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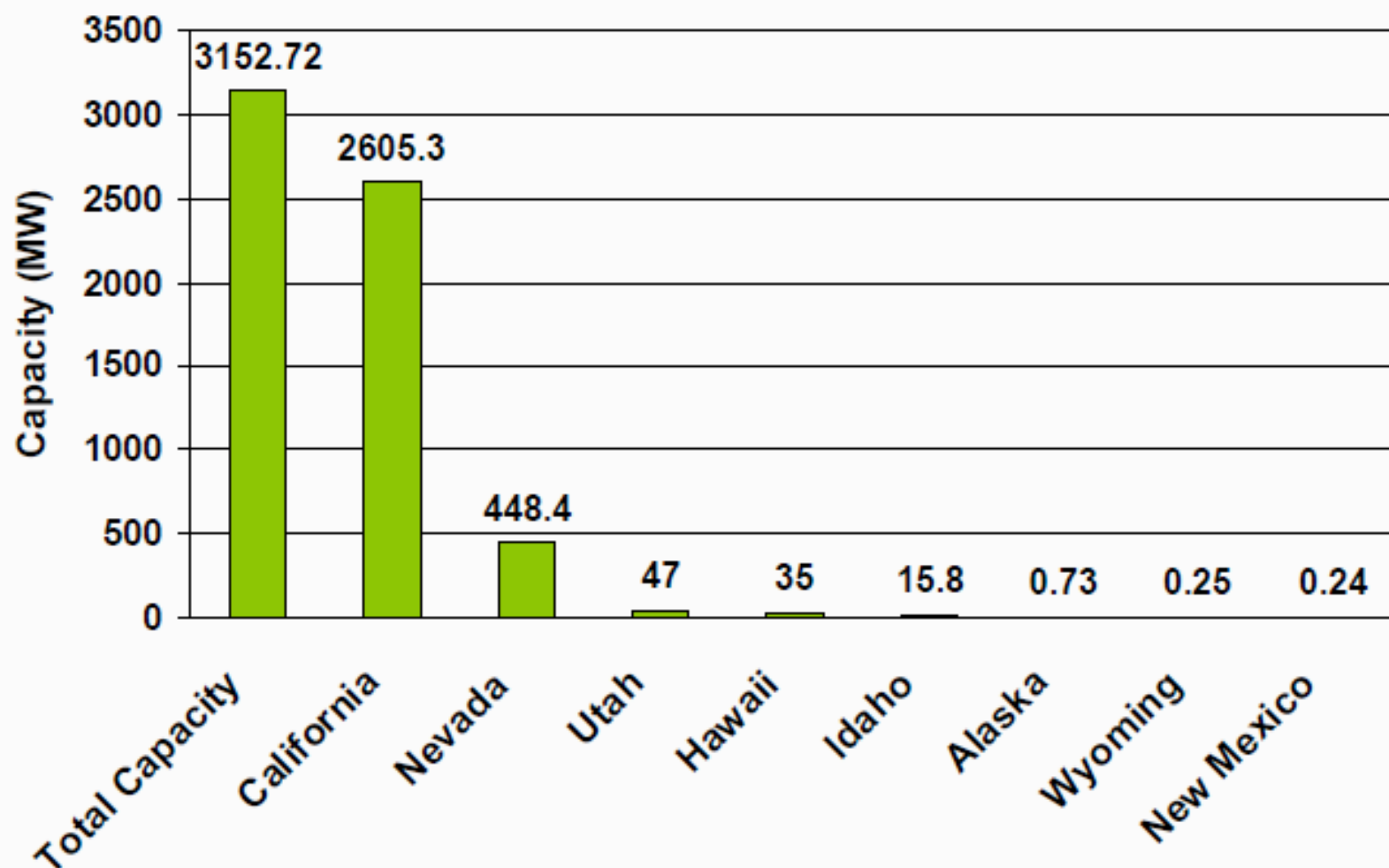


RNRF  
December 8, 2009

# Geothermal Power:

- Current Production
- Projects Under Development
  - Projected Growth
  - Emerging Resources
  - ARRA Initiatives
- Priorities for Continued Growth

Figure 1: August 2009 Geothermal Power Capacity On-Line (MW)



