

Exh. RG-1T
Docket UE-210829
Witness: Rohini Ghosh

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFICORP dba
PACIFIC POWER & LIGHT COMPANY

Respondent.

Docket UE-210829

PACIFICORP

DIRECT TESTIMONY OF ROHINI GHOSH

June 2024

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1 I. INTRODUCTION AND PURPOSE

2 Q. Please state your name, business address, and present position with PacifiCorp
3 d/b/a Pacific Power & Light Company.

4 A. My name is Rohini Ghosh, and my business address is 825 NE Multnomah Street,
5 Suite 2000, Portland, Oregon 97232. I am currently employed as a Regulatory
6 Projects Director.

7 Q. Please describe your education and professional experience.

8 A. I have a Bachelor of Science (Honors) Degree in Economics from the University of
9 Nottingham, Malaysia Campus and a Master of Science Degree and a Ph.D. in
10 Economics from the University of Wyoming. My graduate research was in energy
11 economics, with a specific focus on the large-scale build out of wind resources
12 considering both environmental and transmission constraints.

13 I joined PacifiCorp in February 2021. In my previous roles on the Integrated
14 Resource Plan (IRP) team at PacifiCorp, I was involved in the modeling, analysis,
15 and development of the 2021 and 2023 IRPs and all the company's Clean Energy
16 Implementation Plans (CEIP) filings in Washington since the inaugural 2021 filing. I
17 joined regulation in October 2023 and in my current role, support the Multi-State
18 Process (MSP) and contribute to a range of other cross-functional initiatives, many of
19 which pertain to clean energy planning and policy across PacifiCorp's Western states.

20 Q. What is the purpose of your testimony in this case?

21 A. I provide additional detail on PacifiCorp's long-term modeling assumptions that led
22 to lowered interim and specific clean energy targets in the Clean Energy
23 Implementation Plan (CEIP) Biennial Update (CEIP Biennial Update) compared to

1 the Revised CEIP, provide an update on our current procurement efforts that will not
2 be impacted by these revised interim targets, and discuss the company's updated
3 incremental cost calculation.

4 **II. OVERVIEW OF PACIFICORP'S IRP AND CEIP BIENNIAL UPDATE**

5 **Q. What is the purpose of this section?**

6 A. I describe how PacifiCorp developed its 2023 IRP, filed as the 2021 IRP Two-Year
7 Progress Report in Washington,¹ and how this analysis and additional steps were
8 necessary to create a portfolio compliant with the Clean Energy Transformation Act
9 (CETA) that serves as the basis for the CEIP Biennial Update.

10 **Q. Please provide an overview of PacifiCorp's IRP process.**

11 A. PacifiCorp's IRP represents the company's least-cost, least-risk plan to reliably meet
12 customer demand over a 20-year planning period. PacifiCorp's IRP process uses
13 thorough analysis and modeling that measures cost and risk to develop the company's
14 plans to provide reliable and reasonably priced service for its customers. The primary
15 objective of the IRP is to identify the least-cost, least-risk portfolio of resources that
16 can serve customers in the future with manageable risks.

17 PacifiCorp completes an IRP cycle every two years (odd-numbered years),
18 which includes preparing a full IRP every two years and an update to the full IRP in
19 the off years (even-numbered years). PacifiCorp submits both its IRP and IRP Update
20 to each of the six regulatory commissions in the states where the company provides
21 retail service.

¹ *In re PacifiCorp, d/b/a Pac. Power & Light Co., Regarding 2021 Integrated Resource Plan Compliance*,
Docket No. UE-200420, Washington 2021 Integrated Resource Plan Two-Year Progress Report (Amended
Final) (May 31, 2023).

1 For Washington specifically, PacifiCorp must file an IRP with the
2 Commission by January 1, 2021, and every four years thereafter,² and at least every
3 two years after the utility files its IRP, beginning January 1, 2023, the utility must file
4 a two-year progress report.³

5 Each IRP is developed through an open and public process, with input from an
6 active and diverse group of stakeholders, typically including state regulatory
7 commissions, state consumer-advocacy departments, customer-sponsored advocacy
8 groups, environmental-advocacy groups, resource-advocacy groups, independent-
9 power producers, project developers, other utilities, and customers. During the public-
10 input process, which typically spans at least a full year before the release of a full
11 IRP, PacifiCorp holds regular meetings with stakeholders to solicit feedback on its
12 planning assumptions, methodologies, and model results.

