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QUARTERLY PROGRAM REPORT

Grant number: R021599
CFDA number: 81.117
Grantee: State of Oregon

Project period: 10/01/2004 - 09/30/2008

Reporting period: 10/01/2006 - 03/31/2007

Date received: **Final report:** No

Comments:

***Geothermal Energy Outreach in the State of Oregon
Fifth Semi-Annual Report
March 2007***

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. Appendix A contains the **Strategic Plan** outlining objectives for this program.

Program activities

The following highlights the principal accomplishments during the third half-year starting in October 1, 2006 through March 30, 2007:

The Program in **November** hosted the seventh Working Group meeting. The workshop was divided into two sessions: 1) How geothermal power development activities are regulated by federal and state government, and 2) How geothermal energy works and how it can be developed to generate electricity. The meeting hosted a record high 66 registered attendees.

**Seventh Meeting of the Oregon Geothermal Working Group
With
An Informational Workshop Geothermal Energy 101**

**Organized by the Pacific NW Geothermal Resource Council,
3EStrategies and the Oregon Department of Energy
Bend, OR, November 7, 2006**

When: Tuesday, November 7, 2006, 9 AM to 4:30 PM

Where: Mc Menamin's Old St. Francis School, 700 NW Bond Street, Bend, Oregon 97701, Phone: 541-330-8567

As the economic and environmental costs of fossil fuel resources continue to rise, renewable energy sources are becoming more attractive and feasible. Oregon is one of a few states in the country that has geothermal energy potential for large-scale electricity generation.

This workshop is divided in two sessions. The morning will primarily be focused on how Geothermal

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Development is regulated by federal and state government.

In the afternoon, we will have the Geothermal Energy 101 session which will explain how geothermal energy works and how it can be developed to generate electricity. Representatives of companies that have made recent announcements of geothermal generating facilities in Oregon will provide information. The session will also address the environmental and economic implications of geothermal energy development and will feature a case study from a community that has harnessed this resource.

*****AGENDA*****

- 09:00 Welcome/Introductions - Carel DeWinkel, Oregon Department of Energy (ODOE)
- 09:15 Highlights from the Geothermal Resource Council's and GeoPowering the West annual meetings - Al Waibel, Columbia Geoscience, Alex Sifford, Sifford Energy Services, and Roger Hill, Sandia Laboratories
- 09:30 Geothermal Development: US Bureau of Land Management Role & Responsibilities, Patrick Geehan, BLM
- 10:15 Break
- 10:30 Geothermal Development: US Forest Service Role & Responsibilities, Bob Fujimoto and Larry Chitwood, US Forest Service
- 11:15 Geothermal Development: Oregon's Energy Facilities Siting law, Carel DeWinkel, ODOE
- 11:30 Development of a geothermal Geographic Information System (GIS), Clark Niewendorp, Oregon Department of Geology and Mineral Industries

12:00 Lunch (\$10 per person for buffet lunch, to be paid on site)

Workshop Agenda continued: afternoon session

Geothermal Energy Development 101

- 01:30 Oregon's Energy Challenges and Opportunities, Cylvia Hayes, 3EStrategies
- 01:45 What is geothermal energy, how is it used, and what is the process for developing a geothermal electricity generation facility?, Alex Sifford, Sifford Energy Services
- 02:30 Discussion
- 03:00 Break
- 03:15 Recent Announcements of geothermal electric generating facilities in Oregon: representatives from Davenport Resources, Nevada Geothermal, and US Geothermal
- 03:45 Case study of Mammoth Lakes, CA: How geothermal development influences communities, Alex Sifford, Sifford Energy Services
- 04:15 Central Oregon's unique geothermal opportunity, Dave McClain, McClain and Associates
- 04:30 Concluding remarks

04:45 - 7:00 Reception (with cash bar)

Comments from State Representative Chuck Burley.

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Opportunity to speak directly with the presenters and the representatives from geothermal development projects in Oregon.

Note: most of the following speakers used power point presentations, which are posted on the ODOE web page.

Minutes from the meeting follow.

The meeting began with introductions from the record high 66 registered attendees. Following that a trio of working group members - Al Waibel, Alex Sifford and Roger Hill - related highlights from the Geothermal Resource Council's and GeoPowering the West annual meetings.

