Exh. JL-1CT
Docket UG-170929
Witness: Jing Liu
REDACTED VERSION

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **CASCADE NATURAL GAS CORPORATION,** **Respondent.**	**DOCKET UG-170929**

TESTIMONY OF

Jing Liu

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Weather Normalization
Low Income Bill Discount Program Proposal

February 15, 2018

CONFIDENTIAL PER PROTECTIVE ORDER – REDACTED VERSION

TABLE OF CONTENTS

LIST OF EXHIBITS

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Jing Liu. My office address is 1300 South Evergreen Park Drive Southwest, P.O. Box 47250, Olympia, Washington, 98504. My email address is jing.liu@utc.wa.gov.

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

A. I am employed by the Washington Utilities and Transportation Commission (Commission) as a Regulatory Analyst.

Q. How long have you been employed by the Commission?

A. I have been employed by the Commission since July 2008.

Q. Would you please state your educational and professional background?

A. I hold a Bachelor's degree in English Language and Literature, a Master's of Arts degree in organizational communication and a Master of Science degree in communication technology and policy from Ohio University. I also completed four years of doctoral study in public policy at Ohio State University. I worked as a graduate research associate at the National Regulatory Research Institute (NRRI) from 2005 to 2007. I worked in the telecommunications section of the Commission from 2008 to 2014 and was responsible for developing and implementing telecommunications universal service policies, designating Eligible

Telecommunications Carriers in Washington and annually recertifying telecommunications carriers to receive high cost support. I worked extensively on telecommunications low income assistance issues. Since I began working in the energy regulatory section of the Commission in 2014, I have reviewed tariff revisions of purchased gas adjustments, gas pipeline cost recovery mechanisms, decoupling, residential exchange credits, renewable energy credits, and property tax riders, as well as energy conservation plans. I have testified on weather normalization and low income issues in general rate cases.

Q. Have you previously testified before the Commission?

A. Yes. I provided testimony to the Commission in the proceedings addressing United Telephone Company of the Northwest Inc.'s intrastate access charges (UT-081393), the acquisition of Verizon Northwest, Inc. by Frontier Communications Corporation (UT-090842), the acquisition of Qwest Corporation by CenturyLink, Inc. (UT-100820), Frontier Communications Northwest, Inc.'s petition for competitive classification (UT-121994), low income issues in Avista Corporation's ("Avista") General Rate Case (UE-160228/UG-160229), and decoupling, weather normalization, and low income program issues in Puget Sound Energy, Inc.'s ("PSE") General Rate Case (UE-170033/UG-170034).

II. SCOPE AND SUMMARY OF TESTIMONY

Q. What topics will you be discussing in your testimony?

A. My testimony has two components: weather normalization and the low income bill assistance program.

Q. What is your recommendation on weather normalization adjustments?

A. I recommend the Commission adopt Staff's weather normalization adjustments using the methodology parties settled, and the Commission approved, in Cascade's 2015 general rate case ("GRC").[1] The method uses the monthly sales data for residential and commercial schedules in four different regions in Cascade's service area in Washington. The Company's newly proposed CityGate forecasting model presented in the initial filing is seriously flawed and should be rejected.

In total, Staff's three adjustments related to weather normalization reduce Cascade's annual revenue requirement by $8,732,610, which is a $974,533 greater reduction to revenue requirement than the Company's proposal. I explain this calculation in detail later in my testimony.

[1] *Wash. Utils. & Transp. Comm'n v. Cascade Nat'l Gas Corp.*, Docket UG-152286, Order 04, Exhibit A: Joint Settlement Agreement, 14, ¶44 (Jul. 7, 2016) [hereinafter "2015 GRC Settlement"].

Q. What is your recommendation on the Company's low income bill assistance program?

A. I recommend the Commission accept my proposal to update and revamp the Company's Washington Energy Assistance Fund ("WEAF") from a grant-based financial assistance program to a bill discount program.

III. WEATHER NORMALIZATION

A. Overview

Q. Please summarize the key findings of your testimony on weather normalization adjustments.

A. I contest three revenue adjustments related to weather normalization. They are R-1: restating weather normalization adjustment; R-3: restating revenue adjustment; and P-9: pro forma revenue adjustment. All three are tied to the weather-normalized sales from my regression analysis. I recommend using the method all parties agreed to in the settlement agreement of Cascade's 2015 general rate case ("2015 GRC Settlement") and rejecting the Company's use of a newly proposed forecasting model at the city gate level.

With all three adjustments combined, Cascade proposed a $7,758,077 reduction in revenue requirement. My analysis produces a total of $8,732,610 reduction in revenue requirement, differing from the Company's results by $974,533.

A comparison of Staff's and the Company's proposals on these three adjustments is provided in Table 1, below.

Table 1. Comparison of Staff and the Company's Adjustments Related to Weather Normalization

	R-1	R-3	P-9	Combined
	Restating Weather Normalization	Restating Revenue Adjustment	Pro Forma Revenue Adjustment	
Net Operating Income Effect				
Company	$3,077,609	($1,501,021)	$3,242,702	$4,819,290
Staff	$2,444,754	($1,557,514)	$4,537,428	$5,424,667
Difference	($632,855)	($56,493)	$1,294,725	$605,377
Revenue Requirement Effect				
Company	($4,954,324)	$2,416,338	($5,220,091)	($7,758,077)
Staff	($3,935,556)	$2,507,281	($7,304,336)	($8,732,610)
Difference	$1,018,768	$90,943	($2,084,245)	($974,533)

Q. Could you please describe the purpose of weather normalization?

A. Weather normalization, also called temperature normalization or revenue normalization due to temperature, is a restating adjustment to a company's test year revenue to reflect a level of sales under normal weather. It estimates the gas that a utility would have sold if the temperature had been "normal."

Because residential and commercial customers' gas consumption is highly correlated with temperature, the Company's sales are subject to temperature swings that are out of the Company's control. Weather normalization allows us to evaluate revenue sufficiency under the expectation that weather will be normal in the rate year. As a result, weather normalization protects *both* a company and its customers

from misleading revenue signals resulting from abnormal weather. It enables a comparison of a company's earnings from year to year, with the influence of temperature variations taken out of the equation.

Q. Could you give an example?

A. Yes. If a test year has a warmer winter than normal, a company's gas sales would be lower than the normal level because customers consume less gas for heating. In this example, a company's per book revenue should be adjusted upward to a sales volume expected under a normal winter, as setting prospective rates relies on the assumption that temperature will be normal during the rate year. Without this adjustment, test year revenue would be lower than normal, perhaps even giving the impression that the company needs a rate increase when the weather-normalized revenues would be sufficient. The opposite adjustment would be justified if a test year has a colder winter than normal.

Q. How do you perform a weather normalization adjustment?

A. A weather normalization adjustment for gas sales typically involves three basic components: (1) deviation in test year heating degree days (HDD) from a "normal" benchmark; (2) weather sensitivity coefficients from statistical models;[2] and (3) numbers of customers for each weather sensitive schedule in the test year. The product of these three components produces an adjustment in energy sales.

[2] A weather sensitivity coefficient indicates how much more gas will be consumed if temperature goes down by one degree, or how much less will be consumed if temperatures go up by one degree.

Q. Where does temperature data come from for this adjustment?

A. Most utilities use the temperature data published by the National Oceanic and Atmospheric Administration ("NOAA") for major airports in their service territories. Most utilities' practice of using this data makes sense because it is freely available and collected by an objective party. The temperature data is then converted to HDDs. HDD measures the deviation in the actual temperature below the baseline temperature, commonly 60 or 65 degrees Fahrenheit.[3] Higher HDDs indicate colder weather. Cascade uses 60 Fahrenheit as the base temperature.[4] Staff does not contest this baseline in this rate case. Typically, 30-year average HDDs are used as the benchmark for normal temperature to smooth out the fluctuations in weather conditions over time. With the exception of December 2016, all winter and shoulder months in the test year were warmer than the 30-year Normals in Cascade's Washington service areas, contributing to an overall upward adjustment to the Company's sales and its per book revenue.

Q. Can you explain how to calculate weather sensitivity coefficients?

A. Yes. The fluctuation in HDDs explains a substantial portion of the variation in gas consumption for residential and commercial classes. In other words, energy consumption is highly correlated with temperature once the temperature exceeds a threshold that challenges human comfort. For example, as ambient temperature

[3] Using 60 as the baseline temperature, if the temperature is 51 degrees Fahrenheit, HDD is 9; if the temperature is 71 degrees Fahrenheit, HDD is 0.
[4] Robertson, Exh. BR-1T at 4:20 - 5:9.

drops below 60 degrees Fahrenheit, any further decrease in temperature is highly correlated with an increase in the heating load.

A regression model can be used to produce weather sensitivity coefficients to quantify the amount of change in therm sales per degree change in temperature. This coefficient multiplied by the total deviation in HDDs and the number of customers determines the adjustment needed to achieve normal sales.