13 **Q. Can you describe the methodology that PacifiCorp used in the 2023 IRP to**
14 **optimally develop system-wide portfolios?**

15 A. Yes. PacifiCorp implemented a more advanced optimization modeling system called
16 PLEXOS for its 2021 IRP and used this same software and processes for the 2023
17 IRP. The PLEXOS modeling system provides three platforms (referred to as long
18 term (LT), medium term (MT) and short term (ST)), that work on an integrated basis
19 to inform the optimal combination of resources by type, timing, size, and location
20 over a 20-year planning horizon. The PLEXOS software allows for improved,
21 simultaneous, endogenous modeling of resource and transmission options, and greatly

² WAC 480-100-625(1).

³ WAC 480-100-625(4).

1 reduces the volume of individual portfolios needed to evaluate the impacts of
2 alternative resource decisions.

3 **Q. Please describe how PacifiCorp used the LT model.**

4 A. PacifiCorp used the LT model to produce unique resource portfolios across a range of
5 different planning cases. Informed by the public-input process, PacifiCorp identified
6 case assumptions that were used to produce optimized resource portfolios, each one
7 unique regarding the type, timing, location, and number of new resources that could
8 be pursued to serve customers over the next 20 years. Portfolios from the LT model
9 are informed by an hourly review of reliability conditions, based on ST model
10 simulations (described below). This ensures each portfolio meets minimum reliability
11 criteria in all hours over the planning horizon.

12 **Q. Please describe how PacifiCorp used the MT model.**

13 A. PacifiCorp used the MT model to perform stochastic risk analysis of the portfolios.
14 Each portfolio was evaluated for cost and risk among up to five price-policy scenarios
15 with different natural gas price⁴ and carbon dioxide (CO₂) price assumptions:

- 16 • Medium natural gas and medium CO₂ prices (MM);
- 17 • Medium natural gas and no CO₂ prices (MN);
- 18 • High natural gas and high CO₂ prices (HH);
- 19 • Low natural gas and no CO₂ prices (LN); and
- 20 • Medium natural gas prices and CO₂ priced at the social cost of greenhouse
21 gases (SCGHG).

⁴ Natural gas price assumptions are also used to develop a consistent set of wholesale electricity price assumptions.

1 A primary function of the MT model is to calculate an optimized risk-
2 adjustment, representing the relative risk of a portfolio under unfavorable stochastic
3 conditions for that portfolio.

4 **Q. Can you please describe what are stochastic risk and optimized risk-**
5 **adjustments?**

6 A. Stochastic risk is the range of present value revenue requirement (PVRR) that result
7 from expected outcomes. This allows the company to assign a probability to a
8 distribution of portfolio costs, given uncertainty in key input assumptions, to provide
9 a measure of standard deviation. The MT model applies 50 iterations in the stochastic
10 study setup and shocks loads, electric and gas prices, hydro generation, and thermal
11 outages. A primary function of the MT model is to calculate an optimized risk-
12 adjustment, representing the relative risk of a portfolio under unfavorable stochastic
13 conditions for that portfolio. The optimized risk-adjustment is measured as the PVRR
14 from the ST model plus five percent of the 95th stochastic iteration of the PVRR from
15 the MT model.

16 **Q. Please describe how PacifiCorp used the ST model.**

17 A. PacifiCorp used the ST model to evaluate each portfolio to establish system costs
18 over the entire 20-year planning period. The ST model accounts for resource
19 availability and system requirements at an hourly level, producing reliability and
20 resource value outcomes as well as a PVRR, that serves as the basis for selecting
21 least-cost, least-risk portfolios. As noted above, ST model simulations were also used
22 to identify the potential need for resources in the portfolio to maintain system
23 reliability.

1 **Q. Can you describe PVRR?**

2 A. Yes. PVRR is the anticipated net present value of the costs and expenses that are
3 expected to result from any given portfolio of resources, expressed as a representation
4 of cost-of-service revenue requirement.⁵ PVRR includes both the known and
5 projected net present values of various costs and expenses, including: existing
6 contracts, market purchase costs, market sales revenues, generation costs (fuel, fixed
7 and variable operation and maintenance, decommissioning, emissions, unserved
8 energy and unmet capacity), costs of demand-side management (DSM) resources,
9 amortized capital cost for existing and potential new resources, and cost for existing
10 and potential transmission upgrades, to name a few. The risk-adjusted PVRR for any
11 given portfolio is compared against alternative portfolios to determine the least-cost,
12 least-risk portfolio of resources.

