

Annual U.S. Geothermal Power Production and Development Report

April 2011



GEOTHERMAL ENERGY ASSOCIATION

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ANNUAL GEOTHERMAL POWER PRODUCTION AND DEVELOPMENT REPORT: APRIL 2011

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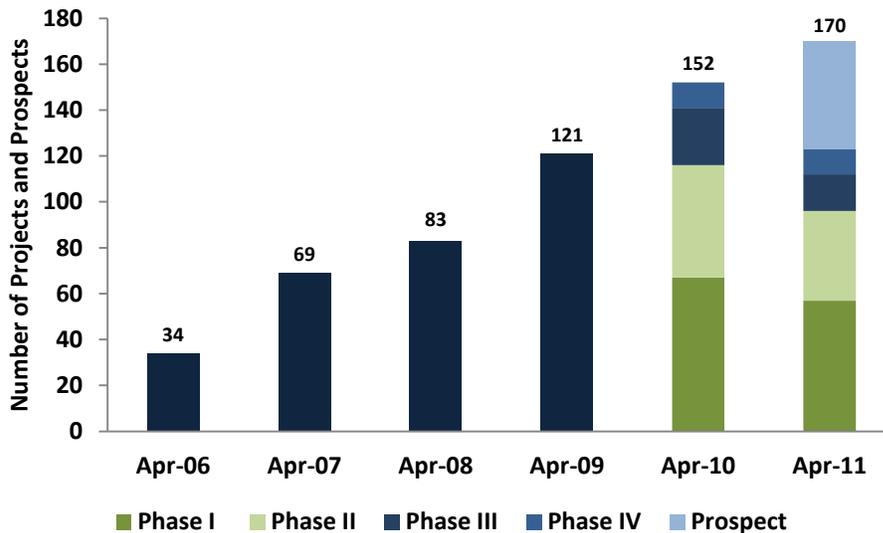
Please Note: GEA is reporting project information that is provided by developers or public sources. We do not independently verify the data provided or warrant its accuracy.

Cover Photo Courtesy of ThermaSource, Inc.

Executive Summary

There are 3,102 MW of geothermal power in production in nine states: Alaska, California, Hawaii, Idaho, Nevada, New Mexico, Oregon, Utah and Wyoming. Geothermal companies continue to explore and develop geothermal resources at a growing number of sites throughout the United States (US). While the economic downturn of 2008 adversely impacted the rate of geothermal resource development, the geothermal industry has maintained steady growth in the US through 2010 and into 2011. The total number of geothermal projects-under-development, as well as geothermal prospects, reported in 2011 increased 12% over 2010.

Figure 1: Total Confirmed Projects + 2011 Prospects

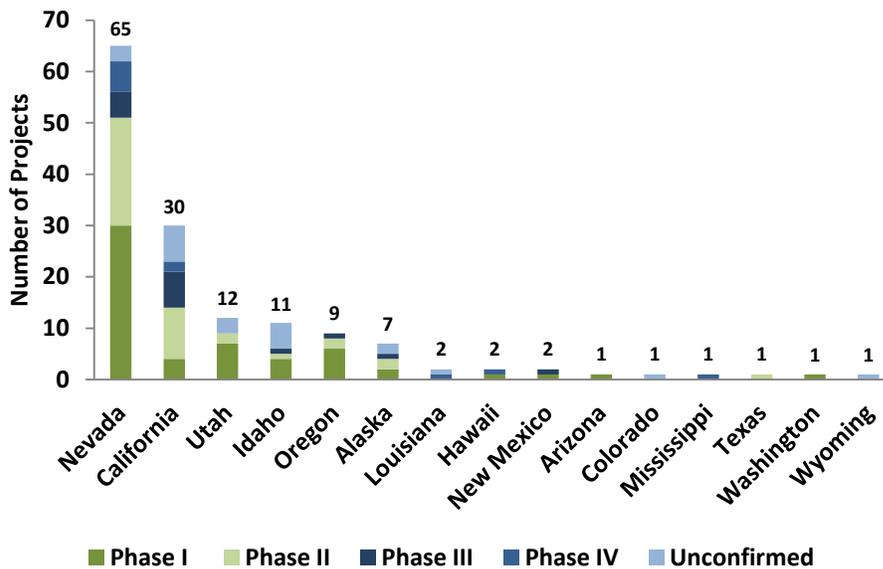


Source: GEA

Figure 14 accounts only for those geothermal projects and prospects which have been confirmed by the developer. Unconfirmed projects for which a public record exists but which have not been confirmed to GEA by the developer increase the projects and prospects total to 193. Altogether, these projects are developing approximately 5102 – 5745 MW of geothermal resources.

The new projects were identified under development in 15 states: Nevada, California, Utah, Idaho, Oregon, Alaska, Louisiana, Hawaii, New Mexico, Arizona, Colorado, Mississippi, Texas, Washington, and Wyoming.

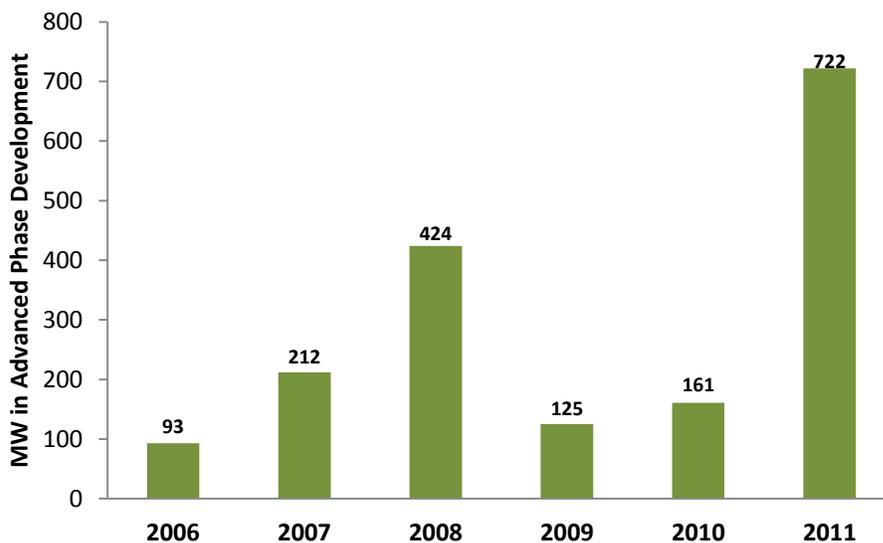
Figure 2: Number of Geothermal Projects in Development by State and Phase



Source: GEA

In 2010 only one company, Nevada based Ormat Technologies, brought a new power plant online, a 15MW plant in Jersey Valley, Nevada. This increased total US installed capacity to 3102 MW. Although the amount of geothermal capacity brought online in 2010 did not reach levels attained in previous years, the geothermal industry is poised to bring a significant amount of geothermal electricity to the grid in the coming years. The 2011 Annual Report reveals a significant increase in the number of projects reaching the advanced stages of development. In total, some 756-772 MW of new capacity are in the drilling/construction phases (Phase 3-4), and should be completed in the next few years.

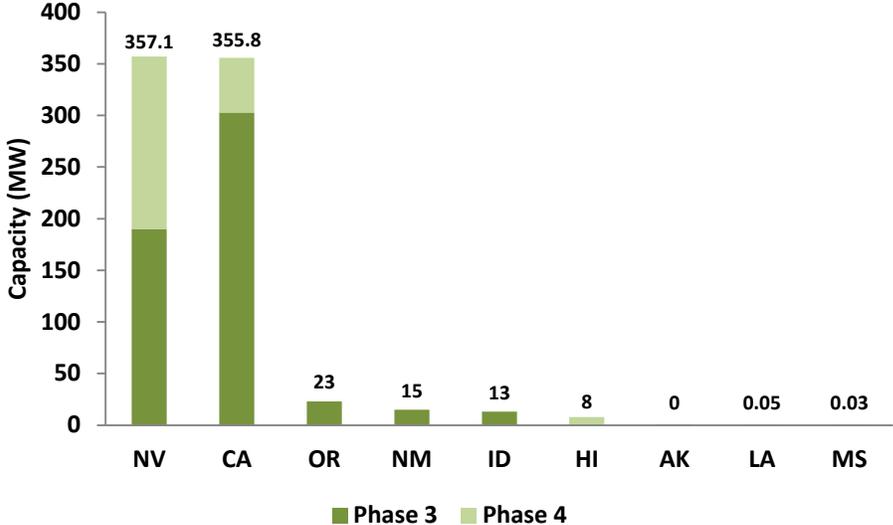
Figure 3: Advanced Phase Project Development 2006 – 2011



Source: GEA

While the majority of advanced stage projects are in Nevada and California, projects were also identified in Oregon, New Mexico, Idaho and Hawaii, and smaller capacity (<1 MW) projects were also nearing completion in Alaska, Louisiana and Mississippi.

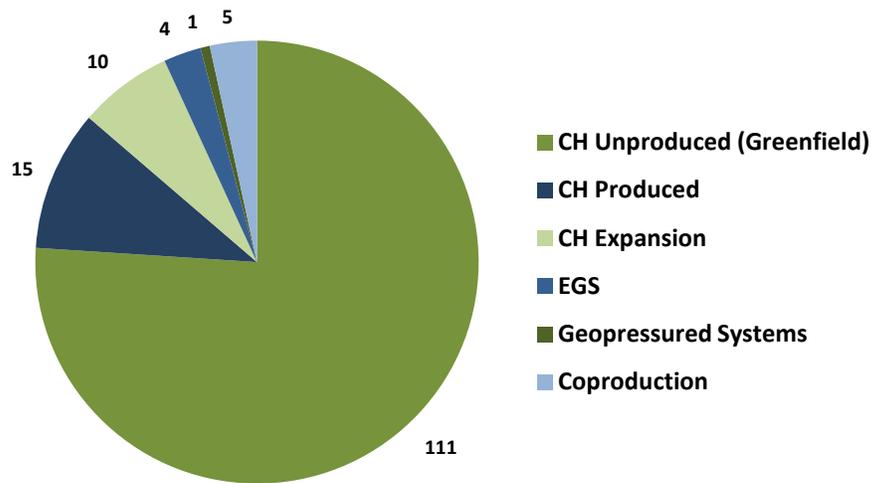
Figure 4: Advanced Stage Planned Capacity Additions (PCA) by State



Source: GEA

The expansion of the geothermal industry is also reflected in the large number of geothermal power projects being developed in new, greenfield sites. Developers are increasingly exploring for and developing areas where little or no previous development has taken place. Of the projects identified in GEA’s 2011 Annual Report, approximately 76% of them are developing conventional hydrothermal geothermal resources in unproduced areas. In addition to the development of conventional geothermal resources, the 2011 Annual Report identifies five geothermal and hydrocarbon coproduction projects, four enhanced geothermal systems projects, and one geopressured resource development project.

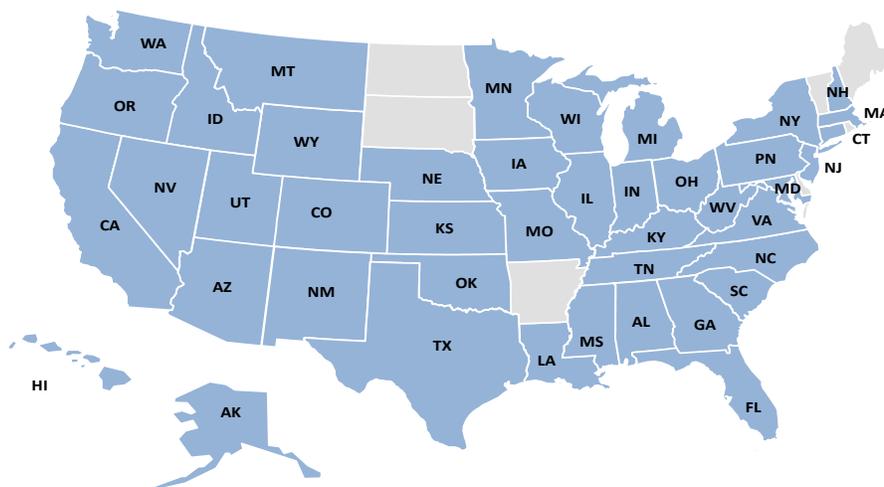
Figure 5: Number of Projects by Project Type



Source: GEA

The expansion into new geothermal fields and the development and utilization of new geothermal technologies requires the assistance of a large network of supporting industries that reaches beyond the western US. Companies developing geothermal projects in the West require the goods and services of vendors identified in 43 different states to support the development of geothermal resources.

Figure 6: Map of US States with Vendors Supporting Geothermal Development



Source: GEA

1. Overview of Terms and Methodology

To increase the accuracy and value of information presented in its annual US Geothermal Power Production and Development Update, the Geothermal Energy Association (GEA) developed a reporting system known as the Geothermal Reporting Terms and Definitions. The Geothermal Reporting Terms and Definitions act as a guideline to project developers in reporting geothermal project development information to the GEA. A basic understanding of the Geothermal Reporting Terms and Definitions will also aid the reader in fully understanding the information presented in this annual report.