B. Staff's Analysis of Cascade's Weather Normalization Models

Q. Was weather normalization addressed in the Company's last general rate case?

A. Yes. Staff had issues with the Company's weather normalization adjustment in Cascade's 2015 GRC. At the time, both Cascade and Staff used monthly sales data for each schedule in four service territories in Washington. In the 2015 GRC Settlement, the parties agreed to implement the following changes to weather normalization in the Company's Commission Basis Report:

a. Use 10 years of usage and weather data;

b. Use National Oceanic and Atmospheric Administration ("NOAA") weather data for both actual temperature and the "normal" temperature benchmark;

c. Refine regression models to exclude insignificant monthly heating degree day variables;

d. Include a trend variable in the regression models when appropriate, and correct common statistical problems such as serial correlations;

e. Identify outliers by comparing predicted usage with actual usage as well as double-checking data accuracy and re-specifying regression models if necessary; and,

f. Use an alternative way of reporting monthly usage if unbilled therms are not trued up monthly: align heating degree days with billing cycles on a monthly basis, rather than using monthly usage data that includes gross estimates of unbilled therms.[5]

1. Cascade's CityGate Forecasting Model

Q. In this rate case, did Cascade use the method agreed to in the 2015 GRC Settlement?

A. No. Although the Company presented results using the 2015 GRC Settlement's methodology, the Company did not use those results. Rather, Cascade witness Mr. Brian Robertson proposed an entirely new method to calculate the test year gas sales under normal weather.[6] The new method uses the daily pipeline throughput data allocated to different customer classes at each city gate or city gate loop.[7] I refer to it throughout my testimony as the "CityGate forecasting model."

[5] 2015 GRC Settlement at 14, ¶ 44.
[6] Robertson, Exh. BR-1T at 3:23-25 and 7:1-18.
[7] Cascade has 29 individual city gates and 7 city gate loops in Washington.

Q. Does Staff recommend the Commission accept Cascade's CityGate forecasting model?

A. No. Besides representing a significant deviation from the methodology parties collectively accepted in the 2015 GRC Settlement, the CityGate forecasting model suffers from a number of serious flaws. In particular,

1) The daily CityGate data is not accurate enough to be useful in performing a reliable weather normalization analysis;
2) Cascade's uses temperature data from a third party vendor (Schneider Electric), the veracity to which neither Staff nor Cascade can attest; and
3) Cascade relies on a single temperature coefficient across all months of the year, even though customer temperature sensitivity varies according to season. Therefore, the Company's analysis does not adequately depict the relationship between temperature and sales throughout the year.

The cumulative result of these flaws is that the sales adjustments proposed by Mr. Robertson unreasonably skew the revenue requirement in the Company's favor.

Q. Can you please expand on why you think Cascade's CityGate forecasting model is not acceptable for weather normalization purposes?

A. Yes. In appearance, the Company's forecasting model has the advantage of using data at a very granular level. It consists of daily usage for different customer classes at each CityGate or CityGate Loop from July 1, 2010, to November 30, 2016. In general, granular data is preferred in statistical analysis. More fine-tuned units of analysis *usually* yield better statistical analysis and more accurate forecasting results.

Daily data increases the sample size and allows a greater degree of freedom in statistical inference. However, upon examining layers of data sources embedded in the Company's daily "usage per customer" per customer class, I found that the daily values were derived from multiple, complicated allocations. They are not the metered daily usage per customer per schedule and fail to provide the kind of granular data needed to make a precise forecasting model. Staff's approach – the approach agreed upon in the 2015 GRC Settlement – is, therefore, more acceptable for the purpose of weather normalization.

Q. Could you peel off the layers around the Company's daily "usage per customer" data and elaborate upon the deficiencies you found in each step?

A. Yes. The "usage per customer" is the core of weather normalization analyses. Without accurate measures, any regression analysis would just be "garbage in, garbage out." The resulting weather-related sales adjustment will not reflect reality. The following is my understanding of the Company's calculation for "usage per customer" and my critique about the wrongful assumptions in each step.

1. Pipeline Gas Flow Data

The Company starts with its daily pipeline gas flow data from its pipeline electric bulletin board for each city gate or city gate loop.[8] The raw flow data is not adjusted for line loss. My understanding is that line loss could be caused by an array of reasons including operational pressure release, meter testing, pipeline damage, leakage, or stolen gas. The occurrences and magnitudes of line losses can vary by

[8] Robertson, Exh. BR-2 at 3.

city gate on any given day. The Company did not make any adjustment for line loss at the city gates. As a result, the daily usage data is exaggerated and inaccurate because it includes various degrees of line loss on a daily basis.

2. Core Usage

To come up with daily "core usage," the Company uses daily pipeline gas flow data minus the metered usage for non-core schedules (transportation customers). Unfortunately, the two sources of meter readings at the Company's city gates are not accurate or consistent. The calculated "core-usage" turns out to be negative on some occasions, which makes no sense at all. Even though the Company manually deleted negative usages from the data set, it begs the question of whether the remaining positive core usage data can be relied upon. The Company has only retained these positive core usage values because they are not negative. There may be numerous inaccurate core usage values in the data set.

For illustrative purposes, consider the Sedro Woolley Loop. It consists of two city gates: Mount Vernon and Sedro Woolley. At the Sedro Woolley city gate, the non-core meter reading turned out to be more than the pipeline meter reading for June 3-4, 2013 and October 9, 2016. As a result, the calculated core usage for Sedro Woolley Loop for these three days were negative. The Company deleted the three days in its analysis. While this is a "fix" for the most obvious data errors, it does not address the source of error and fails to detect or address any erroneous data in the dataset that merely happened to be non-negative. For example, On June 5, 2013, Sedro Woolley city gate's non-core meter continued to show a higher reading than the pipeline gas flow total. However, after summing up Mount Vernon and Sedro

Woolley city gate, the calculated core usage was positive. The Company retained this daily value (2,382 therms) in its data analysis even though it is significantly lower than any of the adjacent days (over 15,000 therms).

3. Core Usage for Each Customer Class

The Company developed "class usage ratios" based on historical monthly billed usage and applied the ratio to allocate daily core usage to the residential, commercial, and industrial classes. This approach assumes that the "class usage ratio" remains exactly the same every day throughout the month. Such an assumption is untenable. Additionally, because there are multiple billing cycles in given monthly billed usage, the "class usage ratios" developed from monthly billed usage does not necessarily translate to an accurate class usage ratio on a daily basis. In Staff's opinion, this demonstrates a big data gap in gauging class-specific daily usage and undermines the idea that the dataset used by the Company provides accurate granularity.

4. Number of Customers

The Company does not use or know the actual number of customers for each class behind each city gate or city gate loop. It started with the number of customers for each class in each town. Towns can be served by more than one city gate. The Company developed a "town-CityGate customer ratio" using its customer counts in 2013 and the GIS Silverlight view. The 2013 customer ratio is then applied to the customer counts in each town to produce monthly customer counts for each class at each city gate or city gate loop between July 2010 and November 2016. This approach makes three unreasonable assumptions: (1) the 2013 customer ratio

remains true every day for six and half years; (2) the customer ratio among the classes remains exactly the same for each city gate for 2,345 days; and, (3) customer ratios among all city gates serving the same town remain the same during these same 2,345 days. Considering that residential, commercial, and industrial customers do not necessarily grow at the same pace, as well as necessitating a secondary assumption that the residential-commercial-industrial customer mix remains the same for all six and a half years, Staff believes this method is unreasonable and unsupportable.

5. Temperature Sensitivity for Customer Classes instead of Rate Schedules

The Company ran regression models for each of three classes: the residential class includes schedules 502 (construction dry-out customers), 503 (residential) and 541 (gas air conditioning); the commercial class includes Schedules 504 (commercial), 511 (more than 50,000 therms) and 512 (compressed natural gas); and, the industrial class includes Schedules 505 (industrial), 570 (interruptible) and 577 (Limited interruptible). However, all of the schedules in any of these three classes have distinctive usage characteristics, which is why they are different schedules in the first place. Mixing them together biases the weather sensitivity coefficients. Schedule-level analysis, instead of class-level analysis, would be more appropriate because the groups of customers under analysis will be more homogenous.

In sum, the Company made a number of bold and unrealistic assumptions to calculate the daily "usage per customer" data. It started with city gate gas throughput data, not the actual consumption data. The so-called daily "usage" data for a particular customer class is allocated rather than metered. The numbers of

customers are not real counts specific to a city gate. Each customer class contains customers with heterogeneous characteristics. The errors in those assumptions compound upon each other. The resulting usage data represents the Company's best guess as to the average class consumption on each given day from July 2010 to November 2016, not the actual daily consumption. I applaud the Company's efforts to go through the tedious steps to come up with an estimate of daily usage per customer for each class and for each of the 36 city gate and city gate loops, but I do not believe the Company's daily usage data is fit for a rigorous regression analysis for the purpose of weather normalization. As a matter of fact, neither PSE nor Avista have used city gate-level analyses to develop gas weather normalization adjustments. Staff will entertain usage of such a forecasting model only when the Company obtains accurately-metered daily consumption data in the future.

Q. Do you have issues with the Company's temperature data?

A. Yes. The Company uses temperature data from a third-party vendor, Schneider Electric. Staff recommends that the Commission reject Cascade's use of temperature data from Schneider Electric. The Commission should support the use of NOAA data for weather normalization adjustments because the data is reputable, publically available, transparent, and free of charge.

None of the reasons the Company has offered in the past for its refusal to use NOAA data, and instead use Schneider Electric data, justifies its refusal in this rate case. In the past, the Company has explained that it uses Schneider Electric's data because Schneider Electric supposedly modifies temperature data to improve

accuracy, as needed. Staff's understanding is that Schneider Electric does not collect temperature data itself, but instead relies on the weather data from the National Weather Service, which is part of NOAA.[9] Then, Schneider Electric's "improvement" to the data is a black box, for which neither the Company nor any other party has provided explanation.