13 **Q. How did these three PLEXOS models work together to inform the economic**
14 **analysis presented in PacifiCorp's 2023 IRP and CEIP Biennial Update?**

15 A. In the first step, resource portfolios were developed using the LT model. The LT
16 model develops portfolios of resources that minimize operating costs for existing and
17 prospective new resources, subject to system load balance, reliability, and other
18 constraints. Over the 20-year planning horizon, the model optimizes resource
19 additions subject to known or projected resource costs and load constraints. These
20 constraints include seasonal loads, operating reserves, and regulation reserves, in

⁵ Not all elements of revenue requirement are included in the IRP. For instance, rate base for certain assets whose lives will not change because of the IRP (i.e., existing transmission assets) are not stored in the model, because they would be the same in all portfolios. The IRP relies on comparative analysis among different portfolios, and consequently, rate base from existing assets included in a portfolio unaffected by IRP outcomes would net to zero when compared to any other portfolio developed as part of an IRP.

1 addition to a minimum capacity reserve margin for each load area represented in the
2 model.

3 To accomplish these optimization objectives, the LT model performs a least-
4 cost dispatch function for existing and potential planned generation, while
5 considering cost and performance of existing contracts and new DSM alternatives
6 within PacifiCorp's transmission system. Resource dispatch is based on
7 representative data blocks for each of the 12 months of every year. This dispatch
8 function also determines optimal electricity flows between zones and includes spot
9 market transactions for system balancing and seeks to minimize the system PVRP.

10 Each portfolio developed by the LT model must have sufficient capacity to be
11 reliable over the IRP's 20-year planning horizon. The resource portfolios reflect a
12 combination of planning assumptions such as resource retirements, CO₂ prices,
13 wholesale power and natural gas prices, load growth net of assumed private
14 generation penetration levels, cost and performance attributes of potential
15 transmission upgrades, and new and existing resource cost and performance data,
16 including assumptions for new supply-side resources and incremental DSM
17 resources.

18 **Q. What is the next step in the modeling process?**

19 A. In the second step, PacifiCorp conducted a reliability assessment using the ST model.
20 The ST model begins with an LT model portfolio that has not been assessed for
21 hourly reliability and simulates the portfolio at an hourly level over the 20-year
22 planning horizon. This results in two critical pieces of data: (1) reliability shortfalls
23 by hour; and (2) the value of energy potential of each resource to the system. This

1 information then determines the most cost-effective resource additions needed to
2 meet reliability shortfalls, leading to a reliability-modified portfolio. The ST model is
3 then run again with the modified portfolio to calculate an initial PVRR, that is risk-
4 adjusted by outcomes of MT model stochastics that occur in the third step of the
5 process.

6 **Q. Please describe how the MT model is used to conduct cost-and-risk analysis.**

7 A. In the third step, resource portfolios developed by the LT model and adjusted for
8 reliability by the ST model are simulated in the MT model to produce metrics that
9 support comparative cost-and-risk analysis among the different resource portfolio
10 alternatives. The stochastic simulation in the MT model produces a dispatch solution
11 that accounts for chronological commitment and dispatch constraints. The MT model
12 simulation incorporates stochastic risk in its production cost estimates by using the
13 Monte Carlo sampling of stochastic variables, which include load, wholesale
14 electricity and natural gas prices, hydro generation, and thermal unit outages. The MT
15 model results are used to calculate a risk adjustment that is combined with the ST
16 model system costs to achieve a final risk-adjusted preferred portfolio of resources.

17 **Q. What does the final risk-adjusted preferred portfolio of resources represent?**

18 A. The preferred portfolio is the least-cost, least-risk systemwide portfolio of resources
19 that, based on then-current assumptions and data, will best serve PacifiCorp's
20 customers over the 20-year planning period.

21 **Q. How are the IRP preferred portfolio and the CEIP portfolio related?**

22 A. The IRP preferred portfolio and the CEIP portfolio are developed using the same
23 overall types and vintage of input assumptions across the system. However, the two

1 portfolios are developed using different price-policy scenarios.

2 **Q. How did PacifiCorp create the CEIP Biennial Update portfolio?**

3 A. Creating the CEIP Biennial Update portfolio involved four steps. Beginning with
4 PacifiCorp's 2023 IRP, the company: (1) created a system-wide portfolio optimized
5 using the SCGHG price assumption; (2) identified which resources from this six-state
6 portfolio optimized under SCGHG should be allocated to Washington customers; (3)
7 determined whether any additional resources or incremental actions were necessary to
8 comply with CETA (based on the same PLEXOS modeling steps discussed above);
9 and (4) extrapolated results from PacifiCorp's 20-year planning horizon through
10 2045, creating the updated CEIP portfolio (W-10 CETA).⁶ New generation resources
11 incremental to the systemwide portfolio optimized under SCGHG are considered situs
12 to Washington, while energy efficiency and demand response resources (which are
13 situs resources by their nature) are automatically maximized for Washington in both
14 the initial IRP analysis and final CEIP analysis. These additional actions or resources
15 becomes PacifiCorp's CETA-compliant CEIP portfolio. Each step is discussed below.