The Geothermal Reporting Terms and Definitions serve to increase reporting clarity and accuracy by providing industry and the public with a lexicon of definitions relating to the types of different geothermal projects, and a guideline for determining which phase of development a geothermal resource is in. These two tools help to characterize resource development by type and technology. They also help to determine a geothermal project's position in the typical project development timeline.

1.1 Geothermal Resource Types and their Definitions

In reporting a project in development to the GEA, the developer of a geothermal resource is asked to indicate which of the following definitions their project falls under:

Conventional Hydrothermal (Un-produced Resource): the development of a geothermal resource where levels of geothermal reservoir temperature and reservoir flow capacity are naturally sufficient to produce electricity and where development of the geothermal reservoir **has not** previously occurred to the extent that it supported the operation of geothermal power plant(s).

Conventional Hydrothermal (Produced Resource): the development of a geothermal resource where levels of geothermal reservoir temperature and reservoir flow capacity are naturally sufficient to produce electricity and where development of the geothermal reservoir **has** previously occurred to the extent that it currently supports or has supported the operation of geothermal power plant(s).

Conventional Hydrothermal Expansion: the expansion of an existing geothermal power plant **and** its associated drilled area so as to increase the level of power that the power plant produces.

Geothermal Energy and Hydrocarbon Co-production: the utilization of produced fluids resulting from oil and/or gas-field development for the production of geothermal power.

Geopressed Systems: the utilization of kinetic energy, hydrothermal energy, and energy produced from the associated gas resulting from geopressed gas development to produce geothermal electricity.

Enhanced Geothermal Systems: the development of a geothermal system where the natural flow capacity of the system is not sufficient to support adequate power production but where hydraulic fracturing of the system can allow production at a commercial level.

1.2 Tracking Projects through the Development Timeline

In addition to defining their project according to the above list of definitions, developers also indicate to GEA their projects' current status in the project development timeline using a four phase system. This system captures how much, and what type of, work has been performed on that particular geothermal resource up until the present time. These four phases of project development are:

Phase I: Resource Procurement and Identification

Phase II: Resource Exploration and Confirmation

Phase III: Permitting and Initial Development

Phase IV: Resource Production and Power Plant Construction

Each of the four phases of project development is comprised of three separate sections, each of which contains phase sub-criteria. The three separate sections of sub criteria are resource development, transmission development, and external to resource development (acquiring access to land, permitting, signing PPA's and EPC contracts, securing a portion of project financing, etc.). For a project to be considered as being in any particular phase of development a combination of sub-criteria, specific to each individual project phase, must be met.

1.3 Planned Capacity Addition (PCA) and Resource Capacity Estimates

Finally, at each phase of a project's development a geothermal developer has the opportunity to report two project capacity (MW) estimates: a Resource Capacity estimate and a Planned Capacity Addition (PCA) estimate. At each project phase the geothermal resource capacity estimate may be thought of as the MW value of the total recoverable energy of the subsurface geothermal resource. It should not be confused with the PCA estimate, which is defined as the portion of a geothermal resource that "the developer deems to be viable for the economic production of electricity under existing economic conditions." In other words, if the developer were to utilize the geothermal resource under its control to produce electricity via a geothermal power plant, the PCA estimate would be the power plant's estimated installed capacity. In the case of an expansion to a conventional hydrothermal geothermal plant, the PCA estimate would be the estimated capacity to be added to the plant's current installed capacity.

In each phase of development the resource and installed capacity estimates are given different titles that reflect the level of certainty of successful project completion. The different titles as they correspond to the separate phases are as follows:

Phase I: "Possible Resource Estimate" and "Possible PCA Estimate"

Phase II: "Possible Resource Estimate" and "Possible PCA Estimate"

Phase III: "Delineated Resource Estimate" and "Delineated PCA Estimate"

Phase IV: "Confirmed Resource Estimate" and "Confirmed PCA Estimate"

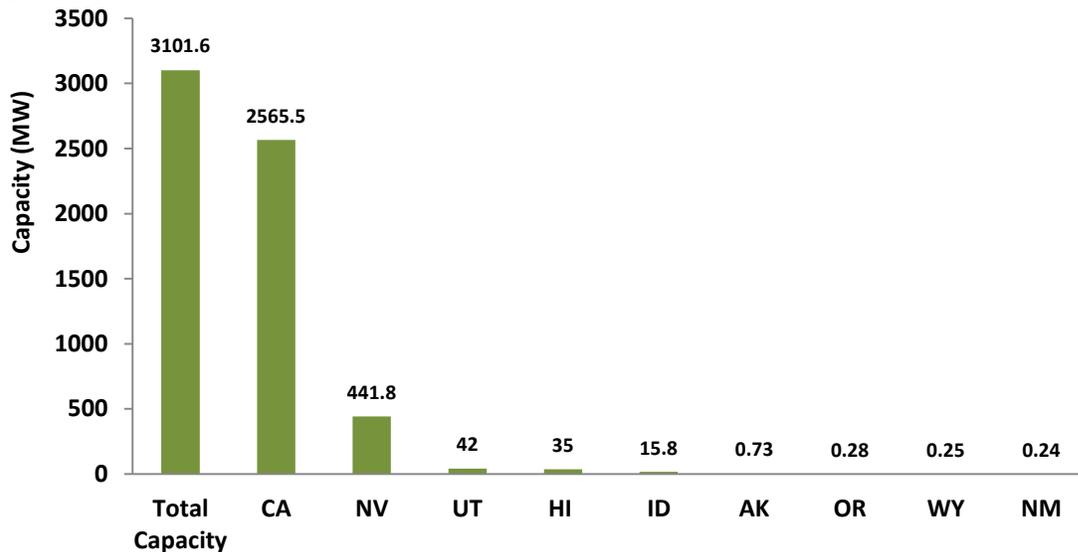
This section outlines how the Geothermal Reporting Terms and Definitions influence the reporting and presentation of project in development information in this report. For a detailed explanation of each phase of development and the outline of its sub-criteria please consult GEA's Geothermal Reporting Terms and Definitions, available at http://geo-energy.org/pdf/NewGeothermalTermsandDefinitions_January2011.pdf.

2. Industry Overview

2.1 Installed Capacity Growth

The United States currently leads the world's countries in installed geothermal energy capacity and continues to be one of the principal countries to increase the development of its geothermal resources. In 2007 geothermal energy accounted for 4% of renewable energy-based electricity consumption in the United States.ⁱ As of March 2011, geothermal electric power generation is occurring in nine US states: Alaska, California, Hawaii, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming. Other states, such as Colorado, Louisiana, Mississippi, and Texas are soon to be added to the list. The United States has a total installed capacity of approximately 3,102 MW.

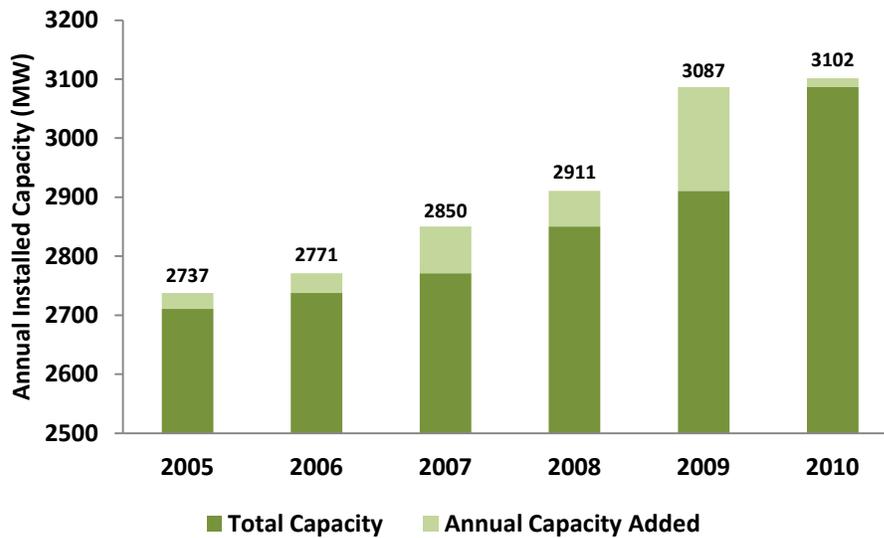
Figure 7: March 2011 US Geothermal Installed Capacity (MW)



Source: GEA

In 2010 one company, Nevada-based Ormat Technologies, brought its 15 MW Jersey Valley power plant online later in the year. The Jersey Valley power plant is located in Pershing County, Nevada and its completion increased installed geothermal capacity in that state to approximately 442 MW.

Figure 8: Total Installed Capacity 2005-2010



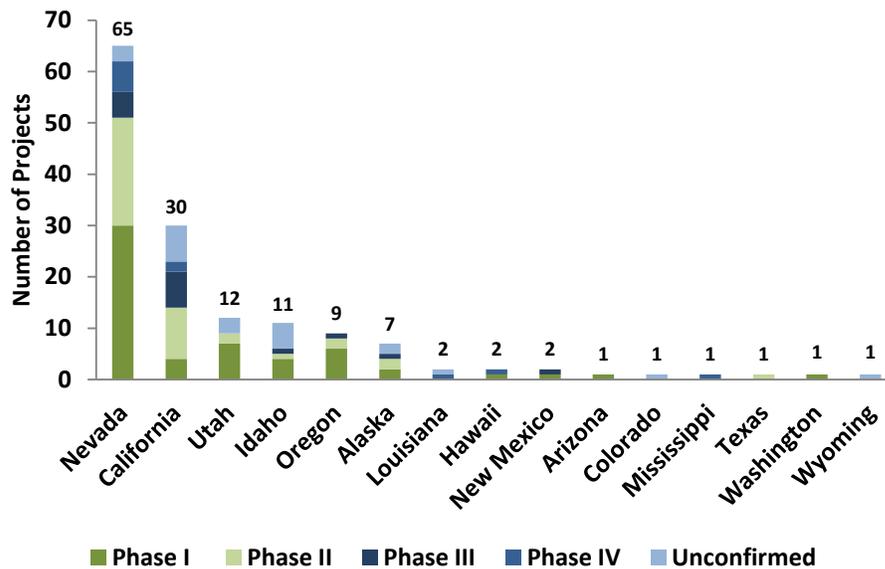
Source: GEA

2.2 Geothermal Capacity in Development

The reduced levels of geothermal capacity coming online in 2010 has been partially attributed to the economic downturn, which made potential investors in geothermal project development and construction more risk-averse. This slowed, somewhat, the pace at which geothermal resources were being developed. However, as the economy recovers and federal and state policies incentivizing investment in geothermal remain in effect, the geothermal industry is expected to see increased geothermal capacity entering advanced stages of development and being brought online in 2011 and the coming years.

While advanced geothermal projects enter or near the construction phase of their development, geothermal companies in the US are also acquiring and developing early stage geothermal resources. In 2011 the geothermal industry is developing 123 confirmed geothermal projects. When accounting for projects not confirmed (i.e. “unconfirmed”) by the developing companies this number increases to 146 projects. The geographic spread of confirmed geothermal projects alone is significant, with projects in various phases of project development located in 15 different states.

Figure 2: Number of Geothermal Projects in Development by State and Phase



Source: GEA

The number of confirmed geothermal projects recorded in this report account for approximately 3633 - 4050 MW of geothermal resources in development. Accounting for unconfirmed projects increases these levels to 4448 - 5040 MW. The total number of confirmed project megawatts is spread among 15 different states in the western US, with smaller scale pilot projects beginning to be developed in the states around the Gulf of Mexico.

Table 1: Total Projects in Development Totals by State

State	Phase 1 - 4 Development			
	Total Projects	PCA (MW)	Resource (MW)	Overall Total (MW)
Alaska	7	50	95	120
Arizona	1	2	0	2
California	30	712-738	1212-1358	1596-1768
Colorado	1	10	0	10
Hawaii	2	8	0	8
Idaho	11	26	589-664	589-664
Louisiana	2	0.05	5	5
Mississippi	1	0.03	0	0.03
Nevada	65	638-648	2132-2408	2250-2536
New Mexico	2	15	0	15
Oregon	9	111	225-250	276-301
Texas	1	1	0	1
Utah	12	40-55	90-160	130-215
Washington	1	0	100	100
Wyoming	1	0.28	0	0.28
Totals:	146	1613-1664	4448-5040	5102-5745*

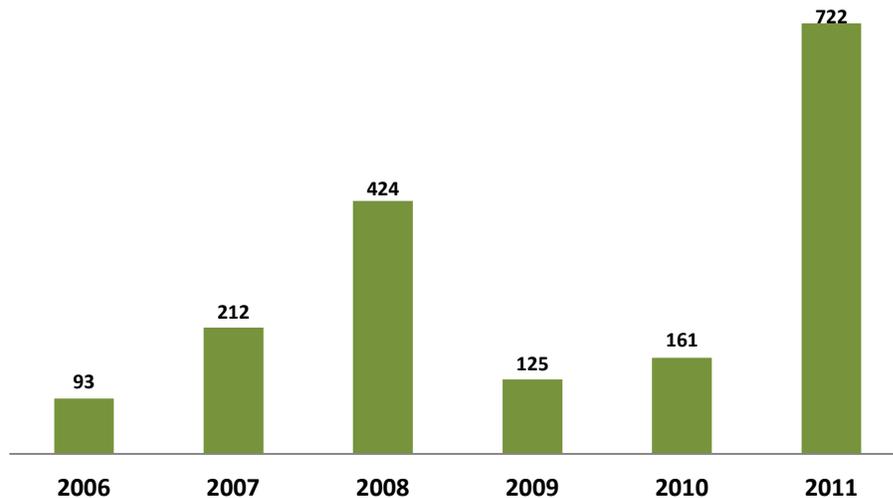
Source: GEA

*PCA and Resource Totals do not add up to Overall Totals because they have been adjusted to avoid double counting. In cases where respondents gave both a PCA value and resource value, it was assumed that the PCA was already included in the stated resource total. In

projects where PCA values but no Resource values were given the PCA value (being the planned capacity of the geothermal power plant) was used as the Resource value and added to the latter to get the Overall Total. As a result, the overall total is less than the sum of PCA and resource values.

