



**Lightning Dock Geothermal**

## GLOBAL GEOTHERMAL POWER GENERATION

- Currently used in 24 countries, with installed capacity of 10,715 MW

Largest capacities:

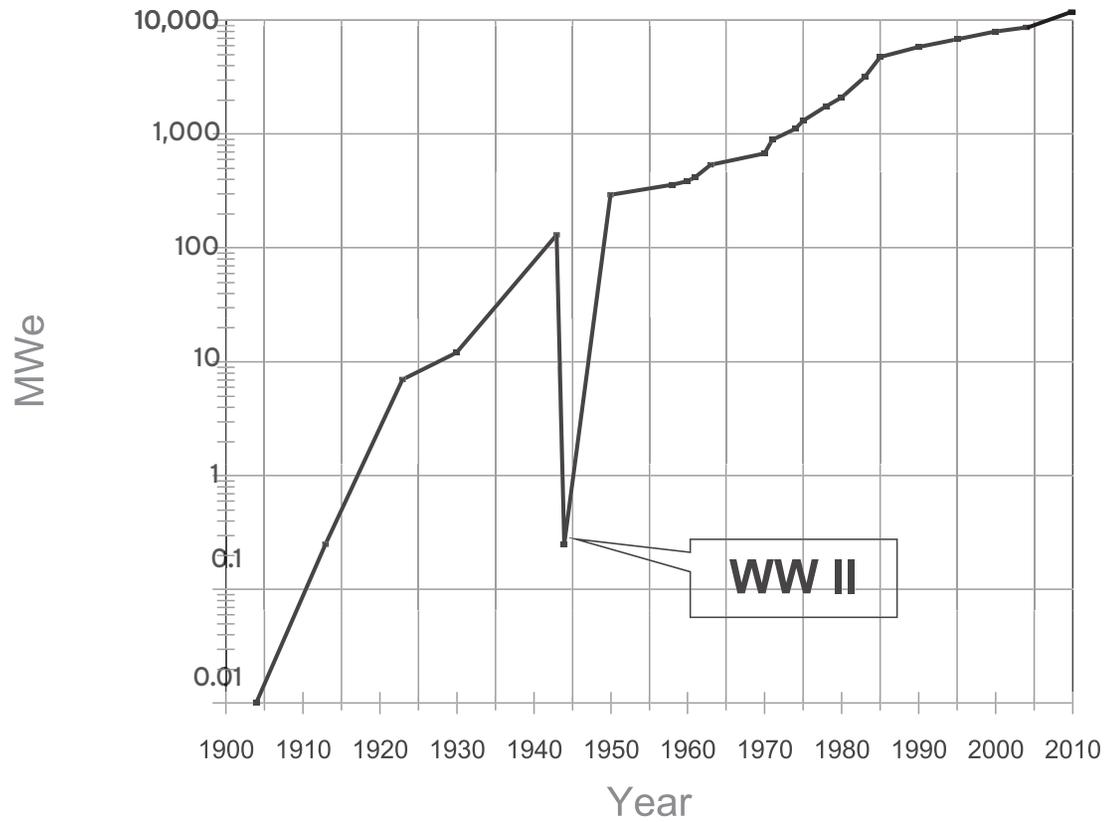
USA..... (3,187 MW)

The Philippines..... (1,904 MW)

Indonesia..... (1,200 MW)

