U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Geothermal Technologies Office (GTO): Quarterly Update

September 25, 2024

Agenda

- Department of Energy and Office of Energy Efficiency and Renewable Energy Updates
- Geothermal Technologies Office (GTO) News and Updates
  - Staff Updates
  - GTO and Geothermal in the News
  - Upcoming and Recent Events
- GTO Program and Project Updates
- Q&A

Celebrating the contributions, culture, and rich history of Hispanic and Latino communities across the country.

DOE/EERE News and Updates

What's happening at the U.S. Department of Energy (DOE) and its Office of Energy Efficiency and Renewable Energy (EERE)?

- DOE Announces $142 Million in Grants to Small Businesses
- Open Technology Commercialization Fund (TCF) Voucher Opportunities
- TCF CLIMR Lab Calls Notice of Intent
- Biden-Harris Administration Invests to Improve Siting of Renewable Energy
- Thermal Storage Included in Solar Project Selections
- DOE Invests $1.4 Million for Opportunities in Energy Communities
- DOE Provides $65 Million for Connected Communities
- GSA and DOE Select Emerging Technologies to Accelerate the Path to Net-Zero Emissions

DOE/EERE News and Updates

EERE Resources

- Get the latest clean energy news by signing up for the **Weekly Jolt newsletter**: your one-stop-shop for the latest articles, announcements, and upcoming events from EERE
- Sign up for the **EERE Funding Listserv** to get updates on new funding opportunities across the office

Stay in the Know!

- Follow DOE, Secretary Granholm, and EERE on social media

#Geothermal Everywhere

U.S. Department of Energy

- X: @ENERGY
- Facebook: @energygov
- LinkedIn: @u-s--department-of-energy
- Instagram: @energy

Secretary of Energy

- X: @SecGranholm
- Facebook: @SecGranholm
- Instagram: @secgranholm

DOE Office of Energy Efficiency and Renewable Energy

- X: @eeregov
- Facebook: @eeregov
- LinkedIn: @eeregov

Staff Updates

Staff Additions	
Federal	David Wang
Fellow	Billy Shinevar

Staff Departures	
Fellow	Sudeep Kanungo

Alexandra Prisjatschew
Acting Program Manager for Data, Modeling, and Analysis team

Upcoming Events

Sept. 29–Oct. 2 | National Association of State Energy Officials Annual Meeting

Oct. 21–Oct. 23 | New York City NY-GEO 2024

Oct. 28–Oct. 30 | Interstate Oil and Gas Compact Commission Annual Conference

Oct. 27–Oct. 30 | 2024 Geothermal Rising Conference

Nov. 20–Nov. 21 | Mountain West Renewables

Dec. 4 –5 | Demonstrate Deploy Decarbonize 2024

Geothermal at Recent Events!

- Deputy Secretary David Turk and Lauren Boyd attended and spoke at DOE's Geothermal Convening event
- Elisabet Metcalfe presented at a clean energy learning webinar with the Landscape Architecture Foundation
- Secretary Jennifer Granholm, Lauren Boyd, and Sudeep Kanungo attended the P-TECC Ministerial in Bucharest, Romania
- Kevin Jones spoke at a GeoZone town hall event hosted by Sonoma Clean Power in Santa Rosa, California
- Arlene Anderson presented at the International District Energy Association's IDEA2024 conference
- Multiple GTO staff attended the GEODE Kickoff event in Houston, Texas
- Alexis McKittrick presented at the National Association of Regulatory Utility Commissioners' Innovation Webinar on networked geothermal
- Alexis Prisjatschew presented to the National Science and Technology Council's Critical Minerals Subcommittee
- David Wang presented at DOE's 2024 Sustainability Summit
- Jeff Bowman and Jeff Winick presented at an internal DOE reservoir thermal energy storage deep dive
- GTO staff attended the American Rock Mechanics Association Annual Meeting, Geothermal Rising's Subsurface Symposium, the Oklahoma Native Renewable Energy Conference, and more!

Top: Lauren Boyd in a brainstorming session at DOE's Geothermal Convening. Bottom: Secretary Granholm and Lauren Boyd at the P-TECC Ministerial in Romania. DOE photos.

