Board of Trustees

Energy & Minerals in Southwest Utah
June 20, 2024

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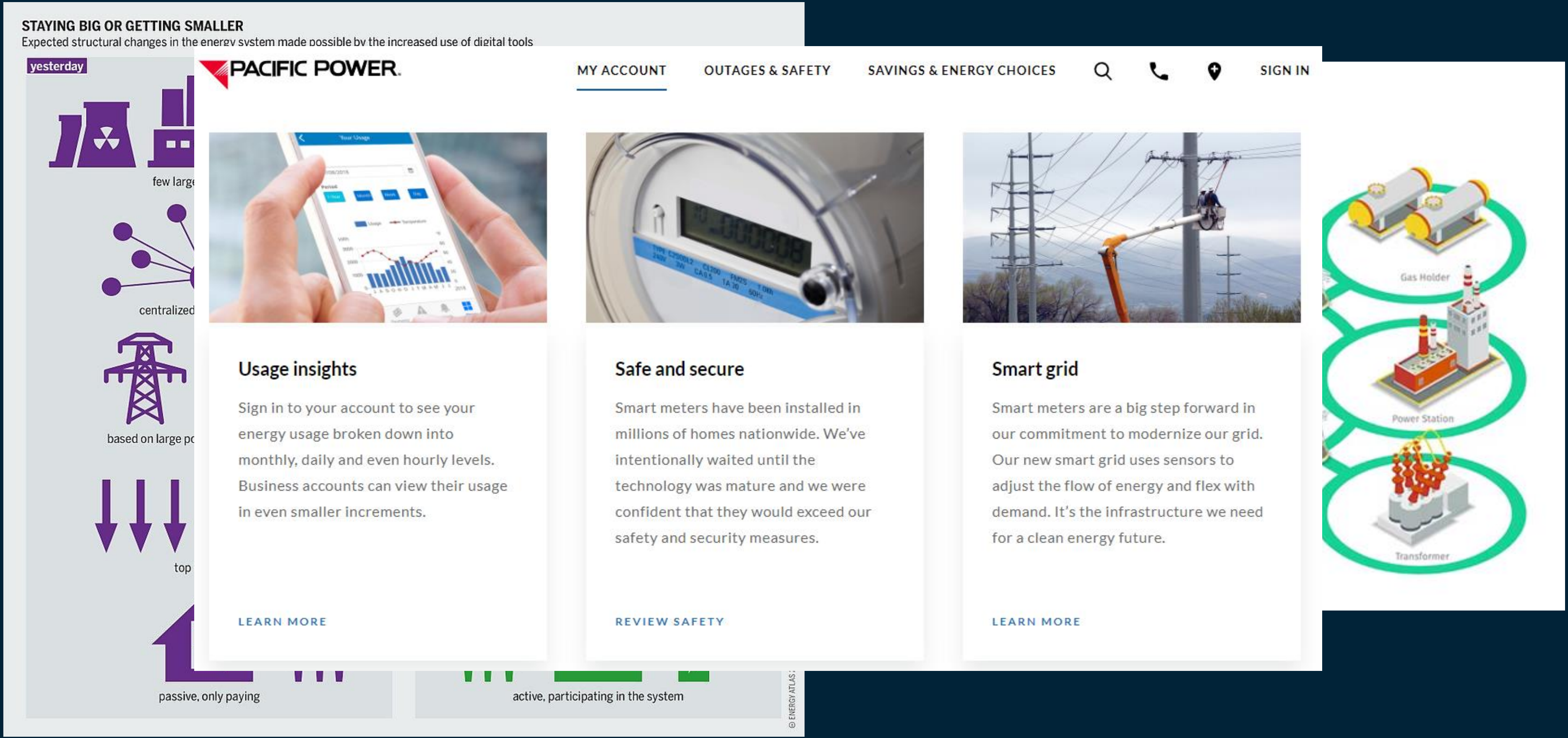
Energy in the Future…



Executive Summary—Levelized Cost of Energy Version 17.0[1]

The results of our Levelized Cost of Energy ("LCOE") analysis reinforce what we observe across the Power, Energy & Infrastructure Industry—sizable and well-capitalized companies that can take advantage of supply chain and other economies of scale, and that have strong balance sheet support to weather fluctuations in the macro environment, will continue leading the build-out of new renewable energy assets. This is particularly true in a rising LCOE environment like what we have observed in this year's analysis. Amplifying this observation, and not overtly covered in our report, are the complexities related to currently observed demand growth and grid-related constraints, among other factors. Key takeaways from Version 17.0 of Lazard's LCOE include:

1. Low End LCOE Values Increase; Overall Ranges Tighten

   Despite high end LCOE declines for selected renewable energy technologies, the low ends of our LCOE have increased for the first time ever, driven by the persistence of certain cost pressures (e.g., high interest rates, etc.). These two phenomena result in tighter LCOE ranges (offsetting the significant range expansion observed last year) and relatively stable LCOE averages year-over-year. The persistence of elevated costs continues to reinforce the central theme noted above—sizable and well-capitalized companies that can take advantage of supply chain and other economies of scale, and that have strong balance sheet support to weather fluctuations in the macro environment, will continue leading the build-out of new renewable energy assets.

2. Baseload Power Needs Will Require Diverse Generation Fleets

   Despite the sustained cost-competitiveness of renewable energy technologies, diverse generation fleets will be required to meet baseload power needs over the long term. This is particularly evident in today's increasing power demand environment driven by, among other things, the rapid growth of artificial intelligence, data center deployment, reindustrialization, onshoring and electrification. As electricity generation from intermittent renewables increases, the timing imbalance between peak customer demand and renewable energy production is exacerbated. As such, the optimal solution for many regions is to complement new renewable energy technologies with a "firming" resource such as energy storage or new/existing and fully dispatchable generation technologies (of which CCGTs remain the most prevalent). This observation is reinforced by the results of this year's marginal cost analysis, which shows an increasing price competitiveness of existing gas-fired generation as compared to new-build renewable energy technologies. As such, and as has been noted in our historic reports, the LCOE is just the starting point for resource planning and has always reinforced the need for a diversity of energy resources, including but not limited to renewable energy.

3. Innovation Is Critical to the Energy Transition

   Continuous innovation across technology, capital formation and policy is required to fully enable the Energy Transition, which we define to include a generation mix that is diverse and advanced enough to meet the ongoing reshaping of our energy economy. The Energy Transition will also require continued maturation of selected technologies not included in our analysis (e.g., carbon capture, utilization and sequestration ("CCUS"), long duration energy storage, new nuclear technologies, etc.). While the results of this year's LCOE reinforce our previous conclusions—the cost-competitiveness of renewables will lead to the continued displacement of conventional generation and an evolving energy mix—the timing of such displacement and composition of such mix will be impacted by many factors, including those outside of the scope of our LCOE (e.g., grid investment, permitting reform, transmission queue reform, economic policy, continued advancement of flexible load and locally sited generation, etc.).

(1) This analysis has been compiled using U.S.-focused data.

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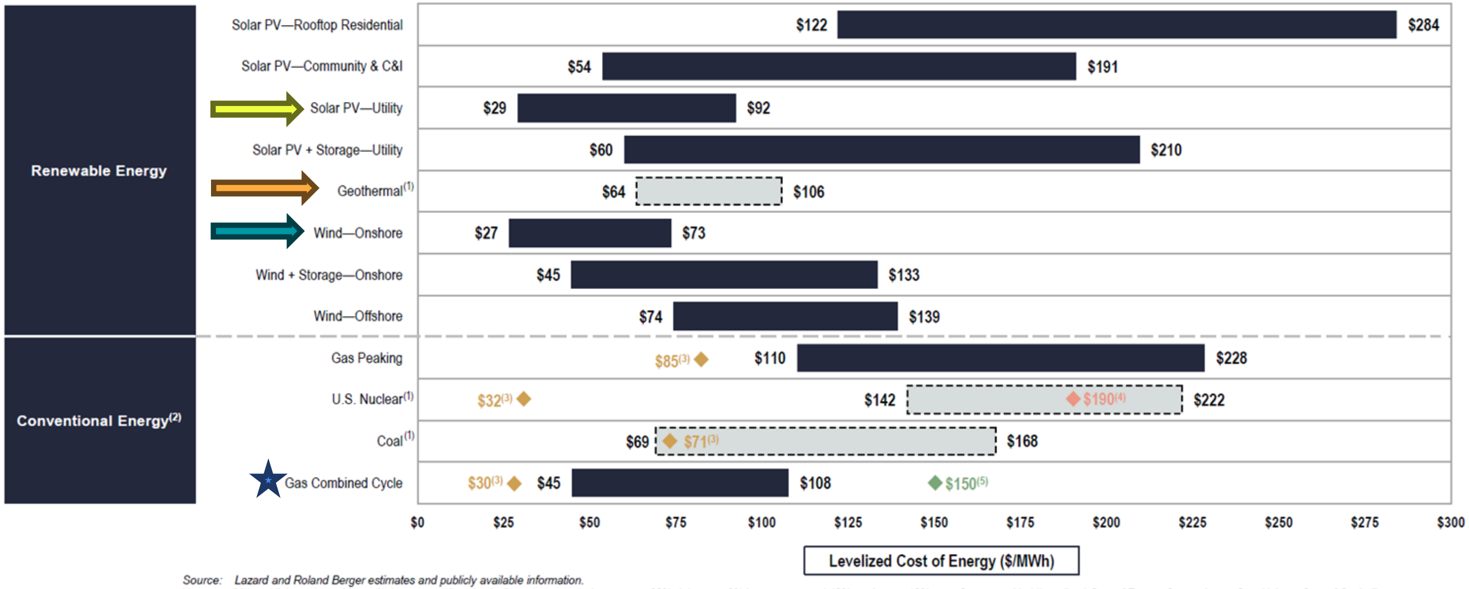
Gold numbers denote LCOE assuming operation of fully depreciated plants and salvage value is equivalent to decommissioning and site restoration.