The Company has also explained in the past that it uses Schneider Electric data because its parent company and sister companies use it. This is hardly a compelling reason for the Company to refuse to use NOAA data. Staff does not object to Cascade's parent or sister companies' use of Schneider Electric data. Neither does Staff object to Cascade's use of Schneider Electric data for other purposes. Staff believes the Commission should require Cascade to use NOAA data for its weather normalization adjustment, however, because of NOAA's reputation, public availability, and transparency.

The Company has also argued that NOAA does not produce daily data in a timely enough manner for the Company's purposes. Even if a time delay exists before NOAA publishes its daily temperatures online, as Cascade claims, it is no excuse for the Company's failure to use NOAA data in this rate case. NOAA's time delay would not have restricted the Company's use of NOAA data for the *test year* – that data would have been readily available at the time the Company prepared its general rate case filing.

[9] *See* National Weather Service, *We are the National Weather Service*, https://www.weather.gov/about/nws (last visited Feb. 12, 2018).

Q. Do you have issues with the regression models that the Company uses in its weather normalization adjustments?

A. Yes, I do. The Company's regression model assumes that customers' gas usage sensitivity remains the same throughout all seasons. However, Staff would expect to see residential customers' gas usage in the summer to be very flat and the sensitivity coefficients to be close to zero and not statistically significant. Not distinguishing seasonal or monthly differences in temperature sensitivity biases the regression results. This creates significant doubt for the reliability of the Company's regression models.

To account for the seasonality of weather sensitivity, in my analysis, I use the interaction terms of monthly dummy variable and HDD as the explanatory variables (for example, January*HDD). If such variables are not statistically significant for certain months, I exclude them and re-run the regression until I get a parsimonious model with a good fit. My regression results indicate higher temperature sensitivity in the winter months, lower in the shoulder months and no sensitivity in the summer months, as indicated in Exh. JL-2.

2. Using the 2015 GRC Settlement Method

Q. If Cascade were to have based its weather normalization sales adjustment on the 2015 GRC Settlement method, how would those results compare to Staff's current recommendation?

A. Table 2, below, shows the comparison of Staff's sales adjustment and the Company's.

Table 2. Comparison of Weather Normalization Sales Adjustments

	Cascade CityGate Forecasting Model	Cascade 2015 GRC Settlement Method	Staff 2015 GRC Settlement Method
Schedule No. 503 Residential	12,970,005	15,052,093	14,207,770
Schedule No. 504 Commercial	5,541,986	6,136,665	8,140,084
Schedule No. 505 Industrial	593,880	-	-
Schedule No. 511 Large Volume	814,309	-	-
Total Adjustment (Therms)	**19,920,180**	**21,188,758**	**22,347,854**

As we can see by the right two columns, above, by using the method agreed to in the 2015 GRC Settlement, Staff and Cascade would have produced adjustments within 5 percent of each other for the current case.[10] By abandoning the settlement method in favor of the CityGate forecasting method, the Company decreases its normalization adjustment by an additional 6 percent, in turn increasing its requested rate relief.

[10] Neither Staff nor the Company proposes to apply weather normalization adjustments to large volume and industrial schedules using the 2015 GRC Settlement method.

Please see Exh. JL-2 for my regression model output, and Exh. JL-3 for my calculation for weather normalization sales adjustment.

Q. Why did your sales adjustment differ from the Company's, even when you both used the same method following the 2015 GRC Settlement?

A. The difference can be attributed to the following three reasons:

1. For Cascade's Bremerton-Aberdeen-Longview service area, I used the NOAA temperature data provided from the Bremerton airport in my regression analysis whereas Mr. Robertson used NOAA temperature data from the Hoquiam airport. My analysis showed that the Bremerton temperature data produced a better fit for the model than the Hoquiam temperature data. This is reasonable and unsurprising because most of the combined usage from the three disparate areas occurs in the Bremerton area and most of the customers reside in the Bremerton area.

2. I filled in missing data points in NOAA daily temperature data with the most up-to-date temperature data published on NOAA website to make the aggregate monthly HDDs more accurate.[11] It also appeared that NOAA updated temperature data for December 30, 2017, after Cascade completed its analysis. I used the most up-to-date temperature data published on the NOAA website.

[11] If a daily temperature value is missing, I used the average temperature from the adjacent days as a proxy.

3. For 30-year monthly normal HDDs, I used NOAA's 30-year normal HDD data for 1981-2010.[12] They are slightly different from the 30-year rolling average used by Mr. Robertson.[13] I prefer to use the NOAA 1981-2010 Normals because for the purposes of producing a 30-year publication, NOAA committed additional quality control resources to ensure that the data were as accurate as possible. However, I recognize the time lag since 2010 and I do not strictly oppose the use of rolling 30-year rolling average in this particular case. Ultimately, the difference in results between using my 30-year monthly normal HDDs from 1981-2010 and Mr. Robertson's 30-year rolling average is negligible.

Q. Why did Cascade not adopt the weather normalization results using the method agreed upon in the 2015 GRC Settlement?

A. The Company appears to have disliked the results. While Mr. Robertson presented the results of using the 2015 GRC Settlement method in his testimony, he stated that he believes the results "appear to be abnormally high, and the Company does not expect a normal weather year to be this high in usage."[14] He stated that "[a]pplying an adjustment of 15,052,093 to the 110,096,508 of actual therms results in an adjusted amount of 125,148,601 therms for the residential class."[15] Further, he

[12] *See* NOAA, *1981-2010 U.S. Climate Normals*, https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/climate-normals/1981-2010-normals-data (last visited Feb. 12, 2018).
[13] Robertson, Exh. BR-1T at 4:2-4. Mr. Robertson used the average daily temperature based on the most recent 30 years of weather history in each weather location.
[14] Robertson, Exh. BR-1T at 6:15-16.
[15] Robertson, Exh. BR-1T at 6:11-13.

stated that "[i]n the past seven years of data, the year 2012 most closely replicated the normal weather year."[16] He proceeded to use 2012 as a baseline for a normal weather year to extrapolate the 2016 normalized sales.[17] He concluded that, given the customer growth between 2012 and 2016, Cascade would expect to sell 120,000,000 therms for the residential schedule for the Test Year 2016.[18]

Q. Do you agree with Mr. Robertson's rationalization?

A. No. Mr. Robertson did not explain why the 2015 GRC Settlement method is inadequate for producing the weather normalization adjustment. Instead, he relied on some rough estimates and concluded that the results are abnormally high. Staff thinks the Company's decision to make these changes is capricious and results from its discovery that the principled methodology agreed upon produces results that are disfavored by the Company.

Staff cannot support even the most basic assumption made by Mr. Robertson. 2012 cannot be used as a fair baseline to estimate the sales under normal weather. Exh. JL-5 displays a monthly comparison of actual HDDs and NOAA 30-year Normals for the four weather stations in Cascade's Washington service territory. Overall, the temperature in 2012 is warmer than the normal benchmark, especially for most of the winter and shoulder months. Therefore, the Company should expect higher sales in a normal year than the 2012 level.

[16] Robertson, Exh. BR-1T at 6:16-18.
[17] Robertson, Exh. BR-5.
[18] Robertson, Exh. BR-1T at 6:17-22.

Q. What is your opinion of Cascade's presentation using the 2015 GRC Settlement method?

A. I think it is imprecise. However, the results would not be as unreasonable as the Company's proposal to use its CityGate forecasting model.

C. Results of Staff Weather Normalization Adjustments

Q. Could you explain your revision to R-1 "restating weather normalization adjustment?"

A. Yes. As shown in Exh. JL-3, my weather normalization sales adjustment on an annual basis is 22,347,854 therms. For the corresponding revenue adjustment, however, I only include the sales adjustment for January 2016 – August 2016, which amounts to 16,472,944 therms. I used the margin rate in place during those eight months.[19] I do not adjust the Company's revenue for September 2016 – December 2016 because Cascade implemented a revenue decoupling mechanism for those four months.

[19] The Company used the margin rate in effect September 1, 2016 to calculate revenue impact from weather normalization for all 12 months.

Q. Can you explain why the Company's implementation of a decoupling mechanism on September 1, 2016, is important for consideration of the weather normalization adjustment?

A. Yes. Cascade's last general rate case concluded with the Commission's approval of the 2015 GRC Settlement. That settlement included a revenue decoupling mechanism, effective September 1, 2016.[20] Under the decoupling mechanism, the Company's authorized revenue is calculated monthly based on authorized Revenue per Customer and the actual number of customers. The deviation between the authorized revenue and the collected revenue is trued-up in an annual decoupling filing through customer surcharges or credits on Tariff Schedule 594. Essentially, the decoupling mechanism set the Company's revenue at a per-customer basis, not based on actual sales. It eliminates revenue fluctuation due to weather, conservation, or other factors. Monthly decoupling deferral amounts are booked in the sales revenue accounts. Therefore, the Company's booked revenue for September 2016 – December 2016 accurately reflects the authorized revenue the Company was entitled to. There is no need to do any weather normalization adjustment to the Company's per book revenue for those four months.

Q. Why is it not appropriate to weather-normalize the revenue for September 2016 through December, 2016?

A. My weather normalization model shows that under normal temperature, the Company would have sold 5,874,910 therms of gas for September 2016 – December,

[20] *Wash. Utils. & Transp. Comm'n v. Cascade Nat'l Gas Corp.*, Docket UG-152286, Order 04, 3, ¶¶ 8-9 (Jul. 7, 2017); 2015 GRC Settlement at 3-5, ¶¶ 7-14.

