

LPRO: LEGISLATIVE POLICY AND RESEARCH OFFICE

# ENERGY

## BACKGROUND BRIEF

The U.S. Department of Energy's Energy Information Administration (**EIA**) tracks energy use in four broad categories: electricity, petroleum, natural gas, and coal across the residential commercial, industrial, and transportation sectors. Oregon ranked 39<sup>th</sup> in the nation, on a per capita basis, for total energy consumption in 2016 (the most recent year for which data is available). Energy use in Oregon is distributed between transportation (30.4 percent), residential (24.3 percent), industrial (26.1 percent), and commercial (19.2 percent).

Energy is a significant economic driver in both Oregon and the United States. The EIA reports that Oregon spent \$11.79 billion on energy in 2016 (most recent data).<sup>1</sup> The Majority of the energy used by Oregonians comes from hydroelectric sources. Energy planning efforts in Oregon focus first on conservation and increased efficiency to meet extra consumer demand, and then on increased generation from local renewable and traditional sources.

### **ELECTRICITY**

In Oregon, electricity is sold through two types of utilities: investor-owned utilities (**IOUs**) and consumer-owned utilities (**COUs**). Three IOUs operate in Oregon and are private companies regulated by the Oregon Public Utility Commission (**PUC**): Portland General Electric (**PGE**), PacifiCorp (formerly Pacific Power), and Idaho Power Company. The PUC regulates the retail rates charged by IOUs to ensure that all customers are charged fair and reasonable rates, while the utility earns a rate of return on its investments. The IOUs generate their own power, contract for power from third-party producers, or purchase power from energy markets. COUs are not regulated by the PUC, but are instead self-regulating, not-for-profit public entities.

In addition to IOUs and COUs, there are electricity service suppliers (**ESSs**). An ESS is a third-party entity that sells electricity services directly to more than one nonresidential retail customer pursuant to a direct access tariff as authorized by Senate Bill 1149 (1999). The PUC must certify ESSs before they may enter into a direct access

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<sup>1</sup> U.S. Department of Energy, Energy Information Administration (EIA), State Energy Expenditure Estimates, 2016

agreement. In 2017,<sup>2</sup> the IOUs accounted for 63.8 percent of Oregon’s retail electricity sales, while 37 COUs accounted for 31.5 percent of sales. Five ESSs supplied the remaining 4.7 percent. The COUs purchase most of their power from the Bonneville Power Administration (**BPA**), a large federal power marketing agency that owns and operates 31 hydroelectric projects and 15,000 miles of transmission lines across the Pacific Northwest.<sup>3</sup>

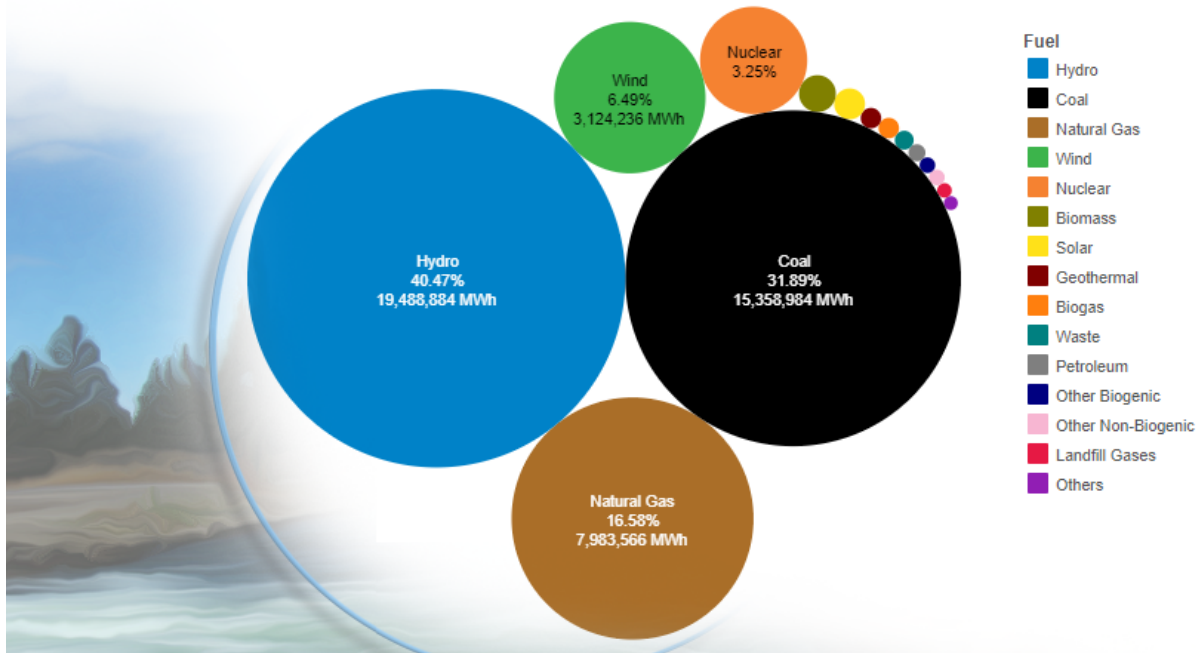
**ELECTRICITY GENERATION AND CONSUMPTION**

The Oregon Department of Energy reports that for 2014-2016, hydroelectric power supplied 40.47 percent of the state’s consumption, followed by 31.89 percent from coal (mostly from imports of electricity from out-of-state coal-fired power plants), 16.58 percent from natural gas, and a growing percentage from nonhydroelectric renewables, led by wind at 6.49 percent.<sup>4</sup>

**Fuels Used to Generate Electricity Consumed in Oregon**

This information is based on a three-year average (2014-2016).

