

Examining the Energy Landscape

Where do we get our electricity, how much do we expect to need and where will it come from?

By Pam Blair

Business as usual no longer is good enough when it comes to generating and delivering energy.

The world's appetite for power is growing—particularly in China and India—and that is affecting the United States.

Fuel prices are soaring at the same time the nation's electricity supply is being stretched beyond its capability to meet the growing demand.

Electric utilities are looking to replace outdated power generation and delivery systems, and build new sources of generation to meet their load growth, rein in out-of-control fuel costs and address environmental concerns.

According to the U.S. Energy Information Administration (EIA), total electricity consumption is expected to grow from 3,821 billion kilowatt-hours (kWh) in 2006 to 5,149 billion kWh in 2030, increasing at an average rate of 1.3 percent a year.

A Water-Driven System

Hydropower is king in the Pacific Northwest, accounting for 60 percent of the region's peak capacity of nearly 40,000 MW and 48 percent of the firm energy load of more than 24,000 average megawatts (aMW).

For customers of the Bonneville Power Administration, the percentage of hydro is nearly 90 percent at peak



capacity and 80 percent for firm resources.

Combined, the 31 federal dams generate 20,474 MW of electricity.

Regionally, coal is second, providing 20.5 percent of firm energy.

“Most of this capacity consists of large central station units completed between 1968 and 1986,” according to a Northwest Power and Conservation Council assessment.

Low coal prices, limited natural gas availability and nearly complete development of low-cost hydropower made coal a “resource of choice” at that time, the council said.

Natural gas combustion

turbines contribute 9.2 percent of the energy used in the Northwest.

Although higher prices have reduced the attractiveness of bulk power generation using natural gas, an additional 170 MW of natural gas capacity is planned for 2008 to serve peak needs.

Cogeneration provides 8.1 percent of the region's power, and nuclear contributes 3.6 percent.

A Regional Surplus

The region is estimated to have a surplus of about 2,300 aMW, based on the driest historical water year.

“The assessment provides a high assurance that the Northwest will avoid blackouts due to an inadequate overall power supply for the next three to five years,” said Tom Karier, chairman of the council. “This is good news, but it does not ensure that the region will avoid periods of high prices, nor does it ensure that individual utilities have control over enough electricity through contracts with power suppliers or from their own power plants to meet their customers' needs.”

Because much of the surplus is not committed to utilities, it could be sold to the highest bidder.

New Resources Added

Since 2005, the region has added nearly 1,900 MW of new capacity—primarily wind, but also some natural gas.

Wind plant construction is driven by extension of

Nevada: Renewable Rich, But Fossil Fuel Importer

According to the EIA, during 2006, natural gas-fired plants supplied 59.2 percent of Nevada's energy needs. Coal was second at 27.5 percent, followed by hydropower at 10.9 percent and other renewables at 2 percent.

In late 2005, Nevada's largest plant, the coal-fired Mohave Generating Station, was shut down for failure to install pollution control equipment.

Interstate pipelines supply Nevada with natural gas from California and neighboring Rocky Mountain states.

Nevada's largest operating power plant now is Hoover Dam, which also supplies markets in Southern

California and Arizona.

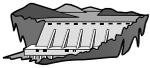
Nevada is second only to California in the generation of electricity from geothermal energy, and leads the nation in geothermal power potential.

A 64-MW, 300-acre solar power plant went online in June. According to the U.S. Department of Energy, Nevada could produce more than 600,000 MW from solar technologies.

Much of the state also is suitable for wind power development.

Several high-voltage transmission lines connect Nevada to other western electricity grids. Nevada hopes to increase electricity sales to California. ■

Legend



Hydro



Wave



Solar



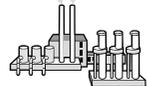
Biomass



Coal



Wind



Geothermal



Nuclear



Gas/oil

the federal production tax credit, the California renewable portfolio standard and high natural gas prices, the council said.

Nine public power utilities and three affiliates developed a 200-MW wind project east of Goldendale, Washington.

Another 1,200 to 2,200 MW of wind power development is expected from 2007 through 2009.

In December, the first commercial geothermal power plant in the Northwest began operating in Southern Idaho, generating 13 MW.

Permitting issues and high development costs have been barriers to geothermal development.

Biomass provides about 2 percent of Northwest generating capacity.

