Geothermal Energy Association

U.S. Geothermal Power Production and Development Update

March 2009

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GEOTHERMAL ENERGY ASSOCIATION

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U.S. GEOTHERMAL POWER PRODUCTION AND DEVELOPMENT UPDATE: MARCH 2009

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Cover photos (top to bottom): Geothermal Fumarole (NREL); Raser Technologies' 14-MW Thermo Hot Springs Power Plant: Start-up December 2008 (Raser Technologies); Transmission Lines (BLM)

1. Installed Capacity/Generation

The United States leads the world in online capacity of geothermal energy and continues to be one of the principal countries to increase its geothermal growth. Further, in 2007 geothermal energy accounted for 4 % of renewable energy-based electricity consumption in the United States.[1] As of March 2008, geothermal electric power generation is occurring in eight U.S. states: Alaska, California, Hawaii, Idaho, Nevada, New Mexico, Utah and Wyoming. Other states, such as Oregon and Colorado, are soon to be added to the list.

States generating geothermal energy and existing capacity:

Total installed capacity: 3040.27 MW (March 2009)
Total generation: 14,885 GWh (2007)[2]

Figure 1: March 2009 Geothermal Power Capacity On-Line

Alaska	California	Hawaii	Idaho	Nevada	New Mexico	Utah	Wyoming	**Total**
.68 MW	2605.3 MW	35 MW	15.8 MW	333 MW	.24 MW	50 MW	.25 MW	**3040.27 MW**

State Installed Capacity Data

1.1. Alaska

The first geothermal power plant in Alaska was installed in 2006 at Chena Hot Springs. It is a small-scale unit, using organic rankine cycle (ORC) technology to produce electricity from a low-temperature resource (165°F). Since it came online the power plant has added a subsequent 200 kW unit as well as one 280 kW unit. This brings total production to 680 kW.[3]

1.2. California

U.S. geothermal capacity remains concentrated in California. In 2007, 4.5 % of California's electric energy generation came from geothermal power plants; amounting to a net-total of 13,439 GWh. Recently the state welcomed the addition of a new power plant, 50-MW North Brawley. California now has approximately 2605.3 MW of installed capacity.[4]

1.3. Hawaii

Currently, one power plant operates on the big island of Hawaii. This plant, Puna Geothermal Venture, delivers an average of 25-30 MW (35 MW name-plate capacity) of firm energy on a continuous basis, supplying approximately 20% of the total electricity needs of the Big Island.[5]

1.4. Idaho

In January 2008, the first geothermal power plant came online in Idaho. Raft River, a binary plant that uses a 300°F resource, has a nameplate production capacity of 15.8 MW. Currently, net electrical power output is between 10.5 and 11.5 MW. An expansion to this plant, as well as several other projects around the state, is underway. [6]

[1] U.S. DOE: Geothermal Technologies Program. Geothermal Tomorrow (Sept. 2008).
[2] U.S. DOE: Geothermal Technologies Program. Geothermal Tomorrow (Sept. 2008).
[3] Alaska Energy Authority: http://www.akenergyauthority.org/
[4] California Energy Commission: http://www.energy.ca.gov/
[5] Hawaii Department of Business, Economic Development and Tourism: http://hawaii.gov/dbedt/info/energy/renewable/geothermal
[6] Idaho Office of Energy Resources: http://energy.idaho.gov/

1.5. Nevada

In 2008, Nevada had 18 power plants, with a nameplate capacity of 333 MW. Together, these plants produced a gross output of 10,791 MWh during the year. With more developing projects than any other state, it is expected that Nevada's installed capacity will jump in the future.[7]

1.6. New Mexico

In July 2008, a 0.24 MW pilot installation project came online in the state. The full project, Lightning Dock geothermal power plant, is designed to produce 10 MW of electrical power and it is expected to come online early this year.[8]

1.7. Utah

Currently, Utah has three power plants online. Unit 1 of the Blundell Plant has a gross capacity of 25 MW and Unit 2 has a capacity of 11 MW. Utah's third power plant came online in December 2008 and was the first commercial power plant in the state in more than 20 years. Thermo Hot Springs has a gross capacity of 14 MW and is expected to generate with a net capacity of approximately 10 MW.[9]

1.8. Wyoming

The first geothermal power plant in Wyoming came online in September 2008. The co-production demonstration project consists of a 250 kW organic rankine cycle power unit. For more information about the project, see 5. Emerging Technologies (section 5.2., Hydrocarbon/Geothermal Co-Production).

2. New Activity

The following results identifies up to 5487.4 MW of new geothermal power plant capacity under development in the United States (this includes projects in the initial development phase).* Unconfirmed projects, some of which might be developed in the next few years, increases the potential capacity to 5650.4 MW. There are 12 states with projects currently under consideration or development, including: Alaska, Arizona, California, Colorado, Florida, Hawaii, Idaho, Nevada, New Mexico, Oregon, Utah, and Washington. Between confirmed and unconfirmed projects there are a total of 126 developing projects.