Note that while a projects resource capacity value provides an estimate of the amount of recoverable electricity (MW) from an underground reservoir, a projects PCA (Planned Capacity Added) estimate is the portion of that geothermal resource which a developer deems viable for production via a geothermal power plant (see Section 1 explaining the Geothermal Reporting Terms and Definitions used in this report). Currently geothermal industry companies are developing 1377 - 1393 MW of confirmed PCA projects. When accounting for unconfirmed projects the range of PCA in development is 1613 – 1664 MW. Of this, 756 – 772 MW are advanced stage (Phase 3 – 4) geothermal projects expected to be completed in the next three to four years.ⁱⁱ

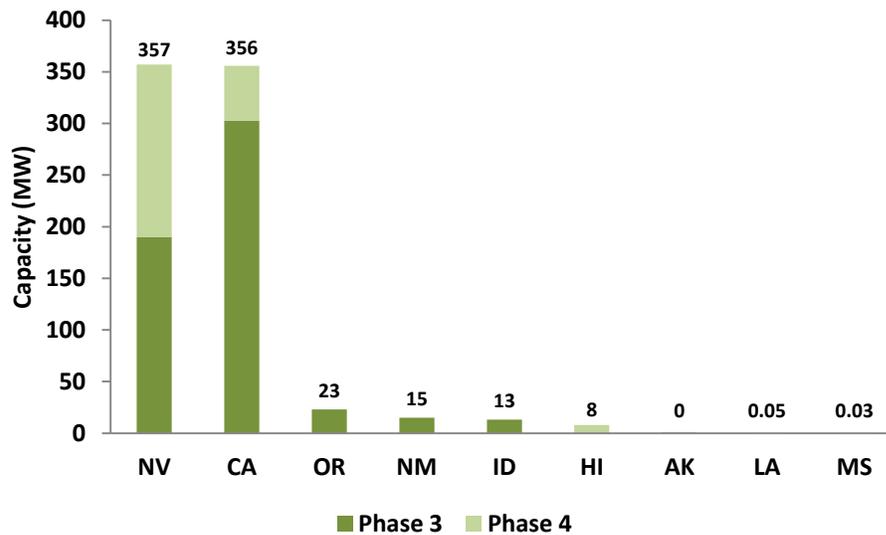
Figure 3: Advanced Phase Project Development 2006 – 2011



Source: GEA

While the majority of advanced stage projects are currently located in Nevada and California, projects are also nearing construction and production in Oregon, New Mexico, Idaho, and Hawaii. Smaller capacity projects (< 1 MW) are also nearing completion in Alaska, Louisiana, and Mississippi.

Figure 4: Advanced Stage Planned Capacity Additions (PCA) by State



Source: GEA

The total amount of PCA and resource capacity (MW) in development in the US in respect to their location and project status (phase) is outlined in Table 2 below.

Table 2: Developing Geothermal Capacity (MW) by State and Phase

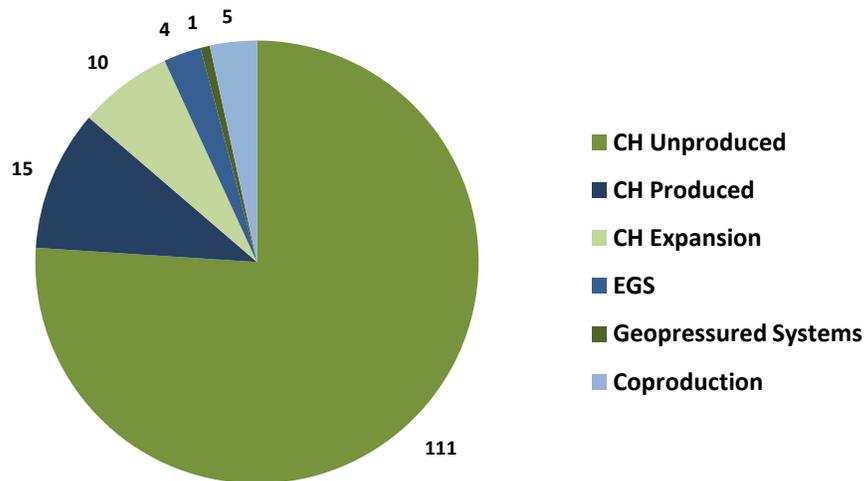
State	Phase 1		Phase 2		Phase 3		Phase 4		Unconfirmed	
	PCA	Resource	PCA	Resource	PCA	Resource	PCA	Resource	PCA	Resource
Alaska	15	60	10	10	0.4	5	0	0	25	20
Arizona	2	0	0	0	0	0	0	0	0	0
California	100	110-140	102	429-545	297-303	83	53	150	160-180	440
Colorado	0	0	0	0	0	0	0	0	10	0
Hawaii	0	0	0	0	0	0	8	0	0	0
Idaho	13	0	0	150	13	114	0	0	0	325-400
Louisiana	0	0	0	0	0	0	0.05	0	0	5
Mississippi	0	0	0	0	0	0	0.03	0	0	0
Nevada	133	1068-1163	158	645-680	180-190	250-320	167	164-185	0	5-60
New Mexico	0	0	0	0	15	0	0	0	0	0
Oregon	56	145-170	32	80	23	0	0	0	0	0
Texas	0	0	1	0	0	0	0	0	0	0
Utah	0	0	0	70-95	0	0	0	0	40-55	20-65
Washington	0	100	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0.28	0
Total:	319	1483-1633	303	1384-1560	528-544	452-522	228	314-335	235-270	815-990

Source: GEA

As the geographical reach of the geothermal industry expands, developers are increasingly exploring for and developing conventional hydrothermal geothermal resources in areas where little or no previous development has taken place. Of the 146 projects surveyed, 111 of them are developing conventional hydrothermal resources in “unproduced” areas (CH Unproduced),

15 of them are developing conventional hydrothermal resources in “produced” (CH Produced), and 10 are expansions to existing conventional hydrothermal power plants (CH Expansion). The remaining projects are five geothermal and hydrocarbon coproduction (Coproduction), four enhanced geothermal systems (EGS) and, one geopressured system (Geopressured Systems) project(s).

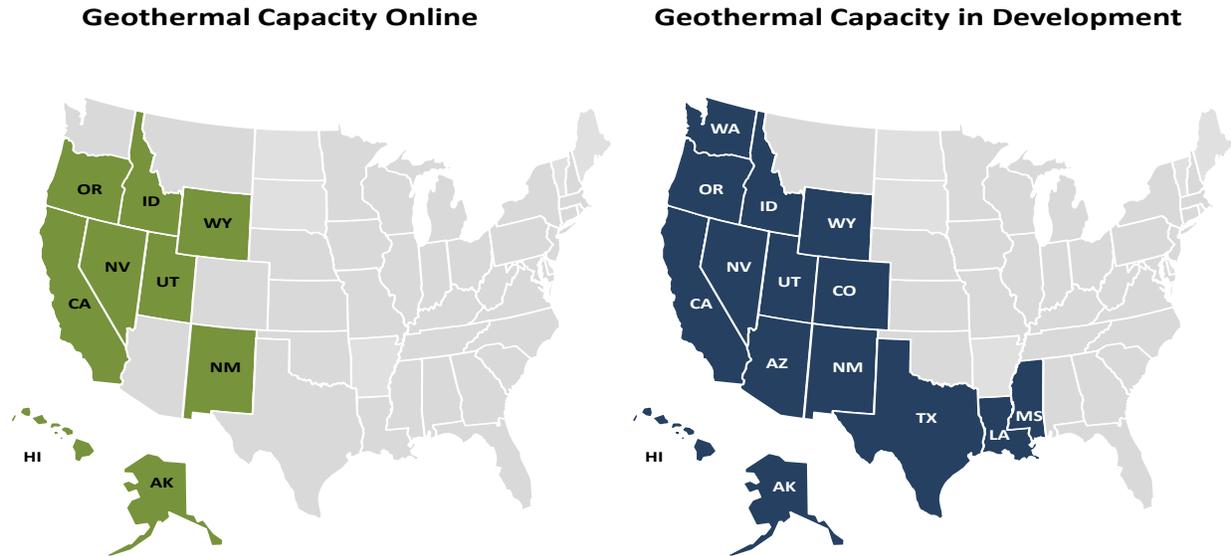
Figure 5: Number of Projects by Project Type



Source: GEA

Geothermal installed capacity currently remains concentrated in the western US, but the exploration for and development of new resources, as well as the application of new technologies is expanding the geographic extent of the industry. Projects featuring the development of conventional hydrothermal resources as well as EGS pilot projects are increasing in the western US. At the same time, pilot projects focusing on generating geothermal electricity from low temperature fluids left over as a byproduct from oil and gas production, as well as projects aiming to harness electricity from geothermal fluids under high geological pressure, are emerging in states along the Gulf of Mexico.

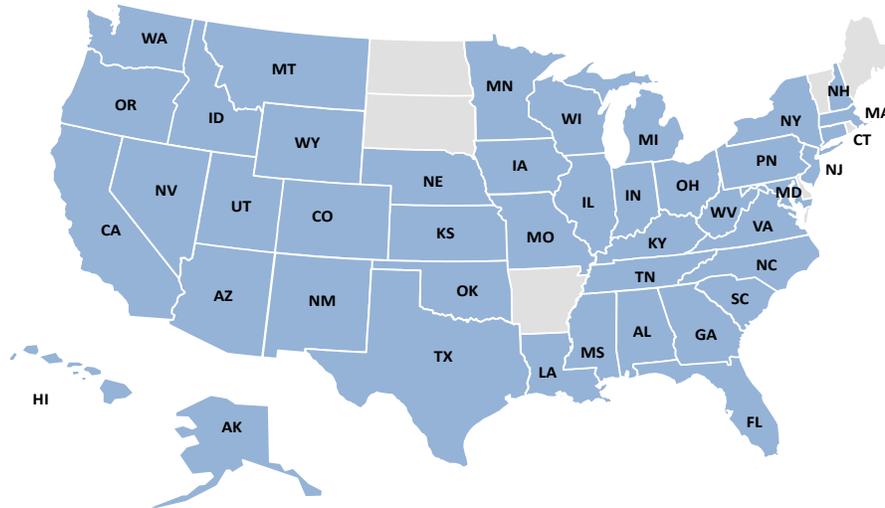
Figure 7: Maps of US States with Geothermal Capacity Online and Under Development



Source: GEA

While the number of states with geothermal installed capacity and projects in development is significant, the reach of the geothermal industry is still more extensive. Companies offering various products, services, and expertise in both the industrial and service sectors are needed to support additional geothermal development. Vendors supporting the development of geothermal resources abound throughout the US as shown in Figure 6.

Figure 6: Map of US States with Vendors Supporting Geothermal Development



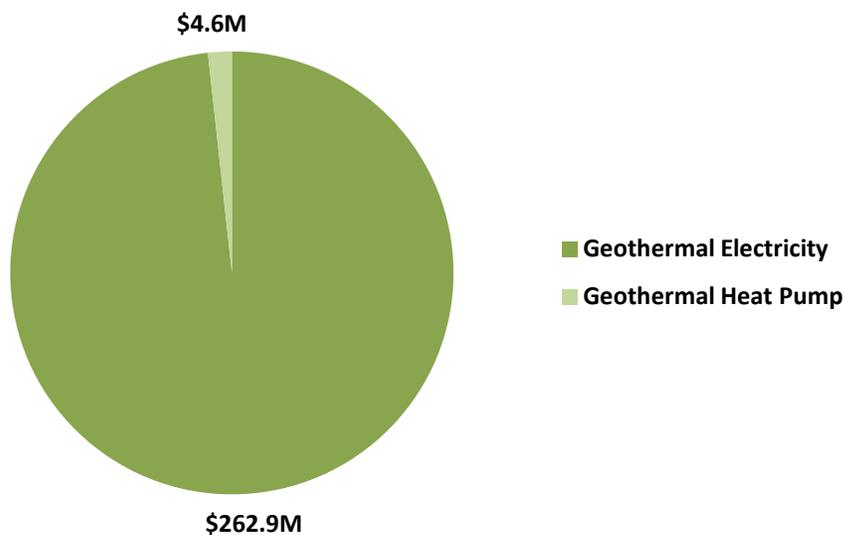
Source: GEA

In addition to states with both online and developing geothermal projects, and those with developing projects only, companies whose goods and services support the development of geothermal resources for power generation are found in 28 other states. In total, companies developing geothermal resources have identified vendors needed to support their operations in 43 states.