On behalf of its owners, PNGC Power—a Portland-based electric power cooperative serving 15 distribution co-ops in seven western states—manages the Coffin Butte Resource Project near

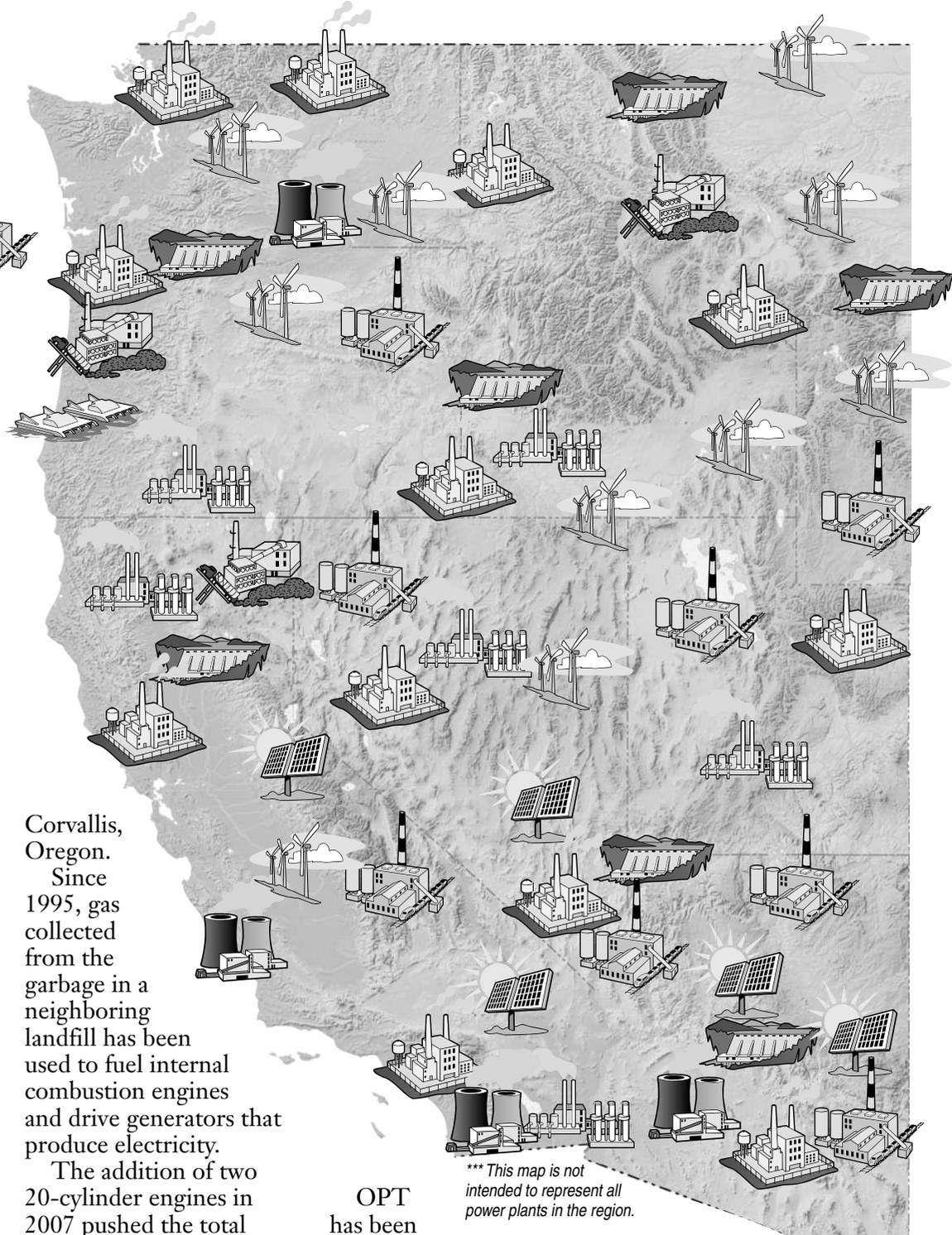
Corvallis, Oregon.

Since 1995, gas collected from the garbage in a neighboring landfill has been used to fuel internal combustion engines and drive generators that produce electricity.

The addition of two 20-cylinder engines in 2007 pushed the total generating capacity from 2.5 MW to 5.66 MW.

In 2007, PNGC Power signed an agreement to work with Ocean Power Technologies (OPT) on development of a wave park near Reedsport, Oregon.

Using a buoy system, OPT plans to generate 2 MW of energy about 2.5 miles off the coast at a depth of 50 meters.



*** This map is not intended to represent all power plants in the region.

OPT has been issued a preliminary permit by the Federal Energy Regulatory Commission for up to 50 MW of capacity at the site.

“As PNGC Power strives to maintain competitive prices and reliable service for its members, we are increasingly looking at promising new technologies to meet load

growth,” said PNGC Power President and Chief Executive Officer John Prescott. “Our participation in the development of the Reedsport OPT Wave Park demonstrates our member cooperatives’ commitment to explore alternative energy resources to meet customer needs into the future.” ■