Exh. HSH-1Tr
Dockets UE-260005, UG-260006
and UE-260113
Witness: Hannah S. Halliday

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**DOCKETS UE-260005 & UG-260006**
In the Matter of the Petition of **PUGET SOUND ENERGY** **For an Accounting Order Authorizing the Deferred Accounting Treatment for FERC Interest Associated with Mandatory Transmission Network Upgrades**	**DOCKET UE-260113** **(Consolidated)**

TESTIMONY OF

HANNAH S. HALLIDAY

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

Weather Normalization, Time of Use Schedules

July 28, 2026

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TABLE OF CONTENTS

I. INTRODUCTION 1

II. SCOPE AND SUMMARY OF TESTIMONY 2

III. WEATHER NORMALIZATION 4

A. Weather Normalization Introduction 4

B. The Climate Normal Year in Weather Normalization 9

C. Weather Normalization Adjustments 13

D. Impact of Staffs Weather Normalization Adjustment on the Test Year 14

E. Adjusting the Non-Test Year Volumes 20

F. Non-adjustment Methodology Concerns 25

G. Weather Normalization Conclusions 33

IV. TIME OF USE SCHEDULES 35

A. Time-of-Use Introduction and Background 35

B. PSE's Full-Scale Time-of-Use Program Proposal 42

C. Staff's Assessment of the TOU Program Proposal 45

D. Staff's Alternative Schedule Proposal 53

E. TOU Schedule Conclusions 59

LIST OF EXHIBITS

Exh. HSH-2	PSE Response to UTC Staff DR 222, Attachment A, 2006 JAD-1T, Jeffrey Dubin Testimony
Exh. HSH-3	Revised Testimony of UTC Staff Witness Jing Liu in Dockets UE-190529, UG-190530, UE-190274 and UG-190275 (Dec. 17, 2019)
Exh. HSH-4	PSE Response to UTC Staff DR 117, Attachment E, 2022 Testimony from Kelly Xu
Exh. HSH-5	PSE Response to UTC Staff DR 218
Exh. HSH-6	NWPCC Summary of Climate Change Scenarios Web Page
Exh. HSH-7	NWPCC Power Plan 2021
Exh. HSH-8	PSE Response to UTC Staff DR 219
Exh. HSH-9	PSE Response to UTC Staff DR 220
Exh. HSH-10	PSE Response to UTC Staff DR 219, Attachment B
Exh. HSH-11	Summary Tabs from PSE's Response to UTC Staff DR 219
Exh. HSH-12	Summary of Volume Adjustments
Exh. HSH-13	PSE Response to UTC Staff DR 222
Exh. HSH-14	Testimony of UTC Staff Witness Yohannes Mariam in Dockets UE-060266, et al. (July 25, 2006)
Exh. HSH-15	PSE Response to UTC Staff DR 223
Exh. HSH-16	Final Order 08 in Dockets UE-060266 and UG-060267
Exh. HSH-17	Testimony of Staff Witness Jason Ball in Dockets UE-190529, UG-190530, UE-190274 and UG-190275 (Nov. 19, 2019)
Exh. HSH-18	Testimony of PSE Witness Ahmad Fauqui in Dockets UE-220066 and UG-220067 (Jan. 31, 2022)
Exh. HSH-19	Slides from Third PSE Interested Parties Collaborative Concerning Time-Varying Rates
Exh. HSH-20	Electric Schedule 327 Tarif
Exh. HSH-21	Staff Memo in Docket UE-250725
Exh. HSH-22	PSE Response to Staff DR 244
Exh. HSH-23	PSE Response to Staff DR 122

Exh. HSH-24 Slides from the Second PSE Stakeholder Collaborative Concerning Time-Varying Rates
Exh. HSH-25 Slides from the Third PSE Stakeholder Collaborative Concerning Time-Varying Rates
Exh. HSH-26 Alternative TOU Schedule Rates from Staff

I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Hannah S. Halliday, and my business address is 621 Woodland Square Loop SE, Lacey, WA 98503. My business mailing address is P.O. Box 47250, Olympia, WA 98504-7250. My email address is Hannah.Halliday@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 regulator analyst in the Energy Transformation section of the Regulatory Services division.

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

A. I have a B.S. in Chemistry and Materials science from Western Washington University, followed by a Masters degree in Meteorology and PhD in Atmospheric Chemistry from The Pennsylvania State University. Following my formal education, I was employed by NASA as a postdoctoral fellow where I worked in the airborne sciences division. In 2019, I joined the US Environmental Protection Agency as a research scientist in the Office of Research and Development, and eventually the Office of Air and Radiation where I worked within the air policy office. I have been employed by the Washington State Utilities and Transportation Commission since 2025.

Q. Have you previously testified before the Commission?

A. Yes. I have provided testimony in Northwest Natural Gas Company's 2025 General Rate Case (UG-250610), and Avista's 2026 General Rate Case (UE-260007/UG-260008).

II. SCOPE AND SUMMARY OF TESTIMONY

Q. What is the purpose and scope of your testimony?

A. This testimony addresses two topics: the first is the weather normalization adjustment to the test year within the revenue requirement and rate setting models; this adjustment modifies the volumes of the test year to account for experienced weather, and set the volumes based on a climate normal year. This testimony examines the weather normalization methodology and adjusts some of the assumptions within that method. The second half of the testimony examines PSE's proposal for a full-scale residential Time of Use (TOU) rate program, examining how the proposal deviates from the pilot, assumptions within the modifications, and how changes to the proposed schedules modify the ultimate proposed rates.

Q. Please summarize your recommendations.

A. For the weather normalization adjustment, Staff recommends that the company adjust their methodology to remove the use of climate projections within the construction of the climate normal year. When applied across the full rate case, this adjustment is expected to increase expected customer energy volumes modestly,

which lowers the revenue requirement per energy unit, marginally dropping rates and shifting risk away from the rate paying customers. Additionally, Staff requests that the Commission require the company to include testimony on this adjustment in future general rate cases (GRCs) and proposes a set of assumptions within the weather normalization methodology that should be revisited for future GRCs.

For the full-scale residential TOU schedule program, staff discusses some significant weaknesses in PSE's proposed schedules and presents alternative TOU schedules for the proposed program. Staff recommends that PSE use a rate design that is much closer to the piloted TOU schedules for the full-scale residential TOU schedules, rather than the modified schedule proposed by the company. The company was not able to show equivalency between the schedules that were piloted and what was proposed here. Without an analysis of equivalency, the schedules proposed in the GRC are not supported by the success of the pilot. Staff's preference is for the Company to adopt Staff's proposed variation.

Q. Have you prepared any exhibits in support of your testimony?

A. Yes. I prepared Exhibits HSH-2 through HSH-26, listed above in the List of Exhibits.

III. WEATHER NORMALIZATION

A. Weather Normalization Introduction

Q. What is Weather Normalization?

A. Weather normalization is the statistical process that removes the effects of experienced weather on measured load over an energy system. In load forecasts, the primary inputs are the number of customers and the energy use per customer (UPC); that UPC value for a period of time will be driven by the weather, and, if those temperature relationships are not effectively removed, the resulting baseline load curve can be distorted. A distorted baseline that doesn't have the weather effects appropriately removed will lead to inaccurate estimates of energy consumption for the territory, which ultimately affect the revenue requirement of the system.

The weather normalization process is communicated as UPC and ultimately is output as a load adjustment on the test year within the GRCs, either positive or negative, in kWh for the electric system and therms for the gas system. When done appropriately, the weather normalization adjustment will remove weather effects while keeping intact other driving trends such as efficiency gains and technology changes.

Q. Where is Weather normalization used in the PSE GRC?

A. The weather normalized test year is a direct input in the workpapers for Chris T. Mickelson and John D. Taylor. The weather normalization adjustments to the test

year in these two work papers are ultimately propagated to the revenue requirement model and the embedded cost of service model.

Q. When did PSE substantively create and update its weather normalization method?

A. PSE did not include testimony that discussed its weather normalization methodology in the current case but was forthcoming when staff requested information. PSE's current weather normalization method was substantively developed and documented in the 2006 GRC, with direct testimony from Dr. Durbin detailing the methodological considerations underlying the Company's approach.[1] In 2019, UTC staff instigated an update to the PSE weather normalization method; the direct testimony of Commission Staff member Jing Liu[2] discussed a methodological issue in how PSE assigned load to the different weather normalized schedules. The Company accepted Staff's recommendations in that 2019 GRC. PSE last documented its weather normalization method in the direct testimony from Kelly Xu from the 2022 PSE GRC.[3] In 2022, PSE did not update its methodology but submitted testimony stating that the company was using the 2019 updates to the method for the GRC, as well as documenting how it accounted for covid era effects in the method.

[1] Halliday, Exh. HSH-2.
[2] Halliday, Exh. HSH-3 at 10:1–29:8.
[3] Halliday, Exh. HSH-4.

Q. How does PSE run their weather normalization adjustment?

A. For each schedule that is weather normalized, PSE uses the following steps:

1. The relationship between recorded energy use (load in UPC) and weather (proxied with heating degree days (HDDs values) and cooling degree days (CDDs values) is established using regression on historical observations, while including additional explanatory variables such as weekday, covid, or season.
2. The Climate normal for the territory is calculated using observations from NOAA weather stations; PSE sources its weather observations from the Sea-Tac International Airport weather station (NOAA Station KSEA). Daily historical data is used to calculate the appropriate HDD and CDD values, using a range of balancing point temperatures.
    a. For the currently filed GRC, PSE is also sourcing temperature data from three climate models, with data sourced from the Northwest Power and Conservation Council (NWPCC). Under this methodology PSE uses 15 years of historic observations and 15 years of climate forecasts to create a 30-year average centered on the present.
3. The regression coefficients for the CDD and HDD variables, derived in part A, are the "weather sensitivity coefficients."[4] These weather sensitivity coefficients are multiplied by the difference between the Test Year Actual

[4] Halliday, Exh. HSH-4 at 2.

CDD or HDD and the climate normal CDD or HDD, which produces a change in load for the test year.

a. The conceptual model here is that the weather adjustment is the difference between the regression using historical observations, and the regression run with the climate normal temperature curve. All non-weather variables are the same and thus cancel out, leaving just the HDD and CDD coefficients, which can be multiplied by the difference between the historic HDDs/CDDs and the climate normal HDDs/CDDs. This is a straightforward mathematical formulation of the weather adjustment, and while it's not the only way to run it, it is the simplest method.

4. The change in load from step 3 is multiplied by the customer count, which provides the total energy adjustment rather than units of UPC.