Green number denotes LCOE High for gas combined cycle plant using 20% green Hydrogen by volume stored in Salt Cavern (ACES)

Levelized Cost of Energy Comparison—Version 17.0

Selected renewable energy generation technologies remain cost-competitive with conventional generation technologies under certain circumstances



Source: *Lazard and Roland Berger estimates and publicly available information.*

Note: Here and throughout this analysis, unless otherwise indicated, the analysis assumes 60% debt at an 8% interest rate and 40% equity at a 12% cost. See page titled "Levelized Cost of Energy Comparison—Sensitivity to Cost of Capital" for cost of capital sensitivities.

(1) Given the limited public and/or observable data available for new-build geothermal, coal and nuclear projects the LCOE presented herein reflects Lazard's LCOE v14.0 results adjusted for inflation and, for nuclear, are based on then-estimated costs of the Vogtle Plant. Coal LCOE does not include cost of transportation and storage.

(2) The fuel cost assumptions for Lazard's LCOE analysis of gas-fired generation, coal-fired generation and nuclear generation resources are $3.45/MMBTU, $1.47/MMBTU and $0.85/MMBTU respectively, for year-over-year comparison purposes. See page titled "Levelized Cost of Energy Comparison—Sensitivity to Fuel Prices" for fuel price sensitivities.

(3) Reflects the average of the high and low LCOE marginal cost of operating fully depreciated gas peaking, gas combined cycle, coal and nuclear facilities, inclusive of decommissioning costs for nuclear facilities. Analysis assumes that the salvage value for a decommissioned gas or coal asset is equivalent to its decommissioning and site restoration costs. Inputs are derived from a benchmark of operating gas, coal and nuclear assets across the U.S. Capacity factors, fuel, variable and fixed operating expenses are based on upper- and lower-quartile estimates derived from Lazard's research. See page titled "Levelized Cost of Energy Comparison—New Build Renewable Energy vs. Marginal Cost of Existing Conventional Generation" for additional details.

(4) Represents the illustrative midpoint LCOE for Vogtle nuclear plant units 3 and 4 based on publicly available estimates. Total operating capacity of ~2.2 GW, total capital cost of ~$31.5 billion, capacity factor of ~97%, operating life of 60 – 80 years and other operating parameters estimated by Lazard's LCOE v14.0 results adjusted for inflation. See Appendix for more details.

(5) Reflects the LCOE of the observed high case gas combined cycle inputs using a 20% blend of green hydrogen by volume (i.e., hydrogen produced from an electrolyzer powered by a mix of wind and solar generation and stored in a nearby salt cavern). No plant modifications are assumed beyond a 2% increase to the plant's heat rate. The corresponding fuel cost is $6.66/MMBTU, assuming ~$5.25/kg for green hydrogen (unsubsidized PEM). See LCOH—Version 4.0 for additional information.

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Utah's Diverse Geology & Geography

Utahs diverse geology and geography allow for all types of energy development typically without conflict.

The Trust Lands Administration works to maximize the natural resource available on each of our properties.

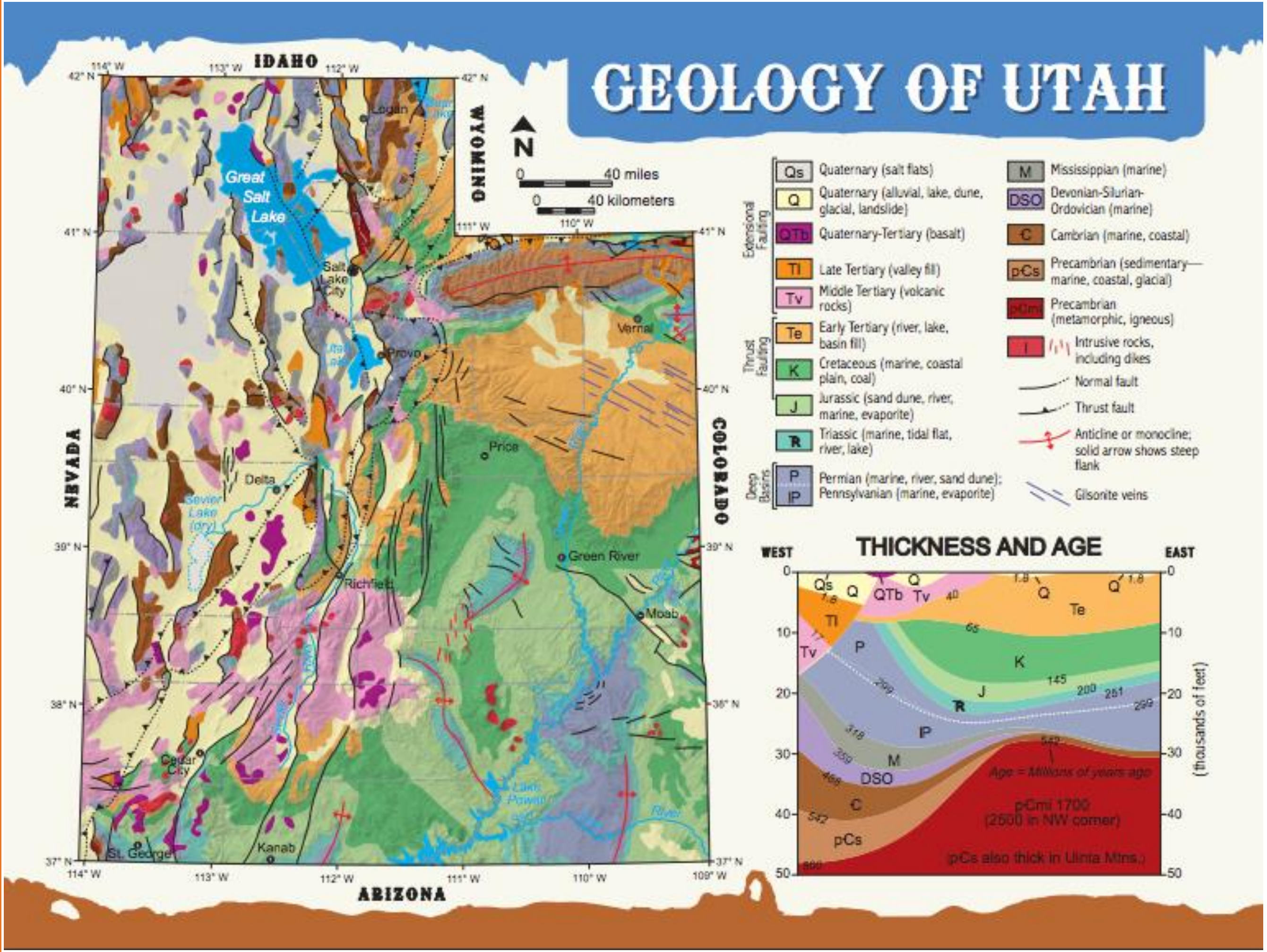
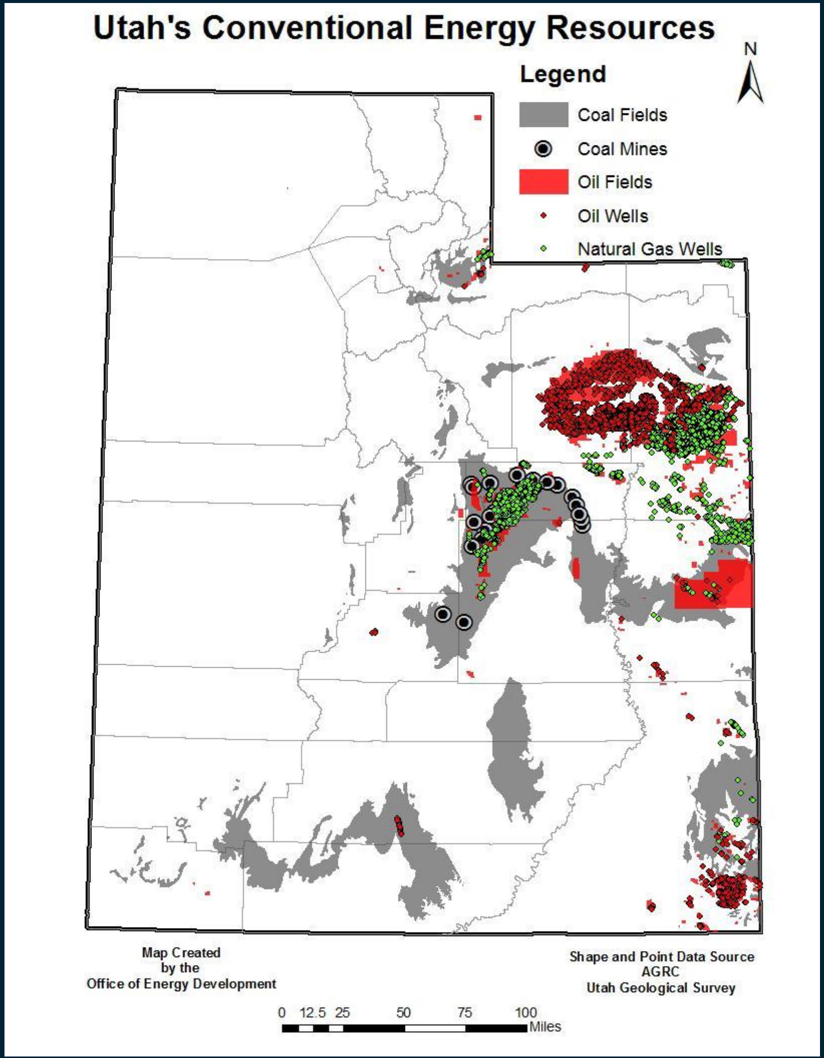
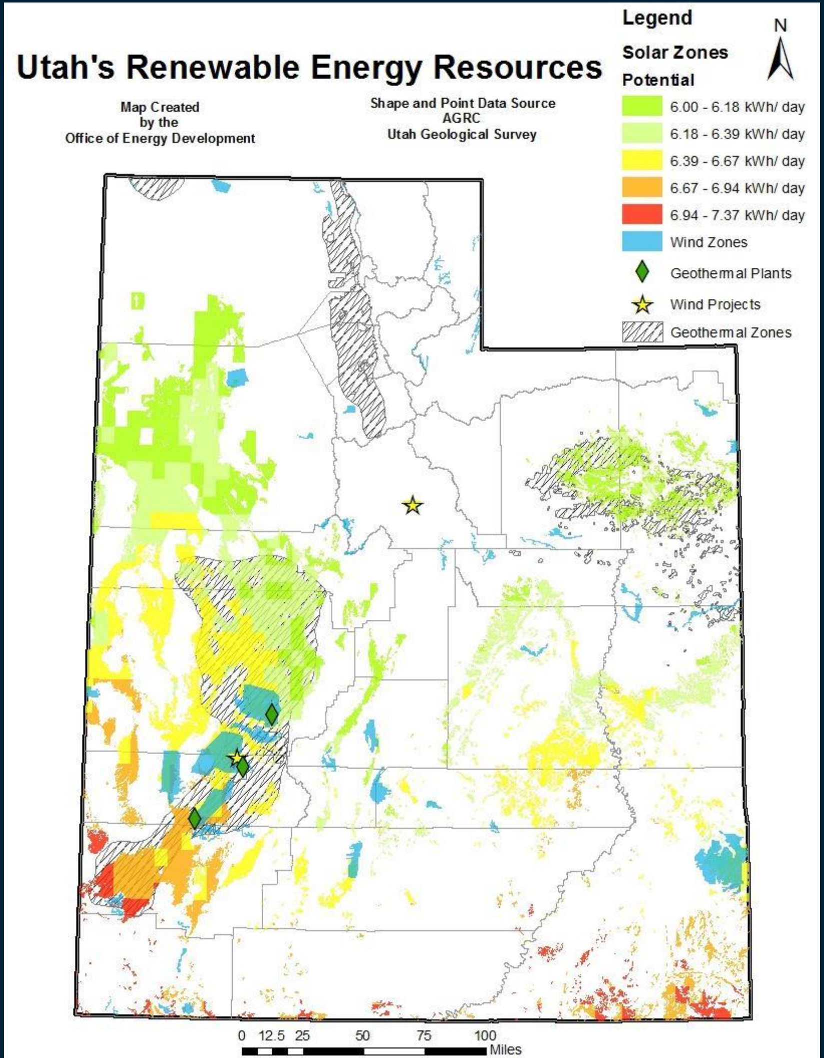