2016. The corresponding net margin revenue is an additional $1,643,919. However, under the decoupling mechanism, the additional 5,874,910 therms that the Company would have sold under normal weather conditions is irrelevant to its booked revenue because the booked revenue is "decoupled" from the sales. It would not be fair to add this $1.6 million to the Company's test year revenue because the Company would have refunded that amount to the customers in the decoupling true-up next year. While this is in the Company's favor, here, Staff's believes it is important to make this adjustment based upon the correct principle and honestly account for the principle's impact.

Q. What is the effect of your changes to adjustment R-1?

A. As shown in Table 1, the Company's R-1 adjustment increases its net operating income by $3,077,609 and reduces its revenue requirement by $4,954,324. Staff's revision to R-1 increases the Company's net operating income by $2,444,754, which is $632,855 less of an increase than the Company's proposal. Staff's revision also reduces the Company's revenue requirement by $3,935,556, which is $1,018,768 less of a reduction to the revenue requirement than the Company's proposed adjustment. My calculation for Staff's revision to R-1, restating weather normalization adjustment, can be found in Exh. JL-3 and Exh. JL-4.

Q. Please explain adjustment R-3 "restate revenue adjustment."

A. This adjustment restates the Company's gas revenue and gas cost based on the Weighted Average Cost of Gas ("WACOG") rates effective September 1, 2016. The

Company's booked gas revenue and gas cost in the test year were based on two WACOGs: one before, and one after September 1, 2016. The latter was smaller. Therefore, the Company needs to adjust its gas revenue and cost to a level that reflects the cheaper WACOG from September 1, 2016, going forward. This item also included a small adjustment for net unbilled and deferrals. I include the Company's detailed explanation for this adjustment in Exh. JL-6.[21]

In this restating adjustment, the Company uses weather normalized sales for the entire 12 months to re-price gas revenue and gas cost to reflect the gas-related revenue and expense at the current WACOG under normal weather. Therefore, my weather normalization sales adjustment flows through the results, without otherwise affecting the mechanism of this adjustment.

Q. What is the effect of your changes to adjustment R-3?

A. In its initial filing, the Company reduces its net operating income by $1,501,021 and increases its revenue requirement by $2,416,338 in this adjustment. As shown in Table 1, based on my weather normalization result, Staff's revision to this adjustment reduces the Company's net operating income by $1,557,514, which is a $56,493 greater reduction to net operating income than the Company's proposal. Staff's revision also increases the revenue requirement by $2,507,281, which is a $90,943 greater increase to the revenue requirement than the Company's proposal. My calculation for this adjustment is included in my Exh. JL-7.

[21] Cascade's Response to NWIGU Data Request No. 6, attachments omitted.

Q. Please explain adjustment P-9 "Pro Forma Revenue."

A. In this adjustment, the Company priced the modified test year billing determinants at the current rates to derive its revenue perspective for the rate year before any proposed increase to rates. In the test year, the Company had a margin rate increase effective September 1, 2016. If the current billing rates were in place for all 12 months in the rate year, the Company would have received more revenue as compared to the test year, hence reducing the need for a rate increase. The modifications to the test-year billing determinants also reflect the effect of weather normalization and proposed schedule migrations.[22] In addition, the Company also included the effect from annualization of Cost Recovery Mechanism ("CRM") revenue.[23]

In other words, this adjustment calculates how much total revenue the Company would get if (1) the weather is normal; (2) proposed schedule migration is in place; and, (3) the current rates, including CRM rates, are in place for 12 months in the rate year. It is a necessary middle step to evaluate how much more revenue the Company needs to get to its required revenue level. Because it is a forecast of revenue outside the test year, it is considered a pro forma revenue adjustment.

[22] In this rate case, the Company proposes to migrate Schedule 502 customers to Schedule 503, migrate Schedule 512 customers to Schedule 504 and migrate Schedule 577 customers to Schedule 570.
[23] The Company had a new CRM rate effective November 1, 2016. In this pro forma revenue adjustment, the Company calculates how much more CRM revenue it would get on an annual basis if the current CRM rate continues throughout the rate year.

Q. What is the effect of your changes to adjustment P-9?

A. As with adjustment R-3, my weather normalization sales adjustment flows through the results. Based on my weather-normalized sales for the test year, I anticipate that the Company will obtain $9,679,995 more revenue than the test year before adding annualized CRM revenue. After taking out the effect of restating weather normalization in adjustment R-1 ($4,313,453), adding the additional CRM revenue through annualization ($1,748,783), and adding the reversal of 2016 decoupling deferral ($189,011), the amount for "pro forma revenue adjustment" is $7,304,336. The reasons that it is fair to add the reversed amount of decoupling deferral from 2016, (a refund of $189,011 to ratepayers) is because the Company will not need to repeat this refund to customers in the future.[24]

As reflected in Table 1, the Company's proposed adjustment to P-9 increases the net operating income by $3,242,702 and reduces the revenue requirement by $5,220,091. Staff's revisions to adjustment P-9 increase the net operating income by $4,537,428, which is a $1,294,725 greater increase than the Company's proposal. Staff's revisions to adjustment P-9 reduce the revenue requirement by $7,304,336, which is a $2,614,467 greater reduction to revenue requirement than the Company's proposal. My calculation for this adjustment is included in Exh. JL-8.

[24] The Company provided a revised workpaper in Docket UG-171014, which updated the deferral balance as of December 31, 2016. Docket UG-171014, Cascade Nat'l Gas Corp.'s Revised CNGC Advice W17-09-03 Exh A WP 10-19-2017, "Balances at 12-31-2016" (Oct. 19, 2017).

IV. LOW INCOME BILL DISCOUNT PROGRAM PROPOSAL

Q. What is the subject of your low income testimony?

A. In this section, I provide a general overview of the Company's Washington Energy Assistance Fund ("WEAF") and the progress made since the last general rate case. I examine the problems caused by the lack of a consistent formula in determining the WEAF benefit amount. Finally, I propose replacing the current grant-based financial assistance program with a bill discount program.

A. Program Overview

Q. What is your understanding of the Commission's role regarding low income assistance?

A. All utilities regulated by the Commission have a bill assistance program to provide financial aid to qualified low income customers. Such programs play an important role in making the bills affordable to all customers and reducing the Company's bad debt. My understanding is that any party to a general rate case can propose changes to the low income bill assistance program and the Commission's role is to determine whether to authorize the proposed changes.[25]

[25] RCW 80.28.068; RCW 80.28.080.

Q. Could you please describe Cascade's Low Income Bill Assistance Program?

A. Yes. Cascade's WEAF program has been in operation since 2006. It provides financial assistance to customers whose income is below 150 percent of the Federal Poverty Line ("FPL"). Like other regulated utilities in Washington, Cascade contracts with Community Action Agencies ("CAAs") to verify customer eligibility and determine the WEAF grant amount. WEAF grants currently appear as a lump sum credit on customer bills.

Q. Have there been recent changes to WEAF?

A. Yes. In the 2015 GRC Settlement, stakeholders agreed upon a number of improvements to the program.[26] Significant changes included:

- Adoption of four program goals;
- Establishment of the Low Income Energy Assistance Advisory Group (Advisory Group);
- Establishment of an annual cost recovery mechanism for WEAF;[27]
- Establishment of a five-year spending cap from 2016-2017 program year through 2020-2021 program year;[28]
- Allowing those Cascade ratepayers who cannot show documentation of legal residence to receive WEAF benefits.

[26] 2015 GRC Settlement at 9-13, ¶¶ 27-42.
[27] Prior to September 1, 2016, WEAF was funded through general gas rates.
[28] Prior to 2016-2017 program year, WEAF was budgeted at $800,000 and usually under-spent. The annual budget cap for 2016-2017 was set at $1,047,000 in 2015 GRC settlement with a 5.1 percent increase for the next four years.

Q. How do the agencies use the money collected for the WEAF program?

A. The total spending in the 2016-2017 program year was $1,036,577.[29] Of that total, 79 percent was disbursed as a direct benefit for low income customers to offset their bills; 18 percent was used to cover the CAAs' costs based on $75 per each successful application; and, 4 percent was spent on the outreach activities that the Advisory Group agreed on as well as a needs assessment study.[30] Table 3, below, summarizes the disbursement of WEAF direct customer benefits in the last five program years.

Table 3. WEAF Customer Benefits in Last Five Years[31]

Program Year	Grants	Households Served	Average Grant
2012-2013	$698,936	2,341	$299
2013-2014	$760,759	2,430	$313
2014-2015	$813,338	3,207	$254
2015-2016	$731,059	2,297	$318
2016-2017	$813,911	2,387	$341

As shown in Table 3, in the 2016-2017 program year (right after the terms of the 2015 GRC Settlement were implemented), WEAF benefitted 4 percent more households than the previous year.

[29] Docket UG-171009, Cascade Nat'l Gas Corp.'s Advice No. W17-09-04 Supplement, Attachment A, "WA 2016-Post Revision" (Oct. 18, 2017). The total spending amount can be gathered from summing the 2016-2017 Program Year totals for "Payments to Customer Accounts (CC&B CI1573)," "Payments to agencies thru AP," and "Other Program Costs."
[30] *See id.*
[31] *See* Cascade's Response to UTC Staff Data Request No. 99.

