



LPRO: Legislative Policy and Research Office

# ENERGY

## BACKGROUND BRIEF

Energy is a significant economic driver in both Oregon and the United States. Oregonians spent about \$14.9 billion on energy in 2014.<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.

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 2014 (the most recent year for which data is available). Louisiana consumes the most energy per capita and New York the least. Energy use in Oregon is distributed between transportation (30.8 percent), residential and industrial (25 percent each) and commercial (19.2 percent).

### ELECTRICITY

In Oregon, electricity is sold through two types of utilities: investor-owned utilities (IOUs) and consumer-owned utilities (COUs). The IOUs (Portland General Electric, Pacific Power and Idaho Power) are private companies regulated by the Oregon Public Utility Commission (OPUC). OPUC 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 OPUC, 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 non-residential retail customer pursuant to a direct access tariff as authorized by Senate Bill 1149 (1999). OPUC must certify ESSs before they may enter into a direct access agreement.

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<sup>1</sup> U.S. Department of Energy, Energy Information Administration (EIA), State Energy Consumption Estimates, 2014.



In 2014,<sup>2</sup> the IOUs accounted for 66 percent of Oregon's retail electricity sales, while 37 COUs accounted for 30 percent of sales. Five ESSs supplied the remaining four 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

According to the EIA,<sup>4</sup> the majority of Oregon's in-state electric generation comes from renewable resources and is dominated by hydroelectric generation (see Table 1).

Table 1

### In-State Electric Generation by Source

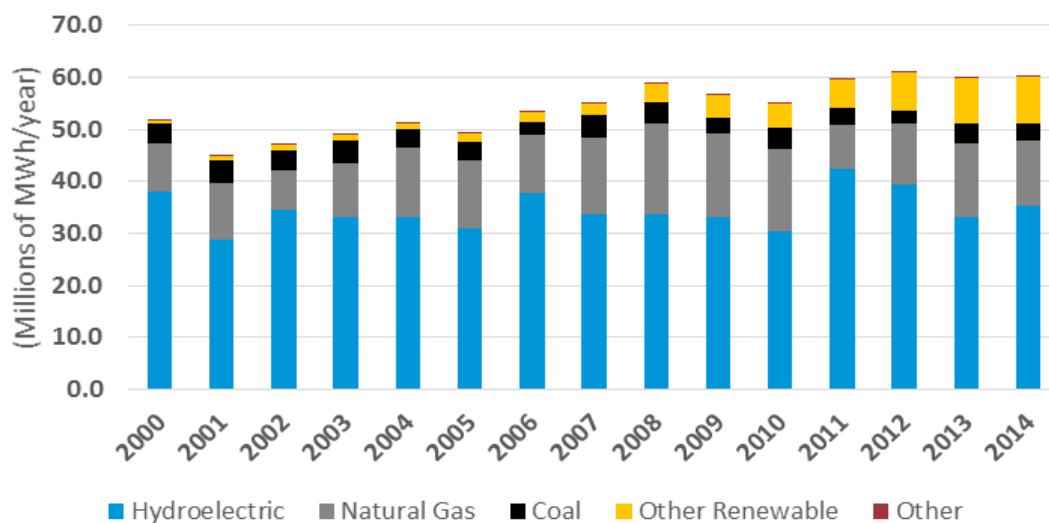


Table 1 reflects in-state electric *generation* from facilities located in Oregon and not *consumption* of electricity by Oregonians. Consumption varies from this generation mix due to significant electricity imports and exports between Oregon and other states across the West resulting from seasonal generation imbalances (e.g., excess hydroelectric generation in winter and spring) and market conditions.

Non-hydroelectric renewable electric generation (e.g., wind, bioenergy, geothermal and solar) comprises a relatively small portion of overall in-state generation. However, EIA data shows that its share is growing rapidly over the last several years, which is consistent with national trends (see Table 2).

<sup>2</sup> OPUC 2014 Oregon Utility Statistics, p. 1.

