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**States generating geothermal energy and existing capacity  
(2006)**

**Total installed capacity: 2830.65 Megawatts (MW) (11/2006)\***

**Total generation: 16,010 GWh (2005)**

<b>Alaska</b>	<b>California</b>	<b>Hawaii</b>	<b>Nevada</b>	<b>Utah</b>
<b>400 kW</b>	<b>2492.1 MW</b>	<b>35 MW</b>	<b>276.4 MW</b>	<b>26 MW</b>

# ORMAT 20MW Burdette Power Plant - Reno, Nevada



# UTC Power 225 KW Power Plant - Chena, Alaska



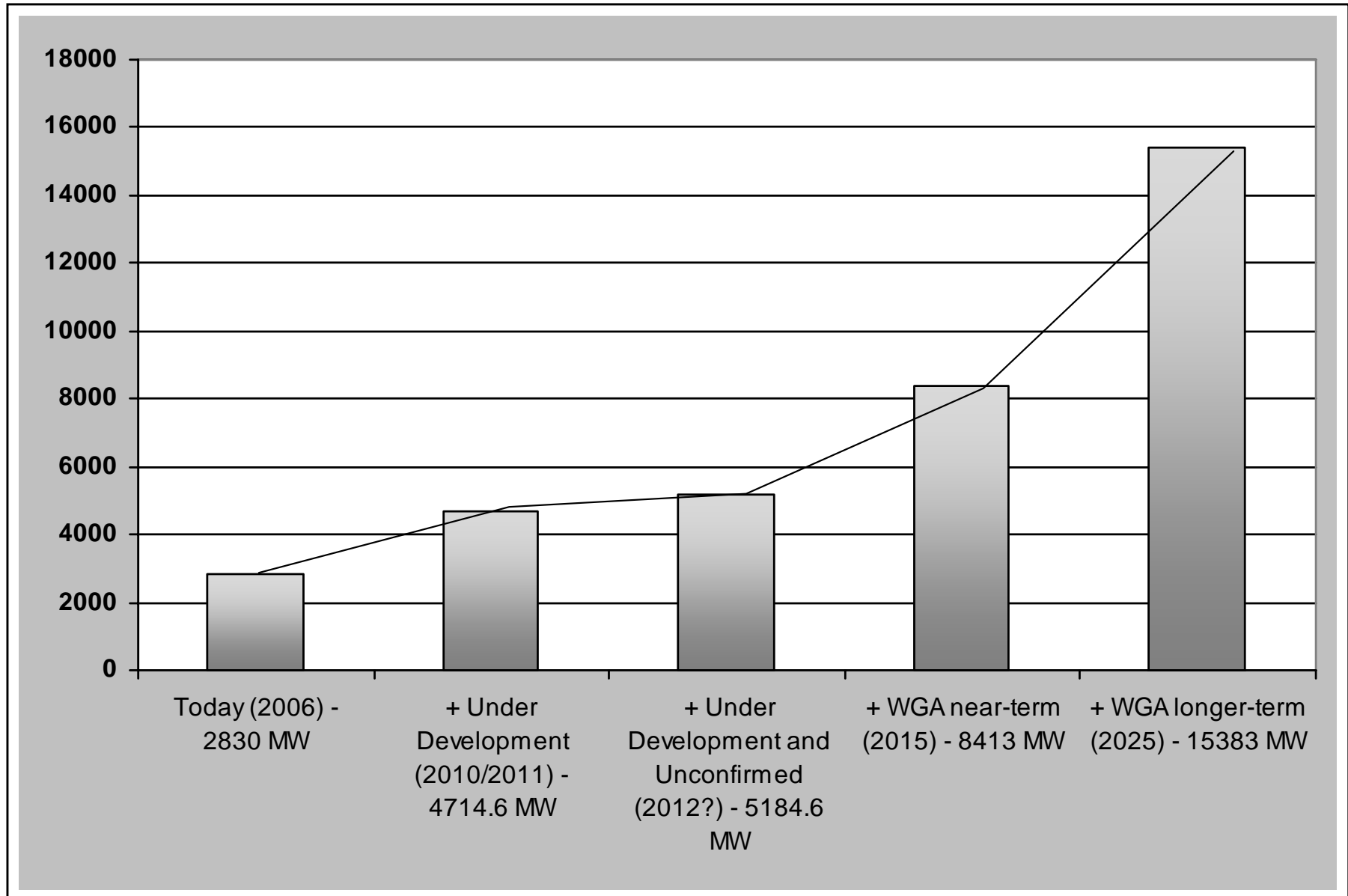
- *Commissioned July, 2006*
- *1 system, 2<sup>nd</sup> unit in Dec 06*
- *Lowest geothermal temp in world <165°F*
- *Drivers: Off-Grid, sustainable geothermal power and heat, for multiple applications*