The projects listed for each state are categorized by the following phases:

- **Phase I:** Identifying site, secured rights to resource, initial exploration drilling
- **Phase II:** Exploratory drilling and confirmation being done; PPA not secured
- **Phase III:** Securing PPA and final permits
- **Phase IV:** Production Drilling Underway/Facility Under Construction
- **Unconfirmed:** Proposed projects that may or may not have secured the rights to the resource, but some exploration has been done on the site

*Only projects in Phase 1 through Phase 4 are covered in the 5487.4 MW

Please Note: GEA is reporting information that is provided to us about these projects. We do not independently verify the data provided.

[7] Nevada Commission on Mineral Resources Division of Minerals: http://minerals.state.nv.us/
[8] New Mexico Energy, Minerals and Natural Resource Department: http://www.emnrd.state.nm.us/main/index.htm
[9] Utah Geological Survey: http://geology.utah.gov/emp/energydata/renewenergydata.htm

Active State Geothermal Projects

Figure 2: Active Geothermal Projects Listed By State

2.1. Alaska: 60 – 100 MW

Phase 1
• NANA Geothermal Assessment Program – Unspecified – Northwest Alaska Native Association • Chena Hot Springs* – 5 MW – Chena Hot Springs • Unalaska – 10 – 50 MW – City of Unalaska • Tongass – 20 MW (Pending Action of Volume II of the PEIS) – Bell Island Hot Springs
Phase 2
• Southwest Alaska Regional Geothermal Energy Project – 25 MW – Naknek Electric Association

2.2. Arizona: 2 – 20 MW

Phase 1
• Clifton – 2 – 20 MW– Arizona Public Service
Unconfirmed
• Northern Arizona University – Unspecified – Received GRED II funding and preliminary studies completed

2.3. California: 1056.6 – 1365.6 MW

Phase 1
• Marine Corps AGCC, Twenty-nine Palms – 5 – 12 MW – Navy Geothermal Program Office • NAF El Centro – 5 – 25 MW – Navy Geothermal Program Office • NAWS China Lake – 5 – 15 MW – Navy Geothermal Program Office • MCAS Yuma Chocolate Mountains AGR – 12 – 30 MW – Navy Geothermal Program Office • NAF El Centro/Superstition Mountains – 12 – 35 MW – Navy Geothermal Program Office • Modoc – 20 MW (Pending Action of Volume II of the PEIS) – Western Geothermal Partners • Modoc – 20 MW (Pending Action of Volume II of the PEIS) - Vulcan • San Felipe – 20 – 25 MW – Esmeralda Truckhaven Geothermal • El Centro – 50 MW (Pending Action of Volume II of the PEIS) • El Centro – 50 MW (Pending Action of Volume II of the PEIS) • Unnamed North Geysers Project – 60 MW – Calpine Corporation • Military Pass Road – 150 – 335 MW – Vulcan Power
Phase 2
• Casa Diablo #4 at Mammoth Lakes – 20 – 30 MW – Ormat Technologies, Inc. • Surprise Valley – 27 – 38 MW – Enel North America • Truckhaven I* – 49 MW – Iceland America Energy, Inc. • Juan Bautista de Anza Geothermal Project – 49.9 MW – Esmeralda Truckhaven Geothermal • Fourmile Hill-Glass Mountain – 49.9 MW – Calpine Corporation • Telephone Flat-Glass Mountain – 49.9 MW – Calpine Corporation • Unnamed Imperial Valley Project – 50 MW – Ormat Technologies, Inc.
Phase 3
• East Brawley – 30 MW – Ormat Technologies, Inc. • Buckeye-North Geysers – 30 MW – Calpine Corporation

- Wildhorse-North Geysers – 30 MW – Calpine Corporation
- Black Rock 1 – 53 MW – CalEnergy
- Black Rock 2 – 53 MW – CalEnergy
- Black Rock 3 – 53 MW – CalEnergy

Phase 4

- The Geysers Field/ WGP Unit 1 Geothermal Project – 35 MW – Western GeoPower Corp.
- Hudson Ranch I – 49.9 MW – CHAR, LLC

Unconfirmed

- Salton Sea – 18 – 38 MW – Sierra Geothermal Power

2.4. Colorado: 10 MW

Phase 2

- Mount Princeton Hot Springs* – 10 MW – Mt. Princeton Geothermal

2.5. Florida: 0.2 MW – 1 MW

Phase 1

- Jay Oil Field – 200 kW (Potential for 1 MW) – Chena Hot Springs, Quantum Resources Management, UTC Power

2.6. Hawaii: 8 MW

Phase 1

- Unspecified Hawaii Project – Unspecified – Ormat Technologies, Inc.

Phase 3

- Puna – 8 MW – Ormat Technologies, Inc.

Unconfirmed

- Maui – Unspecified – Ormat Technologies, Inc.