Q. What analysis programs does PSE use in their weather normalization?

A. For PSE the development of the load and temperature relationship is run in Eviews, using an autoregressive moving average (ARMA) regression. PSE tests the inclusion of a set of explanatory variables that include weekend days, month of year, and lagged degree days, and ultimately fits an ARMA regression to the historic data to determine the load/temperature relationship. Once determined, the temperature coefficients are transferred to Excel in the electric and gas ratemaking workbooks.

The climate normal curve and test year curve are calculated on a daily basis, smoothed to monthly values; these two values are also transferred to the same

workbooks, and used in the calculation of the total energy adjustment per month of the test year.

Q. Does Staff have any concerns about PSE's weather normalization method?

A. Yes. Staff's primary concern is that PSE includes climate forecasts in the weather normalization adjustment, specifically in the calculation of the climate normal year. Staff does not consider this appropriate for the adjustment methodology. The long-term projections from the climate models should not be included in the short-term forecasts used in the GRC timeframes, which are more significantly affected by drivers such as seasonality and short term (annual or shorter) events. Staff will address the methodological concerns, as well as the impact of a revenue requirement (RR) adjustment, both on the test year and on the forecast gap and rate year volumes.

Q. Does Staff have any additional concerns beyond the climate normal year?

A. Yes. In addition to the construction of the climate normal year, Staff has some additional concerns, that we will be addressing outside of the RR adjustment:

1. Staff is concerned about the short time period of data that PSE is using to develop the weather and load relationship.
2. Staff recommends that PSE use a full autoregressive integrated moving average (ARIMA) model, rather than the ARMA model that they are currently using.
3. The selection of the HDD and CDD balancing points for each schedule is unclear.

4. Staff recommends that PSE begin testing additional weather observations and sub territories, moving towards a data forward approach to weather normalization.

B. The Climate Normal Year in Weather Normalization

Q. What is the risk of including climate forecasts in the climate normals?

A. When the climate normal year is constructed with climate forecasts, the ultimate effect is to make the climate normal year unrealistically warmer than what the historic data-only climate normal year would have been. In the scenario of the weather adjustment to the energy volumes in the GRC, this means that we are underestimating the load in the winter, while overestimating the summer loads.

Ultimately this lowers the expected overall load on the system, leading to lower expected sales volumes being used when setting the revenue requirements. Lower sales volumes in the test year means that the revenue requirement is increased, as the company needs to charge more per unit of energy to meet its revenue needs.

Q. What are the practical impacts of employing climate year estimates that are "too warm?"

A. While this sounds reasonable on face value, the effect of moving to a warmer climate normal year too quickly is a subtle form of risk shifting to the customer. When the experienced weather over a year is colder than the climate normal year, customers

end up buying more energy, which they purchase at what is essentially a higher than necessary rate, which means that they hold the difference, and would be due a refund. In contrast, when the experienced weather is warmer than the climate normal year, the difference is being held by the company, which can pursue a revenue true up subject to the deadbands. Moving to a warmer climate normal year effectively moves the risk to the customers, who are holding the difference between the forecast and the actual loads through their rates.

Q. When did PSE begin using climate forecasts in their climate normals?

A. PSE began incorporating climate change projections into their base energy and peak demand forecasts in 2023, through the 2023 Electric Report. In that document they note that at the time of writing there were no standards or best practices for incorporating climate change scenarios into demand forecast, which necessitated the Company developing their own approach.[5] PSE states that they initially included climate forecasts in the weather normalization for the 2024 GRC, which was uncontested by the UTC at that time.[6]

Q. What climate models are being used by PSE in the calculation of the climate normals?

A. PSE is electing to use three climate models that have been selected by the Northwest Power and Conservation Council (NWPCC): CanESM2, CCSM4, and CNRM.[7]

[5] Popisil, Exh. CJP-7.
[6] Halliday, Exh. HSH-5 at 3.
[7] Halliday, Exh HSH-6 at 2.

These three models were selected and documented in NWPCC's 2021 Northwest Power Plan; in documentation on the development of the 2021 Northwest Power Plan NWPCC notes that they are using climate data developed from the River Management Joint Operating Committee (RMJOC).[8] While the links to the RMJOC reports in the NWPCC report and documentation were depreciated, Staff was able to find and review the RMJOC work, and were satisfied with the analysis. While there are disagreements that Staff has with the selection of the climate models (for instance, the use of RCP8.5[9]), that discussion is not material for the case at hand.

Q. Why is PSE using climate forecasts in the calculation of the climate normals?

A. PSE details the reasoning for using climate projections in the construction of the climate normal year in Staff DR 218. In short, PSE is attempting to account for the warming climate being experienced within the Company's territory, by replacing the standard 30-year historical average used in many weather normalization methods with what is essentially a future weighted year that uses 15 years of observational data and 15 years of climate forecast data. The company's stated goal in its defense of this practice is to adjust a cold bias in the weather record compared to currently experienced conditions, while adjusting the revenue requirement to more accurately represent the "rate period conditions."

[8] Halliday, Exh. HSH-7 at 53.
[9] Halliday, Exh. HSH-7 at 54-55 & n.47.

Q. Does Staff agree with PSE's use of climate forecasts in the calculation of the climate normals?

A. As a general position Staff agrees with the Company that climate predictions are an important tool for the utilities, and the change in conditions should be integrated into the long-term forecasts. However, Staff disagrees with the company that this method is appropriate for the short-term forecasting that is necessary in the GRCs. In IRPs, companies must look forward ahead quite significantly, and in the face of the changing conditions, utilities need to be planning for the realities of climate change, policy incentives, and technology improvements; in these long-term forecasts, staff supports PSE's methodology and agrees with their methodology adjustments.

However, the climate projections the company is using are based on RCP 8.5, which has heating increasing unrealistically rapidly in time, especially as we move further into the future. As climate projections move out from the current time period, each additional year of projection adds more heat to the climate normal year. The climate normal year created with the climate projections is moving the Company to a summer peaking system prematurely and effectively downsizing the volume adjustments on too short of a timeline. In short-term forecasts and GRC weather normalizations, Staff's position is that the Company would be better served by shortening to a 20-year climate record construction of the climate normal year using only observational data, rather than including climate forecasts to a 30-year average. This shortening of the climate record used strikes a good balance between needing enough data to smooth out stochastic variations from weather while simultaneously recognizing the current period of changing climate.

C. Weather Normalization Adjustments

Q. What is Staff's Primary Adjustment to the Weather Normalization calculation?

A. As just mentioned, Staff adjusts the climate normal year methodology to use 20 years of historical data. Staff asked the Company to recalculate the climate normal year using that data set and used this to replace the climate normal year that PSE filed, which uses 15 years of historical data and 15 years of Climate Forecasts.

Q. What was Staff's approach to investigating the use of climate forecasts in the weather normalization adjustment?

A. Staff asked PSE to recalculate 1. The climate normal year, using 20 years of historical data and excluding any climate forecasted data, and 2. The resulting temperature adjustment for all weather normalized schedules, gas and electric.[10] Staff also requested that the Company rerun both the revenue requirement models and embedded cost of service models for both electric and gas, using the updated weather normalization temperature adjustment.[11] Staff has included the two DRs for this adjustment as Exhibits HSH-8 (Staff DR 219) and HSH-9 (Staff DR 220).

Q. Was the adjustment that Staff requested comprehensive?

A. No. In Staff DR 219 and Staff DR 220, Staff requested that the company adjust the weather normalization method used in the revenue requirement models (gas and

[10] Halliday, Exh HSH-9.
[11] Halliday, Exh HSH-10.

electric) and recalculate the resulting revenue requirements and embedded cost of service models. However, the weather normalization adjustment only adjusts the volumes of the test year. The estimated energy volumes for the gap year and the three rate years (RY1, RY2, and RY3) are sourced from the load forecast and are separate from the test year volumes.

Because of this differential treatment for energy volumes, the results of Staff's DR request for a methodology change are incomplete. This testimony will discuss the impacts of adjusting the test year weather normalization methodology. Separately, we will discuss how staff assessed making the weather normalization method adjustment on the rate structure for the full GRC.

D. Impact of Staffs Weather Normalization Adjustment on the Test Year

Q. What is the tested impact of removing the climate forecasts from the climate normal weather?

A. PSE provided the results of the recalculated climate normal year in Staff DR 219. PSE calculated the climate normal year using 20 years of historic data between January 1, 2005, and December 31, 2024. These results are summarized in Table 1; in short, moving the climate normal year construction to a fully historical record and removing climate forecasts gives us a colder climate normal. This effectively adds HDDs to the winter months (higher winter load compared to the original filing, positive deltas in Table 1) and removes CDDs from the summer months (lower summer load compared to the original filing, negative deltas in Table 1). The full

summary by month, with deltas, can be found in the exhibits,[12] with a summary plot included in Figure 1.

Table 1. Summary of Staff's requested change to the construction of the climate normal year and delta between staff adjustment and PSE's original filed values. All values are HDD or CDD values, in degrees F.

	Annual Total (HDD or CDD)
Originally Filed Normal HDD65	4313.2
DR 219 Adjusted Normal HDD65	4672.4
Test Year Actual HDD65	4645.5
Originally Filed Difference (Normal - Actual)	-332.3
DR 219 Adjusted Difference (Normal - Actual)	26.9
Delta (DR 219 Difference - Original Difference)	***359.2***
Originally Filed Normal HDD60	2928.6
DR 219 Adjusted Normal HDD60	3234.0
Test Year Actual HDD60	3204.3
Originally Filed Difference (Normal - Actual)	-275.7
DR 219 Adjusted Difference (Normal - Actual)	29.6
Delta (DR 219 Difference - Original Difference)	***305.4***
Originally Filed Normal HDD55	1793.9
DR 219 Adjusted Normal HDD55	2045.2
Test Year Actual HDD55	2031.1
Originally Filed Difference (Normal - Actual)	-237.2
DR 219 Adjusted Difference (Normal - Actual)	14.1
Delta (DR 219 Difference - Original Difference)	***251.3***
Originally Filed Normal HDD45	372.2
DR 219 Adjusted Normal HDD45	470.2
Test Year Actual HDD45	484.8
Originally Filed Difference (Normal - Actual)	-112.6
DR 219 Adjusted Difference (Normal - Actual)	-14.7
Delta (DR 219 Difference - Original Difference)	***98.0***
Originally Filed Normal CDD60	748.0
DR 219 Adjusted Normal CDD60	638.7
Test Year Actual CDD60	667.5

[12] Halliday, Exh. HSH-10.

