

The Mountain Region

Colorado, Montana, New Mexico, Utah, Wyoming

Pioneers of Off-Grid, Independent Power Sources

Renewable energy technologies have gained a firm foothold as off-grid independent power sources in the Mountain region. Renewable energy systems are well-suited for this region, where densely populated urban centers are separated by vast expanses of prairie, rangeland, or rugged mountain terrain. Because of the terrain, power line extensions are very costly to build, and extreme weather conditions make maintenance difficult and expensive. To avoid expensive line extensions, the utility commissions of New Mexico and Colorado have adopted regulations requiring utilities to provide customers with information on stand-alone photovoltaic systems.

K.C. Electric Association of Colorado has been a leading pioneer in the use of renewable energy systems on farms and ranches. The utility services about 6,000 customers in a 4,000-square-mile territory. During a typical winter, heavy snow will down 500 to 1,000 utility poles and 40 miles of power line, requiring maintenance expenditures of about \$400,000. More than 50 percent of these power lines serve small loads such as water pumping for a single stock tank. Many ranchers are now purchasing their own photovoltaic systems to pump water, charge electric fences, operate irrigation flow controls, and power remote lights. Photovoltaic systems have also been installed at many parks and recreation areas in the West, often providing power at a lower cost and with less environmental impact than other power options.

Significant Potential for Utility-Scale Renewable Energy Systems

Some of the best solar resources in the nation are located in the Mountain region — like those in the southwestern deserts. Additionally, wind resources in this region are the second largest in the nation. The region could feasibly develop thousands of megawatts of grid-connected wind power and even export wind power to other regions.

In 1998, the City of Fort Collins Light and Power began delivering power generated by two 600-kilowatt turbines located near Medicine Bow, Wyoming. The first major wind development in the region has occurred in Arlington, Wyoming, where PacifiCorp and the Eugene Water and Electric Board constructed a 42-megawatt project. The Public Service Company of Colorado (PSCo) has subscriptions for its Windsourc program that have reached the equivalent of 20 megawatts. PSCo also has photovoltaic programs that include 15 kilowatts of off-grid generation and residential solar roof installations.

In addition to wind and solar, the region contains significant geothermal and biomass resources. Colorado, New Mexico, and Utah have large geothermal resource reserves, capable of providing an additional 1,600 megawatts of electric generation capacity.

Dependence on Coal, Rapid Population Growth, and Pressing Environmental Concerns

The emerging renewable energy technologies will still face intense competition from fossil-fuel energy sources in the Mountain region. This area contains roughly 120 billion metric tons of the nation's known recoverable coal reserves, almost half the U.S. total. The Mountain region now relies on coal for nearly 90 percent of its electric energy production.

The region produces 75 percent more electricity than it consumes and sells electricity to neighboring utilities. The abundance of conventional energy resources has resulted in some of the lowest electricity rates in the nation — about 20 percent lower than the national average. With such favorable economics, fossil fuels are likely to remain the source of baseload utility power for years to come.

Since 1970, the region's total population grew by almost 50 percent — twice the national average. Along with rapid population growth comes an increase in electricity demand and concern about emissions from fossil-fuel based electricity production. The amount of coal-fired electricity has grown six-fold since 1970, causing increased emissions of nitrogen oxide, particulates, and carbon dioxide. Renewable energy offers an alternative for maintaining environmental quality in a region that derives much of its income from outdoor activities such as agriculture, ranching, tourism, and recreation.



National Park Service

At Dangling Rope Marina, on the north shore of Lake Powell in southern Utah, diesel generators once provided power for lights, gas and waste pumps, and a small store. The diesel power system was expensive to operate, ran 24 hours a day, and was noisy. Today, a new photovoltaic array, generating 110 kilowatts of electric power, supplies the Marina's electricity needs — quietly, cleanly, and efficiently.