- Global thermal energy potential varies from 35,000 MW to 2,000,000 MW

## WORLDWIDE GEOTHERMAL POWER PRODUCTION 1904-2010



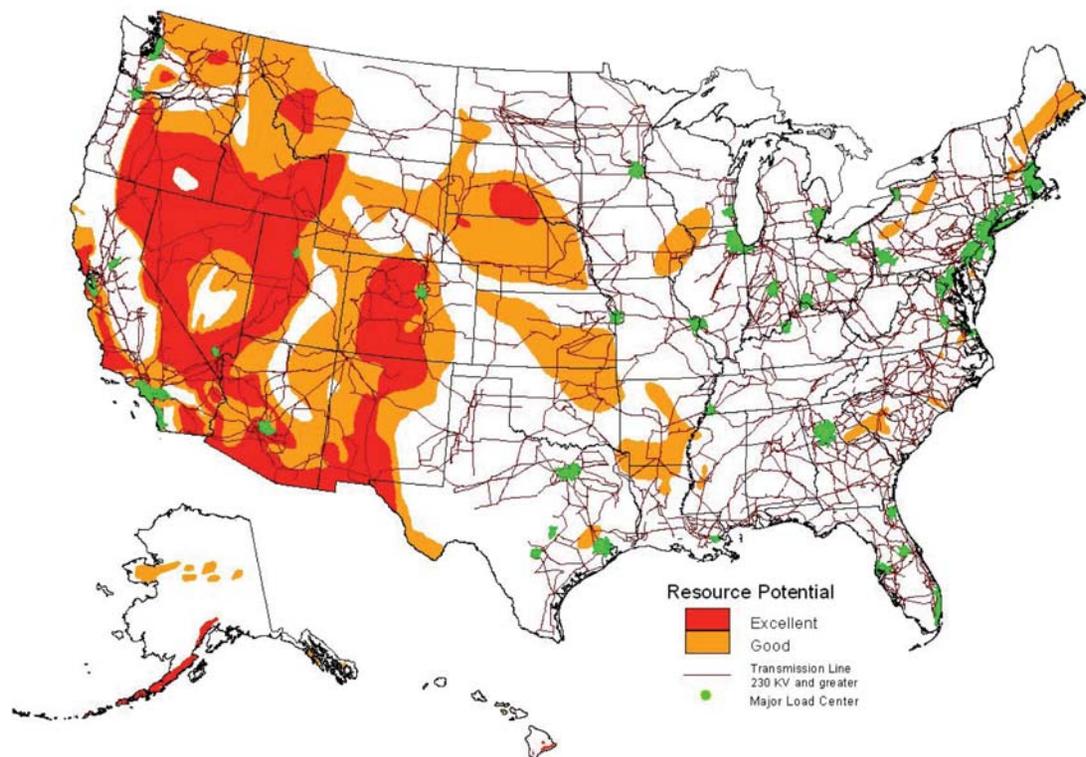
2010 worldwide  
capacity = 10,715 MW

1 MW can power  
1000 homes

## US GEOTHERMAL ELECTRICITY PRODUCTION

- Geothermal power plants are the fourth-largest source of US renewable electricity, after hydropower, biomass, and wind power
- US installed geothermal capacity was 3,187 MW from 77 geothermal power plants in 9 States (2012)
  - National statistics
    - 15 billion kWh of geothermal power per year, enough to power over 2 million homes (1.5% of US homes)
    - Comparable to consuming 1 billion gallons of oil (0.05% of oil consumption annually) or 6 million short tons of coal (0.6%) per year
  - 82% of that capacity is in California, and 58% of California's capacity at one site: The Geysers, 70 miles north of San Francisco (power to 725,000 homes)
  - New Mexico sits atop a world-class resource but currently produces none of national total
- In 2011, the US geothermal industry was developing 130 projects in 15 States
  - Potential to provide 5-10% of national electricity needs
  - Cyraq's Lightning Dock project is one of those 130 projects

