



Combined Heat and Power and the Oregon Renewable Energy Act

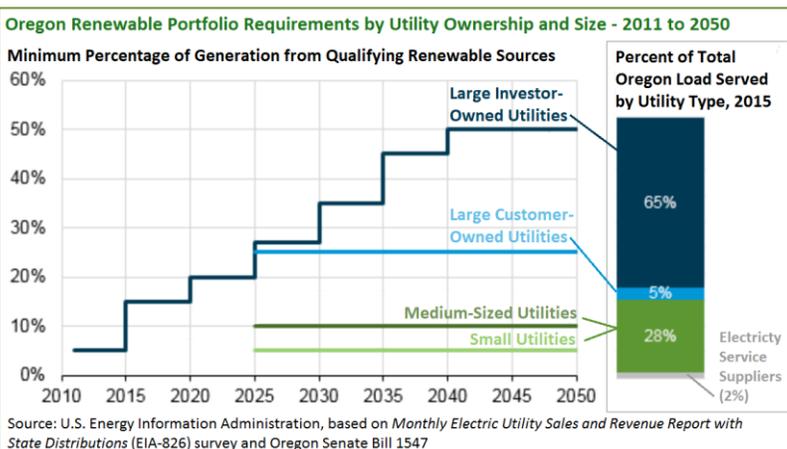
Policy Description

In 2007, Oregon enacted Senate Bill (SB) 838, the Oregon Renewable Energy Act, which created a renewable portfolio standard (RPS) for electric utilities and retail electricity suppliers. Oregon's RPS encourages biomass- and biogas-fired combined heat and power (CHP) projects by granting renewable energy credits (RECs) for both the electricity and thermal energy generated from eligible renewable energy sources. The legislation gives examples of RPS-eligible biomass feedstocks, including organic wastes, landfill gas or biogas from organic matter or wastewater, agricultural residues, spent pulping liquor, energy crops, and forest debris and thinnings harvested to improve ecological health and reduce fire risk.¹

Since enactment, Oregon's RPS has undergone several revisions, most recently in 2016.² A revision in 2010, with passage of HB 367, allowed pre-1995 biomass and municipal solid waste facilities to be eligible for RPS compliance. The revision in 2016 with the passage of SB 1547 added thermal-RECs³ and increased target levels, such that Oregon now has one of the highest RPS requirements in the country.⁴

The act applies to investor-owned utilities, municipal utilities, cooperative utilities, and retail suppliers; electricity service suppliers do not have to meet RPS requirements. Different targets apply depending on utility ownership and size.⁵ The state's two large investor-owned utilities, PacifiCorp and Portland General Electric, must meet 50% of their retail load with eligible renewable energy sources by 2040. As a large customer-owned utility, Eugene Water and Electric Board (EWEB) must meet an RPS target of 25% by 2025 and maintain this level through at least 2040. The RPS mandate for the

remaining electric utilities that operate in Oregon (37 small- and medium-sized utilities) remains at either 5% or 10% by 2025, depending on the percentage of electricity load supplied.



The act encourages renewable energy development both within Oregon and regionally. To be eligible for RECs, the generation must be registered with the Western Renewable Energy Generation Information System (WREGIS), which encompasses 14 western U.S. states, two Canadian provinces, and Baja California in Mexico.⁶ Existing RPS-approved facilities are nevertheless predominantly located in Oregon (69%) with the rest located in Washington (16%),

Idaho (8%), Utah (5%), and British Columbia (1%). Of the 11 biomass- and biogas-fired CHP projects (excluding landfill gas projects) approved as of 2019, eight are in Oregon, two are in Idaho, and one is in Washington.

¹ Oregon Revised Statutes, ORS Chapter 469A, "Renewable Portfolio Standards": https://www.oregonlegislature.gov/bills_laws/ors/ors469A.html

² "U.S. Renewable Portfolio Standards, 2019 Annual Status Update," Lawrence Berkeley National Laboratory:

https://eta-publications.lbl.gov/sites/default/files/rps_annual_status_update-2019_edition.pdf

³ One electricity-based REC is created with the generation of one megawatt-hour of qualifying electrical energy. One thermal-REC or "T-REC" is created with the recovery of 3,412,000 British thermal units (Btu) of qualifying thermal energy and, for the purposes of complying with the Oregon RPS, is equivalent to one REC.

