



Oregon Clean Fuels Program

Electricity Carbon Intensity Values for 2022

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This document publishes the statewide and utility-specific grid mix carbon intensity values for electricity reported as a vehicle fuel in the Oregon Clean Fuels Program for the 2022 reporting year.

General methodology

The CFP calculates the carbon intensity of transportation fuels on a lifecycle basis, which means both direct and indirect emissions are included. For electricity, that means looking at both the direct emissions from the smokestacks of power plants, as well as the indirect, upstream emissions from the extraction and transportation of the source of the electricity to the power plant.

Direct emissions

The electricity sector is one of many that is required to report annually to DEQ's [Greenhouse Gas Reporting Program](#). Utilities and electric generators report how much electricity they produce or procure and the source of their electricity generation. The emission rates are reported in tons per megawatt-hours and then converted to grams CO₂e per megajoule of energy by using the following factors:

- 1 Metric Ton (mt) = 1,000,000 grams (g)
- 1 Megawatt-hour (MWh) = 1,000 Kilowatt-hour (kWh)
- 1 kWh = 3.6 megajoules (MJ)

Indirect emissions

For electricity, indirect emissions represent anything upstream from the power plant. For example, in the case of natural gas it includes energy used at the wellhead and throughout the transmission system, including fugitive methane emissions. With coal, it includes energy used in mining and transportation to the power plant. The OR-GREET 3.0 model is used to calculate the upstream emissions associated with that generation mix.

Statewide mix carbon intensity calculations for 2022

Statewide mix direct emissions

The most recent information from the GHG Reporting Program is from 2020. The table below shows that information for all providers of electricity and the adjusted statewide mix after removing the energy and emissions from the utilities that have requested a utility-specific mix:

	All electricity providers	Adjusted statewide mix
mt/MWh	0.332	0.464
gCO ₂ e/MJ	92.19	128.94

Statewide mix indirect emissions

The table below shows the generation mix in 2019 for statewide emissions, the most recent data year the generation mix was available:

Fuel Type	Statewide %
Biogas	0.18%
Biomass	0.72%
Coal	27.45%
Geothermal	0.08%
Hydro	37.23%
Natural Gas	24.80%
Nuclear	3.50%
Other Biogenic	0.08%
Other Non-Biogenic	0.24%
Petroleum	0.05%
Solar	0.75%
Waste	0.06%
Wind	4.86%
Total	100.00%

The related upstream emissions as calculated in OR-GREET 3.0 for the statewide generation mix is **17.08 gCO₂e/MJ**.

BPA mix indirect emissions

The table below shows the 2020 generation mix for the Bonneville Power Administration, which serves a number of smaller utilities in Oregon:

Fuel Type	BPA %
Biogas	0.00%
Biomass	0.00%
Coal	0.00%
Geothermal	0.00%
Hydro	83.16%
Natural Gas	5.39%
Nuclear	11.45%
Other Biogenic	0.00%
Other Non-Biogenic	0.00%
Petroleum	0.00%
Solar	0.00%
Waste	0.00%
Wind	0.00%
Total	100%

In line with DEQ guidance, market purchases without a specified source of electricity have been attributed to natural gas. The related upstream emissions as calculated in OR-GREET 3.0 for the BPA generation mix is **2.61 gCO₂e/MJ**.

Utility-specific carbon intensity calculations for 2022

Utility-specific direct emissions

The table below shows the direct emissions attributable to individual utilities that have opted in to using a utility-specific carbon intensity, rather than the statewide mix carbon intensity.

