BEFORE THE

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PUGET SOUND ENERGY, Respondent. In the Matter of the Petition of PUGET SOUND ENERGY, Petitioner, For an Accounting Order Authorizing deferred accounting treatment of purchased power agreement expenses pursuant to RCW 80.28.410.	DOCKETS UE-240004, UG-240005, and UE-230810 *(Consolidated)*

RESPONSE TESTIMONY OF DR. LANCE D. KAUFMAN

ON BEHALF OF

ALLIANCE OF WESTERN ENERGY CONSUMERS

(REDACTED)

August 6, 2024

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I. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME AND OCCUPATION.

A. My name is Lance D. Kaufman. I am a consultant representing utility customers before state public utility commissions in the Northwest and Intermountain West. My witness qualification statement can be found at Exhibit LDK-2.

Q. PLEASE IDENTIFY THE PARTY ON WHOSE BEHALF YOU ARE TESTIFYING.

A. I am testifying on behalf of the Alliance of Western Energy Consumers ("AWEC"). AWEC is a non-profit trade association whose members are large energy users in the Western United States, including customers receiving electric and natural gas services from Puget Sound Energy, Inc. ("PSE" or "Company").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I provide testimony on the following items:

- Natural Gas Depreciation Expense;
- Decarbonization Rate Adjustment and Targeted Electrification Pilot Phase 2;
- Wildfire Prevention Tracker;
- Cost of Service Study;
- Rate spread;
- Natural Gas Rate design;
- Cost of Capital; and
- Short-Term CETA Acquisitions.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.

A. I make the following recommendations:

- No change be made to PSE's depreciation rates until after PSE has developed an Integrated System Plan that identifies PSE's decarbonization plan. If the Commission finds that depreciation rates should be changed in the current rate case, I recommend that the rates in Table 3 be adopted and all other depreciation rates remain unchanged.
- PSE's proposal to initiate Phase 2 of its Targeted Electrification Pilot and its proposed Decarbonization Rate Adjustment tracker should both be rejected. If the Commission allows PSE to move forward with its Targeted Electrification Pilot Phase 2, costs should be spread only to those customers that would benefit from the results of the pilot regardless of whether those costs are recovered in base rates or through PSE's proposed Decarbonization Rate Adjustment. If the Commission allows PSE to recover Targeted Electrification Pilot Phase 2 costs pursuant to its Decarbonization Rate Adjustment tracker, Schedule 87T customers, natural gas customers that are Energy Intensive Trade-Exposed ("EITEs") with their own compliance obligations under the Climate Commitment Act ("CCA"), Schedule 449 and 459, and special contract customers should be excluded from the allocation of costs in this tracker.
- PSE's proposed Wildfire Prevention Tracker should be rejected. If the Commission allows PSE to implement a Wildfire Prevention Tracker, the special contract and high voltage Schedule 46/49 customers should be excluded from the allocation of costs in this schedule.
- PSE's Cost of Service Study for natural gas service should be adjusted to: (1) directly assign distribution mains for Schedules 87 and 87T customers served by 4-inch and greater mains; (2) accelerated depreciation, if permitted by the Commission, should be allocated associated with fuel switching using customer counts.

- For electric rate spread, adopt PSE's recommended rate spread. For natural gas rate spread, adopt the rate spread set forth in Table 8.
- For natural gas rate design for Schedules 87/87T: (1) add the storage commodity costs from the Cost of Service Study to the procurement charge for Schedule 87; (2) escalate the procurement charge for Schedule 87 proportionally to base rate increase in Rate Year 1 and Rate Year 2.
- Adopt AWEC's cost of capital as set forth in Table 11, which includes a Return on Equity of 9.2 percent for both Rate Year 1 and Rate Year 2.
- Direct PSE to remove the CETA premium from rates in both Rate Years 1 and 2 and direct PSE to only procure short-term CETA compliant energy; if it has an energy and capacity need and the total costs of such energy is lower than $42/MWh.

II. NATURAL GAS DEPRECIATION EXPENSE

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS REGARDING DEPRECIATION EXPENSE.

A. I make the following recommendations in this section.

1. The Commission find that it is premature to modify PSE's depreciation rates prior to the Commission approving an Integrated System Plan for PSE and therefore reject PSE's proposed gas depreciation rate changes and maintain existing depreciation rates.
2. Should the Commission conclude that PSE's depreciation rates should be updated as part of this proceeding, I recommend the changes set forth in Table 3, below.
3. Allocate accelerated portion of depreciation expense using customer counts.

Q. GIVEN THAT THE COMPANY'S DEPRECIATION RATES WERE LAST UPDATED IN ITS 2022 GENERAL RATE CASE, WHY IS PSE PROPOSING TO UPDATE RATES AGAIN IN THIS CASE?

A. PSE argues that updating its Depreciation Study at this time is appropriate because there is "more information" about the future outlook of gas assets, particularly driven by what it describes as the combined effect of Washington's "combined goals" to get to net zero greenhouse gas emissions by 2050 through the Climate Commitment Act ("CCA"), Clean Energy Transformation Act ("CETA"), and the state's adoption of new building codes.[1] Further driving these changes is the Company's line extension policy enacted in its 2022 general rate case.[2]

Q. ARE THERE REGULATORY REQUIREMENTS THAT REQUIRE PSE TO DEPRECIATE ITS NATURAL GAS SYSTEM AS PROPOSED BY PSE IN THIS CASE?

A. No. While I am not an attorney and AWEC intends to address the legal and policy requirements applicable to PSE's depreciation rates in this case in briefing, it is my understanding that PSE's proposal in this case is driven by its desire to achieve net zero by 2050 for its natural gas system, not a specific legal mandate.

Q. WHAT DEPRECIATION CHANGES DOES PSE RECOMMEND IN THIS CASE?

A. PSE proposes revised depreciation rates for all accounts except fully depreciated accounts. Most revisions are minor updates that do not involve modified retirement curves or salvage values. The table below identifies accounts where PSE proposes revised depreciation parameters. PSE reduces the average life of survivor curves by 10 to 15 years, and makes a

[1] Allis, Exh. NWA-1T at 3:9-19.

[2] *Id.* at 3:13-14. Notably, the Company's line extension policy was enacted as a function of settlement in its 2022 general rate case, and not driven by specific legal requirements.

few changes to net salvage percent. PSE's proposal increases annual depreciation expense for the affected accounts by $71 million, a 48 percent increase relative to current rates.

Table 1: PSE proposed Depreciation Rate Change Expense Impact

		Current		Proposed				
	ACCOUNT	SURVIVOR CURVE	NET SALVAGE PERCENT	SURVIVOR CURVE	NET SALVAGE PERCENT	CALCULATED ANNUAL ACCRUAL AMOUNT	INCREASE Dollars	Pct
352.00	WELLS	60-R4 *	(25)	60-R4	(35)	912,151	189,857	26%
376.20	MAINS - PLASTIC	55-R3	(50)	45-R3	(50)	67,006,015	17,127,277	34%
376.40	MAINS - WRAPPED STEEL	60-R2	(50)	50-R2.5	(50)	20,875,527	5,707,694	38%
378.00	MEASURING AND REGULATING STATION EQUIPMENT	43-R2	(50)	35-R3	(50)	7,974,932	2,714,627	52%
380.20	SERVICES - PLASTIC	50-R2.5	(100)	40-R3	(100)	85,607,269	27,570,694	48%
380.30	SERVICES - WRAPPED STEEL	50-R2.5	(100)	40-R3	(100)	9,973,022	6,725,852	207%
381.00	METERS	42-R2	(30)	30-R3	(25)	8,531,993	4,424,880	108%
382.00	METER INSTALLATIONS	47-S1.5	(30)	35-R3	(30)	10,154,516	4,152,444	69%
382.20	METER MODULE INSTALLATIONS - AMI	20-S2.5	(5)	20-R3	(5)	2,169,546	40,225	2%
383.00	HOUSE REGULATORS	50-R3	(5)	35-R3	(10)	1,070,528	653,569	157%
384.00	HOUSE REGULATOR INSTALLATIONS	50-R3	(5)	35-R3	(10)	3,337,213	1,718,947	106%
	TOTAL PLANT					**217,612,712**	**71,026,066**	48%

Q. WHAT JUSTIFICATION DOES PSE RELY ON TO SUPPORT ITS PROPOSED ACCELERATED DEPRECIATION OF THE NATURAL GAS SYSTEM?

A. Within the context of PSE's "Net Zero by 2050," the primary justification that PSE offers to support its proposal to shorten the services lives for a subset of accounts by 10 years, is that customer fuel switching may lead to stranded costs,[3] and recovering these costs from remaining customers will cause intergenerational inequity.[4]

Q. DOES PSE'S PROPOSAL RESOLVE EQUITY ISSUES ASSOCIATED WITH FUEL SWITCHING?

A. No. AWEC agrees with PSE that customers who do not switch fuels should not bear the stranded costs associated with fuel switching. However, PSE has only identified one of several equity issues associated with fuel switching. In addition to not fully characterizing the equity issues with fuel switching, PSE has not correctly measured the stranded costs associated with fuel switching.

[3] *Id.* at 4:9-25.
[4] *Id.* at 35:7-25.

Q. WHAT OTHER EQUITY ISSUES SHOULD THE COMMISSION CONSIDER?

A. In addition to considering intergenerational equity, the Commission should consider equity across gas distribution schedules and between gas and electric customers.

Q. HOW CAN FUEL SWITCHING CAUSE INEQUITY AMONG GAS DISTRIBUTION SCHEDULES?

A. PSE's forecast of fuel switching is concentrated in the residential class, with a forecasted 60 percent decrease in residential customers relative to a 40 percent decrease to industrial customers.[5] Moreover, some industrial schedules will likely have much less than a 40 percent decrease in customers. For example, the only customer served under 88T is Puget LNG, and it is highly unlikely that this customer will electrify. The complexity of electrification for extra large industrial customers makes it unlikely that 40 percent of Schedule 87 and 87T customers will electrify. It is not equitable for schedules that are not expected to switch fuels to pay for the stranded costs associated with schedules that cause the majority of these stranded costs.

Q. HOW CAN FUEL SWITCHING CAUSE INEQUITY BETWEEN GAS AND ELECTRIC CUSTOMERS?

A. PSE notes that "if a customer decides to fully electrify their energy usage, the infrastructure providing gas service directly to that customer would be retired."[6] The undepreciated share of these retired assets must be paid by remaining customers.[7] However, because the customer that has fully electrified is no longer a gas customer, it does not share in the recovery of these costs. This creates inequity where the costs of electric customers are paid by gas customers.

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5 Kaufman, Exh. LDK-3C (PSE Response JEA DR 002_Attach A).
6 Allis, Exh. NWA-1T at 20: 16- 17.
7 Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 008).

Q. DOES PSE'S PROPOSAL ADDRESS THE ADDITIONAL FORMS OF INEQUITY THAT YOU NOTE?

A. No, it does not. PSE's proposal only affects when depreciation dollars are recovered, it does not affect which customers are responsible for depreciation dollars. PSE proposes to accelerate depreciation associated with fuel switching from all customers using generic allocation factors. For example, PSE allocates distribution depreciation based on each schedule's allocation of distribution plant, which is proportional to each schedules peak and average usage.[8] This means that even if 100 percent of electrification is concentrated in one or two schedules, all schedules will pay for the associated increase in depreciation expense. In addition, PSE does not assign any costs of accelerated depreciation to electric schedules. Thus, customers that electrify early will avoid the majority of accelerated depreciation costs under PSE's proposal.

Q. DO THE ALTERNATIVES CONSIDERED BY PSE, SUCH AS UNITS OF PRODUCTION DEPRECIATION, RESOLVE THESE OTHER EQUITY CONCERNS?

A. No. Cross-schedule and cross-fuel type subsidies remain under the units-of-production depreciation method for a similar reason, namely because these methods do not spread accelerated depreciation costs to the schedules and customers that cause them.

Q. HAS PSE DEVELOPED A DECARBONIZATION PLAN TO INFORM ITS PROPOSAL IN THIS CASE?

A. No. PSE does not consider its updated decarbonization study to be a plan. PSE does not currently have a decarbonization plan and does not expect to form a decarbonization plan until the 2027 Integrated System Plan.[9]

[8] 240004-05-PSE-WP-JDT-4-GCOS-MODEL-WAC-24GRC-02-2024.xlsx.
[9] Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 060).

a. Changes to PSE Gas Depreciation Rates are Premature

Q. SHOULD PSE BE PERMITTED TO ACCELERATE GAS DEPRECIATION RATES PRIOR TO AN APPROVED INTEGRATED SYSTEM PLAN?

A. No. The Commission should refrain from approving accelerated depreciation of PSE's gas plant, or a subset thereof, prior to approval of an Integrated System Plan consistent with the requirements of ESHB 1589. While I am not an attorney, and AWEC will address legal and policy requirements in its post-hearing briefing, it is my understanding that the Company developed and filed this case prior to the passage of ESHB 1589 in the 2023 legislative session. Section 7(1) of that bill places requirements on PSE for developing a depreciation study "that reduces the gas rate base consistent with an approved integrated system plan" and requires the Commission to approve a depreciation schedule "that depreciates all gas plants in service as of July 1, 2024, by a date no later than January 1, 2050," while also considering affordability. More broadly, ESHB 1589 represents a significant change in Washington policy to decarbonize PSE's natural gas system and was developed with the intent of taking a holistic approach to decarbonization in an effort to ensure that customer affordability remains at the forefront of this transition. Accelerating the timeline of one aspect of that legislation, without the benefit of a holistic Integrated System Plan, is unsupported in this case and would lead to rate shock to PSE's natural gas customers. If the Commission is inclined to allow for the accelerated depreciation of some or all accounts, then changes to PSE's proposal are warranted as discussed below.

Q. IS PSE'S PROPOSAL TO ACCELERATE DEPRECIATION RATES CONSISTENT WITH ITS OWN FINDINGS IN ITS UPDATED DECARBONIZATION STUDY?

A. No. By PSE's own updated decarbonization study analysis filed in December 2023, fuel-switching for residential customers faces significant barriers in terms of costs, and additionally,

provides no net societal benefit to customers.[10] As such, accelerating depreciation at this time only serves to place significant costs on customers that are unlikely to fuel-switch at this time due to costs, lack of ability to alter fuel sources, or desire to retain natural gas service. In fact, PSE forecasts a 1 percent increase in residential and commercial customers from the test year to Rate Year 2.[11]

Q. WOULD PASSAGE OF WASHINGTON'S INITIATIVE MEASURE 2066 AND INITIATIVE MEASURE 2117 IN NOVEMBER IMPACT THE APPROPRIATENESS OF PSE'S UPDATED DEPRECIATION STUDY ASSUMPTIONS IN THIS CASE?

A. Yes. Initiative Measure 2066 has qualified for the ballot in November 2024.[12] If this initiative passes, it will have the effect of rolling back portions of ESHB 1589. Initiative Measure 2117 has also qualified for the ballot in November 2024, and if passed, would repeal the Climate Commitment Act.[13] If successful, both of these initiatives should heavily impact PSE's assumptions related to the decarbonization of its natural gas system and customer fuel-switching. The success of these measures will not be known until after the evidentiary record in this case closes, which further supports a delay in accelerating PSE's natural gas depreciation rates. If these initiatives pass, but the Commission approves PSE's proposal – or even a modified version thereof – customers will be forced to bear significant rate increases for the duration of the MYRP without any justification.

b. AWEC recommended depreciation rates if changes are found to be timely

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10 Docket Nos. UE-220066/UG-220067, PSE GRC Stipulation O: Updated Decarbonization Study (Dec. 22, 2023).

11 *See* 240004-05-PSE-WP-JDT-5-GAS-RATE-SPREAD-DESIGN-24GRC-02-2024 sheet "Exh JDT-5 (Rate Design)".

12 *Initiative to the People 2066 certified to November General Election ballot*, WA Secretary of State (July 24, 2024), https://www.sos.wa.gov/about-office/news/2024/initiative-people-2066-certified-november-general-election-ballot.

13 *Letter Margins*, (June 20, 2023), https://www2.sos.wa.gov/_assets/elections/initiatives/ballottitleletter_3038.pdf.

Q. WHAT ACCOUNTS DOES PSE PROPOSE REVISED RATES FOR?

A. PSE proposes revised depreciation parameters for all accounts except fully depreciated accounts. Most revisions are minor updates that do not involve modified retirement curves or salvage values. PSE's proposal increases annual depreciation expense for the affected accounts by $71 million, a 48 percent increase relative to current rates.

PSE's proposal impacts wells, mains, regulating stations, services, meters, and house regulators. However, PSE's testimony only offers rationale for changes to gas services, meters, meter installations, gas mains, and regulator stations.

Q. SHOULD THE COMMISSION APPROVE CHANGES TO ACCOUNTS FOR WHICH PSE OFFERS NO SUPPORTING TESTIMONY?

A. No. PSE's testimony includes no explanation for modifying wells or house regulators. I therefore recommend no changes be made to Accounts 352.00, 383.00, or 384.00. I also recommend no changes be made to accounts where PSE does not propose any changes to net salvage or survivor curves.

