

Geothermal Power in 2012

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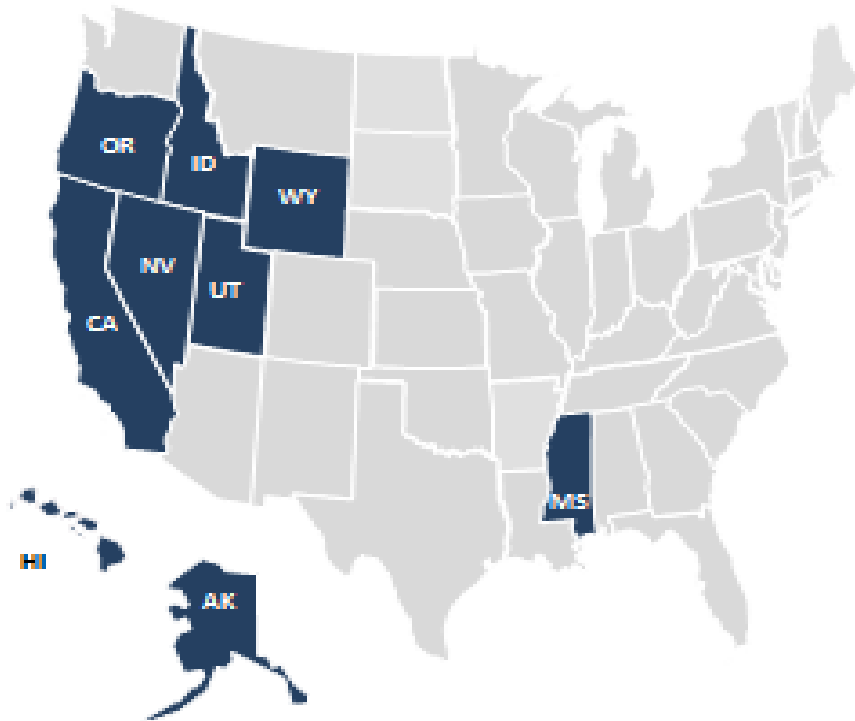


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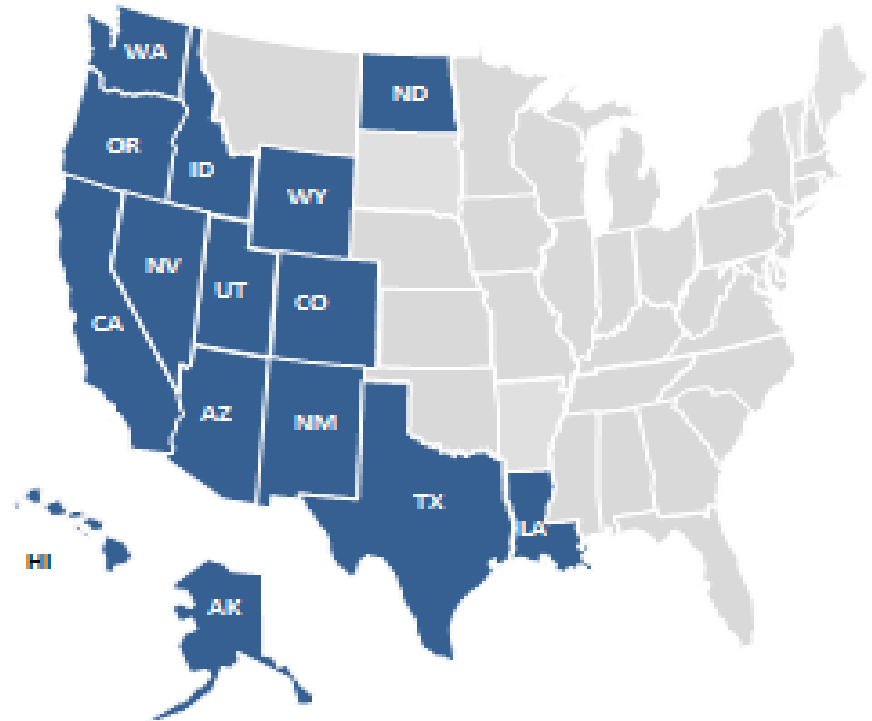
- 3,187 MW of power in production in 9 states.
- > 147 power projects under development in 15 states which when put on-line would triple geothermal power production
- 17 demonstration projects utilizing low-temperature geothermal, co-production from oil/gas wells, or geopressured resources.
- 7 Enhanced Geothermal Systems (EGS) demonstration projects designated by DOE.
- Small, distributed generation geothermal power systems operating in Alaska, New Mexico, Oregon, Nevada and Wyoming.