Patrick Geehan, the US Department of Interior Bureau of Land Management (BLM) Deputy Oregon State Director for Minerals addressed his agency's role and responsibilities. The BLM leases both fluid and solid minerals on federal lands. Beginning with resource definitions, he explained the agency administration of geothermal leasing, bonds, operation, utilization and royalties. The recently enacted Energy Policy Act of 2005 modified many leasing provisions. One of the best changes in this speaker's opinion is the change to calculating royalties based on gross kWh sales. (Sean Haggerty of the California State BLM office added that the agency was revising royalty rates to conform with the law and also performing a nationwide environmental impact statement.) Patrick ended his talk with an impromptu presentation to the next speaker, Bob Fujimoto for his years of federal service.

The US Department of Agriculture Forest Service responsibilities were presented by Bob Fujimoto, Mineral Leasing Coordinator in the Regional Foresters Office. His presentation covered activities the Forest Service as surface manager approves outright such as surface exploration on unleased land. Bob also addressed activities the Forest Service advises the BLM on such as exploration on Newberry Volcanic National Monument lands and reclamation. This advice many times shows up in conditions to leases and permits.

Curtis Dixon of the US Department of Agriculture briefly discussed federal rural development incentives available through his agency. For more information, please check the USDA web site at www.rurdev.usda.gov/or/rbs.htm

John Lund of the Geo-Heat Center at Oregon Institute of Technology in Klamath Falls outlined his college's ambitious plans to expand geothermal energy use. Proposed projects include power generation, both low- and high-temperature technologies, plus aquaculture and greenhouse direct use applications.

Carel DeWinkel of ODOE covered the state of Oregon Energy Facilities Siting law. Geothermal plants greater than 38.85 MW in size come under state power plant siting law and administrative

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rules. The Energy Facilities Siting Council reviews applications based on standards. The Council issues a Site Certificate binding the applicant and all political subdivisions. State agencies issue permits with the Council's conditions. Standards to be met include wildlife habitat, soil protection, land use, protected areas, structural, threatened and endangered species, organizational expertise, retirement of the facility and financial assurance, and public services. One valuable question from the audience in his talk related to an agreement between federal and state agencies covering well inspection and bonding requirements. Such an agreement does indeed exist between BLM and DOGAMI.

Clark Niewendorp, with the Oregon Department of Geology and Mineral Industries discussed his agency beginning to develop a geothermal Geographic Information System covering all known well and spring data in Oregon. The work is just beginning and will continue through June 2007.

Cylvia Hayes, Director of 3EStrategies presented a number of energy challenges and resulting opportunities facing Oregon. The result is her forecast of many opportunities in central Oregon for geothermal and other renewable energy firms.

A "Geothermal Energy 101" talk - what geothermal energy is and how is it used - was presented by Alex Sifford, Sifford Energy Services. He also walked through the general process for developing a geothermal power plant: exploration, leasing, environmental assessment, and permitting.

Doug Perry, President of Davenport Power LLC briefly discussed his firm's Newberry Geothermal Project development efforts following the signing of a power purchase agreement with Pacific Gas & Electric Co. His firm finished exploration activities within the last week.

Brian Fairbank, President of Nevada Geothermal Power provided a current update of his firm's activities in Nevada and Oregon. The Crump Geyser project in Lake County Oregon is the company's second priority exploration prospect. Magnetic and resistivity surveys have been completed. Nevada Geothermal commissioned GeothermEx to estimate reserves. The firm's conclusion was 40 MW of probable and 60 MW of most likely reserves.

Alex Sifford presented a case study of geothermal development in Mammoth Lakes, California. One clear lesson in building a geothermal power plant in an area physically and economically similarly to Deschutes County is to establish an advisory committee before, during and after development. Property taxes to Mono County for the 40 MW (gross) plants exceed \$860,000 each year. Royalties to the county are about \$39,000.

Dave McClain, McClain and Associates ended the session with a talk on Central Oregon's unique geothermal opportunity. Starting in Latin (fitting for the former Catholic school the meeting was held

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in) Dave gave his list of top local prospects: Klamath Falls, Newberry and Crump Geyser. He ended by discussing the Confederated Tribes of Warm Springs approach to possible development, a "four legged stool" of providing for the future generations, energy, economy and culture.

Following the official meeting, a reception was held with comments from the local state Representative Chuck Burley. It was an opportunity to speak directly with the presenters and the representatives from geothermal development projects in Oregon.

The Program in **December** assisted Brian Cole of the Orbis Group, who is working with the City of Vale and Vale Senior Citizen Center, Inc. to build a new 7700 square foot Senior Center in Vale, Oregon. Funding is being sought by June 2007, with construction following in summer. A geothermal water line is apparently adjacent to the property and Orbis Group wants to determine feasibility of using this energy source. Andrew Chiasson of the Geo-Heat Center may be providing technical assistance.