Q. Has Cascade sought the advice of its WEAF Advisory Group since the 2015 GRC Settlement?

A. Yes. The Advisory Group consists of representatives from Cascade, various CAAs, the Energy Project, UTC Staff and occasionally Public Counsel Staff. I've been a staff representative since the formation of the group in 2016. The Advisory Group convened six times between August 2016 and December 2017. Cascade solicited input from Advisory Group members for customer outreach, adjusted its radio advertisement plan and added Facebook advertisements based on member feedback. Cascade also circulated a monthly fund disbursement log to help Advisory Group members keep track of expenditure and fund balance. Cascade completed a Low Income Needs Assessment study in compliance with the 2015 GRC Settlement. Cascade has also proactively petitioned to raise the annual caps to prevent fund deficiency even though the actual spending turned out to be below the original cap.

Q. Does the Low Income Needs Assessment, mentioned above, support continuation of the WEAF program?

A. Yes. Cascade contracted with Eastern Washington University for a Low Income Needs Assessment ("EWU Needs Assessment") which was completed in November 2017.[32] The main area of interest was the penetration ratio of the WEAF program. This is, essentially, the take-rate, or the ratio between the number of customers who received WEAF benefit and the number of all potentially eligible customers. The EWU Needs Assessment indicated that the penetration ratio is 10.4 percent at the

[32] *Wash. Utils. & Transp. Comm'n v. Cascade Nat'l Gas Corp.*, Docket UG-152286, Low-Income Needs Assessment Study (Dec. 11, 2017).

125 percent of FPL threshold for Cascade's Washington service area, and 8.4 percent at the 150 percent of FPL threshold. This penetration rate is comparable to PSE and Avista.[33]

The secondary area of interest for the EWU Needs Assessment was the gas cost burden, or customers' spending on Cascade gas service, as a percentage of their household income.[34] It indicated that across 2013-2015 the average spending on Cascade gas service for unsubsidized households was $518, or 0.8 percent, of household income, whereas the average customer spending of subsidized households was just $92, or 0.5 percent, of household income.[35] This is a desirable outcome, with subsidized households spending a lower percentage of their income on gas than unsubsidized households.

The EWU Needs Assessment demonstrated that the WEAF program significantly reduced low income households' energy burden as reflected in low income households' low gas cost burden, but there is still room for improvement in terms of reaching out to more customers and striving for a higher penetration ratio.

[33] PSE indicated that about 20 percent of households in the counties it serves is under 150 percent of FPL *See* Sasville, Exh. SAS-1T at 3:8-10, Dockets UE-170033 and UG-170034. This puts the penetration rate of the PSE Help and LIHEAP program at about 18 percent for electric service and 8 percent for gas service.

Based on the 2015 estimates of number of households under 125 percent FPL and Avista's Low Income Rate Assistance Program (LIRAP) Annual Summary Report for 2016-2017 Program Year, LIRAP Heat reaches about 14 percent of the eligible population with electric and gas services combined. However, the penetration rate for gas customers is likely much lower.

[34] The usual metric for this analysis is the energy burden, however, that metric considers all spending on energy from all sources. In this case, we are looking exclusively at the spending on natural gas service as a subset, which I have called gas cost burden.

[35] Eastern Washington University, *Analysis of Low-Income Heating Assistance Programs Administered by Cascade Natural Gas in its Washington State Service Area*, 2 (Nov. 2017), *filed in Wash. Utils. & Transp. Comm'n v. Cascade Nat'l Gas Corp.*, Docket UG-152286 (Dec. 11, 2017).

Q. What is WEAF's funding level?

A. Through the 2015 GRC Settlement, the Commission has already approved annual funding increases that continue through the 2020-2021 program year.[36] Additionally, on June 28, 2017, the Commission approved Cascade's petition to increase WEAF annual budget caps by 15 percent and allow an additional 5 percent buffer as indicated in Table 4, below.[37]

Table 4. WEAF Budgets

Program Year	Original Budget	Current Budget	Soft Cap
2016-17	$1,047,000	$1,204,050	$1,256,400
2017-18	$1,100,000	$1,265,000	$1,320,000
2018-19	$1,156,000	$1,329,400	$1,387,200
2019-20	$1,215,000	$1,397,250	$1,458,000
2020-21	$1,276,000	$1,467,400	$1,531,200

Q. Do you think the Commission should increase the WEAF funding level in this GRC?

A. No, not at this time. Gas bills have been relatively stable and the five-year funding plan builds in an annual increase of 5.1 percent. In the event that it becomes an issue, the 2015 GRC Settlement provided that Cascade may petition to increase funding without the need of filing a GRC.[38]

[36] 2015 GRC Settlement at 13, ¶ 42.
[37] *Wash. Utils. & Transp. Comm'n v. Cascade Nat'l Gas Corp.*, Docket UG-152286, Order 05, 1-2, ¶ 3 (Jun. 28, 2017).
[38] The 2015 GRC Settlement states that "Cascade may file a petition with the Commission to modify the cap amounts." 2015 GRC Settlement at 13, ¶ 42.

B. WEAF Over-Subsidization

Q. Do you perceive any problem with WEAF at this time?

A. Yes. Currently, the way CAAs calculate the WEAF benefit for income-qualified households allows over-subsidization of a significant number of customers. This over-subsidization provides certain customers more funding than they need, thereby inefficiently allocating limited funding resources and potentially preventing other eligible customers from receiving support.

Q. How do CAAs determine the WEAF benefit?

A. CAAs interview applicants and determine the amount of financial support from both LIHEAP and WEAF, but the CAAs serving Cascade customers do not currently use a consistent and standard formula in calculating WEAF support. In place of a standard formula, the agencies use at least four different methods, at their discretion, to calculate the benefit for a customer. The four methods the Energy Project is aware of are:

- Low Income Home Energy Assistance Program ("LIHEAP") grant computation formula;
- The PSE HELP computation formula;
- A combination of the two, above; and
- Flat grant awards.[39]

[39] The Energy Project's Response to UTC Staff Data Request No. 1.

Q. Do other regulated utilities use a standard formula for their low income bill assistance programs?

A. Yes. PSE and Avista instruct their CAAs to use a consistent formula for their CAAs to calculate their low income bill assistance. Pacific Power & Light Company ("PacifiCorp") implements a rate discount program where the same rate credits apply to all income-qualified customers.

Q. Why is the lack of a uniform method a problem?

A. Staff believes the lack of uniformity is discriminatory because if the same customer were to apply for energy assistance at different agencies, that customer would receive different amounts from WEAF. The lack of a standard formula has also led to over-subsidization of a significant amount of customers.

Q. Would the LIHEAP formula be suitable to determine the WEAF grant?

A. No. Calculating the WEAF grant from the LIHEAP formula does not evaluate the household's need for additional assistance after the award of LIHEAP funding, it merely doubles it.

A household can be eligible for both federal LIHEAP and WEAF if the household income is at or below 125 percent of the FPL.[40] The LIHEAP formula is designed to cover 50-90 percent of the customers' heating bill (total bill minus base load usage) in inverse proportion to the household income: the lower the income, the

[40] WEAF is available to households that are at or below 150 percent of the FPL; LIHEAP is available to households that are at or below 125 percent of the FPL.

greater the percentage of heating cost is covered by LIHEAP grant.[41] In that situation, granting a WEAF benefit based on that same formula would, essentially, double the LIHEAP grant: a household would get more than 100 percent of their annual bill covered and end up with a credit balance for an extended period of time.

Q. Would the PSE Help formula, or a hybrid of the LIHEAP and PSE Help formula, be suitable to determine the WEAF grant?

A. No. While PSE's Help formula does cover only 20-60 percent of the bill after subtracting LIHEAP support, the formula was developed for the purpose of its own customer characteristics, many of whom are dual-fuel customers, and in consideration of its own program budget. It is not a good instrument to use for Cascade, especially without first analyzing the unique circumstances of Cascade's customers. Mixing components of the LIHEAP and PSE Help formulas is equally inadvisable.

Q. Would a flat amount approach be suitable to determine the WEAF grant?

A. No. Providing a flat amount, especially going with the maximum amount of $500, is an irresponsible use of Cascade rate payers' money and is disconnected from the household income level or the actual need on gas bills. When combined with LIHEAP, such practice results in unnecessarily high credits on the customer account, limiting the ability of the WEAF program to reach more customers in need.

[41] The LIHEAP calculation considers the costs from all heating sources: electric, natural gas, wood, fuel oil, and propane.

Q. What is the extent of the over-subsidization problem?

A. Cascade's Revised Response to UTC Staff Data Request No. 96C (confidential) provided detailed bill information for all customers that received any kind of energy assistance (LIHEAP, WEAF, Winter Help[42] or any combination of the three) in 2016-2017 program year. A total of [redacted] customers received some type of energy assistance.[43] The customer counts for each type of energy assistance are depicted in the following diagram.

Figure 1 (Confidential). Number of Low Income Customers Receiving Energy Assistance from Multiple Sources

FIGURE 1 IS REDACTED

[42] Winter Help is a small bill assistance fund provided through voluntary contributions by Cascade shareholders and customers.

[43] A total of [redacted] accounts are provided for 2016-2017 program year, yet [redacted] accounts have negative energy assistance credits (refund upon account closing). It leaves a total of [redacted] with positive energy assistance credits.