Oregon consumes an average of 48,157,378 MWh of electricity each year. This graph illustrates the resources responsible for Oregon’s electricity that is ultimately sold and distributed to utility customers.



<sup>2</sup> OPUC 2017 Oregon Utility Statistics, p.1., <https://www.puc.state.or.us/docs/statbook2017.pdf>

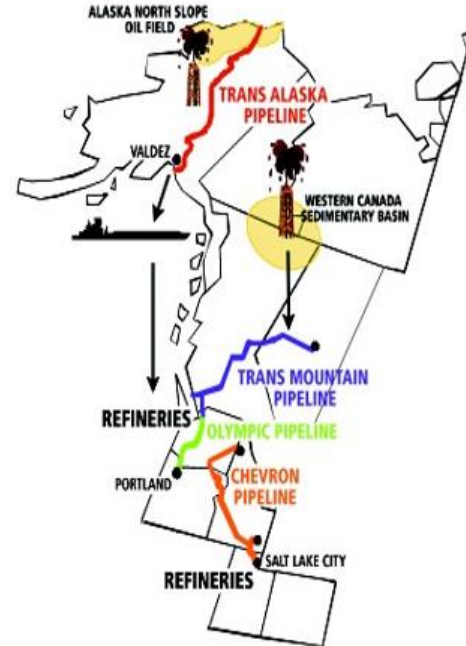
<sup>3</sup> <https://www.bpa.gov/news/AboutUs/Pages/default.aspx>

<sup>4</sup> [https://www.oregon.gov/energy/energy-oregon/Pages/Electricity-Mix-in\\_Oregon.aspx](https://www.oregon.gov/energy/energy-oregon/Pages/Electricity-Mix-in_Oregon.aspx)

**PETROLEUM**

Oregon imports 100 percent of its petroleum, more than 90 percent from refineries in Washington’s Puget Sound region.<sup>5</sup> Oregon, along with Alaska, Arizona, California, Hawaii, Nevada, and Washington, form a nearly self-contained system of petroleum production and consumption.

Approximately 80 percent of the crude oil the Puget Sound refineries use originates in Alaska’s North Slope oil fields. This percentage is changing as Puget Sound refineries increasingly source crude oil from the Western Canada Sedimentary Basin (tar sands and wells), and the oil fields in Alaska decline. Less than five percent of Puget Sound refineries’ crude oil comes from the continental United States, Mexico, Indonesia or the Middle East. However, these percentages are changing as refineries in Washington now receive crude oil by rail from the Bakken field in Montana/North Dakota.<sup>6</sup>

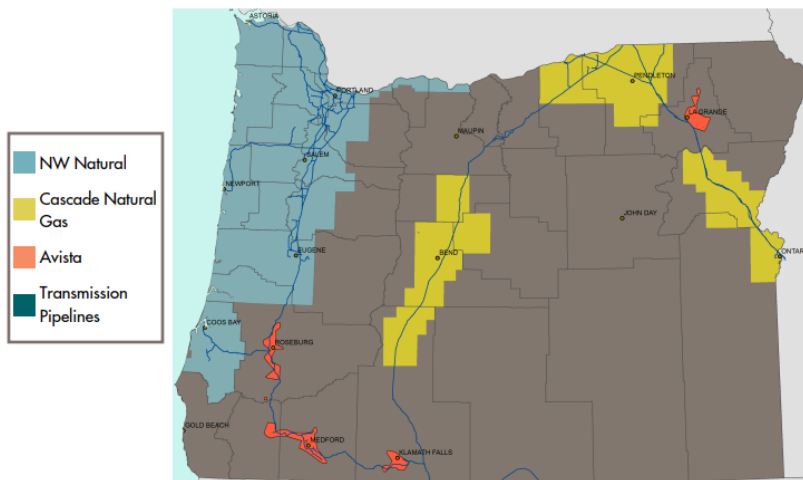


Ninety-three percent of Oregon’s transportation fuel comes from petroleum-based products.

**NATURAL GAS**

An increase in Oregon’s renewable energy has had an effect on other resources in the electricity mix. The percentage of natural gas-powered electricity in Oregon has increased from 12.1 percent in 2012 to 18.4 percent in 2016.<sup>7</sup> There has also been a 60 percent

*Oregon Natural Gas Transmission Pipelines and Utility Territories*



References: 1, 15, 17, 20

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increase in natural gas used for electricity between 2012 and 2016. Northwest Natural, Cascade Natural Gas, and Avista are the state’s investor-owned natural gas distribution utilities.