Geothermal In the News

Get news updates in *The Drill Down*! geothermal.energy.gov

United States Energy Association's (USEA) | Power Sector Podcast: Sean Porse discussing DOE's Pathways to Commercial Liftoff:: Next-Generation Geothermal Power

ThinkGeoEnergy | Focus on Geothermal Webinar**:** Kevin Jones discussing research and updates from Utah FORGE

Newswise | Utah FORGE Achieves Crucial Geothermal Milestone

The Hill | Big Oil, Clean Energy Chart Future of Geothermal Energy

TriplePundit | Innovators Look to Overcome the Limits of Geothermal Energy in the U.S.

Denver 7 | 'Earth-Powered Beer': The World's Deepest Hot Spring Helps This Colorado Brewery Brew Its Beer

ThinkGeoEnergy | U.S. DOE Awards Grants to Two Small Businesses for Geothermal Research

New Haven Independent | City Wins Green to Go Green

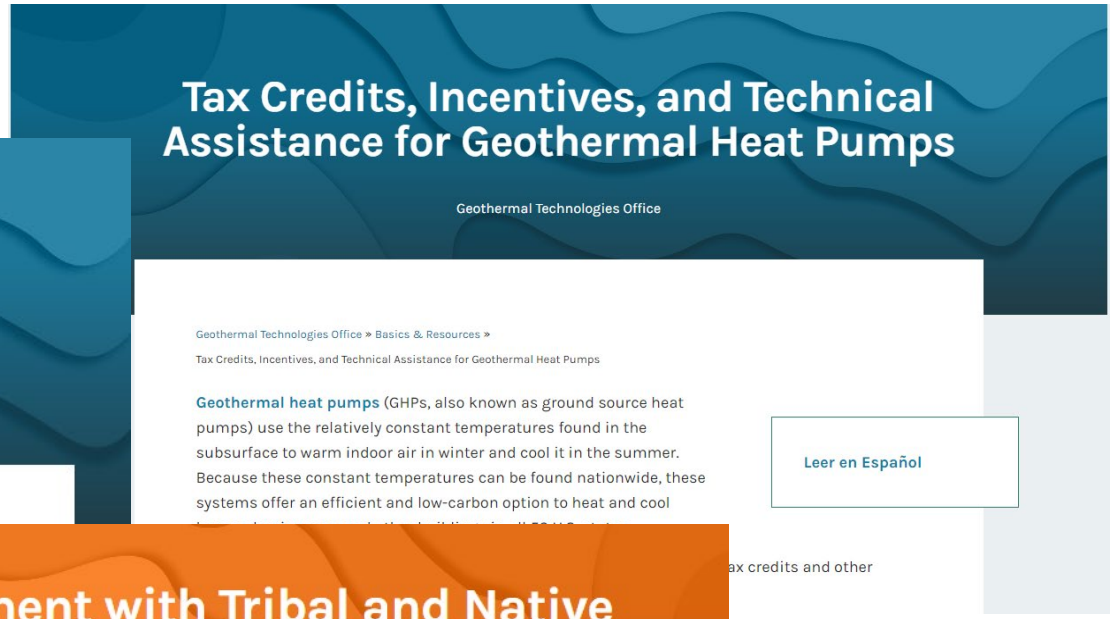
ThinkGeoEnergy | OU Team Pitches Geothermal Greenhouse Design for Osage Nation in Oklahoma

Photos top to bottom: USEA, Denver7, New Haven Independent, University of Oklahoma