Originally Filed Difference (Normal - Actual)	80.5
DR 219 Adjusted Difference (Normal - Actual)	-28.8
Delta (DR 219 Difference - Original Difference)	***-109.3***
Originally Filed Normal CDD65	308.3
DR 219 Adjusted Normal CDD65	252.1
Test Year Actual CDD65	283.7
Originally Filed Difference (Normal - Actual)	24.6
DR 219 Adjusted Difference (Normal - Actual)	-31.6
Delta (DR 219 Difference - Original Difference)	***-56.2***

Note that the input to the weather sensitivity coefficients for the weather normalization is not the calculated HDD or CDD values, but instead the difference between the test year and the climate normal year; the delta values in Table 1 capture the difference between what was used in the weather normalization calculation in the original filing ("Originally Filed Difference") and the difference used in staff's adjustment ("DR 219 Adjusted Difference").

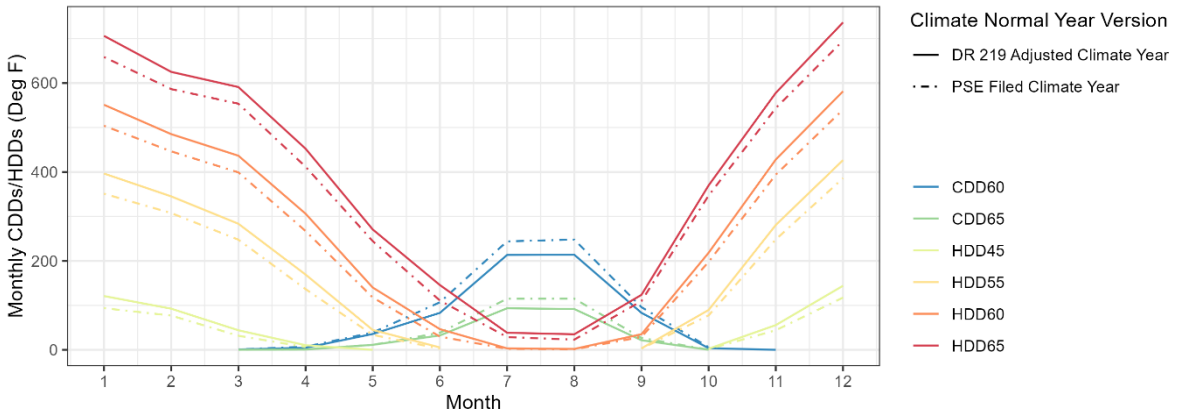

Figure 1. Climate normal year as filed (Dashed line, 15 years of historical data & 15 years of climate forecasts), vs. DR 219 adjusted climate normal year (Solid line, 20 years of historical data).

Staff include all HDD and CDDs calculated for the territory: two CDD values, with balancing points of 60 and 65 degrees Fahrenheit, and four HDDs, with balancing points at 45, 55, 60, and 65 degrees Fahrenheit. Across all months Staff's adjustment to the climate normal year adds HDDs and removes CDDs – adding winter peaking volume and removing summer peaking volume compared to the climate forecast adjusted climate year used in PSE's original filing.

Q. Please summarize the Rate Case impacts from the weather normalization adjustment on the Test Year.

A. Staff Exhibit HSH-11~~2~~ includes the summary tabs that PSE prepared as part of their responses to Staff DR 219[13]; In this exhibit Staff includes PSE's summaries of the revenue requirement, the volume, and the proposed revenue change for each rate year for both gas and electric Schedules. The high-level takeaways for electric and gas are summarized in Table 2.

As shown in table 2, the DR 219 adjustment to the weather normalization adjustment on the test year adjusts the test year volumes up for both electric and gas schedules (a positive delta for both kWh and therms) and increases the test year revenue adjustments for both systems. On the electric system the proposed uniform revenue changes increase for the electric schedules and are unchanged for the gas schedules. This ultimately leads to marginally higher electric system rates from this change, and no change to the gas rates.

[13] PSE updated WP-CTM-4-E-RATEMAKING-PORTFOLIO-26GRC-02-2026.xlsx as attachment C to Staff DR 219; PSE updated WP-JDT-4-G-RATEMAKING-PORTFOLIO-26GRC-02-2026.xlsx as attachment D to Staff DR 220. The summary tabs fare found in Halliday Exh. HSH-11~~2~~.

Table 2. Summary of changes to the test year and RY1 – RY3 revenue changes.

Electric System (All Schedules)	PSE filing	DR 219 Adjustment	Delta
Test Year Annual Energy Adjustment (kWH)[14]	-236,143,097	-28,314,113	***207,828,983***
Test Year Total Revenue Adjustments ($)[15]	$ (102,261,177)	$ (72,945,065)	***$ 29,316,112***
	RY1	**RY2**	**RY3**
Delta Proposed Revenue Change (DR 219 Adjustment - PSE Filing)[16]	$ 1,774,500	$ 15,998	$ (822)
DR 219 Proposed Uniform Revenue Change (%)	43.88%	4.77%	13.49%
Delta Proposed Uniform Revenue Change (DR 219 Adjustment – PSE Filing)	0.08%	0.00%	0.01%
Gas System (All Schedules)	PSE filing	DR 219 Adjustment	Delta
Test Year Annual Energy Adjustment (therms)[17]	-45,701,500	-2,775,129	***42,926,371***
Test Year Total Revenue Adjustment ($)[18]	$ (641,382,437)	$ (616,490,809)	***$ 24,891,628***
	RY1	RY2	RY3
Delta Proposed Revenue Change (DR 219 Adjustment - PSE Filing)[19]	$ 10,326	$ (1,708)	$ (1,168)
Proposed Uniform Revenue Change (%)	28.33%	6.85%	8.15%
Delta Proposed Uniform Revenue Change (DR 219 Adjustment – PSE Filing)	0.00%	0.00%	0.00%

[14] Halliday, Exh. HSH-1~~1~~2, Tab: CTM-Volume Summary.
[15] Halliday, Exh. HSH-1~~1~~2, Tab: CTM-Revenue Summary.
[16] Halliday, Exh. HSH-1~~1~~2, Tab: CTM-Rate Spread.
[17] Halliday, Exh. HSH-1~~1~~2, Tab: JDT-Volume Summary.
[18] Halliday, Exh. HSH-1~~1~~2, Tab: JD T-Revenue Summary.
[19] Halliday, Exh. HSH-1~~1~~2, Tab: JDT-Rate Spread.

Q. Why does the DR 219 adjustment raise rates over the GRC rate years?

A. The critical piece for understanding the impact of the DR 219 adjustment on the rate years is to understand that the weather normalization adjustment to the test year did not affect the energy volumes estimated for the rest of the GRC. While increasing the energy volumes on the test year increased the revenue for the test year specifically, this adjustment is subsequently removed from the volumes in the gap year. Removing the test year volume adjustment from the gap year pushes up the revenue changes over the rate years, and very marginally increases the rates.

Q. Did Staff's weather normalization adjustment to the test year significantly impact the broader rate case?

A. No. The weather normalization adjustment that staff made to the test year in Staff DR 219 adjusted the test year volumes as expected, but the DR 219 adjustment only adjusted the volumes on the test year and left all of the RY volumes untouched. The energy volumes on the rate years are calculated from a load forecast model, which is separate from the test year volumes. Table 2 above showcased the impact of the adjustment on the test year; note that while the test year revenue and volume adjustments track being adjusted to a colder climate year compared to what was originally filed (more energy volume in the test year, higher revenues), the revenue changes for the GRC rate years do not – instead, we see uneven changes to the revenues and rates marginally increasing.

E. Adjusting the Non-Test Year Volumes

Q. Why is Staff adjusting the non-test year volumes?

A. As discussed, the weather normalization adjustment to the test year does not adjust any of the energy volumes used in the gap year or the rate years; instead, those volumes calculated with a separately run load forecast.[20] As documented in both Staff's weather normalization DRs and the filed exhibits of the Company, the Company is very clear that weather normalization within the load forecasts is done with the climate projections that Staff is objecting to in this GRC.[21]

Due to PSE's approach on the GRC volume estimate process, Staff's DRs investigating the impacts of a methodology were incomplete, and Staff's adjustment of the test year weather normalization methodology was limited. Ultimately, Staff lacked the time to fully expand the request for the Company to adjust its load forecasts. Since adjusting the load forecasts was not feasible given the procedural schedule in this case, Staff adjusted the load forecasts found in the RR models[22] upwards slightly based on the adjustments that Staff requested be made to the test year.

Q. What were the adjustments that Staff made to the load forecasts within the GRC ratemaking and revenue worksheets?

[20] The load forecasts are found in Mickels, Exh. CTM-4-RATEMAKING-PORTFOLIO for the Electrical schedules (kWh) and Taylor, Exh. JDT-4-RATEMAKING-PORTFOLIO for the gas schedules (therms).
[21] Halliday, Exh HSH-5 at 127-133; Halliday, Exh HSH-6.
[22] Halliday, Exh. HSH-12.

A. Staff determined the forecasted load adjustment by ratioing the adjusted test year volumes (post weather normalization) that the company filed with the Staff adjusted test year volumes from DR 219. This produces the results as a percentage increase to the volumes that Staff's weather normalization adjustment would have made. Staff assumes that any load forecast values that are providing volumes for the gap and rate years are already weather normalized, using the climate normal year construction that staff objects to; thus the load forecast adjustment should be approximately the ultimate increase in volume between the original filing and the results of Staff DR 219.

This is not intended to be a perfect methodological adjustment; rather, what staff is attempting to do here is estimate how staff's adjustment to the weather normalization methodology would have moved the forecasted loads, generally, on an annual basis. We used the change to the adjusted test year volumes as an indicator of which direction and how much each schedule would have been pushed; in all cases, the annual expected load is higher due to the colder climate normal year. Staff Exhibit HSH-12 includes the workbook pages with the adjusted forecasts, for clarity and completeness.

Table 3, below, shows the load forecast adjustments by weather normalized schedule. Staff used the test year adjusted volumes, looking at the percentage difference between PSE's original filing and the DR 219 adjustments. All schedules had their volumes increased through the DR 219 adjustment, and that adjustment upwards is characterized by the percentage increase.

Table 3. Staff's load forecast adjustment by weather normalized schedule.