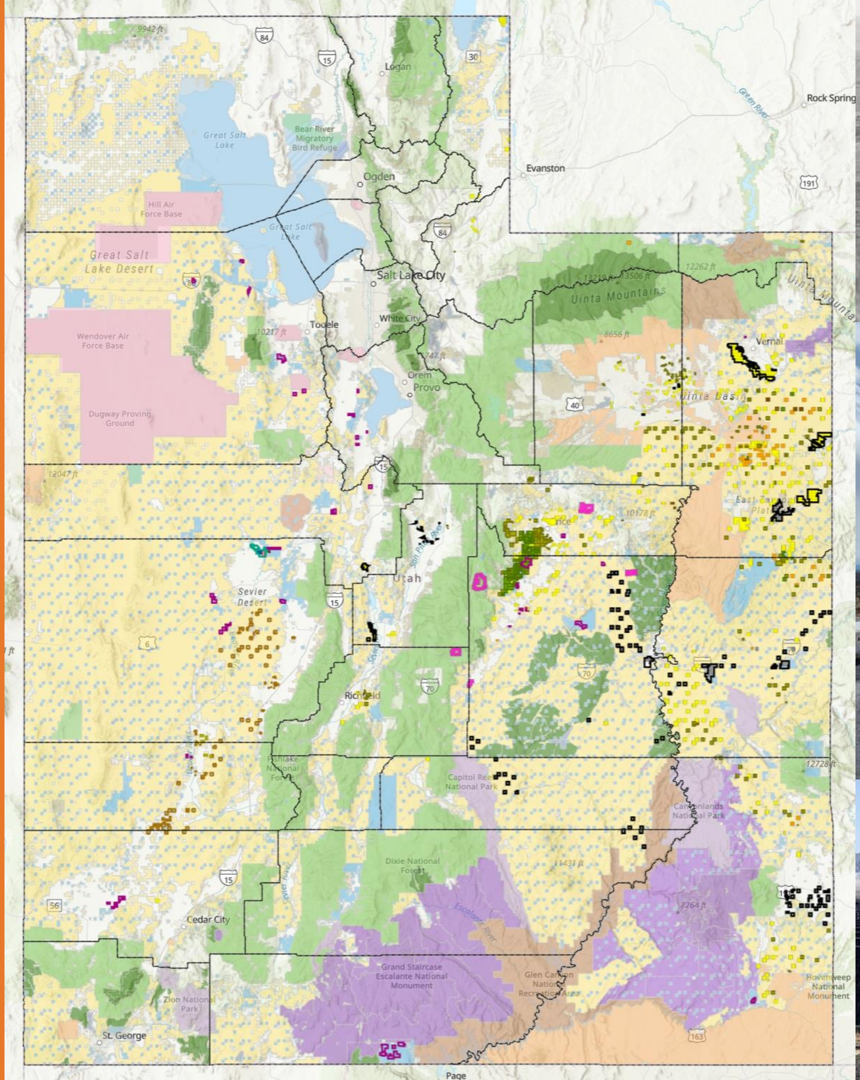
Image from Utah Geologic Survey


Utah's Conventional Energy Resources
Legend
Coal Fields
Coal Mines
Oil Fields
Oil Wells
Natural Gas Wells
N
Map Created
by the
Office of Energy Development
Shape and Point Data Source
AGRC
Utah Geological Survey
0 12.5 25 50 75 100
Miles


Utah's Renewable Energy Resources
Legend
Solar Zones
Potential
6.00 - 6.18 kWh/ day
6.18 - 6.39 kWh/ day
6.39 - 6.67 kWh/ day
6.67 - 6.94 kWh/ day
6.94 - 7.37 kWh/ day
Wind Zones
Geothermal Plants
Wind Projects
Geothermal Zones
N
Map Created
by the
Office of Energy Development
Shape and Point Data Source
AGRC
Utah Geological Survey
0 12.5 25 50 75 100
Miles

Energy related lease’s on Trust Lands

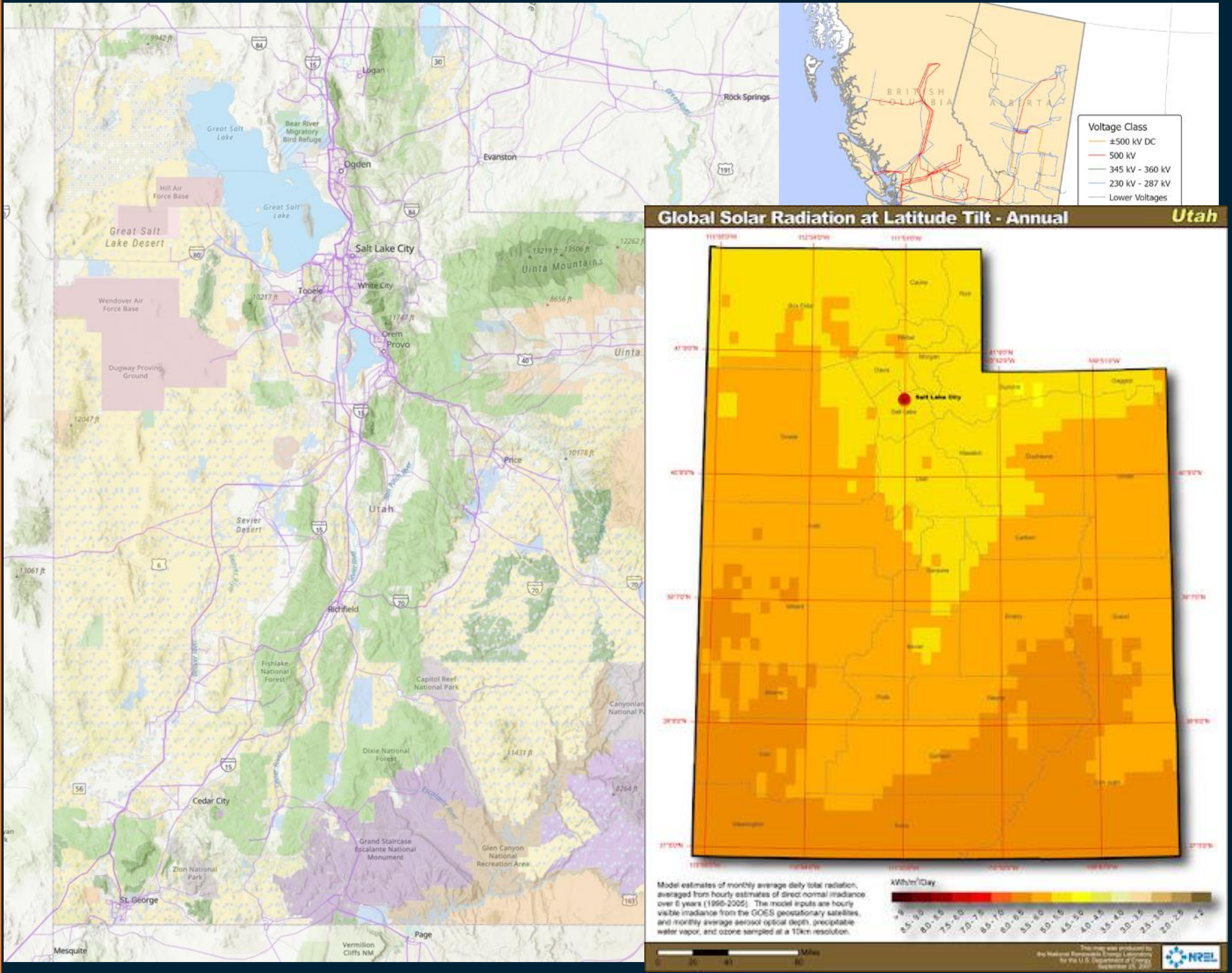
- Helium
- Helium Oil Gas and Associated Hydrocarbons
- Natural Gas and Crude Oil Storage
- NGL Storage
- Oil and Gas
- Oil and Gas (Special)
- Oil Gas and Associated Hydrocarbons
- Oil Gas and Hydrocarbon
- Oil Gas and Hydrocarbon (Special)
- Coal
- Energy Storage and Development
- Hydrogen
- Solar
- Wind
- Geothermal

