather normalization removes the effect of non-normal temperatures from test year loads. Temperature adjustment provides the basis for weather normalization, which affects test year billing determinants, test year revenues, the allocation of certain costs to rate classes, and for electricity, test year power costs, allowing all to be calculated in a way that is more reflective of normal operating conditions.

Q. Generally speaking, how does PSE perform its weather normalization calculation?

A. PSE first compares actual daily loads for a multi-year time period to actual daily temperatures for the same multi-year period. This permits PSE to develop coefficients that describe the relationship between temperature and load. Regression analysis is used to isolate the incremental weather effects from other factors such as weekdays versus weekends, loads on holidays, or seasonal factors not related to temperature. The estimated weather effects on load are termed "weather sensitivity coefficients."

Then, PSE uses the weather sensitivity coefficients and "normal" weather data to convert the actual test year loads to normal loads. 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 1979 through 2008 for this case.

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

A. Yes, the same methodology was used with updated information. The methodology used in this case is based on the Company's weather normalization methodology presented in its 2006 GRC, Docket Nos. UE-060266 and UG-060267, with several minor modifications that I discuss later in my testimony. The Commission accepted the Company's weather normalization analysis in that docket. *See* Docket No. UE-060266 and UG-060267 (*consolidated*), Order 08, ¶163.

B. <u>Recent Actual Temperature Patterns</u>

Q. Please describe the temperatures experienced during the test period.

A. The temperatures experienced at Sea-Tac during calendar year 2008 were the coldest the region has experienced since 1985. Measured by heating degree days ("HDD") using a 65˚F base[1], the following table shows annual actual HDDs for the most recent 10 years and how each year compared to a normal year. The test

[1] 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.

year period, January through December 2008, was over 8 percent colder than normal in total.

	Heating Degree Days (Base 65)											
	1999	2000	2001	2002	2003	2004	2005	2006	2007	**2008**	Normal*	2008 % Diff from Normal
Jan	714	783	707	738	602	766	709	581	833	**820**	732	12.0%
Feb	649	625	688	648	659	598	646	624	610	**630**	641	-1.7%
Mar	667	643	618	726	575	543	508	623	567	**694**	587	18.2%
Apr	501	437	533	507	504	365	443	461	464	**568**	457	24.4%
May	415	368	330	392	342	276	245	281	302	**306**	308	-0.5%
Jun	247	179	246	167	134	113	185	126	176	**252**	172	46.3%
Jul	128	84	118	76	29	40	45	54	19	**71**	68	5.1%
Aug	65	100	72	70	28	35	33	60	49	**77**	55	40.5%
Sep	157	172	176	158	131	211	188	133	193	**144**	155	-7.0%
Oct	428	392	441	436	344	378	354	415	462	**422**	398	6.1%
Nov	535	676	551	549	675	605	671	623	625	**482**	595	-19.0%
Dec	740	762	723	679	716	693	701	761	778	**866**	754	14.8%
Total	5,245	5,219	5,201	5,146	4,739	4,622	4,727	4,743	5,079	**5,332**	4,922	8.3%
% Diff. from Normal	7.0%	6.0%	6.1%	5.0%	-3.3%	-6.1%	-3.6%	-3.2%	3.6%	**8.3%**		

* Note: February normal is based on 29 days for leap year. Percent differences from normal for all years except 2000, 2004, and 2008 are based on a 28-day normal February having 621 HDDs.

During 2008, January, March, October, and December were all colder than normal by 12 percent, 18 percent, 6 percent, and 15 percent, respectively. April 2008 continued the very cold trend into spring, with temperatures 24 percent colder than normal. November 2008 was the notable exception, with temperatures 19 percent warmer than normal.

C. Overview of the Company's Electric Temperature Adjustment

Q. Please describe how the electric weather normalized loads were calculated.

A. The system level temperature adjustment was calculated in total and allocated to each of the applicable schedules by month, based on the Company's temperature adjustment methodology approved in its 2006 GRC, with one minor modification

I discuss later in my testimony.