<http://www.puc.state.or.us/docs/statbook2014WEB.pdf>

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

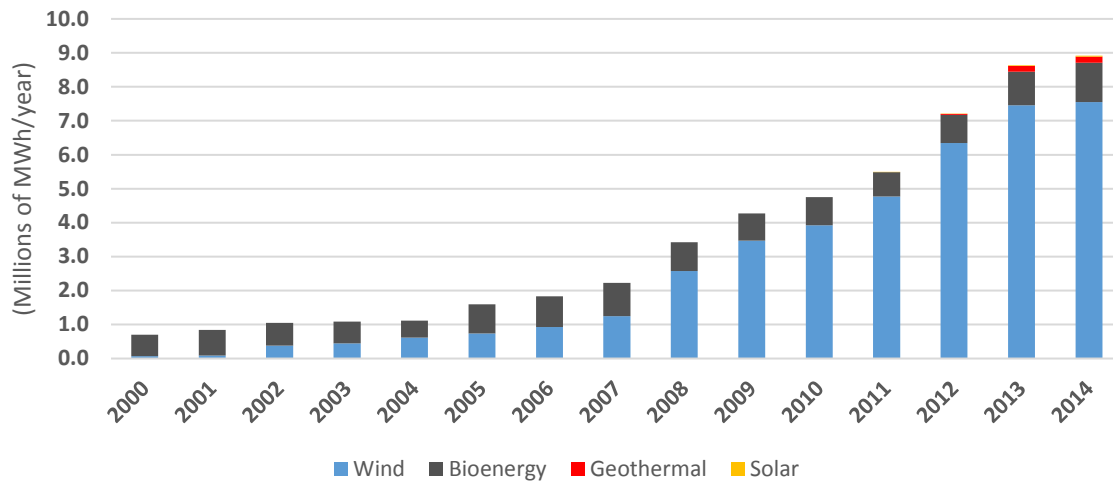
<sup>4</sup> Table 5. Electric power industry generation by primary energy source, 1990 through 2014,

"Oregon Electricity Profile 2014," U.S. Energy Information Agency. March 24, 2016. (Available online:

<http://www.eia.gov/electricity/state/Oregon/>)



Table 2

**In-State Non-Hydro Renewable Electric Generation**

In terms of consumption of electricity by Oregonians, the Oregon Department of Energy reports<sup>5</sup> that for 2012-2014, hydroelectric power supplied 42.88 percent of the state's consumption, followed by 33.65 percent from coal (mostly from imports of electricity from out-of-state coal-fired power plants), 13.55 percent from natural gas and a growing percentage from non-hydroelectric renewables, led by wind at 5.62 percent.

2012-2014 Electricity Resource Mix	
Hydro	42.88%
Coal	33.65%
Natural Gas	13.55%
Wind	5.62%
Nuclear	3.21%
Biomass	0.35%
Other*	0.74%

\* < 0.2% from each of the following: Waste, Landfill, Geothermal, Petroleum, Solar, and Cogeneration

According to the EIA,<sup>6</sup> as of April 2016, the average residential rate for electricity in Oregon was 10.5 cents/kWh (more than 15 percent lower than the national average of 12.43 cents/kWh) and the average commercial rate was 8.87 cents/kWh (12 percent lower than the national average). Oregon consumed 47.3 million MWh of electric generation in 2014,<sup>7</sup> or approximately 11,833 kWh per capita annually.

## PETROLEUM

Oregon imports 100 percent of its petroleum, more than 90 percent from refineries in Washington's Puget Sound region.<sup>8</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

<sup>5</sup> <https://www.oregon.gov/energy/energy-oregon/Pages/Electricity-Mix-in-Oregon.aspx>

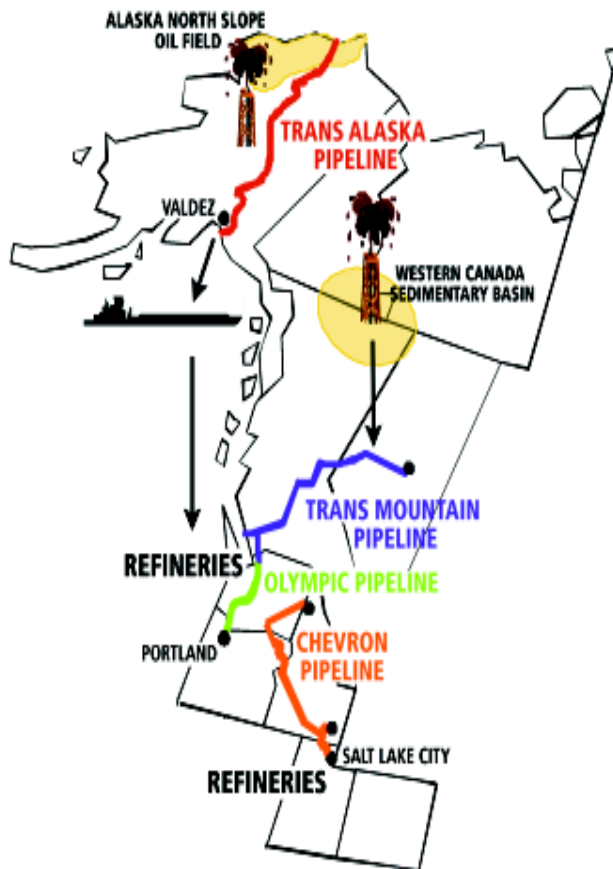
<sup>6</sup> EIA State Profile and Energy Estimates: Oregon. Available online: <http://www.eia.gov/state/data.cfm?sid=OR>

<sup>7</sup> EIA Oregon Electricity Profile, 2014. Available online: <https://www.eia.gov/electricity/state/oregon/>

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



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>9</sup>

The majority of Oregon's petroleum is used in the transportation sector, mainly gasoline. In

the past decade, ethanol and biodiesel now make up 7.4 and 1.3 percent of the fuel mixture, respectively.