Weather Normalized Electric Schedules			
Schedule	Company Filed Test Year Adjusted Volumes (kW) [23]	DR 219 Adjusted Test Year Adjusted Volumes (kW)[24]	DR 219 Adj. Value / Company Filed Value, %
Sch 7	11,272,993,230	11,456,254,655	**1.63%**
Sch 7A	2,451,772	2,457,321	**0.23%**
Sch 8/24	2,591,491,960	2,602,762,766	**0.43%**
Sch 11/25	3,002,105,398	3,008,900,321	**0.23%**
Sch 12/26	1,912,706,949	1,913,230,319	**0.03%**
Sch 10/31	1,343,119,284	1,345,917,333	**0.21%**
Sch 43	101,300,890	103,607,786	**2.28%**
Firm Resale	6,939,829	7,045,799	**1.53%**
Weather Normalized Gas Schedules			
Schedule	Company Filed Test Year Adjusted Volumes (therms)[25]	DR 219 Adjusted Test Year Adjusted Volumes (therms)[26]	DR 219 Adj. Value / Company Filed Value, %
Sch 23	538,388,826	568,602,071	**5.61%**
Sch 31 C&I	223,850,668	232,352,938	**3.80%**
Sch 41 C&I	68,428,137	70,339,128	**2.79%**
Sch 85 C&I	17,889,890	18,297,142	**2.28%**
Sch 86 C&I	4,201,701	4,372,977	**4.08%**
Sch 87 C&I	17,730,722	18,108,999	**2.13%**
Sch 41 T	20,515,414	20,644,509	**0.63%**
Sch 85 T	55,509,896	55,605,159	**0.17%**
Sch 87 T	65,832,043	66,221,746	**0.59%**

[23] Mickelson, Exh. CTM-4-RATEMAKING_PORTFOLIO Tab: "Exh CTM-Volume Summary."
[24] Halliday, Exh. HSH-12, Tab: "Exh CTM-Volume Summary."
[25] Taylor, Exh. JDT-4-RATEMAKING_PORTFOLIO Tab: Exh JDT-Volume Summary.
[26] Halliday, Exh. HSH-12, Tab: "Exh JDT-Volume Summary."

Q. Are there methodological issues with Staff's adjustments to the Revenue Requirement load forecasts?

A. Yes. This is staff's attempt to adjust a load forecast based on the test year; this is intended as an example showing the overall impact of an ad hoc adjustment to the load forecasting, with staff ultimately taking the position that this is the company's problem to resolve correctly in a compliance filing. There are a handful of methodological issues in staff's adjustment; the most egregious is the lack of seasonality. Staff's forecast adjustment applied an annual adjustment over monthly forecast data, which is not best practice. However, it does allow the Commission to get some estimate of how a load forecast adjustment would have nudged revenue requirements, and the resulting change to the proposed rates.

Q. What is the ultimate result of adjusting both the test year and Staff's weather normalization adjustment to the load forecasts?

A. Staff Exhibit HSH-12~~3~~ contains the summary tabs of the changes, which are summarized here in Table 4. For the electrical system, the ad hoc volume adjustment leads to a decrease in the proposed revenue change over all three rate years, and a decrease in the uniform revenue changes (i.e., lower rates) compared to the original PSE filing. For the gas system, the adjustment produces a significant decrease in the proposed revenue change, and similarly a decrease in the uniform revenue changes compared to the original PSE filing.

The results shown in Table 4 are the expected impact on the revenue requirement of a colder climate normal year, which pushes up the energy volumes

expected, and thus pushes down the revenue requirement per energy unit and thus pushes down rates. While a slight adjustment, this meaningfully stacks into the rest of the revenue requirement model, which is covered in testimony by Staff witness Sorrells.

Table 4. Summary Table of Staff's adjustments to the forecast energy volumes used for the rate years in the GRC.

Electric System (All Schedules)	**RY1**	**RY2**	**RY3**
Staff Volume Delta Proposed Revenue Change (Staff Volume Adjustment - PSE Filing)[27]	$ (28,881,468)	$ (228,774)	$ (136,699)
Proposed Uniform Revenue Change (%)[28]	42.50%	4.71%	13.35%
Delta Proposed Uniform Revenue Change (DR 219 Adjustment – PSE Filing) (%)	-1.30%	-0.05%	-0.13%
Gas System (All Schedules)	**RY1**	**RY2**	**RY3**
Staff Volume Delta Proposed Revenue Change (Staff Volume Adjustment - PSE Filing)[29]	$ (25,061,203)	$ 83,364	$ 186,195
Proposed Uniform Revenue Change (%)[30]	23.97%	6.63%	7.90%
Delta Proposed Uniform Revenue Change (Staff Volume Adjustment – PSE Filing) (%)	-4.35%	-0.22%	-0.25%

Q. Does Staff have any comments to add about the load forecasts in the revenue requirement models?

[27] Halliday, Exh. HSH-12, Tab: "CTM-Rate Spread."
[28] Halliday, Exh. HSH-12, Tab: "CTM-Rate Spread."
[29] Halliday, Exh. HSH-12, Tab: "JDT-Rate Spread."
[30] Halliday, Exh. HSH-12, Tab: "JDT-Rate Spread."

A. Yes. As noted in Staff witness Dr. Major's testimony, one of the concerns that Staff has with the current GRC is that there is not sufficient documentation as to PSE's load forecasting. As seen here with the weather normalization adjustment, the load forecasts are foundational pieces of the rate models, in addition to being extremely important inputs to the decision making and planning that takes place within the company. When the company does not explicitly testify to what its load forecasts are and where they are used, it produces situations like the one seen here with weather normalization – adjustments that are only partially getting at methodological concerns. When there is also a lack of transparency, intentional or not, and parties are required to pursue discovery to arrive at a baseline understanding of the Company's proposal or practice.

Staff's need to make an ad hoc adjustment to the rate year volumes is a prime example of where having testimony would have greatly benefited all interested parties in the case. Clarity from PSE concerning not only the method used, but where the forecasts are used, would have saved considerable difficulty for all sides, and it would have led to a much clearer adjustment from Staff that would not require the company to be returning to the issue with a compliance filing later.

F. Non-adjustment Methodology Concerns

Q. Are there other methodological concerns that Staff has with PSE's Weather Normalization methodology?

A. Yes. Staff recommends some changes that we would like to see in the weather normalization in future GRCs. However, Staff is not requesting that PSE make these changes in the current GRC; while Staff believes these issues are substantive, they are deeper methodological issues that should be resolved long term and will move the company towards better general practices rather than making meaningful short-term adjustments. Staff's concerns are as follows:

1. The time period used the develop the weather and load relationship for the weather normalization methodology is short, and Staff would like to see PSE re-examine this assumption in their method.
2. Staff would like to see PSE expand to testing a full ARIMA model, rather than just the ARMA model.
3. Staff would like to see the Company revisit how HDD and CDD balancing points are selected.
4. Staff would like to see PSE begin investigating adding complexity to the weather normalization regressions, including some of the other weather factors that drive heating and cooling load beyond just temperature.

Q. What are staff's concerns with the short time period being used to develop the temperature/load relationship?

A. Staff is concerned about this short relationship because this is out of normal for how Staff's understanding of weather normalization should be run. Weather normalization relationships are typically constructed with at least ten years of data, providing a sufficient time period to capture moderate term relationships between the

load and the weather (proxied by HDDs and CDDs). The point of the relationship is to be able to isolate the weather effects on load, while leaving intact the longer-term trends in load demand and efficiency. Staff is concerned that the short time period runs the risk of over emphasizing short term trends in the use per customer, and PSE is not assessing the appropriateness of the assumption with the modern data.

Q. Why is PSE's weather normalization methodology using a short time period for its load/weather relationship?

A. The length of the historic record used to develop the weather normalization relationship was set in the 2006 PSE GRC, in the testimony of Dr. Jeffrey Dubin.[31] In short, for that case, the expert witness built the relationships using the data that was available at the time, which was limited to five years of historic data for the gas system.[32] To keep the gas and electrical system adjustments as consistent as possible, that case shortened the electrical system records as well; while witness Dubin did not explicitly state the reason for the 4 year electric model compared the five years used for the gas system, Staff's read of the testimony indicates that Dubin set the beginning of that model to begin after the efficiency gains in 2001 had normalized.[33]

For that case, the expert witness was able to show that the short time series was sufficient for the 2006 case, which Staff notes was a one-year GRC. The Commission approved the methodology in the 2006 GRC, although the Order states that the Commissioners had no substantial comments on the details of the method as

[31] Halliday, Exh. HSH-2.
[32] Halliday, Exh. HSH-2 at 15:2 – 16:3.
[33] Halliday, Exh. HSH-2 at16:4 – 17:3.

elucidated by Dr. Durbin and PSE staff. In the intervening time since 2006, rather than reassessing the appropriateness of the 4-year (electric) and 5-year (gas) histories, PSE has simply been using those time frames, rolling them forward to meet the GRC year.

Q. Why is staff concerned with the temperature-load relation in particular?

A. In the 2006 GRC Dr. Dubin limited the data for the model based on available data. He ran some tests to show reasonable outcomes at the time, but those tests only affected the electric schedule. Dr. Dubin's analysis reads as a post-hoc justification for using the shortened time period, which comported with staff's request at the time for consistency in ratemaking process and outcomes.

Once the 2006 GRC was settled, PSE never actually revisited this assumption. Now, twenty years later, it is very reasonable for Staff, PSE, and all intervenor parties to ask, "Are four years for the electric schedules and five for the gas schedules still appropriate?" The answer is "maybe, but we do not know" because the Commission and the parties cannot make that assessment without looking at the underlying data.

Q. Why is Staff concerned about the absence of data in this case?

A. Staff's concern is that the Company is excluding data that could be useful for understanding and strengthening the causal relationships in its forecasting models. Especially considering that the Company is using the autoregressive regression relationships, its methods can handle complex time series of data. Part of the 2006-

case justification for 4-5 year datasets is that the shortened time periods mean that PSE was able to drop some of the standard predictive variables because they were not considered significant enough in these short time periods. Now in 2026 when trying to assess whether those datasets and time periods are reasonable, the absence of real data means Staff and PSE cannot assess the continued appropriateness of the short time period or analyze the full scope of predictive variables.

That said, Staff would like to strongly encourage PSE to fully re-examine the time period assumption that was locked in during the 2006 GRC, and to also consider a full set of predictive variables for the weather normalization. It has been 20 years; the time to revisit PSE's methodology has come. Staff, all intervening parties, ratepayers, and the Commission itself should do the necessary deep dive to make sure things still make sense. This is especially true considering that the short time period was allowed in 2006 for distinct, practical reason – the Company only had that much data available. PSE's own records now indicate that it currently has 17 years of electrical data, and 12 years of gas data at the appropriate level of granularity for the weather normalization. The data limitations that PSE developed their weather normalization method around in 2006 no longer exist.[34]

Q. What are the methodological issues with PSE's regression fit?

A. This is the ARMA versus ARIMA modeling approach issue. Staff was provided with enough data to recreate and test the weather normalization adjustments. As part of

[34] Halliday, Exh. HSH-14.

this, Staff was able to reproduce the ARMA fits for the electrical schedules that it examined, but when Staff expanded the regression testing, it was able to find a better fit with a full ARIMA model.