16 **Q. What is the SCGHG?**

17 A. The SCGHG is an administratively required cost that represents Washington's
18 estimate of the direct and indirect costs associated with the emissions of greenhouse
19 gases.⁷ The SCGHG is applied such that the SCGHG is reflected in market prices and
20 dispatch costs for the purpose of developing the portfolio and the selection of long-
21 term resources, as well as being included in the calculations of operational outcomes.

⁶ *In re PacifiCorp, d/b/a Pac. Power & Light Co., Regarding 2021 Integrated Resource Plan Compliance*, Docket No. UE-200420, Washington 2021 Integrated Resource Plan Two-Year Progress Report (Amended Final), Vol. 1, at 247.

⁷ RCW 19.280.030(3)(a).

1 **Q. Did PacifiCorp include the SCGHG planning adder in every portfolio in the**
2 **2023 IRP filings?**

3 A. No. PacifiCorp plans for its six-state system, and no state that PacifiCorp operates
4 in—including Washington—requires utilities to incorporate the SCGHG as a dispatch
5 adder that impacts the expected operations of existing generating facilities. Rather
6 Washington requires utilities to use the SCGHG a planning adder for IRP and CEIP
7 purposes. Because of that, PacifiCorp did not include the SCGHG in every portfolio
8 in its 2023 IRP filings.

9 **Q. In the first step of the CEIP Biennial Update preferred portfolio planning**
10 **process, can you please explain how PacifiCorp’s CEIP Biennial Update**
11 **incorporated the SCGHG?**

12 A. Yes. In every IRP, PacifiCorp models several carbon adders based on assumptions of
13 real-world conditions during the 20-year planning horizon.⁸ Under then-current
14 planning assumptions, PacifiCorp’s 2023 IRP determined that medium carbon and
15 medium natural gas prices were the conditions that were the most reasonably
16 expected to occur over the planning horizon. These two conditions are reflected in
17 “MM” of the P-MM portfolio.⁹

18 For the CEIP Biennial Update, PacifiCorp used the P-SC portfolio in place of
19 the P-MM portfolio, which effectively replaced the medium carbon planning adder
20 with the SCGHG, as the starting point for CETA analysis. For Washington resource
21 selections, the SCGHG was assumed to start in 2023, and just like the medium carbon

⁸ *In re PacifiCorp, d/b/a Pac. Power & Light Co., Regarding 2021 Integrated Resource Plan Compliance*,
Docket No. UE-200420, Washington 2021 Integrated Resource Plan Two-Year Progress Report (Amended
Final, Vol. 1, at 230, Figure 8.4 (May 31, 2023).

⁹ *Id.* at 242, Table 8.11.

1 planning adder, the SCGHG price is reflected in market prices and dispatch costs for
2 the purposes of developing each portfolio (i.e., incorporated into capacity expansion
3 optimization modeling).

4 **Q. Was the CEIP Biennial Update portfolio fully optimized using the SCGHG**
5 **planning adder?**

6 A. Yes. The portfolio P-SC was developed using the SCGHG in the resource capacity
7 expansion decisions, specifically, in the LT modeling step of portfolio development.
8 This means that the SCGHG dispatch adder is applied to all emitting resources on a
9 dollars per pound basis, where the model calculates the amount of emissions based on
10 fuel usage and is also reflected in market prices.

11 **Q. Did this result in the CEIP Biennial Update including the SCGHG in the**
12 **selection of each resource allocated to Washington?**

13 A. Yes.

14 **Q. In the second step, how did PacifiCorp identify resources that should be**
15 **allocated to Washington customers?**

16 A. Because the PLEXOS software plans for system-wide resources, the company had to
17 perform a post-modelling allocation exercise to determine what renewable and non-
18 emitting resources were necessary to comply with CETA while also serving
19 Washington customers over the 20-year planning horizon.

20 This exercise built from the system-optimized P-SC portfolio and layered on
21 several material assumptions, including then-relevant forecasts of Washington load
22 growth and market prices, and what resources qualified as CETA-compliant

1 renewable and non-emitting energy.¹⁰ For example, when a resource was expected to
2 generate renewable energy certificates (RECs), and that energy was allocated to
3 Washington, that resource was assumed to generate one renewable megawatt-hour
4 that could be used to comply with CETA for every REC generated. Additionally,
5 PacifiCorp assumed that nuclear and hydrogen non-emitting peaking plants would
6 qualify as non-emitting resources under CETA.

7 This analysis identified the resources that were forecasted to be allocated to
8 Washington customers, and as a result, PacifiCorp's CEIP includes a portion of the
9 resources that were included in the system-optimized P-SC portfolio.

