
The Economic, Environmental, and Social Benefits of Geothermal Use in Texas

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Geothermal heat and water have been used hundreds of years before Texas became the “Lone Star State.” Native peoples soaked in the natural hot springs. Today, geothermal heat or water are used in several places across the state for swimming, soaking, and heating.

Economic benefits

Geothermal resources benefit Texas’s economy in several ways. Geothermal energy reduces fossil fuel energy usage, cuts operating costs, and offsets the burning of fossil fuels. Geothermal businesses create jobs, foster commercial growth, promote rural development, pay taxes, and attract tourists.

The first commercialized use of geothermal water in Texas occurred in 1893 with the discovery of hot mineral water in Marlin. The town grew rapidly as bathhouses, hotels, hospitals, and boarding houses were built to treat and house the thousands of people who came to bathe in the healing hot water. Up until the 1960s, Marlin was considered one of the world’s leading health resorts.

In 1903, Marlin built the Hot Springs Pavilion at the site of the first hot artesian well. The Marlin Chamber of Commerce currently runs the open-air pavilion which contains a four-spout fountain with constantly running thermal water. The fountain is a popular site for resting tired feet, and filling water jugs with spring water to drink.



Brochure advertising the health benefits of Marlin’s mineral water (Photo: MarlinTexas.com)

Also in Marlin, Falls Community Hospital, a 44-bed community hospital serving Falls and Robertson counties, began using geothermal water to heat the building in 1982, as part of a U.S. Department of Energy (DOE) demonstration project. Geothermal heat saves the facility about 10.2 million cubic feet of natural gas per year. About 200 people work in the hospital and clinic.



Falls Community Hospital in Marlin (Photo: Falls Community Hospital).

Geothermal water and heat are used in other parts of Texas as well. “An oasis nestled deep in the Chinati Mountains of West Texas,” the Chinati Hot Springs resort located 50 miles southeast of Marfa opened its doors in 1935. The resort offers guests three indoor private baths, two rooms with private outdoor baths, a group hot tub, rustic adobe cabins, guest rooms attached to the main house, campsites, and “all the sweet-tasting spring water you can drink.” Run by a husband and wife team, about 2,000 people visit the Chinati Hot Springs each year.

Cotulla High School uses geothermal water to heat the school which employs 375 people.

In Austin, geothermal water cuts heating costs, saving taxpayer money. A neighborhood institution, Big Stacy Pool in Austin is the city’s only heated outdoor public swimming pool. The free pool has been open year-round since it was built in the 1930s by the Works Progress Administration. Warm geothermal water fills the 4,000-square foot, 178,000-gallon pool most of the year; city water is used during the hot summer months. Including rotating lifeguards, 16 people work at the

pool. About 72,000 people visit Big Stacy Pool each year.

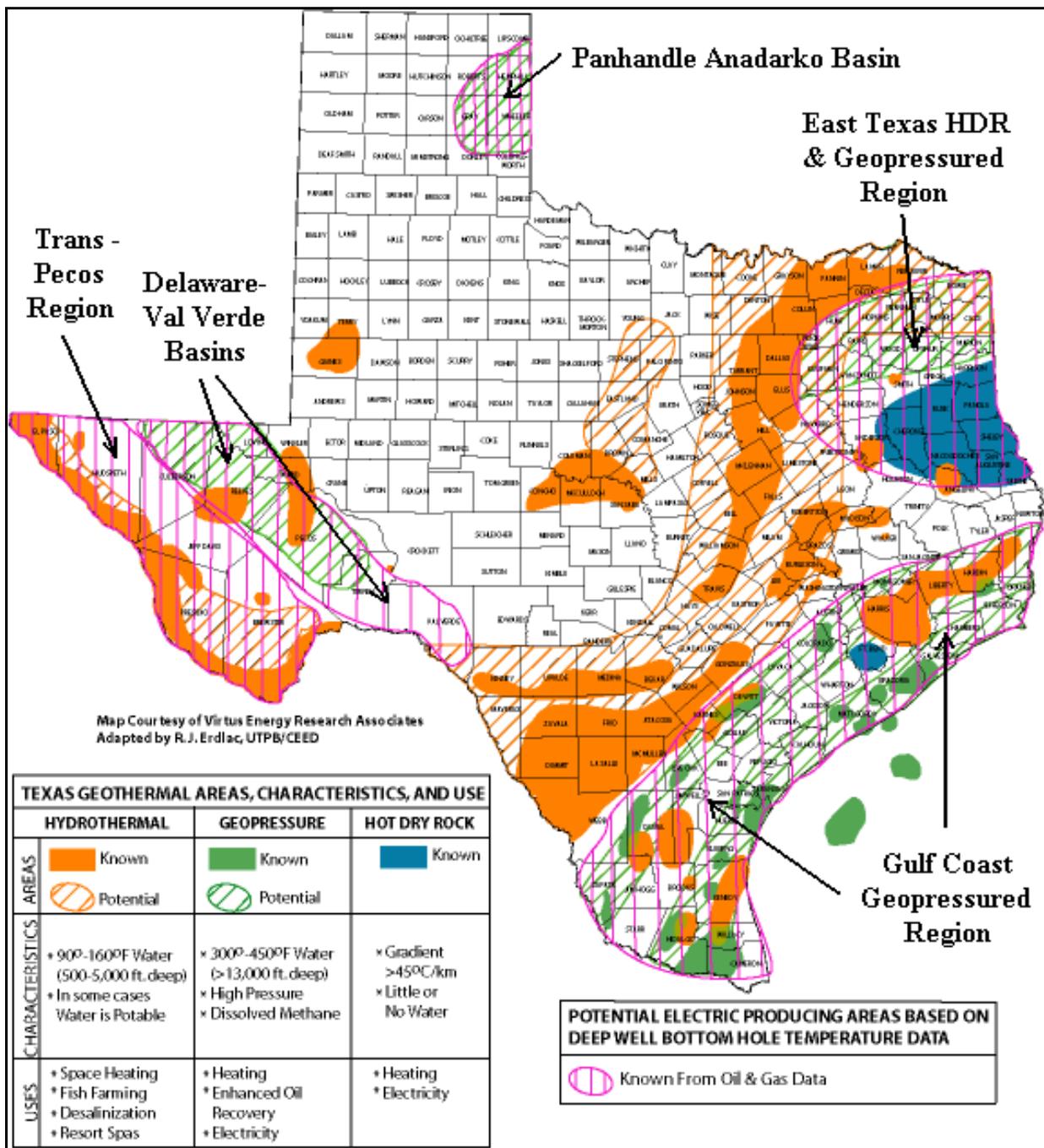
Founded in 2000 “to restore traditional practices of gathering around cool and thermal mineral springs and artesian waters as was custom in the State of Texas,” Spa Waters of Texas is working with the City of Austin to reopen a geothermal well for a public use bathhouse and park. The well was first used in 1929 to heat a pool in the Norwood Estate, a private residence. The property is currently owned by the city.

