GeoPower Texas Co.

Texas Geopressure Power

Senate Business and Commerce Committee

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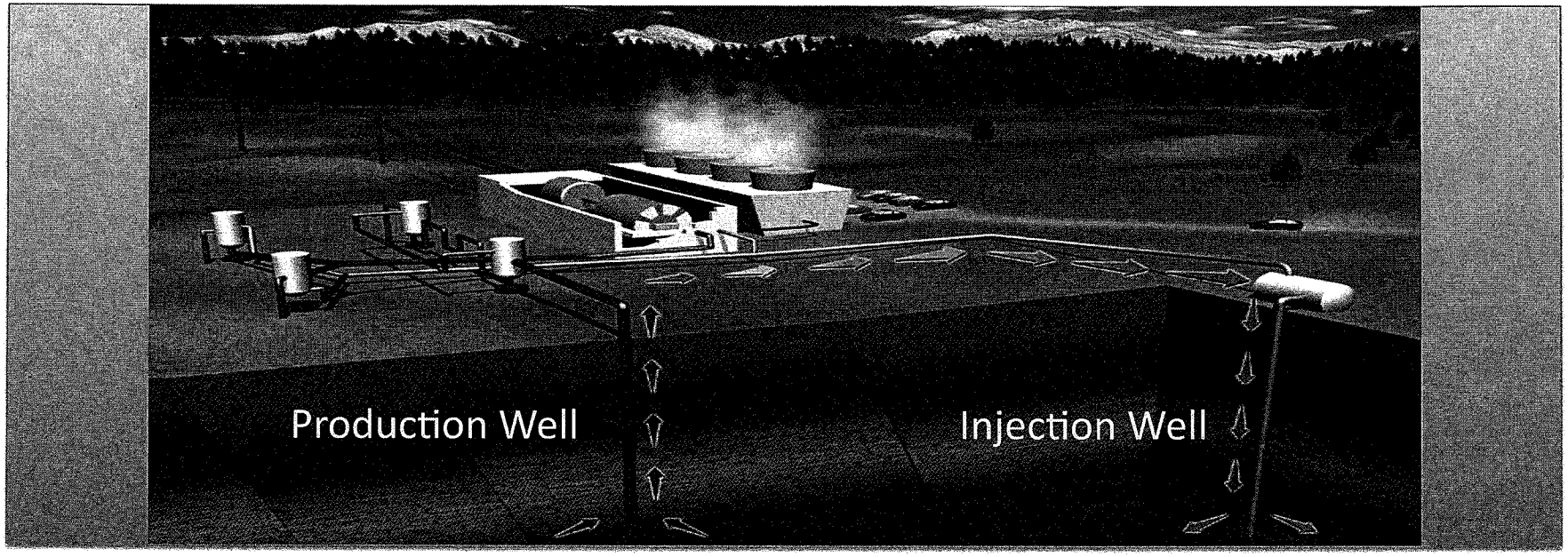
Geothermal
THE Premium Power Source

- Geothermal is considered THE "Premium Power Source." It is clean, renewable 24x7 baseload power with operational availability of over 95 %.
- Geothermal provides 2,800 MW power in the U.S. and nearly 9,000 MW worldwide.
- Geothermal power is cost competitive with new fossil fuel power, particularly with carbon tax risks. Geothermal baseload power eliminates fuel price volatility, supply interruption risks and carbon tax risks inherent with fossil fuel power plants.



