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PacifiCorp d/b/a Pacific Power & Light Company

Washington Energy and Emissions Intensity Metrics 2024 Report

May 30, 2025

Introduction

In November 2006, Washington voters approved Initiative 937, establishing the Energy Independence Act (EIA), which requires electric utilities serving at least 25,000 retail customers to use renewable energy and energy conservation in serving those customers. In September 2015, the Washington Utilities and Transportation Commission (Commission) adopted new administrative rules to implement several legislative changes to the EIA, including WAC 480-109-300, pertaining to the reporting of energy and emissions intensity metrics. On May 7, 2019, the Washington Legislature passed the Clean Energy Transformation Act (CETA), which commits Washington to an electricity supply free of greenhouse gas emissions by 2045. The Commission amended WAC 480-109-300 effective January 28, 2021, following rulemaking by Washington Department of Ecology in WAC 173-444 that established a compliance mechanism under CETA, RCW 19.405.070 and 19.405.020(22), by defining the method for calculation of the greenhouse gas emissions content in electricity an electric utility supplies to its retail electric customer in Washington state. Specifically, it provided a methodology for determining the emissions factor for a specified generating unit and established an emissions rate for unspecified electricity.

Revised WAC 480-109-300 states, in relevant part:

> *(1) A utility must report its greenhouse gas content calculation and metrics of energy and emissions intensity to the commission on or before June 1st of each year. The report must include annual values for each metric for the preceding ten calendar years. Each value reported must be based on the annual energy or emissions from all generating resources providing service to customers of that utility in Washington state, regardless of the location of the generating resources. When the metrics are calculated from generators that serve out-of-state and in-state customers, the annual energy and emissions outputs must be prorated to represent the proportion of the resource used by Washington customers.*
> *(2) Each utility must perform its greenhouse gas content calculation in accordance with the rules enacted by the department of ecology, consistent with RCW 19.405.020 (22)*
> *(3) In addition to the greenhouse gas content calculation, the report shall include the following metrics:*
> *(a) Average megawatt-hours per residential customer;*
> *(b) Average megawatt-hours per commercial customer;*
> *(c) Megawatt-hours per capita;*
> *(d) Million short tons of CO_2e emissions; and*
> *(e) Comparison of annual million short tons of CO_2e emissions to 1990 emissions.*

PacifiCorp d/b/a Pacific Power & Light Company (PacifiCorp or Company), a division of PacifiCorp, submits this 2024 Energy and Emissions Intensity Report (Emissions Report) to the Commission in accordance with reporting requirements established as part of the EIA and WAC 480-109-300 effective January 28, 2021.

This report is consistent with the collaborative workshop documents addressing annual reporting requirements, in Docket UE-131723.

Executive Summary

This report includes the estimated carbon dioxide equivalent emissions associated with serving PacifiCorp's Washington customers between 2015 and 2024, compared to an estimate of the company's 1990 carbon dioxide (CO_2) emissions. PacifiCorp's 1990 carbon dioxide emission level is estimated to be 2,399,078 short tons or 2,176,408 metric tons, as established during workshops in Docket UE-131723, regarding the emissions reporting requirements.

As shown in Table 1 below, PacifiCorp estimates the historical Washington-allocated emissions from 2015 to 2024 to be between approximately 2.34 and 2.93 million metric tons of CO_2 equivalent (CO_2e) annually, or between 108% and 135% of 1990 emissions.[1]

Table 1

Year	Total Annual CO_2e Emissions (Short Tons)	Total Annual CO_2e Emissions (Metric Tons)	Ratio of Annual CO_2 Emissions to 1990 Emissions
2015	3,152,164	2,859,596	131.39%
2016	2,916,164	2,645,500	121.55%
2017	3,154,615	2,861,820	131.49%
2018	2,946,128	2,672,683	122.80%
2019	3,234,494	2,934,285	134.82%
2020	2,897,337	2,628,421	120.77%
2021	2,984,983	2,707,932	124.42%
2022	2,932,065	2,659,926	122.22%
2023	2,580,895	2,341,350	107.58%
2024	2,613,402	2,370,839	108.93%

[1] The ratio of Annual Emissions to 1990 Emissions is likely overstated because the 1990 emissions did not include CO_2 equivalent measurements of N_2O and CH_4, nor emissions associated with generation used to cover transmission losses.