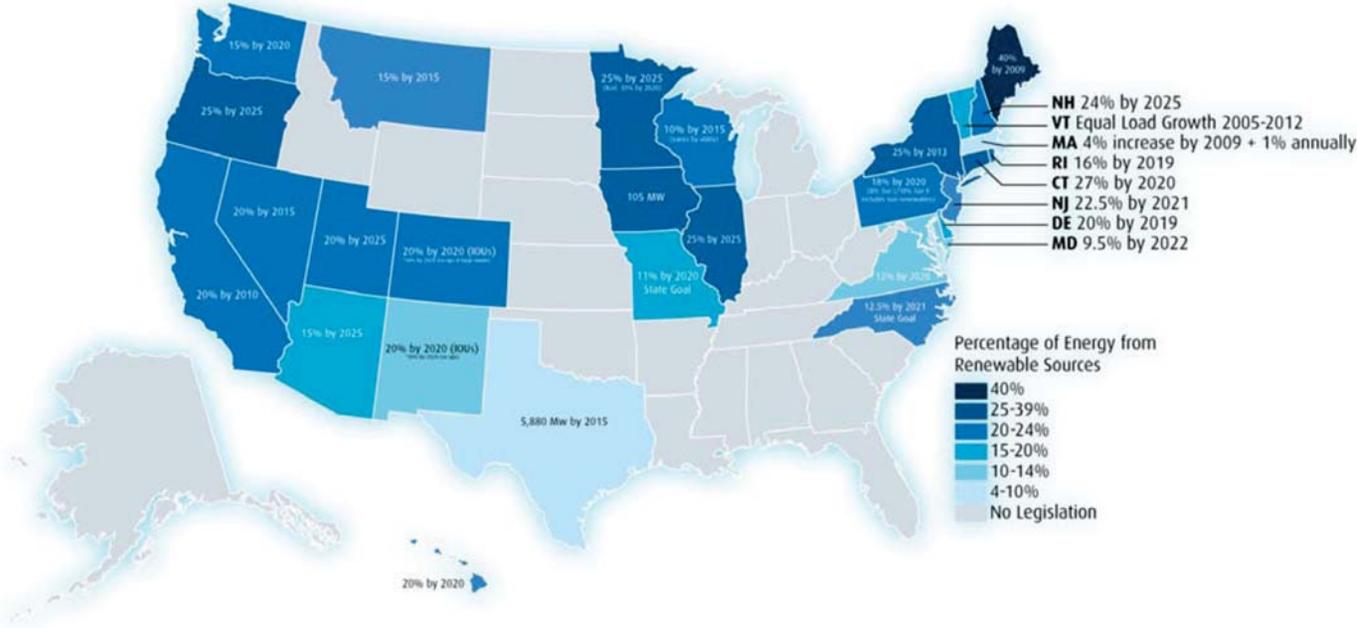
## U.S. GEOTHERMAL RESOURCES, TRANSMISSION, AND LOAD CENTERS



Produced by the National Renewable Energy Laboratory of the US Department of Energy

AMERICAN ENERGY OPPORTUNITY

Renewable Portfolio Standards (RPS) Is Driving Demand - 32 States + District of Columbia