Source: GEA

# The Geysers





# ORMAT 20MW Burdette Power Plant - Reno, Nevada



# UTC Power 225 KW Power Plant - Chena, Alaska



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



New Projects Under  
Development  
September 2009

- **14 States**
- **144 Projects**
- **4699.9 – 7109.9 MW**

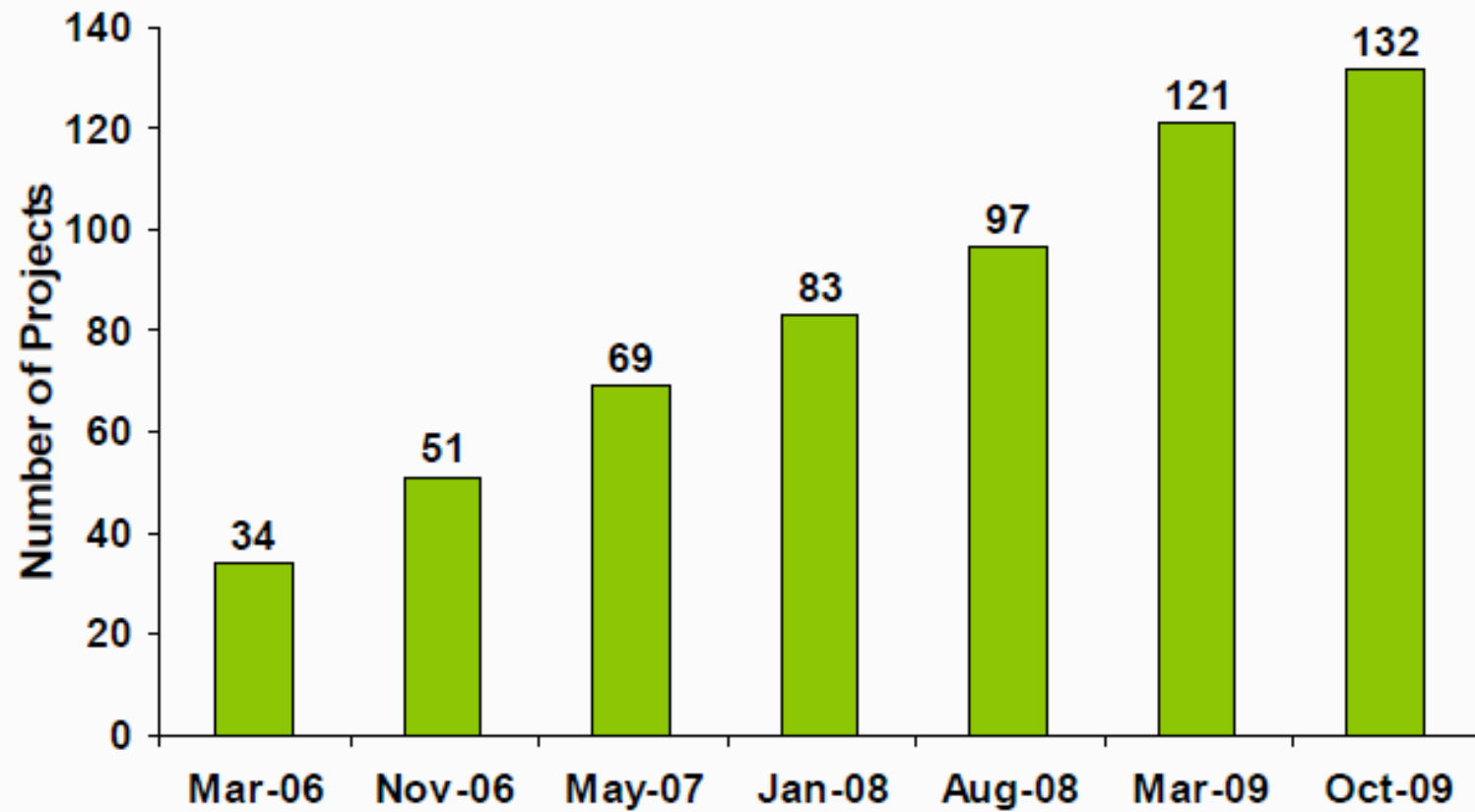


**Figure 4: Developing Projects by State**

<b>State</b>	<b>Phase 1 to Phase 4</b>	<b>TOTAL (with unconfirmed)</b>
<b>Alaska</b>	5/50 – 95 MW	6/70 – 115 MW
<b>Arizona</b>	1/2 – 20 MW	1/2 – 20 MW
<b>California</b>	32/1554.9 – 1938.9 MW	37/1841.8 – 2435.8 MW
<b>Colorado</b>	1/10 MW	1/10 MW