Q. SHOULD THE COMMISSION APPROVE CHANGES TO MAINS OR REGULATING STATION ACCOUNTS?

A. No. PSE speculates that declining throughput could cause many of PSE's gas mains and regulator stations to become obsolete. This speculation is incorrect. Even with declining throughput, PSE will need to keep mains and regulating stations in service to meet the ongoing distribution needs of customers who do not electrify. The only scenario where declining throughput can be associated with early retirements of mains is if PSE pursues blanket electrification, where 100 percent of customers served by a distribution branch or regulating station are electrified. PSE offers no evidence that it intends to pursue such practice. In fact,

PSE claims that it has no ability to influence customer electrification.[14] Thus blanket electrification will only occur by chance, and not as a result of planning, at least at this juncture. Given the highly speculative nature of early retirements, it is unreasonable to assume that electrification will cause any material retirements or obsolescence of distribution mains or regulating stations.

Q. IS IT APPROPRIATE TO APPLY THE UNITS OF PRODUCTION METHOD OF DEPRECIATION OF MAINS AND REGULATING STATIONS?

A. No. As an alternative to shortening the average lives of distribution accounts, PSE investigated using the units of production method for these accounts. However, the units of production method is not appropriate for mains because the functionality and value of these assets does not decline with units of production. Units of production is typically involved when depreciating assets that have a fixed volume of use over their lifetime, such as coal mine investments. This is not the case for distribution facilities. In addition, distribution assets provide a demand service, not a volumetric service. To the extent that units of production is used, it should be based on annual peak demand rather than annual volume. PSE offers no evidence that demand will decrease over time and under PSE's preferred decarbonization scenario, which relies on the use of hybrid heat pumps, peak demand is not expected to decline.

Q. IF THE COMMISSION FINDS THAT IT IS APPROPRIATE TO UPDATE DEPRECIATION RATES TO REFLECT ELECTRIFICATION, WHAT ACCOUNTS SHOULD BE UPDATED?

A. While AWEC generally finds that it is premature to implement depreciation changes associated with electrification, if changes are made, they should only be made to service (380.20 and 380.30) and meter (381, 382.00, and 382.20) accounts at this time.

[14] Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 002).

Q. HAS PSE ACCURATELY IDENTIFIED DEPRECIATION RATE CHANGES ATTRIBUTABLE TO DECLINING CUSTOMERS AND THROUGHPUT?

A. No. PSE's analysis regarding declining customers is flawed because it is only based on one of four electrification scenario studies, and represents the most extreme decrease in customer counts of these studies.[15]

Q. CAN YOU IMPROVE PSE'S ESTIMATE OF ASSETS THAT MAY BE RETIRED EARLY DUE TO DECLINING CUSTOMER COUNTS?

A. Yes. I recommend using an average of PSE's decarbonization scenarios when evaluating customer counts.

Q. HOW DOES PSE MODEL CUSTOMER COUNTS WHEN EVALUATING DEPRECIABLE LIVES?

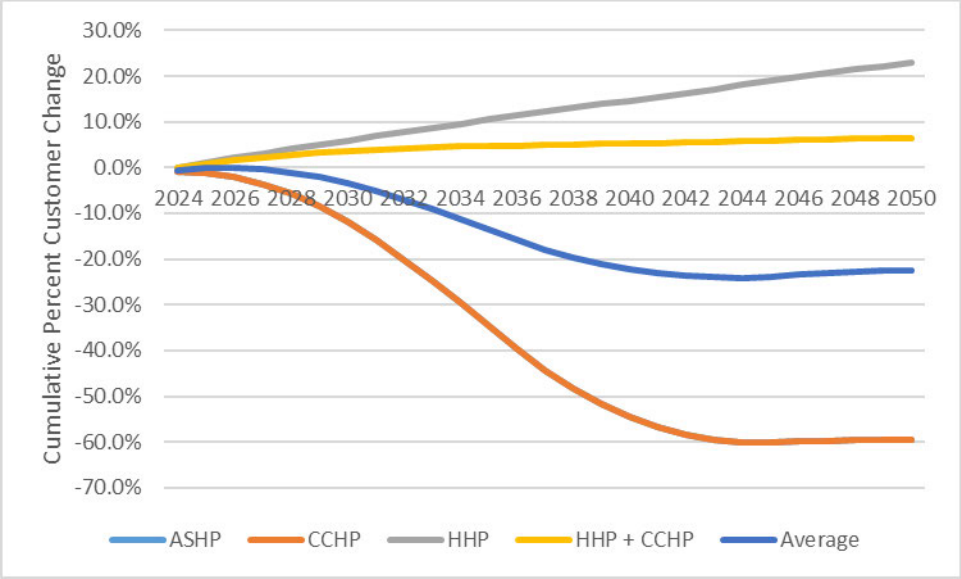
A. PSE models a 60 percent decrease in customer counts.[16]

Q. HOW DOES PSE MODEL CUSTOMER COUNTS WHEN EVALUATING DECARBONIZATION SCENARIOS?

A. PSE models four decarbonization scenarios, with customer counts declining in two scenarios and increasing in two scenarios, and with changes spread over 27 years rather than 10 years. Figure 1 below illustrates the cumulative change in customer counts for each scenario. There are two factors of note, the scenarios with declining customers experience declines from 2024 to 2044, and the average decline is 22 percent, not 60 percent.

Figure 1: Customer Changes in PSE's Decarbonization Study Scenarios

[15] Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 006; PSE Response JEA DR 002_Attach A.xlsx).
[16] Allis, Exh. NWA-1T at 33, Figure 4.



Q. WHICH DECARBONIZATION SCENARIO WAS PREFERRED BY PSE?

A. PSE currently has a preference for the hybrid heat pump scenarios, HHP and HHP + CCHP.[17] These scenarios both have positive customer growth in every year.

Q. GIVEN THE RANGE IN OUTCOMES FOR DECARBONIZATION SCENARIOS, IS IT REASONABLE TO FIND THAT POTENTIAL STRANDED COSTS ARE HIGHLY UNCERTAIN?

A. Yes. Two of the four scenarios studied have no net customer losses. In these scenarios there is no reason to expect that PSE will retire distribution assets early, or following a pattern that deviates from historical experience.

Q. IS THERE RISK IN ASSUMING THAT THE COSTLIEST DECARBONIZATION SCENARIO WILL BE ADOPTED?

A. Yes. PSE's analysis is not the least cost scenario, and has the most extreme customer decrease. Given that PSE's preferred hybrid heat pump scenarios actually anticipate increased customers over time, PSE's assumption that Northwest Natural's customers will decline by 60 percent by

[17] Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 060).

2034 will likely prove to be incorrect. If customers grow rather than decline, PSE will not experience the early retirements assumed in PSE's depreciation study. Thus the increased depreciation rates intended to recover the cost of these early retirements will be erroneous. Over-estimating retirements leads to excess depreciation rates and inequity issues.

Q. PSE ARGUES THAT THE RISK OF INACCURATE DEPRECIATION RATES ARE NOT SYMMETRICAL, AND THAT OVER-ESTIMATING DEPRECIATION RATES IS NOT AS CONCERNING AS UNDER-ESTIMATING DEPRECIATION RATES.[18] DO YOU AGREE?

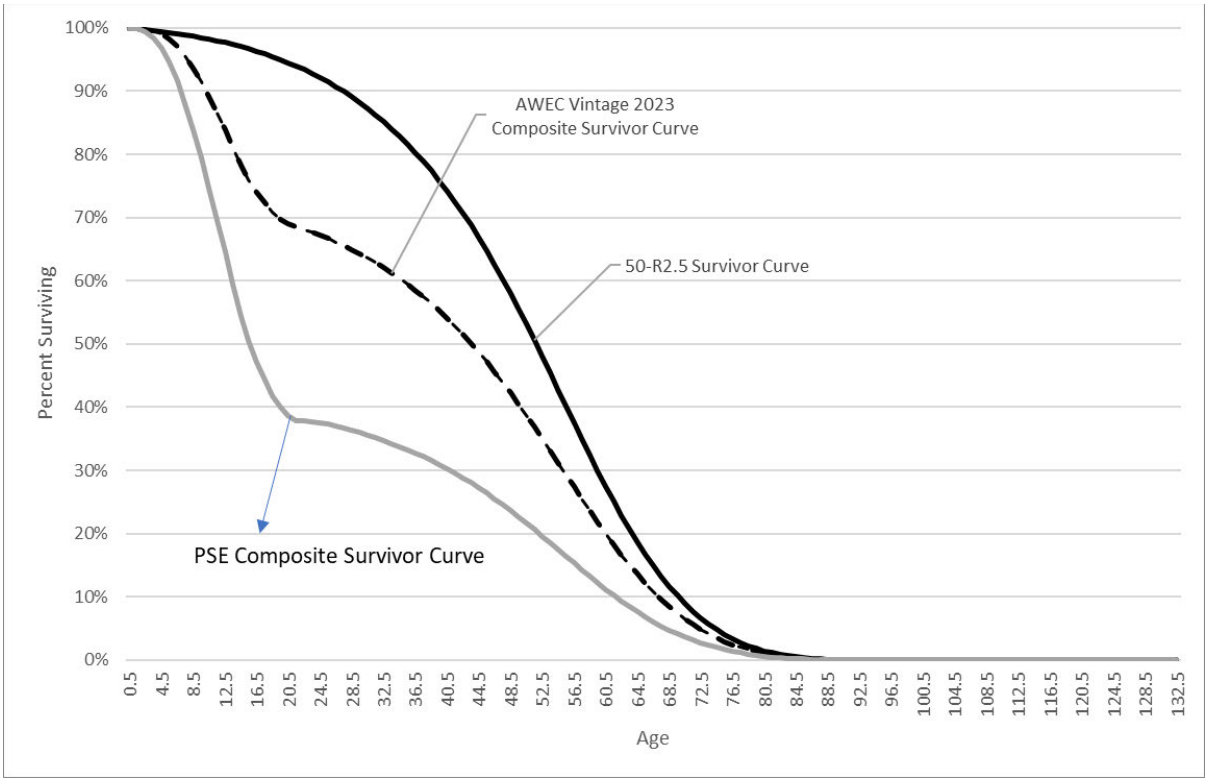
A. No. As representatives of customers, AWEC finds over-estimation of depreciation rates to be inequitable. Over-estimation of depreciation rates results in future generations paying an inequitably low share of depreciation expense. In addition, over-estimation of depreciation rates can cause residential and other small customer classes to pay an excess share of depreciation expense because depreciation is recovered during a period when these customers are allocated a larger share of depreciation expense. The Commission should establish accurate depreciation rates rather than rely on alleged asymmetry in risks.

Q. HOW DOES USING AN ACCURATE ESTIMATE OF CUSTOMERS AFFECT PSE'S ANALYSIS?

A. Figure 2 compares PSE's analysis of the impact of electrification on services with AWEC's proposal to use an average of all decarbonization scenarios.

Figure 2: AWEC Revised Composite Survivor Curve

[18] Allis, Exh. NWA-1T at 36.



When a more accurate estimate of customers is used, the average remaining life of assets is substantially higher. The table below compares the average remaining life under PSE's average life analysis, PSE's proposed retirement curves, and AWEC's average life analysis.

Table 2: Average Remaining Life Under PSE and AWEC Customer Forecast

		Average Remaining Life		
Account	Account Description	PSE Proposed[1]	PSE Customer Forecast[2]	AWEC Customer Forecast[3]
380.20	SERVICES - PLASTIC	25.7	22.9	31.4
380.30	SERVICES - WRAPPED STEEL	5.6	15.6	18.9
381.00	METERS	13	20	26.3
382.00	METER INSTALLATIONS	19.5	20.3	27.0

1) Based on PSE's proposed IOWA Curves Exh. NWA-3 Page 51
2) Based on PSE's composit survivor curves Exh. NWA-3 Page 37
3) PSE's composit survivor curve model adjusted to reflect all four decarbonization scenarios

Q. WHY DOES PSE'S PROPOSED AVERAGE REMAINING LIFE DIFFER FROM PSE'S AVERAGE REMAINING LIFE BASED ON CUSTOMER FORECAST?

A. PSE initially analyzes average remaining life by calculating a composite survivor curve using historical retirement patterns and forecasted customers.[19] However, PSE's proposed rates do not reflect these hybrid curves. Instead, PSE proposes rates based on standard IOWA curves with average service lives adjusted to reflect the average service life of the composite curves.[20] Due to differences between the shapes of the composite curves and the standard curves, this results in proposed average remaining lives for Accounts 380.30 and 381.00 that are substantially lower than the modeled average remaining life.

Q. HOW DO YOU CALCULATE THE AVERAGE REMAINING LIFE?

A. I calculate the average remaining life by modifying PSE's composite model to reflect the average customer count across all four of PSE's decarbonization scenarios. This increases the average remaining life for all accounts.

Q. WHAT IS THE IMPACT OF YOUR ADJUSTMENT?

A. PSE's proposal increases annual accruals, based on June 2023 plant balances, by $70.8 million. My primary recommendation eliminates all of this increase. Should the Commission reject my primary recommendation, my alternative recommendation is to limit changes to services and meters and to reflect all decarbonization scenarios, which reduces the increase to $13.1 million. The table below summarizes my adjustments to current depreciation rates. No depreciation rate changes should be made to accounts not listed below.

[19] Allis, Exh. NWA-3 at 36- 37.
[20] *Id.* at 37.

Table 3: AWEC Recommended Depreciation Rates

	Account	Remaining Life	Accrual Amount	Accrual Rate
380.2	SERVICES - PLASTIC	31.4	70,019,412	4.86%
380.3	SERVICES - WRAPPED STEEL	18.9	2,948,164	7.30%
381	METERS	26.3	4,220,253	3.60%
382	METER INSTALLATIONS	27.0	7,328,947	3.55%

Q. SHOULD THE ACCELERATED DEPRECIATION ASSOCIATED WITH ELECTRIFICATION BE ALLOCATED TO SCHEDULES THAT ARE EXPECTED TO ELECTRIFY?

A. Yes. PSE should allocate the cost of accelerated deprecation to the schedules that are causing this cost. This is discussed in more detail in the cost of service section of this testimony.

Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING DEPRECIATION RATES?

A. I recommend that no change be made to PSE's depreciation rates until after PSE has developed an Integrated System Plan that identifies PSE's decarbonization plan. This reduces gas depreciation expense by $77 million in Rate Year 1 and $80 million in Rate Year 2.[21] If the Commission finds that depreciation rates should be changed in the current rate case, I recommend that the rates in Table 3 be adopted and all other depreciation rates remain unchanged.

[21] Free, Exh. SEF-16.

III. DECARBONIZATION RATE ADJUSTMENT AND TARGETED ELECTRIFICATION PILOT PHASE 2

Q. WHAT COSTS DOES PSE PROPOSE TO RECOVER THROUGH THE DECARBONIZATION RATE ADJUSTMENT?

A. This rate adder would recover the costs of PSE's Targeted Electrification Pilot Phase 2, the only costs currently being proposed to be recovered from this rider, from all rate schedules.[22] Targeted Electrification Pilot Phase 2 costs include fuel switching incentives, marketing, and overhead costs.[23] As discussed in the testimony of Mr. Mullins, the Commission should reject PSE's proposal to establish a Decarbonization Rate Adjustment altogether. For this proposed tariff rider in particular, PSE's proposal to recover specific pilot program costs that benefit only a subset of its customers via a recovery mechanism where costs are allocated to all customers is not the appropriate method for cost recovery. If the Commission determines that PSE's Targeted Electrification Pilot Phase 2 should move forward, these costs should not be recovered such that only those customers that would benefit from the results of the pilot program would bear its costs.

Q. PLEASE SUMMARIZE PSE'S PROPOSAL FOR PHASE 2 OF ITS TARGETED ELECTRIFICATION PROGRAM.

A. PSE is proposing to initiate Phase 2 of its current Targeted Electrification Pilot Program, thereby expanding the scope of the pilot beyond its residential and small commercial natural gas customers. Targeted Electrification Pilot program participation is limited to customers in dual fuel areas – in other words, customers that take both natural gas and electric service from

[22] Mannetti, Exh. JM-1CT at 23:3-5.
[23] *Id.* at 22, Table 3.

PSE.[24] PSE justifies Phase 2 of its pilot as helping to achieve CCA compliance.[25] AWEC intends to address the flaws in PSE's interpretation of applicable legal obligations in briefing. However, as discussed below, PSE's allocation of costs to certain customer classes is unsupported under its own rationale and should be rejected in this case.