To determine the extent to which over-subsidization occurs, I have analyzed average yearly customer bills, average yearly energy assistance and compared the September 30, 2017,[44] account balances of these customers in two different groups. The findings are presented in Table 5 and Table 6, below.

Table 5, below, shows customers' bills and levels of energy assistance they received in the 2016-2017 program year. The average amount of energy assistance that customers received was very close to their yearly bills. On average, [redacted] percent of customers received credits exceeding 80 percent of their yearly bill total, and [redacted] percent of customers received credits exceeding their yearly bill total. For customers who received both WEAF and LIHEAP, these percentages are [redacted] percent and [redacted] percent, respectively.

Table 5 (Confidential). Bill and Energy Assistance of Cascade's Low Income Households (2016-2017 Program Year)

	All Customers Receiving Any Amount of Energy Assistance	Customers Receiving both WEAF and LIHEAP
Households	[redacted]	[redacted]
Households with 1-Year of Bill History	[redacted]	[redacted]
Average Yearly Bill	[redacted]	[redacted]
Average Yearly Energy Assistance	[redacted]	[redacted]
Households with Assistance Exceeding 80% of Bill	[redacted]	[redacted]
Households with Assistance Exceeding 100% of Bill	[redacted]	[redacted]

[44] September 30 is the end of a LIHEAP/WEAF Program Year, which makes it an appropriate date on which to evaluate.

Table 6, below, shows that a vast majority of customers, [redacted] percent, had a credit balance remaining on their accounts at the end of the program year (September 30, 2017), averaging [redacted] in credit balance. In other words, due to the flaws in the current method (or absence of a consistent method) with calculating a customer's need for financial assistance, it is common for low income assistance to exceed a customer's total yearly bill. This over-subsidization problem is more prominent among customers who received both LIHEAP and WEAF, [redacted] percent of whom had a credit balance at the end of the program year, with an average credit balance of [redacted].

Table 6 (Confidential). Account Balance at End of 2016-2017 Program Year

	All Customers Receiving Any Energy Assistance		Customers Receiving both WEAF and LIHEAP	
Accounts with a Balance (customer owes)	[redacted]	[redacted]	[redacted]	[redacted]
Accounts without a Balance, or Closed	[redacted]	[redacted]	[redacted]	[redacted]
Accounts with a Credit Balance	[redacted]	[redacted]	[redacted]	[redacted]
Average Account Balance		[redacted]		[redacted]
Highest Credit Balance		[redacted]		[redacted]

All in all, the Company was carrying [redacted] credits for low income customers at the end of the 2016-2017 program year, which was [redacted] percent of WEAF pledged in the same program year. This is a large amount of credits that are not being used, as intended, in the program year.

Q. Could these credit balances be attributed to other causes?

A. Possibly. Although most of the customers received energy assistance in the early half of the program year, some customers did not get assistance until after April. It is also possible that customers paid a portion of the annual bills out of their own pocket.

To more accurately evaluate the impact of energy assistance over a year, I reviewed the credit balance of only those customers who received WEAF in the month of October 2016.[45] A total of [redacted] customers received WEAF in October 2016, while also receiving LIHEAP in the same program year. After a year, the average balance for these 46 customers was a credit balance of [redacted]. In other words, the average customer receiving both WEAF and LIHEAP, starting in October 2016, received [redacted] more in assistance than their entire yearly gas bill. Of the [redacted] customers receiving both WEAF and LIHEAP, only [redacted] owed money towards their gas bills as of September 30, 2017, while [redacted] customers had a credit balance.[46] These 35 customers, essentially, did not have to pay for gas for more than a year. One account even had a credit balance of [redacted]. The distribution of the customer counts is shown in the Table 7, below.

[45] Cascade's Revised Response to UTC Staff Data Response No. 96C (confidential).
[46] Three accounts were closed prior to September 30, 2017.

Table 7 (Confidential). Customers Receiving WEAF and LIHEAP in October 2016

	Account Balance as of September 30, 2017	Customers
Balance (customer owes)	$3 - 119	[redacted]
Credit Balance (customer has unspent credits)	($0 - 100)	[redacted]
	($100 - 200)	[redacted]
	($200 - 300)	[redacted]
	($300 - 400)	[redacted]
	($400 - 500)	[redacted]
	($500+)	[redacted]
Total		[redacted]

Q. Why is a credit balance a problem?

A. Staff believes it is inconsistent with the principle of fairness and equity. In general, more financial support should be made available for those who need it the most. Staff advocates for a formula that reflects the relationship between customer need and the support given.[47] Households with lower income and a higher energy burden should get more financial support. It is necessary and prudent to make gas service affordable to all customers, but this does not mean we should allow ratepayer money to sit un-used.

Q. Does a credit balance cause other problems?

A. Yes. It can potentially cause additional workload for CAAs and, counter-intuitively, create a burden on customers.

[47] For example, the LIHEAP and PSE Help benefit curves reflect the inverse relationship between household income level and the benefit level.

WEAF has a credit balance threshold of $300: if a customer has more than $300 left of energy assistance from a prior year, the customer will not qualify for WEAF until they spend down the credit below $300. So, at an appointment, the CAA will discover that a customer with a credit balance above $300 is ineligible for WEAF funding and only eligible for LIHEAP. The customer may make another appointment with the CAA to apply for WEAF again after they spend down their credit balance below $300. This is more work for both the customer and the CAAs. In the 2016-2017 Program Year, [redacted] Cascade customers received LIHEAP support, yet [redacted] of them ([redacted] percent) did not receive WEAF.[48] This could be attributable to those customers having more than a $300 credit balance at the time of application. Furthermore, a credit balance for an extended period of time does not foster customers' awareness of bills, price signals, and conservation. When a customer becomes accustomed to not paying a bill for an extended period of time, the customer may become conditioned to ignore the bills and succumb to accumulation of debt to a point that triggers a crisis and results in the possibility of disconnection. In addition, over-subsidized customers are unlikely to have incentives to address any underlying weatherization issues in their home, which would save energy and money in the long run.

[48] Cascade's Revised Response to UTC Staff Data Request No. 96C (confidential).

C. WEAF Update: Bill Discount

Q. What do you propose to standardize the WEAF formula?

A. I propose that the Commission update WEAF by implementing a bill discount program, providing a specified level of discount to qualified low income customers. I believe a bill discount program has inherent advantages over a grant-based program. It will address the over-subsidization problem. It will eliminate the need for CAAs' intake staff to use a complicated worksheet to calculate the WEAF amount. It treats all similarly situated customers fairly. It makes the program benefit easier to explain and to understand.

Staff's proposal can be succinctly stated: customers who receive benefits through LIHEAP will receive an additional 30 percent pre-LIHEAP bill discount; and, all other qualifying customers will receive a 50 percent bill discount. I provide greater detail and explanation later in my testimony.

Q. Is there a desire for the bill discount program Staff is proposing?

A. There is not consensus. However, stakeholders including Staff, the Energy Project, and Cascade have been part of ongoing dialogue discussing the potential for a bill discount program. In the 2015 GRC Settlement, parties agreed that "[s]takeholders should explore a rate discount program or a percentage of household income program to complement the current WEAF grant program."[49]

[49] 2015 GRC Settlement at 12-13, ¶ 41.

Q. Did stakeholders explore alternative program designs after the 2015 GRC Settlement?

A. Yes, although to a limited extent. Staff circulated two proposals to the Advisory Group by email in 2016, one based on Percentage of Bill and one based on Percentage of Income Payment Plan. However, due to schedule conflicts and work load issues, the Advisory Group never discussed Staff's two proposals. Staff accepts its fair share of the responsibility for these discussions not taking place, and believes that this should not impede the discussion in this rate case, or the ability of the Commission to provide direction as to the proper design of WEAF.

Q. Could you please explain your bill discount program design, in detail?

A. Of course. In my proposed bill discount program for WEAF, all income-qualified customers that receive federal LIHEAP benefit will receive a 30 percent discount off of their monthly, pre-LIHEAP bill; all income-qualified customers that do not receive a benefit from the federal LIHEAP will receive a 50 percent discount off their monthly bill through WEAF. By "monthly, pre-LIHEAP bill," I mean that the 30 percent bill discount is factored from the customer's bill *prior* to any reduction that may take place from the application of LIHEAP funds to the customer's bill.

The bill discount that I propose should apply to the basic charge, margin rate, and gas cost rate. The discount could also be applied to adder schedule rates (for example, conservation surcharges) to the extent that it is technically feasible to implement it in the Company's billing system. The bill discount should not, however, be applied to miscellaneous and one-time charges such as customer

deposits, disconnection, and re-connection fees, non-sufficient-funds check fees, field visit charges, new premise charges, etc.

In Exh. JL-9C, I present the detailed bill impact step by step, including customer bill, LIHEAP support, WEAF support, and a range of examples of household gas bill cost burden. I present the scenarios with average consumption and with extremely high consumption, with and without LIHEAP support. Key assumptions such as average bills and household income are explained in the notes of Exh. JL-9C.