<b>Florida</b>	1/0.2 – 1 MW	1/0.2 – 1 MW
<b>Hawaii</b>	2/8 MW	2/8 MW
<b>Idaho</b>	5/238 – 326 MW	5/238 – 326 MW
<b>Louisiana</b>	0	1/.05 MW
<b>Mississippi</b>	0	1/.05 MW
<b>Nevada</b>	60/1776.4 – 3323.4 MW	64/1876.4 – 3473.4 MW
<b>New Mexico</b>	1/20 MW	1/20 MW
<b>Oregon</b>	13/317.2 – 368.2 MW	13/317.2 – 368.2 MW
<b>Utah</b>	10/272.4 – 332.4 MW	10/272.4 – 332.4 MW
<b>Washington</b>	1/Unspecified	1/Unspecified
<b>Total</b>	<b>132 Projects</b> <b>4249.1 – 6442.9 MW</b>	<b>144 Projects</b> <b>4699.9 – 7109.9 MW</b>



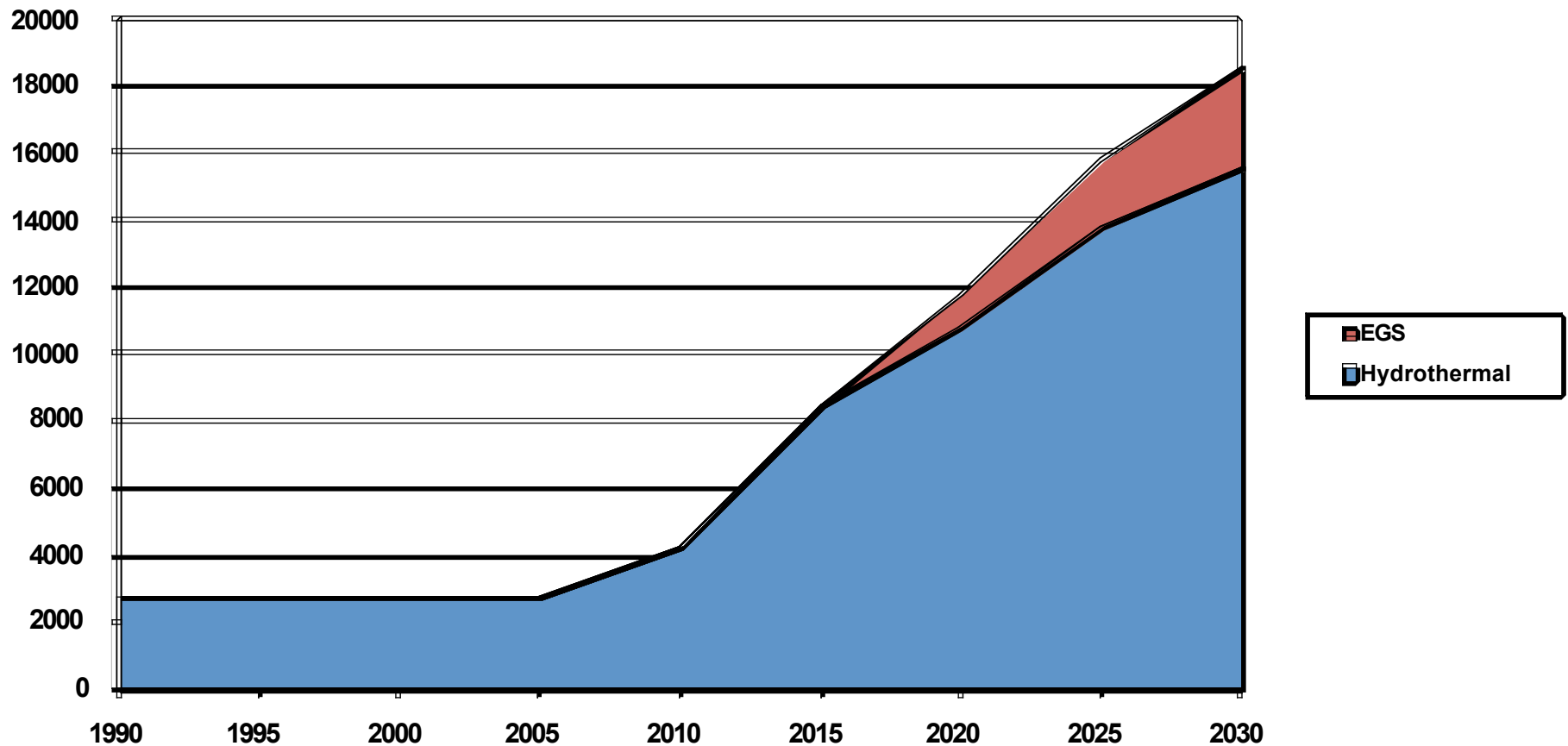
**Figure 8: Total Confirmed Projects 2006 – 2009**