Q. What is the functional difference between an ARIMA and an ARMA model?

A. An ARMA model is an ARIMA with I = 0, which means that there is no integration of the underlying data; i.e., an assumption that there is no differencing needed in the data, because the data is stationary. This is not a good assumption in timeseries data, and certainly not data with cyclical behavior. While the ARMA regressions will provide a better fit over an ordinary least squares regression, adding integration will give a more comprehensive understanding of the load/weather relationship.

Q. Was staff able to determine the rate impacts of these ARIMA order changes on the case?

A. No, Staff was not able to sort this out in time for this case, but it expects slight differences in the results. While Staff expects that these will be small changes, incorporating better practices into the weather normalization methodologies will be overall beneficial to the utility and all interested parties. A better fit to the underlying data will more clearly capture the load/energy relationships, and more realistically model the cyclical behavior inherent in a seasonal relationship, creating more robust causal relationships. If there is anything the Commission should take from Staff testimony on this subject, it is that Staff's goal is to update forecasting

methodologies and processes to incorporate better practices and improve transparency for all parties and the Commission itself.

Q. How does PSE determine HDD and CDD balance points for each schedule?

A. Rather than selecting a single HDD and/or CDD balancing point for each schedule, PSE calculates six separate degree day values for the experienced weather: two CDDs (balancing points of 60 and 65 degrees Fahrenheit), and four HDDs (balancing points of 45, 55, 60, and 65 degrees Fahrenheit). As far as Staff has been able to tell, these degree day values are available for use in the predictive relationships, but they must pass statistical tests to be included. This use of multiple degree day determinations was originally proposed by PSE in the 2006 GRC to account for nonlinear temperature and load relationships, as a way to account for some expected non-linear behavior of load and temperature.[35] While staff expressed concern about the use of this technique in its response testimony and recommended a load study to validate the method,[36] the technique has persisted over the past two decades. Only one of the schedules currently uses two HDD balancing points (Electric Schedule 43), the remaining use a single HDD and CDD balancing point, with some of the schedules using some variations of lagging or removing shoulder seasons from the degree days.

[35] Halliday, Exh. HSH-2 at 21:1–26:11.
[36] Halliday, Exh. HSH-14 at 7:5–9:23.

Q. What are Staff's concerns about the determination of HDD and CDD balancing points?

A. Staff was mostly able to follow the characterization of the degree day selection, which included characterization of the temperature sensitivity of the different schedules, but Staff encourages the company to document this process more clearly in future GRCs so that other parties may readily understand what the company is doing. Staff would like to see two things: the first is a more comprehensive explanation for how the balancing points are selected for each schedule, with schedule specific analysis of the actual load information underlying that balance point; and second, a more comprehensive examination of the use of the double HDD values in Schedule 43, with data showing the appropriateness of this non-linear degree day construction.

Q. Are there other changes that Staff would like to see in the weatherization method?

A. Yes. Ultimately, Staff would like to see PSE begin testing the inclusion of an expanded weather observation dataset. Weather normalization uses temperatures through HDDs and CDDs as proxy, but daily temperature is not the only weather aspect that drives heating and cooling needs; factors such as prior days' temperature, solar insolation, and precipitation all drive load uses. Not all factors are significant in the regression relationships, and predictive variables can vary significantly between schedules, but testing them will give the company better insight into the physical drivers that are influencing load in their territory.

Staff is also interested in seeing the company examine the use of sub territories for weather normalization. Kittitas county in particular is worth an examination, since its location on the east side of the mountains makes the experienced weather there much different. An approach that Staff has seen work reasonably well is to premises weight the adjustments from different subterritories into a single value that can be used for each Schedule; Per Staff DR 223, roughly 1 – 2% of the premises sit in Kittitas county.[37] Staff would like to make the point that we are not asking the Commission to mandate that the company include subterritories, but Staff encourages the company to consider doing so as it revisits some of the foundational assumptions baked into the method.

G. Weather Normalization Conclusions

Q. Why is staff insistent about this point?

A. While the weather normalization adjustment to the test year is ultimately a minor adjustment in the GRC, it substantive matters because it is the only adjustment to the real measured loads used in the revenues, and it provides Staff with a window to how a company is more broadly approaching its load forecasting. Additionally, PSE points to the method being fully litigated and approved by the Commission in the 2006 GRC, but a review of those documents and the order associated with the case show that this method was not the fully formed end product that PSE is positioning it

[37] Halliday, Exh. HSH-15.

as. In fact, even during the 2006 case Commission Staff explicitly stated that while it agreed to the method for the current case (2006), the company needed to do more work to show the validity of its methods, especially around the balancing point temperatures.[38] Additionally, the order language itself encourages the company to continue to develop the method.[39] Instead the methodology has been effectively unchanged since 2006, with fundamental assumptions left as artifacts from its birth. The changes that have been meaningfully made, such as the inclusion of climate forecasting, introduce a risk shift that worries staff. That is because these subtle changes can shift which party is holding the difference between the projected UPC and the actuals; moving to too warm of a climate normal year or leaving out predictive factors that drive the load/temperature relationship on longer time frames can move the GRC energy volumes unrealistically low, driving rates up prematurely and creating a situation where customers are effectively overpaying for energy.

Q. What is staff's ultimate recommendation for the weather normalization adjustment?

A. Staff is making three recommendations for the current GRC. The first is that PSE adopt Staff's recommendation to move its construction of the climate normal year for their test year weather normalization to a 20-year historical record construction. This adjustment has already been characterized in Staff DR 219, and is included in Staff's final adjustment.

[38] Halliday, Exh HSH-14 at 7:5–9:23.
[39] Halliday, Exh. HSH-16 at 55-56.

Staff's second recommendation is for the company to recalculate the short-term load forecasts, adjusting the climate normal methodology in the same way Staff adjusted the weather normalization here, and use those recalculated energy forecasts in the revenue and ratemaking workbooks. The results must be filed as a compliance filing showing the ultimate impact on revenues, rates, and the cost of service.

Finally, Staff requests that PSE include testimony on the weather normalization methodology in its next GRC, which should include the company revisiting the assumptions in the methodology discussed here in testimony. These include the length of the historical record used in the methodology, expanding the regression fits to a full ARIMA model, and exploring the use of additional weather variables and subterritories for their weather normalized schedules.

IV. TIME OF USE SCHEDULES

A. Time-of-Use Introduction and Background

Q. What are the Time of Use schedules?

A. PSE proposes the launch of a full-scale Time of Use (TOU) program for residential customers. As detailed in the direct testimony of Christopher T Mickleson (CTM-1T), the full-scale TOU program will include two residential schedules (Schedule 307, a two-tier residential Schedule, and Schedule 327, a three-tier electric vehicle specific residential schedule) and is a critical piece for PSE's demand response

goals.[40] The goal of these programs is to use a time varying rate (TVR) that increases the price of electricity during peak hours (both for load demand and electricity cost), which should, in a well-designed program, provide financial motivation for customers to shift their electric load to off-peak hours which are priced below the standard residential rate. This benefits the company by flattening the load curve over the day, moving more use to times when power is cheaper to generate or acquire. While TOU schedules are not impacting overall demand, when they are operating well they allow the company to prompt load shifting to times when there is lower capacity demand, easing the need for peak capacity investments, and saving both the Company and the consumers money.

Q. When was the TOU pilot proposed by PSE?

A. PSE began looking at time varying rate (TVR) schedules nearly 30 years ago and piloted a TOU schedule in 2001; ultimately, PSE elected not to move forward with TOU at that time. UTC Staff reintroduced TOU schedules in the 2019 GRC, with witness Staff Ball's testimony recommending that PSE implement pilots for both time of use and critical-peak pricing.[41] As Advanced Metering Infrastructure (AMI) has become more widespread and embedded in the operations of the utilities, these types of variable rate plans are more realistic to implement because the Company has direct measurements reported to the utilities automatically. In the 2022 PSE GRC testimony was submitted by Ahmad Faruqui, associated with the Brattle Group,

[40] Staff witness Quinn Weber's testimony addresses PSE's demand response program.
[41] Halliday, Exh. HSH-17 at 62:1–66:19.

proposing a TOU pilot.[42] The Commission approved the TVR pilot in Docket UE220066/UG220067 Final Order 24/10.

Q. Please provide more information about the TOU Pilot that was run by PSE.

A. PSE's TOU schedule pilot was designed by the Brattle Group, and was run from October 1, 2023 to September 30, 2025. The pilot tested four schedules: three residential schedules and one commercial schedule. Table 5 summarizes the tested schedules. The pilot was capped at 7500 participants, who were chosen at random from the PSE ratepayers and given the opportunity to participate. Winter was defined as October through March; Summer was April through September.[43]

Table 5. The TOU Schedules piloted by PSE.[44] These rates were applicable for the pilot period which ran from October 1, 2023, to September 30, 2025. The pilot was closed in January 2026 through Docket UE-250725, and rates were set for the GRC gap year.

Schedule	Customer Type	Time Buckets	Comments	Rates (pre 1/29/2025/post 1/29/205)
307	Residential TOU	*Summer*: On-Peak (Weekdays 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm)	Summer only has a single peak time in the evening. *Summer Price Ratio:* 3.1:1 *Winter Price Ratio:* 4.9:1	*Summer*: On-Peak: $0.1969/kWh ($0.3164/kWh) Off-Peak: $0.0636/kWh ($0.1021/kWh) *Winter*: On-Peak: $0.3128/kWh ($0.5027/kWh) Off-Peak:

[42] Halliday, Exh. HSH-18.
[43] August, Exh. AAA-15 at 15.
[44] August, Exh. AAA-14 at 1.