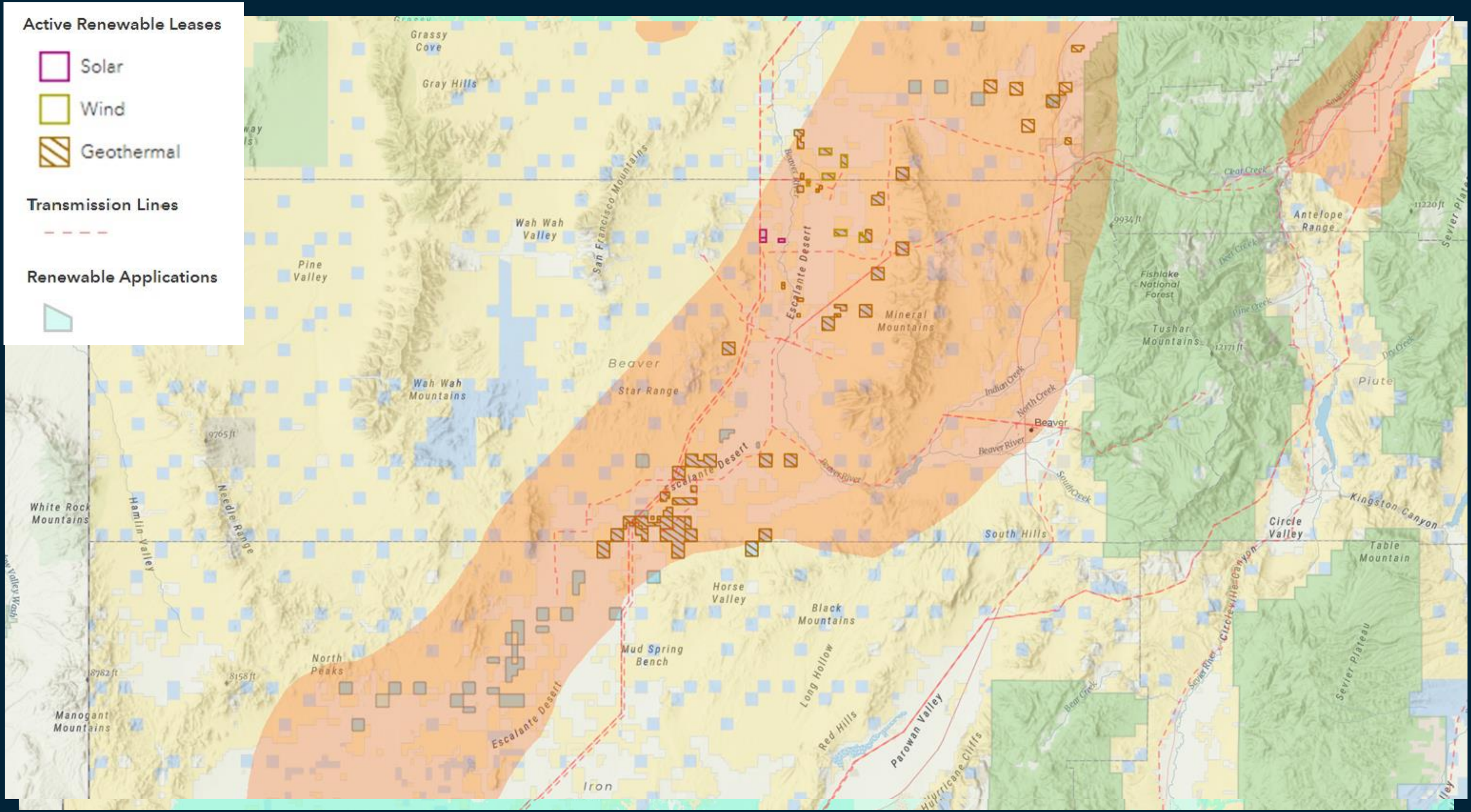


What makes developing renewable energy different?

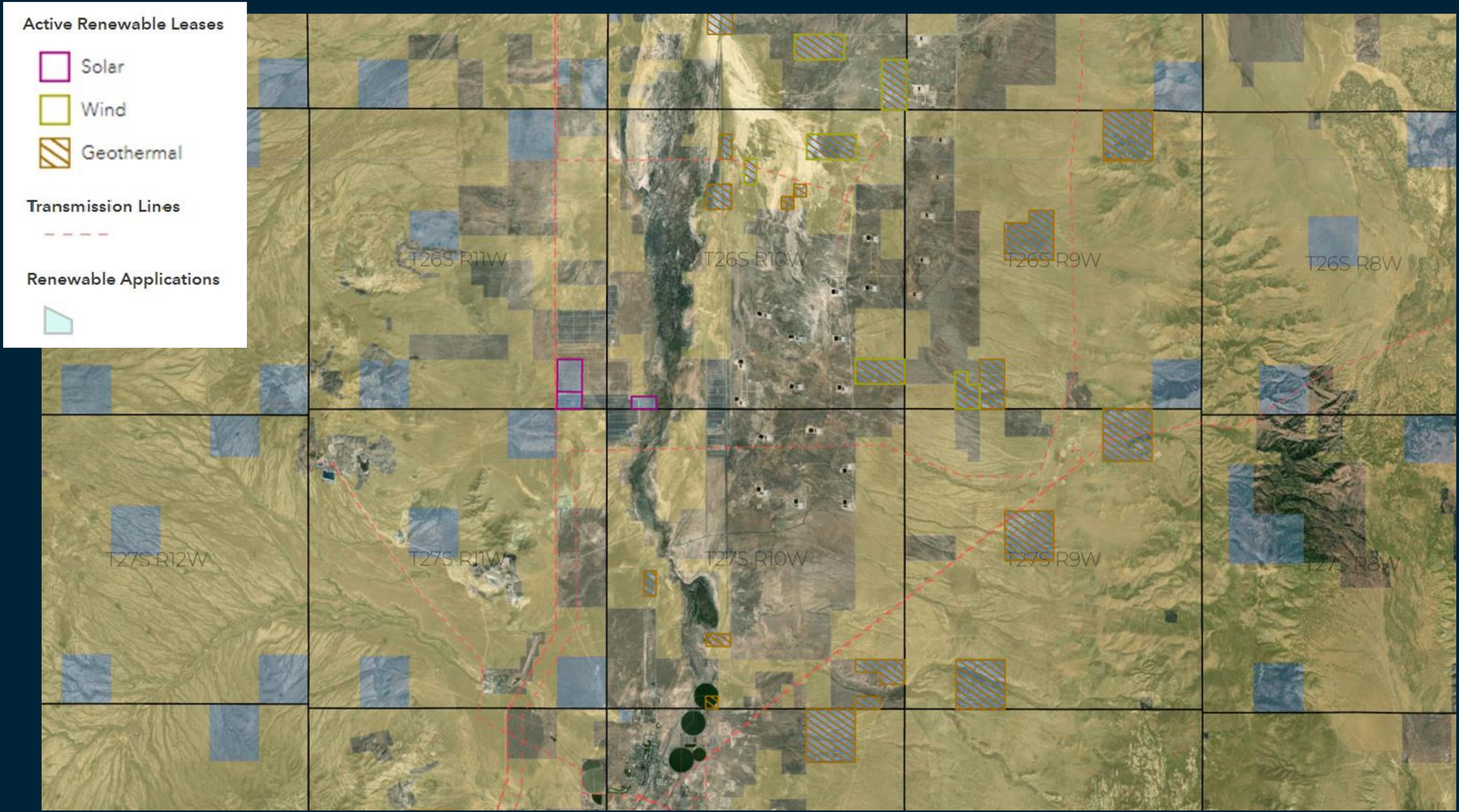
Unlike traditional energy development, renewable energy projects require the alignment of three variables:

- Available land
- Transmission
- Available resource





Active Renewable Leases
Solar
Wind
Geothermal
Transmission Lines
Renewable Applications
Grassy Cove
Gray Hills
Wah Wah Valley
San Francisco Mountains
Pine Valley
Beaver
Star Range
Wah Wah Mountains
Escalante Desert
Mineral Mountains
Beaver
Beaver River
North Creek
Indian Creek
Fishlake National Forest
Tushar Mountains
Antelope Range
Piute
Circle Valley
Kingston Canyon
Table Mountain
South Hills
Horse Valley
Black Mountains
Mud Spring Bench
North Peaks
White Rock Mountains
Hamlin Valley
Needle Range
Manogant Mountains
Iron
Long Hollow
Red Hills
Parowan Valley
Sevier Plateau


Active Renewable Leases
Solar
Wind
Geothermal
Transmission Lines
Renewable Applications
T26S R11W
T26S R10W
T26S R9W
T26S R8W
T27S R12W
T27S R11W
T27S R10W
T27S R9W
T27S R8W