Geothermal Power is Expanding

States with Geothermal Power Production in 2011*



States with Geothermal Capacity in Development in 2011



Examples of New Geothermal Power Plants



Galena III, NV, U.S., 26.7 MW, 2008 (Air-cooled OEC)



Untapped US Geothermal Power Potential*

- in 13 Western US States Only

- **Identified Geothermal Systems:** 3,675 MWe (95% probability) to 16,457 MWe (5% probability)
- **Undiscovered Geothermal Systems:** 7,917 MWe (95% probability) to 73,286 MWe (5% probability)
- **Enhanced Geothermal Systems:** 345,100 MWe (95% probability) to 727,900 MWe (5% probability)**

-
- **Industry Target: 11,592MW – 89,743MW of Hydrothermal Power in 13 Western States remains to be developed!**

*USGS: Assessment of Moderate-and High-Temperature Geothermal Resources of the United States, Sept. 2008

** Does not include other non-conventional resources.

Industry Views Resource Potential & Applications as Vast and Various But....

- Significant risks are related to finding, developing and confirming the resources.
- Long lead times impact cost, risk and make financing projects difficult.
- Government policies are a mismatch with geothermal needs.
- Federal research support has been inconsistent and minimal.

Key Policy Factors Influencing US Geothermal Growth

- State/Federal Renewable Standards
- Federal Tax Incentives
- Federal Leasing and Permitting
- DOE/Industry Technology Development
- Climate Change Legislation/Regulation

RPS Challenge: valuing renewable energy sources

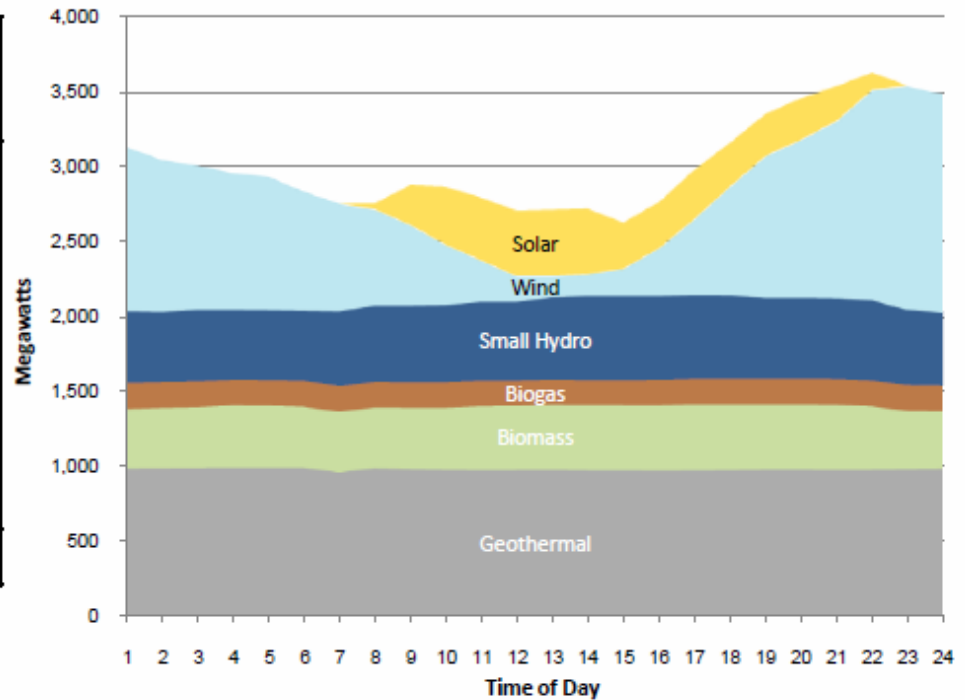
24-Hour Renewables Production

Renewable Resources	Peak Production (MW)	Daily Production (MWh)
Solar	440	4,484
Wind	1515	17,725
Small Hydro	574	12,583
Biogas	176	4,149
Biomass	440	9,927
Geothermal	1000	22,639
Other Renewables *	68	1,613
Total Renewables		73,121

Total 24-Hour System Demand (MWh): 781,335

This table gives numeric values related to the production from the various types of renewable resources for the reporting day. The total renewable production in megawatt-hours is compared to the total energy demand for the ISO system for the day.