2.7. Idaho: 238 – 326 MW

Phase 1

- Sulphur Springs* – 25 – 50 MW – Idatherm, LLC
- Preston Area Project* – 50 MW – Idatherm, LLC
- China Cap* – 50 – 100 MW – Idatherm, LLC

Phase 2

- Willow Springs* – 100 MW – Idatherm, LLC

Phase 3

- Raft River Expansion – 13 – 26 MW – U.S. Geothermal

2.8. Nevada: 1767.4 – 3297.4 MW

Phase 1

- Nellis Air Force Base – 5 – 30 MW – Navy Geothermal Program Office
- Gerlach – 7 – 15 MW – Sierra Geothermal Power
- Howard – 8 – 17 MW – Sierra Geothermal Power
- Spencer – 9 – 19 MW – Sierra Geothermal Power
- Hawthorne – 10 – 22 MW – Sierra Geothermal Power
- Hawthorne Army Ammunition Depot 2 – 10 – 30 MW – Navy Geothermal Program Office
- Naval Air Station, Fallon – 10 – 30 MW – Navy Geothermal Program Office
- Hawthorne Army Ammunition Depot – 12 – 25 MW – Navy Geothermal Program Office

- Sulphur – 12 – 27 MW – Sierra Geothermal Power
- Dixey Valley – 14 – 31 MW – Sierra Geothermal Power
- Wells – 15 – 32 MW – Sierra Geothermal Power
- Soda Lake Expansion – 16 – 29 MW – Magma Energy
- Pearl Hot Springs – 22 – 45 MW – Sierra Geothermal Power
- Fish Lake Valley – 25 MW – Esmeralda Energy Company/Geo-Energy Partners
- New York Canyon – 27 – 54 MW – Vulcan Power
- Gabbs Valley – 30 MW – Ormat Technologies, Inc.
- Panther – 34 MW – Magma Energy
- Salt Wells – 35 – 76 MW – Sierra Geothermal Power
- Desert Queen – 36 MW – Magma Energy
- Black Warrior – 37 MW – Nevada Geothermal Power
- Dixey Valley North – 40 – 90 MW – Sierra Geothermal Power
- Lee Allen – 48 – 115 MW – Vulcan Power
- North Salt Wells – 48 – 101 MW – Sierra Geothermal Power
- Colado – 121 – 232 MW – Vulcan Power
- Brady EGS – Unspecified – Ormat Technologies, Inc., DOE
- Desert Peak EGS – Unspecified – Ormat Technologies, Inc., DOE
- Dead Horse – Unspecified – Ormat Technologies, Inc.
- Pyramid Lake* - Unspecified – Pyramid Lake Energy Project
- Smith Creek – Unspecified – Ormat Technologies, Inc.

Phase 2

- Devil's Canyon – 10 MW – Raser Technologies
- Trail Canyon – 10 MW – Raser Technologies
- Truckee – 10 MW – Raser Technologies
- Darrough Ranch Project – 12 MW – Great American Energy
- Gerlach – 15 – 30 MW – U.S. Geothermal
- Silver Peak – 15 – 42 MW – Sierra Geothermal Power
- San Emidio – 20 – 25 MW – U.S. Geothermal
- Blue Mountain – 24 MW – Nevada Geothermal Power
- Silver State Geothermal – 25 – 50 MW – Oski Energy
- McGinness Hills – 30 MW – Ormat Technologies, Inc.
- Naval Air Station, Fallon-Mainside – 30 MW – Navy Geothermal Program Office
- Fernley-Hazen – 30 – 150 MW – GRID-Geothermal Rail Industrial Development, Vulcan Power
- Alum – 41 – 85 MW – Sierra Geothermal Power
- Barren Hills – 55 – 117 MW – Sierra Geothermal Power
- Sou Hills Project – Unspecified – Montara Energy Ventures

Phase 3

- Carson Lake – 18 – 30 MW – Ormat Technologies, Inc., Nevada Power Company
- Pumpernickel Valley – 20 – 30 MW – Nevada Geothermal Power
- Reese River – 26 – 58 MW – Sierra Geothermal Power
- Hot Sulphur Springs (Tuscarora) – 32 – 48 MW – TG Power
- Aurora – 132 – 350 MW – Vulcan Power
- Patua Hot Springs – 175 – 378 MW – Vulcan Power
- Jersey Valley – 18 – 30 MW – Ormat Technologies, Inc.

Phase 4
• San Emidio "Repower" Project – 8.4 MW – U.S. Geothermal • Rye Patch* – 13 MW – Presco Energy • Salt Wells – 13 MW – Enel North America • Stillwater – 32 MW – Enel North America • Blue Mountain/Faulkner I – 50 MW – Nevada Geothermal Power • Salt Wells – 117 – 245 MW – Vulcan Power
Unconfirmed
• Emigrant – 50 MW – Esmeralda Energy Company • Fish Lake Valley 2 – 25 – 75 MW – Esmeralda Energy Company