Q. SHOULD THE COMMISSION APPROVE PHASE 2 OF PSE'S TARGETED ELECTRIFICATION PROGRAM AT THIS TIME?

A. No. Similar to PSE's proposal for accelerating depreciation for certain accounts on its natural gas system, PSE's proposal to significantly expand its Targeted Electrification Program at this time is premature at best. First, ESHB 1589, should it remain intact, requires PSE and the Commission to consider decarbonization of PSE's natural gas system on a holistic basis with specific requirements for decarbonization measures. PSE's proposed Phase 2 does not take these requirements into account, nor does the Company speak to how this program may help inform or change its goals given the passage of ESHB 1589. Second, PSE also states that it will use the learnings from Phase 2 in an effort to decarbonize,[26] but then also states that it will file its Targeted Electrification Strategy in January 2025.[27] The timing of PSE's Targeted Electrification Strategy makes it impossible for the Company to utilize learnings from the pilot to inform its Targeted Electrification Strategy. Third, PSE's proposal in this case is not fully developed,[28] nor does it demonstrably benefit all customers who would bear its costs.[29]

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24 Kaufman, Exh. LDK-3C (PSE Response to WUTC DR 036).
25 Mannetti, Exh. JM-1CT at 21:2-10; Kaufman, Exh. LDK-3C (PSE Response to WUTC DR 31).
26 Kaufman, Exh. LDK-3C (PSE Response to WUTC DR 164).
27 Kaufman, Exh. LDK-3C (PSE Response to JEA DR 043).
28 *See e.g.* Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 024) (PSE conceding that there is no breakdown between commercial and industrial budgets); PSE Response to AEWC DR 026 (PSE conceding that it has not reached out to its industrial customer to determine whether the proposed pilot program would "make electrification economically viable."); PSE Response to AWEC DR 027 (PSE conceding that it is "unlikely that an entire industrial customer location will be electrified during this timeframe….").
29 *See e.g.* Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 025).

Finally, by PSE's own admission, its efforts in this pilot were not developed in accordance with traditional cost-effectiveness measures and will not solve cost-effectiveness challenges.[30] In sum, PSE seeks to spend $22.3 million, or possibly more,[31] for a pilot program that is not informed by ESHB 1589 requirements, does not rely on cost-effective measures, and will not inform its Targeted Electrification Strategy, among other flaws. For these reasons, the Company's proposal is at best, premature and should be rejected for purposes of this general rate case proceeding. Should the Commission decide to move forward with some or all of PSE's proposals for Phase 2, adjustments to PSE's proposed cost allocations and recovery mechanism are warranted.

Q. SHOULD SCHEDULE 87T CUSTOMERS BE ALLOCATED COSTS ASSOCIATED WITH THE TARGETED ELECTRIFICATION PILOT PHASE 2?

A. No. Most of the resources anticipated for individual electrification programs are targeted at PSE's residential customers. There is one combined Commercial and Industrial Targeted Electrification Grant Pilot that would "leverage existing energy efficiency processes to facilitate electrification of commercial and industrial customers in PSE's dual fuel territories."[32] Even so, by PSE's own admission, this pilot program does not benefit unbundled gas customers.[33] Moreover, Schedule 87T customers use gas for industrial processes that are unlikely to be capable of fuel switching.[34] Unless the Commission specifically addresses stranded costs, large transport customers will likely pick up much of the stranded costs associated with fuel switching through base rates. Allocating large transport customers the

30 Kaufman, Exh. LDK-3C (PSE Response to WUTC DR 101; WUTC DR 164).
31 Kaufman, Exh. LDK-3C (PSE Response to JEA DR 012).
32 Mannetti, Exh. JM-1CT at 20:5-7.
33 Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 025).
34 Fuel switching is primarily economical with the application of heat pump technology, which is not available for high temperature industrial processes.

direct costs of fuel switching in addition to the indirect costs is inequitable and violates the principles of matching costs and benefits in rates.

Q. DO ENERGY INTENSIVE TRADE-EXPOSED ("EITES") CUSTOMERS BENEFIT FROM THE TARGETED ELECTRIFICATION PILOT?

A. No. PSE is not responsible for the carbon emissions of its natural gas customers that are also EITEs. PSE justifies its pilot because these programs will "help reduce Climate Commitment Act compliance obligations of gas customers."[35] However, it is my understanding that PSE does not hold the compliance obligation for its customers that are also EITEs. My understanding is consistent with the Company's Schedule 111 cost recovery, in which the Company recovers net CCA compliance costs, which is not applicable to EITEs. [36] As such, EITEs should be excluded from the allocation of costs under both PSE's Targeted Electrification Pilot Phase 2 and its proposed Decarbonization Rate Adjustment.

Q. DO SCHEDULE 449 AND 459 CUSTOMERS BENEFIT FROM TARGETED ELECTRIFICATION PILOT PHASE 2?

A. No. Schedule 449 and 459 customers can only benefit if they are dual-fuel electric and gas customers and PSE has not determined that there is any benefit for these customers.[37] Further, it is my understanding that these customers already pay for CCA compliance through their respective energy providers and receive no corresponding benefit from the fuel-switching of PSE's natural gas customers to PSE electric customers.

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35 Mannetti, Exh. JM-1CT at 21:2-10; *see also* Kaufman, Exh. LDK-3C (PSE Response to WUTC DR 31).

36 PSE's Schedule 111 is accessed at https://www.pse.com/-/media/Project/PSE/Portal/Rate-documents/Gas/gas_sch_111.pdf?rev=c28ae1b97962437ba83514e3d6adb60c&sc_lang=en.

37 Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 025).

Q. WHAT IS YOUR RECOMMENDATION FOR THE ALLOCATION OF THE DECARBONIZATION RATE ADJUSTMENT?

A. Should the Commission approve PSE's Targeted Electrification Phase 2, I recommend that Schedules 87T, 449, 459, EITEs, and special contracts be excluded from allocation of these costs. This is my recommendation regardless of whether the Commission allows for cost recovery through PSE's proposed Decarbonization Rate Adjustment. Exhibit LDK-5 contains my proposed allocation.

IV. WILDFIRE PREVENTION TRACKER

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS REGARDING THE WILDFIRE PREVENTION TRACKER.

A. My primary recommendation is that PSE's proposal to establish a Wildfire Prevention Tracker be rejected, as discussed in the testimony of AWEC witness Mr. Bradley G. Mullins. PSE's proposed Wildfire Prevention Tracker is predominantly composed of two items, wildfire insurance (approximately $20 million per year)[38] and capital carrying costs ($3-8 million per year).[39] Both insurance premiums and capital spending are typical components of base rates and do not require a separate tracking mechanism. Should the Commission decline to reject PSE's proposed tracker, AWEC recommends that special contract and high voltage 46/49 customers be excluded from the allocation of these costs because these customers are already directly assigned the cost of underground (i.e. low fire risk) distribution facilities.

[38] Free, Exh. SEF-22 rows 13 and 16.
[39] *Id.* at rows 15 and 25.

Q. HOW DOES PSE ALLOCATE THE WILDFIRE PREVENTION TRACKER?

A. PSE allocates the Wildfire Prevention Tracker using the 2024 GRC Renewable Peak Credit Demand Component.[40] PSE claims that this is consistent with the cost of service methodology under WAC 480-85.[41] However, WAC 480-85 only requires the renewable peak credit be used for generation costs.

Q. WHY DO YOU RECOMMEND EXCLUDING THE SPECIAL CONTRACT AND HIGH VOLTAGE 46/49 CUSTOMERS FROM THE ALLOCATION OF WILDFIRE PREVENTION TRACKER COSTS?

A. PSE's wildfire prevention plan is primarily directed towards reducing the PSE's electric system faults that cause wildfires through electric arcs and sparks.[42] PSE's 2023 Wildfire Mitigation and Response Plan accomplishes this through undergrounding wires, installing protectors for overhead wires, and investing in fault protection facilities. The plan's capital budget includes $131 million in capital spending, with only $3 million directed to transmission investments.[43] The largest single project type is underground conversion, with 56 percent of 2025 budget allocated to undergrounding.[44] Special Contract and High Voltage 46/49 customers are only served by underground distribution facilities and directly assigned these facilities.[45] Thus, if wildfire prevention costs were included in base rates, these costs would not be allocated to Special Contract and High Voltage 46/49 customers. Excluding the Special

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40 240004-05-PSE-WP-CTM-5-COS-Model-Per-WAC-Rules-24GRC-02-2024 sheet Exh CTM-6 (141WFP) column D.
41 Mickleson, Exh. CTM-1T at 59: 19-22.
42 Murphy, Exh. RM-3.
43 *Id.* at 4.
44 *Id.*
45 Mickleson, Exh. CTM-1T at 20: 14-17 and 240004-05-PSE-WP-CTM-5-COS-Model-Per-WAC-Rules-24GRC-02-2024 sheet "GrandTotal" rows 88-112.

Contract and High Voltage 46/49 customers from the allocation of these is costs is therefore reasonable.

V. COST OF SERVICE STUDY

Q. PLEASE SUMMARIZE YOUR ADJUSTMENTS TO PSE'S COST OF SERVICE COST STUDY.

A. I recommend the following changes be made to PSE's cost of service study:

1. Directly assign distribution mains for Schedule 87 and 87T customers served by 4-inch and greater mains.
2. Allocate accelerated depreciation associated with fuel switching using customer counts.

a. Direct Assignment of Gas Mains

Q. DOES PSE CURRENTLY DIRECTLY ASSIGN GAS MAINS?

A. Yes. PSE directly assigns gas mains to Schedule 88T.[46]

Q. WHAT CUSTOMERS ARE SERVED BY SCHEDULE 88T?

A. Schedule 88T is a new distribution schedule for exclusive interruptible service.[47] Puget LNG, the only customer currently expected for service under Schedule 88T, was previously an 87T customer.[48]

Q. WHAT DISTRIBUTION MAINS SERVE THE SINGLE SCHEDULE 88T CUSTOMER, PUGET LNG?

A. Puget LNG is served by Golden Givens Limiting Station and North Tacoma Gate Station. The figure below illustrates the mains serving Puget LNG.

[redacted]

46 Kaufman, Exh. LDK-3C (PSE Response to NUCOR DR 001).
47 Taylor, Exh. JDT-1T at 16:18.
48 *Id.* at 4: 21-23.

[redacted]

Q. ARE THE DISTRIBUTION MAINS SERVING PUGET LNG SIMILAR TO THE MAINS SERVING OTHER CUSTOMERS ON SCHEDULE 87/87T?

A. Yes. The distribution for all customers served under Schedule 87/87T by 4 inch or greater mains are included in Exhibit LDK 3. The figure below illustrates the mains serving one of these customers.

[redacted]

[redacted]

Schedule 88T and Schedule 87/87T customers have several unique features that make general allocation factors poor representations of the share of PSE's distribution system serving these schedules. These unique features include the following:

- Served by large diameter mains;
- Direct path connecting customer to limit or gate station;
- Few customers on the schedule; and
- PSE's general allocator used for distribution mains is the peak and average allocator. This allocator grossly overestimates the share of facilities serving these schedules because it

allocates small diameter mains, which do not serve large customers, and because it fails to account for the economies of scale associated with serving large customers.

Q. GIVEN THE SIMILARITIES BETWEEN SCHEDULES 87/87T AND SCHEDULE 88T, IS IT REASONABLE TO DIRECTLY ASSIGN MAINS TO THESE SCHEDULES?

A. Yes. Like Schedule 88T, Schedule 87/87T distribution costs are not well represented by general allocators, and it is practical to directly allocate the cost of mains serving these customers.

Q. HOW DO YOU RECOMMEND TREATING SCHEDULE 87/87T COSTS IN THE COST OF SERVICE STUDY?

A. I recommend directly assigning costs for customers served by 4-inch and greater mains. I recommend continuing to allocate costs for customers served by smaller than 4-inch mains.

Q. HOW DO YOU MEASURE THE DIRECT COSTS OF SERVING SCHEDULE 87/87T CUSTOMERS?

A. I calculate the feet of pipe 4", 6", and 8" pipe serving each customer and multiply the installed replacement cost per foot of pipe. I assign a share of pipe over 8-inches by multiplying the system replacement cost for each pipe size by the peak and average allocator for these customers. The table below identifies the feet of 8-inch and under pipe serving these customers:

[redacted]

[redacted]

The table below identifies the replacement cost of directly assigned pipe for Schedule 87/87T.

[redacted]

[redacted]

Q. DOES THE COST OF SERVICE STUDY ASSIGN REPLACEMENT COST TO CUSTOMER CLASSES?

A. No. The cost of service study assigns embedded cost rather than replacement cost. I calculate directly assigned embedded cost for Schedule 87/87T by multiplying PSE's gross distribution plant balance by the ratio of directly assigned replacement cost to system replacement cost, as illustrated in the table below.

[redacted]

Q. HOW DOES YOUR METHOD OF DIRECTLY ASSIGNING COSTS COMPARE TO THE METHOD USED BY PSE?

A. My method of calculating replacement cost per foot is consistent with PSE's method. My method of first calculating replacement cost, then adjusting proportionately to embedded cost is also consistent with PSE's method. However, my method assigns a greater share of the direct path distribution main than PSE's method. This is because PSE only assigns a portion of 1 mile of distribution main, while I assign a portion of all larger distribution mains and 100 percent of distribution mains from 4- to 8-inches. The method used by PSE appears to limit direct assignment to assignment of distribution upgrades. It appears that the majority of distribution pipe serving Schedule 88T customers pre-existed the customer, and that pre-existing pipe was not included in the distribution mains directly assigned to Schedule 88T.

Q. HOW ARE COSTS DIRECTLY ASSIGNED TO SCHEDULE 87/87T INCORPORATED INTO THE COST OF SERVICE STUDY?

A. I replicate PSE's method of implementing direct assignment for Schedule 88T and the special contract. I add directly assigned plant and accumulated depreciation to the direct assigned mains plant and accumulated depreciation and remove this amount from the balance of mains plant and accumulated depreciation (rows 72, 73, 180, and 181 of Inputs Account.) I also update the DIR_MAINS allocator to include Schedule 87/87T directly assigned plant and I

remove volumes of Schedule 87/87T customers served by 4-inches and over from the MAINS allocator.[49]

Q. IF THE COMMISSION DOES NOT APPROVE DIRECT ASSIGNMENT OF SCHEDULE 87/87T, DO YOU HAVE AN ALTERNATE RECOMMENDATION?

A. Yes. Given the similarity between Schedule 88T and 87/87T, these schedules should have similar treatment in the COSS. If the Commission declines to directly assign mains to 87/87T, the Commission should not approve direct assignment of mains to Schedule 88T.

Q. WHAT IS THE IMPACT OF YOUR RECOMMENDATION?

A. A common measure of cost of service results is the parity ratio. A parity ratio of 1 indicates that a rate schedule is paying the same proportion of cost of service as the system average. Schedules with parity ratio above one are paying a relatively large share of their cost of service, while schedules with parity ratio below one are paying a relatively low share of their cost of service. My recommendation increases Schedule 87/87T's parity ratio from 0.57 to 1.47.

b. Fuel Switching Stranded Costs

Q. HOW IS PSE PROPOSING TO RECOVER THE STRANDED COSTS ASSOCIATED WITH FUEL SWITCHING?

A. PSE is proposing to recover these costs by accelerating depreciation for distribution accounts by 10 years, and recovering the accelerated depreciation expense in the same manner as base depreciation expense.

[49] 240004-05-PSE-WP-JDT-4-GCOS-EXT-ALLOC-24GRC-02-2024.xlsx sheet EXTERNAL, rows 69 and 78.

Q. HOW DO YOU RECOMMEND THESE COSTS BE RECOVERED?

A. I recommend these costs be functionalized to distribution, classified as customer, and allocated using the CUST allocation factor. PSE has estimated stranded costs based on the number of customers switching from gas to electric service. Because customer count is the driving factor underlying PSE's analysis, customer count provides a reasonable measure for allocating these costs. An alternate measure could be the peak and average allocator weighted by the number of fuel switching customers in each schedule. However, PSE has not provided an estimate of the number of customers expected to switch fuels by schedule.

Q. IS YOUR RECOMMENDED TREATMENT OF FUEL SWITCHING STRANDED COSTS CONSISTENT WITH THE COST OF SERVICE RULES SET IN WAC 480-85?

A. No. Stranded costs are primarily distribution plant accounts which, under WAC 480-85, are to be directly assigned or allocated based on design day (peak) and annual throughput (average) based on system load factor. Direct assignment is AWEC's preferred method of treating these costs, however direct assignment can only be conducted after the fact, and if accelerated depreciation is being recovered in this case, it is being recovered in advance of fuel switching activity. Allocation based on peak and average use is not equitable because this method does not reflect the cost drivers for stranded costs. AWEC therefore requests an exemption from WAC 480-85, as permitted under WAC 480-85-070, which will be further addressed further in its briefing in this case.

Q. WHAT IS THE IMPACT OF YOUR RECOMMENDATION?

A. The table below compares the parity ratio under PSE's model, after adjusting to reflect direct assignment of mains, and the cumulative impact of both direct assignment of mains and allocation of fuel switching costs using customer count.