2.3 Federal Incentives and Programs

The increased progress in the development of geothermal projects has been fueled by federal incentives and funding which help offset the risk and high capital cost of geothermal development. With certain conditions, geothermal power projects are eligible for the full Production Tax Credit (PTC) if placed in service by December 31, 2013. In addition, the American Recovery and Reinvestment Act of 2009 (ARRA) has made projects eligible for the PTC also eligible for a grant in lieu of the tax credit from the Treasury Department. The grant is equivalent to a 30% tax credit for the eligible portions of their capital investment. Projects which are in construction by the end of calendar year 2011 and are placed in service by the end of calendar year 2013 may receive the cash grant. Geothermal developers have cited the cash grant as a particularly important factor in sustaining development through the economic recession. Since 2009 approximately \$262.9M and \$4.6M in cash grants have been provided to utility-scale geothermal projects and geothermal heat pump projects respectively. Projects receiving cash grants span 19 different states.ⁱⁱⁱ

Figure 9: Cash Grants to the Geothermal Industry by Technology Type



List of “Geothermal Electricity” Department of Treasury Cash Grant Awardees

Awardee/Project	Award Date	State	Amount (\$)
Enel NA, Salt Wells	9/29/2009	NV	61,520,872
Geysers Power Co./NA	2/26/2010	CA	2,224,148
NGP/ Blue Mountain I	11/9/2009	NV	57,872,513
Ormat/ North Brawley	8/17/2010	CA	108,285,626
Solutions in Human Resources/NA	11/28/2009	PA	5,071
Raser Technologies/ Thermo 1	2/16/2010	UT	32,990,089
Total:			262,898,319

Source: US Department of Treasury, GEA

Another incentive driving the increased development of geothermal resources in the US is the Department of Energy (DOE) Loan Guarantee Program. The Energy Policy Act of 2005 (EPAct 2005) authorized loan guarantees through DOE to renewable energy projects that reduce green house gas emissions and employ new or significantly improved technologies. In 2009 ARRA amended the Loan Guarantee Program, adding section 1705 to authorize loan guarantees for renewable energy projects that commence construction no later than September 30, 2011. Since 2009 Nevada Geothermal Power received a \$78.8M for its 49.5 MW Blue Mountain “Faulkner 1” power plant, which it brought online in 2009. U.S. Geothermal also received a \$96.8M loan guarantee for its Neal Hot Springs project, which is currently under development in Malheur County, Oregon.^{iv}

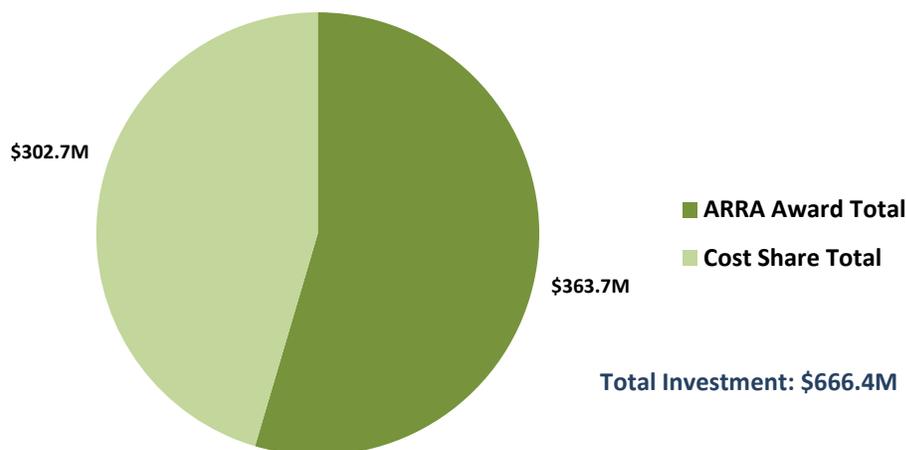
Table 3: DOE Loan Guarantee Section 1705 Geothermal Projects

Project	Developer	State	Jobs Supported		Amount (\$)
			Permanent	Construction	
Blue Mountain	Nevada Geothermal	Nevada	14	200	78,800,000
Neal Hot Springs	U.S. Geothermal	Oregon	12	150	96,800,000
Total:			26	350	175,600,000

Source: US Department of Energy, GEA

DOE federal stimulus legislation funding (ARRA) is also having an important influence on the US geothermal market. In October 2009, the Department of Energy announced the results of its competitive solicitation under ARRA for geothermal technology projects. DOE announced awards that could result in up to \$338M in ARRA funding to geothermal research and development, and would require an additional \$280M in recipient cost-share. As of March 2011, GTP ARRA awards totaled nearly \$363.7M when accounting for ARRA funding to national labs. Total cost share contributes an additional \$302.8M, bringing the combined ARRA/cost share geothermal technology investment to more than \$666.4M.^v

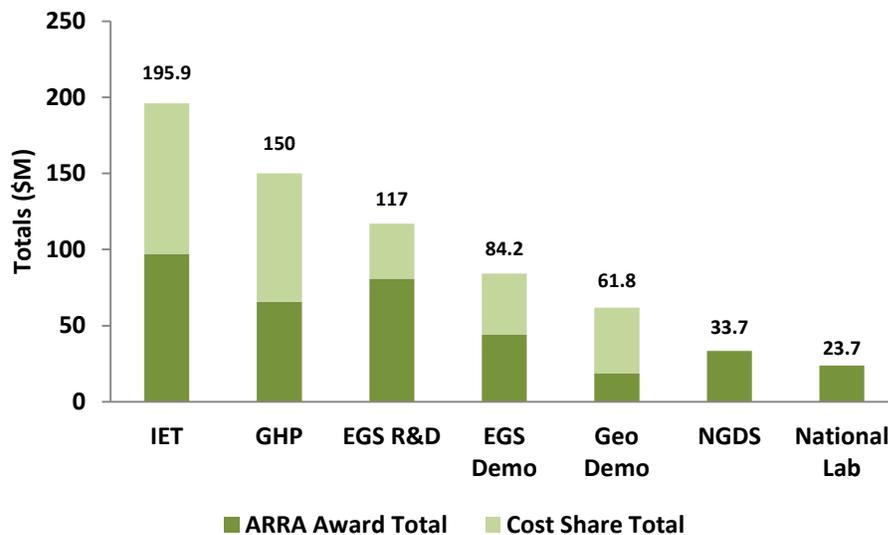
Figure 10: Total DOE ARRA/Cost-Share Geothermal Investment



Source: US Department of Energy, GEA

Funding for geothermal technology projects via ARRA is distributed among six categories, including Innovative Exploration and Drilling Projects (IET, up to \$97.2M, 24 projects), Coproduced, Geopressured, and Low Temperature Geothermal Demonstration Projects (Geo Demo, up to \$18.7M, 10 projects), Enhanced Geothermal System Demonstrations (EGS Demo, up to \$44.2M, 3 projects), Enhanced Geothermal Systems Components Research and Development/Analysis (EGS R&D, up to \$80.8M, 45 projects), Geothermal Data Development, Collection, and Maintenance (National Geothermal Data System/NGDS, up to \$33.7M, 4 projects) and Ground Source Heat Pump Demonstrations (GHP, up to 65.5M, 37 projects). Additionally, ARRA provided \$23.7M in funding to national labs throughout the US for research and development in various geothermal technologies. It is planned that 122 projects in 39 states will receive DOE ARRA funding with recipients ranging from private industry, academic institutions and tribal entities to local governments, and DOE National Laboratories.

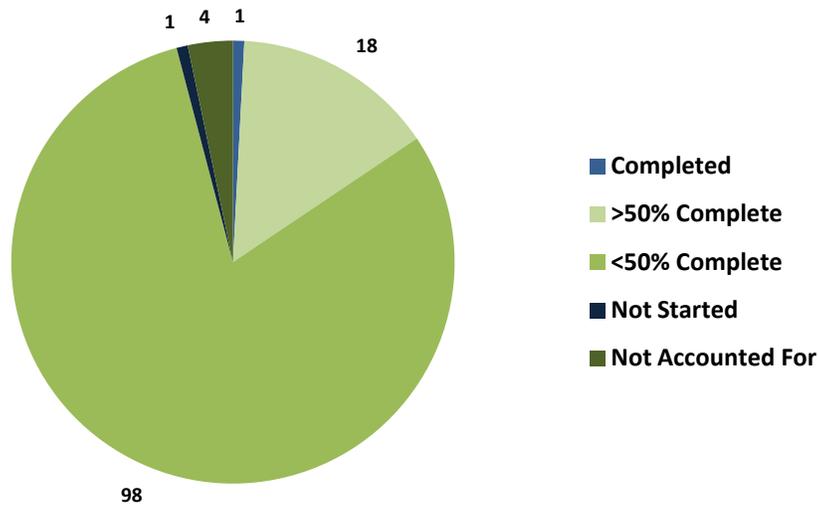
Figure 11: Total DOE ARRA/Cost-Share Geothermal Investment by Technology Focus



Source: US Department of Energy, GEA

A review of ARRA awards administered through the DOE Geothermal Technologies Program (GTP) reveals that the impact of stimulus funding has not yet peaked for geothermal. At the end of 2010, of the 122 projects receiving ARRA funding through the DOE GTP: 1 has been completed, 18 are more than 50% complete, 98 are less than 50% complete, 1 has not been started, and 4 are unaccounted for on Recovery.gov. The vast majority of projects that have yet to be completed indicate that much of this total will be spent in the coming years, boosting job growth within the geothermal sector.^{vi}

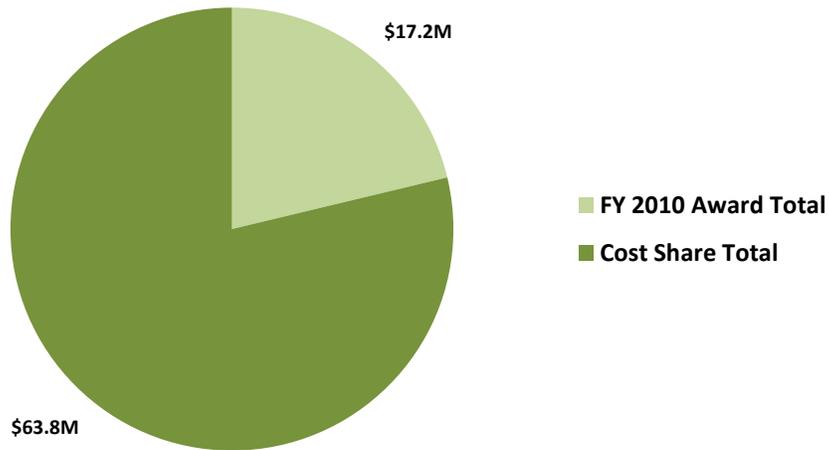
Figure 12: ARRA Funded Geothermal Project Progress



Source: US Department of Energy, GEA

The Department of Energy Geothermal Technologies Program also supports the advancement of geothermal technology through annual appropriations. In 2010 GTP allocated approximately \$17.2M of federal funding to seven companies with projects intended to develop and demonstrate new geothermal technologies utilizing low temperature geothermal fluids, geothermal fluids recovered from oil and gas reservoirs, and highly pressurized geothermal fluids. Of the seven companies' projects, four will advance the technology and implementation of binary systems designed to generate electricity from lower temperature resources. Two projects are designed to generate electricity from geothermal fluids under highly pressured geological conditions. The seventh project will utilize fluids produced as a byproduct of hydrocarbon production from oil and gas wells.^{vii} The aggregate industry cost share for the seven FY 2010 projects is approximately \$63.8M.

Figure 13: DOE GTP FY 2010 Allocation and Cost-Share Totals



Source: US Department of Energy, GEA

Federal tax incentives, the Department of Treasury Cash Grant and the DOE Loan Guarantee program combined with strong state renewable portfolio standards are expected to drive growth in the geothermal industry in the near term. Additionally, with the majority of ARRA funding to various projects being less than complete, stimulus funding still stands to be a significant driver of further geothermal development in 2011.

3. State Tables: Capacity in Development and DOE Funded Projects

The following results identify 3633 – 4050 MW of confirmed new geothermal power plant capacity under development in the United States. Unconfirmed projects increase the potential capacity to 4448 – 5040 MW. There are 15 states with projects currently under consideration or development: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Louisiana, Mississippi, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming. Between confirmed and unconfirmed projects there are a total of 146 geothermal projects in development.