<b>State</b>	<b>Unconfirmed</b>	<b>PHASE 1 (Identifying site, secured rights to resource, initial exploration drilling)</b>	<b>PHASE 2 (Drilling and confirming)</b>	<b>PHASE 3 (Securing PPA and final permits)</b>	<b>PHASE 4 (Under Const.)</b>	<b>TOTAL* (PHASE 1 to PHASE 4)</b>
<b>Number of sites and MW-range “# of sites/#MW”</b>						
<b>AK</b>	<b>1/15 MW</b>	<b>1/20 MW</b>			<b>1/0.6 MW</b>	<b>2/20.6 MW</b>
<b>AZ</b>		<b>1/2-20 MW</b>				<b>1/2-20 MW</b>
<b>CA</b>		<b>5/320-330 MW</b>	<b>3/326.8 MW</b>	<b>5/139.5 MW</b>	<b>2/35-73 MW</b>	<b>15/821.3-869.3 MW</b>
<b>HI</b>		<b>1/30 MW</b>		<b>1/8 MW</b>		<b>2/38 MW</b>
<b>ID</b>	<b>2/200 MW</b>		<b>1/26</b>		<b>1/10 MW</b>	<b>2/36 MW</b>
<b>NM</b>			<b>2/21 MW</b>			<b>2/21 MW</b>
<b>NV</b>	<b>5/72-102 MW</b>	<b>7/304-393 MW</b>	<b>3/49-64 MW</b>	<b>6/157-167 MW</b>	<b>3/37 MW</b>	<b>19/547-661 MW</b>
<b>OR</b>		<b>3/86-91 MW</b>	<b>1/40-60</b>	<b>2/60.2 MW</b>		<b>6/186.2-211.2 MW</b>
<b>UT</b>	<b>2/135 MW</b>		<b>1/36.6 MW</b>		<b>1/11 MW</b>	<b>2/47.6 MW</b>
<b>Total</b>	<b>10 projects 422-452 MW</b>	<b>18 projects 762-884 MW</b>	<b>11 projects 499.4-534.4 MW</b>	<b>14 projects 364.7-374.7 MW</b>	<b>8 projects 93.6-131.6 MW</b>	<b>51 projects 1719.7-1924.7 MW</b>

# GEOHERMAL POTENTIAL BY 2025

We can triple capacity in 10 years



**An Assessment of Geothermal Resource Development Needs in  
the Western United States**

**January 2007**

Daniel J. Fleischmann  
Geothermal Energy Association



*Exp. Area Groundbreaking. Photo by Daniel J. Fleischmann*

Prepared for the U.S. Department of Energy

**EXECUTIVE SUMMARY**

## **New Study Finds Extensive Undeveloped Geothermal Resource in Western US; Identifies Barriers, Challenges, and Opportunities for Future Geothermal Development**