Table 7: Parity Ratio at Present Rates Under Proposed COSS

	Residential (16,23,53)	Comm. & Indus. (31,31T)	Large Volume (41,41T)	Interruptible (85, 85T)	Limited Interruptible (86, 86T)	Non-Exclusive Interruptible (87, 87T)	Exclusive Interruptible (88T)	Contracts	Total
PSE Model	1.10	0.81	0.94	0.85	1.31	0.57	1.15	2.26	1.00
Direct Assignment to 87/87T	1.09	0.81	0.93	0.83	1.29	1.47	1.15	2.26	1.00
Customer Allocation of Fuel Switching	1.08	0.82	0.95	0.85	1.31	1.49	1.17	2.30	1.00

Q. WHAT MEASURE DID YOU USE FOR THE COST OF FUEL SWITCHING?

A. I used the alternate proposed incremental depreciation expense described in my testimony on depreciation above of $13 million.[50] This amount should be replaced by the Commission's determination on the appropriate level of accelerated depreciation. For example, if my primary depreciation recommendation of no accelerated depreciation expense is adopted, no change is necessary. If PSE's recommendation of $71 million is adopted, $71 million in depreciation expense should be assigned using the CUST allocator.

VI. RATE SPREAD

Q. WHAT STANDARD DO YOU RECOMMEND APPLYING FOR RATE SPREAD?

A. I recommend adopting Staff's recent practice of characterizing deviations from rate parity of less than 0.05 as within the margin of error, more than 0.1 as unreasonable, more than 0.2 as excessive, and deviations more than 0.3 as grossly excessive.[51] Schedules with grossly excessive deviations should be given 25 percent or 200 percent of average rate change, as necessary to move towards rate parity.[52] Schedules with excessive deviations should be given 50 percent or 150 percent of average rate change as needed to move towards parity. Schedules

[50] My alternate recommendation is used for illustrative purposes because my primary recommendation of zero accelerated depreciation has no impact on allocations, and renders the illustration moot.

[51] Docket Nos. UE-200900, UG-200901, and UE-200894 (*consolidated)* Jordan, Exh. ELJ-1T at 10, Table 1.

[52] For example, under a rate increase and a parity ratio above one, a lower than average increase is necessary to move towards parity. Under a rate decrease and a parity ratio above one, a higher than average decrease is necessary to move towards parity.

with unreasonable parity ratios should be given 75 percent or 125 percent of average rate change as needed to move towards parity.

Q. WHAT RATE SPREAD DO YOU PROPOSE FOR ELECTRIC AND GAS SERVICE?

A. PSE's proposed electric rate spread is sufficiently close to my recommended standard that I make no alternate proposal for electric rate spread. My recommended gas rate spread is summarized below.

Table 8: Recommended Gas Rate Change as Percent of Average

	AWEC COSS	Rate Spread
Residential (16,23,53)	1.08	100%
Comm. & Indus. (31,31T)	0.82	125%
Large Volume (41,41T)	0.95	100%
Interruptible (85, 85T)	0.85	125%
Limited Interruptible (86, 86T)	1.31	25%
Non-Exclusive Interruptible (87, 87T)	1.49	25%
Exclusive Interruptible (88T)	1.17	75%
Contracts	2.30	N/A
Total	1.00	100%

Q. HOW SHOULD REVENUE DIFFERENCES RESULTING FROM INSUFFICIENT OR EXCESS TOTAL REVENUE UNDER YOUR PROPOSED GAS RATE SPREAD BE TREATED?

A. If my rate spread results in excess or insufficient revenue, I recommend the difference be reallocated across all schedules except special contracts proportionally to the initial allocation. This replicates PSE's methodology with the exception that Schedule 88T is included in any reallocation.

Q. DO YOU HAVE ANY SPECIFIC CONCERNS WITH PSE'S PROPOSED GAS RATE SPREAD?

A. Yes. PSE's proposed rate spread is to set Schedule 88T equal to rate parity. I have two concerns with PSE's proposal. First, PSE fails to implement the proposal in a fair manner, and

as a result sets Schedule 88T rates substantially lower than rate parity. Second, PSE is proposing preferential treatment for its affiliate company Puget LNG. The ultimate impact of PSE's proposal is a 73 percent decrease in rates for Schedule 88T while all other schedules experience a 34 to 84 percent increase in rates.[53] PSE's own cost of service study shows that Schedule 88T is relatively close to rate parity, with a parity ratio of 1.15.

Q. PLEASE EXPLAIN THE UNFAIR IMPLEMENTATION OF SETTING SCHEDULE 88T TO PARITY.

A. PSE sets rates to parity by setting Schedule 88T Rate Year 1 and Rate Year 2 revenue equal to the Schedule 88T cost of service in PSE's Cost of Service Study ("COSS"). There are two critical errors in this approach. First, PSE's COSS does not reflect the total revenue requirement in Rate Year 1 or Rate Year 2. The second issue is that the COSS uses total therms for Schedule 88T that are less than half the forecasted Schedule 88T therms in Rate Year 1 and Rate Year 2. The table below illustrates total cost of service, Schedule 88T rate spread, and Schedule 88T therms in the COSS, Rate Year 1, and Rate Year 2. PSE effectively assumes Schedule 88T costs are fixed at 2023 levels regardless of rate year cost increases or Schedule 88T volume increases.

[redacted]

[53] *See* 240004-05-PSE-WP-JDT-5-GAS-RATE-SPREAD-DESIGN-24GRC-02-2024 sheet Exh JDT-5 (Rate Des Sum) columns E and G.

Q. HOW COULD PSE'S PROPOSED PARITY RATE BE IMPLEMENTED FAIRLY?

A. A more fair approach is to assume that Schedule 88T costs grow with the revenue (given inflation, this is fair) and that they grow with therms (given therms are an allocation factor and an input into compound factors, this is also fair). The table below illustrates Schedule 88T parity revenue requirement under this approach.

[redacted]

Q. CAN YOU EXPLAIN YOUR SECOND CONCERN THAT SCHEDULE 88T IS RECEIVING PREFERENTIAL TREATMENT?

A. PSE is proposing atypical and preferential treatment for its affiliate, Puget LNG. This preferential treatment leads to a 73 percent rate decrease for PSE's affiliate while all other schedules are experiencing rate increases, even schedules with larger parity ratios than PSE. The specific preferential actions PSE has taken are:

1. Isolate Puget LNG into a standalone rate class, Schedule 88T,
2. Exclude Schedule 88T from allocation of mains that serve Schedule 88T,[54]
3. Move the stand-alone rate class to parity despite cost of service results in line with many other rate schedules,[55] and

[54] Recall from the prior testimony that PSE does not appear to directly assign preexisting mains to Schedule 88T.

[55] Under PSE's COSS, Schedule 88T is 0.15 from rate parity, similar to residential (0.10), commercial and industrial (0.19), and interruptible (0.15).

4. Implement parity rates in a manner that moves rates below parity while the Company's overall revenue requirement is growing.

Q. HOW CAN PSE'S PREFERENTIAL TREATMENT OF SCHEDULE 88T BE ADDRESSED?

A. Preferential treatment can be resolved by directly assigning mains to Schedule 87/87T in the manner described in my cost of service testimony and by spreading rates to Schedule 88T consistently with other rate schedules with similar rate parity to Schedule 88T.

Q. PLEASE SUMMARIZE YOUR RATE SPREAD RECOMMENDATIONS.

A. I recommend the commission adopt the rate spread presented in Table 8 for gas customers. If my rate spread is not adopted I recommend changing Schedule 88T rates by the same percentage applied to other schedules within 10 to 20 percent of rate parity.

VII. NATURAL GAS RATE DESIGN

Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS REGARDING GAS RATE DESIGN.

A. I make two rate design recommendations for Schedule 87/87T:

1. Add the storage commodity costs from the COSS to the procurement charge for Schedule 87.
2. Escalate the procurement charge for Schedule 87 proportionally to base rate increases in Rate Year 1 and Rate Year 2.

Q. WHY DO YOU RECOMMEND ESCALATING THE PROCUREMENT CHARGE FOR RATE YEAR 1 AND RATE YEAR 2?

A. The procurement charge proposed by PSE reflects 2023 costs. If the procurement charge is not increased to reflect the cost increases to Rate Year 1 and Rate Year 2, the procurement charge will under-recover sales costs and shift costs from bundled customers to transport customers.

VIII. COST OF CAPITAL

Q. WHAT IS YOUR RECOMMENDED COST OF CAPITAL?

A. My recommended cost of capital is presented in the table below.

Table 11: AWEC Cost of Capital

Rate Year 1			
Component	% of Total	Cost %	Weighted Ave Cost %
Short-Term Debt	1.81%	5.07%	0.092%
Long-Term Debt	49.19%	5.27%	2.592%
Common Stock Equity	49.00%	9.20%	4.508%
	100.00%		7.192%
Rate Year 2			
Component	% of Total	Cost %	Weighted Ave Cost %
Short-Term Debt	1.81%	4.08%	0.074%
Long-Term Debt	49.19%	5.36%	2.637%
Common Stock Equity	49.00%	9.20%	4.508%
	100.00%		7.218%

Q. WHAT COST OF EQUITY DOES PSE REQUEST?

A. PSE requests an authorized return on equity of 9.95 percent in Rate Year 1 and 10.5 in Rate Year 2.[56]

Q. WHAT COST OF EQUITY DO YOU RECOMMEND?

A. I recommend a cost of equity of 9.20 percent in both rate years.

Q. WHAT IS THE BASIS FOR YOUR RECOMMENDATION?

A. My recommendation is based on analysis of market data, surveys of institutional investors, consideration of both non-diversifiable risk and PSE specific risk, financial models designed to

[56] Peterman, Exh. CGP-1CT at 10-11.

assess the return expect by investors for investments comparable to PSE, and the adequacy of resulting returns to maintain credit and attract capital on reasonable terms.

Q. DO YOUR RECOMMENDATIONS RESULT IN FAIR AND REASONABLE RATES?

A. Yes, the basis for my recommendations meets commonly accepted standards for fair and reasonable rates. I agree with the Company's witnesses that the *Hope*[57] and *Bluefield*[58] cases identify appropriate guidance for fair and reasonable rates, and that this guidance is that:

- The return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks;
- The return should be reasonably sufficient to assure confidence in the financial soundness of the utility; and
- The return should be adequate, under efficient and economical management, for the utility to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.

Q. HOW DO YOU APPLY THESE STANDARDS?

A. I apply these standards by considering the return investors expect from comparably situated utilities, considering whether such utilities, when prudently managed, maintain investment grade credit ratings, and whether such utilities are capable of attracting capital.

Q. DO THE FIRMS IN PSE'S PROXY GROUP CONSTITUTE COMPARABLY SITUATED UTILITIES?

A. Yes. The firms in the proxy group operate in the same industry and country as PSE, operate under comparable regulatory frameworks, and face comparable risks.

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57 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).
58 *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923).

Q. CAN ANALYSIS OF PSE'S PROXY GROUP IDENTIFY THE RETURN EXPECTED BY INVESTORS FOR INVESTMENTS OF COMPERABLE RISK?

A. Yes. The Discounted Cash Flow ("DCF") and Capital Asset Pricing Model ("CAPM") models are generally accepted models that measure the return expected by investors. Applying these models to a comparable proxy group of companies results in estimates of the return expected by investors from comparable investments. These models are based on market data and investor forecasts. Thus, the model results estimate the investment returns that investors expect. These models are forward looking. The inputs that I use reflect investor expectations about the future rather than the past, including expected interest rates, inflation rates, stock market performance, and utility industry performance. The "Risk Premium" and "Expected Earnings" models presented by PSE[59] do not measure the return expected by investors and do not satisfy the *Hope* and *Bluefield* standards.

Q. SHOULD SHORT-TERM FORECASTS FOR MARKET PERFORMANCE GUIDE THE AUTHORIZED ROE?

A. No, I do not recommend basing the ROE on short-term predictions about market performance. The actual performance of equity investments varies greatly from year to year and attempts to forecast short-term performance are highly speculative. Historically, equities have had a wide range of returns, with the overall market returns from negative 40 percent annual returns to positive 50 percent annual returns. During recessions, some investors may expect the stock market to have negative returns. But it would be unwise to authorize a negative cost of equity in such situations. Similarly, economically stimulating events such corporate tax cuts or COVID cash stimulus will cause expected market returns to be abnormally high, however such

[59] Bulkely, Exh. AEB-1T at 6.

situations do not warrant abnormally high authorized ROEs. The investment institution Morgan Stanley forecasted 2024 equity returns of only 4 percent.[60] I do not use Morgan Stanley's forecast in my analysis because it reflects what a single investment institution forecasts for 2024, not the return that investors expect on average over multiple years.

Q. HOW DO INVESTORS EXPECT THE U.S. STOCK MARKET TO PERFORM?

A. Investors expect future performance of the U.S. stock market to fall short of historic returns. Investors have consistently had this expectation over the last 20 years, despite recent years where the stock market or utility equities have over or under performed.[61]

Q. HOW DOES THE *HOPE* AND *BLUEFIELD* STANDARD THAT THE AUTHORIZED ROE CONTROLS WHETHER RATES ARE FAIR AND REASONABLE, NOT THE METHODOLOGY, INFORM THE PRESENT DISCUSSION?

A. One of the *Hope* and *Bluefield* standards is that it is the authorized ROE that controls whether rates are fair and reasonable, not the methodology used to establish the ROE. This means that the Commission should consider not only appropriateness of the method that parties used to arrive at an ROE, but also the reasonableness of the recommended ROE itself independent of method. Cost of capital witness opinions differ with respect to which models are relevant, and what inputs to use for these models. The length and complexity of cost of capital testimony can make judging and evaluating the fairness of methodology difficult. In this testimony, I attempt to simplify the discrepancies between me and the Company by focusing on the five main differences between my models and the Company's.[62] These main differences identify

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60 Lisa Shalett. *2024 U.S. Stock Market Outlook: A Time for Balance* (2024); https://www.morganstanley.com/ideas/us-stock-market-outlook-2024.

61 Laurence B. Siegel and Paul McCaffrey Editors (2023) Revisiting the Equity Risk Premium *CFA Institute Research Foundation.* Pages vi to ix.

62 These differences are described in detail below.

important methodological differences between myself and the Company. I believe my methodology more reliably identifies investor expectations.

However, the Commission can also sidestep methodological disputes and consider the reasonableness of the proposed ROE. Cost of capital models are simply mathematical approaches to estimating the returns expected by investors for investments of comparable risk. In addition to considering the merits of my proposed model changes, the Commission can directly compare each party's recommended ROE with the consensus cost of capital broadly reported on by institutional investors.

Q. DOES YOUR RECOMMENDATION MEET INVESTOR RETURN EXPECTATIONS?

A. Yes. My recommendation results in returns that are somewhat higher than investor expectations. However, my recommendation is closer to investor expectations than the Company's proposal. JP Morgan's 2024 forecasted return for US large cap equity returns is 7.0 percent.[63] Goldman Sachs forecasts a 2024 total return on the S&P 500 of 6 percent.[64] Morgan Stanley forecasts 2024 equity returns of 4 percent.[65] Charles Schwab forecasts the total returns for U.S. large and small company stocks to be 6.2 and 6.3 percent on average over the next ten years.[66] These forecasts are well below the 10.5 percent average historic returns for U.S. stocks. While actual returns may be higher or lower than investor expectations, large investment institutions expect equity returns between 5 and 7 percent over both the short-term

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63 2024 Long-Term Capital Market Assumptions, page 12 exhibit 7, https://am.jpmorgan.com/content/dam/jpm-am-aem/global/en/insights/portfolio-insights/ltcma/noindex/ltcma-full-report.pdf.

64 David J. Kostin, et. al. *2024 US Equity Outlook*: *All You Had to Do Was Stay*, at 1, https://www.goldmansachs.com/intelligence/pages/gs-research/2024-us-equity-outlook-all-you-had-to-do-was-stay/report.pdf

65 Lisa Shalett. *2024 U.S. Stock Market Outlook: A Time for Balance* (2024); https://www.morganstanley.com/ideas/us-stock-market-outlook-2024.

66 Emre Erdogan & Seth McMoore, Schwab's 2024 Long-Term Capital Market Expectations Schwab (2024), https://www.schwab.com/learn/story/schwabs-long-term-capital-market-expectations.

and the long-term. The Commission can evaluate proposed ROEs outside of methodological disputes by comparing recommended ROEs with investor expectations about overall market returns.

Both the Company's 9.75 percent ROE and my ROE of 9.25 percent are well above the short and long-term returns expected for US stocks. Our ROE results greatly exceed expectations for market returns because we use highly conservative assumptions.[67]

Even if the Commission is not persuaded by my methodological arguments, the Commission should accept my recommended ROE because it is closer to investor expectations about equity market returns.