Prior 10-year Annual Metrics for all Generating Resources Serving Washington Customers

Table 2 below provides the average megawatt-hour (MWh) per residential and commercial customer, the average megawatt-hour per capita, and estimated population served over time.[2]

The MWh per customer is determined by dividing the proportional MWh for each customer class by the number of customers for the same customer class. The MWh per capita represents the total annual load for the year, divided by the estimated population served for the year.

Table 2

Year	Average MWh per Residential Customer	Average MWh per Commercial Customer	MWh per Capita	Population
2015	15.91	111.11	15.16	300,450
2016	16.15	102.30	14.68	301,905
2017	17.21	106.02	15.18	303,749
2018	15.33	107.02	14.69	296,875
2019	16.52	104.00	14.91	305,829
2020	15.55	99.72	14.43	308,836
2021	15.93	100.74	14.91	307,849
2022	17.06	100.36	14.80	313,990
2023	16.04	99.91	13.75	315,704
2024	15.42	98.56	14.19	315,568
10-Year Average	**16.11**	**102.98**	**14.67**	**307,076**

PacifiCorp's Washington population had steady year-over-year growth between 2015 and 2023, except for slight reduction in 2021 and 2024.

[2] In this report, the term 'customer' represents the number of customers billed. The term 'population' refers to the estimated number of people served within the residential customer count.

Subtotal Metrics – Energy and Emissions from Unknown Generation Sources[3]

The table below shows the annual Washington-allocated energy, emissions, and percentage of load served from unknown generation sources.

Table 3

Unknown Resource - Annual Metrics[3]			
Year	**MWh**	**CO_2e Metric Tons Emissions**	**Percentage of Load Served**
2015	596,016	260,459	13.28%
2016	847,919	370,540	19.73%
2017	815,875	356,537	17.78%
2018	662,441	289,486	15.64%
2019	756,345	330,523	17.20%
2020	901,501	393,956	20.39%
2021	824,812	360,443	17.90%
2022	987,740	431,642	21.04%
2023	1,220,940	533,551	27.86%
2024	1,224,396	535,061	27.21%

[3] Energy supply where the source of generation cannot be specified is categorized under "Unknown Resources," such as market purchases and sales. In contrast, "Known Resources" are those where generation can be directly attributed to a specific facility, such as an owned resource or long-term contract.