Source: GEA

# Projected Growth

Deloitte Market Analysis Report to DOE (9/2008)



# Emerging Resources

- Small Power/Distributed Generation
- Co-production from oil/gas wells
- Geopressured resources
- Enhanced Geothermal Systems/Deep Geothermal

# Provisions in ARRA of particular interest to geothermal

- A three year extension of the production tax credit (PTC) making geothermal power facilities placed in service by December 31, 2013 eligible for the full credit,
- Extension of the 30% investment tax credit (ITC) to new geothermal energy projects and in some cases allowing developers to apply for a cash grant in lieu of the ITC,
- Adoption of a new 30% credit for companies manufacturing renewable/geothermal power equipment,
- \$1.6 billion in new bonding authority for Clean Renewable Energy Bonds, used to finance new renewable power projects by public power, municipal and government entities,
- Up to \$6 billion in loan guarantees for new renewable/geothermal power projects, explicitly for commercial technologies,
- \$400 million in new funding for DOE's Geothermal Technologies Program to implement a wide range of research, development, demonstration and deployment activities.



# DOE ARRA Funding

- The DOE Geothermal Technologies Program (GTP) was provided \$400 million to spur new jobs, new technology, and the geothermal marketplace. DOE developed a series of specific solicitations to support industry and technology advancement.

# October 29, 2009: Department of Energy Awards \$338 Million to Accelerate Domestic Geothermal Energy

- **Innovative Exploration and Drilling Projects** (up to \$98.1 million): Twenty-four projects have been selected focusing on the development of new geothermal fields using innovative sensing, exploration, and well-drilling technologies.
- **Coproduced, Geopressured, and Low Temperature Projects** (up to \$20.7 million): Eleven projects have been selected for the development of new low-temperature geothermal fields, a vast but currently untapped set of geothermal resources. This includes geothermal heat found in the hundreds of thousands of oil and gas wells around the U.S., where up to ten barrels of hot water are produced for every barrel of oil.
- **Enhanced Geothermal Systems Demonstrations** (up to \$51.4 million): Three projects have been selected for the exploration, drilling and development of enhanced geothermal systems (EGS) to validate power production from deep hot rock resources using innovative technologies and approaches.
- **Enhanced Geothermal Systems Components Research and Development / Analysis** (up to \$81.5 million): Forty-five projects have been selected to focus on research and development of new technologies to find and drill into deep hot rock formations, stimulate enhanced geothermal reservoirs, and convert the heat to power.
- **Geothermal Data Development, Collection and Maintenance** (up to \$24.6 million): Three projects have been selected for the population of a comprehensive nationwide geothermal resource database to help identify and assess new fields.
- **Ground Source Heat Pump Demonstrations** (up to \$61.9 million): Thirty-seven projects have been selected to demonstrate the deployment of ground source heat pumps for heating and cooling of a variety of buildings for a variety of customer types, including academic institutions, local governments and commercial buildings.

# Industry Priorities for Continued Growth

- Continued Federal Financial Incentives (PTC, ITC)
- Timely Leasing and Permitting
- DOE Support for Technology/Market Development
- RPS Support for Market Growth

# For More Information



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