Per GEA’s Geothermal Reporting Terms and Definitions (outlined in Section 1 of this report) the projects listed for each state are categorized by the following phases:

- **Phase I:** Resource Procurement and Identification (i.e. identifying resource, secured rights to resource, pre-drilling exploration, internal transmission analysis complete).
- **Phase II:** Resource Exploration and Confirmation (i.e. exploration and/or drilling permits approved, exploration drilling conducted/in progress, transmission feasibility studies underway).
- **Phase III:** Permitting and Initial Development (i.e. securing PPA and final permits, full size wells drilled, financing secured for portion of project construction, interconnection feasibility study complete).
- **Phase IV:** Resource Production and Power Plant Construction (i.e. plant permit approved, facility in construction, production and injection drilling underway, interconnection agreement signed).
- **Unconfirmed:** Project information obtained by GEA from publicly available sources but not verified by the project developer

To properly identify a projects “project type” please refer to the following key:

- **CH Unproduced:** Conventional Hydrothermal (Unproduced) Resource
- **CH Produced:** Conventional Hydrothermal (Produced) Resource
- **CH Expansion:** Conventional Hydrothermal Expansion
- **Coproduction:** Geothermal Energy and Hydrocarbon Coproduction
- **Geopressured:** Geopressured System
- **EGS:** Enhanced Geothermal System

This section also lists federal stimulus and FY 2010 supported on a state by state basis. While some of the projects in development received federal funding through ARRA and/or annual appropriations lists of projects in development are kept separate from lists of federally funded projects. This being the case, duplication of some projects in both lists occasionally occurs.

States with both geothermal power projects in development and federally funded projects are listed first. These are followed by a list of states which have federally funded geothermal research and development and demonstration projects but no geothermal power projects under development within their borders.

3.1 States with Capacity in Development and DOE Funded Projects

The following section lists 15 states with geothermal projects in various stages of development as well as projects receiving federal funding from DOE via ARRA and/or FY 2010 appropriations.

Alaska

Installed Capacity: 0.73 MW

Estimated Resource Capacity in Development: 95 MW

Estimated PCA in Development: 50.4 MW

Number of Projects in Development: 7

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 225 kW from a low-temperature resource (165°F). Subsequent 225 and 280 kW units have been installed, bringing total capacity to 730 kW.

In June, 2010 the State of Alaska enacted legislation to promote the development of geothermal energy by significantly reducing royalty payments from geothermal projects on state lands and streamlining geothermal permitting and regulatory processes with state agencies. Seven different geothermal companies, resorts, utilities, and Native American entities are developing up to 95 MW of geothermal resources in Alaska for potential electricity production. Additionally, the SW Alaska Regional Geothermal Energy and Pilgrim Hot Springs projects received funding awards from the Department of Energy via the American Recovery and Reinvestment Act of 2009 (ARRA).

AK Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Pilgrim Hot Springs	Unaatuq	10	5	CH Unproduced
	Unalaska	City of Unalaska	50	10	CH Unproduced
Phase 2					
	Akutan	City of Akutan	10	10	CH Unproduced

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
	Mount Spurr	Ormat	N/A	N/A	CH Unproduced
Phase 3					
	Chena II	Chena Hot Springs	5	0.4	CH Expansion
Unconfirmed					
	Tongass*	Bell Island Hot Springs	20	N/A	CH Unproduced
	SW AK Geo. Project	Naknek Electric Assoc.	N/A	25	EGS

*Received GRED III funding for Phase I and II of project

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA \$18.8M was allocated to three research and development and demonstration projects in Alaska. The table below provides a complete list of these projects and their current status.

AK DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Naknek Electric Association	EGS Demo	<50% Complete	\$12,376,568	\$12,400,557	\$150,000
Trabits Group	EGS R&D	<50% Complete	\$2,154,238	\$538,557	\$424,120
University of Alaska Fairbanks	IET	<50% Complete	\$4,274,792	\$1,851,345	\$440,184
Total:			\$18,805,598	\$14,790,459	\$1,014,304

Source: GEA

Arizona

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 2 MW

Number of Projects in Development: 1

Number of Geothermal Prospects: 1

Arizona has one confirmed project being developed by GreenFire Energy. This project is intended to utilize CO₂ as an energy carrier from the subsurface geothermal resource to the power plant, and has received a \$2M FY 2010 annual appropriation from DOE.

AZ Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Apache County Project	GreenFire Energy	N/A	2	EGS

Source: GEA

Arizona currently has one prospective geothermal development.

AZ Geothermal Prospects

Prospect Name	Developer/Owner
Clifton	Unknown

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA \$21.9M was allocated to the Arizona Geological Survey for its work in developing the National Geothermal Data System. Additionally, Arizona based GreenFire Energy received \$2M in FY 2010 annual appropriations from DOE.

AZ DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Arizona Geological Survey	NGDS	<50% Complete	\$21,858,224	\$258,897	\$1,648,185
GreenFire Energy	FY 2010	N/A	\$2,000,000	\$2,590,085	N/A
Total:			\$23,858,224	\$2,848,982	\$1,648,185

Source: US DOE, GEA

California

Installed Capacity: 2565.5 MW

Estimated Resource Capacity in Development: 1212 – 1358 MW

Estimated PCA in Development: 712 – 738 MW

Number of Projects in Development: 30

Number of Geothermal Prospects: 4

US geothermal online capacity remains concentrated in California. In 2010, California alone had more installed geothermal capacity than any other country in the world, except the US. In 2007, 4.5 % of California's electric energy generation came from geothermal power plants, amounting to a net-total of 13,439 GWh. California currently has approximately 2565.5 MW of installed capacity.^{viii}

Development of geothermal resources continues to move forward in California. The following table identifies 30 projects being developed by approximately nine different companies. These projects account for approximately 1358 MW of geothermal resource development.

CA Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	El Centro/Superstition Hills	Navy Geothermal Program	5-25	TBD	CH Unproduced
	China Lake South Range	Navy Geothermal Program	5-15	TBD	CH Unproduced
	Orita 2	Ram Power	150	49.9	CH Produced
	Orita 3	Ram Power	150	49.9	CH Produced
Phase 2					
	Canby Cascaded Project	Canby Geothermal	5	2	CH Unproduced
	El Centro/Superstition Mt.	Navy Geothermal Power	12-35	TBD	CH Unproduced
	Yuma Chocolate Mt.	Navy Geothermal Program	12-30	TBD	CH Expansion
	Bald Mountain	Oski Energy	20	TBD	CH Unproduced
	HV	Oski Energy	75-100	TBD	CH Unproduced
	KN	Oski Energy	75-100	TBD	CH Unproduced
	KS	Oski Energy	75-100	TBD	CH Unproduced
	Wendel	Oski Energy	5	TBD	CH Expansion
	Keystone	Ram Power	100	50	CH Unproduced
	New River	Ram Power	50	50	CH Unproduced
Phase 3					
	Black Rock I	CalEnergy	N/A	53	CH Unproduced
	Black Rock II	CalEnergy	N/A	53	CH Unproduced
	Black Rock III	CalEnergy	N/A	53	CH Produced
	CD4	Ormat	N/A	32-38	CH Unproduced
	Wister I	Ormat	N/A	30	CH Unproduced
	Geysers Project	Ram Power	33	26	CH Produced
	Orita I	Ram Power	150	49.9	CH Unproduced
Phase 4					
	Hudson Ranch I	Energy Source	150	49.9	CH Unproduced
	Mammoth Repower	Ormat	N/A	3	CH Expansion

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Unconfirmed					
	Buckeye	Calpine	N/A	30	CH Produced
	Four Mile Hill	Calpine	50	N/A	CH Unproduced
	Telephone Flat	Calpine	50	N/A	CH Unproduced
	Unnamed Glass Mountain	Calpine	320	N/A	CH Unproduced
	Unnamed North Geysers	Calpine	N/A	100	CH Produced
	Wildhorse – North Geysers	Calpine	N/A	30-50	CH Produced
	Suprise Valley	Enel	20	N/A	CH Unproduced

Source: GEA

In addition to the 30 geothermal projects in development, four geothermal prospects with potential for power production have been identified by developers in the State of California. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal “project”, a geothermal prospect has the potential to become so.

CA Geothermal Prospects

Prospect Name	Developer/Owner
East and North Brawley	Ormat Technologies
Rhyolite Plateau	Ormat Technologies
Salton Sea	Ram Power
Truckhaven	N/A

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$32.3M was allocated to 12 research and development and demonstration projects in CA. Additionally, two companies, the Modoc Contracting Company and Oski Energy, received a combined total of \$4M in FY 2010 annual appropriations from DOE.

CA DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Array Information Technology	EGS R&D	<50% Complete	\$1,164,142	\$290,473	\$113,791
CSU, Long Beach Foundation	EGS R&D	<50% Complete	\$433,560	\$156,420	\$76,347
UC Berkeley, Dep. Of Mech. Eng.	EGS R&D	N/A	\$1,777,617	\$444,405	N/A
Oasys Water	Demo	<50% Complete	\$910,997	\$1,989,791	\$502

Ormat Technologies	IET	<50% Complete	\$4,475,015	\$4,050,500	\$515,514
Potter Drilling	EGS R&D	<50% Complete	\$5,000,000	\$2,479,243	\$3,929,008
Ram Power	IET	<50% Complete	\$5,000,000	\$9,328,377	\$0
SAIC	EGS R&D	<50% Complete	\$1,025,953	\$256,489	\$336,652
Simbol Mining	EGS R&D	<50% Complete	\$3,000,000	\$6,633,543	\$1,241,263
Symyx Technologies	EGS R&D	N/A	\$3,000,000	\$1,004,705	N/A
USC	EGS R&D	<50% Complete	\$1,483,189	\$440,824	\$424,697
Geysers Power Company	IET	<50% Complete	\$5,000,000	\$7,130,648	N/A
Modoc Contracting Company	FY 2010	N/A	\$2,000,000	\$3,099,761	N/A
Oski Energy	FY 2010	N/A	\$2,000,000	\$15,705,766	N/A
Total:			\$36,270,473	\$53,010,945	\$6,637,774

Source: US DOE, GEA

Colorado

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 10 MW

Number of Projects in Development: 1

Colorado currently has one geothermal project in an unconfirmed phase of development.

CO Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Unconfirmed					
	Mt. Princeton	Mt. Princeton Geothermal	N/A	10	CH Unproduced

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$18M was allocated to 10 research and development and demonstration projects in CO. The following table provides a complete list of these projects and their current status.

CO DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Dept. of Personnel and Admin.	GHP	<50% Complete	\$4,600,000	\$2,065,728	\$254,075
CO NW Community College	GHP	N/A	\$430,000	\$430,000	N/A
Colorado School of Mines	EGS R&D	<50% Complete	\$245,797	\$91,927	\$151,591
Colorado School of Mines	EGS R&D	<50% Complete	\$1,191,893	\$441,600	\$196,028
Colorado School of Mines	GHP	>50% Complete	\$860,597	\$310,000	\$195,650

Composite Technology Development	EGS R&D	<50% Complete	\$503,650	\$180,000	\$105,000
Composite Technology Development	EGS R&D	<50% Complete	\$940,546	\$240,000	\$410,000
Denver Museum of Science & Nautre	GHP	<50% Complete	\$2,611,832	\$2,619,485	\$133,513
Flint Geothermal	IET	>50% Complete	\$4,778,234	\$3,007,300	\$169,585
Power, Environmental and Energy Research Institute	EGS R&D	<50% Complete	\$1,840,000	\$460,000	\$395,113
Total:			\$18,002,549	\$9,846,040	\$2,010,555

Source: US DOE, GEA

Hawaii

Installed Capacity: 35 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 8 MW

Number of Projects in Development: 2

Number of Geothermal Prospects: 1

One geothermal power plant operates on the big island of Hawaii. This plant, Puna Geothermal Venture, delivers an average of 25–30 MW of electricity to the grid, supplying approximately 20% of the total electricity needs of the Big Island.^{ix} Two additional projects are currently being developed on the island of Maui and the Big Island by Ormat Technologies.

HI Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Ulupalakua (Maui)	Ormat	N/A	N/A	CH Unproduced
Phase 4					
	Puna Expansion	Ormat	N/A	8	CH Expansion

Source: GEA

In addition to the two geothermal projects already under development, Ormat Technologies holds a prospective geothermal project in Hawaii known as Kula. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal “project”, a geothermal prospect has the potential to become so.

HI Geothermal Prospects

Prospect Name	Developer/Owner
Kula	Ormat Technologies

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$4.9M was allocated to Ormat Technologies for a project researching and developing innovative exploration technologies in Hawaii.

HI DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Ormat Technologies	IET	<50% Complete	\$4,911,330	\$5,575,229	\$3,737,241
Total:			\$4,911,330	\$5,575,229	\$3,737,241

Source: US DOE, GEA

Idaho

Installed Capacity: 15.8 MW

Estimated Resource Capacity in Development: 703 – 778 MW

Estimated PCA in Development: 26 MW

Number of Projects in Development: 11

Number of Geothermal Prospects: 5

In January 2008 the first geothermal power plant came online in Idaho. Raft River, a binary plant that uses a 300°F resource, and has a nameplate production capacity of 15.8 MW. Currently, net electrical power output is approximately 11.5 MW. An expansion to this plant, and 9 other projects, is under development.^x

ID Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Raft River III	U.S. Geothermal	114	13	CH Produced
	Newdale	Standard Steam Trust	N/A	N/A	CH Unproduced
	Snake River Plain	Standard Steam Trust	N/A	N/A	CH Unproduced
	Weiser	Standard Steam Trust	N/A	N/A	CH Unproduced
Phase 2					
	White Mountain	Eureka Green Systems	150	N/A	CH Unproduced

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 3					
	Raft River II	U.S. Geothermal	114	13	CH Produced
Unconfirmed					
	China Cap	Idatherm	50-100	N/A	CH Unproduced
	Preston	Idatherm	50	N/A	CH Unproduced
	Renaissance Geothermal	Idatherm	100	N/A	CH Unproduced
	Sulfur Springs	Idatherm	25-50	N/A	CH Unproduced
	Willow Springs	Idatherm	100	N/A	CH Unproduced

Source: GEA

In addition to the 11 geothermal projects in development, five geothermal prospects with potential for power production have been identified by developers in Idaho. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal “project”, a geothermal prospect has the potential to become so.