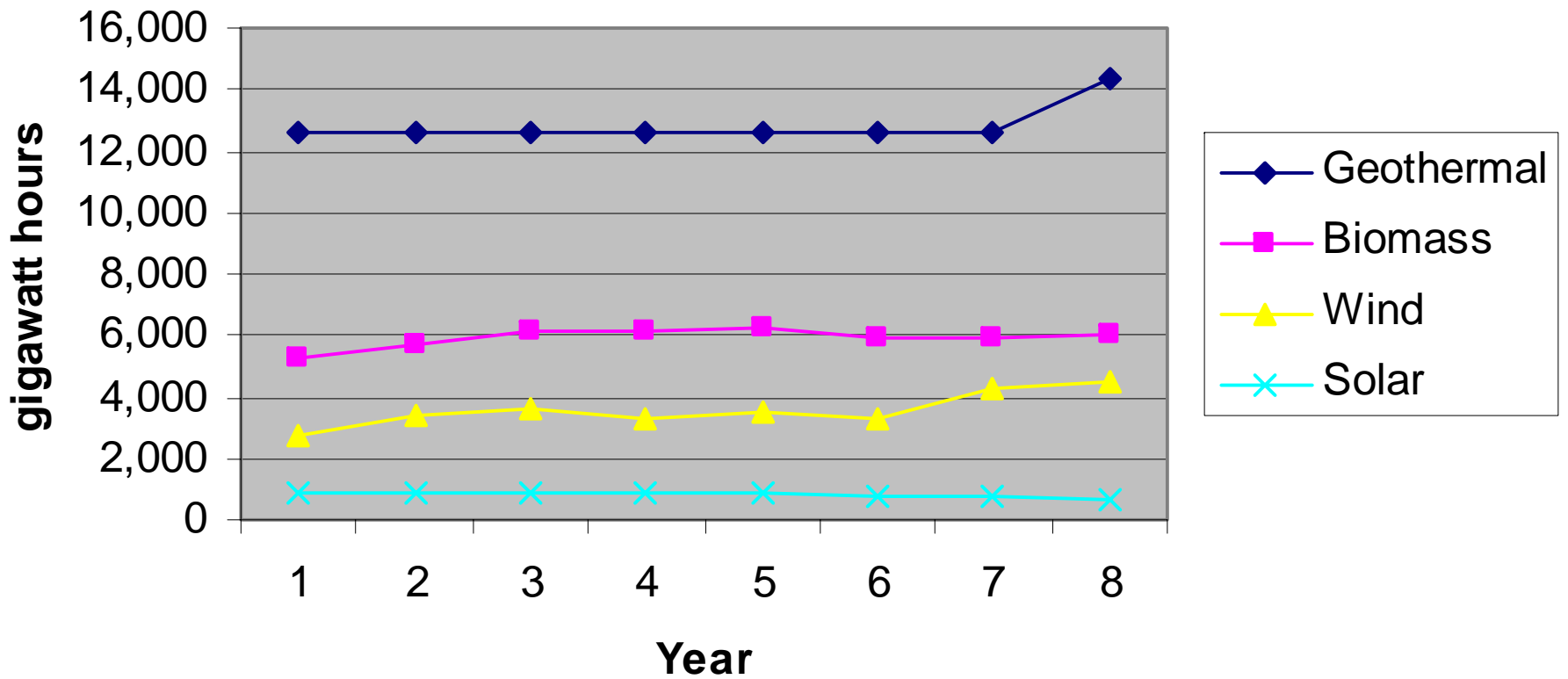
Washington, DC -- A new report released today finds extensive undeveloped geothermal resources in fourteen Western states – Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming. The new report, *An Assessment of Geothermal Resource Development Needs in the Western United States*, written by Dan Fleischmann for the Geothermal Energy Association (GEA) is the most in-depth study we've ever undertaken into the specific barriers and challenges to geothermal energy in the US.

# Key Conclusions

- The West's geothermal resources appear to be more extensive than most people believe;
- The unidentified resource base is a significant near-term target of opportunity with up to 150,000MW;
- Federal and State policies need to be complementary and support a clear path for new project development;
- Federal programs and tax incentives will make a significant difference; and
- Federal efforts should be tailored to support the specific needs in each state