10 **Q. Did this allocation of system resources result in a CETA-compliant portfolio?**

11 A. No. As described in the CEIP Biennial Update, PacifiCorp's modeling and post-
12 allocation processes identified two de minimis capacity shortfalls when evaluating the
13 Washington-allocated CETA-compliant energy against the CETA requirements from
14 2030 through 2045.¹¹ In 2030, PacifiCorp's preferred portfolio indicated an additional
15 67 megawatts (MW) of average annual capacity was needed to achieve CETA's
16 compliance requirements, and an additional 72 annual MW for 2031. These shortfalls
17 are slight compared to the several gigawatts of resources included in the Washington-
18 allocated P-SC CEIP portfolio, but nonetheless would not have resulted in a CETA-
19 compliant portfolio.

¹⁰ *In re PacifiCorp, d/b/a Pac. Power & Light Co. Clean Energy Implementation Plan*, Docket No. UE-210829, CEIP Biennial Update at 9 (Nov. 1, 2023) (CEIP Biennial Update).

¹¹ *Id.* at 33-34.

1 **Q. What was the third step to create the CEIP Biennial Update preferred portfolio?**

2 A. To compensate for this deficit in 2030 and 2031, PacifiCorp added 240 MW of
3 incremental Washington-specific resources in 2030, including 120 MW of small-scale
4 wind capacity, and 120 MW of small-scale solar capacity.¹² These incremental
5 resource additions were added to the Washington-allocated P-SC portfolio.

6 **Q. What was the final step to create the CEIP Biennial Update preferred portfolio?**

7 A. While PacifiCorp's IRP planning horizon is currently 20 years (ending in 2043 for the
8 2023 IRP), the company extrapolated results from 2043 forward through 2045 for the
9 CEIP Biennial Update. This is consistent with traditional IRP modeling, as the IRP
10 uses data extrapolation for many inputs in the 20-year planning horizon (for example,
11 including the escalation calculations used to determine solar, wind and battery storage
12 profiles).

13 These four steps, derived from PacifiCorp's six-state planning processes,
14 resulted in the CEIP Biennial Update portfolio, W-10 CETA.

15 **Q. Were PacifiCorp's assumptions and methodologies for the CEIP Biennial
16 Update reasonable and based on relevant information at the time?**

17 A. Yes. However, as discussed in the testimony of PacifiCorp witness Matthew D.
18 McVee, several of the assumptions and inputs included in the Revised CEIP are now
19 out-of-date.

¹² *Id.*

1 **III. UPDATED INTERIM AND SPECIFIC CLEAN ENERGY TARGETS**

2 **Q. What is the purpose of this section of your testimony?**

3 A. I provide additional explanation of how the company’s analysis resulted in lowered
4 interim and specific renewable energy targets in the CEIP Biennial Update compared
5 to the Revised CEIP.

6 **Q. Can you explain how PacifiCorp’s analysis developed interim targets for the**
7 **CEIP Biennial Update?**

8 A. Yes. After identifying the share of resources from P-SC that were allocated to
9 Washington customers, adding the 240 MW of incremental resources, and
10 extrapolating through 2045, PacifiCorp identified which generation sources from this
11 total portfolio of resources could count towards CETA’s renewable and non-emitting
12 energy targets. From the final resources included in the W-10 CETA portfolio,
13 PacifiCorp developed a forecast of renewable and non-emitting energy allocated to
14 Washington customers and divided that forecast by anticipated Washington retail
15 sales in each year over the planning horizon. The resulting quotient was the
16 company’s interim target for each year. This methodology was consistent with the
17 methods employed in the Revised CEIP.

18 Based on this methodology, PacifiCorp projected meeting 33 percent of
19 Washington retail sales with renewable and non-emitting generation by 2025, 82
20 percent in 2030, and over 100 percent beginning in 2032.¹³ This is contrasted with the

¹³ *Id.* at 8, Figure 1.1.

1 Revised CEIP, which projected 60 percent by 2025, 84 percent by 2030, and not
2 reaching 100 percent until 2040.¹⁴

3 **Q. Can you provide additional discussion on why the CEIP Biennial Update's**
4 **interim and specific clean energy targets are lower until 2031 compared to the**
5 **Revised CEIP?**

6 A. Yes. As noted in PacifiCorp witness McVee's testimony, several of the assumptions
7 incorporated into the 2021 CEIP and Revised CEIP are no longer reasonable due to
8 changed circumstances. I provide additional explanation on the impact of updated
9 resource allocation assumptions, changing load forecasts and near-term resource
10 availability and procurement efforts on the calculated interim targets in the CEIP
11 Biennial Update.