ID Geothermal Prospects

Prospect Name	Developer/Owner
Grays Lake	Eureka Green Systems
Oakley	Eureka Green Systems
Thatcher	Eureka Green Systems
Twin Falls	Eureka Green Systems
Magic Reservoir	Ormat Technologies

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$16M was allocated to four research and development and demonstration projects in ID. The table below provides a complete list of these projects and their current status.

ID DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Blaine County School District #61	GHP	<50% Complete	\$5,000,000	\$11,082,977	\$2,400,235
Boise State University	NGDS	<50% Complete	\$1,550,000	\$0	\$256,652
Boise State University	NGDS	<50% Complete	\$4,992,089	\$0	\$1,045,919

Utah State University	IET	<50% Complete	\$4,640,110	\$1,804,488	\$1,417,876
Total:			\$16,182,199	\$12,887,465	\$5,120,682

Source: US DOE, GEA

Louisiana

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 5.25 MW

Estimated PCA in Development: 0.05 MW

Number of Projects in Development: 2

Louisiana currently hosts two known developing geothermal projects. One is a planned geothermal hydrocarbon co-production unit at a producing gas field. Another project, which has been awarded \$5M of ARRA funding from the DOE Geothermal Technologies Program, will develop geopressured resources at an oil and gas field.

LA Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 4					
	Natural Gas Coproduction	Gulf Coast Green Energy	N/A	0.05	Coproduction
Unconfirmed					
	Sweetlake	Louisiana Geothermal	5.25	N/A	Geopressured

Source: ES DOE, GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA \$5M was allocated to the Sweetlake Geopressure demonstration project being developed by Louisiana Geothermal there. In addition to ARRA funding, Louisiana Geothermal received \$4M in FY 2010 allocations from DOE to conduct an economic feasibility study of geopressured resources.

LA DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Louisiana Geothermal	Geo Demo	<50% Complete	\$5,000,000	\$10,330,574	\$670,786
Louisiana Geothermal	FY 2010	N/A	\$4,000,000	\$20,832,474	N/A
Total:			\$9,000,000	\$31,163,048	\$670,786

Source: US DOE, GEA

Mississippi

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 0.03 MW

Number of Projects in Development: 1

Mississippi's first developing geothermal project is a planned geothermal hydrocarbon co-production (GHCP) unit at a producing oil field

MS Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 4					
	Oil Coproduction	Gulf Coast Green Energy	N/A	0.03	Coproduction

Source: GEA

The oil coproduction project, being developed by Gulf Coast Green Energy, also received ~\$1.6M in ARRA funding in 2009.

MS DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Forrest County	GHP	<50% Complete	\$1,571,027	\$1,571,028	\$83,408
Total:			\$1,571,027	\$1,571,028	\$83,408

Source: US DOE, GEA

Nevada

Installed Capacity: 441.8 MW

Estimated Resource Capacity in Development: 2132 – 2408 MW

Estimated PCA in Development: 638.05 – 648.05 MW

Number of Projects in Development: 65

Number of Geothermal Prospects: 26

There are currently 21 operating geothermal power plants in Nevada with a total operating capacity of 441.8 MW. In 2010 Ormat Technologies brought its Jersey Valley power plant online, adding 15 MW to Nevada's geothermal capacity. With more developing projects than any other state, it is expected that Nevada's geothermal generating capacity will increase significantly in the future.^{xi}

NV Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Lee Hot Springs	Earth Power Resources	32	N/A	CH Unproduced
	Lovelock	Earth Power Resources	32	N/A	CH Unproduced
	Aurora	Gradient Resources	190	N/A	CH Unproduced
	Colado	Gradient Resources	350	N/A	CH Unproduced
	Lee Allen	Gradient Resources	145	N/A	CH Unproduced
	Baltazor Hot Springs	Magma Energy	N/A	N/A	CH Unproduced
	Soda Lake East	Magma Energy	N/A	N/A	CH Unproduced
	Sou Hills	Montara Energy	N/A	N/A	CH Unproduced
	Fallon Test Ranges	Navy Geothermal Program	5-15	N/A	CH Unproduced
	Blue Mountain 2	Nevada Geothermal Power	35	N/A	CH Expansion
	North Valley	Nevada Geothermal Power	120	55	CH Unproduced
	Brady EGS	Ormat Technologies	N/A	N/A	EGS
	Desert Peak	Ormat Technologies	N/A	N/A	EGS
	Dixie Meadows	Ormat Technologies	N/A	30	CH Unproduced
	Edwards Creek	Ormat Technologies	N/A	N/A	CH Unproduced
	Leach Hot Springs	Ormat Technologies	N/A	N/A	CH Unproduced
	Smith Creek	Ormat Technologies	N/A	N/A	CH Unproduced
	Tungsten Mountain	Ormat Technologies	N/A	N/A	CH Unproduced
	Alligator Geothermal	Oski Energy	20-40	N/A	CH Unproduced
	Hawthorne	Oski Energy	25-50	N/A	CH Unproduced
	Hot Pot****	Oski Energy	30-50	N/A	CH Unproduced
	Pilot Peak	Oski Energy	20-40	N/A	CH Unproduced
	Barren Hills	Ram Power	32	24	CH Unproduced
	Delcer Butte	Ram Power	32	24	CH Unproduced
	Devils Canyon	Raser Technologies	N/A	N/A	CH Unproduced
	Trail Canyon	Raser Technologies	N/A	N/A	CH Unproduced
	Marys River	Standard Steam Trust	N/A	N/A	CH Unproduced
	Marys River SW	Standard Steam Trust	N/A	N/A	CH Unproduced
	Gerlach	U.S. Geothermal	N/A	N/A	CH Unproduced
	Granite Creek	U.S. Geothermal	N/A	N/A	CH Unproduced

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 2					
	Fireball	Earth Power Resources	32	N/A	CH Unproduced
	Hot Springs Point	Earth Power Resources	32	N/A	CH Unproduced
	Fallon	Gradient Resources	70	N/A	CH Unproduced
	Salt Wells	Gradient Resources	60	N/A	CH Unproduced
	Desert Queen	Magma Energy	36	N/A	CH Unproduced
	Dixie Valley	Magma Energy	N/A	N/A	Ch Unproduced
	Granite Springs	Magma Energy	N/A	N/A	CH Unproduced
	McCoy*	Magma Energy	80	N/A	CH Unproduced
	Panther Canyon	Magma Energy	34	N/A	CH Unproduced
	Soda Lake II Expansion**	Magma Energy	20-41	23	CH Expansion
	Upsal Hogback	Magma Energy	N/A	N/A	CH Unproduced
	Hawthorne Army Depot	Navy Geothermal Program	5-15	N/A	CH Unproduced
	Fallon-Main	Navy Geothermal Program	30	N/A	CH Unproduced
	Pumpnickel	Nevada Geothermal Power	33	15	CH Unproduced
	Silver State	Oski Energy	25-50	N/A	CH Unproduced
	Alum*****	Ram Power	64	32	CH Unproduced
	Clayton Valley	Ram Power	80	32	CH Unproduced
	Reese River	Ram Power	40	24	CH Unproduced
	Silver Peak*****	Ram Power	24	16	CH Unproduced
	Truckee	Raser Technologies	N/A	N/A	CH Unproduced
	San Emidio II*****	U.S. Geothermal	44	16	CH Produced
Phase 3					
	Patua	Gradient Resources	120	60	CH Unproduced
	Darrough Hot Springs	Great American Energy	30-100	N/A	CH Unproduced
	Carson Lake	Ormat Technologies	N/A	20	CH Unproduced
	Dead Horse	Ormat Technologies	N/A	20-30	CH Unproduced
	New York Canyon	Terra-Gen	100	80	CH Unproduced
Phase 4					
	Florida Canyon Mine	GCGE, ElectraTherm	N/A	0.05	Coproduction
	Soda Lake I Expansion	Magma Energy	20-41	23	CH Unproduced
	McGinness Hills	Ormat Technologies	N/A	30	CH Unproduced

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
	Tuscarora I	Ormat Technologies	N/A	18	CH Unproduced
	Coyote Canyon	Terra-Gen	100	80	CH Unproduced
	San Emidio I (Repower)	U.S. Geothermal	44	16	CH Expansion
Unconfirmed					
	Harmon Lake	Enel	N/A	N/A	CH Unproduced
	Gabbs Valley	GeoGlobal	5-60	N/A	CH Unproduced
	Pyramid Lake	Pyramid Lake Paiute Tribe	N/A	N/A	CH Unproduced

Source: GEA

In addition to the 65 geothermal projects in development, 26 geothermal prospects with potential for power production have been identified by developers in Nevada. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal “project”, a geothermal prospect has the potential to become so.

NV Geothermal Prospects

Prospect Name	Developer/Owner
Beowawe	Magma Energy
Buffalo Valley	Magma Energy
Columbus Marsh	Magma Energy
Black Rock Desert	Mustang Geothermal
Hawthorne	Mustang Geothermal
Monteneva	Mustang Geothermal
Reese River	Mustang Geothermal
Warm Springs	Mustang Geothermal
Edna Mountain	Nevada Geothermal Power
Beowawe	Ormat Technologies
Humboldt House	Ormat Technologies
Hyder Hot Springs	Ormat Technologies
Seven Devils	Ormat Technologies
Tuscarora Expansion	Ormat Technologies
Wildhorse	Ormat Technologies
Dixie Valley	Ram Power
Dixie Valley North	Ram Power
Gerlach	Ram Power
Hawthorne	Ram Power

Howard	Ram Power
North Salt Wells	Ram Power
Pearl Hot Springs	Ram Power
Salt Wells	Ram Power
Spencer	Ram Power
Sulphur	Ram Power
Wells	Ram Power

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$61M was allocated to 18 research and development and demonstration projects in NV. In addition to ARRA funding, two companies, ElectraTherm and Energent Corporation, received approximately \$1M and \$1.2M in FY 2010 appropriations respectively. The table below provides a complete list of these projects and their current status.

NV DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
AltaRock Energy	EGS R&D	<50% Complete	\$1,450,120	\$525,928	\$150,239
Beowawe Power	Geo Demo	>50% Complete	\$2,000,000	\$2,394,380	\$1,796,283
UNR, Board of Regents, NSHE	EGS R&D	<50% Complete	\$935,505	\$1,000,000	\$63,082
UNR, Board of Regents, NSHE	EGS R&D	<50% Complete	\$1,278,070	\$351,600	\$333,178
GeoGlobal Energy	IET	<50% Complete	\$2,820,211	\$2,876,624	\$87,504
Geothermal Technical Partners	IET	<50% Complete	\$1,609,275	\$1,668,576	\$72,903
Magma Energy*	IET	<50% Complete	\$5,000,000	\$9,336,380	\$156,007
Magma Energy**	IET	<50% Complete	\$4,511,945	\$5,527,985	\$1,625,037
Nevada Geothermal Power***	IET	<50% Complete	\$1,597,847	\$1,597,847	\$30,983
Oski Energy****	IET	<50% Complete	\$4,214,086	\$3,985,570	\$0
Presco Energy *****	IET	<50% Complete	\$2,277,081	\$1,934,149	\$430,795
Pyramid Lake Paiute Tribe*****	IET	<50% Complete	\$4,845,534	\$0	\$1,606,782
Sierra Geothermal Power*****	IET	<50% Complete	\$5,000,000	\$7,356,546	\$490,237
Sierra Geothermal Power*****	IET	<50% Complete	\$5,000,000	\$7,356,546	\$2,409,509
Terra-Gen*****	Geo Demo	<50% Complete	\$2,000,000	\$13,484,628	\$1,290,497
TGP Development*****	EGS Demo	<50% Complete	\$10,406,082	\$5,252,711	\$624,169
University of Kansas	IET	<50% Complete	\$2,299,237	\$1,943,282	\$262,525
US Geothermal*****	IET	<50% Complete	\$3,772,560	\$3,451,878	\$413,462
ElectraTherm*****	FY 2010	N/A	\$981,920	\$503,934	N/A
Energent Corporation	FY 2010	N/A	\$1,224,704	\$1,180,660	N/A
Total:			\$63,224,177	\$71,729,224	\$11,843,192

Source: US DOE, GEA

New Mexico

Installed Capacity: 0.24 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 15 MW

Number of Projects in Development: 2

In July 2008, a 0.24 MW pilot installation project went online in New Mexico.^{xii} The full project, Lightning Dock, is being developed by Provo, Utah-based Raser Technologies and is currently expected to produce 15 MW. A second plant is planned for completion at the same site at a later date.