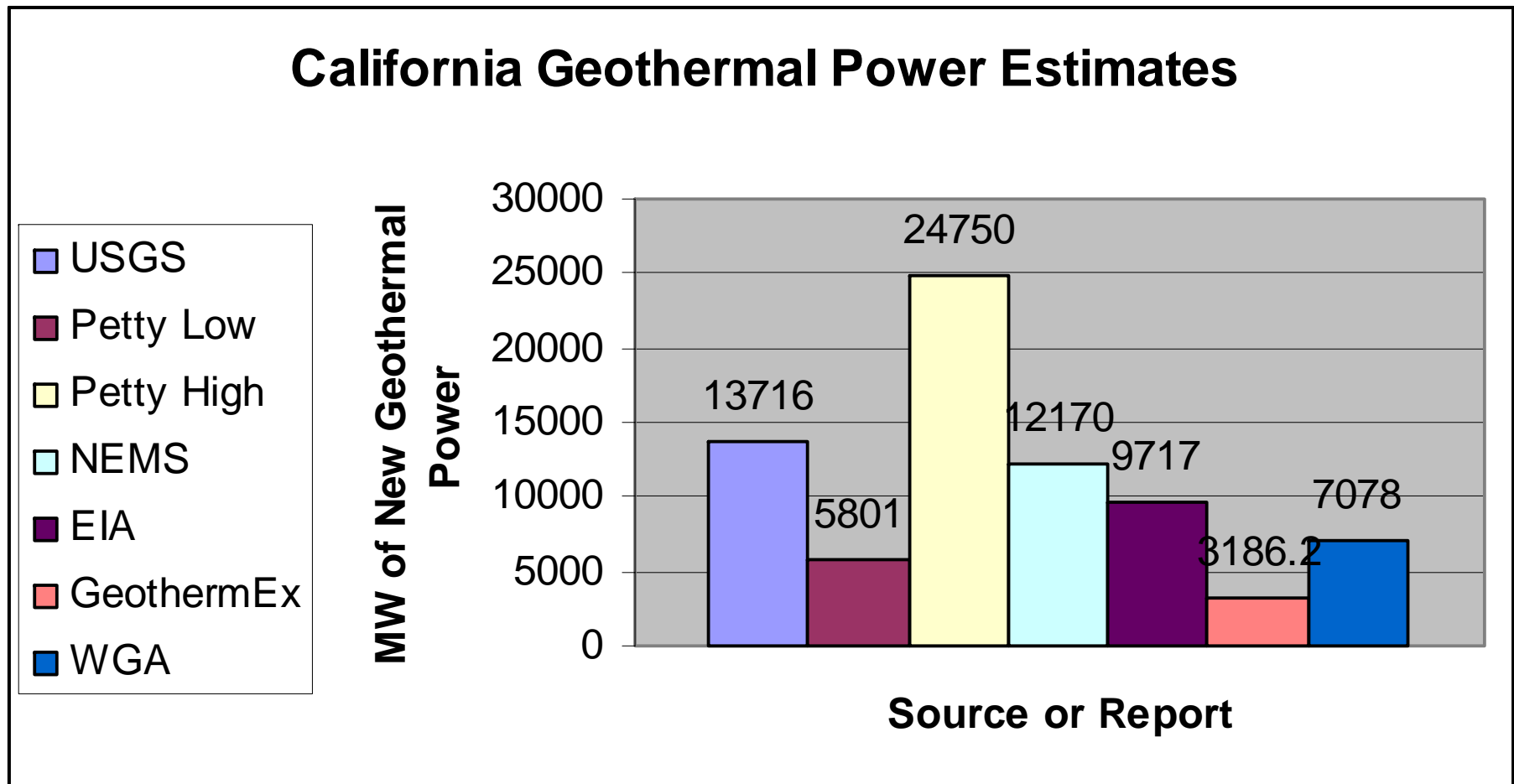
# California Power Generation from Renewable Resources 1998-2005

## California Renewable Power 1998-2005



# A Comparison of Recent Geothermal Power Supply Estimates for California

- **California's Current Capacity: 2400MW**



# California

- California is the largest producer of geothermal electric power in the United States. Geothermal power plants represented 5% of California's energy production in 2005. However, based on analysis performed by GEA, this development is only a fraction of what is possible. While development has stalled since 1992, new capacity is coming online over the next few years. Despite a strong state Renewable Portfolio Standard (RPS) and federal tax incentives for geothermal power plants, much of the new development is limited by transmission issues and delays caused by federal and state permitting regulations. While efforts are being made to prepare a Programmatic Environmental Impact Statement (PEIS) that would allow new leasing in certain areas of the state for the first time in two decades, other areas of the state, beyond those specifically identified in the PEIS, should be considered. The PEIS is a joint effort by the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) in conjunction with the California Energy Commission (CEC). At the time of this writing, the PEIS has not been finalized, and the BLM encourages input about additional sites that should be included.