Geothermal Overview

Chanse Rinderknecht
Energy & Minerals Geoscientist/Lease Manager

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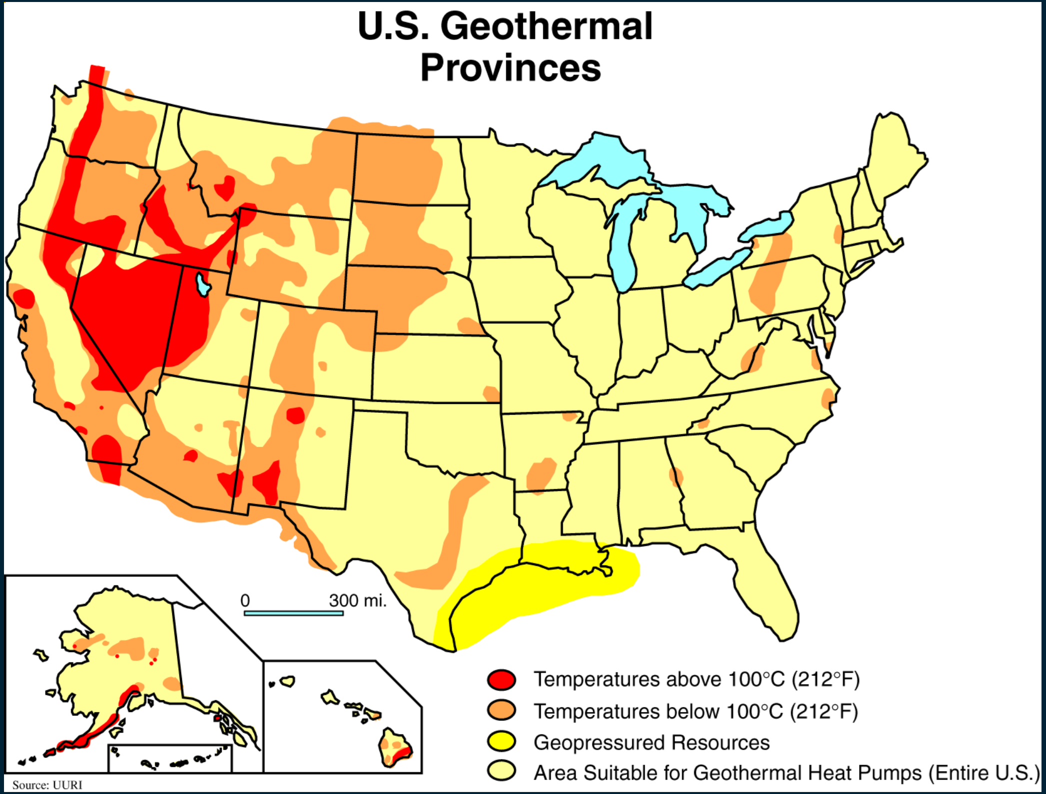
Source of Geothermal Energy

- The earth is an active source of heat…
- At 1,100°F to 2,200°F (60 miles) rock is ductile
- A geothermal resource has three components
  - Source of Heat
  - Relatively high permeability reservoir rock
  - Water/fluid



From Blackett & Wakefield, 2002

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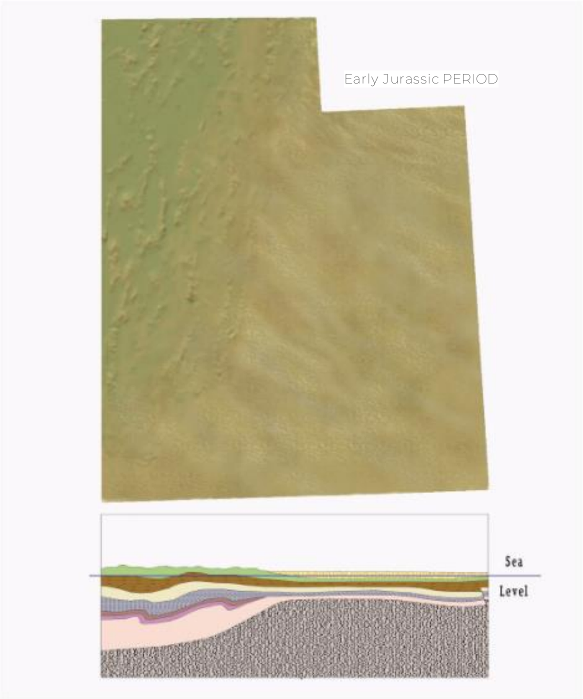
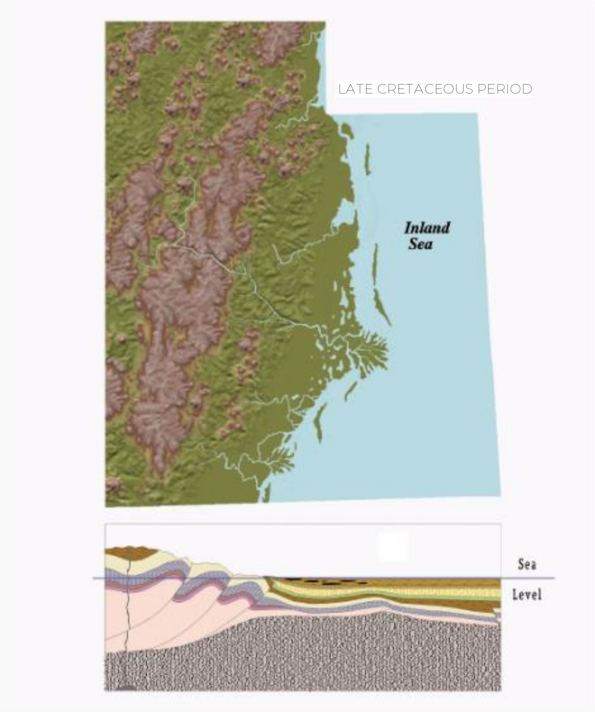
Quick Geologic Overview

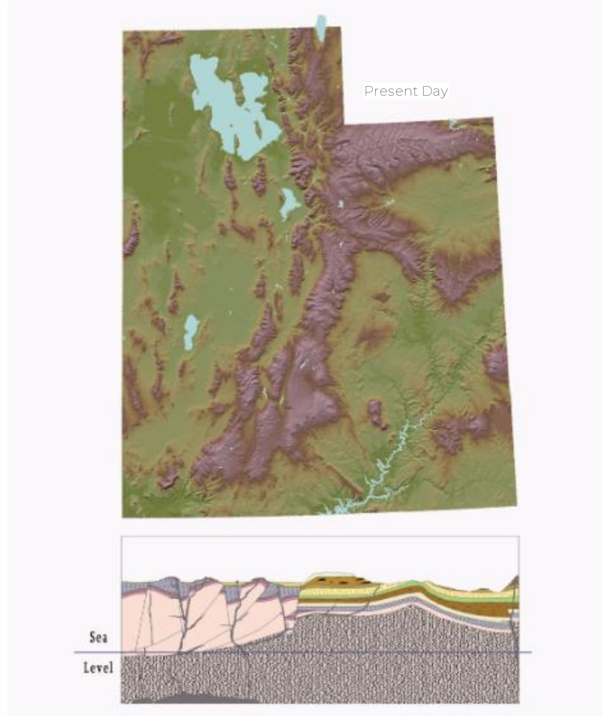
201–174 million years ago



101–66 million years ago



Present Day



From: geology.utah.gov

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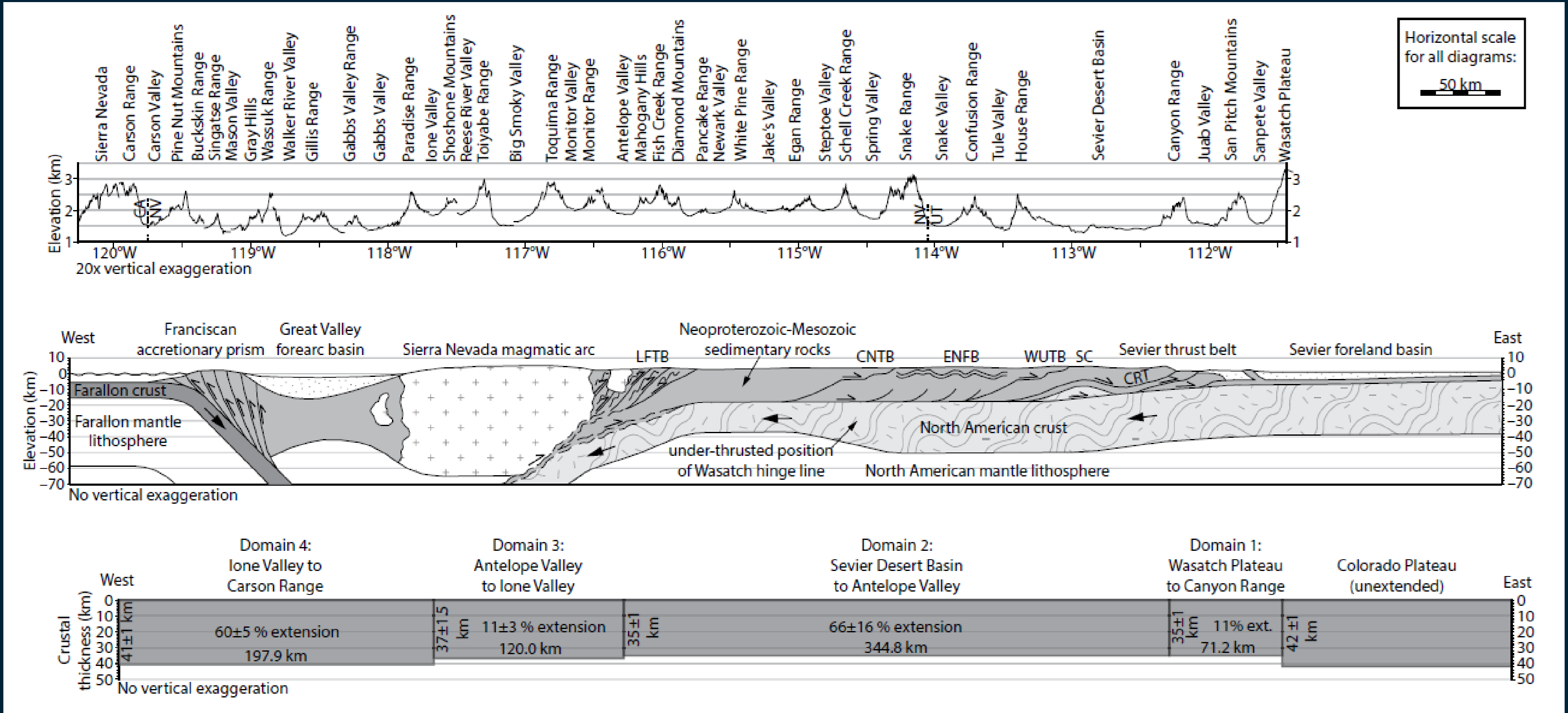
Tectonics



