Geothermal Electricity Fact Sheet

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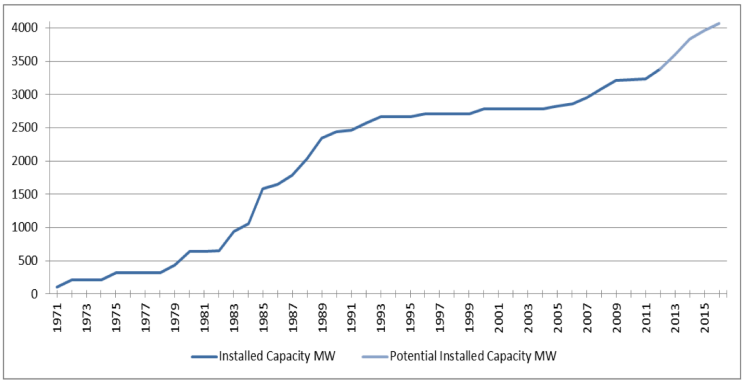
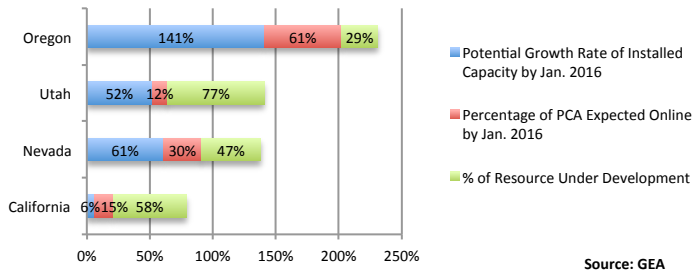
US Installed Geothermal Capacity 1971-2016 (MW)



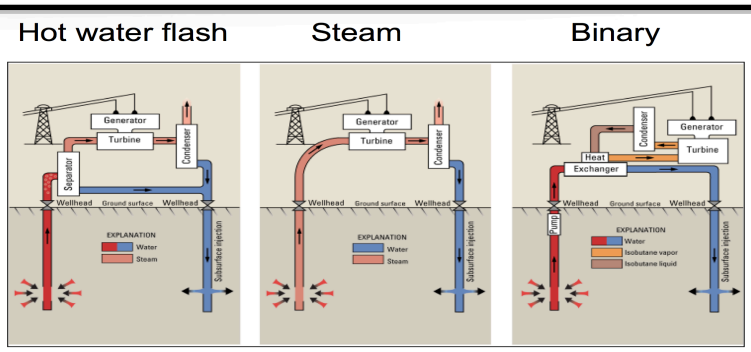
Source: GEA

- Potential Installed Capacity represents reported expected project impacts on completion
- US installed geothermal power capacity increased by 147.05 MW (+5%) in 2013
- Approximately 5.15 to 5.523 GW of known geothermal resources are currently in development
- Around 2.511 to 2.606 GW of potential capacity additions (PCA) are currently under development
- In 2013, 125 developing geothermal projects were reported to the Geothermal Energy Association (GEA)

Comparing Leading Geothermal States



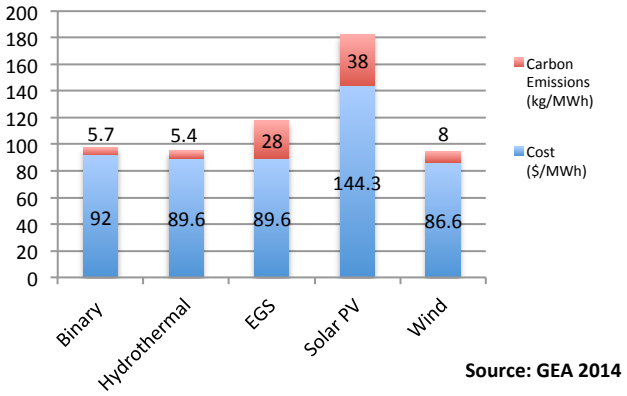
Source: GEA



Key Terms:

- **Conventional Hydrothermal** – the development of a geothermal resource where levels of geothermal reservoir temperature and reservoir flow capacity are naturally sufficient to produce electricity.
- **Binary** – geothermal power conversion technology that operates in a closed-loop system and therefore maintains zero emissions. Highly efficient nationwide potential.
- **Flash** – geothermal power conversion technology in which high-pressure and temperature geothermal fluids are segregated into steam and water in a separator. As a result, pressure decreases.
- **Dry Steam** – geothermal power conversion technology in which steam is taken directly from a geothermal reservoir and used to run turbines and a generator.
- **Enhanced Geothermal Systems (EGS)** – the development of a geothermal system where hydraulic fracturing of the system can allow the production at a commercial level. Nationwide potential with engineered reservoirs 6- to 8-km deep
- **Potential Capacity Additions (PCA)** – the expected power plant's estimated installed capacity.
- **Resource Capacity** – the megawatt (MW) value of the total recoverable energy of a the subsurface geothermal resource.
- **Direct Use** – use of geothermal heat with first converting it to electricity. Highest potential located in western United States, Alaska and Hawaii.

Levelized Cost and Emission Analysis of California Renewable Energy



Source: GEA 2014

- Levelized cost of the three geothermal processes is $90.4/MWh
- Therefore, over its lifetime geothermal energy costs ~40% less per MWh than solar and only ~4% more per MWh than wind.

Benefits:

- Low operating & management costs
- Minimal emissions compared to its competitors (<30 g/kWh)
- High capacity factor (92%)
- Flexible & adaptive to the grid (can handle disturbances)
- Economically competitive over the its full lifecycle

Risks:

- Large upfront investment/drilling costs
- Land availability and leasing agreements
- Land Permitting difficulty can hinder projects
- Long developmental timeline
- Transmission capability (location of resource)

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