Q. Please describe how the Company normalized the test year system level delivered load in this case.

A. As was done in the Company's 2006 and 2007 general rate cases, PSE used weather sensitivity coefficients based on actual daily load data and the actual temperature at Sea-Tac to adjust system level delivered load (Generated Purchased and Interchange, or "GPI") for weather. PSE's "normal" weather dataset was developed using data reported at Sea-Tac over the 30-year period from 1979 through 2008 by calculating daily HDDs and cooling degree days ("CDDs")[2] using several base temperatures (45˚F and 65˚F for HDDs, 60˚F and 65˚F degrees for CDDs). The actual HDDs and CDDs were calculated using the average of the 24 hourly temperatures compared against the base temperature. The amount of temperature adjustment was then calculated by taking the weather sensitivity coefficients and multiplying them by the difference between the actual and normal HDDs and CDDs. This process was applied using each base HDD and CDD included in the model.

Q. How did the Company use temperature normalized GPI electric load to

[2]A Cooling Degree Day is similar to a Heating Degree Day except that it counts the number of degrees the average temperature is above the base.

calculate the load adjustment made to various customer classes (rate schedules) related to weather effects?

A. As in its 2004, 2006 and 2007 general rate cases, PSE used a three-step process to allocate the system level temperature adjustment to rate schedules in order to create rate schedule billing determinants. The first step was to develop regression equations to characterize the relationship between temperature and load for each rate schedule. The coefficients of those equations were permitted to vary by month and by class. The data source for this step was a large sample of daily energy readings from PSE's automated meter reading database. The second step was to simulate daily customer loads using the historical heating and cooling degree days and determine the average monthly load for each customer class. The third step was to weight the sample to the population and normalize the class loads to the net-of-losses weather-normalized GPI load. The amount of temperature adjustment at the GPI level was allocated to each of the applicable schedules by taking the percentage share of each schedule's temperature adjustment amount to total temperature adjustment for all schedules as calculated by the rate schedule normalization equations, then multiplying the system load temperature adjustment by these percentage shares.

Q. What were the results of this process?

A. Applying the process described above to the test year GPI load of 23,571,872 MWh resulted in a total adjustment of 215,347 MWh, or 200,921 MWh delivered

load when adjusted for losses. Because the test year was colder than normal, this adjustment resulted in a pro forma delivered system load that is smaller than actual load delivered during the test year.

With regard to rate schedule normalization, when the GPI temperature adjustment was allocated to the rate schedules the load of the residential schedule was decreased by 176,605 MWh and the loads of all but Schedule 29 Irrigation also decreased. The residential class' adjustment is 88 percent of the net total system adjustment.

The effect of the reduction in load on pro forma revenue and power costs is discussed in the Prefiled Direct Testimony of John H. Story, Exhibit No. ___(JHS-1T).

Q. Has the Company made any changes or updates to the electric system temperature adjustment model since the last general rate case?

A. Yes. The Company made a minor change to the system model in how it estimates the temperature and load relationship on holidays. The model accounts for holidays specifically since there are other factors that contribute to load on those days that are not weather related. Previously, the model was specified so the non-weather factors that contribute to load were the same for all holidays. For this rate case, the holiday variable was broken out to represent individual holidays allowing the non-weather factors that affect load to vary for each major holiday

(New Year's Day, Christmas Eve, Christmas Day, the day after Christmas, Fourth of July, Memorial Day, Labor Day, Thanksgiving Day, and the day after Thanksgiving Day). This minor enhancement slightly improves the coefficients on weather, but does not change the overall theory and methodology of the system model that was approved in the 2006 GRC.[3] Also, as PSE has done in previous cases, it updated the model with recent actual temperature and load data to estimate the coefficients.

Q. Does the Company's electric cost of service and rate design implement the Company's weather normalization methodology?

A. Yes; see the Prefiled Direct Testimony of David Hoff, Exhibit No. ___(DWH-1T), for an explanation of the Company's electric cost of service study and rate design. PSE's cost of service study reflects the weather normalized power costs, and the rate design reflects the pro forma adjustment of energy sales. In addition, the energy allocation factors used in the Company's cost of service analysis use weather normalized loads.

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[3] This modification resulted in a decrease in the electric system adjustment of 1,413 MWh, or 0.65 percent.

D. Overview of the Company's Gas Temperature Adjustment

Q. Please describe how the gas temperature adjustment was calculated.

A. The system level temperature adjustment was calculated in total and allocated to each of the applicable schedules by month based on the Company's gas temperature adjustment methodology approved in its 2006 GRC, with two minor modifications I discuss later in my testimony.