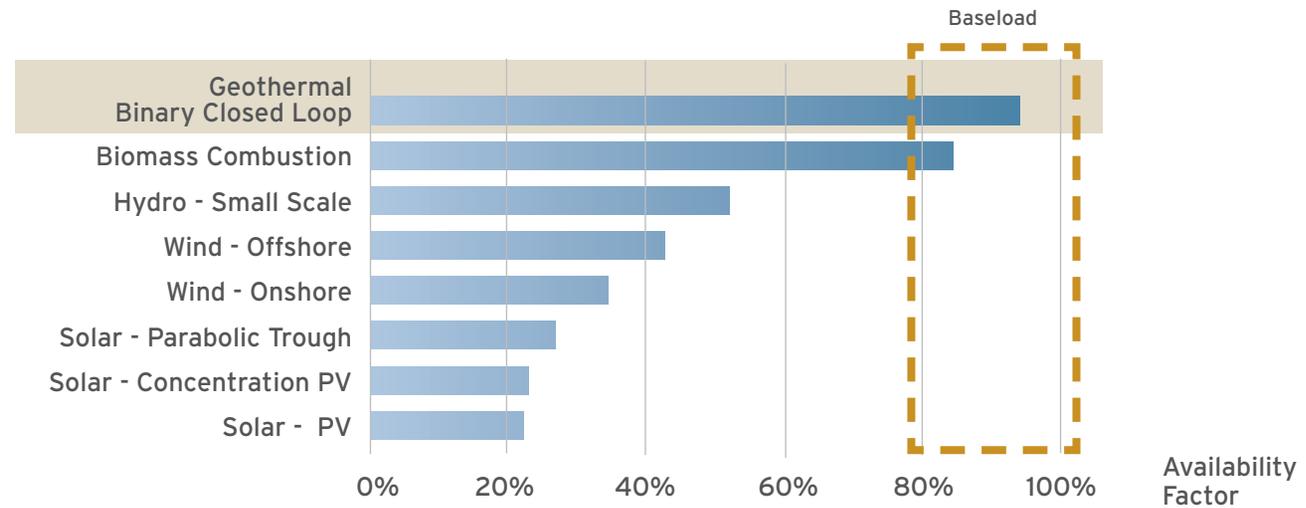


Many Western and Midwest states have adopted renewable portfolio standards (RPS) mandating that 10 to 25 percent of electricity must come from renewable power.

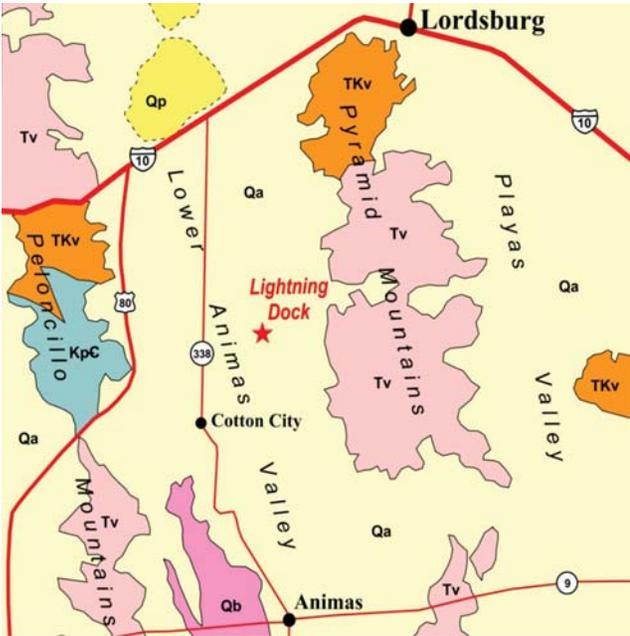
NEW MEXICO RPS	
Wind	4%
Solar	4%
Biomass & Geothermal	2%
Distributed Renewables	3%

## GEOTHERMAL PROVIDES BASELOAD

Domestic demand for renewable energy is legislated in several states. Utilities such as SCPPA, SRP, PG&E and others, have communicated a strong preference for baseload geothermal vs. intermittent sources, such as wind and solar.