Communications and Stakeholder Engagement

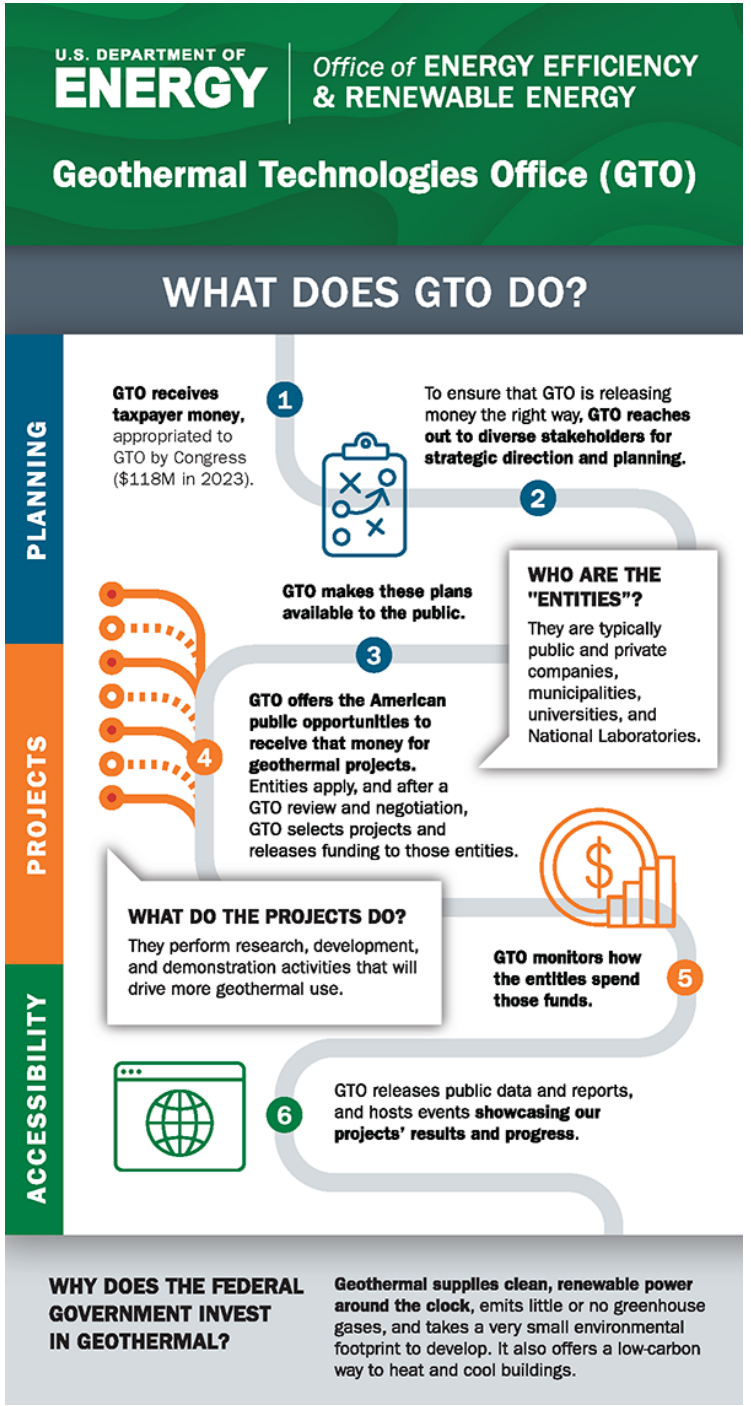
Elisabet Metcalfe

New Web Pages



Geothermal.energy.gov

Funding Pages and Resources



Geothermal.energy.gov

GHP Case Studies

Coming soon!

