GEOTHERMAL
snohomish county pud
Geothermal Power

Geothermal power – literally meaning “earth heat,” from the Greek words geo and therme – draws on the vast energy potential underneath our feet. It’s a power source that’s clean, safe, has the potential to be generated locally and carries minimal environmental impacts. It captures the heat from the Earth – in the form of hot water or steam – and extracts it to drive a turbine and generate electricity.

Many countries have tapped the energy source, most notably Iceland, China and Mexico. The United States leads the world in terms of overall production. In the U.S., California’s Geysers steam field has produced geothermal energy since the early 1960s.

The PUD is evaluating geothermal energy and other resources, (including tidal, wind, solar and biomass energy) as part of its effort to meet growing energy needs through conservation and renewable energy. Initiative 937, passed by voters in fall 2006, requires utilities to obtain a greater share of their energy supply from green renewable sources in the coming years.

Geothermal energy has the potential to be cost competitive with other energy sources – at an estimated 7 to 10 cents per kilowatt-hour, plus transmission costs. It’s particularly attractive when compared to the cost of other green energy sources. The Western US offers many opportunities for geothermal energy due to the presence of volcanic activity, hot springs, geysers and other geological conditions.

A single 100 megawatt plant could meet more than 10 percent of the PUD’s energy needs – or serve about 70,000 homes.

“We see considerable potential for geothermal energy production in Western Washington. It’s a clean, consistent energy source that creates no waste materials in the process. As we look at sites, we also want to be respectful of the environment and ensure we don’t impact any wild or scenic areas in a negative way.”

Steve Klein
Snohomish County PUD
General Manager
While progress has been made using this technology in many countries around the world, one of the challenges is finding feasible sites where energy can be extracted in a cost-effective manner. Its widespread application depends in part upon further technical and economic advances to help identify viable sites.

How do geologists identify geothermal sites?
Geologists use a variety of tools and methods to find potential geothermal sites. For example, they may look at aerial photos and maps. They consider the chemistry of local water sources and the concentration of metals in the soil. They may measure variations in gravity and magnetic fields. Finally, to confirm if a geothermal resource is viable, they drill wells to measure underground temperatures. Researchers look for geothermal reservoirs, which are underground areas of cracked and porous (permeable) hot rock that are saturated with hot water. They can be 500°F and higher.

Viable sites could generate electricity at 7 to 10 cents per kilowatt-hour, plus transmission costs.
Where is the PUD exploring geothermal energy potential?
It’s too early to tell exactly what geothermal sites will be viable. The PUD will continue to research this energy source and consider potential sites in the region. Several Northwest sites have been explored, tested and considered for development by utilities and private companies within the energy industry. In California, geothermal facilities have produced energy for several decades. Geothermal development is not allowed in designated national parks or wilderness areas.

Where are the latest regional developments taking place?
The Newberry Caldera in Oregon (near Bend) could produce 60 average-megawatts by 2010. The Ratt River Project in Idaho (south of Boise), which began producing energy in late 2007, will initially generate 10 average-megawatts of geothermal energy. A site at Meager Mountain, British Columbia, Canada (northwest of Whistler) is being tested for a potential 100 average-megawatt facility.

Why hasn’t geothermal been developed in Washington state before?
The Northwest historically has had low energy prices and abundant hydropower. As the region has grown, it has needed to look to other sources. The initial focus has been on wind energy, but geothermal is a resource that clearly exists in the region.

The U.S. leads the world with current geothermal output at about 3,500 megawatts – enough to power about 3 million homes. A similar amount of geothermal energy is in development in the U.S. The bulk of existing generating capacity, about 3,000 MW, is in California.

Are there any negative environmental impacts with geothermal energy?
Geothermal power is a renewable resource that has little negative impact on the environment when responsibly sited and managed. Steam and hot water do contain naturally occurring traces of hydrogen sulfide (gas that smells like rotten eggs) and other gases that can be harmful in high concentrations. Geothermal plants use “scrubber” systems to clean the air of hydrogen sulfide and other gases. Sometimes the gases can be converted to other products, such as liquid fertilizer. Geothermal plants are compatible with many environments. They’ve been built in deserts, in farming fields amid crops and in mountain forests.
In October, 2009, the U.S. Department of Energy awarded $338 million in Recovery Act funding for the exploration and development of new geothermal fields and research into advanced geothermal technologies. This award represents a significant increase in funding after decades of little support and is indicative of renewed national interest in geothermal energy.

In making the announcement, Secretary of Energy Steven Chu, said, “The United States is blessed with vast geothermal energy resources, which hold enormous potential to heat our homes and power our economy. These investments in America’s technological innovation will allow us to capture more of this clean, carbon free energy at a lower cost than ever before. We will create thousands of jobs, boost our economy and help to jumpstart the geothermal industry across the United States.”

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