Q. HOW CAN THE COMMISSION JUDGE WHETHER RETURNS ARE SUFFICIENT TO ATTRACT CAPITAL ON REASONABLE TERMS?

A. Capital is typically attracted by issuing stock and bonds. A reasonable term for attracting equity is that stock is issued at prices equal to or greater than book value. This means that every dollar of equity invested in a company's assets is worth at least one dollar to investors. When this occurs, equity investors are paying a premium on equity already invested in the company. This premium ensures that the equity investment of existing shareholders is not diluted when attracting capital, thus terms are reasonable. The proxy utilities' stocks are currently priced above book value, indicating that the proxy companies attract capital on reasonable terms. A reasonable term for issuing debt is that debt is issued at interest rates that reflect investment grade credit. All of the proxy utilities have investment grade credit.

[67] For example, we both use market risk premiums and GDP growth forecasts that exceed consensus estimates, and we both report ECAPM model results without validating that the ECAPM parameters are currently applicable to utilities.

Q. CAN RETURNS BE SUFFICIENT TO ATTRACT CAPITAL ON REASONABLE TERMS WITHOUT PROVIDING A RETURN THAT MEETS INVESTOR EXPECTATIONS?

A. No. Investors will only pay a premium over the book value of equity if the return authorized for the book value meets or exceeds investor expectations.

Q. WHAT ARE THE DIFFERENCES BETWEEN YOUR COST OF EQUITY MODELS AND THOSE OF THE COMPANY?

A. I adopt the Company's work papers, proxy group, stock prices, growth forecasts, and interest rates. This greatly reduces the differences in our analysis and allows the Commission to focus on a few key assumptions.[68]

There are five fundamental factors that differ between my analysis and the Company's. First, I add a three stage discounted cash flow model to reflect a transition from short-term growth rates to long-term growth rates.

Second, in the constant growth DCF model I use a constant growth rate that reflects the average growth over the DCF forecast horizon, while the Company assumes that short-term growth expectations continue indefinitely.

Third, I use stock betas that have high predictive value. These betas have two key differences from the Company: 1) I do not use Value Line betas, which are temporarily at abnormal levels due to the COVID stock volatility, and 2) I adjust beta estimates to the industry average rather than the market average. The Company assumes that betas revert to 1 over time. While this assumption may be valid for the market in general, the Company offers

[68] A secondary reason for not updating inputs to current dates is that several key inputs such as Value Line estimates are not publicly available, and it is not appropriate to update public inputs such as stock prices without also updating growth forecasts.

no evidence that utility betas trend towards 1 over time, nor that investors use adjusted betas when evaluating investment in utility stocks.

Fourth, I use a market risk premium that reflects consensus expectations by investors and researchers. The Company uses an ad-hoc dividend discount model that incorrectly assumes short-term growth continues indefinitely and applies arbitrary and biased exclusions to inputs. The Company's market risk premiums exceed consensus estimates and do not reflect investor expectations.[69]

Fifth, I do not adopt a risk premium or expected earnings model. The risk premium model is a circular model, divorced from both market data and financial theory. In addition to these theoretical failures, the regression used in the Company's model is statistically unsound and leads to unreliable conclusions regarding both parameter estimates and statistical significance.

a. <u>Three-Stage Discounted Cash Flow</u>

Q. IS THE SINGLE STAGE DISCOUNTED CASH FLOW MODEL PRESENTED BY PSE THE MOST ACCURATE DCF MODEL?

A. No, the single stage discounted cash flow model is a simplified model that assumes constant growth rates. A more accurate approach is to model time-varying growth rates using the three stage discounted cash flow model.[70]

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69 Some equity risk premium surveys have outlier responses consistent with the company, however outlier responses do not reflect average investor expectations.

70 "Two main types of models are used to implement the DCF method as it is applied to estimating cost of equity capital. The first, and most popular, is the single-stage model. The second, and most accurate (in most instances), is the multi-stage model." Pratt, S. P., Grabowski, R. J. (2010). Cost of Capital: Applications and Examples. United Kingdom: Wiley. Page 359

Q. HAS PSE'S WITNESS ANN BULKLEY PREVIOUSLY SUPPORTED THE USE OF A MULTI-STAGE DCF MODEL?

A. Yes, in PacifiCorp's most recent Oregon general rate case Ms. Bulkley submitted cost of equity testimony relying on a multi-stage DCF model.[71] Ms. Bulkley found that "the multi-stage DCF model is one of the methods considered by 4 investors and regulators…."[72]

Q. HOW DO YOU IMPLEMENT THE THREE STAGE DISCOUNTED CASH FLOW MODEL?

A. I the multi-stage DCF using mean analyst short-term earnings growth forecasts from Value Line, Yahoo! Finance, and Zachs for years 1-5, PSE's real GDP growth rate forecast[73] combined with the US CBO forecast for long-term inflation for years 25 and later, and a linear transition from the initial growth rate and terminal growth rate.

Q. WHAT ARE THE RESULTS OF THE MULTI-STAGE DCF MODEL?

A. The Multi-Stage DCF estimates range from 8.96 percent to 9.24 percent.

b. <u>Long Run Constant Growth Rate</u>

Q. WHAT GROWTH RATE IS NEEDED FOR THE CONSTANT GROWTH DISCOUNTED CASH FLOW MODEL?

A. The constant growth DCF, also referred to as single stage DCF, requires investor expected growth rate over a long time horizon. This is because the model assumes that dividends grow at a constant rate indefinitely. However, rather than use an estimate of the long run dividend growth rate, the Company assumes that short-term growth forecasts persist indefinitely.[74] The correct application of the constant growth rate DCF model is to use a growth rate that reflects average growth, not short-term growth.

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71 Public Utility Commission of Oregon, Docket No. UE 433 Exhibit PAC/400 Bulkley/40 Figure 9.
72 *Id.* at 38:3-4.
73 Kaufman, Exh. LDK-3C (PSE Response to AWEC DR 069).
74 Bulkley, Exh. AEB-1T at 39:4-8.

"An important characteristic of the growth rate in the Gordon Growth Model is that it is the perpetual annual growth rate. Future growth rates do not have to be the same for every year; however, the average rate should be equal to this perpetual rate. For example, if a company is expected to grow at 10% per year for the next four years and 3% per year thereafter, then the average growth rate into perpetuity could be estimated as about 5%....It is theoretically impossible for the sustainable perpetual growth rate for a company to significantly exceed the growth rate in the economy."[75]

Q. WHAT GROWTH RATE DO YOU RECOMMEND FOR THE CONSTANT DCF MODEL?

A. I recommend that the average growth rate across all three stages of my DCF model be used in the constant growth DCF model. This appropriately balances short-term and long-term expectations.

c. <u>Beta Estimation</u>

Q. WHAT IS BETA?

A. Beta is a measure of the correlation between an investment's return and the overall market return.[76] A beta less than one typically indicates that the investment is lower risk and that investors expect a return lower than the market.

Q. HOW DO YOUR BETA ESTIMATES DIFFER FROM PSE'S?

A. I make the following two changes to PSE's proposed betas:

[75] Grabowski and Pratt (2014) Cost of Capital Applications and Examples, Fifth Edition John Wiley & Sons, Inc., Hoboken, New Jersey Page 461.

[76] Technically the correlation is between excess returns or return minus risk free rate.

1. I exclude Value Line betas, which are temporarily over-estimated due to COVID market anomalies.
2. I adjust Bloomberg raw beta estimates towards the industry average rather than towards the market average, as recommended by peer reviewed research.[77]

I make these changes because without these adjustments the betas used by PSE are systematically biased.

Q. HOW ARE PSE'S ESTIMATES OF BETA BIASED?

A. PSE uses Value Line betas. These betas are overly influenced by anomalous COVID stock market behavior and have been adjusted closer to 1 using the Blume adjustment. I show in this testimony that a small number of abnormal weeks following the spread of COVID drive Value Line betas to be higher than other published betas for utility stocks. In addition, the Blume adjustment results in forecasts that are consistently higher than actual betas. The Blume adjustment assumes that betas trend towards 1 over time. This assumption is incorrect for utility stocks. As I show later in this testimony, Value Line betas have forecast bias in both the near term and the long-term. Raw betas and betas adjusted to the industry average are substantially less biased.

Q. WHY ARE VALUE LINE BETAS CURRENTLY INCONSISTENT WITH OTHER BETA SOURCES?

A. The Value Line betas are not consistent with other published betas, which show utility betas to be well below 1.[78] I investigated the source of this difference and determined that it is due to a

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[77] *Investments*, 2d ed., Prentice-Hall, Inc., Englewood Cliffs, 1981, at 344. As quoted in OPUC Docket Nos. UT 125/UT 80, Order No. 00-191 at ¶ 3, 2000 Ore. PUC LEXIS 401 at *67-*68 (Apr. 14, 2000). Michelfelder, R. A., & Theodossiou, P. (2013). Public utility beta adjustment and biased costs of capital in public utility rate proceedings. *The Electricity Journal*, 26(9), 60-68.

[78] For example, Bloomberg, Yahoo, and Zachs report betas for Portland General Electric that are 0.69, 0.59, 0.58. These are substantially lower than Value Line's current beta for Portland General Electric of 0.9.

Value Line's unique combination of short return intervals (weeks rather than months) and a historic period that is just long enough to capture COVID impacts but not long enough to reflect long-term behavior. This is because COVID caused anomalous stock behavior that has an outsized impact on Value Line's beta estimates.

Beta is typically estimated using a statistical tool called Ordinary Least Squares ("OLS") regression. The OLS regression selects parameters (in this case beta) that minimize the squared error of the model. This means that outliers have an abnormally large impact on the results of an OLS regression. The recent Value Line beta estimates for utility stocks estimate betas near or above 1 because of a small number of anomalous weeks where the absolute value of weekly returns ranged from 12 to 17 percent.[79]

Q. HOW DID YOU DETERMINE THAT VALUE LINE'S ABNORMAL BETAS ARE CAUSED BY COVID?

A. I first tested the Value Line betas sensitivity to outliers using a standard method of excluding data more than 3 standard deviations from the mean. The table below identifies the excluded dates and the annualized equity risk premium on those dates.[80]

[79] These are total weekly returns. When compounded over 52 weeks the annualized returns exceed 35000 percent. Five of 260 weeks in the 5 year period used by Value Line were above my threshold level of 3 standard deviations.

[80] The weekly equity risk premium is the difference between total composite return for the New York Stock Exchange and the 30 year US Treasury Yield (sourced from Yahoo Finance using the tickers ^NYA and ^TYX.) The weekly return is annualized by compounding over 52 weeks.

Table 12: Outlier Market Returns

Date	Weekly Return	Annualized Return
3/13/2020	-12%	-99.88%
3/27/2020	-13%	-99.93%
4/3/2020	-17%	-99.99%
4/9/2020	11%	21825%
4/24/2020	12%	35587%

The average raw betas for the proxy group after excluding outliers was 0.67, compared to raw betas of 0.92 prior to the exclusion. I observed that all outlying events occurred within two months of the first U.S. COVID deaths.

Q. WHAT ALTERNATE BETA ESTIMATION METHODS ARE AVAILABLE TO REDUCE THE IMPACT OF COVID ON BETA ESTIMATES?

A. I considered four options:

1. Exclude weeks with returns more than 3 standard deviations from the mean.
2. Exclude data from February 2020 through April 2020.
3. Use monthly rather than weekly returns.
4. Use 4 years of data rather than 5 years of data.

I estimated beta using all four methods. The results of this analysis are presented below. All four methods have similar beta estimates, with the average ranging from 0.63 to 0.67

Table 13: Alternative Raw Beta Estimates

Ticker	VL Raw Beta	4 Years	No Covid Months	Monthly Returns	No Outliers
AEE	0.78	0.58	0.56	0.46	0.59
AEP	0.80	0.55	0.50	0.53	0.54
ALE	0.96	0.81	0.84	0.78	0.85
AVA	0.83	0.67	0.64	0.49	0.64
BKH	1.11	0.84	0.81	0.69	0.83
CMS	0.78	0.55	0.50	0.41	0.52
CNP	1.23	0.76	0.80	1.01	0.85
DTE	0.94	0.64	0.62	0.68	0.65
DUK	0.79	0.49	0.44	0.49	0.45
EIX	0.99	0.81	0.75	0.97	0.77
ETR	1.01	0.70	0.64	0.74	0.68
EVRG	0.87	0.54	0.50	0.59	0.52
EXC	1.00	0.81	0.80	0.57	0.82
IDA	0.84	0.55	0.55	0.60	0.56
LNT	0.84	0.58	0.55	0.59	0.56
MGEE	0.60	0.62	0.61	0.73	0.61
NEE	0.87	0.78	0.71	0.55	0.71
NWE	1.08	0.71	0.71	0.48	0.74
OGE	1.11	0.80	0.80	0.78	0.84
OTTR	0.98	0.87	0.88	0.57	0.87
PEG	0.95	0.73	0.72	0.59	0.71
PNW	0.96	0.67	0.62	0.53	0.65
PPL	1.19	0.78	0.81	0.87	0.84
SO	0.88	0.60	0.57	0.55	0.58
SRE	0.96	0.76	0.71	0.76	0.74
WEC	0.76	0.45	0.40	0.44	0.42
XEL	0.77	0.48	0.49	0.42	0.49
Average	**0.92**	**0.67**	**0.65**	**0.63**	**0.67**

Q. WILL THE VALUE LINE BETAS RETURN TO NORMAL SOON?

A. Yes. The Value Line betas will begin returning to the level indicated by the other four methods as the COVID affected weeks roll outside the 5-year history. This will begin in March 2025 and be completed in April 2025. The majority of the test year will occur after the outlying data roll off of Value Line's beta estimates.

Q. DO ANY OF YOUR ALTERNATE METHODS RETAIN 100 PERCENT OF THE COVID AFFECTED DATA?

A. Yes. Using monthly returns does not exclude any COVID related data. If the Commission believes that the COVID stock behavior is reasonably representative of future expectations and should be given weight, the Commission should use monthly returns.

Q. WHAT IS YOUR CONCLUSION REGARDING VALUE LINE BETAS?

A. Value Line betas should not be in the current case.

Q. WHAT IS THE BLUME ADJUSTMENT USED BY VALUE LINE?

A. The Blume adjustment is a stylized adjustment grounded in research from the 1970s.[81] Beta is typically estimated using a fixed historic period for data, such as the five prior years. Stock betas vary over time because the historic period rolls forward through different periods. Blume studied the beta of stock portfolios and estimated the relationship between betas in initial 7-year period with a subsequent 7-year period. The table below reproduces his results.

Table 14: Reproduction of Blume Regression Results

MEASUREMENT OF REGRESSION TENDENCY OF ESTIMATED BETA COEFFICIENTS FOR INDIVIDUAL SECURITIES

Regression Tendency Implied Between Periods	$\beta_2 = a + b\beta_1$
7/33-6/40 and 7/26-6/33	$\beta_2 = 0.320 + 0.714\beta_1$
7/40-6/47 and 7/33-6/40	$\beta_2 = 0.265 + 0.750\beta_1$
7/47-6/54 and 7/40-6/47	$\beta_2 = 0.526 + 0.489\beta_1$
7/54-6/61 and 7/47-6/54	$\beta_2 = 0.343 + 0.677\beta_1$
7/61-6/68 and 7/54-6/61	$\beta_2 = 0.399 + 0.546\beta_1$

In the table above, β's are ordinary least square estimates of beta for the corresponding time periods. The Blume adjustment approximates these results by setting the "a" in the equation to 0.33 and the "b" in the equation to 0.66. Thus, the Blume adjustment assumes that the OLS

[81] Blume, M.E. (1971), On the Assessment of Risk. The Journal of Finance, 26: 1-10. https://doi.org/10.1111/j.1540-6261.1971.tb00584.x.

beta in a forecasted period equals 0.33 plus 0.67 times the OLS beta in the historic period. However, the Blume Adjustment is based on empirical research that is 50 years out of date, focused on portfolios rather than individual equities, and that was not performed on the utility industry specifically. More modern research indicates that utility betas do not trend towards 1.[82] This makes the Blume adjustment inappropriate for estimating utility cost of capital.