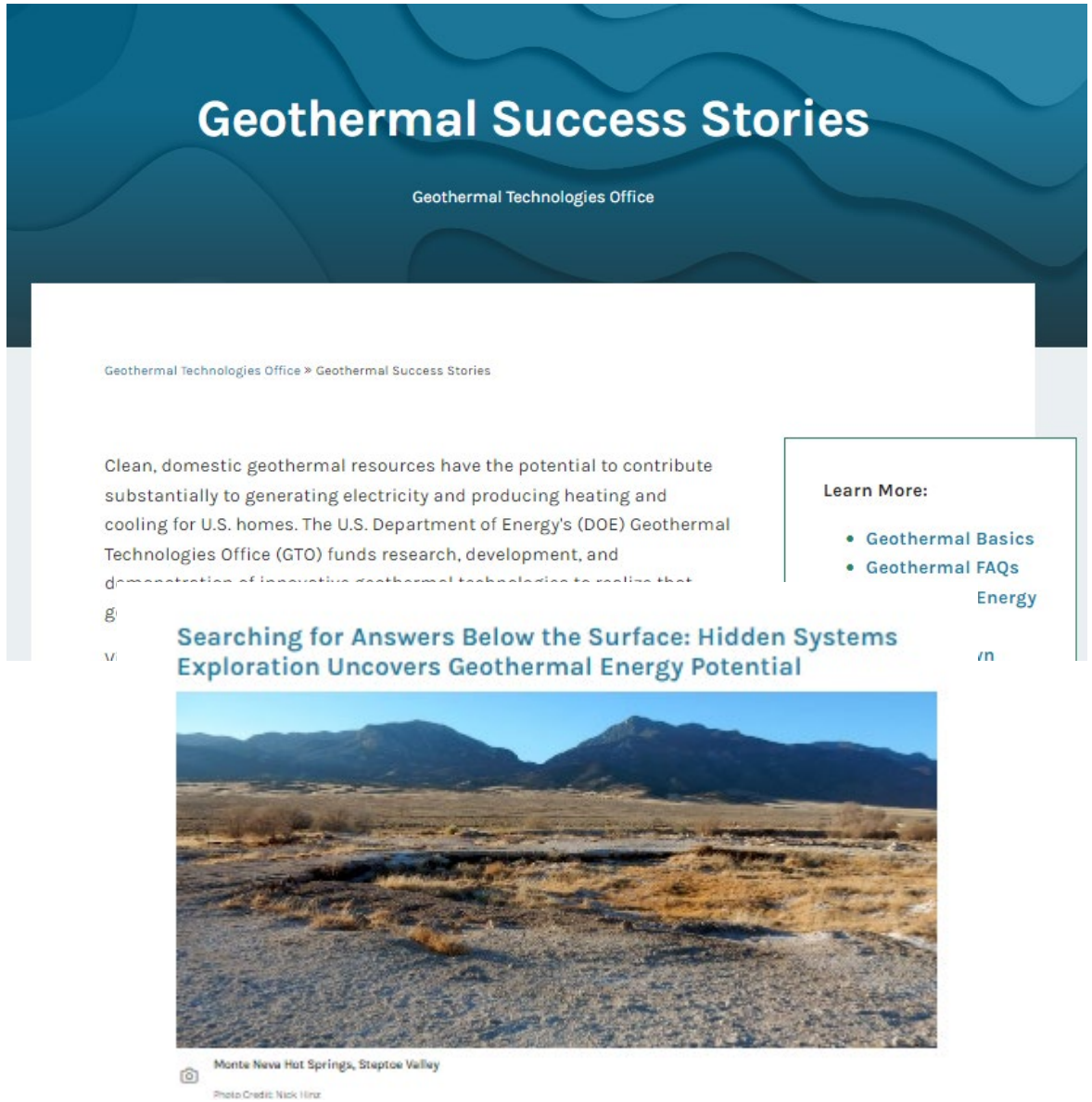
- Goal to help new entities, communities, and individuals get background on existing installations and what went into them
- Features 20 networked and individual geothermal heat pump installations nationwide
- Includes fast facts and statistics on energy use, cost savings, and project funding
- Features dedicated web pages and printable PDF versions

GHP construction at a Medford, NY, home for a veteran; construction included workforce training. Photo courtesy United Way.

GTO Success Stories

Recent success stories on GTO's website:

- Geothermal Collegiate Competition Helps Communities Explore Clean Energy
- Searching for Answers Below the Surface: Hidden Systems Exploration Uncovers Geothermal Energy Potential
- Cracking the Code: Microseismicity Findings Point to Improved Geothermal Extraction



energy.gov/eere/geothermal/geothermal-success-stories

Geothermal Collegiate Competition

Geothermal Collegiate Competition
U.S. DEPARTMENT OF ENERGY

Registration for the 2024 GCC is open.

- Teams of three or more collegiate students—undergraduate and/or graduate—and ***all majors*** welcome and encouraged to participate!
- Opportunity to gain real-world geothermal experience and work with communities.
- Official competition rules on HeroX.
  - First place: $10,000 and national recognition
  - Second place: $6,000
  - Third place : $2,000
  - Bonus award: $2,000 for an outstanding submission from a team of all Tribal and/or community college students.

Technical Track: Perform a resource assessment and design a geothermal heating and cooling system for a community; design can also include other renewable energy technologies and/or storage.

Policy Track: Present idea for a geothermal heating and cooling system in a community or campus, focused on analysis of the regulatory environment, economic assessment, and workforce development analysis.

energy.gov/eere/geothermal/geothermal-collegiate-competition
and herox.com/geothermalcollegiatecompetition2024

NSF-GTO Geothermal INTERN Selections

- Second cohort of geothermal interns in the National Science Foundation (NSF) INTERN program
- 24 students will work with geothermal companies, national laboratories, or state agencies on projects that advance geothermal technologies

California Institute of Technology
Central Michigan University
Colorado School of Mines
Florida State University
Georgia Institute of Technology
Northwestern University
The Pennsylvania State University
South Dakota School of Mines and Technology
Texas A&M University
University of Memphis
University of Minnesota, Twin Cities
University of Mississippi
University of Southern California
University of Texas, El Paso
University of Texas, Rio Grande Valley
University of Utah
West Virginia University

energy.gov/eere/geothermal/nsf-intern-program

Geothermal Rising Conference

Visit GTO in booth #147 to learn the latest about our research, grab our new initiative postcards, and—best of all—chat with GTO staff!

