



Fact Sheet

Specified Source Emission Factor

Methods to Assign Emission Factors to Specified Electricity Generating Sources

Introduction

Oregon's Greenhouse Gas Reporting Program rules (OAR 340-215) require electricity suppliers to calculate and report greenhouse gas emissions from the power supplied to end-users (e.g., homes and businesses) in Oregon using emission factors approved and published by DEQ. DEQ must calculate and assign emission factors to a specified source using the equation found in OAR 340-215-0120(6)(a) or, for asset-controlling suppliers, OAR 340-215-0120(6)(b). The emission factor for calculating emissions from unspecified power is 0.428 MT CO₂e/MWh.

This document describes the data sources and methodology used to calculate and assign emission factors to specified sources for a given reporting year by electricity suppliers. DEQ reviews and revises this document periodically to reflect improvements to data and methodology.

Zero-emitting specified sources

Specified sources with a generating fuel type of wind, solar, hydro, or geothermal closed-loop are considered non-emitting and assigned emission factors of zero.

Greenhouse gas-emitting specified source emission factors

DEQ assigns anthropogenic (human caused) and biogenic (naturally occurring) facility-specific emission factors for all other specified sources registered by electricity suppliers. Each emission factor calculation includes totaling the facility-level emissions for the calendar year, including the carbon dioxide, methane, and nitrous oxide emissions emitted from electricity generation in metric tons of carbon dioxide equivalent (MTCO₂e) and dividing that total by the net electricity generation in megawatt-hours (MWh) from the facility.

General greenhouse gas emission factor equation:

$$\frac{\text{Source Annual GHG Emissions MTCO}_2\text{e}}{\text{Source Annual Net Generation MWh}} = \text{Facility Specific Emission Factor} \left(\frac{\text{MTCO}_2\text{e}}{\text{MWh}} \right)$$

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Data availability

Although the same general equation is used to calculate emissions for each greenhouse gas-emitting specified source, the emissions and power generation data is not consistently available for all specified sources. For this reason, DEQ has implemented a tiered approach to calculating emission factors.

DEQ's primary data sources for the development of emission factors include data from the U.S. Environmental Protection Agency reported through the EPA's Greenhouse Gas Reporting Program (40 C.F.R. Part 98) and data published by the U.S. Energy Information Administration (EIA). For a given reporting year, the EPA and EIA data used is that of the previous calendar year. When those data sets were unavailable for a specified source, DEQ used alternative methods. The following sections describe the different data sources and tiers of methodology for assigning emission factors.

Tier 1: EPA data methodology

When both the EPA emissions and EIA data are available for a specified source and the source cogeneration factor, as calculated by DEQ, is greater than or equal to 90 percent, DEQ uses EPA emissions data and EIA power generation data to determine and assign the specified source emission factor. The calculation used is shown below:

$$\text{Facility Specific Emission Factor} = \frac{\text{EPA source GHG emissions (MT CO}_2\text{e)} * \text{cogeneration correction factor}}{\text{EIA source net generation (MWh)}}$$

Where:

EPA source greenhouse gas emissions = The sum of all greenhouse gas emissions reported under Subpart C and Subpart D for the previous calendar year from the individual facility as published by EPA based on 40 C.F.R. Part 98.

Cogeneration correction factor = The ratio of electric energy to total energy for an individual power plant, determined by dividing the sum of all annual Electric Fuel Consumption (mmBTUs) by the sum of all annual Total Fuel Consumption (mmBTUs) for all reported fuel type codes for the calendar year from Form EIA-923. This factor is used to account for nonelectric heat use at the power plant. If a calculated cogeneration factor was less than 0.9, the EPA method was not used to assign emission factors.

EIA source net generation = The sum of all net generation (MWh) from the individual power plant from all reported fuel type codes for the calendar year from Form EIA-923.

Although some sources report to the EPA, the EPA data reported is not specific to the electricity generating unit and cannot be used to assign emission factors. DEQ uses the EIA data methodology described below for these sources.

Tier 2: EIA data methodology

If EPA data is unavailable or the facility's cogeneration factor is less than 90 percent, but EIA data is available, DEQ uses the EIA's power generation data and default emission factors by fuel type to determine the facility-specific emission factor of a specified source, as follows:

$$\text{Facility Specific Emission Factor} = \frac{\text{EIA source GHG emissions (MT CO}_2\text{e)}}{\text{EIA source net generation (MWh)}}$$

Where:

EIA source greenhouse gas emissions = The sum of all greenhouse gas emissions (MT CO₂e) from the individual power plant for the calendar year, based on fuel consumed for all reported fuel type codes published by EIA. Emissions are calculated by DEQ based on the electric fuel type consumption (mmBTUs) and using the EPA's Tier 1 Calculation Methodology in 40 C.F.R. Part 98 Subpart C. DEQ applied default emission factors by fuel type to electricity consumption values. Where a fuel type was not specified in EPA Subpart C Tables C-1 or C-2, DEQ used emission factors published by the International Panel on Climate Change (2006). All emissions are calculated and converted into metric tons of carbon dioxide equivalent (MT CO₂e).

Facility source generation = The sum of all net generation (MWh) from the individual power plant from all reported fuel type codes for the calendar year from Form EIA-923.

Tier 3: Fleet median methodology

For sources where EPA and EIA data is unavailable, DEQ assigns an emission factor based on generating fuel type. This is calculated based on the median emission factor for that fuel type across all facilities that reported to the EIA in the previous year. This median number is then assigned as the facility-specific emission factor of a specified source with a matching primary fuel type.

Tier 4: Custom data methodology

Several specified sources require a custom approach to determine the facility-specific emission factor based on their unique facility type or reporting situation. For example, if a source did not report to the EIA or EPA, but an alternative verifiable data source is available, DEQ could use that data source to determine an emission factor using the calculation in OAR 340-215-0120(6)(a).

Additional information

Primary fuel type

Where data is available, DEQ uses all electricity generating fuel types reported by a source to calculate that facility's emissions. However, separate from calculating emission factors, DEQ assigns a primary fuel type to a source for facility-level inventories. Where EIA data is available, primary fuel type is determined by the fuel type with most reported electricity consumed for the most recent year data is available. Alternative data could be used to determine primary fuel type for those that did not report to the EIA.

Greenhouse Gas Reporting Program

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