2.9. New Mexico: 10 MW

Phase 4
• Lightning Dock – 10 MW – Raser Technologies

2.10. Oregon: 292.4 – 318.4 MW

Phase 1
• Glass Buttes – Unspecified – Ormat Technologies, Inc. • City of Klamath Falls – 1 MW – (Distributed Generation Project) – City of Klamath Falls • Klamath Falls Plant – 10 MW – Raser Technologies • Hood River County – 20 MW (Pending Action of Volume II of the PEIS) – Portland General Electric • Willamette – 20 MW (Pending Action of Volume II of the PEIS) – Estate of Max Millis • Hood River County – 30 MW (Pending Action of Volume II of the PEIS) – Portland General Electric • Willamette – 30 MW (Pending Action of Volume II of the PEIS) – Estate of Max Millis
Phase 2
• Neal Hot Springs – 20 – 26 MW – U.S. Geothermal
Phase 3
• Geoheat Center at the Oregon Institute of Technology (OIT) – 0.2 MW – (Distributed Generation Project) – OIT • Crump Geyser – 40 – 60 MW – Nevada Geothermal Power • Newberry Geothermal – 120 MW – Davenport Power, US Renewables Group, Riverstone
Phase 4
• Geoheat Center at the Oregon Institute of Technology (OIT) – 1.2 MW – OIT

2.11. Utah: 194 MW

Phase 1
• Drum Mountains – Unspecified – Ormat Technologies, Inc. • Thermo 2 – Unspecified – Raser Technologies • Thermo 3 – Unspecified – Raser Technologies • Thermo 1A – 5 MW – Raser Technologies • Thermo – 20 MW – Magma Energy
Phase 2
• Cove Fort – 69 MW – Enel North America
Phase 3
• Shoshone Renaissance Geothermal Project – 100 MW – Shoshone Energy

2.12. Washington: Undefined

Unconfirmed
• Mt. Baker – Unspecified – Vulcan Power

*The information for these projects was confirmed in August 2008.

3. Developing Project Summaries

Figure 3: Developing Projects by Phase

State	Unconfirmed		Phase I		Phase II		Phase III		Phase IV	
	#	MW	#	MW	#	MW	#	MW	#	MW
Alaska			4	35-75	1	25				
Arizona	1	Unspecified	1	2-20						
California	1	18-38	12	409-677	7	295.7-316.7	6	249	2	84.9
Colorado					1	10				
Florida			1	0.2-1						
Hawaii	1	Unspecified	1	Unspecified			1	8		
Idaho			3	125-200	1	100	1	13-26		
Nevada*	2	75-125	30	711-1262	15	327-625	7	421-924	6	233.4-361.4
New Mexico									1	10
Oregon			7	111	1	20-26	3	160.2-180.2	1	1.2
Utah			5	25	1	69	1	100		
Washington			1	Unspecified						
Totals	**5**	**93-163**	**65**	**1418.2-2371**	**27**	**846.7-1171.7**	**19**	**951.2-1487.2**	**10**	**329.5-457.5**

NV* - There are 30 projects in Phase I, but developers did not disclose projected MW values for five projects

Phase I: Identifying site, secured rights to resource, initial exploration drilling
Phase II: Exploratory drilling and confirmation being done; PPA not secured
Phase III: Securing PPA and final permits
Phase IV: Production Drilling Underway/Facility Under Construction
Unconfirmed: Proposed projects that may or may not have secured the rights to the resource, but some exploration has been done on the site

Figure 4: Developing Projects by State

State	Phase 1 to Phase 4	TOTAL (with unconfirmed)
Alaska	5/60-100 MW	5/60-100 MW
Arizona	1/2-20 MW	2/2-20 MW
California	27/1038.6-1327.6 MW	28/1056.6-1365.6 MW
Colorado	1/10 MW	1/10 MW
Florida	1/0.2-1 MW	1/0.2-1 MW
Hawaii	2/8 MW	3/8 MW
Idaho	5/238-326 MW	5/238-326 MW
Nevada	58/1692.4-3172.4 MW	60/1767.4-3297.4 MW
New Mexico	1/10 MW	1/10 MW
Oregon	12/292.4-318.4 MW	12/292.4-318.4 MW
Utah	7/194 MW	7/194 MW
Washington	1/Unspecified	1/Unspecified
Total	**121 projects 3545.6-5487.4MW**	**126 projects 3638.6-5650.4 MW**