12 **Q. Would it be possible to quantify how these issues discussed in the testimony of**
13 **PacifiCorp witness McVee contributed to PacifiCorp's reduced interim targets?**

14 A. Generally, yes, however it is difficult to create an apples-to-apples comparison. While
15 PacifiCorp can draw connections between the drivers that have been discussed
16 qualitatively and the resulting data, it is difficult to make a direct comparison between
17 the two sets of targets, because they are based off different underlying system-
18 optimized portfolios that change for all the reasons that the IRP changes every cycle.

19 Besides these run-of-the-mill IRP process changes that would skew any direct
20 comparison, there have also been small changes to PacifiCorp's calculation for
21 interim targets, reflecting improvements in the company's understanding of the
22 categorization of CETA-qualifying generation (for example, including qualifying

¹⁴ *In re PacifiCorp, d/b/a Pac. Power & Light Co. Clean Energy Implementation Plan*, Docket No. UE-210829, Revised 2021 CEIP at 11, Figure 1.1 (Mar. 13, 2023) (Revised CEIP).

1 hydro resources as “REC-generating” rather than as “non-emitting”). For these
 2 reasons, PacifiCorp cannot with measurable certainty identify specific reductions in
 3 the CEIP Biennial Update interim targets caused by any specific variable or
 4 assumption.

5 **Q. Nonetheless, can you provide a high-level comparison of outcomes between the**
 6 **CEIP Biennial Update and Revised CEIP?**

7 A. Yes. Table 1 compares outcomes from the CEIP Biennial Update and the Revised
 8 CEIP through the first four-year compliance period (2022-2025); each row of data
 9 represents the change between the values in megawatt-hours (MWh).

TABLE 1—Biennial CEIP Biennial Update Less Revised CEIP¹⁵

	Notes	<i>MWh</i>				Total
		2022	2023	2024	2025	
Washington Retail Sales	WA load net of DSM, PG	0	52,110	49,434	37,246	138,790
WA Allocation of System Energy	all generating resources	0	1,038,962	-1,456,065	-1,437,461	-1,854,563
Proxy Market (allocation to Load)	Assumed to be the source of energy covering the gap between allocation and load	0	-983,367	731,037	1,698	-250,632
WA Non-emitting (MWh)	Includes Nuclear, Non-emitting peakers	0	0	0	0	0
WA REC Generating Resources (MWh)	Includes hydro	0	-169,837	-609,198	-1,082,762	-1,861,797
Total CETA compliant		0	-169,837	-609,198	-1,082,762	-1,861,797

10 Table 1 represents the inputs that are used to calculate the interim clean
 11 energy targets on an annual basis, and specifically shows the differences between the
 12 CEIP Biennial Update relative to the Revised CEIP.

13 The first row of data, “Washington Retail Sales” represents the change in the
 14 forecasted retail sales (MWh): Washington customer load at the meter, net of
 15 demand-side resources (including new energy efficiency selections from the CEIP

¹⁵ Please refer to 210829-PAC-RG-WP-6-17-24.xlsx.

1 portfolio) and line losses. The second row, “WA Allocation of System Energy”,
2 shows the change in all energy forecasted to serve Washington customers (MWh).
3 The third row “Proxy Market” is the change in the gap between forecasted retail sales
4 and all available resource generation (MWh) and is purely informational. The fourth
5 row of data “WA Non-Emitting” shows the change in all non-emitting energy
6 resources forecasted to serve Washington customers—note that in this CEIP period,
7 there are no resources currently available to serve customers that fall within this
8 definition of non-emitting. The fifth row of data “WA REC Generating Resources”
9 includes the change in all existing and new renewable resources that are assumed to
10 generate RECs compliant with CETA, including hydro resources. And finally, the last
11 row, “Total CETA compliant”, is the change in the total non-emitting and REC
12 generating energy forecasted to serve Washington customers.

13 **Q. What does the comparison between the annual data for the CEIP Biennial**
14 **Update and the Revised CEIP show in relation to the interim targets?**

15 A. Interim clean energy targets are simply calculated as retail sales divided by total
16 CETA-compliant energy in each year. Table 1 summarizes the changes in the inputs
17 to that calculation that lead to the decreases in interim targets for 2023-2025.

18 First, there is an increase in the forecasted retail sales in the CEIP Biennial
19 Update of approximately 37 to 52 gigawatt-hours (GWh) per year, as compared to the
20 Revised CEIP, based on updated load forecasts. The Revised CEIP assumed that
21 PacifiCorp will need to serve 16,288,439 MWh over the first CEIP compliance period
22 (2022-2025);¹⁶ the CEIP Biennial Update assumes 16,427,372 MWh over the same

¹⁶ Revised CEIP at 12, Table 1.1.