Data, Modeling, and Analysis

Alexandra Prisjatschew

Geothermal Resources' Value in Implementing Decarbonization

- Unique value proposition to decarbonize the economy while supporting the grid
- Clean resource with high capacity factor, 24/7 availability, and minimal land use footprint
- Flexible geothermal operations and geothermal power coupled with storage could broaden the breadth of services that geothermal power provides to a decarbonizing grid

GRID
Geothermal Resources' Value in Implementing Decarbonization

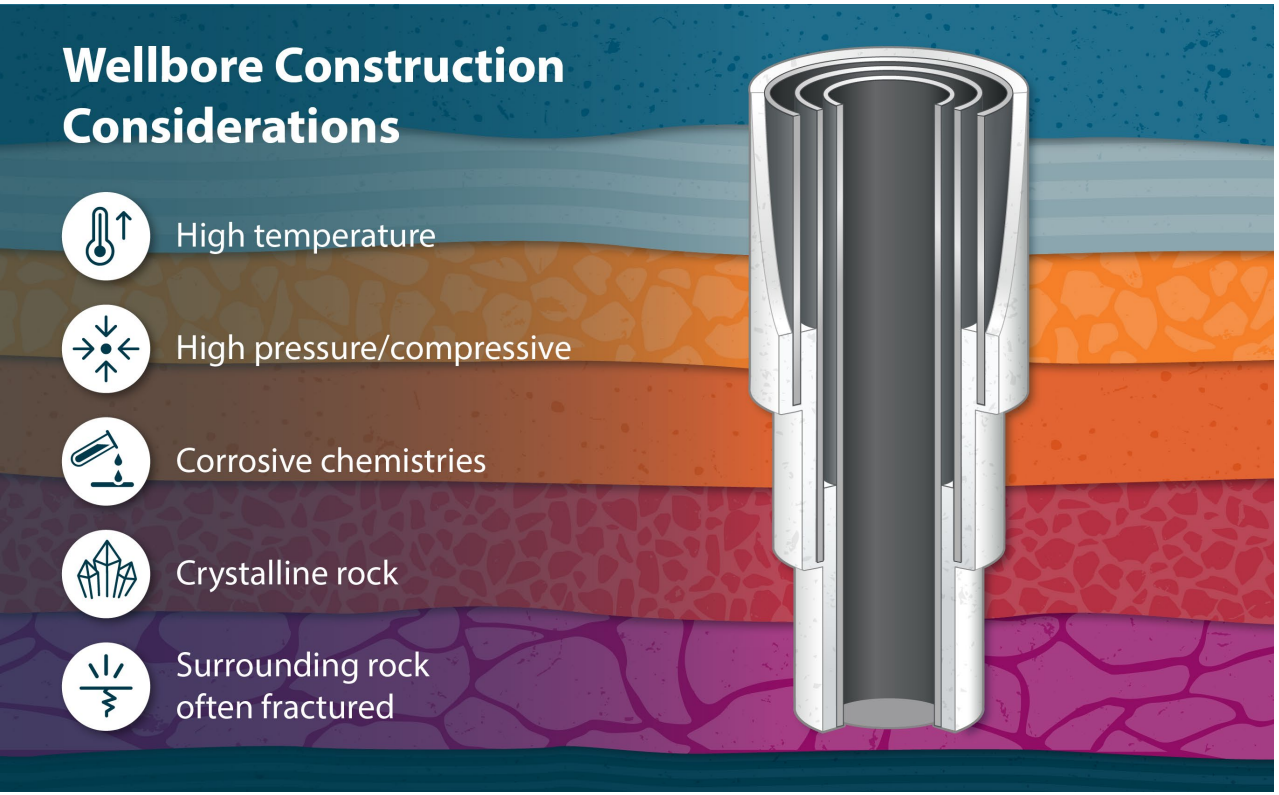
Applications under review

Seeks to better understand and quantify the value of these services

Enhanced Geothermal Systems

Kevin Jones

High-Temperature Tools for Well Integrity Evaluation



Five projects selected to address downhole cement and casing evaluation tools for use in high-temperature and hostile geothermal wellbores:

- Clemson University
- Innovative Downhole Solutions, Inc.
- Lawrence Berkeley National Laboratory
- Los Alamos National Laboratory
- Schlumberger Technology Corporation

energy.gov/eere/geothermal/wellbore-construction-and-evaluation

Utah FORGE Updates

- **Successfully stimulated** 16A(78)-32 (injection) and 16B(78)-32 (production) to **develop interwell connectivity**
- 9-hour circulation test following stimulation **proved fluid flow and energy transfer**
- **Successful full-scale 30-day circulation test** in Aug/Sept; consistent rate of **420 gpm** injected, with **no drop in injectivity** and showing a **constant recovered fluid temperature of about 370° F**

FORGE data are publicly available on the Geothermal Data Repository.