⁴ "State Renewable Portfolio Standards and Goals," National Conference of State Legislatures:

<http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>

⁵ "Higher Oregon renewable portfolio standard targets likely to boost wind power," U.S. Energy Information Agency:

<https://www.eia.gov/todayinenergy/detail.php?id=25932>

⁶ "WREGIS Operating Rules, May 2018," Western Electricity Coordinating Council: <https://www.wecc.org/Corporate/WREGIS%20Operating%20Rules.pdf>

Policy Outcomes

In 2007, just 2% of Oregon's electricity needs were met with renewable energy sources. By 2015, non-hydro renewable resources in Oregon's fuel mix had nearly quadrupled to 7.6%.⁷ As of 2019, biomass and biogas CHP projects have received RPS approval at 11 sites.⁸ The oldest is Biomass One's 30 MW wood debris-fired CHP plant, a privately owned project that began operation in 1987. The project sells 175,000 MWh of electricity annually⁹ to Pacific Power & Light under a 2011 25-year power purchase agreement.¹⁰ It sells 35 million pounds of steam per year to an adjacent plywood mill.¹¹ The plant consumes 335,000 tons of wood waste per year.

The most recent RPS-approved biomass or biogas CHP project is the City of Gresham Wastewater Treatment Plant.¹² Biogas is combusted in two 400 kW Caterpillar G3508 engines to produce electricity, which offsets onsite electricity use in a net metering agreement with Portland General Electric (PGE). Any excess generation is donated to PGE's low-income program as part of the net metering terms. Heat recovered from the engines' jacket water is used to heat the digester and the facility's buildings. In 2015, the plant began receiving fats, oil, and grease from area restaurants, nearly doubling its biogas production. In 2018, the plant became the first Oregon facility to be certified for thermal RECs.

The largest of the 11 biomass or biogas CHP projects is a 36 MW CHP facility located at the Georgia Pacific Wauna Paper Mill near Clatskanie. This project was constructed by Clatskanie People's Utility District and EWEB on property leased from Georgia Pacific. Paper sludge and black liquor, occasionally co-fired with natural gas, is burned in a fluidized bed boiler to provide high-pressure steam for electricity production with low-pressure steam from the steam turbine serving paper mill needs. Electricity generation in 2018 was 136,849 MWh.¹³

The smallest of the 11—Farm Power Northwest's Misty Meadows 750 kW dairy digester project—reached full operation in January 2013.¹⁴ This 2,000-cow dairy is the site of one of two RPS-approved digester projects by Farm Power located in the Tillamook area.

Summary of RPS-Approved Biomass and Biogas CHP Facilities

Facility Type	Number of Facilities	Total Nameplate Capacity (MW)	Oldest Plant	Newest Plant
Biogas Dairy	3	6.2	2012	2013
Biogas WWTF	2	2.0	1997	2005
Biomass/Paper Byproducts	2	43.5	1996	2011
Biomass/Woody	4	77.3	1987	2011
Totals	11	129	1987	2013

Source: Oregon Department of Energy, RPS Approved Facilities, 11/19/2019

Lessons To Share

- Adding thermal-RECs to the RPS encourages biomass-fired CHP. As of August 2018, the Oregon Department of Energy had four applications from projects for thermal RECs, including a pulp and paper plant and a wood products plant.
- Oregon supports the continued operation of plants with a long history of successful operation. Biomass One, constructed in 1987, became eligible for RPS approval after passage of HB 367 in 2010, allowing biomass facilities constructed prior to 1995 to qualify.
- Requirements to meet Oregon's RPS differ by utility ownership structure and size. In the future, the legislature may revise these requirements, especially for large consumer-owned utilities and medium- and small-sized utilities.

For More Information

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OREGON DEPARTMENT OF ENERGY

<https://www.oregon.gov/energy>

More CHP Profiles:

www.nwchptap.org

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⁷ "Electricity Mix in Oregon," Oregon Department of Energy: <https://www.oregon.gov/energy/energy-oregon/Pages/Electricity-Mix-in-Oregon.aspx>

⁸ Oregon Department of Energy: https://www.oregon.gov/energy/energy-oregon/Documents/November_2019_OR_RPS_Approved_Generators.xlsx

⁹ National Public Energy: http://nationalpublicenergy.com/proj_biomassone.html; Biomass One: <https://biomassone.com/electricity>

¹⁰ Power Purchase Agreement between Biomass One, L.P. and PacifiCorp: <https://edocs.puc.state.or.us/efdocs/RPA/re142rpa151119.pdf>

¹¹ "Review of Biomass Fuels and Technologies," Yakima County Public Works: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.217.7739&rep=rep1&type=pdf>

¹² "Grounded Podcast: Gresham Powers through the FOG," August 23, 2018, Oregon Department of Energy: <https://energyinfo.oregon.gov/blog/2018/8/23/grounded-podcast-gresham-powers-through-the-fog>

¹³ "Report of Independent Auditors, 2018 and 2017," Western Generation Agency: https://www.clatskaniepud.com/wp-content/uploads/2018.Audit_Western-Generation-Agency.pdf

¹⁴ "Biogas Projects: Farm Power Misty Meadow," NW Natural: <https://www.nwnatural.com/Residential/SmartEnergy/WhatWeAreDoing/BiogasProjects/FarmPowerMistyMeadows>