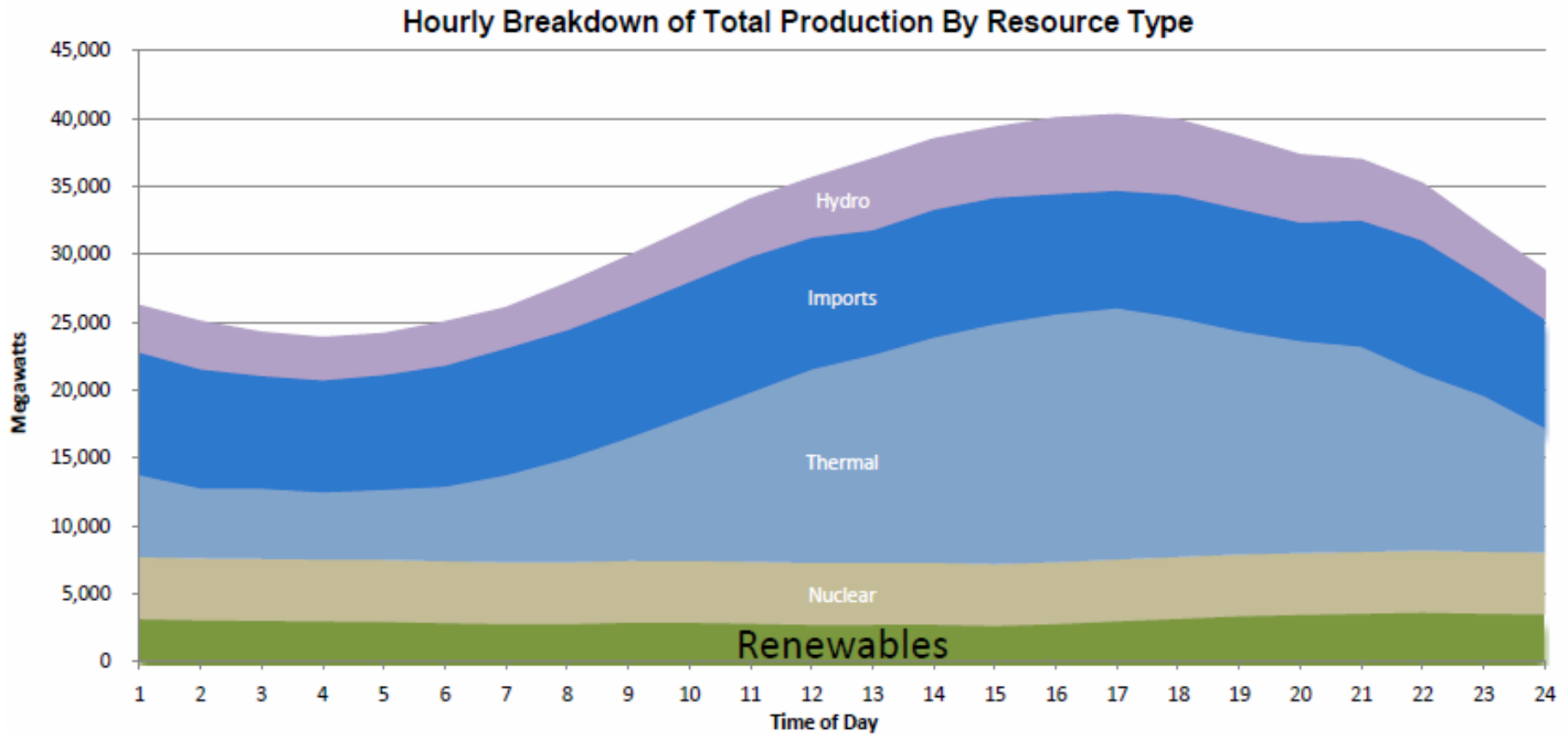
Hourly Breakdown of Renewable Resources



This graph shows the production of various types of renewable generation across the day.

