

U.S Department of Energy
Semi-Annual Program Report

Geothermal Outreach

Grant No.: R021599

CFDA number:

Grantee: Oregon Department of Energy

Project period: 10/01/04

Through: 09/30/08

Reporting from: 10/01/07

Through: 03/31/08

Date received:

Final report:

*Geothermal Energy Outreach in the State of Oregon
Seventh Semi-Annual Report
April 2008*

Statement of Objectives

The Oregon Department of Energy (ODOE) provides information and services to the geothermal community and other stakeholders. By leading the GeoPowering the West (GPW) effort for Oregon, ODOE maintains working relationships with others, including but not limited to: Tribes, Oregon Department of Geology and Mineral Industries, USDOE, U.S. Forest Service, Bureau of Land Management, National Park Service, the Oregon Institute of Technology, Geothermal Resources Council, and the Geothermal Education Office. This effort will help expand direct use of geothermal energy in Oregon and may lead to overcoming barriers to geothermal power plant developments.

Program activities

The following highlights the principal accomplishments during the fifth half-year starting in October 1, 2007 through March 31, 2008.

October 2007:

Program activities in October began with attending the Geothermal Resources Council annual meeting in Sparks, Nevada. Staff noted the following highlights of the meeting:

Market activity high –Power market including renewable portfolio standards spur development activities in CA, NV, ID, OR and elsewhere.

Market attraction – Icelandic banking interest is significant, Canadian capital markets are funding three firms development, Siemens is entering the market with a project in Germany, United Technologies is selling low-temperature binary systems at \$1500/kW and 16 week lead time, ThermaSource has expanded to over 100 employees and four drilling rigs for hire.

Market disruption – United Technologies off-the-shelf low-temp binary plant

Employment demand is up – 2 firms were actively soliciting new employees; and University of Nevada Reno now offers a new renewable energy program

Staff presented information to the Idaho Geothermal Energy Working Group, specifically the latest geothermal power exploration activities in Oregon. These include the Neal Hot Springs,

Crump Geyser and Newberry volcano prospects. In addition, as noted last month, Eugene Water & Electric Board plans to purchase power from Raft River project of US Geothermal.

Minutes of the July 23 meeting presentations were added to the ODOE website in October. They can be found at <http://egov.oregon.gov/ENERGY/RENEW/Geothermal/OGWG-Meetings.shtml>.

Other Activities: The Pacific Northwest Section of the Geothermal Resources Council provided training for 31 federal employees Oct. 17.

November 2007

Program activities in November were few. The Newberry Geothermal Project continues to advance, with this month's announcement by Davenport Power of approval to maintain roads and prepare pads for exploratory well drilling. Following Davenport's press release, feedback was captured in an Oregonian newspaper article. In the article, a response is attributed to a central Oregon Sierra Club member indicates that group will oppose the project. Based on that, Staff has set up a meeting with local Sierra Club representatives on May1 following the next OGWG workshop.

Staff responded to two consumer inquiries regarding ground source heat pumps and engineers with expertise in geothermal power plants.

December 2007

Activities in December include a ground source heat pump meeting with Dave Brook of ODOE, Curt Jungwirth of Curt's Refrigeration in Newberg and Jim Foushee, a local builder. Curt and Jim are installing a Subterra ground source heat pump at Jim's home. It's a "direct expansion" system: refrigerant circulated in copper tubing buried in the ground. In the 1980s quite a number were installed locally and then some had performance problems. These folks are interested in restarting the company and getting the equipment eligible for Oregon Residential Energy Tax Credit program. Staff reviewed for them the RETC requirements – 1) equipment COP of 3.5+ and 2) installation by a tax-credit certified technician.

The original system was reviewed by the Program contractor in his then-capacity with ODOE in 1984(!). It had a Coefficient of Performance (COP) of about 3.4 - just under current requirement of 3.5 COP. Mr. Jungwirth claims that the new system uses the more efficient scroll-type compressor and therefore would likely meet the requirement. As far as reliability, he explained that as the company grew, outsiders began changing the installation techniques and that's the reason for the problems that eventually bankrupted the company.

ODOE staff proposed to Mr. Jungwirth that approval would be requested for the following. First, ODOE would deem the system to meet the COP requirement for a year and that he would monitor an actual installation for the next year, under the review of a 3rd party, such a PGE heat pump specialist, Kevin Rafferty, or some other specialist familiar with the equipment, to verify the 3.5 COP performance.

The second requirement is that these systems need to be installed by a tax-credit certified technician. Mr. Jungwirth has submitted an application to be certified by ODOE but has never had IGSHPA certification. In lieu of that he claims 35 years of ground-source installation and refrigeration experience. ODOE staff held internal discussions regarding allowing this to meet administrative rule requirements for "other training approved by the ODOE Director" and will inform Mr. Jungwirth of both decisions. It seems reasonable that if ODOE allows his experience

to count toward certification, that the system he already installed should be eligible (subject to the first point above). Approval on both points was subsequently denied.

The Program earlier provided notice of USDA Value-Added Producer Grant and §9006 Rural Energy Grant packager training to the geothermal community. It took place December 17, 2007 in Portland, Oregon. The training was well attended with at least two folks active in geothermal energy in the 25+ audience.