Q. Please describe how the Company normalized the test year total gas system load in this case.

A. As was done in the 2006 and 2007 general rate cases, PSE used weather sensitivity coefficients based on actual load data and actual temperature at Sea-Tac to adjust system level delivered gas load (Firm, Interruptible and Transport) for weather. As with the electric model, PSE's "normal" weather dataset was developed using data reported at Sea-Tac over the 30-year period from 1979 through 2008 by calculating daily HDDs using two base temperatures (45˚F and 65˚F). Also consistent with the electric model, the actual HDDs were calculated using the average of the 24 hourly temperatures compared against the base temperature. The amount of temperature adjustment was calculated by taking the weather sensitivity coefficients and multiplying them by the difference between the actual and normal HDDs. PSE performed this process for each base HDD (45˚F and 65˚F) that is included in the model to yield temperature adjusted load.

Q. How did the Company use temperature adjusted gas load to calculate the load adjustment for various customer classes (rate schedules) related to weather effects?

A. As in its 2006 and 2007 cases, PSE examined monthly usage patterns of all of the Company's gas rate classes to identify which rate classes are weather sensitive. This analysis identified the following rate schedules (classes) as temperature sensitive: Schedule 23 (Residential), Schedule 31 (Commercial, Industrial), Schedule 41 (Commercial, Industrial), Schedule 85 (Commercial), Schedule 86 (Commercial), Schedule 87 (Commercial), and Special Contracts (Industrial). The Company next developed regression equations to characterize the relationship between temperature and load for each of the above temperature sensitive rate schedules. The amount of temperature adjustment of system level delivered load was then allocated to each of the applicable schedules by taking the percentage share of each schedule's temperature adjustment relative to the total temperature adjustment for all schedules as calculated by the rate schedule normalization equations.

Q. **Are the rate classes identified as temperature sensitive for this case the same as the 2006 and 2007 cases?**

A. All classes that were considered temperature sensitive in PSE's 2006 and 2007 cases are considered temperature sensitive for this case. In addition, Schedule 41 (Commercial, Industrial) was also identified as a temperature sensitive rate class

and is included in the normalization for this case.

Q. Has the Company made any updates to the gas system temperature adjustment model since its last general rate case?

A. Yes. The same enhancement to the holiday variable that was made to the electric system model was also made to the gas system model. In addition, the Company modified the model's treatment of gas load curtailment in the interruptible and transportation equations. Previously, the model used dummy variables for each day on which gas load was curtailed. The dummy value was changed to be the gas load curtailment value, allowing the model to remove the portion of load affected by curtailment and improving the specification of the remaining weather-specific portion of load for days on which gas was curtailed. These two changes to the model do not markedly change the results and are considered general housekeeping modifications. Also, as PSE has done in previous cases, it updated the model with recent actual temperature and load data to estimate the coefficients.

Q. Were there any updates to the gas rate schedule temperature adjustment model?

A. In addition to the enhancements made to the system model, there was a modification made to the gas rate schedule equations. The original gas rate schedule equations allowed the estimated coefficients on weather variables to

vary uniquely by each calendar month. This methodology was adjusted to restrict the weather sensitivity coefficients to be identical across months in the same season. This allows the estimated seasonal coefficient to be more robust by including more observations per seasonal coefficient.

Q. Did these updates to the system and rate schedule models change the overall theory and methodology approved in the 2006 GRC?

A. No; as I mentioned before, these updates are considered general housekeeping modifications, and they did not significantly affect the model results.[4]

Q. Were there any other circumstances specific to the test year period that affected the gas weather normalization process?

A. As described in detail by Janet Phelps in her Prefiled Direct Testimony, Exhibit No. ___(JKP-1T), the Company closed several existing rate schedules and opened several new rate schedules during the test period. Specifically, rate schedules 36, 57, and 51 were closed, and new rate schedules 41T, 85T, and 87T were opened on November 1, 2008. Weather normalized loads for rate classes that closed were based on the estimated coefficients of the closed rate schedule as of October 2008. The weather normalized load from each closed rate schedule was then added to the schedule that assumed the customers from the closed schedule in

[4] These modifications resulted in a decrease in the gas system adjustment results of 314,260 therms, or 0.65 percent.

November.

Q. What were the results of PSE's gas temperature adjustment process?

A. Applying the process described above to the test year delivered load of 1,167,892,703 therms resulted in a total temperature adjustment of -47,583,582 therms. Because the test year was colder than normal, this adjustment resulted in a pro forma delivered system load that is smaller than actual load delivered during the test year.