Carbon Emissions Trend Analysis

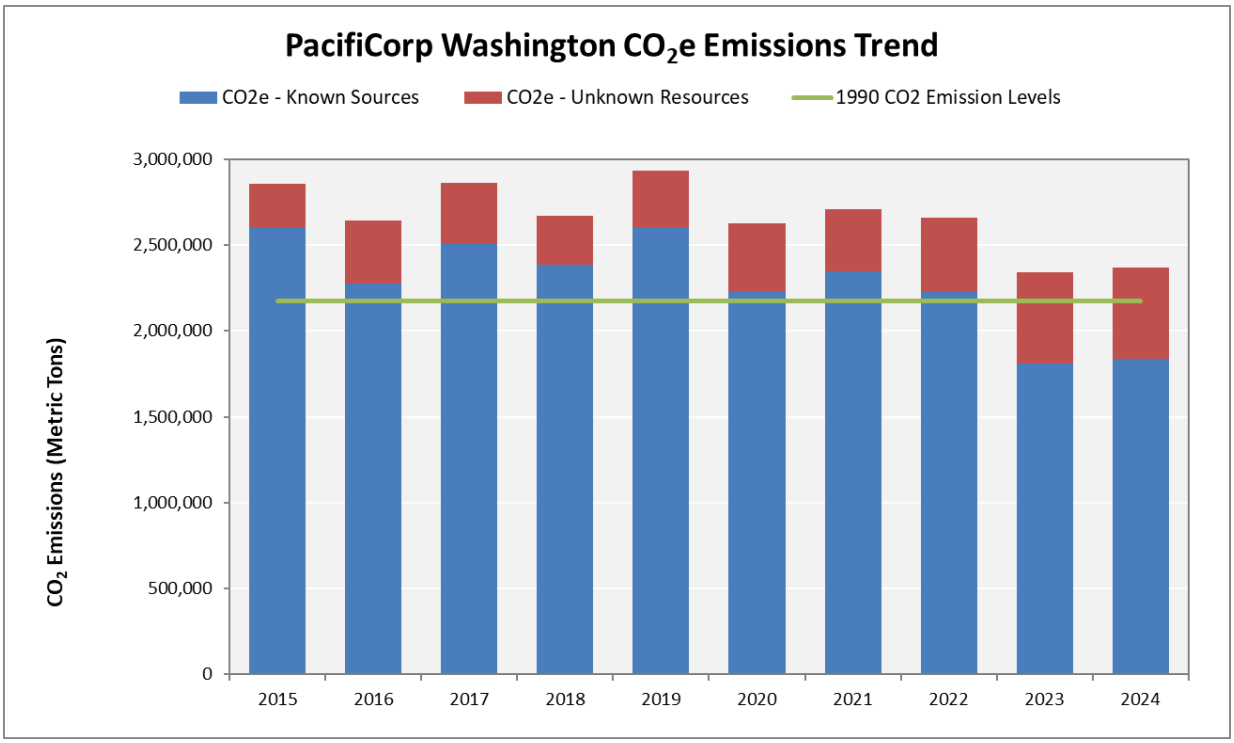
There are multiple factors that generally impact a utility's carbon dioxide emissions levels. These factors include, but are not limited to:

- Changes in demand due to economic growth or recession
- The price of different fuel and energy sources
- Variations in generation and the relative resource mix in a particular year
- State policy developments such as renewable portfolio standards, emissions reduction requirements, and technology-specific emissions performance standards
- Demand-side programming and energy efficiency

Figure 1 shows PacifiCorp's Washington-allocated CO_2e emissions between 2015 and 2024. Over this period, annual emissions associated with Washington ranged between 2.34 and 2.93 million metric tons of CO_2e. Emissions fluctuated year-to-year due to several factors. An uptick in 2019 was partially attributed to wind facilities being offline for capital upgrades to increase output and efficiency. Emissions dropped in 2020 as wind generation resumed following the repowering of resources. In 2021, emissions rose slightly due to load growth, and 2022 levels remained generally consistent with 2021. In reporting year 2023, PacifiCorp observed a notable reduction in emissions—the lowest in the past decade—representing an 11.98% decrease from 2022. This reduction in CO2e was primarily driven by coal supply shortages across certain coal-fired facilities. To compensate for the shortfall, there was an increased reliance on unspecified market purchases, which generally carry a lower emission factor than coal. This trend combined with increased usage of cleaner energy sources and aligned with regulatory mandates across multiple states, contributed to a meaningful net reduction in emissions.

In 2024, emissions rose slightly—up 1.26% from 2023—driven in part by a higher load. While coal-fired generation decreased significantly by 19.3%, natural gas and unspecified market purchases increased to offset the reduction and meet the increased load. An unfavorable hydro year further limited renewable output, though wind generation saw a modest increase. Collectively, these shifts in the generation mix contributed to the overall rise in emissions.

Figure 1



PacifiCorp's carbon emissions are shaped by a relationship between operational, market, and environmental factors. While isolating the impact of any one driver is challenging, some consistent patterns are evident. Hydroelectric output, for example, plays a pivotal role: in historically dry years such as 2015 and 2018, reduced hydroelectric generation led to increased market reliance, contributing to elevated emissions from unspecified sources. Similarly, 2024's unfavorable hydroelectric conditions required increased dispatch from natural gas resources and purchases from the market, despite continued declines in coal generation. Across the decade, PacifiCorp's gradual coal retirement trajectory has supported long-term emissions reductions, while repowering efforts—including those that temporarily reduced wind output in 2019—have ultimately strengthened renewable capacity. In addition to resource availability, external factors such as the COVID-19 pandemic in 2020 and evolving market participation through the Western Energy Imbalance Market (WEIM) have also influenced annual emissions. These long-term transitions—including increasing renewable buildout, resource balancing, and shifts in customer demand—underscore the complexity of emissions forecasting and the importance of maintaining system flexibility.