1 period.¹⁷ This is almost a full percentage increase in retail sales over a single four-
2 year period, which is used in the denominator in the calculation of clean energy
3 interim targets. Thus, the increase in retail sales increased the volume of CETA-
4 compliant energy that the company required to meet the same target (i.e. a one MW
5 increase in the forecasted retail sales would require a one MW increase in the
6 forecasted CETA-compliant for energy for the interim target to remain unchanged).

7 Second, total Washington-allocated REC-generating resources decreased by
8 approximately 170,000 MWh in 2023 to over 1,082,000 MWh less REC-generating
9 resources in 2025.¹⁸ There is a total decrease of roughly 1,862,000 MWh in REC-
10 generating renewable energy for Washington over the four-year period. The decrease
11 in REC-generating energy can be traced back to the explanations in the testimony of
12 PacifiCorp witness McVee regarding updated resource allocations, thermal resource
13 assumptions and near-term resource availability.

14 **Q. Can you expand upon why total REC-generating energy forecasted to serve**
15 **Washington customers decreased in the CEIP Biennial Update?**

16 A. Yes. There are two broad issues that contribute to the decrease in total REC-
17 generating energy available to serve Washington retail sales in the CEIP Biennial
18 Update: resource allocation assumptions and near-term resource availability.

19 First, the change in assumptions regarding a Post-Interim Period allocation
20 methodology in 2024 and onwards resulted in lower assumed allocation factors across
21 all new CETA-compliant resources. Rather than receiving a higher fixed allocation

¹⁷ CEIP Biennial Update at 8-9, Table 1.2; *see also In re PacifiCorp, d/b/a Pac. Power & Light Co., Regarding 2021 Integrated Resource Plan Compliance*, Docket No. UE-200420, Washington 2021 Integrated Resource Plan Two-Year Progress Report (Amended Final), Volume II at 409, Appendix O, at 408, Table O.1.

¹⁸ *See* Table 1 above.

1 factor of any renewable resources added in 2024-2025, Washington customers are
2 assumed to only receive a dynamic system-share factor. Additionally, existing system
3 renewable resources are also no longer assumed to be allocated by a fixed share based
4 on historical load but are allocated by the same dynamic system share factor as
5 defined under the 2020 Protocol and WIJAM. This change in the allocation
6 assumptions generally resulted in lower allocations of all system renewable and non-
7 emitting resources for Washington customers. While retail sales increased, forecasted
8 Washington load growth, relative to other jurisdictions, decreased. Thus, the forecast
9 of the dynamic system share allocation for Washington is decreasing, which helps
10 contribute to a lower allocation of existing and new REC-generating resources.
11 Additionally, the increase in available coal-fueled and natural-gas-converted
12 resources to serve Washington customers helps lower the relative need for other
13 REC-generating resource capacity.

14 Second, REC-generating energy reported in the CEIP Biennial Update reflects
15 the fact that there were delays in new renewable resources available to come online
16 by 2025. This was caused by impacts to near-term resource availability given
17 repricing and competition for CETA-compliant resources from the 2020 All Source
18 Request For Proposals. While it is hard to disentangle the impacts of both reduced
19 allocations of system renewables and less incremental renewable capacity, both were
20 important updates to the assumptions in the CEIP Biennial Update.

21 Again, while it is impossible to draw direct conclusions whether any of
22 PacifiCorp's changed assumptions drove specific percentage or MWh reductions in
23 the company's interim targets, this analysis should provide a meaningful overview of

1 the delta between the company's two CEIP interim target assumptions and
2 calculations.

3 **Q. Do you have anything else you would like to add regarding PacifiCorp's interim**
4 **targets?**

5 A. Yes. PacifiCorp's interim targets rely on forecasts of system-wide and Washington-
6 allocated energy and retail electric sales, and additional variables that are outside of
7 the company's control. Even under the best circumstances, PacifiCorp cannot
8 guarantee that actual conditions will reflect forecasted interim targets.

9 **IV. PACIFICORP PROCUREMENT STRATEGIES**

10 **Q. Is PacifiCorp concerned that these updated interim targets will impact its**
11 **procurement strategies?**

12 A. No. PacifiCorp is sensitive to concerns regarding its lowered interim targets.
13 However, PacifiCorp stands by its representations in its CEIP Biennial Update that it
14 is on-track to comply with CETA's 100 percent clean energy requirements almost a
15 decade early.