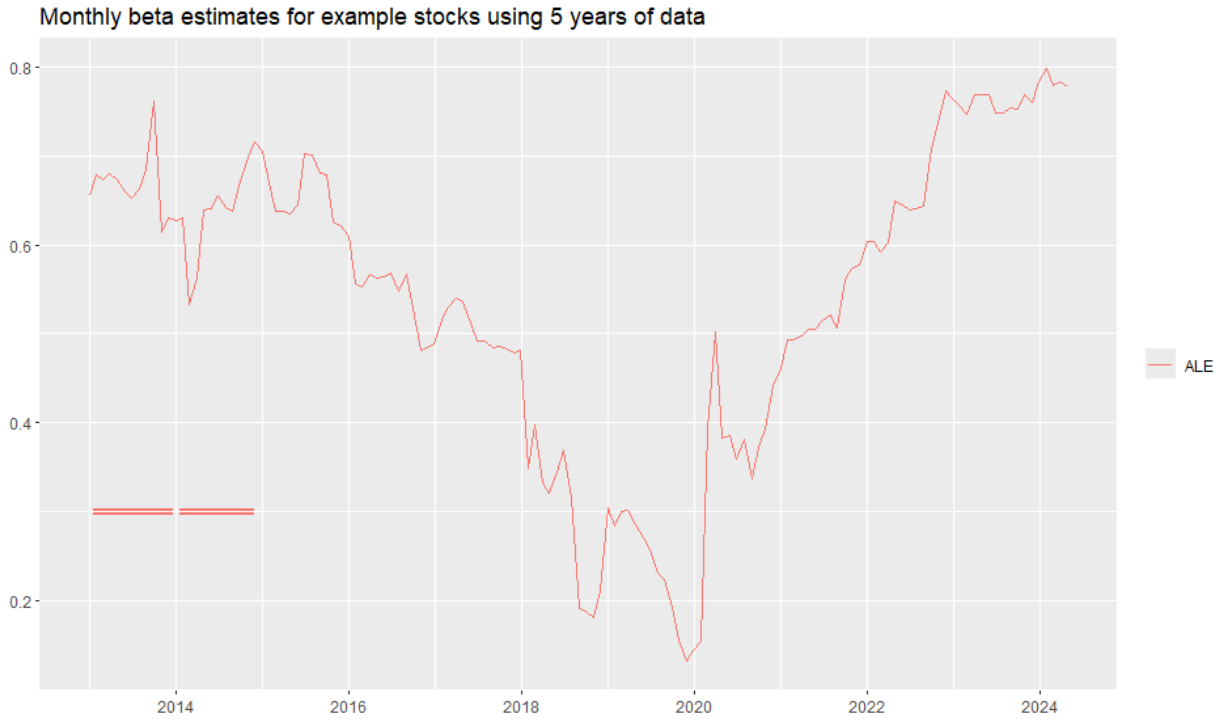
The Blume adjustment can be evaluated by considering how utility stock betas change over time. To illustrate the pattern of utility stock betas, I calculated betas over an extended period for a selection of utility stocks.[83] The figure below shows the variation in beta for ALLETE, an electric utility, when calculated with OLS regression on a rolling window of 5 years of monthly returns.[84]

[82] Michelfelder, R. A., & Theodossiou, P. (2013). Public utility beta adjustment and biased costs of capital in public utility rate proceedings. *The Electricity Journal*, 26(9), 60-68.

[83] I selected utilities for which historic Value Line beta forecasts were publicly available.

[84] ALLETE was selected only for illustrative purposes. The following figures illustrate the betas for all selected utilities.

Figure 5: Beta Estimate for ALLETE



There are several factors of note in this figure. The estimate varies substantially over time, ranging from 0.1 to 0.8 over less than five years. If the raw beta were used to forecast future betas, and were selected at the peak of 0.8, it would clearly result in forecast error. Adjusting a beta estimate of 0.8 towards the average of approximately 0.5 would increase the accuracy of the forecast. Adjusting the beta towards 1, as done by the Company, would decrease the accuracy of the forecast.

Figures 6 and 7 below show that these patterns hold for many utility stocks. Note that there is not consistent movement towards 1 over time.

Figure 6: Raw Beta Over Time Group 1

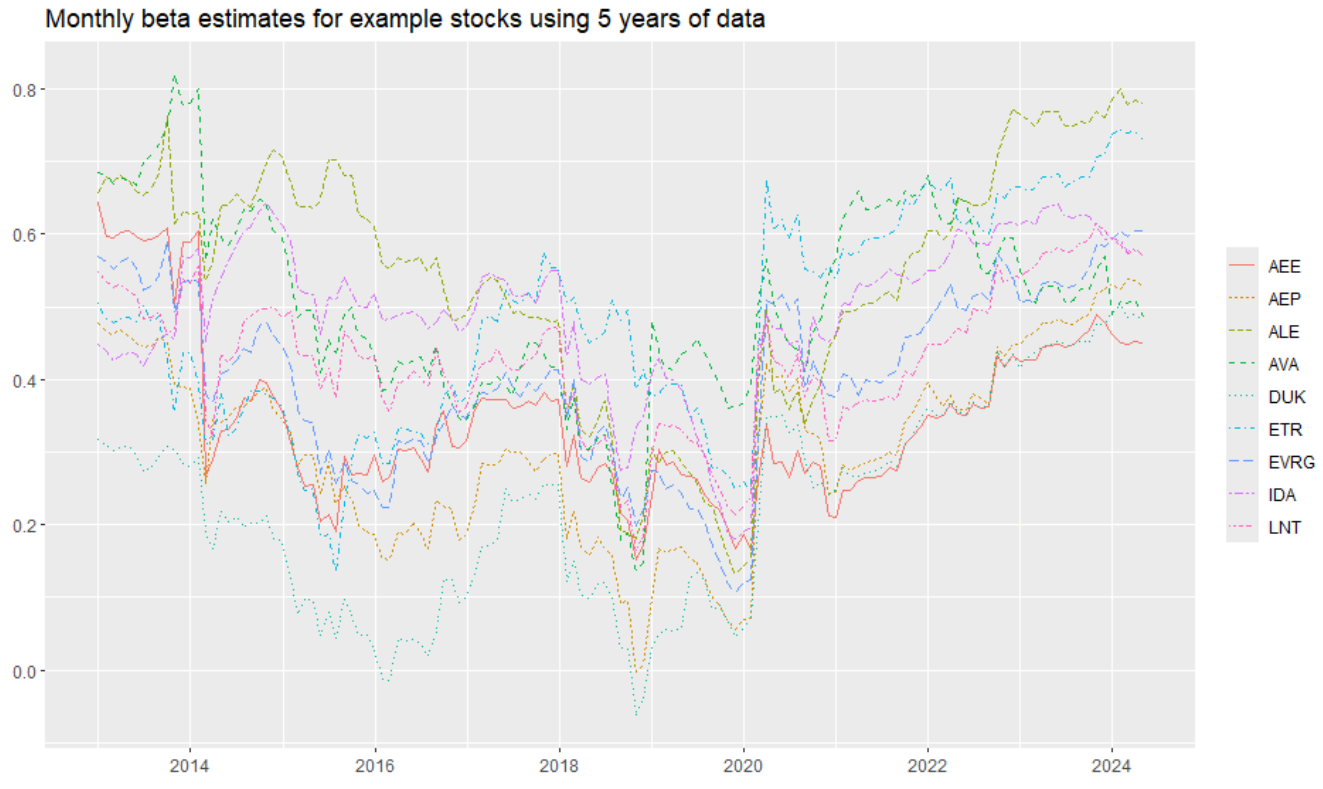
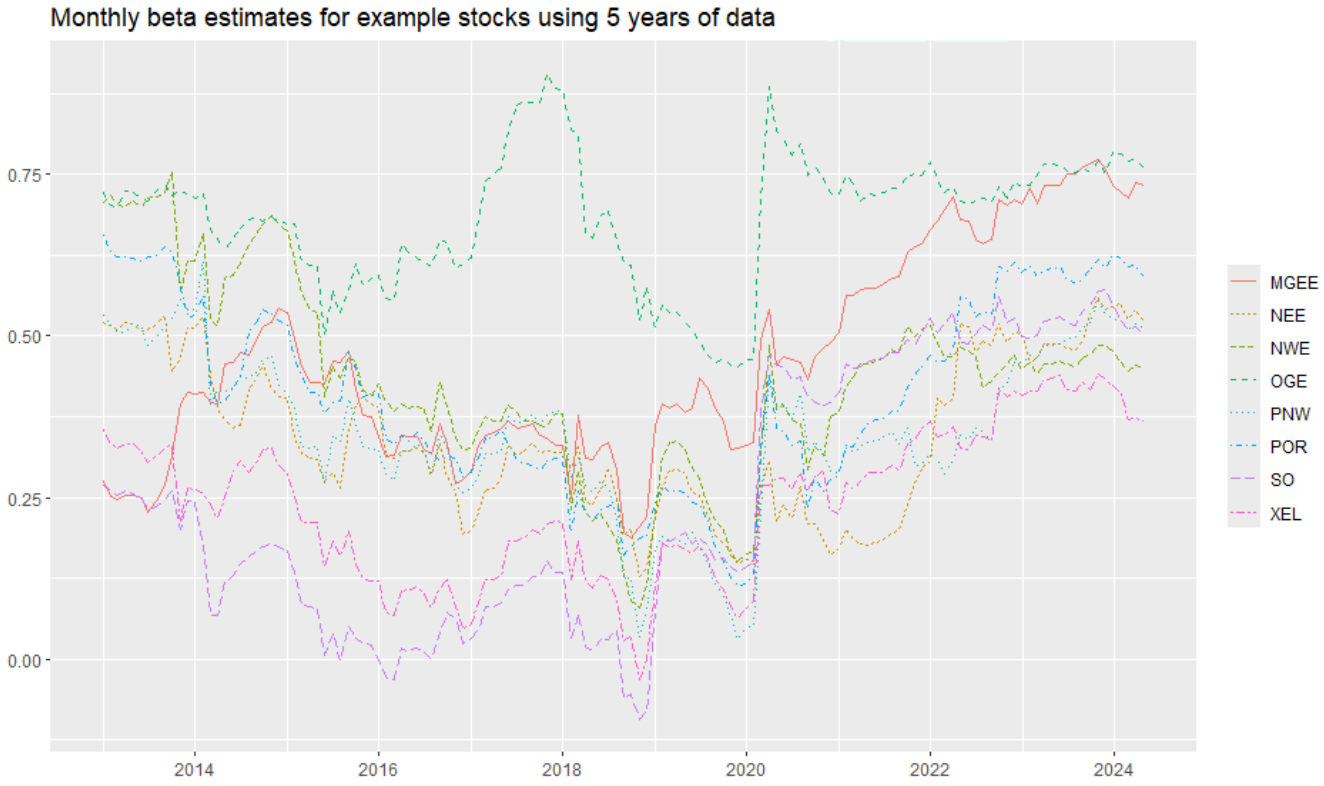


Figure 7: Raw Beta Over Time Group 2



The following patterns are apparent when examining the utility betas. First, Figures 6 and 7 show utility betas vary over time, but do not systematically converge towards 1. Notice that betas trend down from 2014 to 2019, and while betas trend up from 2019 to 2022, this trend flattens out before approaching 1. Second, beta rarely exceeds 0.7 and, on average, remains well below 0.7. Third, the OLS beta both increases and decreases over time, and because of this, the OLS beta provides a reasonable approximation of beta over the following year. Fourth, while there appears to be some trend over time, the trend is short-lived, in that it does not push industry average beta outside of the range of approximately 0.3 to 0.6. Finally, the betas from 2022 to present do not trend up or down, suggesting that, at least for the current rate case, the OLS beta is a very reasonable approximation of near-term future beta.

Q. DOES VALUE LINE'S ADJUSTMENT OF UTILITY BETAS TO THE MARKET AVERAGE INSTEAD OF INDUSTRY AVERAGE ACCURATELY FORECAST BETAS?

A. No, the Value Line betas forecasts are systematically higher than actual betas. This is because adjusting utility betas towards 1 systematically and erroneously increases betas above their historic values. If an adjustment is made, the adjustment should be made to the industry average, not the market average. This position is supported by financial economist William F. Sharpe:[85]

> Information of the type shown in Table 13-4 [industry average betas] can be used to "adjust" historic beta values. For example, the knowledge that a corporation is in the air transport industry suggests that a reasonable estimate of the beta value of its stock is greater than 1.0. It thus makes more sense to adjust a historic beta value toward a value above 1.0 than to the average for all stocks.[86]

In the context of this case, the "industry" is reflected by the proxy group, betas should be adjusted towards the proxy group average.

Q. DOES VALUE LINE'S ADJUSTMENT OF BETAS TOWARDS ONE OVER-INFLATE UTILITY COST OF CAPITAL?

A. Yes. The practice of adjusting beta towards 1 overinflates utility cost of capital. As can be seen in the figures above, utility stocks rarely exceed a beta of 0.7. However, Value Line betas are well above this threshold. Peer-reviewed research supports my assertion that this is not appropriate and inflates utility cost of capital, finding that "an empirical analysis suggests that the commonly used Blume CAPM beta adjustment is not appropriate for electric and electric and gas public utility betas, and may bias the cost of common equity capital in public utility

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[85] Dr. Sharpe is one of the originators of the capital asset pricing model and was awarded the 1990 Nobel Memorial Prize in Economic Sciences.

[86] *Investments*, 2d ed., Prentice-Hall, Inc., Englewood Cliffs, 1981, at 344. As quoted in OPUC Docket Nos. UT 125/UT 80, Order No. 00-191 at ¶ 3, 2000 Ore. PUC LEXIS 401 at *67-*68 (Apr. 14, 2000).

rate proceedings."[87] This research suggests that "adjustment to beta should be based upon the likely future trend in peer group or public utility betas, or the specific utility's beta, not the trend in betas for all stocks in general."[88]

Recall that since 2022, utility betas have been relatively flat.[89] Thus, if this advice is followed, it is appropriate to make no adjustment to beta, or adjust to the current peer group average without trending the average up or down.

Q. HAVE OTHER COMMISSIONS PREVIOUSLY RULED ON THE USE OF ADJUSTED BETAS?

A. Yes. The Oregon Commission has ruled against adjusting betas to the market average.[90] The Illinois Commerce Commission found that adjusting betas in the ECAPM model produces inflated estimates of the cost of equity.[91] The California Public Utility Commission has found that adjusting betas guarantees high ROE estimates.[92]

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87 Michelfelder, R. A., & Theodossiou, P. (2013). Public utility beta adjustment and biased costs of capital in public utility rate proceedings. *The Electricity Journal*, 26(9), 60-68.

88 *Id*.

89 Figures 6 and 7.

90 Oregon Public Utility Commission, Docket Nos. UT 125/UT 80, Order No. 00-191 at 43 (Ap. 14, 2020). The use of adjusted betas was disputed in this case. The Commission noted that "[t]hus, if any adjustment to the raw beta is appropriate, it should be toward the industry average rather than toward a generic average of all stocks."

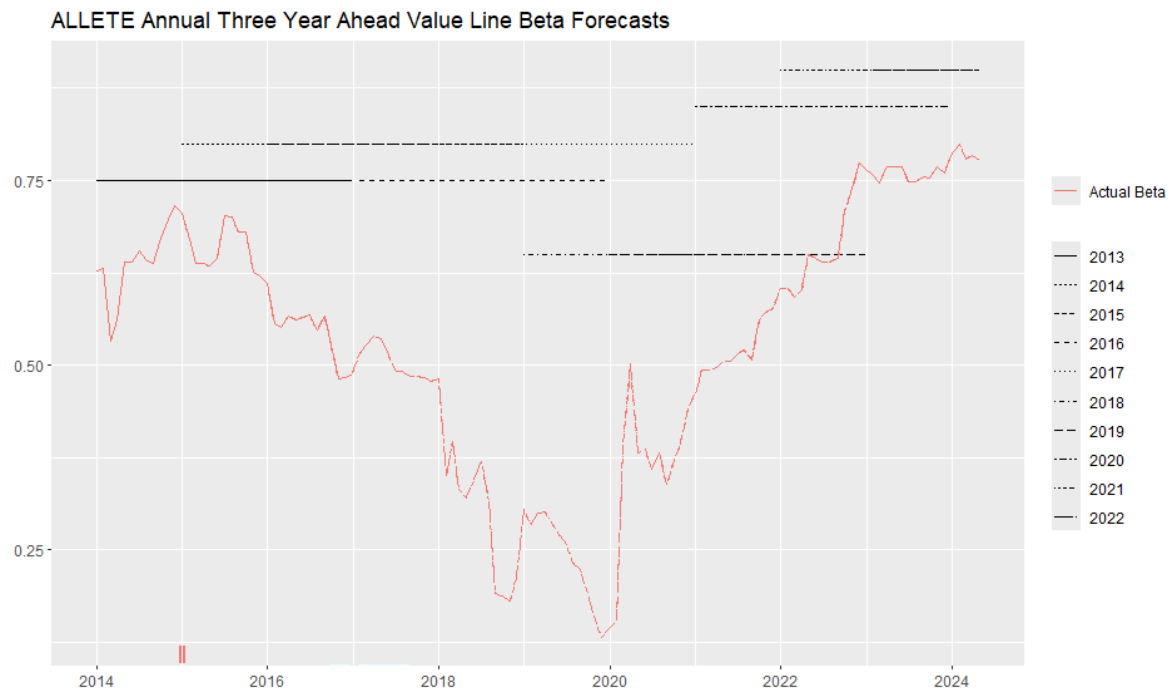
91 Illinois Commerce Commission, Docket No. 11-0767, Order at 109 (Sep. 19, 2012). "The Commission cannot recall a proceeding in which it relied upon the ECAPM in establishing the cost of common equity for a utility. In the instant proceeding, the record supports a finding that use of adjusted betas in the ECAPM is inappropriate. As Staff witness Ms. Freetly explained, by using adjusted betas she already effectively transformed her Traditional CAPM into an ECAPM. Therefore, including an additional beta adjustment in the ECAPM model would result in inflated estimates of the samples' cost of common equity."