Orbis Group is also working with owners David and Lee Manuel on the restoration of the Hot Lake Hotel near La Grande, Oregon.

Administrative rule changes were adopted in **December** that change new state ground source heat pump tax credit certification requirements. Effective Jan. 1 the standards for Ground Source Heat Pump equipment Residential Energy Tax Credit program eligibility will match the ENERGY STAR® program i.e., Coefficient of Performance of at least 3.3. In addition, technician certification standards will require International Ground Source Heat Pump Association Certification training (or equivalent) and one installation each year. Training requirements for installer technicians now include training calls.

The Program began 2007 focused on ground source heat pump training. Three technician certification conference calls took place on **January** and two more in **February**. Twenty nine technicians dialed in for these one hour events with the primary goal of explaining new state tax credit certification requirements. Program and ODOE staff responded to contractor questions. Current Oregon certified contractors are listed on the agency website.

A copy of the call agenda is below

2007 Geothermal Update Conference Call**Attendance****Purpose of the Update Conference Call**

To talk with geothermal professionals about the state energy tax credit program

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To share what is new with the tax credit programs
To share technical geothermal information
To discuss other incentives and federal tax credits
To give you resources at the Oregon Department of Energy
To get feedback from geothermal professionals

What is NEW?

General - Residential Energy Tax Credit

- New Rule Jan. 1, 2007** - Tax-credit certified technicians must have or be employed by a company that has a Construction Contractors Board (CCB) license
- New Rule Jan. 1, 2007** - First-time technician applicants must show proof of successful completion with the previous 5 years of IGSHPA training or IGSHPA certified manufacturer's installer training or other training approved by the ODOE Director. If IGSHPA or other training is more than 5 years old, applicant must also complete two-hour relevant installer training, community college HVAC course or other training approved by the ODOE Director with the previous year.
- New Rule Jan. 1, 2007** - To maintain tax-credit technician certification, technician must have completed during the previous calendar year a minimum of one tax credit approved ground source heat pump installation or proof of having completed at least two hours of relevant installer training, community college HVAC course or other training approved by the ODOE Director.
- New Rule Jan. 1, 2007** - The system COP for geothermal systems was increased. The COP must be at least 3.3 for closed loop systems and 3.5 for direct expansion (DX) systems.

General - Business Energy Tax Credit

For an Oregon business that has a qualifying geothermal system installed
 Non-profit or public entity can use the Pass-through Option
 Must apply for the tax credit **before** the start of project
 Must show a 15-year payback or eligible cost is prorated

Tax-credit certified technician

Oregon Dept. of Energy certifies diagnostic, duct, solar and geothermal technicians

Oregon residents applying for a tax credit must use tax-credit certified technician

Oregon Dept. of Energy lists tax-credit certified technician's employer on its Web site

Why certification? To make geothermal consistent with other tax credit requirements and increase quality assurance.

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Tax-credit certified geothermal technician must show proof of International Ground Source Heat Pump Association training (IGSHPA) or an IGSHPA certified manufacturer's training program or other training approved by the Oregon Department of Energy Director during the previous 5 years.
Technician must sign annual agreement

- To maintain tax-credit certification, geothermal technician must:
 1. Sign and update certification agreement on annual basis.
 2. Participate in an annual "update" conference telephone call with ODOE.
 Maintain current requisite technical certification and licensing.
 Install and submit a minimum of one (1) geothermal Residential Energy Tax Credit applications or proof of having completed at least two hours of relevant installer training, community college HVAC course or other training approved by the ODOE Director.

Technical Issues

Geothermal space or water heating system must be installed in a closed-loop configuration
 The system COP for geothermal systems is increased. The COP must be at least 3.3 for closed loop systems and 3.5 for direct expansion (DX) systems.
 Only systems that use a subsurface coil of tubing or heat exchanger and do not remove water from the ground, lake, pond or stream are eligible.
 Tax-credit certified technician must provide an accurate description of the equipment or system on the application form.
 Technician must provide a 12-month minimum system warranty.
 Technician must provide homeowner with an owner's manual and explain basic operation and proper maintenance of system to the owner.
 Use Geothermal Tax Credit Yield Table:

System Tons	BTU per Hour Output	Estimated Savings	Tax Credit Amount
3 ton and under	Less than 40,000	1,000 kWh	\$600
4 ton	40,000 - 49,999	1,165 kWh	\$700
5 ton	50,000 - 64,999	1,335 kWh	\$800
6 ton and over	65,000 and over	1,500 kWh	\$900

Tips

Technical portion of forms must be filled out by technician
 Technician must sign application form
 Itemized receipt required marked "PAID" with contractor signature and date
 Homeowner must sign form

Other incentives:

Federal tax credit for geothermal (Please contact the IRS or a tax professional for

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assistance on claiming the federal tax credit.