California Power Production on August 2, 2011

Total California ISO Electricity Production for August 2, 2011



This graph depicts the production of various generating resources across the day.

Federal Tax Incentives

- Congress extended PTC to geothermal in 2005
- The lead time for a new geothermal power plant is 4-8 years
- The PTC and 30% ITC expire for geothermal at the end of 2013
- Current tax credit structure may not be ideal for base load technologies

Federal Leasing and Permitting

- 2005 Energy Policy Act established all competitive leasing system
- 2005 law established 5-year trust fund to support NEPA, permitting and other administrative work
- Trust fund was terminated early and BLM has let DC geothermal program lead lapse

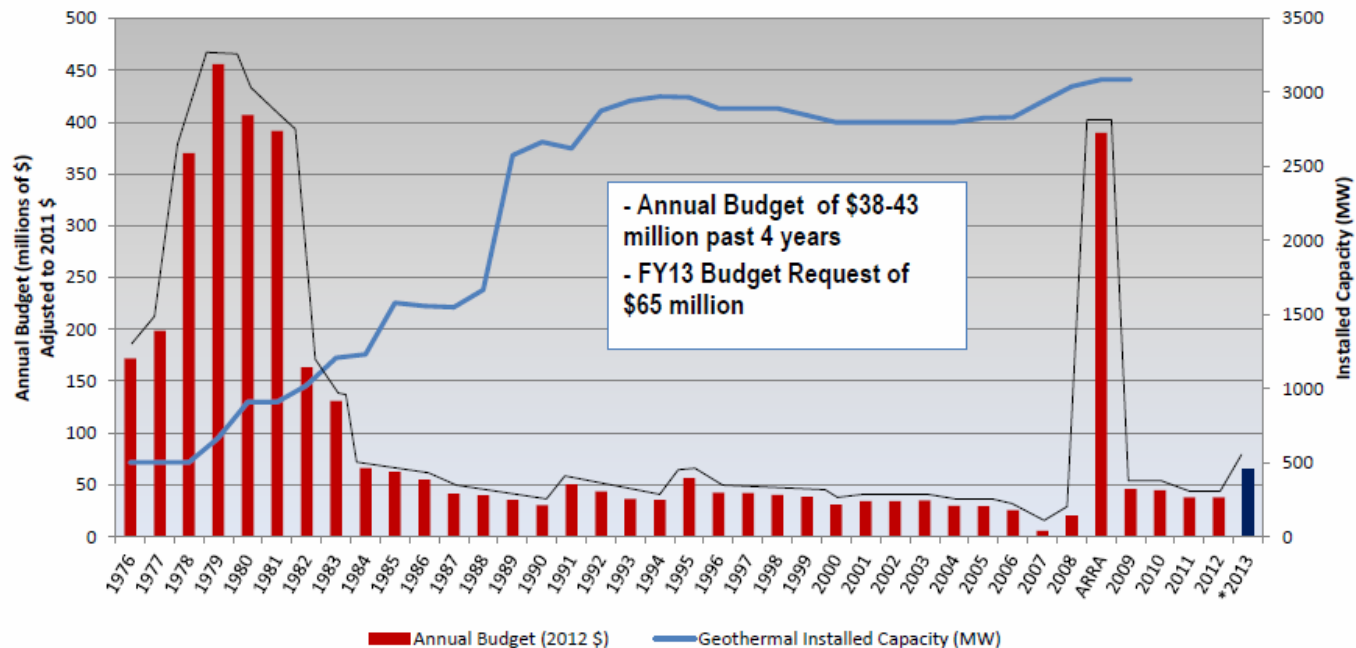
DOE Support Has Been Minimal and Inconsistent

Federal Geothermal Program 1976-2012

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

The Geothermal Technologies Program annual budget peaked in the late 1970s.