During December the Program communicated with staff at Portland General Electric regarding power transmission issues. Transmission is a considerable issue for any developer, and in particular renewable energy developers that are tied to a specific site for the "fuel". PGE staff suggested a possible solution of geothermal developers in particular regions pitching together on a transmission line, thus spreading costs. However, with separate geothermal sites being developed that may not be feasible. Wind energy has benefited from economies of scale that help reduce the burden of transmission interconnection costs. Many locations have reached a critical mass of development where developers are working together to get lines built to the site (as did PGE with Biglow Canyon wind farm most recently). A small group of developers will be assessed of their interest in further discussions with PGE or we may pursue this as a topic for a OGWG meeting.

Staff this month investigated producing a geothermal consumer guide similar the one the Idaho Energy Office redistributed in 2007 (*Geothermal Resources in Idaho A Consumer's Guide*). Costs estimates equal approximately \$1.50 per copy. Both digital and hard copy versions were provided to ODOE in December. We will discuss this publication at the May OGWG meeting and if folks see a benefit, proceed.

Bonneville Power Administration may resolve legal challenges for the Glass Mountain project. Settlement terms are being negotiated that may result in the wholesale utility no longer contracted to purchase geothermal power.

January 2008

Program activities centered on a presentation at the third Business Alliance for Sustainable Energy (BASE) Summit in January. The conference focused on new developments that increase Oregon's energy independence. Program representatives, filling in for invitees from the OIT Geo-Heat Center, spoke during the morning session. The Pacific Northwest Section of the Geothermal Resources Council staffed a table at the event with information from the Program and the Geo-Heat Center. The BASE presentation is available on the 3E Strategies website in February www.3estrategies.org.

The Program mailing list was updated.

February 2008

Program activities began early in February with a discussion of opportunities to tap into geothermal energy for Government Camp, Oregon. There is strong community wide and property specific interest in seeing what the potential could be, what resources are available, next steps involved and the expertise available. Based on the meeting, Collins Lake Resort officials will investigate ground source heat pump opportunities for the next phase of development. A broader community-based system was discussed at length, but the risks were considered higher than the potential rewards, in spite of significant future development planned for Government Camp.

Staff discussed at length geothermal energy use options with a representative of PepsiCo/Quaker Oats corporate facilities team. The firm is building a soft drink plant in Albany, Oregon and is exploring renewable energy sources. Heating would be needed for the plant and offices. The representative was familiar with ground source heat pump technology. Process use (steam) and power supply options were also discussed with the company. State incentives were included as well.

The Program this month addressed the issue of home-owner installed ground source heat pump systems. Specifically, two home owners who are installing their own systems and want to qualify for the state residential energy tax credit. In the past, ODOE with the cooperation of the local power company measured the system's Coefficient of Performance (COP). The Program solicited input on this issue from past employees, John Lund of the OIT Geo-Heat Center and John Geyer, an independent GSHP trainer. The suggested course of action is to undertake an instantaneous COP test, one that can be performed by any HVAC contractor. It will measure the temperatures of the incoming and outgoing loop lines (temperature rise) and measure amperage of the electrical circuit feeding the heat pump. System installation details would include:

- Sketch of ground loops - depth, overall width of trench, spacing of pipes
- Loop design: e.g., slinky, 4-pipe, etc.
- Pipe material, diameter & length
- Pressure test results for loop(s)
- Type of antifreeze in loop

In February the Oregon Dept. of Geology received an application to drill a geothermal well. DOGAMI circulated these applications to the state agency directors and to Deschutes County where the wells are to be located. In addition to the drilling permit application, Davenport provided a detailed Plan of Exploration for the Newberry Geothermal Exploration Project. Northwest Geothermal Company (NGC) is proposing to drill, complete, and test up to nine wells on Federal Geothermal Leases OR-12437 and OR-40497 from three well pad sites proposed within Sections 29, 16 and 17 in Township 21 South, Range 12 East, in the Fort Rock district of the Deschutes National Forest, Deschutes County, Oregon.

New links were added to the website this month. The DOGAMI Geothermal Information Layer for Oregon is now linked to ODOE's website.

A new firm is joining the geothermal industry, one with Oregon roots. See www.geothermpower.com for information on this formative stage geothermal energy firm.

March 2008

Program activities in March began with a residential direct use application coming before ODOE for a tax credit. Most of the Klamath Falls systems were installed prior to the advent of state incentives in the 1980s. At that time, some new systems and others needing to be rebuilt came in for state tax credits. Since then, virtually no new systems have been installed so this application was a "re-education" for those involved.

The Program this month finalized details for the next OGWG meeting May 1 in Bend. A final agenda will be included in the April report. It will be an exciting program as geothermal power development activities are at a level not seen in nearly two decades in Oregon. US Geothermal announced at the end of February that drilling will proceed at the company's Neal Hot Springs (Malheur Co.) site. Drilling activity at the Newberry project is underway with a fresh infusion of capital allowing the firm to move forward quickly. A third potential power plant received local

land use approval in Klamath County. ORMAT is also investigating opportunities in Oregon, and inquired about power plant siting regulation this month.

A field trip to see the latest drilling at Newberry volcano is planned for the May 1st OGWG meeting.