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Background Brief on ...

# Energy

Energy is a significant economic driver in both Oregon and the United States. Oregonians spend about 13 billion dollars on energy annually; approximately 40 percent of energy consumed in Oregon is produced in-state<sup>1</sup> and most of that is renewable energy (hydropower). 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's total energy consumption in 2010 (the most recent year for which data is available) ranks it 40<sup>th</sup> in the nation on a per capita basis. Wyoming consumes the most energy per capita and New York and Rhode Island the least. Oregon's energy consumption falls mainly in the transportation sector, followed by residential, industrial and commercial.

In October 2011, Governor Kitzhaber appointed a 10-Year Energy Plan Task Force (**Task Force**) to make recommendations on coordinated actions and initiatives that the state can undertake to ensure a continued supply of affordable, reliable energy. The Task Force met for six months and developed nearly 200 recommendations. Governor Kitzhaber issued a Draft 10-Year Energy Action Plan (**Plan**) in June 2012 that incorporated the Task Force's recommendations. The Governor's Office is currently gathering public comment on the Plan with the intention to issue a final version in the fall of 2012.

## Electricity

Electricity is sold in Oregon through two types of utilities: investor-owned (**IOU**), and consumer-owned utilities (**COU**). The IOUs (Portland General Electric,

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<sup>1</sup> U.S. Department of Energy, Energy Information Administration (EIA), State Energy Consumption Estimates, June 2012.

Type	Percent	Source	Notes
Hydro	39	Primarily from dams operated by BPA on the Columbia and Snake River systems. Additional resources include dams operated by Oregon utilities on other river systems in Oregon and Washington.	New sources are expected to come from irrigation systems, pumped storage and upgrades to existing federal dams.
Coal	35	Generating facilities include plants in Utah, Wyoming and Montana in addition to the Boardman plant in NE Oregon. Coal for these plants is largely sourced from Montana, Wyoming, Utah, Colorado, Alberta and British Columbia.	The Boardman plant is currently scheduled to close at the end of 2020.
Natural Gas	16	Natural gas is sourced from British Columbia, Alberta, Wyoming, Colorado and New Mexico and enters Oregon via two interstate pipelines.	The El Paso Corp. activated the Ruby Pipeline in July 2011; running from Wyoming to Oregon.
Nuclear	4	Columbia Generating Station near Richland, Washington. Uranium is sourced from: DOE recycled depleted uranium, Russia-US megatons to megawatts program (recycled Russian nuclear weapons) and Canada.**	The operating license for this plant was recently extended by the Nuclear Regulatory Commission to run through the end of 2043.
Renewables	5	Primarily wind farms along central and eastern Columbia River area and in NE Oregon, as well as Wyoming.	Solar, biomass, geothermal and wave are growing sectors.
Other	1	Mostly petroleum fuels used as supplementary combustion sources	A variety of minor sources.

**Table 1** Oregon's Electricity Mix 2010\*

\*Data from Oregon Department of Energy

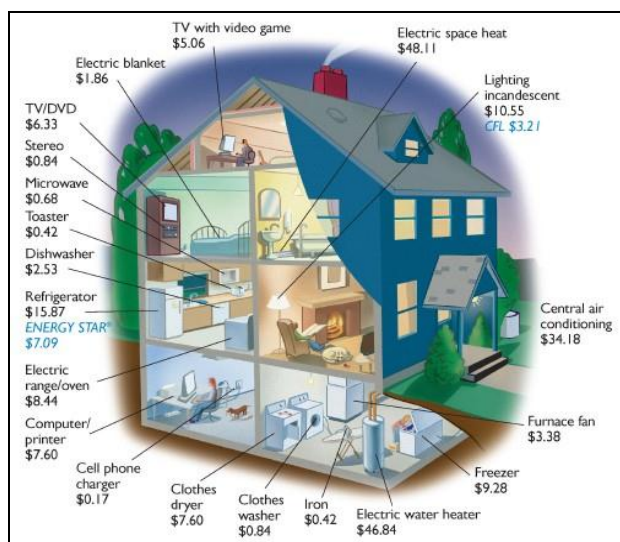
\*\* Information from Energy Northwest

Pacific Power and Idaho Power) market makes up approximately 70 percent of Oregon's electricity supply; 37 consumer- or publicly owned utilities supply the rest. The consumer and public utilities purchase most of their power from the Bonneville Power Administration (BPA). The IOUs generate their own power or purchase power from energy markets.

Electricity use in Oregon is distributed between residential (41 percent), commercial (34 percent), and industrial (25 percent) consumers. Oregon's electricity is generated from hydroelectricity, coal, natural gas, nuclear, and renewable sources (see Table 1).

A typical household in Oregon uses about 1,000 kilowatt hours (kWh) of electricity per month. For 2009, the EIA reports that Louisiana and Tennessee had the highest average monthly residential electric consumption (1,273 and 1,248 kWh respectively), while Maine has the lowest (521 kWh).

In 2009, the highest electricity uses in U.S. households were space cooling (18 percent) and lighting (15 percent). The EIA reports that Oregon's typical household consumes more electricity on heating than cooling – 49 percent of Oregon households use electricity for home heating, compared to 30 percent nationally. Pacific Power created the diagram (Figure 1) that illustrates which household appliances consume the most energy in a typical Oregon household.