		Off-Peak (All other hours, including holidays and weekends)		$0.0636/kWh ($0.1021/kWh)
317	Residential TOU with Peak Time Rebates (PTR)	*Summer*: On-Peak (Weekdays 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends)	Summer has a single peak time in the evening. PTR incentives were communicated on an ad-hoc basis.	*Summer*: On-Peak: $0.1591/kWh ($0.2365/kWh) Off-Peak: $0.0830/kWh ($0.1234/kWh) *Winter*: On-Peak: $0.1841/kWh ($0.2736/kWh) Off-Peak: $0.0830/kWh ($0.1234/kWh)
327	Residential EV Charging TOU	*Summer*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) Super Off-Peak (All Days including weekends and holidays 11 pm – 7 am) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours,	Both summer and winter have a morning and evening peak time for weekdays (not including holidays). Super off-peak times are overnight every day, including holidays and weekends. *Summer Price Ratio:* 3.6:1.6:1 *Winter Price Ratio:* 6.7:1.7:1	*Summer*: On-Peak: $0.1595/kWh ($0.2566/kWh) Off-Peak: $0.0716/kWh ($0.1152/kWh) Super Off-Peak: $0.0443/kWh ($0.0713/kWh) *Winter*: On-Peak: $0.2955/kWh ($0.4753/kWh) Off-Peak: $0.0746/kWh ($0.1199/kWh) Super Off-Peak: $0.0443/kWh ($0.0713/kWh)

		including holidays and weekends) Super Off-Peak (All Days including weekends and holidays 11 pm – 7 am)		
324	Small Commercial TOU	*Summer*: On-Peak (Weekdays 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends)	Summer has a single peak time in the evening. The commercial schedule included PTR incentives were communicated on an ad-hoc basis. This schedule was limited to small commercial customers who were not eligible for the large commercial demand response programs.	*Summer*: On-Peak: $0.1557/kWh ($0.2267/kWh) Off-Peak: $0.0770/kWh ($0.1121/kWh) *Winter*: On-Peak: $0.1808/kWh ($0.2632/kWh) Off-Peak: $0.0770/kWh ($0.1121/kWh)

Q. Are there any inconsistent details on the Schedule Descriptions that staff would like to note?

A. Yes. In the pilot, Schedule 327 included a year-round morning peak-hour time block, while all other tested schedules (307, 317, and 324) only had a morning peak time in the winter seasons (October through March). This difference in the 327 schedule is documented in the contractor supplied materials,[45], and the PSE tariffs;[46]; however, PSE's direct testimony mistakenly reported Schedule 327 to exclude the summer

[45] August, Exh. AAA-15 at 23; August, Exh. AAA-14 at 26.
[46] Halliday, Exh. HSH-20.

morning peak hours.[47] Staff puts this on record so that other interested parties trying to replicate rate spreads in the PSE workbooks are saved some headaches.

Q. Was the TOU pilot successfully completed?

A. Yes. PSE filed UE-250725 on September 22, 2025, which closed the PSE TOU pilot and adjusted the schedules for the gap year while the 2026 GRC was filed and reviewed. PSE requested nine adjustments to its TOU tariffs, which staff supported and which the Commission ultimately approved for the gap year. This filing was resolved on December 11, 2025, at the Commission's open public meeting.

In addition to closing out the pilot and modifying the rates for the gap year through the Commission's open meeting process, PSE also released two reports to the public about the TOU pilot. The year 1 report was released in 2025,[48] and the final report was released in January 2026.[49]

Q. What were the notable changes to the TOU schedules that were made in UE-250725?

A. Docket UE-250725 closed the TOU pilot program. Staff's open meeting memo details and discusses the proposed changes.[50] The tariff changes that are applicable to the current testimony are as follows:

[47] Mickleson, Exh. CTM-1T.
[48] August, Exh. AAA-14.
[49] August, Exh. AAA-15.
[50] Halliday, Exh. HSH-21.

1. Two of the piloted schedules were closed: Schedule 317, a residential TOU schedule with peak time rebates, and 324, a small commercial TOU schedule. Customers enrolled in those two schedules were either moved back to the standard rate, or, for residential customers, were given the opportunity to transition to one of the remaining residential TOU schedules while the 2026 PSE GRC was filed and decided.
2. The two pilot-specific-low-income support programs that were included in the pilot were allowed to expire.
    a. the enabling technology program (which provided smart thermostats to participants) was closed, and
    b. the TOU Bill Protection program was allowed to stand for existing residential customers enrolled in the TOU schedules, but these programs will expire at the launch of the full-scale residential TOU schedules proposed here.
3. PSE adjusted their policies to allow TOU customers to move off their TOU schedules mid-cycle. Customers who move to a standard Schedule 7 rate are blocked from re-enrolling in a TOU schedule for 12 months, to prevent gaming of the system.

Q. Why did PSE terminate Schedules 317 and 324?

A. Staff's Open Meeting Memo for UE-250725 discusses this in detail,[51] but in short, the results of the pilot showed that the two terminated schedules did not meet the needs of the enrolled customers. Schedule 317 customers were not receiving enough benefit from the peak time rebate mechanism to justify its continued operation; the average Schedule 317 customer received an average annual benefit of about $4/year. In contrast, Schedule 324 was not effective in shifting load for the small commercial customers; on average, participants had higher bills compared to Schedule 24, there was increased load associated with these schedules, and there was generally negative consumer satisfaction coupled with a low engagement with survey efforts.

B. PSE's Full-Scale Time-of-Use Program Proposal

Q. Does the Full-Scale TOU Schedule proposal in the GRC differ from what was piloted?

A. Yes. PSE has proposed a full-scale residential TOU program that has two schedules: Residential schedules 307 and 327 will be available to all residential customers on an opt-in basis. The proposed schedules and rates are summarized below in Table 6.

Table 6. The proposed schedules and rates in the current GRC, updated from CTM-1T Table 6 via Staff DR 244.[52]

Schedule	Customer Type	Time Buckets	Comments	Rates (RY1/RY2/RY3)
307	Residential TOU	On-Peak (Weekdays 4 pm – 9 pm) Off-Peak (All	There are no seasonal rate differences	On-Peak: $0.635087/kWh ($0.647411/kWh)

[51] Halliday, Exh. HSH-21.
[52] Halliday, Exh. HSH-22.

		other hours, including holidays and weekends)	between summer and winter. *Price Ratio:* 4.1:1	($0.692333/kWh) Off-Peak: $0.156525/kWh ($0.159562/kWh) ($0.170634/kWh)
327	Residential EV Charging TOU	On-Peak (Weekdays 4 pm – 9 pm) Off-Peak (All other hours, including holidays and weekends) Super Off-Peak (All Days including weekends and holidays 11 pm – 6 am)	There are no seasonal rate differences between summer and winter. Super off-peak times are overnight every day, including holidays and weekends. *Price Ratio:* 4.7:1.5:1	On-Peak: $0.593070/kWh ($0.604602/kWh) ($0.665010/kWh) Off-Peak: $0.186626/kWh ($0.190255/kWh) ($0.203413/kWh) Super Off-Peak: $0.127385/kWh ($0.129862/kWh) ($0.138843/kWh)

Both PSE witnesses August[53] and Mickelson[54] address the new TOU schedules, and the testimony from PSE summarizes the changes in the proposed schedules from the piloted schedules as follows:

1. Seasonality in the schedules was dropped, to maintain consistent schedules throughout the year and improve predictability. This change removed both seasonal (summer/winter) rates as well as any morning peak times.
2. The evening peak was expanded from three hours (5 pm – 8 pm) in the pilot to five hours (4 pm – 9 pm) for both schedule 307 and 327.

[53] August, Exh. AAA-1T at 55:1–71:7.
[54] Mickelson, Exh. CTM-1T at 86:1–89:16.

3. The super off-peak time in Schedule 327 was shortened by one hour and would run from 11 pm – 6 am (piloted as 11 pm – 7am).

Q. Are the proposed rates shown in Table 6 what was filed in the Company's direct testimony?

A. No. As part of the initial filing, the Company included workbooks that allowed Staff to investigate the rate spread for alternative TOU schedules, which staff partially used to confirm the proposed rates in CTM-1T. In that investigation, Staff was not able to fully replicate the CTM-1T Table 6 rates; Staff DR 244 helps elucidate why this happened – a combination of the company updating the holiday schedule in witness Mickelson's Exhibit CTM-6, (CTM-1T Table 6 was run with an outdated holiday schedule), coupled with a small error in the Schedule 327 set up in CTM-6. In the originally filed version of CTM-6, the super off-peak rates for Schedule 27 were terminating at 5am, rather than 6am. The rates in Table 6 reflect the updated workpapers from PSE included in the response to Staff DR 244,[55] which Staff was able to independently replicate with its copies of the work papers.

Q. Why are the PSE TOU schedules proposed in the current GRC different from what was piloted?

A. Witness Mickelson addresses the changes from the piloted schedules directly.[56] PSE removed seasonal differences, both in rates and the existence of a morning peak in

[55] Halliday, Exh. HSH-22.
[56] Mickelson, Exh. CTM-1T at 80:5–84:17.

any of the schedules, at least partially based on customer confusion and dissatisfaction. Witness Mickelson's testimony noted that customers misunderstood the summer schedules, which lack a morning peak time, which lead to "dissatisfaction and complaints" when bills were higher in the winter.[57] Rather than adjusting the communication strategy, PSE elected to drop the morning peak across both final schedules; its justifications were simplification of the schedules and the final report on the pilot's indication that price signals were most effective in the evening.[58] To compensate for removing the morning peak hour window, the evening on-peak window was expanded to cover the a larger number of high cost hours where load is consistently high throughout the year. The shortening of the super off-peak window in Schedule 327 was made to fully avoid the beginning of increased morning usage.[59]

C. Staff's Assessment of the TOU Program Proposal

Q. Does staff have concerns about with the GRC proposed TOU schedules?

A. Yes. Staff has four primary concerns with the proposed TOU schedules presented in the GRC.

1. These proposed schedules are significantly different from what was piloted, and PSE has not been able to show equivalency between the piloted and proposed schedules.

[57] Mickelson, Exh. CTM-1T at 81:3-10.
[58] Mickleson, Exh. CTM-1T at 81:11–82:2.
[59] Halliday, Exh. HSH-23.

2. When Staff looked at the peak hours that were shown in the original Brattle Group proposal, the Company is not matching the Schedules to the actual reality of the peak usage. – i.e. dropping the morning peak is missing a period of both load and price increases.[60]
3. A continuous five-hour peak timing period is very long and does not mesh well with the state policy and utility-specific incentives to move customers to electrification.
4. PSE has designed the TOU schedule rates in the full-scale program to be revenue neutral with schedule 7 customers. However, this greatly reduces the cost savings incentives for customers who will reroll in the proposed TOU schedules.

Q. Was PSE able to show equivalency between the proposal and the pilot?

A. No. While the results of the pilot are being used to justify the launch of the full-scale TOU program, PSE has not sufficiently shown equivalency between the piloted and proposed schedules. PSE's response to Staff DR 122[61] presented a qualitative defense of the changes made to the proposed schedules but lacks quantitative analysis.