Stimulation activities at Utah FORGE. Photo by Lauren Boyd.

Virtually visit FORGE!
https://utahforgevirtualtour.imaginxavr.com/

GEODE Kickoff

- Identifying ways to access and apply best practices from the larger domestic oil and gas industry to overcome barriers for geothermal energy and encourage private investment
- Kick-off event Sept. 10 and 11, 2024 in Houston
- First 12 months will focus on brainstorming and roadmapping future research
- **Entities, individuals, national labs, etc., working in the subsurface are encouraged to reach out to Project InnerSpace or GTO on how to get involved**

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GEODE
Geothermal Energy from Oil + Gas
Demonstrated Engineering

energy.gov/eere/geothermal/geothermal-energy-oil-and-gas-demonstrated-engineering

Hydrothermal Systems

Alexis McKittrick

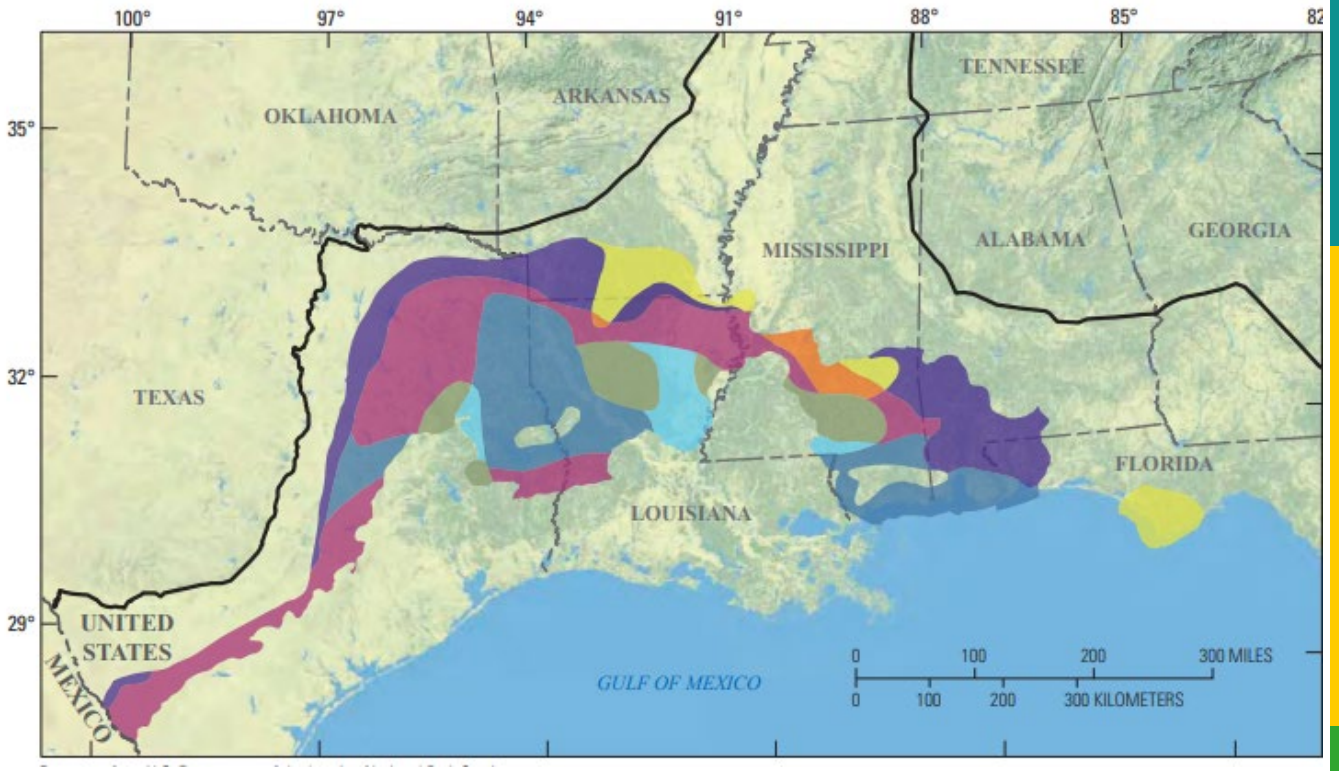
Critical Minerals Lab Call

Spodumene. Courtesy USGS.