## NATURAL GAS

In 2014, 37.8 percent of Oregonians relied on natural gas as the primary energy source for home heating needs, significantly below the national average of 48.5 percent.<sup>10</sup> As noted above, natural gas power plants also generate approximately 13.5 percent of the electricity consumed in Oregon. Northwest Natural, Cascade Natural Gas and Avista are the state's investor-owned natural gas distribution utilities.

The Mist gas field in northwestern Oregon is the only producing natural gas field in the Pacific Northwest. Total natural gas production exceeds 65 billion cubic feet of gas since its discovery in 1979. The Mist field includes two underground natural gas storage projects, using three depleted natural gas reservoirs that can store 14 billion cubic feet of natural gas to meet peak demands during colder months. Exploration well-drilling continues at Mist; however, production has declined markedly from its high of over four billion cubic feet of natural gas per year in the mid-1980s.<sup>11</sup>

Oregon also imports natural gas via two main interstate pipelines: the Williams Company Northwest Pipeline (dark blue on Map 1) 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 1) in service, running from Malin, east along the Oregon-California

<sup>9</sup> EIA Washington Profile Analysis. Available online: <https://www.eia.gov/state/analysis.cfm?sid=WA>

<sup>10</sup> EIA Oregon Profile Data. Available online: <http://www.eia.gov/state/data.cfm?sid=OR#EnergyIndicators>

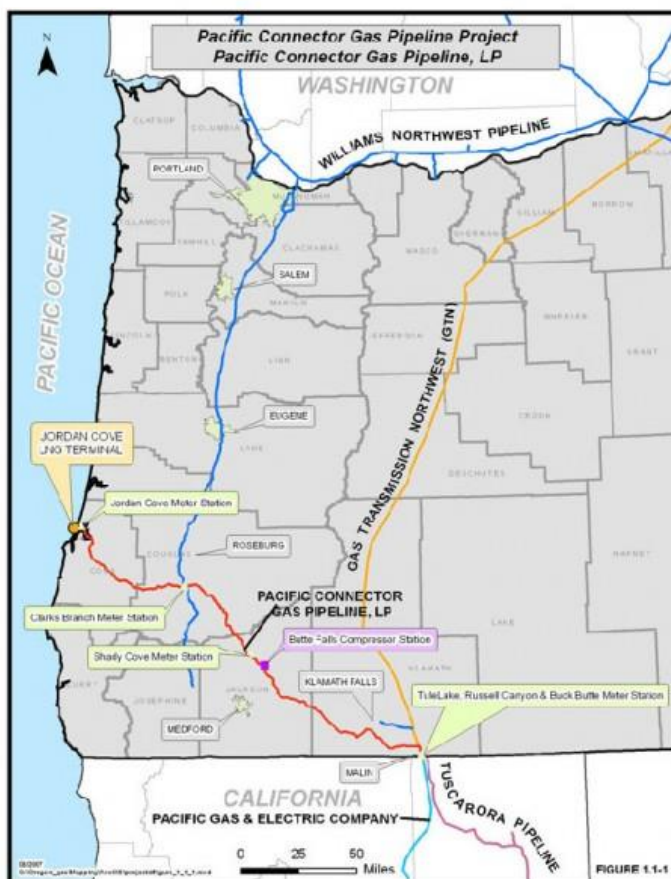
<sup>11</sup> EIA Oregon Profile Analysis. Available online: <http://www.eia.gov/state/analysis.cfm?sid=OR>



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 Veresen, 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 below) to the Ruby pipeline in Malin. The Federal Energy Regulatory Commission denied permits for the project in March 2016, and the project was awaiting a rehearing as of August 2016.

Map 1



## 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 and consumer-owned utilities, state and academic institutions, the Energy Trust of Oregon, the NW Energy Efficiency Alliance, Pacific Coast Collaborative and BPA.

Oregon has designed a number of programs to encourage energy efficiency and conservation (Table 3). ODOE estimates that the cumulative energy savings and electricity generated through these programs is enough to meet the energy needs of approximately 1.5 million homes in Oregon.



### ENERGY EFFICIENCY AND CONSERVATION PROGRAMS AND LEGISLATION IN OREGON (TABLE 3)

<b>Program</b>	<b>Established</b>	<b>Purpose</b>
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	Provides 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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