With regard to rate schedule normalization, when the system temperature adjustment was allocated to the rate schedules, the loads of all of the temperature sensitive schedules were reduced. The residential schedules represented 67 percent of the total weather adjustment, decreasing by 31,841,170 therms.

The effect on pro forma revenue of the reduction to volume is discussed in the Prefiled Direct Testimony of Janet Phelps, Exhibit No. ___(JKP-1T).

Q. Does the Company's gas cost of service study and rate design implement the Company's temperature adjustment methodology, as approved in the 2006 general rate case?

A. Yes, as explained in the Ms. Phelps' Prefiled Direct Testimony, Exhibit No. ___(JKP-1T), the cost of service study and the rate design reflect the pro forma adjustment of throughput.

III. RESIDENTIAL BILL IMPACTS

Q. Has the Company calculated the impacts of its proposed rate increase to residential electric and gas customers' bills?

A. Yes, the Company has calculated the bill impacts of its proposed residential electric and gas rate increase as described by Mr. Hoff in his Prefiled Direct Testimony, Exhibit No. ___(DWH-1T), and Ms. Phelps in her Prefiled Direct Testimony, Exhibit No. ___(JKP-1T), respectively. The remainder of my testimony presents the effects of the Company's proposal on PSE's customers' bills.

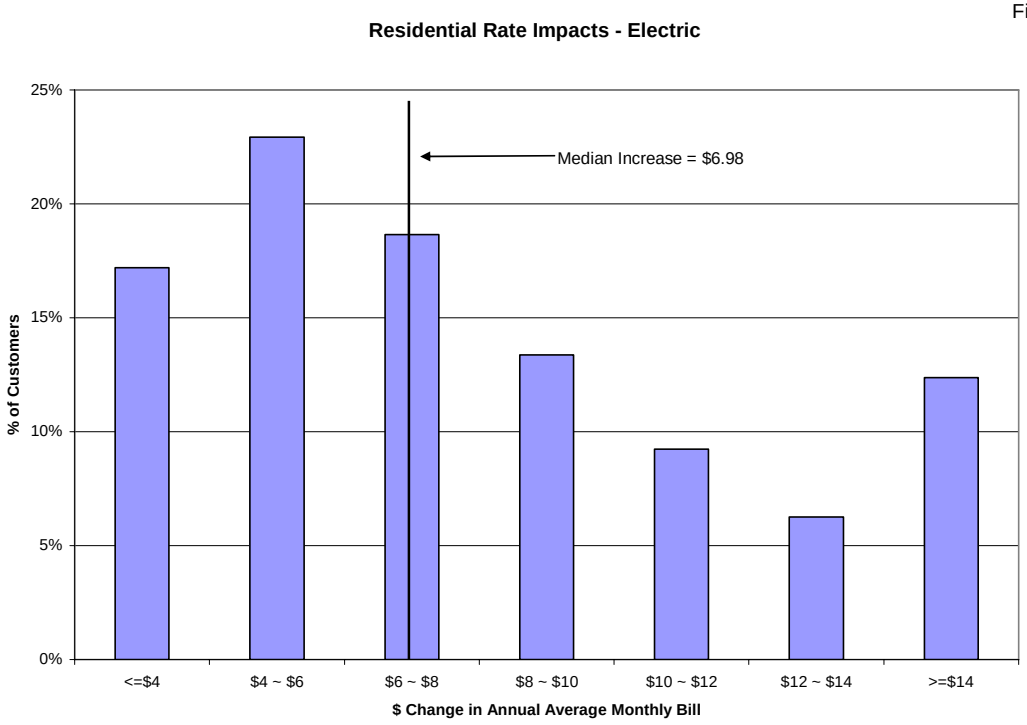
A. Effect of PSE's Proposal on Residential Electric Bills

Q. What effect will the Company's proposed rate increase have on residential electric bills?

A. As explained by Mr. Hoff in his Prefiled Direct Testimony, Exhibit No. ___(DWH-1T), the Company is proposing to apply the same percentage increase to the basic charge and both blocks of the energy charge in Schedule 7. As a result, all customers (including low income customers), regardless of their usage, will see the same percentage increase in their bills, both on an annual basis and a monthly basis. This increase is 9.1 percent when all supplemental rate schedules are included in the calculation. However, the dollar amount of the increase will vary depending on usage.