From: S.P. Long., 2019

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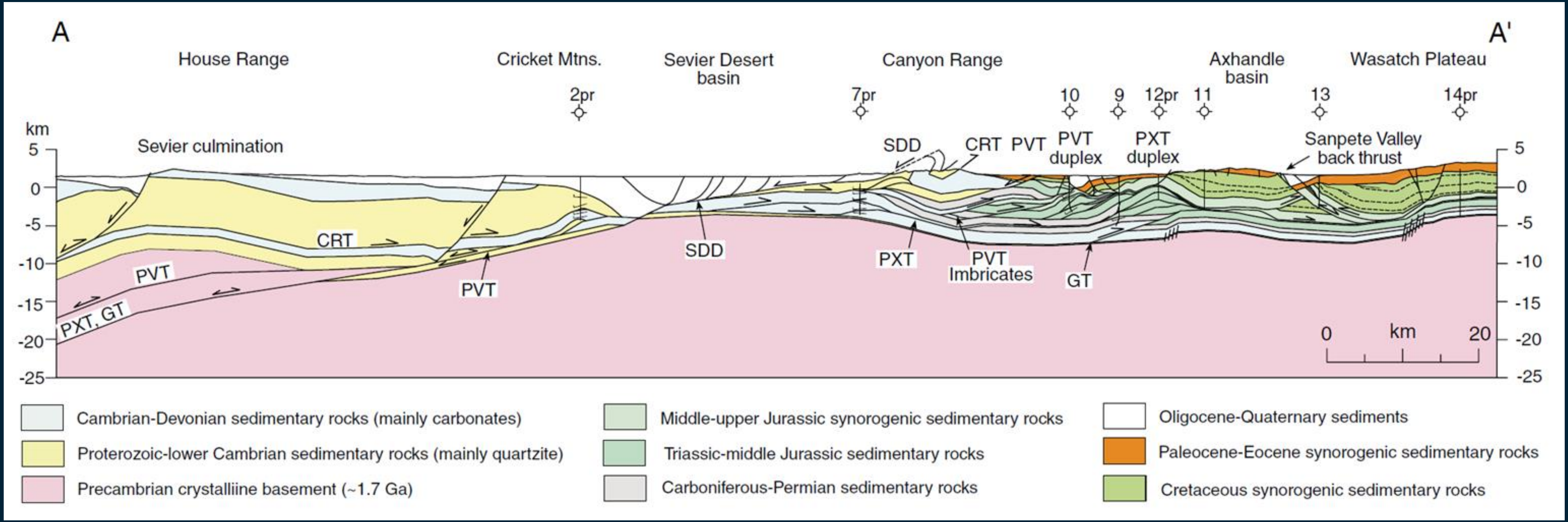
Tectonics & Reservoir



From DeCelles and Coogan., 2006

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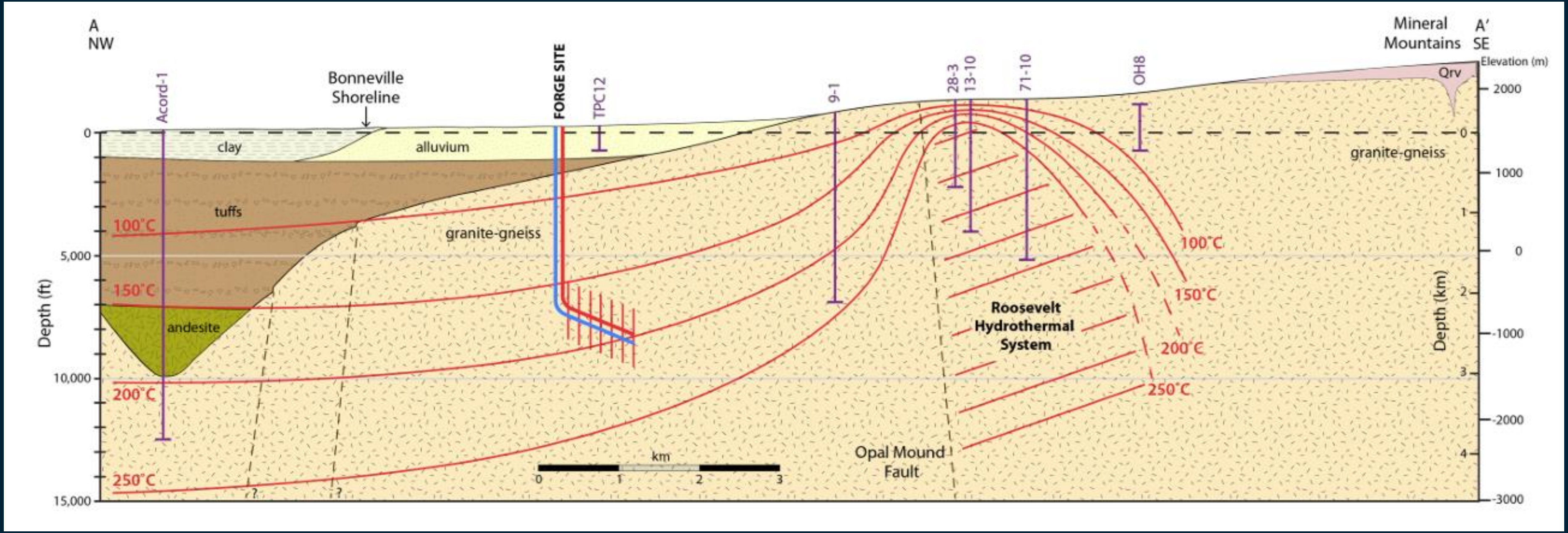
Stimulating the Reservoir



From Simmons et al. 2016

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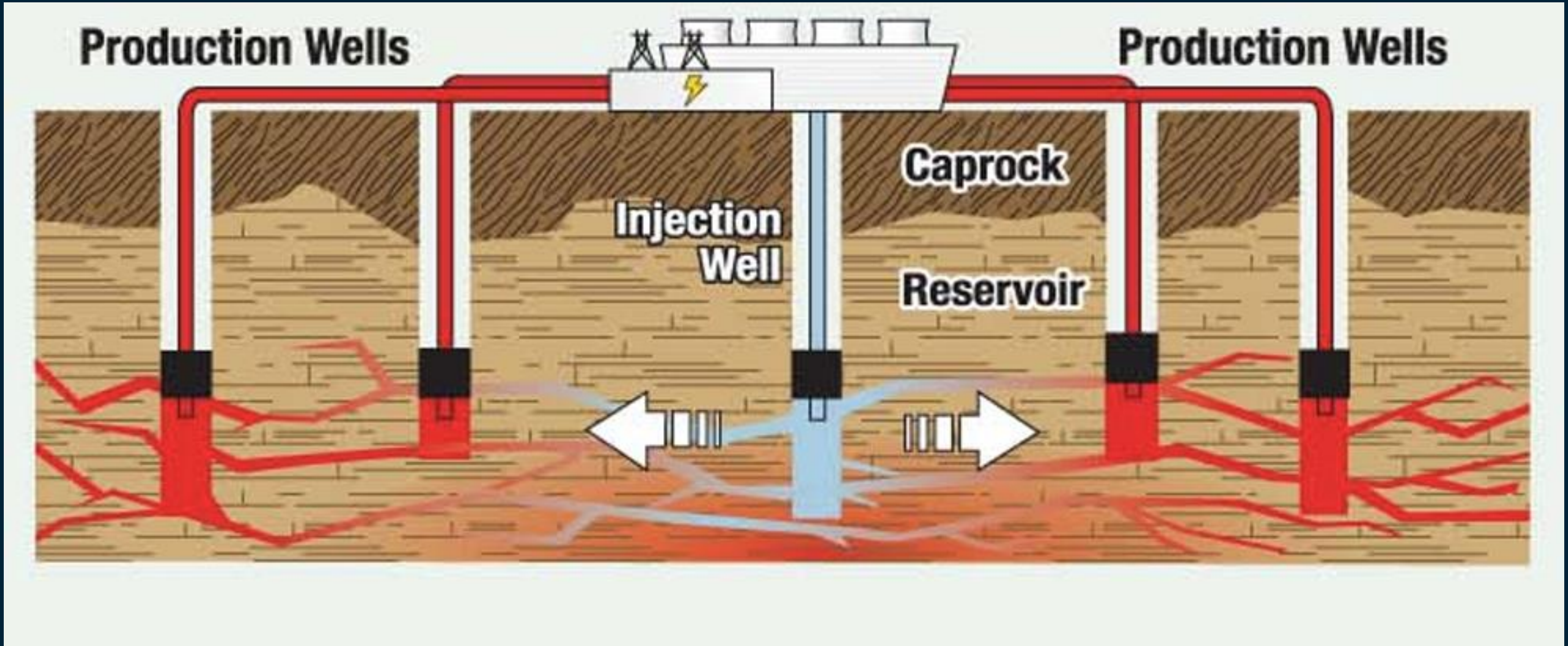
EGS Geothermal System