92 Public Utilities Commission of The State of California, Application 18-12-001, Decision on The Test Year 2019 General Rate Case For Liberty Utilities (Calpeco Electric) LLC at 39 (Sep. 2, 2020) (internal citation omitted) The CPUC finds "…that empirical CAPMs tend to produce higher overall cost of capital estimates because adjusting betas upward for electric utilities, which tend to have low betas, guarantees a higher ROE."

Q. HOW DO NEAR-TERM FORECASTS USING VALUE LINE AND BLOOMBERG ADJUSTED BETAS COMPARE TO FORECASTS USING YOUR BETAS?

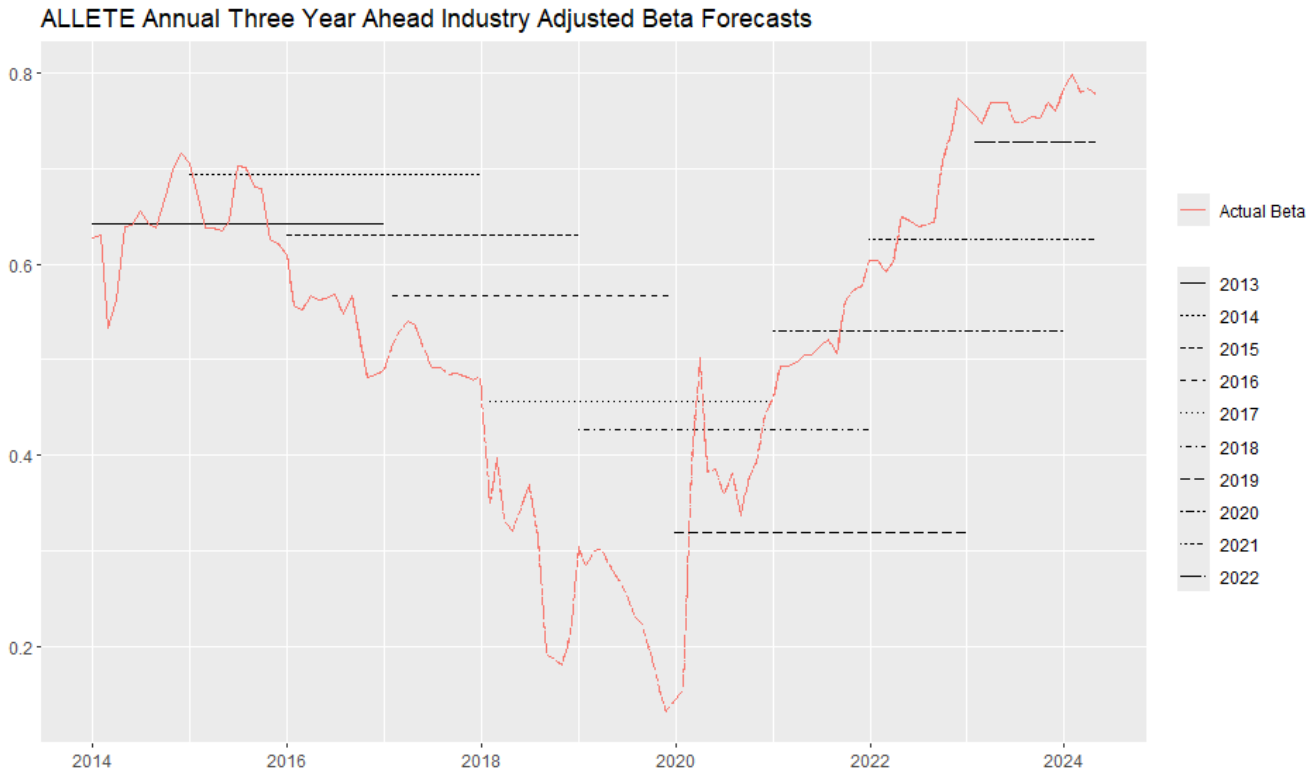
A. Near term (1-3 year) forecasts using Value Line betas are substantially more biased than forecasts using my proposed beta measure.[93] I compared the forecast error for Value Line beta forecasts and forecasts based on an adjustment towards industry average beta. I performed annual forecasts from 2013 to 2023 and compared the forecasted values to actual values for the three years following the forecast. The two figures below compare these forecasts to actual betas for an illustrative stock, ALLETE. Note that the Value Line beta forecasts are above actual betas for nearly every forecast. This is a clear indication that, at least for ALLETE, there is substantial forecast bias when the Blume adjustment is used.

Figure 8: Actual and Value Line Beta



[93] Note that this analysis uses betas estimated with 5 years of monthly returns, which appropriately addresses COVID outliers while still applying consistent treatment across all 5-year time bands considered.

Figure 9: Actual and Industry Adjusted Beta Forecast



The forecasts using industry adjusted betas are clearly closer to the actual beta and fall both above and below actuals in a more even manner.

The pattern demonstrated for ALLETE is consistent with most utilities. I used the following formula to calculate a normalized forecast metric ("NFM") that identifies forecast bias:

$$NFM = \frac{(Forecast - Actual)}{(Forecast + Actual)}$$

A value below zero indicates consistent under forecasting, while a value above zero indicates consistent over forecasting. The NFM provides a numeric method of measuring forecast bias that does not require viewing the figures presented for ALLETE. The table below reports the

average NFM for each year and forecast method. The Value Line forecast over forecast beta in every forecast year.[94] The absolute value of NFM exceed the NFM of industry adjusted beta forecasts for every forecast year.

Table 15: NFM Company and AWEC Proposed Betas

Forecast Date	Industry Adj.	Value Line
12/31/2013	0.25	0.38
12/31/2014	0.28	0.42
12/31/2015	0.28	0.48
12/31/2016	0.29	0.47
12/31/2017	0.26	0.48
12/31/2018	0.12	0.31
12/31/2019	-0.06	0.19
12/31/2020	-0.02	0.30
12/31/2021	0.02	0.26
12/31/2022	0.03	0.22
Average	0.15	0.35

Q. HOW DO YOU CALCULATE BETA FOR YOUR CAPM AND ECAPM MODELS?

A. I adjust beta to the industry average. I calculate the industry average by averaging beta for PSE's peer group. The industry average beta is 0.70.[95] I then adjust betas towards the industry average by weighting raw betas by 67 percent and average beta by 33 percent.

[94] Values are greater than zero in every year.

[95] I base the industry average using the Value Line OLS specification with outlier weeks removed.

Q. WHAT IS THE IMPACT OF YOUR LOWER ESTIMATE OF BETA ON ROE?

A. All else equal, a lower beta estimate for a company lowers the forecasted return for the company. My recommended betas reduce the estimation of PSE's cost of common equity relative to the Company's estimate.

Q. WHAT RECOMMENDATION DO YOU HAVE REGARDING BETAS?

A. I recommend the Commission use betas that are not sensitive to the inclusion of abnormal COVID related market behavior. I also recommend that the Commission find that betas should not be adjusted to the market average.

d. <u>Equity Risk Premium</u>

Q. HOW DO BETAS RELATE TO COST OF COMMON EQUITY?

A. The CAPM model calculates cost of equity as the risk-free rate of return plus beta times the equity risk premium. The risk-free rate is typically modeled using low risk bonds, such as 20- or 30-year treasury bond yields. The equity risk premium is the difference between expected market returns and the risk-free rate.

Q. HOW DOES PSE'S EQUITY RISK PREMIUM COMPARE TO THAT USED BY INVESTORS?

A. PSE uses a dividend discount model based on short-term analyst growth forecasts and a biased selection of firms.[96] Nearly all third-party estimates of the equity risk premium indicate it is between 3 and 6 percent.[97]

Q. WHY IS PSE'S PROPOSED RISK PREMIUM SUBSTANTIALLY HIGHER THAN ALL OTHER AVAILABLE ESTIMATES OF THE EQUITY RISK PREMIUM?

A. PSE relies on the following method of calculating ERP:

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96 *See* Bulkely, Exh. AEB-8.

97 Table 17 below.

1. Obtain short-term earnings growth forecasts for S&P 500 firms.
2. Select firms with growth between 0 percent and 20 percent.
3. Calculate the cost of equity based on the average dividend yield and growth rates of selected firms, weighted by market capitalization.
4. Subtract the risk free rate from cost of capital to obtain MRP.

This method has two critical flaws. First, short-term growth rates do not reflect long-term growth rates. This has already been discussed earlier in my testimony. Second, the selection criteria of 0 percent and 20 percent are arbitrary and play a pivotal role in the resulting MRP estimate. The table below illustrates PSE's MRP under a variety of selection criteria.

Table 16: PSE ERP Under Alternate Growth Limits

Lower Growth Limit	Upper Growth Limit	Market Returns	Risk Free Rate	ERP
0%	20%	12.56%	4.77%	7.78%
-20%	20%	11.58%	4.77%	6.81%
0%	15%	11.01%	4.77%	6.23%
-15%	15%	9.93%	4.77%	5.16%

The PSE analysis, which applies asymmetric growth limits, results in an ad hoc and arbitrary estimate of the ERP that deviates materially from consensus estimates from respected data vendors such as Bloomberg and Kroll as well as that of institutional investors and academic researchers.

Q. IS PSE'S ESTIMATE FOR THE EQUITY RISK PREMIUM EXTRAORDINARILY HIGH?

A. Yes. The table below summarizes estimates for the equity using a variety of methods. PSE's ERP, and my corrected version with unbiased bounds, are in the first two rows of the table.

Both of PSE's estimates are higher than all other method in Table 17, and 33 to 50 percent higher than the average ERP estimate of 4.78 percent.

Table 17: Recent Equity Risk Premium Estimates

Approach Used	*ERP*	*Additional information*
PSE Method	8.46%	S&P Weighted Growth Forecast Between 0 and 20%
Corrected PSE Method	7.48%	S&P Weighted Growth Forecast Between -20% and 20%
Kroll ERP	5.00%	Kroll's June 2024 Recommended US Equity Risk Premium
Survey: CFOs	4.42%	Campbell and Harvey survey of CFOs (2018); Average estimate. Median was 3.63%.
Survey: Global Fund Managers	4.60%	Merrill Lynch (January 2020) survey of global managers
Historical - US	5.06%	Geometric average - Stocks minus T.Bonds: 1928-2022
Historical - Multiple Equity Markets	5.00%	Average premium across 20 markets from 1900-2022: Dimson, Marsh and Staunton (2022)
Current Implied premium	4.60%	From S&P 500 - January 1, 2024
Average Implied premium (1960-2022)	4.21%	Average of implied equity risk premium
Average Implied premium (2012-2022)	5.37%	Average of implied equity risk premium
Default spread based premium	4.24%	Baa Default Spread on 1/1/23 * Median value of (ERP/ Default Spread)
Survey: Gobal Finance	5.60%	Finance and economics professors, analysts and managers of companies (2023)
Survey	3-6%	CFA 2021 ERP Forum Survey
Average (Excluding PAC Methods)	4.81%	

Q. ARE THE EQUITY RISK PREMIUMS IN TABLE 17 CONSISTENT WITH INVESTOR FORECASTS FOR MARKET RETURNS?

A. Large institutional investors expect U.S. equities to have total returns of 5 to 7 percent.[98] Market equity return is the sum of the risk-free rate and the equity risk premium. This suggests that investors either expect very low interest rates, equity risk premiums at the lower range of

[98] John Bilton, Karen Ward, & Monica Issar. *2024 Long-Term Capital Market Assumptions*, at 12 Exh. 7, *available at*: https://am.jpmorgan.com/content/dam/jpm-am-aem/global/en/insights/portfolio-insights/ltcma/noindex/ltcma-full-report.pdf; David J. Kostin, et. al *2024 US Equity Outlook: "All You Had to Do Was Stay,"* at 1 *available at:* https://www.goldmansachs.com/intelligence/pages/gs-research/2024-us-equity-outlook-all-you-had-to-do-was-stay/report.pdf , Lisa Shalett. *2024 U.S. Stock Market Outlook: A Time for Balance* (Jan. 10, 2024) *available at:* https://www.morganstanley.com/ideas/us-stock-market-outlook-2024, Emre Erdogan & Seth McMoore, Schwab's 2024 *Long-Term Capital Market Expectations Schwab* (Jan. 2, 2024) *available at:* https://www.schwab.com/learn/story/schwabs-long-term-capital-market-expectations .

Table 17 or a combination of both. Assuming that PSE's forecasted risk-free rate of 4.2 percent is correct, institutional investors have an ERP of 1.8 to 2.8 percent.

Q. WHAT MEASURES DO YOU USE FOR THE EQUITY RISK PREMIUM?

A. I use two measures. The first is the PSE's ERP model adjusted to have symmetric growth bands of -20 percent to +20 percent. For the second ERP measure I use Kroll's forward-looking ERP. Kroll's June 2024 Recommended US Equity Risk Premium ("Kroll ERP") is 5.0 percent. The Kroll ERP provides a timely measure of the equity risk premium supported by a widely accepted publisher.

Q. CAN YOU PROVIDE MORE DETAIL ON THE VARIOUS METHODS OF ESTIMATING THE EQUITY RISK PREMIUM?

A. There are three broad approaches to estimating the equity risk premium:

1) Survey of investors or other experts regarding expectations for future returns;

2) Historical premium of equities over riskless investments; and

3) Forward looking premiums based on current market prices.[99]

Q. DO MARKET SURVEYS OF INVESTORS OR OTHER EXPERTS REVEAL PSE'S PROPOSED EQUITY RISK PREMIUM IS UNREASONABLY HIGH?

A. Yes. Market surveys show that the average risk premium required by investors is materially lower than the forecast produced by PSE. Recent survey-based estimates of the equity risk premium are available from institutional investors, corporate management, and academics. The table below summarizes this data.

Table 18: Summary of Investor and Finance Professional Surveys

Date	Survey	Estimate

[99] Damodaran, Aswath, Equity Risk Premiums (ERP*): Determinants, Estimation, and Implications* – The 2022 Edition (March 23, 2022). Available at SSRN: https://ssrn.com/abstract=4066060 or http://dx.doi.org/10.2139/ssrn.4066060.

Feb-2007	Merrill Lynch survey of institutional investors[100]	3.5
Mar-2007	Merrill Lynch survey of institutional investors[101]	4.1
2010	Merryll Lynch survey of institutional investors[102]	3.76 to 3.9
Jan-2012	Merrill Lynch survey of institutional investors[103]	4.08
Feb-2014	Merrill Lynch survey of institutional investors[104]	4.6
June 2020	Merrill Lynch survey of institutional investors[105]	2.5
Dec-2017	Graham and Harvey survey of CFOs[106]	3.63
Jan-2016	Graham and Harvey survey of CFOs[107]	3.55
2000 to 2017	Graham and Harvey survey of CFOs[108]	2.42 to 4.56, 3.63 average
2011	Fernandes et al. survey of Academics[109]	5.6
2022	IESE Business School survey of Academics, investors, and executives[110]	5.5

100 Global Fund Manager Survey, cited in Damodaran (2022).
101 *Id.*
102 *Id.*
103 *Id.*
104 *Id.*
105 *Id.*
106 Graham, J.R. and C.R. Harvey, 2018, *The Equity Risk Premium in 2018*, Working paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3151162. Cited in Damodaran (2022).
107 *Id.*
108 Graham, J.R. and C.R. Harvey, 2018, *The Equity Risk Premium in 2018*, Working paper, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3151162. Cited in Damodaran (2022).
109 Fernandez, P., J. Aguirreamalloa and L. Corres, 2011, Equity Premium used in 2011 for the USA by Analysts, Companies and Professors: A Survey, Working Paper, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1805852&rec=1&srcabs=1822182. Cited in Damodaran (2022).
110 Fernandez, Pablo and García de Santos, Teresa and Fernández Acín, Javier, Survey: *Market Risk Premium and Risk-Free Rate Used for 95 Countries in 2022* (May 23, 2022). Available at SSRN: https://ssrn.com/abstract=3803990 or http://dx.doi.org/10.2139/ssrn.3803990

2021	CFA Institute Research Foundation[111]	3 to 6

Q. WHAT RISK PREMIUM EXISTS IN HISTORIC MARKET DATA?

A. The historical risk premium depends on the time period studied, method of averaging, and basis for risk free rate. Damodaran, a widely published and well-respected finance researcher, provides persuasive rationale for using an extended time horizon, geometric averaging, and U.S. Treasury bond rate as the risk-free rate.[112] This results in an equity risk premium of 5.13 percent.[113] Historic risk premiums have an advantage over surveys in that they are market-driven, and thus are not subjective or exposed to other drawbacks of surveys. However, unlike surveys, historic risk premiums are not forward looking. Implied risk premiums provide a market-based approach to estimating a forward-looking risk premium.