Annual Budget for the Geothermal Technologies Program
and Installed Capacity
1976 - 2012

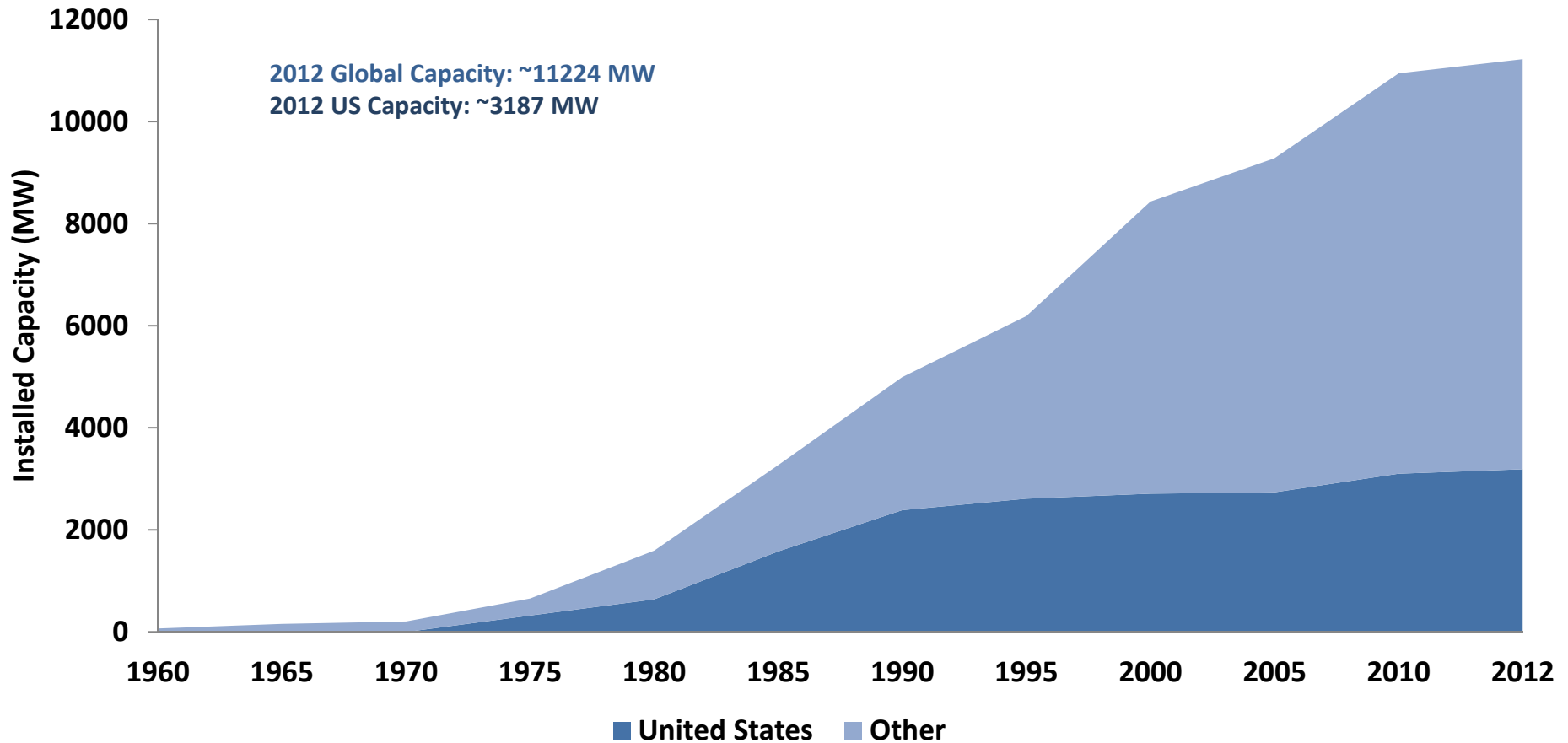


*Request

Strong Growth in Global Market

- 22 countries built new geothermal power plants between 2005 and 2010.
- 70 countries as of 2010 had projects under consideration/development, a 52% increase from 2007.
- US industry has robust participation in global market -- Geothermal is one renewable technology the US exports more than it imports (National Export Initiative).

Global vs US Installed Geothermal Capacity 1960 – 2012



You are invited:

**GEA International
Geothermal Energy
Showcase 2012**

Wednesday, May 23, 2012

8:00 a.m. – 5:30 p.m.

**Ronald Reagan Building and
International Trade Center, Atrium Hall
Washington, DC**

For More Information:



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www.geo-energy.org