# Idaho

- The first commercial geothermal power plant is currently under construction at Raft River, and several other areas are under consideration. Past exploration and development efforts have been limited because power rates in Idaho were among the lowest in the country for many years and the state's small population did not necessitate new sources of electric power. Therefore, there is a great need for exploration and resource characterization to better define resource potential. Currently the best guess by even the most knowledgeable researchers in the state is that Idaho could sustain anywhere from a handful of geothermal power plants to rivaling Nevada or even Southern California in recoverable resource. A number of promising geothermal prospects are on BLM and USFS land which further complicates development. Further, both geothermal direct use and electric power projects may conflict with water allocation issues that can also limit development. For these reasons, federal and state support is needed to mitigate barriers and to help researchers understand the resource potential so that they may plan accordingly for future development.

# Nevada

- From 1984 through 1992, 14 geothermal power plants were developed in Nevada. 15 years later, Nevada is seeing a resurgence in development: 24 new plants under development have a combined capacity of up to 751 MW; nine projects with power contracts already secure have a combined capacity of up to 204 MW. Nevada is the one state that has put together federal and state efforts to develop geothermal in an effective way. While some of the recent success in Nevada is owed to prior exploration and research, progress could not have been accomplished without the coordinated effort of state and federal agencies, the state RPS, the federal Production Tax Credit (PTC), the BLM efforts to reduce leasing backlogs, the USDOE's support for cost-shared drilling and technical assistance, and the work of the Great Basin Center for Geothermal Energy at the University of Nevada Reno. These efforts can serve as a model for other states, but they must continue to maintain industry momentum.

# New Mexico

- Geothermal resources have an opportunity to be a large contributor to the energy needs of New Mexico. To date, however, New Mexico only uses its geothermal resources for thermal heating applications in about a dozen locations. The greatest use of geothermal resources in New Mexico has been its greenhouses, which provide a few hundred jobs and \$30 million in annual revenues. During the 1970s and 1980s a large geothermal power project was under development in the Valles Caldera in north-central New Mexico. Resource and regulatory issues led to the cancellation of the project. At the time, it was believed that Valles Caldera was the only geothermal resource area in the state capable of producing a large electric power plant. However, when traveling throughout the state, it became clear that there are a number of attractive resource prospects outside of this conflict area. Unfortunately, limited work has been done in these areas, and most of them are blind (i.e. without apparent surface manifestations). These areas are high-risk and developers in the state need federal or state funding to aid with early exploration and to reduce the high investment risk associated with their development. There is also a need to explore the Rio Grande Rift area in greater detail for both geothermal power prospects and for large-scale geothermal heating potential specifically in Las Cruces and its surrounding areas. In the near term, development is likely for direct use and small-scale power. Drilling has occurred at two locations where small geothermal power units will be installed for an aquaculture facility to produce 10 million pounds of fish annually and a greenhouse that would expand to 40 acres. The resource has been proven at these sites and these projects need continued financial support to ensure project completion.

# Utah

- Utah is the only state in the continental U.S. outside of California and Nevada with an operating geothermal power plant. The first plant came online at Roosevelt Hot Springs in 1984. Two more facilities were built in 1990 that operated at Cove Fort-Sulphurdale until 2003 and 2004 when those facilities were decommissioned. The Blundell geothermal facility at Roosevelt Hot Springs is still operating, and is being expanded. The Cove Fort resource is also being expanded to three times more capacity, with new larger facilities expected to replace the old facilities. Utah also has great potential for direct use applications. A large-scale geothermal heating project was completed in 2005 at the Utah State Prison, 30 miles south of Salt Lake City. Researchers indicate that geothermal resources underlie much of the Wasatch Front, where the vast majority of Utah's population resides. It is clear from the research that the potential extent of Utah's geothermal resource (both for direct use and electric power) is not well understood, and the geology of these resources is complicated in some areas. A lack of state-level funding support and the short extension of the PTC have caused geothermal power projects to be cancelled or delayed. Most agree that federal and state support needs to be expanded for further development to be successful.

# Other States Examined in the Report

- Alaska
- Arizona
- Colorado
- Hawaii
- Montana
- Oregon
- Texas
- Washington
- Wyoming
- “Other parts of the country”

To download a copy of the  
report:

<http://www.geo-energy.org/publications/reports.asp>