From The Department of Energy

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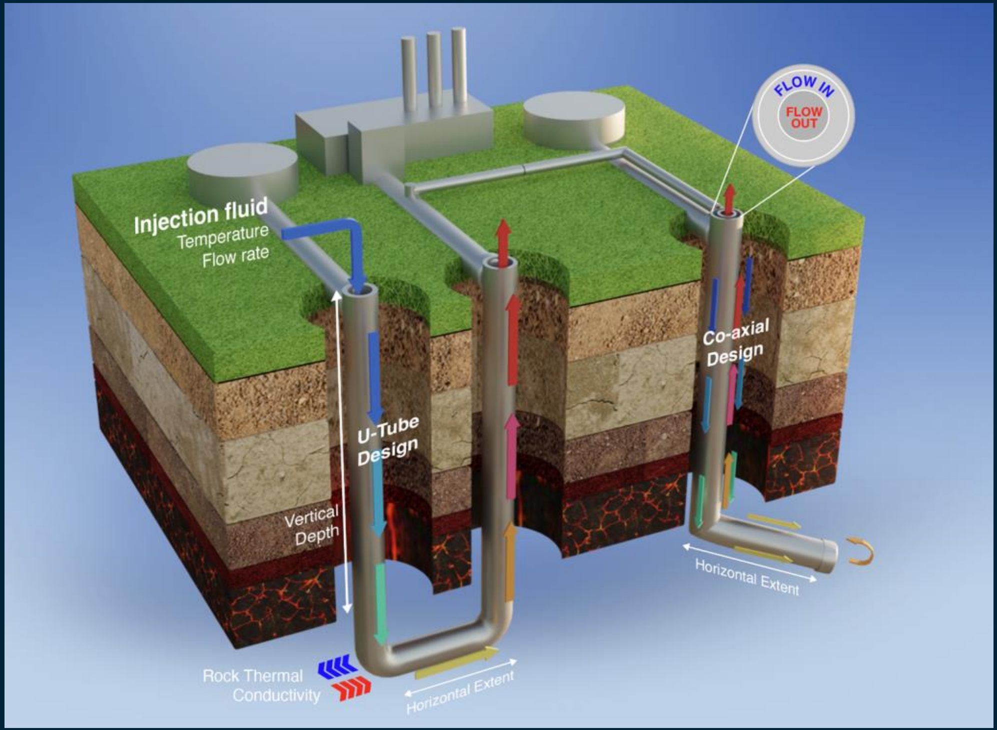
Closed Loop Geothermal System



From Sandia National Laboratory

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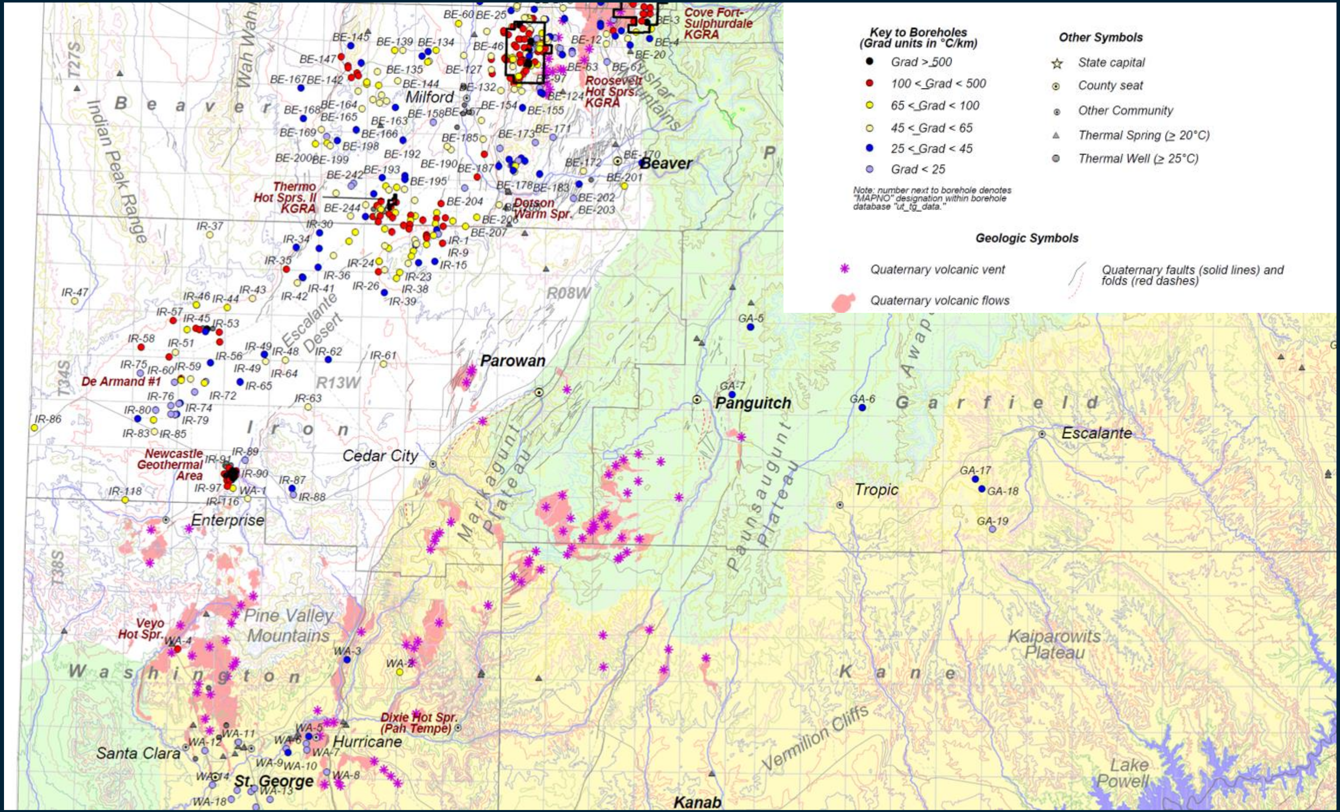
Exploration



From Blacket and Wakefield., 2002

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Mineral Projects

Andy Bedingfield, PE
Assistant Managing Director, Energy & Minerals

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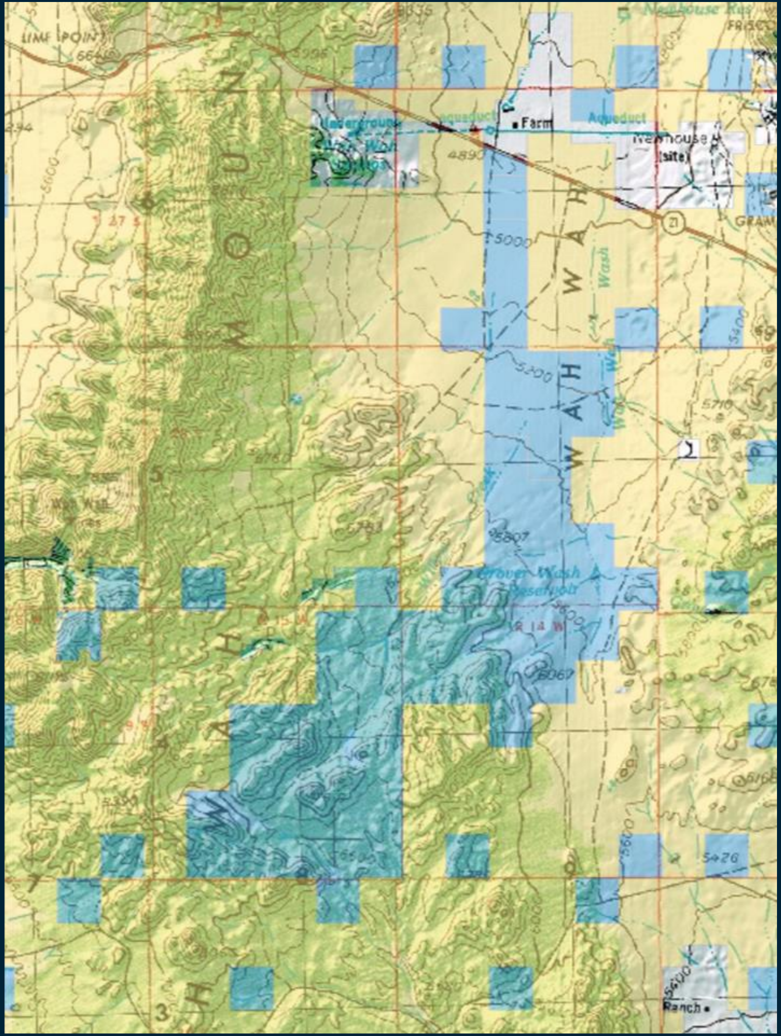
Milford Block

- Obtained in 2001 West Desert Exchange and 2021 UTTR Exchange
- Lease expired March 2024 - 80+ drill holes 2011-2012
- Previous Lessee spent 10 million+ on drilling and pre-feasability studies
- RFP process ongoing - Sept 1
- Alunite Deposit - Potash, Alumina and Sulfuric Acid
- 425 Mt economic reserves, 6.49% K_2SO_4, 15%+ Alumina, 2% SO_4



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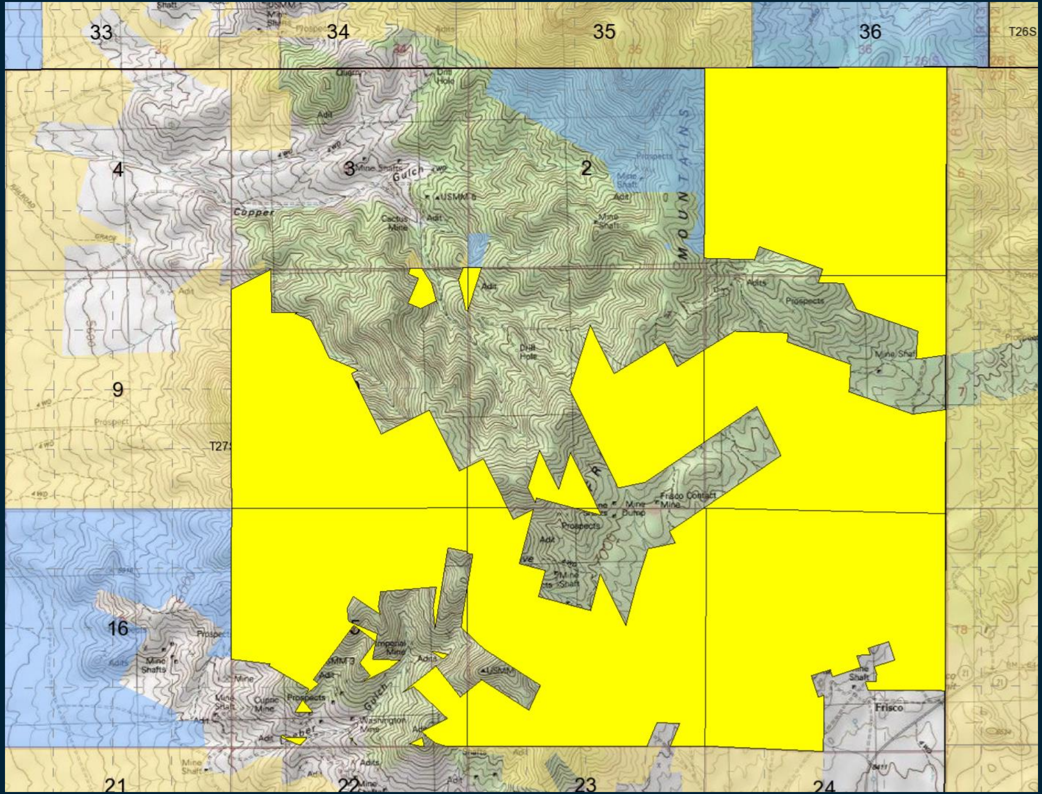
Mineral Exchange Target - Frisco