Q. WHAT FORWARD RISK PREMIUMS CAN BE IMPLIED FROM MARKET DATA?

A. A forward-looking risk premium can be implied from current market prices and expected cash flows. The risk premium is implied by the current market value for a representative index and the expected cash flows from that index. Damodaran finds that the implied equity premium of the trailing 12 months is the best predictor of the actual implied premium.[114] The January 2024 trailing 12-month implied equity risk premium is 4.6 percent.[115] The implied risk premium mirrors the FERC methodology of using a discounted cash flow model, market data, and

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111 Laurence B. Siegel and Paul McCaffrey, Editors (2023) *Revisiting the Equity Risk Premium*. https://www.cfainstitute.org/-/media/documents/article/rf-brief/Revisiting-the-Equity-Risk-Premium.pdf.

112 Damodaran, Aswath, Equity Risk Premiums (ERP): *Determinants, Estimation, and Implications* – The 2022 Edition (March 23, 2022). Available at SSRN: https://ssrn.com/abstract=4066060 or http://dx.doi.org/10.2139/ssrn.4066060.

113 *Id.* at 38.

114 Damodaran (2022) at 131.

115 *See* Damodaran, Aswath, *Implied Equity Risk Premiums (by year)* (Jan 5, 2024), *available at:* https://pages.stern.nyu.edu/~adamodar/pc/datasets/histimpl.xls.

analyst growth forecasts, but is supported by peer reviewed research, unlike the FERC methodology.

Q. DOES THE RANGE OF SURVEY RESULTS FOR THE EQUITY RISK PREMIUM SHOW PSE'S FORECAST IS UNREASONABLY HIGH AT 7.17 PERCENT COMPARED TO THE CURRENT IMPLIED RISK PREMIUM OF 4.6 PERCENT?

A. Yes. The surveys of investors and finance professionals report that the equity risk premium is between 3 and 6 percent. This is consistent with the Krolls estimate of 5 percent and the current implied risk premium of 4.6 percent, but substantially less than PSE's forecast of 7.17 percent.

Q. WHAT MEASURE OF THE EQUITY RISK PREMIUM IS RECOMMENDED FOR USE IN SETTING RATES?

A. There is no one approach to estimating equity risk premiums that is appropriate for all analyses. However, generally, the current trailing 12-month implied equity risk premium is more appropriate when equity markets are assumed to be functioning efficiently, when predictive power is important, or when current equity needs of investors are being considered. A historical risk premium or a long-term geometric average of implied premiums is appropriate when evaluating long-term capital investment decisions or when there is reason to believe that current markets are over- or under-valued. Survey results are appropriate when markets are assumed to be functioning poorly over an extended time.

In setting utility rates, the primary function of estimating the cost of equity is to provide a fair return to equity investors that is sufficient to attract capital. However, utilities also use approved cost of capital in long-term planning and when making capital investment decisions. In an environment of well-functioning capital markets, greatest weight should be placed on the

current implied equity risk premium. It is also appropriate to consider current survey results due to the regulatory focus on investor expectations.

e. Implied Risk Premium Model

Q. DOES PSE PROVIDE AN ROE ESTIMATE USING THE IMPLIED RISK PREMIUM MODEL?

A. Yes, PSE reports the results of the implied risk premium model.[116] The implied risk premium model estimates cost of capital based on a regression of authorized rates of return and bond yields.

Q. DOES THE IMPLIED RISK PREMIUM MODEL REFLECT THE RETURN THAT INVESTORS CAN EXPECT FROM COMPARABLE INVESTMENTS?

A. No, investors cannot expect to earn the investments reported by the implied risk premium model. This is because investors cannot purchase equity in utility companies at book value. Utility stock is typically priced above book value, while authorized ROE is provided for book value of equity. If a utility earns its authorized return, and the authorized return is 10 percent, an equity investor who owns $100 of equity in the firm will earn $10. However, if the equity investor purchased their $100 ownership at a cost of $200 (i.e. a price to book ratio of 2), the return that the investor can expect is only 5 percent. PSE has not made any adjustments in its implied risk premium model to account for utility price to book ratio of utilities. Thus, the analysis does not reflect the returns that investors can expect from comparable investments.

Q. ARE THERE OTHER CONCERNS WITH THE IMPLIED RISK PREMIUM MODEL?

A. Yes, this model is circular and self-perpetuating, relies on dubious statistical models, and does not reflect the peer group.

[116] Bulkley, Exh. AEB-1T at 49:8-50:7.

Q. WHAT DOES IT MEAN THAT THE MODEL IS CIRCULAR?

A. This means that the estimated cost of capital is simply a function of past commission decisions. If this model is used to set cost of capital, cost of capital becomes a circular process that is completely divorced from current market conditions. In addition, any error becomes perpetuated indefinitely. If past commissions have over-estimated cost of capital for utilities, and the implied risk premium model is used for future cost of capital estimates, future cost of capital estimates will perpetuate the historic error. In addition, many past authorized ROEs are the result of stipulations where an erroneous ROE may have been agreed to as part of an overall compromise to reach just and reasonable rates.

Q. HOW IS THE STATISTICAL MODEL DUBIOUS?

A. The model uses ordinary least squares regression, which only produces reliable results when the model errors are independently distributed. However, the errors from PSE's regression have high autocorrelation. The correlation between the error and the lagged error is 0.25. This means that the prior period's error is likely to persist in the current period. The table below summarizes the performance of the implied risk premium model in the last two years. Notice that the model overestimates the risk premium by 0.4 to one percent.

Table 19: Implied Risk Premium Model Error

Period	Actual	Predicted	Error
2022.3	5.88%	6.76%	0.9%
2022.4	5.98%	6.40%	0.4%
2023.1	5.97%	6.48%	0.5%
2023.2	5.86%	6.45%	0.6%
2023.3	5.55%	6.21%	0.7%
2023.4	4.85%	5.89%	1.0%
Average	5.68%	6.36%	0.68%

Given the error in recent periods, it is reasonable to expect the model to significantly overestimate the bond yield premium in 2025.

Q. HOW DOES THE MODEL FAIL TO REFLECT THE PEER GROUP?

A. The authorized returns used in the model are not limited to the peer group. As a result, some utilities that are not comparable are included. For example, the model includes the authorized return on equity for Alaska Electric Light and Power, a small utility in Alaska that is not electrically interconnected with any other utility. The Regulatory Commission of Alaska authorized an ROE of 13.45 percent in 2023. This is clearly not a comparable investment to PSE.

Q. WHAT ARE THE RESULTS OF THE COMPANY'S COST OF EQUITY MODELS WHEN YOUR RECOMMENDATIONS ARE APPLIED?

A. The table below summarizes the cost of equity results for each model when my recommended changes are applied.

Table 20: AWEC Cost of Equity Model Results

Discounted Cash Flow			
Mean	Three Stage	Single Stage	
30-Day Average	9.27%	9.15%	
90-Day Average	9.19%	9.13%	
180-Day Average	8.96%	8.94%	
Constant Growth Average	9.14%	9.08%	
Median			
30-Day Average	9.40%	9.24%	
90-Day Average	9.25%	9.14%	
180-Day Average	8.98%	9.03%	
Constant Growth Average	9.21%	9.13%	
CAPM			
	Current 30-day Average Treasury Bond Yield	Near-Term Blue Chip Forecast Yield	Long-Term Blue Chip Forecast Yield
Corrected PSE ERP	9.45%	9.36%	9.24%
Kroll ERP	8.21%	7.92%	7.54%
ECAPM			
Corrected PSE ERP	9.98%	9.92%	9.83%
Kroll ERP	8.60%	8.31%	7.93%

Q. WHAT IS YOUR RECOMMENDED COST OF EQUITY?

A. The return on equity models indicate a reasonable range of ROE from 8 percent to 9.5 percent. I recommend a cost of equity of 9.2 percent. This is near the top of the reasonable range and is consistent with the cost of equity for a utility with greater than average risk.

Q. WHAT CAPITAL STRUCTURE DOES PSE PROPOSE?

A. PSE proposes a hypothetical capital structure with authorized share of equity higher than the expected equity ratio.[117]

[117] Peterman, Exh. CGP-1CT at 8:1-17.

Q. WHAT IS YOUR RECOMMENDED CAPITAL STRUCTURE?

A. I recommend PSE's forecasted 2024 forecasted common equity ratio of 49 percent be used, rather than PSE proposed hypothetical equity ratio. I use PSE's forecasted Rate Year 1 short-term debt ratio of 1.81 percent with the remaining share of capital supplied by long-term debt.[118]

Q. WHAT COST OF DEBT DO YOU RECOMMEND?

A. I recommend adopting the cost of debt indicated by PSE for Rate Year 1 and Rate Year 2.[119]

Q. WHAT IS YOUR RECOMMENDED COST OF CAPITAL?

A. The tables below summarize cost of capital for each Rate Year.

[118] *Id.* at 10:15-16.
[119] *Id.* at 10:15-16; 11:7-8.

Table 21: Recommended Cost of Capital

Rate Year 1			
Component	% of Total	Cost %	Weighted Ave Cost %
Short-Term Debt	1.81%	5.07%	0.092%
Long-Term Debt	49.19%	5.27%	2.592%
Common Stock Equity	49.00%	9.20%	4.508%
	100.00%		7.192%
Rate Year 2			
Component	% of Total	Cost %	Weighted Ave Cost %
Short-Term Debt	1.81%	4.08%	0.074%
Long-Term Debt	49.19%	5.36%	2.637%
Common Stock Equity	49.00%	9.20%	4.508%
	100.00%		7.218%

Q. WHAT IS THE IMPACT OF YOUR RECOMMENDATION?

A. The table below summarizes the gas and electric revenue requirement impacts of my recommendation, for illustrative purposes only, based on PSE's filed case. PSE's cost of capital should be updated based on the final revenue requirement model to determine the impact to revenue requirement.

Table 22: Revenue Requirement Impacts of AWEC Cost of Capital

	2025 RATE YEAR 1	2026 RATE YEAR 2
Gas Revenue Requirement Impact	($17,327,950.00)	($29,214,186.00)
Electric Revenue Requirement Impact	($40,089,699.00)	($75,971,989.00)

IX. SHORT-TERM CETA ACQUISITIONS

Q. PLEASE SUMMARIZE THE COMMISSION'S GUIDANCE FOR PSE MEETING ITS 2025 CEIP INTERIM TARGET.

A. In this case, PSE has acquired short-term resources in order to meet its 2025 Clean Energy Implementation Plan ("CEIP") interim target of 63 percent. While the Commission ultimately approved a 63 percent interim target for 2025 based on Staff's recommendation,[120] the Commission was also clear that PSE should not make acquisitions to meet this target if doing so would come at an unreasonable cost to its customers.[121] The Commission also indicted that it would consider cost impacts to customers when determining whether PSE achieved CETA compliance for the first compliance period, meaning that if PSE falls short on its interim target due to costs, the Commission was unlikely to conclude that the Company was not in compliance with CETA.[122] The Commission's direction was consistent with the direction of the Washington legislature itself, which stated that meeting CETA's requirements would be balanced with "provid[ing] safeguards to ensure that the achievement of this policy does not impair the reliability of the electricity system or *impose unreasonable costs to customers*."[123]

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120 Docket No. UE-210795, Order 12 at 6-7:20 (Mar. 25, 2024); *see also* PSE's 2023 CEIP Biennial Plan Update at Table 1.1 (Nov. 20, 2023) *available at:* https://www.pse.com/-/media/PDFs/CEIP/2023/001_BU23_Chapters_Final.pdf. Wherein the Company proposes a 2025 interim target of 60%.

121 *Id.*; *see also* Docket No. UE-210795 – March 22, 2024 Open Meeting discussing PSE's CEIP Biennial Update beginning at 36:05, accessed at https://wutc.app.box.com/v/OpenMeetings/file/1481530852585; *see also* Docket Nos. UE-240433/UG-240434 – PSE Work Plan at 5 (June 5, 20240) (internal citations omitted) (PSE acknowledging the Commission's warning that "purchasing unreasonably costly energy should be considered when reviewing the Company's compliance with the interim targets at the end of the compliance period.").

122 Docket No. UE-210795 – March 22, 2024 Open Meeting discussing PSE's CEIP Biennial Update beginning at 36:05, accessed at https://wutc.app.box.com/v/OpenMeetings/file/1481530852585. Commissioners' deliberations discussing ratepayer impacts and interim targets beginning at 1:48:05.

123 RCW 19.405.010(2) (emphasis added).

Q. IS PSE PLANNING TO ACQUIRE RESOURCES TO MEET ITS 2025 INTERIM TARGET?

A. Yes. PSE intends to meet its 2025 interim target through short-term wholesale market purchases. PSE expects the cost of achieving its 2025 interim target, and maintaining that target for 2026, to be [redacted] per MWh. This represents only the incremental cost of CETA compliance.[124] In addition to the [redacted] per MWh cost for compliance, PSE expects to spend [redacted] per MWh for non-CETA compliant energy and [redacted] per kW-year for non-CETA compliant capacity.[125]

Q. DO THESE SHORT-TERM ACQUISITIONS HELP PSE MEET CETA'S REQUIREMENT THAT THE UTILITY'S RETAIL SALES BE GREENHOUSE GAS NEUTRAL BY 2030?

A. No. RCW 19.405.040(1) requires that 80 percent of PSE's retail sales be carbon-free by 2030. CETA specifies that a utility's interim targets are for the purpose of "meeting the standard under RCW 19.405.040(1)."[126] Because PSE is acquiring short-term resources, these resources will not contribute to PSE's 2030 obligations because these contracts will expire before this date and PSE will still need to find replacement resources. Thus these resources offer no progress toward CETA compliance.

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124 *See* PSE Response to AWEC Data Request 22, indicating that its initial estimates for the CETA premium of approximately doubled, and row 15 in the tab named "CETA (C)" in the workpaper *240004-05-PSE-WP-BDM-POWER-COST-IMPACT-OF-NEW-RESOURCES-24GRC-02_1843315_1* of PSE's workpapers in this case, which sets forth its initial estimate of the CETA premium in power costs.

125 *See* row 14 in the tab named "CETA (C)" and row 18 of tab "RA (C)" in the workpaper *240004-05-PSE-WP-BDM-POWER-COST-IMPACT-OF-NEW-RESOURCES-24GRC-02_1843315_1* of PSE's workpapers in this case, which sets forth its initial estimate of the CETA premium in power costs.

126 RCW 19.405.060(1)(a)(ii).

Q. ARE PSE'S 2025 AND 2026 CETA ACQUISITIONS ECONOMICAL?

A. No. The table below illustrates the net energy cost of CETA compliant wind. The cost of CETA compliant wind energy is [redacted] per MWh. The CETA compliant energy that PSE is purchasing is [redacted] per MWh.

[redacted]

Q. DO THESE RESOURCES COME AT A REASONABLE COST TO CUSTOMERS?

A. No. The costs PSE intends to incur are double the costs that PSE would have incurred had PSE obtained a long-term wind resource. Rather than pay market energy costs, plus market capacity costs, plus market premiums for short-term CETA compliance, PSE should focus on acquiring economic resources that meet long-term CETA compliance obligations.

Q. WHAT PREMIUM IS PSE ASKING CUSTOMERS TO PAY FOR SHORT-TERM CETA COMPLIANT RESOURCES?

A. PSE currently expects that customers will pay a premium of approximately [redacted] in power costs in 2025, and a premium of more than [redacted] in power costs in 2026 just to meet PSE's 2025 interim target with short-term resources.[127]

Q. WHAT IS YOUR RECOMMENDATION?

[127] *See* PSE Response to AWEC Data Request 22, indicating that its initial estimates for the CETA premium of approximately doubled, and row 18 in the tab named "CETA (C)" in the workpaper *240004-05-PSE-WP-BDM-POWER-COST-IMPACT-OF-NEW-RESOURCES-24GRC-02_1843315_1* of PSE's workpapers in this case, which sets forth its initial estimate of the CETA premium in power costs.

A. There is no question that CETA is not intended to saddle customers with substantial and uneconomic costs for short-term resource acquisitions that do not in any way help ensure PSE will meet the carbon neutral requirement in 2030, let alone support achieving long-term, lasting change in Washington's resource mix. This is confirmed by PSE, which stated that "[t]hese short-term acquisitions, which are generally for existing renewable resources, are not a sufficient strategy for meeting PSE's longer-term CETA goals because they do not provide any additional clean energy on an on-going basis to PSE or the region, particularly to meet CETA requirements in 2030 and beyond."[128] No For this reason, my recommendation is that the Commission direct PSE to remove the CETA premium from power costs in both Rate Years 1 and 2 and to direct PSE to only procure short-term CETA compliant energy if the total cost of such energy is lower than [redacted] per MWh. This will ensure that such acquisitions are cost-neutral and customers are not paying a premium for resources that do not provide a long-term CETA compliance benefit.

Q. DOES THIS CONCLUDE YOUR OPENING TESTIMONY?

A. Yes.

[128] Docket Nos. UE-240433/UG-240434 - PSE Work Plan at 6 (June 5, 2024).