**Map 1:** Oregon’s Natural Gas Transmission Lines and Service Territories.

<sup>5</sup> EIA Oregon Profile Analysis. Available online: <http://www.eia.gov/state/analysis.cfm?sid=OR>

<sup>6</sup> EIA Washington Profile Analysis. Available online: <https://www.eia.gov/state/analysis.cfm?sid=WA>

<sup>7</sup> Oregon Department of Energy 2018 Biennial Energy Report <https://www.oregon.gov/energy/Data-and-Reports/Documents/2018-Biennial-Energy-Report.PDF>

Oregon has 20 operating natural gas-fired power plants, 10 of which produce between 220 and 689 megawatts (**MW**) of electricity. Of the electricity generated by natural gas in Oregon, about 60 percent is exported to out-of-state users.

The Mist gas field in northwestern Oregon (discovered in 1979) is the only producing natural gas field in the Pacific Northwest. Numerous reservoirs have been found in the field, and it also includes underground natural gas storage capacity in some of its depleted reservoirs.<sup>8</sup> The primary purpose of the Mist field is underground gas storage to help align the seasonal mismatch between energy production and use for the region's natural gas and electric utilities.

Oregon also imports natural gas via two main interstate pipelines: the Williams Company Northwest Pipeline (dark blue on Map 2) and the Pacific Gas and Electric Pipeline (light blue on Map 1, running south from the Oregon-California border). In July 2011, the El Paso Corporation put its Ruby pipeline (not shown on Map 2) in service, running from Malin, east along the Oregon-California border toward Nevada and Utah before terminating in Opal, Wyoming.

If approved by the federal government, the Jordan Cove Energy Project, sponsored by the Canadian energy firm Versen, would result in the construction of a new liquefied natural gas export terminal in Coos Bay. This facility would connect a new 230-mile natural gas pipeline (the "Pacific Connector" pipeline – red on Map 2) to the Ruby pipeline in Malin. The Federal Energy Regulatory Commission denied permits for the project in March 2016, and the project appealed for a rehearing. In May 2019, the Oregon Department of Environmental Quality, charged with enforcing the Clean Water Act standards in the state, reported the project does not meet required standards under the 401 Water Quality Certification program, which regulates the extent to which projects can pollute or degrade waterways.



**Map 2:** Pacific Connector Gas Pipeline Project

<sup>8</sup> EIA Oregon Profile Analysis. Available online: <http://www.eia.gov/state/analysis.cfm?sid=OR>

## ENERGY CONSERVATION AND EFFICIENCY

Since its inception in 1975, the Oregon Department of Energy (ODOE) has focused on policies related to energy conservation and improved efficiency. ODOE works with state, regional, federal, and tribal governments and organizations to promote conservation and efficiency. It works with entities such as the Northwest Power and Conservation Council, investor-owned utilities, state and academic institutions, the Energy Trust of Oregon, the NW Energy Efficiency Alliance, Pacific Coast Collaborative, and BPA.

Oregon has designated a number of programs to encourage energy efficiency and conservation (see Table 1). ODOE estimates that the cumulative energy generated through these programs is enough to meet the energy needs of approximately 1.5 million homes in Oregon.

**Table 1: Energy Efficiency and Conservation Programs and Legislation in Oregon**

Program	Established	Purpose
Residential building codes that include energy efficiency	1974	Increase energy efficiency in residences.
Residential Energy Tax Credit	1977	Encourage homeowners to invest in renewable energy technologies.
Commercial building codes that include energy efficiency	1978	Increase energy efficiency in commercial buildings.
Business Energy Tax Credit	1979	Encourage investments in energy conservation, recycling, renewable energy sources and less-polluting transportation fuels.
Small-scale Energy Loan Program	1979	Offer low-interest, fixed-rate, long-term loans for qualified Oregon projects that invest in energy conservation, renewable energy or alternative fuels, or create products from recycled materials.
Public Purpose Charge	1999	Provide funds for conservation, renewable resources, weatherization for low-income households and energy efficiency in schools.
Energy efficiency requirements for new state buildings	2001	Increase energy efficiency in state buildings.
State appliance efficiency standards	2005	Increase energy efficiency in commercial appliances.
Energy Efficiency and Sustainable Technology Loan Program	2009	Provide low-cost loans to individuals for projects that increase energy efficiency in homes and small businesses.
"Cool Schools" Program	2011	Provide grants and loans to school districts to weatherize, upgrade, and retrofit K-12 public schools for energy efficiency and replace or retrofit school bus fleets to operate on compressed natural gas or other alternative fuels.
State appliance efficiency standards	2013	Minimum energy efficiency standards for televisions, large battery charger systems, inductive charger systems, small battery charger systems with certain exceptions and high light output double-ended quartz halogen lamps.

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