



FACT SHEET

GEOHERMAL IN UTAH

Geothermal energy is heat that originates within the earth. It is contained in the rock and the fluid that fills the fractures and pores within the earth's crust. This resource can be tapped and used in many ways by capitalizing on heat moving from the earth's interior to the surface through several geological and hydrological processes. There is significant potential for geothermal development in Utah.



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TYPES OF GEOHERMAL

Traditional Hydrothermal

- Wells drilled into hot fractured rock that contains high-temperature groundwater.
- Electricity is generated by steam or hot gas brought to the surface to turn the electric turbine.

Enhanced Geothermal System (EGS)

- Uses technology to create an artificial geothermal reservoir in hot, dry rocks.
- Fluid is injected into the subsurface, causing existing fractures to re-open, creating permeability that allows fluid to circulate throughout the rock and transport heat to the surface where electricity can be generated.

Advanced Geothermal System (AGS)

- Multiple wells are drilled into deep hot rocks and connected at depth to make a closed circuit or closed loop.
- Fluid is circulated through the closed loop to gather heat energy and circulated back to the surface to produce electricity.



Wilson Health Spring



Thermo Hot Springs 14 MW



Newcastle Greenhouse

UTAH GEOTHERMAL PRODUCTION AND RESEARCH

Currently in Utah there are:



THREE

Three fully operational geothermal power plants – Cove Fort, Blundell and Thermo. All three plants are traditional geothermal/hydrothermal plants located in Beaver County.



TWO

Two additional traditional geothermal power plants are planned in Beaver County and are expected to begin production in the next several years.



TWO OF THE THREE

Two of the three existing traditional power plant operators are planning major expansions to include new wells/plants, which would more than double their power outputs.



FIVE

Five geothermal power projects are currently in the research and development phase. One project looks at traditional and EGS applications in Sevier, Beaver, Iron and Millard counties. Another is exploring AGS technology in Millard, Juab, Tooele and Box Elder counties. The remaining three exploration projects are traditional geothermal in Iron and Beaver counties.



Utah is one of only seven states that generate utility-scale electricity from geothermal resources. In 2022, geothermal provided about 1% of the state's total electricity generation and 7% of total renewable energy.¹



Utah currently generates about 75 megawatts, or enough energy to power between 56,000 and 75,000 homes, of electric power from geothermal sources. That is just 0.1% of Utah's total geothermal potential (49,400 MW).



Currently, most of the geothermal power generated in Utah is sold out-of-state.² Power purchasing agreements with markets with higher energy prices allow sales directly to the consumer, making out-of-state markets more profitable and attractive.



Utah has significant untapped geothermal potential. The most promising potential is predominantly found in Beaver and Millard counties. Investments in these communities will impact all sectors of the economy and provide various employment opportunities.



Geothermal has applications beyond energy generation, including direct use for heat.



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Utah's energy policy mandates that the state "will develop its energy resources and plan its energy future with a focus on human well-being and quality of life" and lays out priorities for energy resources. Geothermal can meet the state's priorities for energy resources in terms of adequacy, reliability, dispatchability, sustainability, security, and cleanliness. If given time for technological maturity and infrastructure support, geothermal also has the potential to meet the state's goal of affordability, which will drive down the cost curve.

¹ U.S. Energy Information Administration. (2023) Utah: State Profile and Energy Estimates. Available at: <https://www.eia.gov/state/analysis.php?sid=UT>

² OED, personal communication with industry, May 16, 2024.

UTAH DEPARTMENT OF NATURAL RESOURCES GEOTHERMAL COORDINATION



The **Division of Water Rights** is the regulatory agency that reviews and permits geothermal activities statewide, including water rights, geothermal drilling, inspections, maintenance, reporting and well abandonment. The Division reviews applications, issues permits, monitors and inspects work during development and operation and maintains a database of geothermal information.



Utah's Office of Energy Development (OED) is researching policies supporting this emerging industry and working with the Utah Legislature and geothermal companies to optimize the state's untapped geothermal potential. OED is also working with the Utah Geological Survey to provide an interactive web experience with engaging and educational content on Utah's geothermal landscape (e.g., resources, production, and development).



The **Division of Oil, Gas and Mining** has the expertise to provide technical and field support as the industry develops. Oil and gas best practices and Utah administrative rules regulating the oil and gas industry allow for significant crossover.



The **Utah Geological Survey** provides geological information to government agencies, industry professionals, and individuals to encourage and support the responsible development of the state's geothermal resources. Staff inventory, document, and research Utah's abundant energy resources to inform and guide sound decision-making.

ADVANCING GEOTHERMAL IN UTAH

Utah cultivates a diverse energy portfolio to meet the needs of its citizens. It takes an “any of the above” approach because the state understands that all energy resources have a role in meeting increased energy demands.

To support the growth and development of the geothermal energy sector, DNR is looking at data collection and transparency, which are critical for new geothermal development in order to quantify and understand the resource's characteristics. Understanding these characteristics and making them reasonably available can help advance geothermal as a resource.

Incentives

Utah offers the High-Cost Infrastructure Tax Credit, which provides significant tax credits for infrastructure that supports clean energy projects.

High-value Power Purchasing Agreements (PPAs)

PPAs may be a way to carve out jurisdictional exceptions to utility-provider boundaries, allowing energy producers to sell geothermal power to non-energy generating facilities like data centers. Thus, Utah's geothermal resources would stay in Utah rather than be exported to higher-priced energy markets like California or Nevada.

Research and Funding

The San Rafael Energy Research Lab, managed by OED, offers the state opportunities to advance geothermal energy through state and federally-funded research projects. The Lab may also play a critical role in quantifying the characteristics of the heat resources across the state.

Utah FORGE and Fervo

Utah is also home to Utah FORGE (Frontier Observatory for Research in Geothermal Energy), an underground research facility funded by the Department of Energy and managed by the University of Utah Energy and Geoscience Institute. FORGE is developing and testing breakthroughs in EGS to accelerate the uptake of geothermal energy resources

Fervo, a geothermal company, established its Cape Station project next door to FORGE to allow for efficient, real-time data sharing. The synergy between a research lab and a private company has already led to breakthroughs in well-stimulation study design.