- Call released in April for DOE national lab R&D to help advance and develop U.S. critical material supply chains
- Partnered with Fossil Energy and Carbon Management (FECM) and Advanced Materials and Manufacturing Technologies Office (AMMTO)
- Selected seven projects at four DOE national laboratories to receive more than $6 million
    - Lawrence Berkeley National Laboratory:
        - Salton Sea Characterization and Modeling of the Partitioning of Li and other Critical Minerals in the Deep Superhot Portions of the Salton Sea Geothermal Field Reservoir
        - Lithium Resources in the Smackover Formation – Quantification – Origin – Natural and Engineered Lithium Cycle (LiRe – Smac)
    - Los Alamos National Laboratory:
        - Lithium Geospatial Analysis and Resource Assessment in the Smackover Geothermal Fairway (LiGRAS) (joint with AMMTO)

Critical Minerals Lab Call

- Sandia National Laboratories:
  - Supercritical Drilling Material Analysis: Current Practices, Technological Gaps, and Recommendations
  - Combined Analysis of Lithium Brines and Thermal Energy (CALiBrATE) Resources
- Idaho National Laboratory:
  - Characterization of Li and Other Critical Materials of Smackover Formation, Louisiana
  - Characterizing and Estimating Reserves of Li and Other Critical Minerals in Paradox Basin, Utah (FECM)



Base map from U.S. Department of Interior, National Park Service (via USGS)

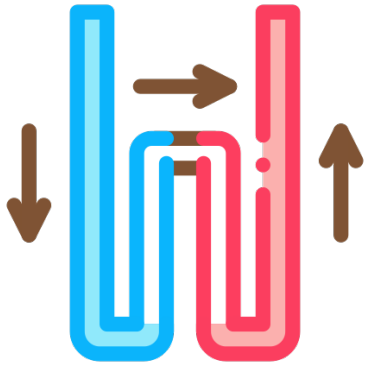
Regional Data Partnerships

- Funding expected in early 2025 to facilitate discovery and development of new U.S. geothermal resources through field data collection, including geophysics and exploratory drilling
- Goal is to support data collection for geothermal resource assessment, exploration, and development across multiple projects
- DOE plans to support partnerships to carry out the following activities:
  - Regional Data Acquisition and Analysis
  - Resource Characterization
  - Data Dissemination

Geothermal steam rises from Pilgrim Hot Springs on the Seward Peninsula in Alaska. Credit: Dick Benoit