For instance, the company had enough information to run an ex ante analysis of the proposed GRC schedules compared to what was piloted. An ex ante analysis would have been a useful data point showing how much the new TOU schedules

[60] Halliday, Exh. HSH-18 at 8:1–10:2.
[61] Halliday, Exh. HSH-23.

differed from what was piloted, before load shifting was included, which would give some insight into how much more of an impact these changes would have on customers who cannot or will not shift load. While an ex post and shadow billing analysis would not have been possible as reported in the Cadmus pilot assessments, Staff sees some additional analysis that could have been included with the granularity of data that the Company has, especially considering the fact that the pilot was run with AMI data, which means that the company should have access to usage data for all participants down to the 15 minute interval. The pilot and supporting real-time AMI data means there is an opportunity to look beyond annual summaries at behavior around peak time transitions, including inferences on how much of a risk secondary peaks are with these types of load shifting schedules. In fact, Staff would argue that the entire purpose of performing the pilot program and gathering the data is to conduct that formal, quantitative data analysis *before* proposing a TOU program.

Q. Are there additional opportunities for increased analysis of the TOU Pilot Program that the Commission should require before authorizing a TOU Program?

A. Yes! The Company missed an opportunity to more closely examine the load shifting differences between the morning peaks between schedule 307 and Schedule 327. Something that Staff notes as a point of interest here is that Schedule 327 included a morning peak year-round, for reasons that were not explained, while schedules 307 and 317 in the pilot only included that morning window in the winter. Because the

pilots were run with AMI data, there is a record of behavior that could be specifically analyzed between the schedules on how much that morning peak contributed to load shifting, and how much of a financial burden the morning peak transferred. The Cadmus analysis of the pilot focused, rightfully in Staff's view, on the significant load shifting benefits of Schedule 327, but left some valuable data and analysis on the table that could have been used to support a more complete, robust modification of the TOU schedules.[62]

Q. What are Staff's concerns about the timing of the peak hours, specifically the removal of morning peak hours?

A. In the Brattle Group testimony that initiated the TOU Pilot, witness Ahmad Faruqui provided weekday system gross load averages separated by month, for both 2018 (actual data) and 2025 (forecasts).[63] The plots show clearly that the winter load has a strong bimodal distribution, with persists through the shoulder seasons, followed by a flat summer load. The same testimony shows marginal and capacity costs following the same bimodal distribution, indicating broad system and company benefits for load shifted away from both morning and evening.

With the new proposed schedules, PSE is dropping the morning peak for all schedules year round, shifting peak hours entirely to the weekday evening peak. PSE defends this on two grounds: that this is meeting a customer preference for simpler

[62] August, Exh. AAA-14; August, Exh. AAA-15.
[63] Halliday, Exh. HSH-18 at 8:1–10:2.

schedules, and that PSE is focusing on the more expensive evening peak hours while removing peak times on the morning time period which has less flexible load.[64]

Staff's concern is that by dropping the morning peak across all schedules, PSE is leaving a valuable demand response window on the table, and the 2019 PSE testimony and PSE's stakeholder collaborative presentations showed that there are months when the morning load is higher than the evening load.[65] While witness Mickelson's testimony indicates that the Company would address morning constraints with demand response programs,[66] the Company does not provide any details on these hypothetical DR programs, including details on frequency and duration.

Finally, Staff notes that PSE positions dropping the morning peak as a benefit for customers, with its response to Staff DR 122 stating "From a cost impact standpoint, removing the morning peak reduces the likelihood that customers incur higher charges during periods of relatively inflexible usage, such as morning heating and household routines. This improves perceived fairness and reduces unintentional bill increases, particularly for customers with limited flexibility to shift essential morning activities."[67]

While Staff acknowledges the reasoning behind PSE's qualitative argument, PSE is not backing this up with any quantitative analysis, and Cadmus's final pilot report notes that there were still load reductions in the morning peaks for all

[64] Halliday, Exh. HSH-23.
[65] Halliday, Exh. HSH-18; Halliday, Exh. HSH-24 at slides 47 – 53.
[66] Mickelson, Exh. CTM-1T at 81:12–82:2.
[67] Halliday, Exh. HSH-23.

residential schedules.[68] Without a more rigorous quantitative analysis, Staff can't evaluate the merits of PSE's assertation that the presence of a morning peak is detrimental to the success of the TOU programs, especially considering that Schedule 327 was a massive success in the pilot while including a morning peak year round.[69]

Q. What are potential issues with the extended evening peak?

A. With PSE dropping the morning peak time window on all schedules, PSE is replacing the evening peak window with an expanded five-hour window that extends from 4 pm to 9pm, covering the entire peak load window on weekdays. While the proposed schedules have fewer total hours within the peak pricing window (five peak hours vs the piloted six peak hours), these five hours are scheduled consecutively across the highest load window for the system.[70] PSE's testimony indicates that they consider this reasonable as the TOU schedules are optional,[71] and the modifications made to the TOU schedules in UE-250725 allow TOU customers to exit these schedules mid billing cycle.[72]

Staff's concern is that this new five-hour peak period covering the entire evening is going to be untenable for long-term participation in the TOU schedules. A typical family may be able to load shift around a shorter window (delaying laundry, shifting cooking hours earlier, and turning off climate controls), but eventually the

[68] August, Exh. AAA-15 at 2 & 9–10; Halliday, Exh. HSH-25 at Slide 10.
[69] August, Exh. AAA-15 at 10; Halliday, Exh. HSH-25.
[70] Mickleson, Exh. CTM-6, Tab: "Table."
[71] Mickleson, Exh. CTM-1T at 83:10-12.
[72] Halliday, Exh. HSH-21 at 6.

length of the window is going to turn shiftable load into inflexible load which can't be effectively shifted for the entire five-hour period. As the long peak time period persists, people will be driven off the TOU schedules due to not being able to effectively load shift for that long, which will ultimately drive down TOU participation significantly as bills rise after enrollment. While PSE makes a qualitative pitch for the expansion of this peak time window,[73] and the pilot results show that there were load reductions achieved for all of the residential schedules in the evening peak time window,[74] PSE is not providing any analysis that load shifting for an additional two hours would be either achievable or sustainable.

As noted above, one of the changes made to the TOU schedules in the close out of UE-250725 was that customers are allowed to leave TOU schedules mid billing cycle, which lowers the friction for customers transitioning back to the standard residential Schedule 7. As noted elsewhere in Staff witness Weber's testimony and the testimony of PSE witness August, PSE discusses using TOU programs towards its compliance with the requirements of the Clean Energy Transformation Act and Washington Decarbonization Act for Large Combination Utilities requirements.[75] If the schedules that are unveiled are not tenable for participants long term, this could hinder PSE's path towards compliance. While there are certainly groups that will succeed with this window of peak time (for example, customers who work outside the home in the evenings), Staff does not think that the success of a TOU program can be built entirely on these customers.

[73] Halliday, Exh. HSH-23.
[74] August, Exh. AAA-15 at 33-50.
[75] August, Exh. AAA-1T, at 65:17-20.

Second, there's a good chance that an extended window like this will drive the creation of a secondary peak at the end of the peak hour window. For instance, heat pumps, which are being strongly incentivized as an electrification approach, do not work well with long breaks in operation, and lose their efficiency when coming back online after extended breaks. Heat pumps, air conditioners, hot water generation, laundry, and cooking all coming online at 9 at the end of an extended period of peak rates have a high potential to drive a secondary demand peak, with built up demand hitting the system as soon as the peak hours end.

Q. Does staff see any issues with the Company's choice to make the proposed Schedules revenue neutral with Schedule 7?

A. Yes. In the proposed TOU program, one of the foundational assumptions in the model that determines the TOU rate spreads is that any TOU schedule proposed should be revenue neutral with Schedule 7, the standard residential rates. To do this, the TOU schedule uses the actual load data from Schedules 307 and 327 in the pilot, which means that any load shifting on those schedules during the pilot is baked into the model – essentially making the customer behavior of the pilot the default expected behavior for a customer to have an equivalent bill compared to schedule 7.

In the development of the pilot there was considerable attention given to how behavioral changes by customers would impact their ultimate benefit from enrolling on a TOU schedule; and the failure of the piloted schedules 317 and 324 was driven by a failure to provide economic benefit. If the base assumption of load on the TOU schedules is set by pilot behavior, which we already know was effective in shifting

load for both Schedule 307 and 317, the financial benefits of the pilot will not materialize.

Staff raises this point because it's another line of evidence that the full-scale TOU program that PSE is proposing is likely not going to work well for the customers enrolled, providing lower than expected benefits and ultimately driving down participation.

The fix for this is to use the load curves of the enrolled customers from prior to the pilot, which would allow comparison of load profiles. We know that the company has this information, because that measured load was a fundamental piece of the pilot analysis, specifically the ex ante analysis. This would have allowed the company to set the rates as revenue neutral with the same customers on schedule 7, keeping the rate savings that the pilot participants intact.

D. Staff's Alternative Schedule Proposal

Q. Did staff investigate the rates proposed by PSE for the schedules?

A. Yes. One of the tools provided to Staff by PSE for this GRC is workbooks for the electric schedules that allowed staff to adjust the TOU schedules and determine what the revenue neutral rates would be for different TOU schedule proposals. Staff used this tool extensively in its examination of the schedules and found them to be very helpful for understanding how rates were set for the full-scale TOU program proposal. Staff modified the workbooks to fully be able to test the schedules and will provide those modified workbooks as work papers for all interested parties.

Q. How do Staff's adjusted workbooks differ from the company's submitted workbooks?

A. Staff modified witness Mickelson's Exhibit CTM-6-E-TVR-ANALYSIS, and the "Exh CTM-Rate Design" tab of Exhibit CTM-4-RATEMAKING-PORTFOLIO. We made the following substantive changes:

1. In Exhibit CTM-6, Staff added a Seasonal split to the time of use schedules that can be tested. This was reflected in two additional tables to Tab "Periods", and a modification to the equations in Tab "TVR" to add a separation of the summer and winter schedules.
2. In Exhibit CTM-4, Staff corrected the Rate calculations in tab "Exh. CTM-Rate Design" for Schedule 307 and Schedule 327 to correctly read in seasonal differences between summer and winter.

Q. If the Company were to use the Piloted TOU schedules, what would the rates be?

A. Staff calculated the rates for the piloted schedules using the Staff modified work books, and the rates for the piloted schedules as they would be if adopted with PSE's current rate model are shown in Table 7.

Table 7: The calculated rates for the schedules as Piloted, using Staff's modified workbooks.