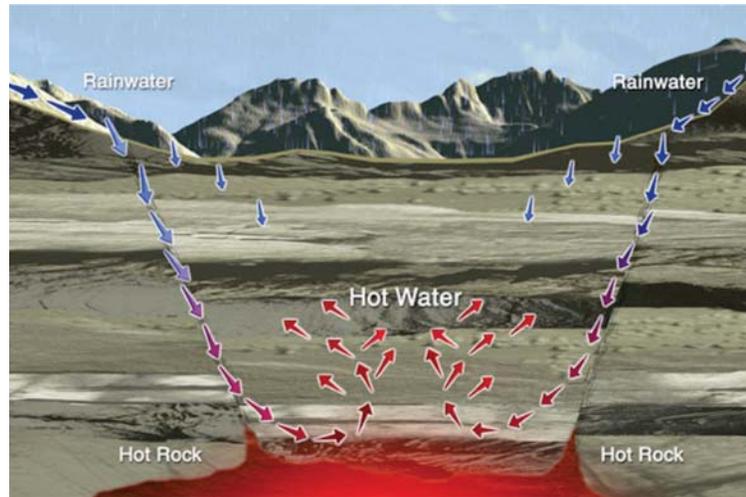


LIGHTNING DOCK PROJECT LOCATION

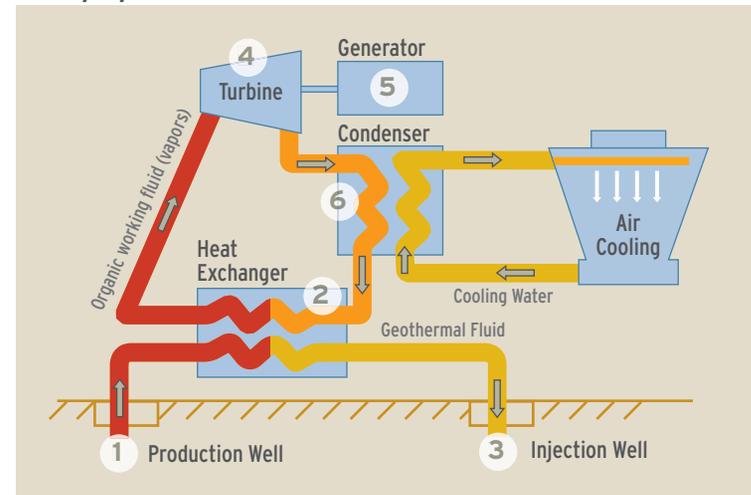


## GEOTHERMAL ENERGY PROCESS

### Geothermal Reservoir



### Binary Cycle Power Plant



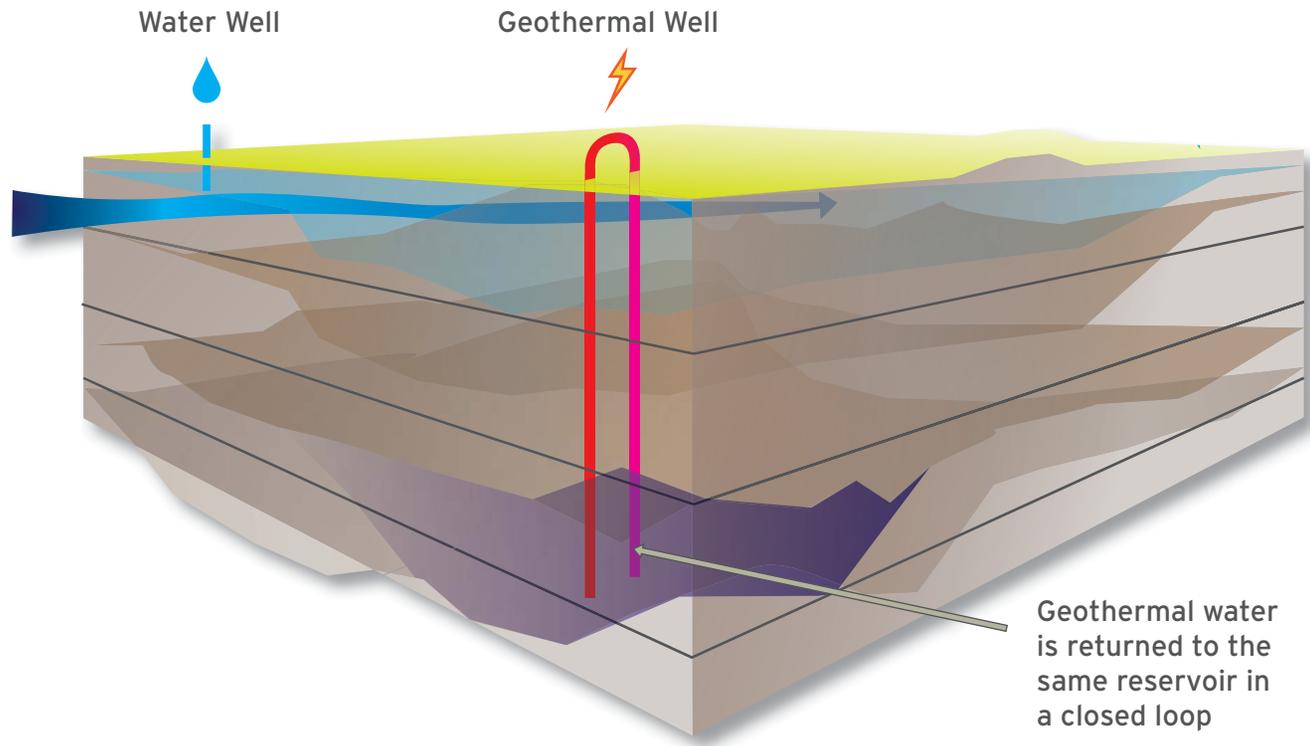
There are two distinct, closed systems to convey fluids in a Binary Cycle Power Plant.