Changes from Prior Years

PacifiCorp's 2024 Washington-allocated emissions increased by 1.26% compared to 2023, while Washington load showed a 3.16% increase.

Report Recommendations

PacifiCorp makes the following recommendations to Staff and the Commission regarding future Energy and Emissions Intensity reports.

In March 2024, HB 1955 was signed into law and repealed RCW 19.405.070 and RCW 19.405.020(22), which were reporting requirements passed in the Clean Energy Transformation Act. These reporting requirements became irrelevant after the passage of the Climate Commitment Act (CCA), which has implemented more complex and third-party verified emissions reporting mechanism for covered entities, including all three Washington electric investor-owned utilities. The Washington Department of Commerce supported HB 1955, which eliminated duplicative and unnecessary greenhouse gas emissions reporting from utilities.

Currently, WAC 480-109-300(2) requires each utility to calculate its GHG content "in accordance with the rules enacted by the department of Ecology, consistent with RCW 19.405.020(22)." However, as stated above, RCW 19.405.020(22) was repealed by HB 1955 to eliminate duplicative reporting. Therefore, to further streamline greenhouse gas reporting in the state, PacifiCorp recommends Staff consider the following proposals:

- Remove the Energy and Emissions Intensity report requirement – Due to the passage of HB 1955, none of the information reported in Energy and Emissions Intensity is required under statute. While these metrics proved helpful before the passage of the Clean Energy Transformation Act and the Climate Commitment Act, this information is now unnecessary and redundant as Clean Energy Implementation Plans (CEIP), CEIP biannual updates, and Community Benefit Indicators (CBIs) are the focus of utilities, the Commission, and stakeholders to measure trends in greenhouse gas emissions. Keeping the Energy and Emissions Intensity reports may cause confusion and show inconsistency with greenhouse gas emissions reported under the CCA or as a CBI. Eliminating the report will eliminate any potential confusion and streamline the focus of the Commission and utilities. PacifiCorp prefers the full repeal of the Energy and Emissions Intensity report requirement.

- Delete the Emissions Intensity Metrics – for the same reasons as above, the Commission has the authority to remove this portion of the report, which would also reduce potential confusion and reduce the administrative burden of filing and reviewing the Energy and Emissions Intensity reports for the utilities and the Commission, respectively. Utilities could continue to report the average megawatt-hours per residential customer, average megawatt-hours per commercial customer; and megawatt-hours per capita.

- Amend WAC 480-109-300(2) to eliminate any reference to the repealed statute and reference Ecology's current CCA reporting calculation in WAC 173-441. Because Ecology's greenhouse gas calculation in WAC 173-441 includes emissions from energy that did not serve Washington retail customers, this rule amendment would need to be explicit that WAC 480-109-300(2) only includes emissions associated with serving Washington retail customers. If this path is chosen, the Commission should also update WAC 480-109-300(3)(e) to eliminate the comparison all together or change the comparison date from 1990 to 2022, as the CCA did not exist in 1990.

The Commission may also choose to deal with this issue in a different venue as the Commission's CEIP regulation under WAC 480-100-650 (3)(h) still requires a utility's CEIP to include the GHG calculation from the now defunct RCW 19.405.070.

PacifiCorp welcomes further discussion with the Commission and stakeholders in whatever forum the Commission sees fit to assess potential changes to or elimination of the Energy and Emissions Intensity reports.

Appendix – Metrics Calculation Methodology, Information Sources and Formula Explanations

This appendix identifies the calculation methodologies, data sources and formulas used to compile the Energy and Emissions Intensity Summaries for 2015 through 2024. The metrics calculated in this report are consistent with the mutually agreed upon methodologies identified in the workshops in Docket UE-131723, WAC 480-109-300 effective January 28, 2021, and WAC 173-444 greenhouse gas (GHG) calculation methodology.