Schedule	Customer Type	Time Buckets	Comments	Rates (RY1/RY2/RY3)
307	Residential TOU	*Summer*: On-Peak (Weekdays 5 pm – 8 pm)	Summer only has a single peak time in the evening.	*Summer:* On-Peak: $0.710567/kWh ($0.724369/kWh)

		Off-Peak (All other hours, including holidays and weekends) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends)	*Summer Price Ratio:* 4.7:1 *Winter Price Ratio:* 4.3:1	($0.774582/kWh) Off-Peak: $0.151429/kWh ($0.154371/kWh) ($0.165072/kWh) *Winter:* On-Peak: $0.649156/kWh ($0.661766/kWh) ($0.707639/kWh) Off-Peak: $0.151429/kWh ($0.154371/kWh) ($0.165072/kWh)
327	Residential EV Charging TOU	*Summer*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) Super Off-Peak (All Days including weekends and holidays 11 pm – 7 am) *Winter*: On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) Super Off-Peak (All Days including	Both summer and winter have a morning and evening peak time for weekdays (not including holidays). Super off-peak times are overnight every day, including holidays and weekends. *Summer Price Ratio:* 4.0:1.4:1 *Winter Price Ratio:* 4.1:1.6:1	*Summer:* On-Peak: $0.526531/kWh ($0.536729/kWh) ($0.573964/kWh) Off-Peak: $0.181835/kWh ($0.185357/kWh) ($0.198216/kWh) Super Off-Peak: $0.132097/kWh ($0.134656/kWh) ($0.143997/kWh) *Winter:* On-Peak: $0.536465/kWh ($0.546855/kWh) ($0.584792/kWh) Off-Peak: $0.213382/kWh ($0.217515/kWh) ($0.232605/kWh)

		weekends and holidays 11 pm – 7 am)		Super Off-Peak: $0.132097/kWh ($0.134656/kWh) ($0.143997/kWh)

Q. Is staff proposing an alternative to the proposed TOU schedules?

A. Yes. One of the issues that PSE identified as a driving reason for moving to a single schedule over the entire year was issues with customers correctly understanding the morning peak, and specifically customers on piloted schedules 307 and 317 not correctly tracking which season had peak hours in the morning. Staff's investigation focused on simplifying the piloted schedules in a different approach from PSE: Rather than dropping all morning peak hours and expanding the evening peak hours, Staff instead modeled rates using a variation of the piloted schedules that keeps a peak hour period for weekdays on all schedules year round, while also keeping the shorter evening peak times for weekdays as per the pilot.

Q. What are the calculated rates for Staff's proposed TOU schedule?

A. Staff proposes the TOU schedule alternative shown in Table 8. This is an annual schedule, based on the piloted schedules, but it uses a morning peak consistently throughout the year. The rates shown here include super off-peak rates that were based on the piloted Schedule 327, which terminates at 7am.

Table 8: Staff's proposed TOU Schedule.

Schedule	Customer Type	Time Buckets	Comments	Rates (RY1/RY2/RY3)
307	Residential TOU	On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends)	There are no seasonal rate differences between summer and winter. All weekdays include a morning peak, with the exception of holidays which have no peak hours. *Price Ratio:* 3.6:1	On-Peak: $0.586070/kWh ($0.597427/kWh) ($0.638894/kWh) Off-Peak: $0.163207/kWh ($0.153795/kWh) ($0.177917/kWh)
327	Residential EV Charging TOU	On-Peak (Weekdays 7 am – 10 am, 5 pm – 8 pm) Off-Peak (All other hours, including holidays and weekends) Super Off-Peak (All Days including weekends and holidays 11 pm – 7 am)	There are no seasonal rate differences between summer and winter. Super off-peak times are overnight every day, including holidays and weekends. *Price Ratio:* 4.0:1.5:1	On-Peak: $0.533518/kWh ($0.543867/kWh) ($0.581518/kWh) Off-Peak: $0.198721/kWh ($0.202576/kWh) ($0.216600/kWh) Super Off-Peak: $0.132373/kWh ($0.134941/kWh) ($0.144282/kWh)

Q. Did staff investigate any other alternative schedules of note?

A. Yes. Staff ran several variations of note. The rates produced in those analyses are found in Exhibit HSH-26. The primary variation was to project rates using a shortened super off-peak time for Schedule 327, conceding PSE's point that

terminating the super off-peak time at an earlier hour prevented overlap with the increase in residential use in the morning peak period. For all presented schedules we also modeled out annual rates versus seasonal (summer/winter) rates.

As a general summary, shortening the super off-peak hours in schedule 327 raises the peak rates slightly, as the schedule has an additional hour of higher rates. Moving to a seasonal rate schedule vs an annual schedule

Q. Why are staff's alternative schedules acceptable and/or better than the Company's proposed schedules that Staff is objecting to above?

A. Because the changes align with what the company piloted with Schedule 327. The pilot for Schedule 327 kept a consistent year-round morning peak, along with the split seasonal schedules. Staff's proposed schedules match the reality of the demand peaks more realistically (keeping that winter morning peak) while keeping a consistent schedule across the year and further softening the ratios due to additional hours being included in the peak time rates.

That said, Staff is presenting a proposal that uses an annual rate instead of the piloted seasonal rate splits. Staff conceded the annual rate as a simplification to the schedules, and because overall the annual rates sit in between the summer and winter rates that the seasonally split schedules produce. However, Staff project the rates and have included the seasonal rates in Exhibit HSH-26 which we present as an alternative to Staff's proposed TOU schedules.

Staff still thinks that ultimately ratepayers with a typical residential schedule will have a difficult time staying on these schedules long term, as discussed above,

but by softening the rates further Staff attempts to reduce the intense rate shock of peak time rates above $0.60/kWh. Staff asserts that these high peak rates will rapidly drive consumers away from engagement with the TOU schedules, which will have a long-term impact on PSE's DR goals.[76]

E. TOU Schedule Conclusions

Q. Are there any additional program notes that Staff would like to discuss in their testimony?

A. Yes. PSE is focused on significant structural changes to the rates from the pilot. However, there was a set of notes within the Cadmus reports on communication with the company that Staff would like to highlight; notably, that PSE seems to have communication issues around the TOU schedules.[77] Cadmus highlighted comments from consumers that noted a lack of granular and on-demand data about usage and rates. Staff raises this point because it matches issues that the Commission has had with the Company in past, specially around effectively communicating changes to their customer base – in fact, resolving UE-250725 was an extremely rocky process due to schedule closure notification issues.

Rather than adjust how the company is communicating and presenting data to their customers, PSE is instead electing to fundamentally change their proposed rate structure, without fully working through equivalency. Staff believes that the issues

[76] Again, Staff witness Weber addresses PSE's DR goals and programs.
[77] August, Exh. AAA-15 at 67-70.

that the Company is using to justify changing the schedules to the proposed structures shown in Table 6 could have just as easily been an argument for revamping and updating the communication protocols and data management for the TOU programs, allowing enrolled customers to have a much better handle on their own real time energy use. Confusion about the timing and presence of the peak times could have been cleared up with faster and simpler customer access to data; similarly, confusion about seasonal rate changes and customer's load shifting success could all have been provided with a more comprehensive evaluation of what customers wanted in terms of communication.

Q. Does Staff have concerns about the long term viability of the TOU schedules?

A. Yes. No matter what the final TOU schedules are, the use of a revenue neutral rate structure that used the pilot load data means that the rate savings PSE was able to show in the pilot will not be present in the full-scale program. Additionally, Staff does not think that the extended evening peak hours in PSE's proposed TOU schedules will be feasible for most customers to adapt to long term, and that by dropping the morning peaks entirely the company is leaving valuable load shifting on the table. While the company states that the morning winter peaks can be met with temporary DR events, Staff was not able to find any estimates for what meeting that particular peak load would look like. What Staff expects is initial enthusiasm from customers, followed by rapid disenrollment, with few of the systemic benefits being seen from the full-scale program over the long term (longer than 1 year) time frame.

Q. Is there a case for requiring PSE to re-do the TOU pilot?

A. Yes. The Company provides a series of qualitative assessments and asks the Commission to approve schedules that are inconsistent with the results and information provided by the Pilot Project. This calls into question the purpose of the Pilot to begin with - if the Commission authorizes a Pilot Program the expectation needs to be that the Company's proposal necessarily follows and includes the results of that Pilot. To the extent the Company wants to do something different, then that new proposal should require thorough quantitative analysis or, more practically, a new pilot project to test a series of qualitative hypotheses.

Q. What is Staff's recommendation?

A. Staff's recommends that PSE use a rate design that is much closer to the piloted TOU schedules for the full-scale residential TOU schedules, rather than the modified schedule proposed by the company, as show in witness Mickelson's testimony. While the company was upfront with the logistical considerations that caused it to modify the piloted schedules, the company was not able to show equivalency between the schedules that were piloted and what was proposed here. Without an analysis of equivalency, the schedules proposed in the GRC are not supported by the success of the pilot.

Staff's preference is for the Company to adopt Staff's proposed variation, shown in Table 8, as it follows closely with the piloted 327 Schedule while also further softening ratios (resulting in lower peak rates) and making a more

manageable peak hour length that aligns with the customer preference of a consistent schedule throughout the year.

Alternatively (although not a preferable alternative), the Company could adopt the schedules as piloted, with the rates presented in Table 7. The risk that Staff sees in this scenario is that the end result of these schedules is peak rates rising above $0.70/kWh by RY2, which will likely drive customers off the TOU schedules (an allowed action, per UE-250725), greatly reducing the effectiveness of the TOU schedules in the DR programs.

A final, separate alternative that could be adopted is to order the company to re-run the TOU pilot, collecting data specifically on the alternative that PSE is proposing in the GRC. While this would provide the necessary data backing up the structural changes that PSE is making, Staff's expectation is that these alternatives would be a failure in terms of customer retention and ability to motived shifted load; nevertheless, if the overall decision is to allow the company their proposal, then staff believes that the full-scale TOU program should be delayed while the company determines exactly what the impact of those schedule changes will be.

No matter which version of the schedules the Commission ultimately approves for the Company, Staff is adamant that when PSE provides their DR program analysis per Staff Witness Quinn Weber's testimony, it must also run an analysis of the success of its TOU schedules and explicitly compare against the piloted 307 and 327 programs. This must include ex ante, ex post, and shadow bill analysis for both the piloted and approved full scale programs, an analysis for shifted

loads, and examination for the risk of secondary peaks. In addition, staff would like PSE to be track of program exits by enrolled customers.

Staff would also like to use these TOU schedules as a reminder for PSE that its communication programs continue to be an area that need attention and improvement. This has been a long-standing issue between PSE and their customers and is being explicitly noted as a weakness in the Cadmus analysis of the pilot program.

Q. Does this conclude your testimony?

A. Yes.