16 This is because of two reasons. First, PacifiCorp has a need for new capacity
17 and energy system resources over the next twenty years. To that end, in 2024 we are
18 adding 1,163 MW of incremental system wind, and another 400 MW of incremental
19 system wind in 2025. In 2026 we are adding 400 MW of incremental solar, and 400
20 MW of incremental battery storage capacity. And we are in advanced negotiations
21 with third parties developing 755 MW of battery storage capacity that can come
22 online by summer of 2026. PacifiCorp also plans to propose specific procurement
23 actions in the 2025 IRP and CEIP to further address its need for additional resources.

1 Washington will receive a share of all new resources, and all new renewable and non-
2 emitting resources will increase the share of Washington retail electricity that is
3 served by CETA-compliant energy (or otherwise displace emitting resources through
4 storage capacity).

5 These are material resource additions that will help transform the mix of
6 resources that serve our customers over the next several decades.

7 Second, because PacifiCorp has been on an independent trajectory to serve
8 Washington customers with renewable and non-emitting resources over the last
9 several planning cycles, the company has a relatively small need for additional
10 Washington-specific CETA-compliant resources to comply with CETA's 2030
11 requirements.¹⁹ PacifiCorp's analysis indicates that it only needs 240 MW of CETA-
12 compliant resources to comply with the law above what system procurement is
13 expected to provide.²⁰ Currently, PacifiCorp anticipates meeting this need with 120
14 MW of small-scale solar, and another 120 MW of small-scale wind.

15 PacifiCorp's updated interim targets do not stand in the way of this progress.
16 Rather, updating interim targets ensures that compliance is measured against the
17 appropriate volume of retail electricity sales, and informed by the most relevant
18 developments regarding the volume and mix of emitting and non-emitting resources
19 that serve PacifiCorp's Washington customers.

¹⁹ *E.g., In re PacifiCorp, d/b/a Pac. Power & Light Co. Clean Energy Implementation Plan*, Docket No. UE-210829, 2023 CEIP Progress Report at 2 (Jul. 3, 2024) (indicating PacifiCorp's Washington retail customers were served with 31 percent CETA-compliance electricity).

²⁰ CEIP Biennial Update at 33-34, Figure 4.1.

1 V. UPDATED INCREMENTAL COST

2 Q. What is the purpose of this section of your testimony?

3 A. I discuss PacifiCorp’s updated incremental cost analyses from the CEIP Biennial
4 Update.

5 Q. Can you describe how PacifiCorp calculated incremental cost?

6 A. Yes. As defined in Washington Administrative Code (WAC) 480-100-660(1),
7 PacifiCorp determined the incremental cost of actions taken to comply with the
8 Revised Code of Washington (RCW) §§19.405.040 and 19.405.050 by comparing its
9 lowest reasonable cost portfolio the CEIP portfolio (W-10 CETA), with the
10 Alternative Lowest Reasonable Cost Portfolio that would have resulted in the absence
11 of CETA (P-SC). The incremental cost forecast was updated in the CEIP Biennial
12 Update.

13 The modeled incremental cost is defined as the forecasted difference in
14 Washington-allocated costs between W-10 CETA and P-SC for the CEIP planning
15 window 2022-2025. Because no additional actions needed to be taken to comply with
16 CETA before 2030, there is effectively no modeled incremental cost during this first
17 four-year CEIP planning period.²¹ Any differences between the portfolio costs during
18 this period are negligible and within the bounds of arbitrary model outcomes.

19 However, PacifiCorp anticipates incurring certain CETA implementation
20 costs not related to procurement efforts during the four-year period. These include
21 administrative costs such as Equity Advisory Group (EAG)-related moderation and
22 communication costs, incremental staffing requirements, and costs related to

²¹ E.g., CEIP Biennial Update, Table 4.1 (noting only 2 million in incremental costs over four-year period).

1 activities undertaken to enhance reach and equitable distribution of DSM programs.
2 These implementation costs above PacifiCorp's procurement efforts average
3 approximately \$1.65 million dollars per year.²²

4 The estimated annual revenue requirement impact of CETA-compliance,
5 combining both the modeled and non-modeled costs, amounted to an average of
6 \$1.35 million per year across the four-year CEIP period.²³

7 **Q. Does PacifiCorp's estimate of incremental cost represent actual costs?**

8 A. No. The CEIP is a planning document and provides an estimate of the costs
9 associated with CETA compliance. Actual compliance costs will be determined in
10 subsequent rate proceedings.

11 **Q. Does PacifiCorp anticipate staying below CETA's cost cap for the first
12 implementation period?**

13 A. Yes.

14 VI. CONCLUSION

15 **Q. Does this conclude your direct testimony?**

16 A. Yes.

²² CEIP Biennial Update at 35, Table 4.2.

²³ CEIP Biennial Update at 36, Table 4.3 (average of total costs across 2022-2025).