Table 1 – Summary Energy and Emissions Intensity Report – 2024

Summary Energy and Emissions Intensity Report - 2024

Utility :	PacifiCorp	
Reporting for year :	2024	**MWh per Capita**
Population Served :	**315,568**	**14.19**

Energy Intensity Metrics

	MWh at Meter	MWh Proportion	Customer Count	MWh per Customer
Residential Customers	1,765,324	39.4%	114,453	15.42
Commercial Customers	1,692,333	37.8%	17,171	98.6
Industrial Customers	825,772	18.4%	456	1,810.9
Irrigation	188,726	4.2%	4,971	38.0
Public Street & Highway Lighting	4,457	0.1%	212	21.0
Total Load Served	4,476,612		137,263	

Emissions Intensity Metrics

	Busbar MWh	Percent of Total Load	**Metric Tons CO_2e**	
Known Resources Serving WA	3,275,134	72.8%		
EPA Methodology			1,835,778	
EIA Methodology				
Unknown Resources Serving WA	**1,224,396**	**27.2%**	**535,061**	**% of 1990 CO_2**
TOTAL GHG Content	2024 Metric Tons CO_2e		**2,370,839**	**108.93%**

1990 Short Tons CO_2	2,399,078

See UTC Docket UE-131723, General Order R-581, Page 7, Paragraph 19.

	1990 Metric Tons CO_2	Short Tons CO_2
Avista	*1,026,894*	*1,131,957*
Pacific Power	*2,176,408*	*2,399,078*
Puget Sound Energy	*6,301,365*	*6,946,064*

I. Energy Intensity Metrics

A. Megawatt-hours (MWh) per Capita

WAC 480-109-300(3)(c) requires a utility to annually report the number of MWh used "per capita." The MWh per capita metric estimates the amount of energy consumed annually by each person in PacifiCorp's Washington service area, using the following calculation:

$$\frac{Total\ Annual\ Washington\ Retail\ Load}{Annual\ Population\ Served}$$

A.1 Total Annual Washington Retail Load

Annual Washington retail load is derived from the Company's FERC Form 1 filings. Load data is not available by customer class, therefore Washington load by customer class was determined using the proportion of retail sales by customer class. The small difference between load and generation is a function of the allocation factors, which are applied based on the current cost allocation methodology. The total load served is metered data and the busbar MWh are allocated based on both load/energy and capacity.

A.2 Population Served

During the UE-131723 workshops, the United States Census Bureau *American Communities Survey* (ACS) was identified as the preferred data source for calculating population served.

For each year between 2015 and 2024, Census block-level ACS data was used to calculate an average household size.[4] The average household size was then applied to the number of residential customers by county, to determine the total population served for each year. Method 1 uses the following formula:

$$County\ Average\ Household\ Size\ \ x\ \ Washington\ Residential\ Customers\ Served$$

B. Megawatt-hour per Customer

WAC 480-109-300(3)(a) and (b) require a utility to annually report the "average number of megawatt-hours per residential customer and per commercial customer." The average MWhs per customer is determined by dividing Washington's annual retail load (MWh at meter) serving a customer class by the number of customers in the same class, in any given year.

$$\frac{Total\ Annual\ Retail\ Load\ Serving\ the\ Customer\ Class}{Annual\ Customers\ in\ Class}$$

[4] United States Census Bureau *American Communities Survey* (ACS) data for reporting years 2015 through 2024 were derived from *Detailed Tables* and *Block Group Data* accessed from https://www.census.gov/cgi-bin/geo/shapefiles/index.php?year=2023&layergroup=Block+Groups.

Annual retail load (MWhs sold) and number of customers are derived from PacifiCorp's annual FERC Form 1 filings.

II. Emissions Intensity Metrics

WAC 480-109-300(3)(d) requires utilities to report annual CO_2e emissions (millions of metric tons).

A. Annual CO_2e Emissions

The Company's total annual emissions are calculated by aggregating the emissions from all generators allocated to serving Washington customers. The generation identified to have served Washington is consistent with the Commission-approved cost allocation methodology effective during the year of reporting. Through 2020, Washington resource allocations were based on Commission-approved Western Control Area (WCA) methodology, which isolates costs associated with the assets, purchases and sales in the west control area. Starting in 2021, the cost allocation methodology transitioned to the Washington Interjurisdictional Allocation Methodology (WIJAM), which includes renewable generation across PacifiCorp system but continues to attribute only western control area thermal generation.