Figure 5: Developing Projects by State and Phase

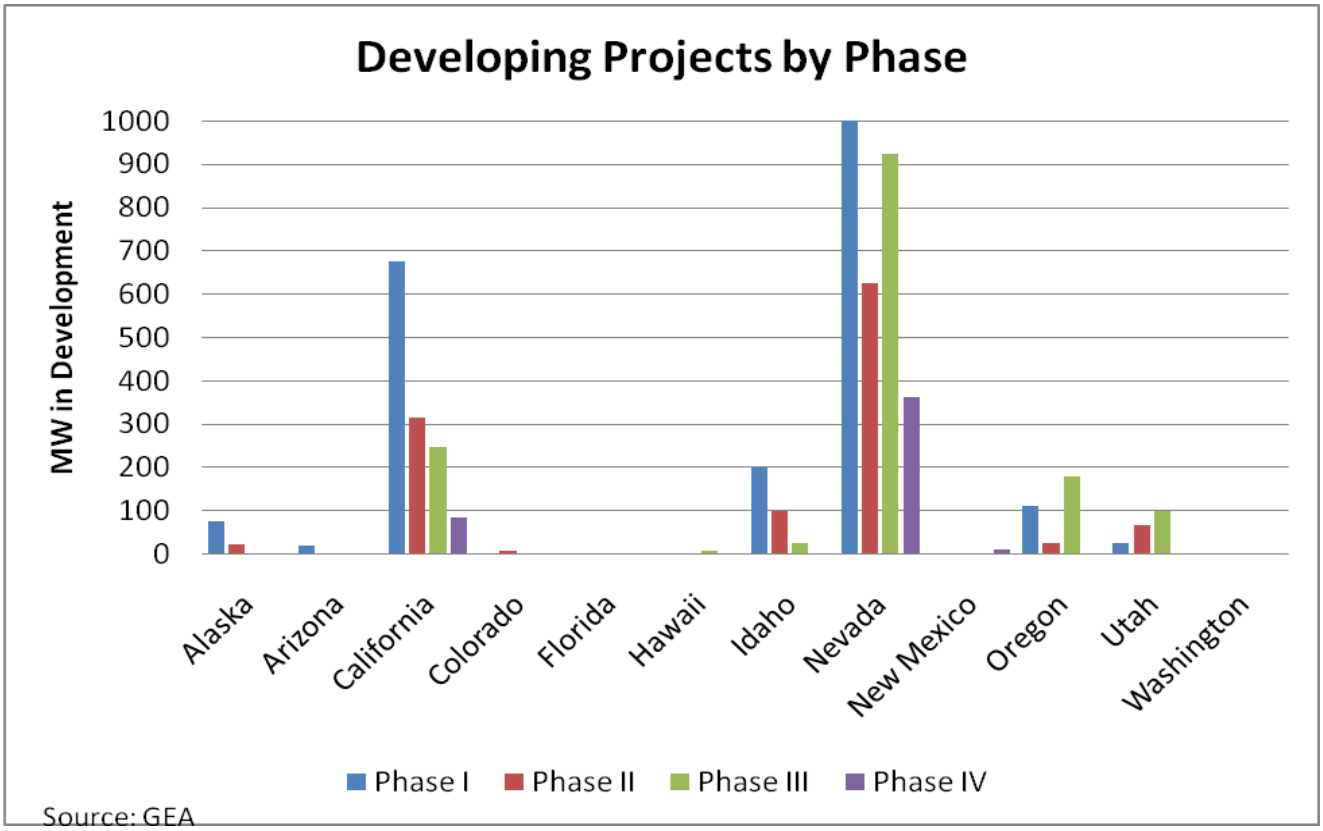
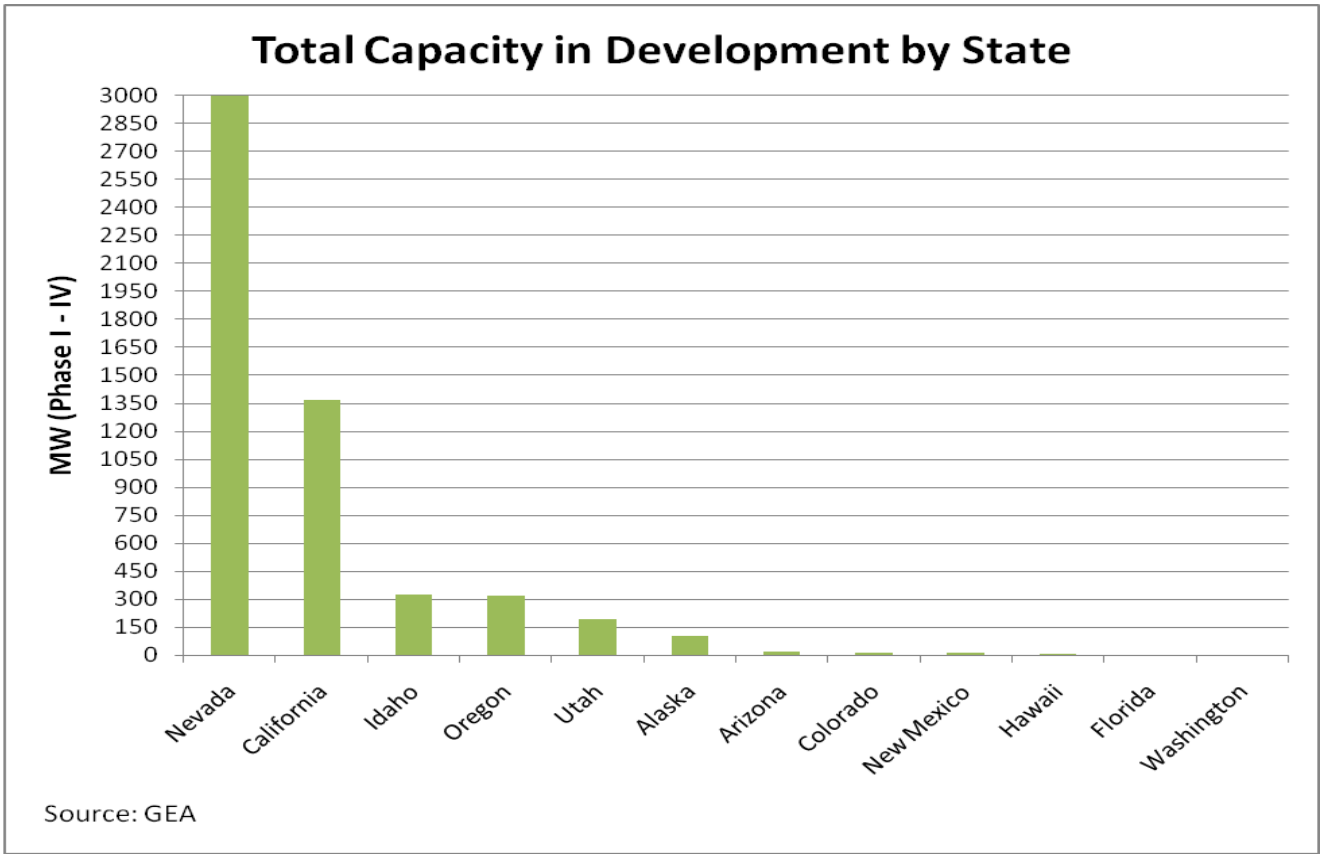