Over a 12-month period, the bill increase for a residential customer using an average of 1,002 kWh per month (more in winter months, less in summer months) will average $8.25 a month. Depending on usage, some customers' bills will increase more, some less. One-half of PSE's customers will see an increase that will average less than $6.98 a month. Approximately 17 percent of customers will see an increase that will average less than $4.00 a month, while approximately 12 percent will see an increase that will average over $14.00 a month. This variance from the average increase is due to customers having lower or higher than average usage. Figure 1 below depicts the impacts of the proposed residential rates on individual customer's bills.

Figure 1



B. Effect of PSE's Proposal on Residential Gas Bills

Q. What effect will the Company's proposed increase have on residential gas bills?

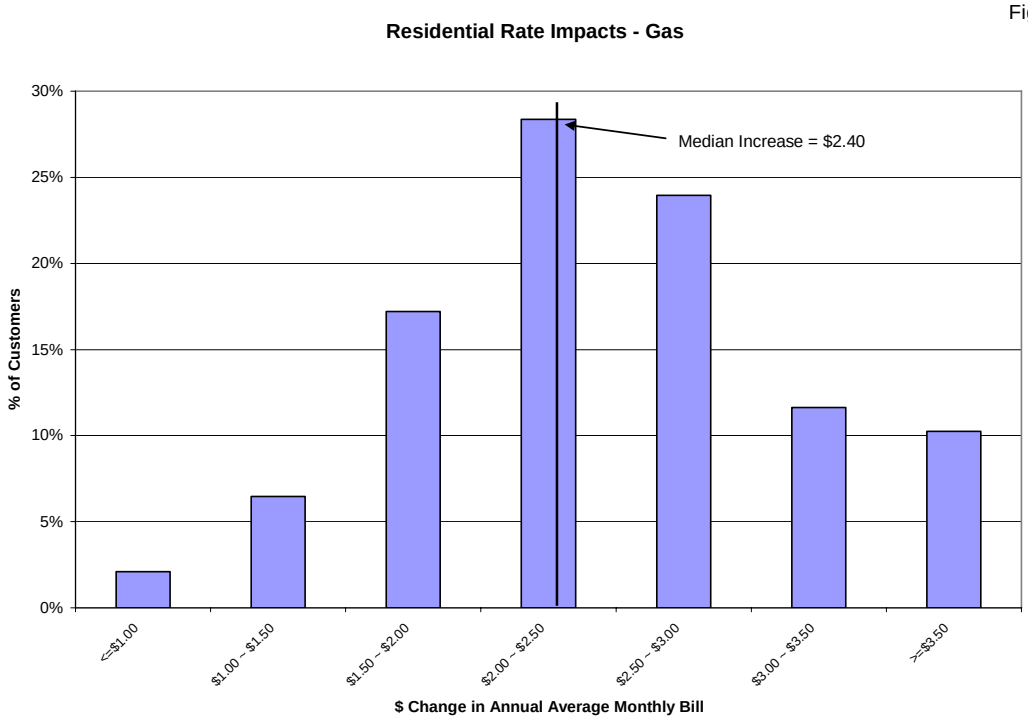
A. As explained by Ms. Phelps in her Prefiled Direct Testimony, Exhibit No. ___(JKP-1T), the Company is proposing to apply the same percentage increase to the basic charge and delivery charge in Schedule 23. As a result of the equal percentage increase to the basic charge and delivery charge, all customers (including low income customers), regardless of usage, will see the same percentage increase in that portion of their bills, both on an annual basis and a monthly basis. When the supplemental rate schedule charges and credits at current rates are included to calculate the *total* bill, the percentage increase is 2.5 percent on average, varying based on usage since the supplemental rate Schedule 101 - Gas Cost makes up a large portion of the total bill.[5]

The dollar amount of the increase will vary depending on usage. Over a 12-month period, the bill increase for a residential customer using an average of 73 therms per month (more in winter months, less in summer months) will average $2.52 a month. Depending on usage, some customers' bills will increase more, some less. One-half of PSE's customers will see an increase that will average less

[5] Supplemental rate schedule charges such as Schedule 101 – Gas Cost are subject to change as a result of separate rate filings by the Company.

than $2.40 a month. Approximately 8.6 percent of customers will see an increase that will average less than $1.50 a month, while approximately 10 percent will see an increase that will average over a 12-month period more than $3.50 a month. This variance from the average increase is due to customers having lower or higher than average loads. Figure 2 below depicts the impacts of the proposed residential rates on individual customer's bills.

Figure 2



IV. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.