To calculate total annual emissions, the Company first assigned an annual emission factor to each generation source according to WAC 173-444, adopted by the Department of Ecology in January 2021. The emission factor was then applied to Washington's allocated share (MWhs) of the resource's annual output. The Annual Company emissions is the sum of all plant emissions and emissions from unknown resources.

Identified below are the steps taken to calculate total carbon emissions per annum:

(a) Calculation for Washington Allocated megawatt hour generation. Washington's share of generation (MWh) of each resource is based on the state's cost allocation methodology (WIJAM) and control area generation allocation factors consistent with Net Power Cost application. Megawatts are consistent with generation reported on FERC Form 1.

Washington Allocated MWh = Annual MWh x CAGW Allocation Factor (%)

(b) Assign each resource an annual emission factor (pounds of CO_2 equivalent per MWh).

Unknown Resources
Consistent with WAC 173-444-040(4), generation from unknown resources were assigned 0.437 metric tons CO_2e/MW of electricity converted to 963 pounds of CO_2e/MWh.

Known Resources

Non-carbon-producing resources as defined by WAC 173-444-020 (23) such as wind, hydro, geothermal and biogas were assigned an emission factor of zero.

Carbon emitting resources such as coal and natural gas were assigned an emissions factor following WAC 173-444-040(2) outlined methodology.

1) Environmental Protection Agency (EPA) plant GHG emissions - Emissions for each resource were calculated by using emissions and heat rate information published by EPA in its EPA *Air Markets Program*.[5] Emissions for coal and gas units from N_2O or CH_4 were calculated and converted to CO_2 equivalent following 40 C.F.R. Part 98 methodology, then combined with direct CO_2 emissions to derive total CO_2e emissions for each plant.
2) Plant Net Electric Generation - Plant net electric generation was referenced from EIA's form EIA-923 program.
3) Cogeneration correction factor – Accounts for nonelectric heat used at the power plant calculated from EIA-923
4) WAC 173-444-040(2)(b) allows the use of the most recent five-year rolling average published emissions values.

$$Plant\ Emission\ Factor\left(\frac{MT}{MWh}\right) = \frac{(EPA\ plant\ GHG\ (metric\ tons)\ x\ cogeneration\ correction\ factor)}{Plant\ net\ electric\ generation\ (MWh)}$$

5) Transmission Losses were added to carbon emitting resource generation calculated under section (a) above consistent with WAC 480-109-300 (5). The energy transmission loss factor is 3.503% as determined by PacifiCorp Washington 2018 Electric System Loss Study dated June 2020.

$$Plant\ Emission\ (MT) = (WA\ Allocated\ MWh\ )x\ (1 + Trans.Loss\ Factor) * Plan\ Emission\ Factor\ \left(\frac{MT}{MWh}\right)$$

B. Ratio of Annual CO_2 Emissions to 1990 CO_2 Emissions

WAC 480-109-300(3)(e) requires utilities to report a comparison of annual million short tons to 1990 emissions. This metric is a simple percentage calculation of each reporting year's total calculated emissions as described above, relative to the utility's estimated carbon emissions in 1990. This ratio is presented in Table 1.

$$\frac{Annual\ Short\ Tons\ of\ CO_2\ Emitted}{1990\ Short\ Tons\ of\ CO_2\ Emitted}$$

The 1990 carbon emission values for each utility were developed in UE-131723 workgroups. 1990 values were calculated by Washington Department of Commerce following its methodology applied to Washington State Electric Utility Fuel Mix Disclosure Report. This

[5] EPA's *Air Markets Program* Data (AMPD) contains current and historical data collected as part of the EPA's emissions trading programs. Accessed from: https://ampd.epa.gov/ampd/.

methodology should be compared to the Department of Ecology adopted rules in WAC 173-444 to confirm appropriate comparison between the years to determine if both methodologies cover equivalent emissions (transmission losses, a consistent unspecified factor, non-CO_2 emissions, etc.).