Q. Could you provide an example to illustrate the WEAF bill discount benefit calculation?

A. Yes. For example, let's consider a low income household with average consumption and a total yearly bill of [redacted],[50] of which [redacted] percent, or [redacted], is the heating bill prior to the application of any LIHEAP benefit. If this customer falls into the income bracket of 0-50 percent of FPL, LIHEAP will provide a grant that equals between 84-90 percent of the heating bill for this income bracket. For illustrative purposes, let's assume that LIHEAP provides [redacted] of support (the average between 84 and 90 percent, multiplied by the heating bill of [redacted]). In this circumstance, a WEAF bill discount (as Staff proposes) would provide 30 percent of the discount off of the bill. Over the span of a year, that would be a discount of [redacted] (yearly bill multiplied by

[50] The yearly total bill assumed here is calculated based on bills for low income customers with the entire 12 month bill history, therefore, it is higher than the average of all low income customers if we include customers with partial-year bills. Based on Cascade's Responses to UTC Staff Data Requests Nos. 23 and 24C (confidential), the average low income customer used less gas than the average residential customer did in calendar year 2016.

30 percent). The bill discount will be provided, however, on a monthly basis. The customer would remain responsible for the remainder of the bill not covered by assistance received through LIHEAP or WEAF's 30 percent bill discount. Over the span of a year, the customer's responsibility would be approximately [redacted], or [redacted] percent of the yearly bill. If the household had four people, the gas cost burden for that household would be [redacted] percent of the household's income. If the household has one person, the gas cost burden for that household is [redacted] percent of the household's income. Please see Exh. JL-9C for more scenarios.

Q. Why do you believe 30 percent is the appropriate level for customers who also receive a benefit from LIHEAP?

A. My proposal keeps the discount level simple so that the benefit will be easy for CAAs to explain, easy for customers to understand, and easy for Cascade to implement. Based on my analysis of Cascade's low income customers' bills, I believe a 30 percent discount will be a meaningful amount of financial support that will result in the following desirable outcomes:

(1) Keep customers' payments affordable: a customer with average consumption will see a yearly bill between [redacted] and [redacted];

(2) Maintain the tiered LIHEAP structure, where households with more income pay more than those with lower incomes; and

(3) Keep gas cost burden at a low level: less than a [redacted] percent gas cost burden, even for the lowest income tier. A customer with extremely high usage[51] in the lowest income tier will have a gas cost burden below [redacted] percent.

Q. Why do you propose to provide a higher level of WEAF support (50 percent) to those low income customers who do not receive a benefit from LIHEAP?

A. As a reference point, under my proposal, WEAF would provide a yearly average support of [redacted] to a low income household who does not receive a benefit from LIHEAP.[52] For the 2016-2017 program year, the average benefit provided by LIHEAP is [redacted].[53] Therefore, I believe offering a 50 percent bill discount to customers who do not receive a benefit from LIHEAP is fair and reasonable.

My analysis showed that, even with 20 percent less in a bill discount, most customers who receive a benefit from LIHEAP still receive slightly more assistance, in total, than a customer that does not qualify for LIHEAP. I considered this balance when considering what percent of bill discount was appropriate and fair.

The additional 20 percent in bill discount under my proposal is, therefore, intended to partially make up for the lack of LIHEAP support for these customers. There are three potential scenarios where a customer could receive WEAF, but not receive LIHEAP benefit:

[51] I used the annual bill of [redacted] as "extremely high" usage. It is derived from the mean of [redacted] plus two standard deviations of [redacted].
[52] Exh. JL-9C.
[53] Cascade's Revised Response to UTC Staff Data Request No. 96C (confidential). The [redacted] that I calculate does not yet include my proposal to add a WEAF bill discount benefit of 30 percent. With the addition of my proposed 30 percent bill discount, the total financial assistance received by the customer would be greater than the LIHEAP benefit, alone.

- A customer's household income is between 126 percent and 150 percent of FPL;
- A customer cannot show documentation of legal residence; or
- LIHEAP funding is not available. It is also possible that while a customer may have gas heating, but the entire or majority of the LIHEAP support is applied to the customer's electricity bill.

In the 2016-2017 program year, [redacted] of [redacted] customers (or [redacted] percent) who received WEAF in the 2016-2017 program year did not receive LIHEAP.[54] This indicates a big gap in energy assistance: over [redacted] of the low income energy assistance applicants do not receive any benefit from LIHEAP, relying solely on WEAF and the small Winter Help fund for financial assistance. These customers need a higher discount from WEAF to have any relief from their gas cost burden.

Under my proposal, a customer with average consumption and without LIHEAP will see a yearly bill under [redacted]. The gas cost burden for a household with average consumption is less than [redacted] percent of household income for each income tier except for the 0-50 percent FPL tier. This discount level will provide more support, in terms of dollars, to households with higher gas usage. A customer with extremely high usage will still have a cost burden that falls below [redacted] percent except for the 0-50 percent FPL tier. For the 0-50 percent FPL tier, the average cost burden is around [redacted] percent with average consumption and [redacted] percent with high consumption. This cost

[54] Staff derived the numbers from Cascade's Revised Response to UTC Staff Data Request No. 17C (confidential). The same data source revealed that in *previous* program year (2015-2016), [redacted] ([redacted] percent) of the [redacted] WEAF beneficiaries did not receive LIHEAP benefit.

burden is reasonable compared with the 23 percent total energy burden of Avista's low income customers within the same income tier.[55]

Q. Why not provide the 50 percent bill discount to all customers?

A. Doing so would result in some customers getting more energy assistance (through the combination of LIHEAP and WEAF) than 100 percent of their yearly bill. Such an outcome is unfair, unnecessary, and undesirable for the reasons enumerated earlier in my testimony.

Q. For customers that do not receive LIHEAP, why do you not propose tiered bill discounts, providing higher percentage of discounts to households with lower income?

A. I proposed 50 percent discount for all customers in that category for two primary reasons: the sake of administrative simplicity; and, for the ease of communication to customers. It also eliminates the additional step for CAAs to disclose the customers' income level to Cascade. Currently, I am not aware of any data on the distribution of gas low income customers across different income brackets. To the extent that other parties feel the need to have a tiered structure, Staff will remain open to discussion.

[55] *Avista Corp.'s Low Income Rate Assistance Program (LIRAP) Annual Summary Report for the Program Period October 2016 through September 2017, Washington*, Dockets UE-010436 and UG-010437, 13, Table 6, Energy Burden (Dec. 26, 2017).

Q. What are the key parameters in your proposal to make WEAF a successful bill discount program?

A. There are six:

1. Cascade must provide CAAs with customers' most recent 12-month bill history without reducing it by energy assistance.

Cascade currently has an online portal available for CAAs to check customer bill history. My understanding is that the bill history shows the usage-related charges, not offset by energy assistance.[56] It is necessary that this remains the case. The amount of 12-month bills provided to CAAs should not be reduced by the WEAF discount. Otherwise, it will result in a decrease in the customers' LIHEAP support in the following year.

2. CAAs must provide customers with LIHEAP support if the customer is eligible and if LIHEAP is applicable.

Staff is not sure of the CAAs' current practice. The intent of this requirement is to guarantee customers receive a federal benefit if they qualify so that WEAF will supplement, but not substitute LIHEAP. In the 2016-2017 program year, over [redacted] of the customers who received WEAF did not receive LIHEAP. It appeared possible that some CAAs may have provided the entire LIHEAP grant to a customer's electricity bill. Staff recommends that, going forward, if a customer uses both electricity and gas in the winter months, CAAs should properly split the LIHEAP support between the electric and gas bills.

[56] Cascade's Response to UTC Staff Data Request No. 25.

3. Allow CAAs to certify customers with stable income every two years instead of requiring certification every year.

This is consistent with the Commission's approved approach in PacifiCorp's Low Income Bill Assistance (LIBA) program, Avista's Senior and Disabled Rate Discount Pilot Program, as well as the most recent PSE general rate case. It will save CAAs' time spent on WEAF recipients with stable income. The intent of this requirement is to cut CAAs' administrative burden and make their resources readily available for new customers. Because Staff recommends the agencies provide eligible customers with LIHEAP, which has a yearly recertification requirement, this requirement would apply to customers who only receive WEAF.

4. The bill discount benefit will last 12 months from the approval, or 24 months for customers with stable income. Cascade shall explicitly note the expiration date of the discount benefits in the customer's bill so that a customer can renew the benefits in a timely manner.

5. The credit threshold of $300 should remain in place.

Under Staff's bill discount program, the average WEAF benefit is below [redacted]. If a customer has $300 or more credit left over from the energy assistance from the prior period, the customer will not likely need more WEAF support. In the situation that the customer does need financial support, Winter Help is available for emergency relief. If eligible, the customer can still receive LIHEAP in that situation.

6. Raise the WEAF maximum support amount from $500 to $700, subject to Cascade's technical ability to implement it in its billing system, or alternatively, remove the limit of WEAF maximum support on each household.

This is to ensure low income customers with very high usage but no LIHEAP support will have adequate assistance. In the data that I reviewed for the 2016-2017 program year, I counted [redacted] customers (who received low income financial assistance) with annual bills exceeding [redacted].[57] The increase in the WEAF cap should assist those households without jeopardizing program spending. However, Staff recognizes it may involve tracking of accumulated credits from month to month, and could become difficult to implement in the Company's billing system. Staff would accept no cap on individual accounts if implementation is a problem. The vast majority of the high-usage customers already received LIHEAP support and, therefore, only need the 30 percent discount as Staff proposes.

Q. Are you able to predict how the bill discount program would perform vis-a-vis the existing grant-based program?

A. Yes. I have used historical data in order to determine that Staff's proposal for a bill discount program would out-perform the current grant-based program, evaluated considering the concerns I have raised in my testimony thus far.