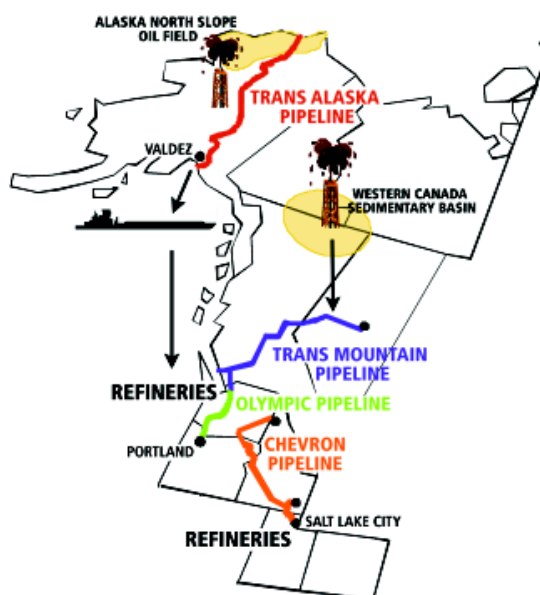
**Figure 1** Pacific Power illustration of monthly energy use in an average four-person, 1,500 square-foot home in Oregon.

## Petroleum

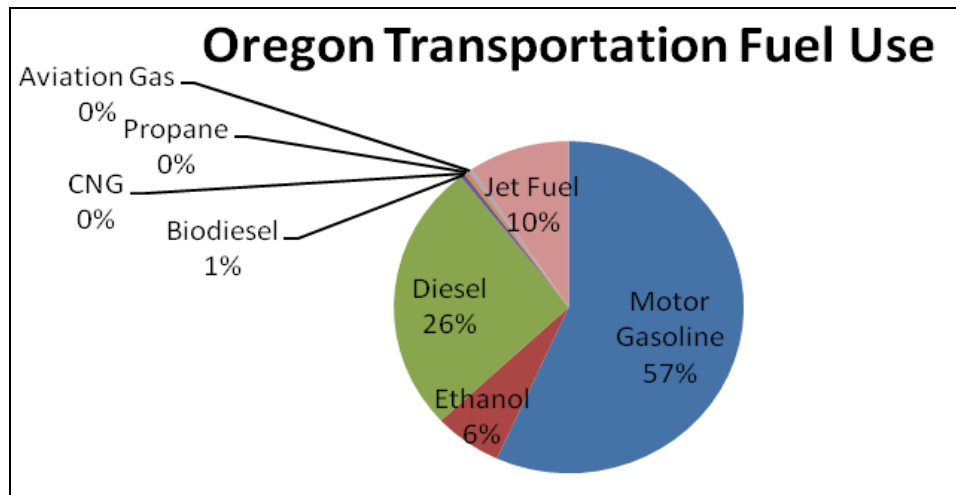
Oregon imports 100 percent of its petroleum, more than 90 percent from refineries in Washington's Puget Sound region. Approximately 80 percent of the crude oil the Puget Sound refineries utilize originates in Alaska's North Slope oil fields. This percentage is changing as Puget Sound refineries increasingly source crude oil from the Western Canada Sedimentary Basin (tar sands and wells), as the oil fields in Alaska decline. Less than five percent of Puget Sound refineries' crude oil comes from the continental U.S., Mexico, Indonesia or the Middle East (Energy Plan).

The remainder of Oregon's petroleum comes from refineries in Salt Lake City and British Columbia. Figure 2 illustrates Oregon's petroleum sourcing network, from crude source to refinery to shipment to Oregon.

The majority of Oregon's petroleum is used in the transportation sector, mainly gasoline. The past decade has seen the addition of ethanol and biodiesel to the fuel mixture, which now make up six and one percent respectively (see Figure 3).



**Figure 2** Illustration of source, refineries and shipment of Oregon's petroleum. [State of Oregon Energy Plan, 2011-2013]



**Figure 3** Breakdown of transportation fuel use in Oregon, reported in State of Oregon Energy Plan 2011-2013.

## Natural Gas

Natural gas consumed in Oregon is imported via two main interstate pipelines: the Williams Company Northwest Pipeline and the Pacific Gas & Electric Pipeline. In July 2011, the El Paso Corporation put its Ruby pipeline in service, running from Opal, Wyoming to Malin, Oregon and serving the Western U.S.

For 2012, the EIA lists Oregon's natural gas uses: electric power (47 percent), industrial (24 percent), residential (17 percent), commercial (12 percent) and vehicle fuel (less than one percent).

On a per capita basis, Oregon was ranked 32<sup>nd</sup> in the nation in 2010 for natural gas consumption at 243 trillion Btu, down 12 percent from 2008. For comparison, Texas uses the most and Hawaii the least (3,458 and 2.7 trillion Btu respectively). Of the 32 states that produce natural gas Oregon ranks 28<sup>th</sup>.

When it comes to home heating, about 35% of Oregon homes heat with natural gas, compared to 51% nationwide.

## Energy Efficiency

Since its inception in 1975, two cornerstones of Oregon Department of Energy's (ODOE) policy have been energy conservation and improved efficiency.

The ODOE works with state, regional, national and tribal governments and organizations to promote conservation and efficiency. These partners include 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 the Bonneville Power Administration.

For more than 35 years, Oregon has designed a number of programs to encourage energy efficiency and conservation (Table 2). 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.

Program	Established	Purpose
Residential building codes that included energy efficiency	1974	Increase energy efficiency in residences.
Residential Energy Tax Credit	1977	Encourage homeowners and renters to purchase energy efficient products and technologies.
Commercial building codes that included 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, 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	House Bill 2960 creates the “Cool Schools” program, which provides grants and loans to school districts for projects to weatherize, upgrade, and retrofit K-12 public schools for energy efficiency; and replacing or retrofitting school bus fleets to operate on compressed natural gas, and other alternative fuels.

**Table 2** Energy Efficiency and Conservation Programs in Oregon

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