Must be placed in service in 2006-2007

\$300 maximum credit for closed loop: EER 14.1 COP 3.3

Open loop: EER 16.2 COP 3.6

Direct expansion: EER 15 COP 3.5

Rebates - Many Oregon utilities offer rebates for geothermal

See Oregon Dept. of Energy Web site (www.oregon.gov/energy) Under "Favorites" click on "Utility Incentives and Other Funding Sources." Then click on the word "incentives" in the third paragraph. Click on State: "Oregon" and Type: "Heat Pump." This will give you all Oregon utilities that offer an incentive for geothermal heat pumps. Or go directly to the site:

<http://www.northwestenergystar.com/index.php?cID=171>

Resources

Angie Whitethorn - Oregon Dept. of Energy - Energy Program Specialist - 1-800-221-8035 or (503) 378-2697 - Call regarding questions on Residential Energy Tax Credits, tax credit forms, and how to become a tax-credit certified technician.

Dave Brook - Oregon Dept. of Energy - Energy Analyst - 1-800-221-8035 or (503) 378-6916 - Call regarding technical questions on Residential Energy Tax Credits.

Lisa Hull - Oregon Dept. of Energy - Energy Analyst - 1-800-221-8035 or (503) 378-6916 - Call regarding questions on Business Energy Tax Credits and forms.

Kathy Estes - Oregon Dept. of Energy - Asst. Loan Officer - 1-800-221-8035 or (503) 378-5048 - Call concerning Energy Loans for geothermal heat pumps.

Suzanne Dillard Oregon Dept. of Energy - Conservation Services Manager - 1-800-221-8035 or (503) 373-7565- Call concerning policy issues for the Tax Credit Program.

The Program participated in the GPW All States Working Group Quarterly Phone Conference Call in **February**. Carel provided information to the group about legislative proposals before the Oregon legislature.

In **March** the Program assisted with a Briefing (and little more) for Geothermal Heat Pump Installers and Technicians for ODOE Energy Tax Credit Certification at Lane Community College in Eugene. This one-day GSHP "refresher" class met the training requirements for existing Technicians to renew their tax-credit certification if they had only one tax credit installation last year, or for new Technicians whose IGSHPA certification is older than 5 years. This workshop covered important aspects of successful residential geothermal heat pump systems. Recent changes and developments on the national scene were discussed and ODOE staff covered incentives for residential GHP

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systems. The speakers were Andrew Chiasson of the Geo-Heat Center, Oregon Institute of Technology and John Geyer, JG&A Inc.

The Geothermal Resources Information Layer for Oregon (GTILO) that DOGAMI is working on reported substantial progress this month. This project is proceeding on two parallel work paths, first being the MapServer interface and the second is GIS data development. Clarke Niewendorp and Deb Schueller of DOGAMI plus a Portland State University student are working on the MapServer interface. The interface is running in test mode. Steps that remain are debugging the interface and its configuration for the server.

On the GIS side, the Hot and Warm Springs file has been completed. The list of thermal springs (greater than 20 degrees C) has grown to about 620, of which nearly 300 are new entries. New spring data are courtesy of the University of Idaho and the Great Basin Center for Geothermal Research. Both polygon coverages for KGRA and Direct-Use areas are ready as well. Researchers are collecting data on existing geothermal prospect wells from agency permit files. Possibly 1000 new exploration wells will be added to the GIS file. DOGAMI has also finished scanning geophysical logs for the geothermal wells. That information will be available as a digital download. The Program is confident of meeting a July completion.

Website additions during the period include:

- 8 Presentations from the November 2006 workshop;

Appendix A**Oregon Geothermal Energy Development Strategic Plan**

**Proposed Activities
September 2006 to October 2008**

MISSION STATEMENT

The Oregon Geothermal Working Group promotes the use of Oregon's geothermal resources for power generation and direct use applications.