In the first closed system, geothermal water is pumped to the ground surface via a Production Well (1) and passes through Heat Exchanger (2). The cooled water then returns to the underground reservoir through an Injection Well (3) to be reheated and recirculated.

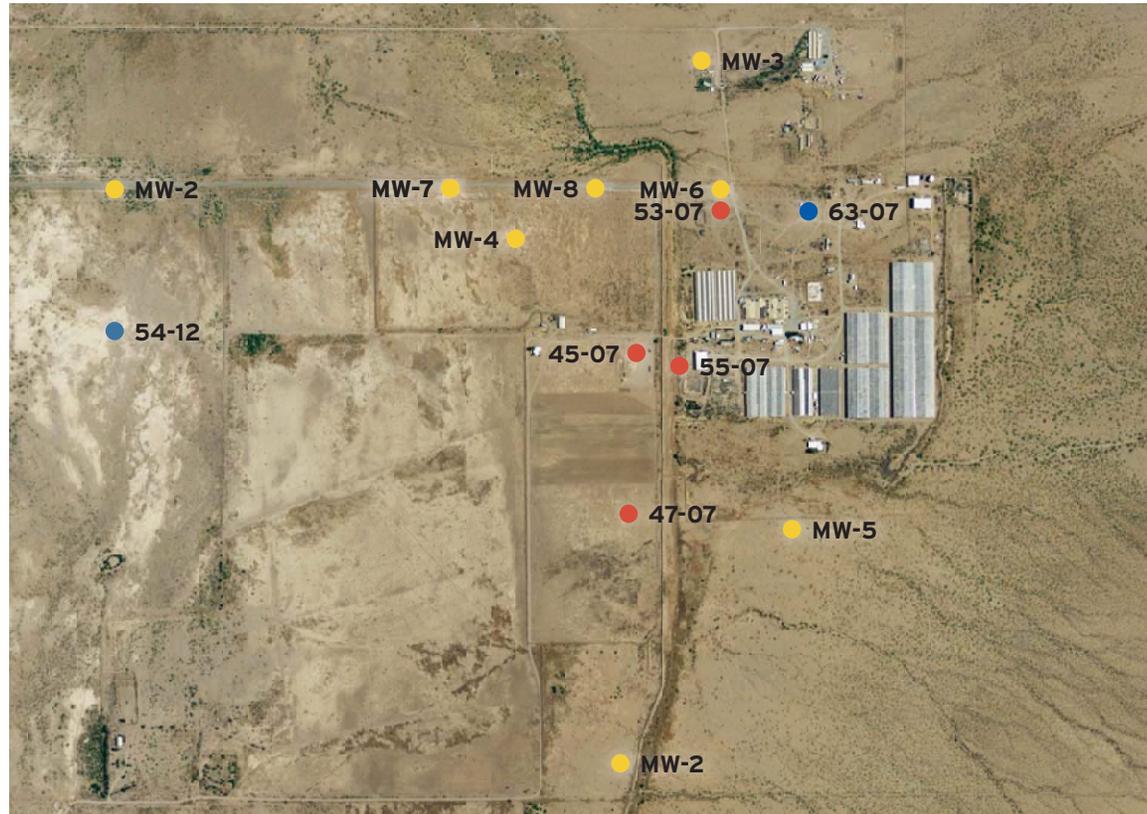
In the second closed system, a separate fluid (the "binary" fluid with a low boiling point) is pumped at

high pressure through the same Heat Exchanger (2) and vaporizes, propelling the Turbine (4) and turning the Generator (5), creating electricity. This vaporized fluid then flows to the Condenser (6), is returned to the liquid phase, and cycles back through the Heat Exchanger (2) to repeat the process.