In its September 2005 analysis of employment resulting from the use of geothermal in the United States, the Geothermal Energy Association used an economic multiplier of 2.5 to calculate indirect and induced employment impacts. Using this multiplier, geothermal use in Texas accounts for about 1,485 direct, indirect, and induced jobs. In addition to jobs, the geothermal businesses pay local, state, and federal taxes.

Environmental benefits

In addition to energy savings, the businesses and communities which use geothermal heat or water prevent the emissions of greenhouse gases (GHG) and air pollutants, helping to keep Texas’s air clean and its sky clear.

If the resorts, school, cities, and hospital had to use electricity to generate the heat that geothermal water naturally contains, they would emit at least 6,175 tons of carbon dioxide annually—the equivalent of 13,028 barrels of oil. In addition, they would emit 11 tons of nitrogen oxides and 13 tons of sulfur dioxides each year into Texas’s air (see Table 1).



Texas geothermal resources as defined by the Texas Renewable Energy Resource Assessment of 1995. The location and boundaries of these geothermal areas are approximate. (The University of Texas of the Permian Basin)

Social benefits

Social benefits are difficult to measure quantitatively. One key social benefit from geothermal energy’s use in Texas, however, is improved quality of life through recreation. Geothermal water allows tens of thousands of Austin residents access to a free year-round swimming pool which is naturally warm during the cooler winter months. Geothermal water attracts tourists to Marlin, the “official mineral water city of Texas,” and other hot spring resorts, both rustic and developed.

The future

Interest in using geothermal heat or water directly or to generate electricity is on the rise in Texas.

Geothermal water resources in the central and southwestern (Trans-Pecos) parts of the state contain an estimated 80 quads of thermal energy potential, according to the

1995 “Texas Renewable Energy Resource Assessment.” By simply adding heat exchangers, many Texas municipalities, e.g., Marlin, Corsicana, Hubbard, and Ottine, could harness the unused heat from the hot water they pump for a variety of purposes including space heating, aquaculture, and greenhouses.

Geothermal could also produce electricity in Texas. With support from the DOE Geothermal Technologies Program, Southern Methodist University (SMU) and The University of Texas of the Permian Basin are leading the effort to generate electricity from heat found in existing, non-producing oil and gas wells. An SMU Geothermal Lab study found that it may be possible to generate up to 2,000 megawatts of electricity from existing oil and gas wells.

The future for geothermal energy in Texas is indeed bright.

Site	Location	Application	Annual Energy Use		Annual Emissions Offset (lbs)		
			Btu billion	Equivalent kWh	Nitrogen oxides	Sulfur dioxide	Carbon dioxide
Big Stacy Pool	Austin	Resort/Pool	5.5	1,611,891	3,928	5,199	2,474,280
Chamber of Commerce Hot Water Pavilion	Marlin	Space Heating	1	293,071	916	1,041	425,292
Chinati Hot Springs, Inc.	Marfa	Resort/Pool	1	293,071	964	670	454,878
Cotulla High School	Cotulla	Space Heating	13	3,809,923	9,284	12,288	5,848,296
Falls Community Hospital & Clinic	Marlin	Space Heating	7.4	2,168,725	6,777	7,703	3,147,157
Totals			27.9	8,176,681	21,869	26,901	12,349,903
					11	13	6,175
					Tons/year		

Table 1 – Greenhouse gas and air pollutant emissions offset by developed geothermal heat and hot water resources in Texas.