NM Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Lightning Dock II	Raser Technologies	N/A	N/A	CH Produced
Phase 3					
	Lightning Dock I	Raser Technologies	N/A	15	CH Unproduced

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$5M was allocated one research and development project and one innovative exploration technology project in NM.

NM DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Arthur Mansure	EGS R&D	<50% Complete	\$50,000	\$12,500	\$26,479
Pueblo of Jemez	IET	<50% Complete	\$4,995,844	\$100,000	\$576,934
Total:			\$5,045,844	\$112,500	\$603,413

Source: US DOE, GEA

Oregon

Installed Capacity: 0.28 MW

Estimated Resource Capacity in Development: 225 – 250 MW

Estimated PCA in Development: 110.5 MW

Number of Projects in Development: 9

Number of Geothermal Prospects: 2

In August 2009, a 0.28 MW geothermal unit began producing electricity at the Oregon Institute of Technology's Klamath Falls campus. Currently, nine known geothermal projects are in development with the potential of providing up to 250 MW to Oregon's electricity grid.

OR Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Newberry I	Newberry Geothermal	120	30	CH Unproduced
	Mahagony	Ormat Technologies	N/A	N/A	CH Unproduced
	Midnight Point	Ormat Technologies	N/A	N/A	CH Unproduced
	Newberry	Ormat Technologies	N/A	N/A	Not Specified
	Olene Gap	Oski Energy	25-50	N/A	CH Unproduced
	Neal Hot Springs II	U.S. Geothermal	N/A	26	CH Produced
Phase 2					
	Crump Geyser	Nevada Geo. Power/Ormat	80	30	CH Unproduced
	GeoHeat Center II	OIT	N/A	1.5	CH Expansion
Phase 3					
	Neal Hot Springs	U.S. Geothermal	N/A	23	CH Unproduced

Source: GEA

In addition to the nine geothermal projects in development, two geothermal prospects with potential for power production have been identified by developers in Oregon. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal "project", a geothermal prospect has the potential to become so.

OR Geothermal Prospects

Prospect Name	Developer/Owner
Alvord	Raser Technologies
Klamath Falls Plant	Raser Technologies

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$36.5M was allocated to seven research and development and demonstration projects in OR.

OR DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
AltaRock Energy	EGS Demo	<50% Complete	\$21,448,389	\$22,355,008	\$572,810
City of Klamath Falls	Geo Demo	Not Started	\$816,100	\$816,100	\$35,119
Johnson Controls	Geo Demo	<50% Complete	\$1,047,714	\$1,090,271	\$27,692
Nevada Geothermal Power*	IET	<50% Complete	\$1,764,272	\$1,839,271	\$350,659
Davenport Power	IET	<50% Complete	\$5,000,000	\$7,830,425	\$506,015
Ormat Technologies**	IET	<50% Complete	\$4,377,000	\$4,327,260	\$473,734
Surprise Valley Electrification	Geo Demo	<50% Complete	\$2,000,000	\$7,513,522	\$27,083
Total:			\$36,453,475	\$45,771,857	\$1,993,112

Source: US DOE, GEA

Texas

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 0.8 MW

Number of Projects in Development: 1

Texas' first developing geothermal project is a planned geothermal hydrocarbon co-production (GHCP) unit in Goliad County.

TX Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 2					
	Goliad Co. Coproduction*	Universal GeoPower	N/A	0.8	Coproduction

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$25.5M was allocated to nine research and development and demonstration projects in TX. The following table provides a complete list of these projects and their current status.

TX DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
ADI Analytics	EGS R&D	<50% Complete	\$1,335,727	\$336,823	\$236,333
Baker Hughes	EGS R&D	<50% Complete	\$5,000,000	\$1,272,780	\$397,000
El Paso County	IET	<50% Complete	\$5,000,000	\$4,812,500	\$461,756
Schlumberger Technology	EGS R&D	<50% Complete	\$4,731,449	\$1,627,901	\$1,674,057
Southern Methodist University	NGDS	<50% Complete	\$5,250,000	\$0	\$320,883
Texas A&M University	EGS R&D	<50% Complete	\$1,061,245	\$498,440	\$119,966
University of Texas at Austin	EGS R&D	<50% Complete	\$1,397,170	\$349,292	\$1,169,987
University of Texas at Austin	GHP	<50% Complete	\$250,000	\$63,200	\$80,058
Universal GeoPower*	Geo Demo	<50% Complete	\$1,499,288	\$2,050,000	\$90,703
Total:			\$25,524,879	\$11,010,936	\$4,550,743

Source: US DOE, GEA

Utah

Installed Capacity: 42 MW

Estimated Resource Capacity in Development: 90 – 160 MW

Estimated PCA in Development: 40 – 55 MW

Number of Projects in Development: 12

Number of Geothermal Prospects: 8

A number of geothermal power plants operate in Utah. Unit 1 of the Blundell power plant has an installed capacity of 23 MW and Unit 2 has a capacity of 9 MW. In April 2009 the low-temperature 10-MW Hatch Geothermal Power Plant in Beaver County began delivering power to Anaheim California.

UT Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Hill Air Force Base	Navy Geothermal Program	N/A	N/A	CH Unproduced
	Drum Mountain	Ormat Technologies	N/A	N/A	Unspecified
	Whirlwind Valley	Ormat Technologies	N/A	N/A	Unspecified
	DeArmand	Raser Technologies	N/A	N/A	CH Unproduced

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
	Drum Mountain	Raser Technologies	N/A	N/A	CH Unproduced
	Thermo 2	Raser Technologies	N/A	N/A	CH Produced
	Drum Mountain	Standard Steam Trust	N/A	N/A	CH Unproduced
Phase 2					
	Thermo	Magma Energy	20	N/A	CH Unproduced
	Cove Fort	Oski Energy	50-75	N/A	CH Unproduced
Unconfirmed					
	Cove Fort	Enel NA	20-65	N/A	CH Unproduced
	Cove Fort 2	Enel NA	N/A	20-35	CH Produced
	Falstaff	Verdi Energy	N/A	20	CH Unproduced

Source: GEA

In addition to the 12 geothermal projects in development, eight geothermal prospects with potential for power production have been identified by developers in Utah. Geothermal developers may have acquired access to a geothermal resource which has the potential for electricity production, but which has not yet met enough project milestones for the geothermal resource to be considered a Phase I project under the Geothermal Reporting Terms and Definitions (see Section 1). While not currently considered a geothermal “project”, a geothermal prospect has the potential to become so.

UT Geothermal Prospects

Prospect Name	Developer/Owner
Abraham	Raser Technologies
Cricket	Raser Technologies
Pavant	Raser Technologies
Thermo 3	Raser Technologies
Thermo 4	Raser Technologies
Thermo Central	Raser Technologies
Thermo Greater	Raser Technologies
Wood Ranch	Raser Technologies

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$3.8M was allocated to five research and development and demonstration projects in UT.

UT DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
CSI Technologies	EGS R&D	>50% Complete	\$766,598	\$585,000	\$375,667
University of Utah	EGS R&D	<50% Complete	\$559,485	\$140,378	\$244,249
University of Utah	EGS R&D	<50% Complete	\$603,230	\$150,930	\$76,615
University of Utah	EGS R&D	<50% Complete	\$944,707	\$441,507	\$57,488
University of Utah	EGS R&D	<50% Complete	\$890,059	\$348,440	\$187,264
Total:			\$3,764,079	\$1,666,255	\$941,283

Source: US DOE, GEA

Washington

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 100 MW

Estimated PCA in Development: N/A

Number of Projects in Development: 1

While the state of Washington currently harbors no geothermal power plants, one company, Gradient Resources, is in the early stages of developing its Mt. Baker project there.

WA Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Phase 1					
	Mt. Baker	Gradient Resources	100	N/A	CH Unproduced

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$3.8M was allocated to one research and development and demonstration project in WA. See table below for details.

WA DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Honeywell International	EGS R&D	<50% Complete	\$3,852,101	\$963,025	\$671,946
Total:			\$3,852,101	\$963,025	\$671,946

Source: US DOE, GEA

Wyoming

Installed Capacity: 0.25 MW

Estimated Resource Capacity in Development: N/A

Estimated PCA in Development: 0.28 MW

Number of Projects in Development: 1

In August 2008, a 0.25 MW GHCP unit was installed at the Department of Energy's Rocky Mountain Oil Test Center (RMOTC) near Casper, Wyoming. The unit, built by Ormat Technologies, Inc., was operated for approximately one year when it was shut down for maintenance. The unit has since resumed operation and RMOTC is developing another site for the installation of a 0.28 MW GHCP unit.

WY Projects in Development

Phase	Project	Developer	Capacity Estimate (MW)		Project Type
			Resource	PCA	
Unconfirmed					
	RMOTC Co-production	RMOTC	N/A	0.28	Coproduction

Source: GEA

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$4.5M was allocated to Novatek for an EGS research and development and demonstration project.

WY DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Novatek	EGS R&D	<50% Complete	\$4,500,000	\$6,184,678	\$2,823,000
Total:			\$4,500,000	\$6,184,678	\$2,823,000

Source: US DOE, GEA

3.2 States with Projects Receiving DOE Funding Only

The following list includes states with companies whose projects are receiving ARRA funding and/or FY 2010 appropriations from DOE. These states do not contain any geothermal projects in development which have been identified to GEA.

Arkansas

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Arkansas has no utility-scale or small power geothermal projects in development. However, ARRA awarded approximately \$4M to two geothermal heat pump projects in that state.

AR DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Cedarville School District 44	GHP	>50% Complete	\$2,420,000	\$2,420,000	\$1,535,594
Newport School District	GHP	N/A	\$1,627,796	\$1,627,796	N/A
Total:			\$4,047,796	\$4,047,796	\$1,535,594

Source: US DOE, GEA

Connecticut

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$4.4M was allocated to four research and development and demonstration projects in CT. The table below provides a complete list of these projects and their current status.

CT DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Gas Equipment Engineering Corp.	EGS R&D	>50% Complete	\$1,243,624	\$416,466	\$645,722
United Technologies Research	EGS R&D	>50% Complete	\$1,191,218	\$297,804	\$766,592
United Technologies Research	EGS R&D	<50% Complete	\$1,816,306	\$454,076	\$803,180
University of Hartford	GHP	>50% Complete	\$146,973	\$36,767	\$52,907
Total:			\$4,398,121	\$1,205,113	\$2,268,401

Source: US DOE, GEA

District of Columbia

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$1.1M was allocated to the Geothermal Heat Pump Consortium.

DC DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Geo. Heat Pump Consortium	GHP	<50% Complete	\$1,077,500	\$0	\$225,663
Total:			\$1,077,500	\$0	\$225,663

Source: US DOE, GEA

Florida

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$0.25M was allocated to Florida International University for a project involving geothermal heat pump systems. This project is more than 50% complete.

FL DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Florida International University	GHP	>50% Complete	\$250,000	\$65,840	\$98,074
Total:			\$250,000	\$65,840	\$98,074

Source: US DOE, GEA

Illinois

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$3.7M was allocated to two geothermal heat pump projects in IL.

IL DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Dep. Of Military Affairs	GHP	<50% Complete	\$1,200,000	\$400,000	\$73,672
Indie Energy Systems Company	GHP	>50% Complete	\$2,459,971	\$2,515,250	\$2,303,638
Total:			\$3,659,971	\$2,915,250	\$2,377,310

Source: US DOE, GEA

Indiana

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$6.3M was allocated to two geothermal heat pump projects in IN.

IN DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Ball State University	GHP	>50% Complete	\$5,000,000	\$5,000,000	\$3,565,119
Indiana Institute of Technology	GHP	>50% Complete	\$1,339,591	\$1,339,591	\$1,178,587
Total:			\$6,339,591	\$6,339,591	\$4,743,706

Source: US DOE, GEA

Massachusetts

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$3.8M was allocated to two EGS research and development and demonstration projects in MA.

MA DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Draka Cableteq USA	EGS R&D	<50% Complete	\$3,222,398	\$1,185,792	\$1,281,875
MIT	EGS R&D	<50% Complete	\$549,148	\$157,290	\$97,844
Total:			\$3,771,546	\$1,343,082	\$1,379,719

Source: US DOE, GEA

Michigan

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$2.7M was allocated to Oakland University for a project involving geothermal heat pumps.

MI DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Oakland University	GHP	<50% Complete	\$2,738,100	\$7,040,830	\$624,707
Total:			\$2,738,100	\$7,040,830	\$624,707

Source: US DOE, GEA

Minnesota

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$2.9M was allocated to a EGS research and development as well as a geothermal heat pump project in MN.

MN DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
City of Eagan	GHP	Completed	\$1,338,000	\$1,430,131	\$1,338,000
University of Minnesota	EGS R&D	<50% Complete	\$1,550,081	\$387,505	\$247,143
Total:			\$2,888,018	\$1,817,636	\$1,585,143

Source: US DOE, GEA

Missouri

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA \$2.5M, was allocated to the University of Missouri for a geothermal heat pump project.