The bill discount design will likely reduce the WEAF benefit level for many households, yet still keep the cost burden at a low level. To confirm this, I performed a backcast on the dataset Cascade provided for 2016-2017 program

[57] Based on Cascade's Revised Response to UTC Staff Data Request No. 96C (confidential), the average annual bill for customers who receive energy assistance is [redacted] with a standard deviation of [redacted]. The mean plus two standard deviation is [redacted]. Therefore, in general, I consider annual bills exceeding [redacted] as extremely high usage.

year.[58] In my backcast, I assume that the number of recipients would not change but the WEAF benefit level would be determined with my proposed discount design.[59]

Table 8, below, shows the hypothetical results of Staff's proposed bill discount program in comparison to the actual results of the current grant-based program.

Table 8 (Confidential). Comparison of Existing and Proposed WEAF Programs

	Existing Grant Program Result (Actual)	Bill Discount Program Result (Proposed)
Recipients[60]	[redacted]	[redacted]
Average WEAF Grant	[redacted]	[redacted]
Standard Deviation	[redacted]	[redacted]
Maximum Grant	[redacted]	[redacted]
Minimum Grant	[redacted]	[redacted]
Total WEAF Support[61]	[redacted]	[redacted]
Average Total Energy Assistance	[redacted]	[redacted]
Households with Energy Assistance Exceeding 80% of Bill	[redacted]	[redacted]
Households with Energy Assistance Exceeding 100% of Bill	[redacted]	[redacted]

[58] Cascade's Revised Response to UTC Staff Data Request No.96C (confidential).
[59] Under Staff's proposal for a bill discount program design, CAAs must provide customers with LIHEAP support on gas bills when the LIHEAP support is applicable. However, I was unable to estimate the interactive effects, where more customers may have received LIHEAP support and only need 30 percent discount from WEAF instead of needing 50 percent from WEAF. Since it is not factored in my backcast, it is possible that my backcast result slightly overstates the WEAF spending under the bill discount program. It is, therefore, possible that under Staff's proposed bill discount program, the costs of WEAF will be less than I indicated, above.
[60] The customer count excludes [redacted] accounts with a WEAF credit refund or no WEAF at all, and [redacted] accounts with no yearly bill history.
[61] Not including offset from WEAF refund in closed accounts.

Table 8, above, shows that if Staff's proposed bill discount program had been implemented at the beginning of the 2016-2017 program year, the total WEAF direct benefit would have been reduced from [redacted][62] to [redacted], a reduction of [redacted], or [redacted] percent.[63] Also, as shown in Table 8, the bill discount program would have significantly reduced the number of households receiving over-subsidization – total energy assistance that exceeded 100 percent or 80 percent of their yearly bills.[64]

Q. How will your proposed bill discount design change the distribution of WEAF benefits?

A. Here, I present two histograms to compare the distribution of WEAF benefits under the existing program and under my proposed bill discount program.

[62] This number does not include any refund to WEAF due to any low-income customer closing their account during the program year.

[63] In this dataset, all customers with annual bills higher than [redacted] received LIHEAP support. Their WEAF benefits are at 30 percent level. The bill discount program expenditure is the same with or without a $700 cap at the household level.

[64] Certainly mismatch between the energy assistance and the annual bills is expected because LIHEAP grant is determined based on the customers' 12-month bills in the prior year, which could be higher or lower than the current year bills due to weather, change of address or the use of back-out method for customers without a complete bill history.

Figure 2 (Confidential). Distribution of WEAF Benefits Under Existing Program

FIGURE 2 IS REDACTED

As shown in Figure 2, a large number of WEAF beneficiaries received large amounts in grants – between $450 and $500. It is probably due to some CAAs' decision to pledge the maximum grant. A total of [redacted] customers, or [redacted] percent, received the maximum amount, $500. Under Staff's proposed bill discount program, the distribution will be much more even, as shown in Figure 3.

Figure 3 (Confidential). Distribution of WEAF Benefits Under Bill Discount Program

FIGURE 3 IS REDACTED

Q. Do other utilities regulated by the Commission have a rate or bill discount program?

A. Yes. PacifiCorp's rate discount program was permitted to go into effect by operation of law in 2001.[65] Also, in Avista's 2014 GRC, the Commission approved a pilot program for senior and disabled low income groups as a supplemental component to its main LIRAP Heat program, beginning October 2015.[66] It has received positive evaluations.[67] Both PacifiCorp's LIBA program and Avista's rate discount program for senior and disabled customers were well received.

[65] Pacific Power & Light Co., Docket UE-002063, Tariff Revisions (effective Feb. 1, 2001).
[66] *Wash. Utils. & Transp. Comm'n v. Avista Corp.,* Dockets UE-140188 and UG-140189, Order 07 (June 25, 2015).
[67] *Wash. Utils. & Transp. Comm'n v. Avista Corp.,* Dockets UE-140188 and UG-140189, Low-Income Rate Assistance Program Status Update (Aug. 30, 2017).

Q. How does Staff's proposal compare to PacifiCorp's LIBA program and Avista's rate discount program for senior and disabled customers?

A. Staff's proposal is similar to these programs in that the discount levels will be published in a tariff; qualified customers will receive a discount on their bills on monthly basis. It is different in that the discount level will be specified as a percentage of the bill; both PacifiCorp and Avista's discount is specified in rates, per kWh or per therm, that are subtracted from the existing rates. In my view, specifying a percentage of the bill leaves more flexibility when the effective rates go up or down in the future. Specifying a discount rate per unit (kWh or therm) will need more monitoring to make sure the discount remains appropriate as the rates fluctuate over time. In addition, both PacifiCorp and Avista's programs cap the number of enrollees in order to limit the budgets. Staff does not propose a cap on the number of WEAF enrollees because in all of my analyses Staff's bill discount proposal costs less. Therefore, Staff believes the funding level will be sufficient.

Q. Does Staff's bill discount proposal address the customers who may have past due balances at the time of applying for assistance?

A. No. The bill discount program is intended to help those in need to maintain their bills on a current basis and avoid the need for additional assistance. It does not provide additional support to reduce customers' unpaid bills that were accumulated prior to the energy assistance application.

To address prior bills, Arrearage Management Program ("AMP") is a possible solution. I am aware of the AMP pilot program that Avista has developed

and intends to implement in the near future. I am concerned, however, that the implementation of an AMP component for a small program like WEAF may be administratively cumbersome and disproportionately costly. I think it would be wise to wait and learn from the operation of Avista's AMP pilot.

Staff recognizes that arrearage may be an area of need and is open-minded about exploring the possibility with other stakeholders to address it. Meanwhile, LIHEAP grants can be applied to pay down balances from prior bills and provide relief to customers' bill crisis. Winter Help can also be utilized as an emergency fund resource, but the distribution of this funding is discretionary and Staff does not take any position that would alter the function of Winter Help.

Q. How does this bill discount program proposal fit the four goals that guide the WEAF program, as included in the 2015 GRC Settlement?

A. Stakeholders adopted four program goals in the 2015 GRC Settlement to guide decisions in all aspects of WEAF program design. They are:

1. Keep customers connected to energy service;
2. Provide assistance to more customers than are currently served;
3. Lower the energy burden of program participants; and
4. Collect data necessary to assess program effectiveness and inform ongoing policy discussion.

Staff believes that its proposed bill discount program is the best solution to meet all four goals. It will keep customers connected to gas service and lower their gas cost burden by providing them with adequate yet not excessive amounts of

energy assistance. It will make more WEAF resources available to new customers. It is built upon analysis of the historical data that Cascade has provided in this rate case. It will be easy for Cascade and other stakeholders to monitor and track the data used as the basis of Staff's recommendation and analyze future results in order to make any necessary improvements.

Q. Could you summarize the advantages of your proposed bill discount proposal?

A. This bill discount proposal is grounded in detailed bill analysis that I performed. It has a lot of advantages compared to the current grant-based approach.

1. It treats similarly situated customers in a fair and equitable manner.
2. The resulting gas energy burden is reasonable.
3. It distributes limited funds more efficiently.
4. It retains conservation signals to low income customers and fosters positive bill payment behavior because the customers are responsible for a portion of the bills.
5. The design of two discount levels is administratively simple, minimizing the Company's and CAAs' administrative burden. CAAs will have no need to use worksheets to calculate the benefit amount.
6. Because the WEAF benefit will be issued each month, Cascade will not need to process WEAF credit refunds when customers close their accounts.
7. A bill discount program design ties benefits to customers' consumption level because the benefit is a portion of the customers' current bill, rather than a grant based on the bill history in the prior year, which may differ from the current-year consumption due to various reasons such as winter weather.

8. By implementing a bill discount program, Cascade will have more control over the benefit level. In case there is a drastic change to LIHEAP funding availability or rates, Cascade can adjust the benefit level on its own initiatives.
9. As we learned from Avista's Senior and Disabled Rate Discount pilot program, a discount program reduces "pride" barrier which deterred some qualified customers from applying for the benefit. Customers were more likely to apply for a discount than a lump-sum grant they may perceive as a charity hand-out.

Q. If your proposal were adopted, would it reduce WEAF funding?

A. No. The intention of Staff's proposal is not to reduce the WEAF funding, but rather to make the program more efficient from multiple angles as I elaborated earlier in my testimony. The program's funding cap will remain the same through 2020-2021. Reimbursement to CAAs will not be affected because it is based on a dollar amount per successful application. However, the average spending on direct benefit for each customer would go down. This means more funds would be made available to reach more eligible customers.

Q. Does this conclude your testimony?

A. Yes.