## A CLOSED LOOP PROCESS

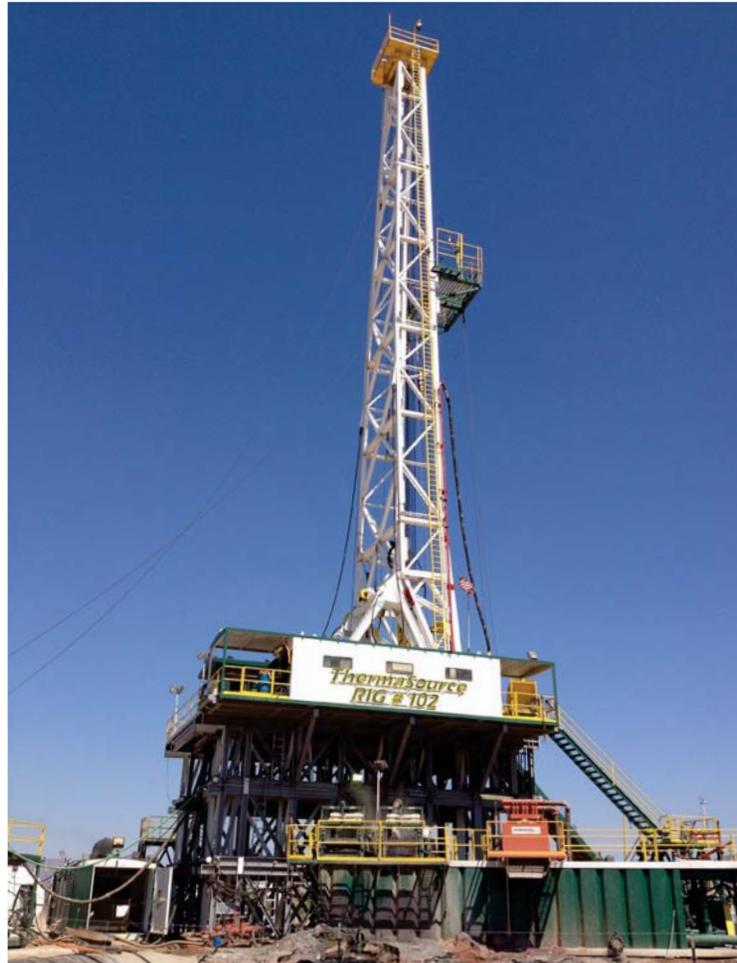


## AERIAL LDG BASE MAP



- Well - Production
- Well - Injection
- Well - Environmental Monitoring

## WELL DRILLING AT LDG

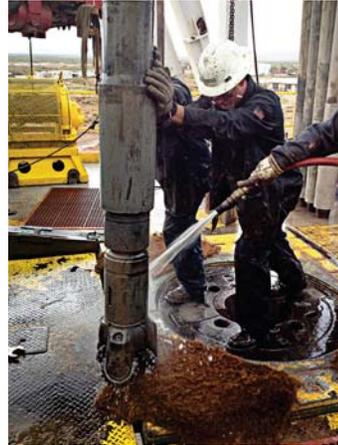


Drilling Rig at Injection Well 63-07

LIGHTNING DOCK - NEW MEXICO



Well Drilling Operations



## PROGRESS ON LDG



LDG 63-7 Drilling Rig in operation, August 2012

- 2008-2009: acquired lease, began permitting, early development
- 2010: Re-entered, drilled, and tested 55-7 (original deep well)
- 2010 (summer): MT Survey
- 2010 (fall/winter): Interference Pump Test (3 wells)
- 2011: Drilled 45-7
- 2011: Summer, 3-D Seismic Survey
- 2012: Tested 45-7
- 2012: Wells Drilled 53-7 & 47-7
- Currently Drilling Well 63-7



**Lightning Dock Geothermal**

For more information contact:

Chuck Smiley  
Lightning Dock Site Manager  
chuck.smiley@cyrqenergy.com  
PO Box 86, Animas, NM 88020  
843.725.9167