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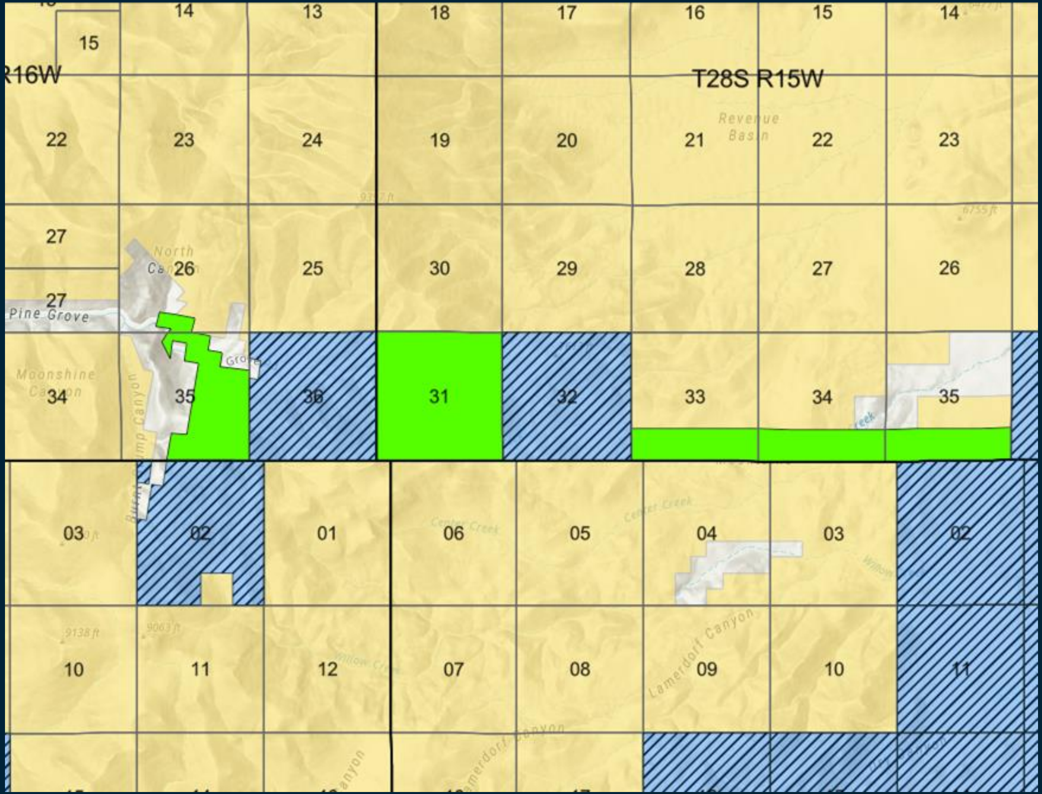
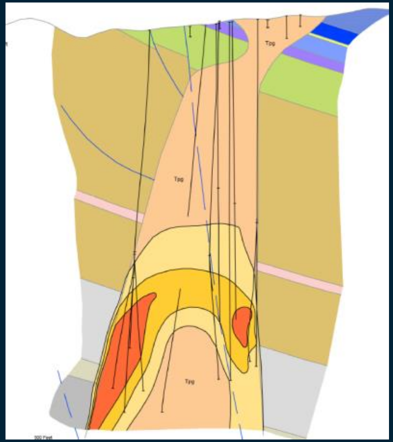
Pine Grove



- Historic mining district - Pb, Zn, Ag in mid 1900's
- Phelps Dodge discovered porphyry 1975 - molybedenum
- 250 million tons of 0.25% MoS2 - 10 kkk in mineral value
- 60% on fee land, 40% BLM (exchange)
- 3,000 ft deep



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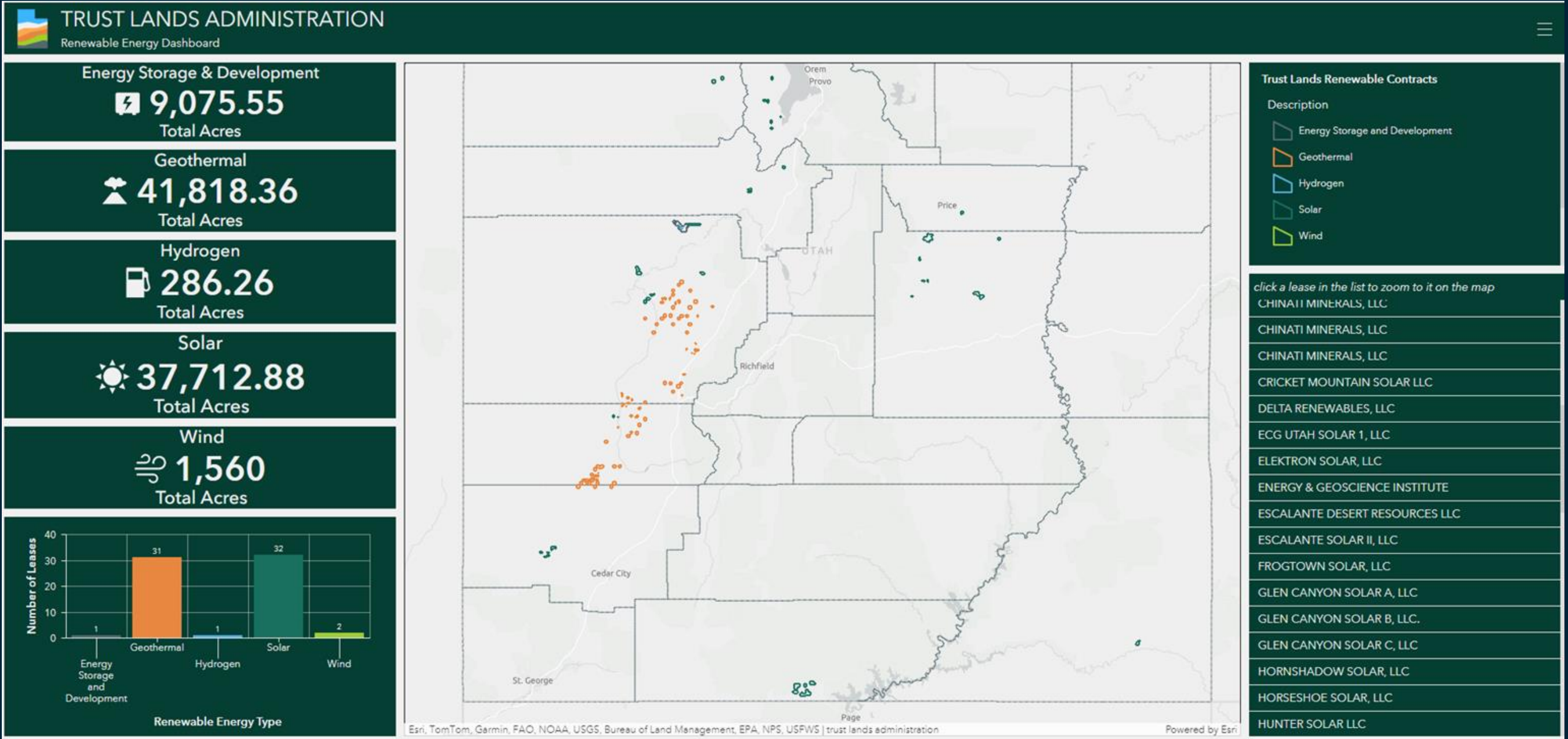
Thanks For Your Time!

Please visit our Renewable Energy Dashboard at trustlands.utah.gov



Renewable Energy Leasing

Solar & wind projects relating to the surface estate follow a leasing process that is typically completed in 90-120 days. Opportunities during this process allow for competing bids, public notice, and agency review.

Geothermal projects (Mineral Estate) follow a modified Mineral OBA process & require Board Approval. This process was redefined and established in early 2022 to require Exploration & Option Agreements.

Exploration Phase (typically 5 yrs)

- Project Area is defined for the anticipated Exploration Area (SITLA, BLM, & private lands, etc.)
- Detailed Plan of Exploration is required within 1yr of Option Agreement Execution, noting specific exploration steps to be taken and timing (wells drilled, engineering studies completed, etc.)
- Yearly reports summarizing work completed and proposed activities for the upcoming years. (Data submitted to TLA staff for review)
- Assuming a resource is found, proponent must submit a Plan of Development defining timing of project, proposed off taker, interconnection constraints, surface facilities, etc. to exercise the Lease Option.

Initial Term (typically 10 yrs)

- Requires annual reports summarizing work completed and proposed activities for the upcoming years to develop the found resource.

Secondary Term (typically 20 yrs with extensions)

- Once a geothermal resource is developed the project enters the secondary/production term.
- Production Terms may be extended with adjustment of economic terms with new PPA's.