Generic Geothermal Steam Flash Plant

Courtesy: Geothermal Education Office

Geothermal Advantage

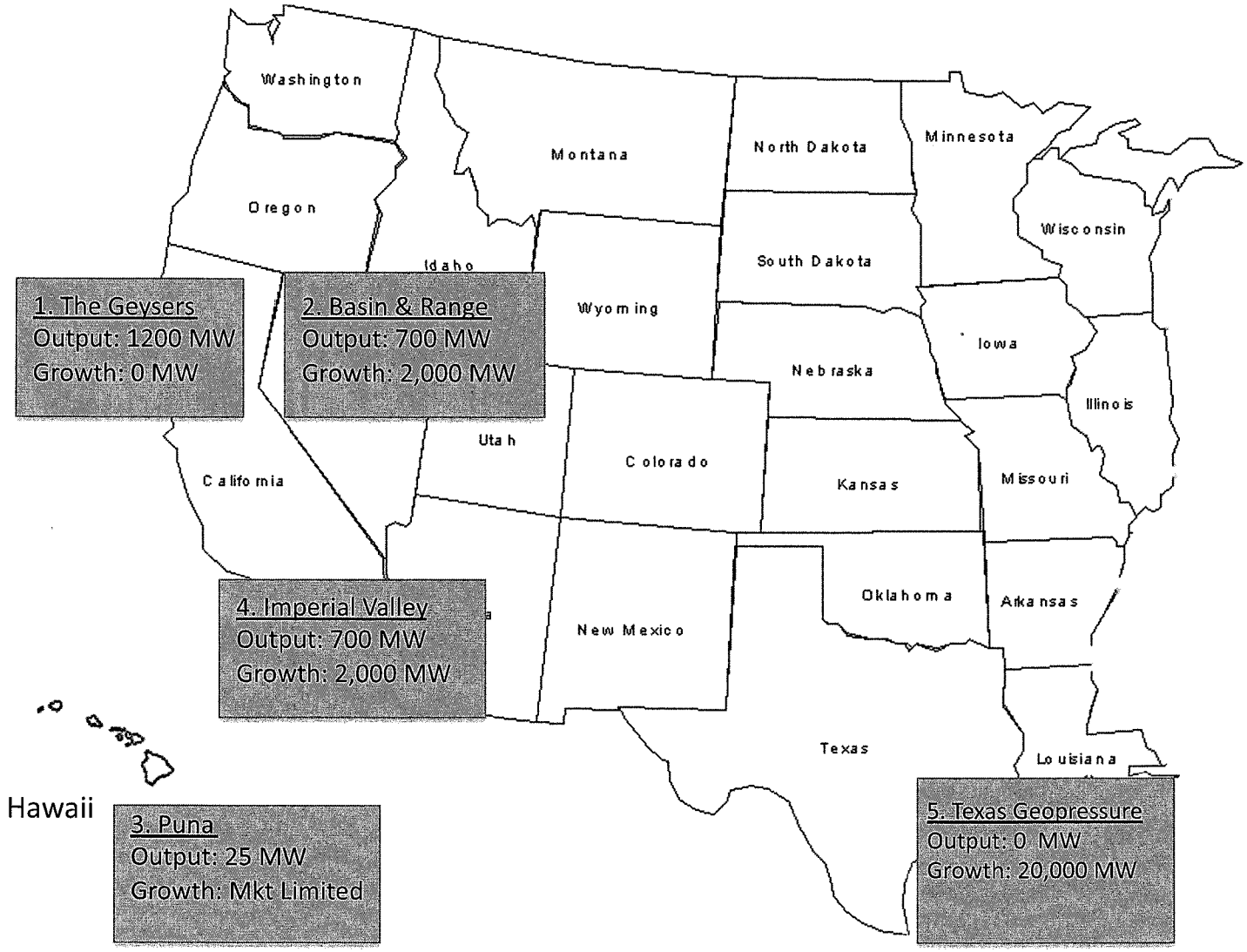
- Overpressurized reservoirs present a unique advantage over traditional geothermal fields with its massive kinetic energy at high pressures.

- Geothermal steamflash power relies primarily on thermal energy expansion of hot fluids into steam to drive turbines. Typical pressures are below 150 psi. Typical steamflash and binary plant turbine blades use only vapor below 300 psi.

- However engineers believe geopressured systems can be optimized by combining "water turbines" like Pelton Wheels with second stage binary turbine "heat energy" to capture the total energy of massive geopressured fluids at 3000 psi.

- This unused massive energy source may be designed to produce up to 2 or 3 times more power per well in the first stage turbine before the thermal expansion of binary cycle turbine working fluids.

American Geothermal Resources And Output
The Five Distinct Geothermal Resource Types



Five Distinct Resource Types

1. Dry Steam: The Geysers northern CA. Low water content, mostly steam temperatures of 400F plus fuels steam flash plants from fractured granite formation. One steamfield yielded over 100 MW output today. Zero growth. Was overproduced, then cutback. Has operated continuously for over 50 years. Least common resource type. Low risk drilling but low water content for recharge. Developed originally by Magma Power, Unical and PGE plants. Now Calpine.

2. Basin and Range: Nevada, eastern CA, Utah, Idaho, New Mexico. About 700 MW. Fracture dominated hard rock resources from 230F to 450F. Supplies both steam flash and binary plants. Estimated 2,000 MW. Location of Vulcan Power Company built by Steve Munson. He is now beginning new developments there. Particular emphasis geothermal power for data centers on 2 Internet fiber optic trunk lines. From 400 ft to 11,000 ft deep. Surface manifestations of hydrothermally altered rock help to visually locate geothermal resource. Relatively higher drilling risks require excellent exploration science programs.

Five Distinct Resource Types: continued

3. **Volcanoes**: Many resource types associated with nearby volcanic systems but only one US geothermal plant on an active volcano. 25 MW Puna Hawaii plant. Steam flash over 500F (corrosive seawater). Rough estimate is 5,000 MW worldwide. Philippines, Indonesia, Iceland and many others.

4. **Imperial Valley:** Southern CA. and northwest Mexico. Tectonics are dominated by a divergent pull-a-part zone shearing Baja California into the ocean. Sedimentary rock strata deposition under Sea of Cortez filling large valley. Hot black smokers vent chemical laden fluids into sedimentary strata. Resource is typically hot and very corrosive. About 700 MW developed today. Some areas not corrosive. Developed originally by Magma Power after it sold The Geysers. Major field now California Energy sub Mid America. Low drilling risks into large horizontal reservoirs like geopressure reservoirs under Texas Gulf Coast. Most fields require chemical treatment plant in front of flash steam plant to clean up corrosive chemicals in the hot fluids. Highest estimated production costs today. Largest well was 50 MW.

Geothermal Resource Type 5

Geopressure: Proven Reservoirs, USDOE Plant Demo, No Use Yet

Output potential: 20,000 MW Gulf Coast region.
Based on USDOE studies by Texas Bureau of Economic Geology.
Billions of dollars of exploration data with thousands of well logs.

Output today: 0 MW
Why no geopressure power ?

1. USDOE believed it proved concept with early version geothermal binary plant and gas burning exhaust heat. Did not use wellhead pressure energy at 3,000 PSI.

2. Texas green power law (RPS) great for wind. Blocked non-wind resources.

3. Without long term fixed price utility contracts, no geo development.

4. No developers meant no applied engineering for efficient plants using new binary plants, gas and massive wellhead pressure.