Figure 6: Total Capacity in Development by State



4. Comparison of Results from GEA Surveys: May2006 – March 2009

Figure 7: Total Installed Capacity 2006 - 2009

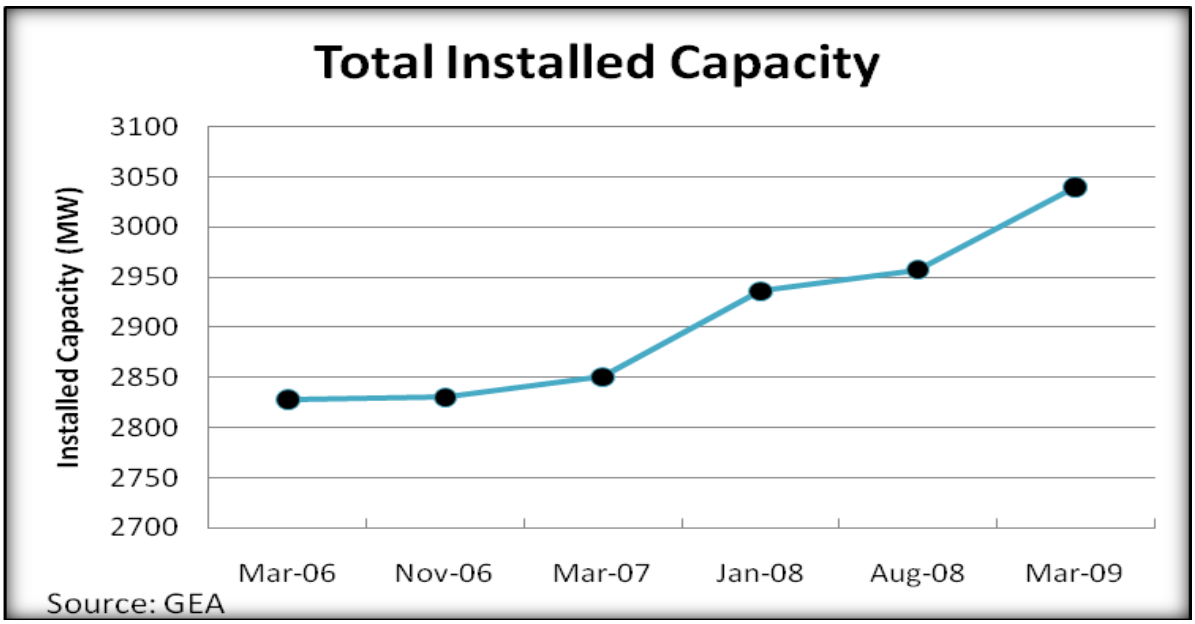
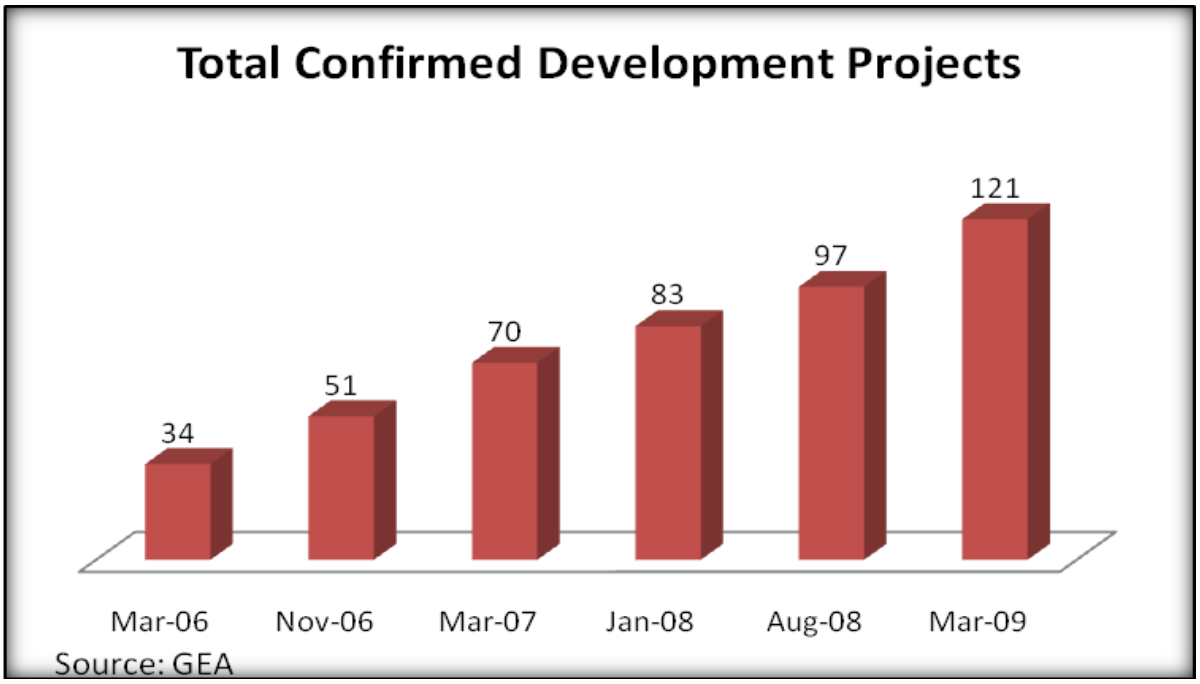