STRATEGIC OBJECTIVES

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- Strategic Objective 1: Organize an Oregon Geothermal Working Group and Implement a Strategic Plan.**
- Strategic Objective 2: Educate the stakeholders and increase public awareness of Oregon's geothermal energy resources, rules, laws, benefits and cost-effective applications.**
- Strategic Objective 3: Promote the establishment of laws, legislation, and policies that encourage the development of geothermal energy for direct use and power generation.**
- Strategic Objective 4: Increase technical knowledge and understanding of Oregon's geothermal resources and their uses.**
- Strategic Objective 5: Promote financial assistance for geothermal energy projects.**
- Strategic Objective 6: Promote innovative and broader use of non-generating applications geothermal energy.**
- Strategic Objective 7: Promote opportunities for geothermal electric power development.**

- Strategic Objective 1: Organize an Oregon Geothermal Working Group and Implement a Strategic Plan.**

Action Plan:

- a. By November 2004, organize an Oregon Geothermal Working Group to review, adopt, and implement the Oregon Geothermal Energy Development Strategic Plan. The Oregon Department of Energy will facilitate and support this group.
- b. Through September 2008, conduct regular working group meetings to review progress of the Strategic Plan. This will include disseminating information to Oregon geothermal energy stakeholders through the Oregon Geothermal Working Group email list and ODOE website.

- Strategic Objective 2: Educate the stakeholders and increase public awareness of Oregon's geothermal energy resources, rules, laws, benefits and cost-effective applications.**

Action Plan:

- a. Through September 2008, sponsor and/or coordinate educational activities (e.g., workshops, symposiums, etc.) to promote the uses of geothermal energy (e.g., space and water heating, aquaculture, industrial applications, power generation)

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to various groups.

- b. Through September 2008, network with resource centers i.e., OIT GeoHeat Center, Geothermal Education Office, NREL in developing educational programs for interested parties, potential users and community leaders in the use of geothermal energy.

Strategic Objective 3: Promote the establishment of laws, legislation, and policies that encourage the development of geothermal energy for direct use, power generation and cascading applications.

Action Plan:

- a. Through September 2008, educate appropriate legislative committees and others influencing energy policies.
- b. By January 2006, identify organizations to promote the drafting of legislation, which may include renewable portfolio standards, set asides, system benefit charge, and tax credits.
- b. Through September 2008, provide technical support to those involved in drafting legislation.
- d. Through September 2008, work with the Oregon Public Utilities Commission to promulgate rules promoting utility purchase of geothermal power.
- e. Through September 2008, explore for possible links with new farm bill to support direct use applications in agriculture.
- f. Through September 2008, encourage the Oregon Congressional delegation to support legislation to promote development of geothermal resources for direct use and power generation.

Strategic Objective 4: Increase technical knowledge and understanding of Oregon's geothermal resources and their uses.

Action Plan:

- a. Through September 2008, promote efforts to improve and update existing geothermal resource databases and maps. Information will be collected from the OIT Geo-Heat Center, the Dept. of Geology & Mineral Industries and the Geothermal Resources Council. Such information will be distributed as part of Strategic Objective 2.

QUARTERLY PROGRAM REPORT**Strategic Objective 5: Promote financial assistance for geothermal energy projects.****Action Plan:**

- a. Through September 2008, compile and disseminate information on available government financial incentives. These include federal incentives (production tax credits), state incentives (loans and tax credits), and Energy Trust of Oregon incentives.

Strategic Objective 6: Promote non-generating applications of geothermal energy.**Action Plan:**

- a. By June 2005, identify and characterize geothermal resources in Oregon suitable for non-generating applications, and make such information regarding the same publicly available.
- b. By December 2005, develop a repository of technical, financial, regulatory and other relevant information on non-generating uses of geothermal energy.
- c. Coordinate with the Oregon Economic Development officials and others in conducting studies that document the rural economic impacts of developing geothermal energy resources for direct use.

Strategic Objective 7: Promote opportunities for geothermal electric power development.**Action Plan:**

- a. By June 2005, identify and characterize resources in Oregon suitable for geothermal electric development, and make information regarding the same publicly available.
- b. By June 2005, make information pertinent to geothermal power plant siting, acquisition of financing, etc. publicly available.
- c. By December 2005, determine from rural electric utilities (including aggregators such as Pacific Northwest Generating Company) their near-term interest in pursuing geothermal development in Oregon

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- d. Through September 2008, work with other stakeholders to resolve existing transmission constraints that could impede development of geothermal electric generation.

Submitted by:

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/s/ Signed electronically

Date:

4/25/2007