MO DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
University of Missouri	GHP	<50% Complete	\$2,476,400	\$2,698,500	\$61,609
Total:			\$2,476,400	\$2,698,500	\$61,609

Source: US DOE, GEA

Montana

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$1.2M was allocated to two geothermal heat pump projects in MT.

MT DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Flathead Electric Cooperative	GHP	>50% Complete	\$155,270	\$164,274	\$32,271
University of Montana	GHP	<50% Complete	\$1,072,744	\$1,082,753	\$60,696
Total:			\$1,228,014	\$1,247,027	\$92,967

Source: US DOE, GEA

North Carolina

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$1.3M was allocated to the City of Raleigh, NC for a geothermal heat pump project.

NC DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
City of Raleigh	GHP	>50% Complete	\$1,293,625	\$1,293,625	\$258,741
Total:			\$1,293,625	\$1,293,625	\$258,741

Source: US DOE, GEA

North Dakota

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$3.5M was allocated to two geothermal demonstration projects being carried out by the University of North Dakota.

ND DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
University of North Dakota	Geo Demo	<50% Complete	\$1,733,864	\$1,734,058	\$36,847
University of North Dakota	Geo Demo	<50% Complete	\$1,733,864	\$1,734,058	\$65,217
Total:			\$3,467,728	\$3,468,116	\$102,064

Source: US DOE, GEA

Nebraska

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$5M was allocated to a geothermal heat pump project in NE.

NE DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
District Energy Corporation	GHP	<50% Complete	\$5,000,000	\$15,132,822	\$3,117,213
Total:			\$5,000,000	\$15,132,822	\$3,117,213

Source: US DOE, GEA

New Jersey

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$0.11M was allocated to Environ International Corporation for a geothermal heat pump project and \$5M in FY 2010 annual appropriations went to NRG Energy.

NJ DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Environ International Corporation	GHP	>50% Complete	\$109,999	\$28,999	\$68,405
NRG Energy	FY 2010	N/A	\$5,000,000	\$19,856,817	N/A
Total:			\$5,109,999	\$19,885,816	\$68,405

Source: US DOE, GEA

New York

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$13.7M was allocated to five research and development and geothermal heat pump projects in NY.

NY DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
GE Global Research	EGS R&D	<50% Complete	\$3,000,000	\$750,000	\$882,970
GE Global Research	EGS R&D	<50% Complete	\$3,408,485	\$852,121	\$456,942
GE Global Research	EGS R&D	<50% Complete	\$2,390,210	\$597,553	\$420,154
General Electric	EGS R&D	<50% Complete	\$2,085,062	\$567,689	\$631,504
University at Albany	GHP	<50% Complete	\$2,786,250	\$2,786,250	\$142,840
Total:			\$13,670,007	\$5,553,613	\$2,534,410

Source: US DOE, GEA

Ohio

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$0.23M was allocated to Ohio's Wright State University for a geothermal heat pump project.

OH DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Wright State University	GHP	>50% Complete	\$232,596	\$58,513	\$173,485
Total:			\$232,596	\$58,513	\$173,485

Source: US DOE, GEA

Oklahoma

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$2.9M was allocated to three research and development and geothermal heat pump projects in OK.

OK DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Climate Master	GHP	<50% Complete	\$233,819	\$77,056	\$76,760
Impact Technologies	EGS R&D	<50% Complete	\$2,399,999	\$600,000	\$677,521
Oklahoma State University	GHP	<50% Complete	\$250,000	\$62,520	\$125,103
Total:			\$2,883,818	\$739,576	\$879,384

Source: US DOE, GEA

Pennsylvania

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$2.8M was allocated to EGS research and development and a geothermal heat pump project in PN.

PN DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
1001 15 th Street Associates	GHP	<50% Complete	\$1,682,920	\$1,682,920	\$3,403
Pennsylvania State University	EGS R&D	<50% Complete	\$1,113,024	\$485,990	\$89,110
Total:			\$2,795,944	\$2,168,910	\$92,513

Source: US DOE, GEA

South Carolina

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$2.5M was allocated to South Carolina's Furman University for a geothermal heat pump project which is more than 50% complete.

SC DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Furman University	GHP	>50% Complete	\$2,457,741	\$2,457,741	\$54,296
Total:			\$2,457,741	\$2,457,741	\$54,296

Source: US DOE, GEA

Tennessee

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$11.1M was allocated to three geothermal heat pump projects in TN.

TN DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Development & Housing Agency	GHP	N/A	\$1,800,000	\$1,800,000	N/A
Oak Ridge City Center	GHP	<50% Complete	\$5,000,000	\$8,206,633	\$3,750
TN Department of Education	GHP	<50% Complete	\$4,255,374	\$5,123,072	\$43,057
Total:			\$11,055,374	\$15,129,705	\$46,087

Source: US DOE, GEA

Virginia

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$2.6M was allocated to two EGS research and development and demonstration projects in VA.

VA DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Bob Lawrence and Associates	EGS R&D	<50% Complete	\$1,499,601	\$378,732	\$384,516
William Lettis and Associates	EGS R&D	<50% Complete	\$1,093,235	\$313,510	\$109,090
Total:			\$2,592,836	\$692,242	\$493,606

Source: US DOE, GEA

Wisconsin

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, \$1.8M was allocated to four geothermal heat pump projects in WI.

WI DOE Funded Projects

Recipient	Focus	Status	Amount	Cost Share	Expenditure
Energy Center of Wisconsin	GHP	>50% Complete	\$190,395	\$55,605	\$95,560
Johnson Controls	GHP	<50% Complete	\$311,324	\$311,324	\$64,906
RiverHeath	GHP	<50% Complete	\$978,168	\$978,168	\$21,300
Skychaser Energy	GHP	>50% Complete	\$325,124	\$463,832	\$36,026
Total:			\$1,805,011	\$1,808,929	\$217,792

Source: US DOE, GEA

West Virginia

Installed Capacity: 0 MW

Estimated Resource Capacity in Development: 0 MW

Estimated PCA in Development: 0 MW

Of the \$360.8M of federal funding provided to the geothermal industry via ARRA, approximately \$1.2M was allocated to West Virginia University for an EGS research and development and demonstration project.

WV DOE Funded Projects

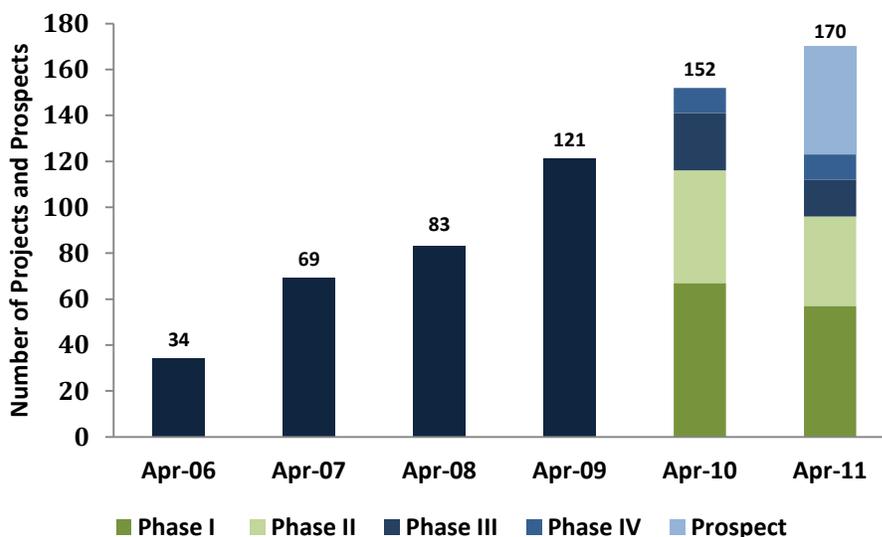
Recipient	Focus	Status	Amount	Cost Share	Expenditure
West Virginia University	EGS GHP	<50% Complete	\$1,206,330	\$306,906	\$144,012
Total:			\$1,206,330	\$306,906	\$144,012

Source: US DOE, GEA

4. Comparison with Previous Report Data and Trends

Due to the new reporting requirements brought about by the implementation of GEA’s Geothermal Reporting Terms and Definitions for 2011, comparison with earlier versions of GEA’s annual reports may be problematic. However, the general trend of projects under development can be estimated by adjusting project totals from the 2010 report for some of the more significant changes made in the 2011 report. In particular, a number of “projects” listed in 2010 are now included as “prospects” in this report. This is due, in part, to the higher standards applied to reporting information on projects in development and in some cases is due to changes in ownership or other company related matters. The consideration of the number of geothermal prospects reported in 2011 along with confirmed projects in development indicates that geothermal developers are actively developing known geothermal resources as well as seeking new prospects for development. The number of projects in development has continued to increase at a steady rate since early 2006.

Figure 14: Total Confirmed Projects + 2011 Prospects

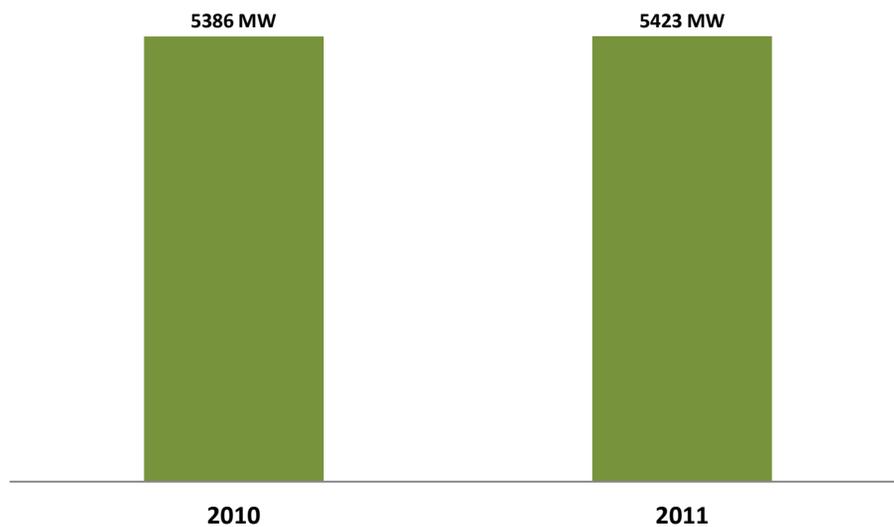


Source: GEA

The changes brought about by the higher reporting standards also impacted the total MW capacity in development being reported by developers in 2011. This is partly due to the shift noted above where some sites are now classified as prospects instead of projects in the report, but also because while in the past developers would only report one capacity value for a project to GEA, the Geothermal Reporting Terms and Definitions gave them the opportunity to report both a resource capacity estimate and a PCA estimate. While these estimates are directly related to each other, they provide different points of information (see section 1 on the Geothermal Reporting Terms and Definitions for further explanation). This makes comparing capacity in development information from the 2011 Annual Report to previous years more complex. However, a comparison of the overall resource capacity in the 2011 Annual report

with the mixed capacity levels from the 2010 report provides insight regarding development trends in the geothermal industry. In 2010 approximately 4407 – 6365 MW of geothermal resources were under development by geothermal companies, while industry reported approximately 5102 – 5745 MW of geothermal development in 2011. The median values for geothermal capacity under development in 2010 and 2011 are 5386 MW and 5423 MW respectively, indicating that the median total geothermal MW under development remains steady. This does not include 18 geothermal prospects whose potential contribution is not estimated.

Figure 15: 2010 and 2011 Average Capacity (MW) in Development



Source: GEA

5. References

ⁱ U.S. DOE: Geothermal Technologies Program. Geothermal Tomorrow (Sep. 2008).

ⁱⁱ The development of stricter project phase criteria, via the Geothermal Reporting Terms and Definitions, has altered the status of certain projects that were previously considered as being in an advanced stage of development. The adherence to a more thorough set of project phase criteria actually led some projects to effectively be listed in earlier phases of project development. For this reason, a comparison of phase 3 and phase 4 project PCA totals to phase 4 capacity in development totals from previous years is more accurate than comparing to capacity in development totals for phase 3 and 4 for previous years.

ⁱⁱⁱ U.S. Department of the Treasury, 1603 Program: <http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx>

^{iv} U.S. Department of Energy, Loan Programs Office: <http://www.lgprogram.energy.gov/>

^v Communication with U.S. Department of Energy, Geothermal Technologies Program:
<http://www.eere.energy.gov/geothermal/index.html>

^{vi} Recovery.gov: <http://www.recovery.gov/About/board/Pages/TheBoard.aspx>

^{vii} U.S. Department of Energy, Geothermal Technologies Program:
http://www.eere.energy.gov/geothermal/projects/foa_listing.cfm/FOANumber/DE-FOA-0000318

^{viii} California Energy Commission: <http://www.energy.ca.gov/>

^{ix} Hawaii Department of Business, Economic Development and Tourism:
<http://hawaii.gov/dbedt/info/energy/renewable/geothermal>

^x Idaho Office of Energy Resources: <http://www.energy.idaho.gov/>

^{xi} Nevada Commission on Mineral Resources Division of Minerals : <http://minerals.state.nv.us/>

^{xii} New Mexico Energy, Minerals, and Natural Resources Department:
<http://www.emnrd.state.nm.us/main/index.htm>



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