Figure 8: Total Confirmed Projects 2006 – 2009



5. Emerging Technologies

As geothermal technology progresses, resources that were once non-commercial are now being actively examined as feasible possibilities. The following are some of the more commonly discussed areas of future development.

5.1. Enhanced Geothermal Systems (EGS) – Often categorized under the antiquated term 'Hot Dry Rock,' EGS is thought by several experts to refer to any resource that requires artificial stimulation. This includes resources that have to be fully engineered, or ones that produce hydrothermal fluid, but sub-commercially. Although EGS technology is still young and many aspects remain unproven, several projects are currently underway. If EGS technology proves commercially successful, it is expected to allow significantly increased extension of and production from existing fields, as well as utilization of geothermal energy in previously implausible locations.

> **Desert Peak (Nevada):** The U.S. Department of Energy has invested more than $5 million in another project that is underway to establish the first commercial project to apply an Enhanced Geothermal System in the United States. Ormat Technologies Inc. and GeothermEx Inc. are among some of the other stakeholders in the project. It is estimated that the completion of the project could add at least 5 MW to the Desert Peak Plant, showing the potential of Enhanced Geothermal System development.

In October of 2008, the Department of Energy (DOE) chose 21 recipients under a Funding Opportunity Announcement for the research, development and demonstration of EGS. Subject to annual appropriations, DOE will provide up to $43.1 million over a four year period to the 21 awardees, 13 of which are first-time recipients. Also included in the list of awardees are various universities, which should help promote innovation. With cost-share by the recipients, the public-private investments will be up to $78 million.

DOE also selected four new cooperative projects with the U.S. geothermal industry for EGS systems demonstrations, which it hopes will lead to technology readiness by 2015.[10] Through the diversity of the projects selected, DOE hopes to not only increase the perception of EGS potential but to also reveal new site locations. For more information on the projects selected, please visit http://www.energy.gov/6624.htm.

5.2. Hydrocarbon/Geothermal Co-Production – Usable geothermal fluids are often found in oil and gas production fields and there is growing interest in producing electricity from these fluids. The Southern Methodist University Geothermal Energy Program has estimated that geothermal co-production has the capability of providing 1000-5000 MW to the seven states in the Texas Gulf Coast Plain alone.[11] Note that there is currently no geothermal electricity production in any of those states.

> **Jay Oil Field (Florida):** A demonstration project at Jay Oil Field is projected to come online this year and will use thermal fluids commonly co-produced from oil and gas wells.[12] The expected capacity of the project is 200 kW but has potential for 1 MW. If successful, a full project could follow at the Florida oil field and provide about 5 percent of the field's total electrical demand. Estimates show that there are thousands of megawatts of geothermal potential in oil fields.
>
> **Rocky Mountain Oil Test Center (Wyoming):** RMOTC is another co-production demonstration project near Casper, Wyoming. In August 2008, a 250 kW Ormat organic Rankine cycle (ORC) power unit was installed and a month later it began operating. As of January 2009, the unit had produced more than 485 MWh of power from 2.6 million barrels of hot water. The demonstration project will operate until

[10] DOE, *DOE Funds 21 Research, Development and Demonstration Projects for up to $78 Million to Promote Enhanced Geothermal Systems*, (October 6, 2008) http://www.energy.gov/6624.htm
[11] McKenna et al, SMU, *Oil and Gas Journal*, (September 5, 2005).
[12] Allan Jelacic, DOE, *The Geothermal Technology Program: A Renaissance* (November 20, 2008)

September 2009. During its operation there will be an evaluation of how to reduce fluctuations of power and to generate more than 250 kW.[13] For more information about the RMOTC project, please visit http://www.rmotc.doe.gov/.