Organization Name	MWh	MTCO ₂ e	MTCO ₂ e/MWh	gCO ₂ e/MJ
Ashland Electric Department	167,675	1,993	0.01	3.30
Blachly-Lane Electric Cooperative	177,415	14,462	0.08	22.64
Cascade Locks	36,192	434	0.01	3.33
Central Electric Cooperative	800,259	41,863	0.05	14.53
Central Lincoln PUD	1,315,946	15,791	0.01	3.33
Clatskanie PUD	917,253	14,750	0.02	4.47
Clearwater Power Company	2,341	28	0.01	3.36
Columbia River PUD	495,423	5,945	0.01	3.33
Consumers Power	430,540	19,319	0.04	12.46
Coos-Curry Electric Cooperative, Inc.	349,446	4,193	0.01	3.33
Emerald PUD	566,629	24,991	0.04	12.25
Eugene Water & Electric Board	2,332,200	61,711	0.03	7.35
Forest Grove Light & Power	261,075	6,476	0.02	6.89
Hermiston Energy Services	106,740	1,281	0.01	3.33
Hood River Electric & Internet Co-op	131,672	1,580	0.01	3.33
Lane Electric Cooperative	253,558	3,037	0.01	3.33
McMinnville Water & Light	730,070	8,443	0.01	3.21
Midstate Electric Cooperative, Inc.	454,316	5,452	0.01	3.33
Milton-Freewater City Light & Power	105,248	952	0.01	2.51
Northern Wasco PUD	1,053,204	70,955	0.07	18.71
Oregon Trail Electric Cooperative	693,003	8,316	0.01	3.33
Salem Electric	335,376	4,025	0.01	3.33
Springfield Utility Board	785,375	9,425	0.01	3.33
Surprise Valley	39,849	478	0.01	3.33
Tillamook PUD	510,111	6,099	0.01	3.32

Utility-specific indirect emissions

For utilities reporting a mix of BPA and other sources, DEQ applied the BPA indirect emissions to their first 3.33 grams of carbon intensity and then prorated the statewide mix upstream emissions value for the remainder. Therefore, a utility with a direct emissions factor of 15 grams would be assigned an indirect emission factor based on the following equation: $2.61 + 17.08 * \frac{15-3.33}{92.19} = 4.77$ grams

Updated carbon intensity values for 2022

The table below shows the carbon intensity values for the statewide mix and utilities that have requested a utility-specific carbon intensity.

	Reported Direct Emissions (gCO ₂ e/MJ)	Estimated Indirect Emissions (gCO ₂ e/MJ)	Total (gCO ₂ e/MJ)	Fuel Pathway Code
Statewide Mix	128.94	17.08	146.02	ORELC2022
Ashland Electric Department	3.30	2.60	5.91	ORELCFRC22
Blachly-Lane Electric Cooperative	22.64	6.19	28.83	ORELCBL22
Cascade Locks	3.33	2.61	5.94	ORELCFRC22
Central Electric Cooperative	14.53	4.69	19.22	ORELCCEC22
Central Lincoln PUD	3.33	2.61	5.94	ORELCFRC22
Clatskanie PUD	4.47	2.82	7.29	ORELCCLA22
Clearwater Power Company	3.36	2.62	5.98	ORELCCPC22
Columbia River PUD	3.33	2.61	5.94	ORELCFRC22
Consumers Power Inc.	12.46	4.30	16.77	ORELCCP22
Coos-Curry Electric Cooperative, Inc.	3.33	2.61	5.94	ORELCFRC22
Douglas Electric Cooperative	3.33	2.61	5.94	ORELCFRC22
Emerald PUD	12.25	4.26	16.51	ORELCEPD22
Eugene Water & Electric Board	7.35	3.35	10.70	ORELCEWE22
Forest Grove Light & Power	6.89	3.27	10.16	ORELCFG22
Hermiston Energy Services	3.33	2.61	5.94	ORELCFRC22
Hood River Electric & Internet Cooperative	3.33	2.61	5.94	ORELCFRC22
Lane Electric Cooperative	3.33	2.61	5.94	ORELCFRC22
McMinnville Water & Light	3.21	2.59	5.80	ORELCMM22
Midstate Electric Cooperative, Inc.	3.33	2.61	5.94	ORELCFRC22
Milton-Freewater City Light & Power	2.51	2.46	4.97	ORELCMF22
Northern Wasco PUD	18.71	5.46	24.17	ORELCNW22
Oregon Trail Electric Cooperative	3.33	2.61	5.94	ORELCFRC22
Salem Electric	3.33	2.61	5.94	ORELCFRC22
Springfield Utility Board	3.33	2.61	5.94	ORELCFRC22
Tillamook PUD	3.32	2.61	5.93	ORELCTPD22
Umatilla Electric Cooperative	49.36	11.14	60.50	ORELCUEC22

Accessibility

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