5.3. Geopressured Geothermal Resources – There is also renewed interest in the energy potential of geopressured-geothermal resources. While located in a number of states, the most significant resources are said to be located in the northern Gulf of Mexico, particularly Texas and Louisiana (offshore and onshore). The USGS has estimated that in addition to thousands of megawatts of geothermal energy, these resources hold as much as 1,000 TCF of potentially recoverable gas. Also, it is estimated that in Texas alone, there exists a total geopressured resource of 5,100 EJ.[14] Although Congress authorized new technology demonstrations for geopressured-geothermal systems in 2007, no new projects or demonstrations have been identified for this report.

For more information on these technologies, see *The State of Geothermal Technology: Parts I & II*, recently released by the Geothermal Energy Association (for electronic copies, please visit: http://www.geo-energy.org/publications/reports.asp).

6. Tribal Land Geothermal Projects

The growing interest in geothermal energy is also recognizable in the increase in tribal land projects. Many Native American tribes are now considering the use of geothermal for their energy needs and are in varying stages of beginning geothermal projects. In October 2008, the Northwestern Band of the Shoshone Nation announced a 100-MW geothermal project located in Northern Utah. Both the Northwest Alaska Native Association Regional Corporation of Alaska and the Pyramid Lake Paiute Tribe also have projects in development.

Other tribes like, Confederated Tribes of the Warm Springs (OR), Fort Bidwell (CA), Citizen Potawatomi Nation (OK), and Winnebago (NB) are also exploring district heating and ground source heat pump possibilities.

Additional areas of interest are Jemez Pueblo (NM) and Walker River (NV). Both private and governmental funds are being invested into some of these projects, most notably Fort Bidwell, which has received Department of Energy funding in the past.

For more information about some of these projects, please visit http://www.eere.energy.gov/tribalenergy/projects_technology.cfm.

[13] Lyle Johnson and Dan Lee Simon, DOE and Ormat Technologies, *Electrical Power from an Oil Production Waste Stream* (February 2009)
[14] Texas State Energy Conservation Office, *Texas Renewable Energy Resource Assessment*, (December 2008).

7. The Bureau of Land Management Lease Sales

The U.S. Bureau of Land Management (BLM) held geothermal lease sales in December 2008, which resulted in the sale of 194,410 acres of land and total revenue of almost $6.2 million. The lease sales took place in Oregon, Idaho, and Utah and should result in an increase of geothermal projects in those areas. The following graph shows a breakdown of the 2008 geothermal lease sales by company.

Figure 9: December 2008 BLM Lease Sales

In each lease sale all acres available were sold, deeming the sales a success. State breakdowns of acres and revenue for the lease sales are as follows:

Figure 10: December 2008 Lease Sales Individual State Breakdown

State	Total Acres	Total Revenue
Idaho	8,675	$59,828
Oregon	41,362	$787,025
Utah	144,372	$5,695,672

*Click on a specific state for more detailed information on the December 2008 lease sales, including bidder results.

BLM has also published an amended plan for geothermal leasing in the Western states. The plan allocates approximately 111 million acres of BLM lands and 79 million acres of National Forest System lands open for leasing. In addition to this, the plan allows pre-existing studies on specific lands to be used along with best management practices. The change will reduce the processing time of future geothermal power development. For more information on BLM's plan, please visit http://www.blm.gov/wo/st/en/info/newsroom/2008/december/NR_12_18_2008.html.

8. Geothermal Heat Pump Update

In the United States, the Geothermal Heat Pump industry has seen continuous growth over the last four years. A February 2009 Energy Information Administration (EIA) report shows that geothermal heat pump shipments increased by 36 percent to 86,396 units in 2007. That same year capacity shipped rose 19 percent to 291,300 tons. Although geothermal heat pumps tend to cost more initially than traditional heating and cooling systems, the high efficiency and ongoing cost-saving potential of geothermal heat pumps has resulted in them becoming more appealing to many consumers. For more information on the EIA report, please visit http://www.eia.doe.gov/cneaf/solar.renewables/page/ghpsurvey/geothermalrpt.pdf

9. Recent Geothermal Publications

The following 2008/2009 publications give additional information on geothermal energy and the industry:

- Geothermal Energy Association:
  Geothermal 101: Basics of Geothermal Energy Production and Use,
  http://www.geo-energy.org/publications/reports/Geo101_Final_Feb_15.pdf
  Geothermal Revenue Under the Energy Policy Act of 2005,
  http://www.geo-energy.org/publications/reports/Geothermal%20Industry%20Employment%20-%20Survey%20Results%20and%20Analysis%20September%202005.pdf

- U.S. Department of Energy:
  Geothermal Tomorrow2008,
  http://www1.eere.energy.gov/geothermal/pdfs/geothermal_tomorrow_2008.pdf

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