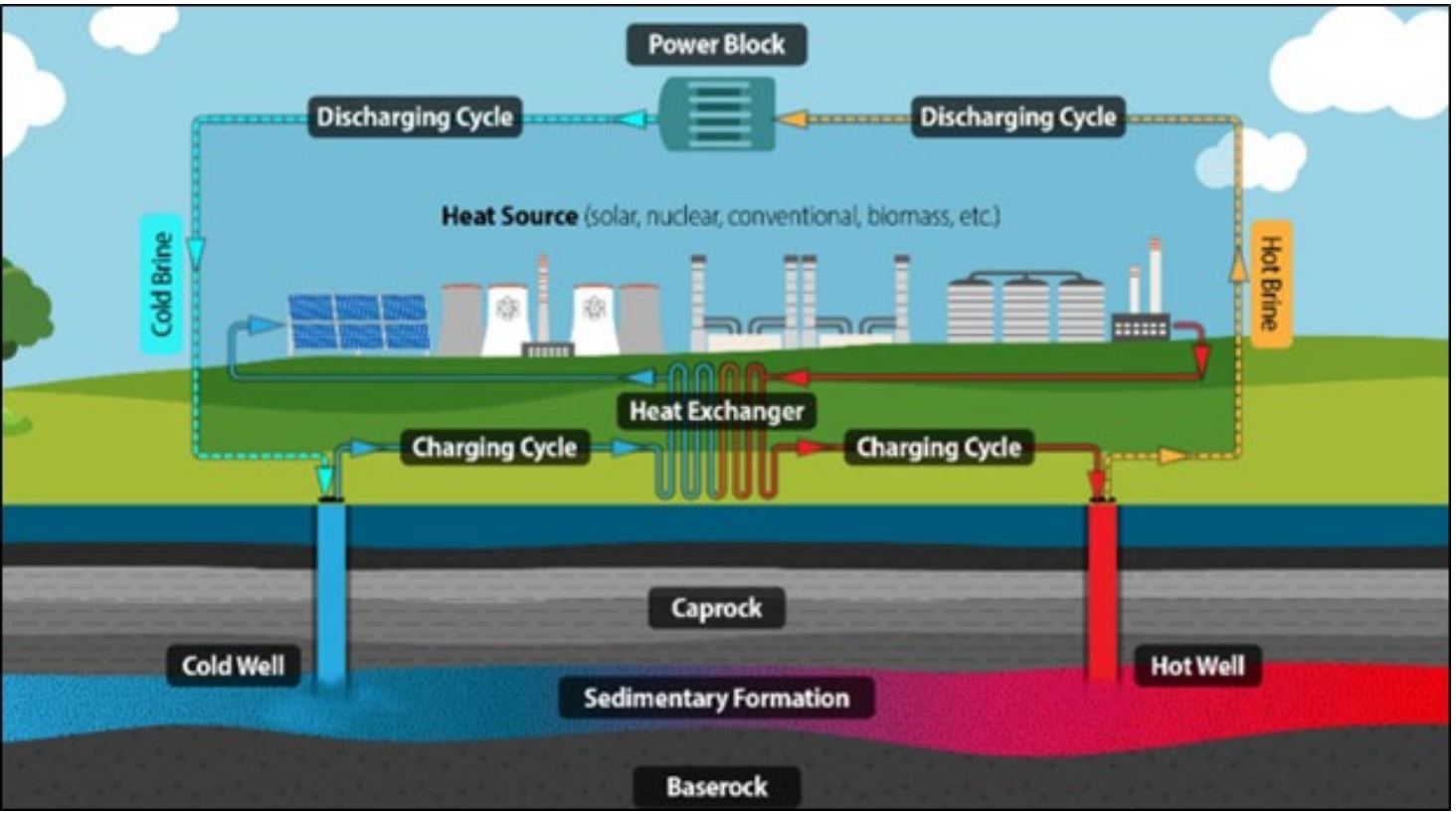
Interested entities: Email **DOE.Geothermal@ee.doe.gov** with name, phone number, email address, and organization, as well as U.S. region(s) of interest, using subject line: *Potential Data Funding*.

Low-Temperature and Coproduced Resources



Alexis McKittrick

Reservoir Thermal Energy Storage (RTES) Demonstration



Project Development Solutions, Inc.
(Bakersfield, CA)

Will pilot a project to demonstrate low-temperature (<130◦ C) RTES technology to reduce emissions from energy-intensive industrial processes

Federal Geothermal (FedGeo) Partnerships

First two FedGeo pilot sites:

- **Detroit Arsenal (U.S. Army Garrison)**, Warren, MI
- **West Point Military Academy**, West Point, NY

  - Tech assistance team helped energy managers at these facilities with steps toward initial system design.
  - Collected building and site-level data, drilled test wells, installed fiber optic sensors, gathered data (thermal resistivity and groundwater flow), integrated data into advanced models to develop initial system design and sizing estimates and procurement criteria.

Drilling a test borehole at Detroit Arsenal
SOURCE: U.S. Army. Photo courtesy Shannon Bergt.

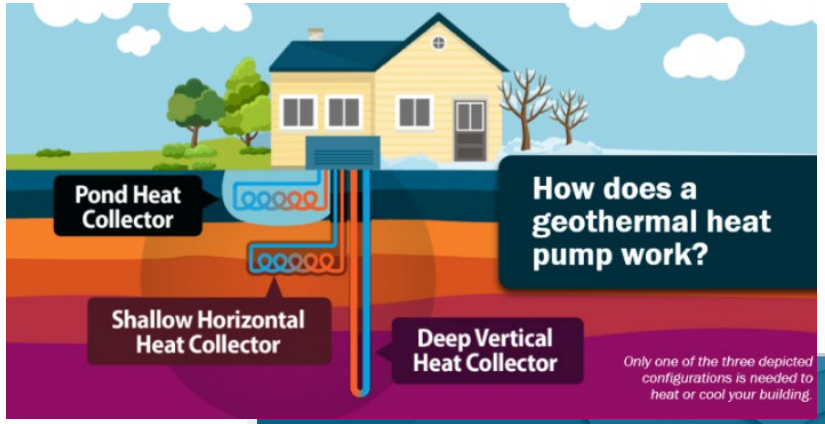
More Resources and Thank You!

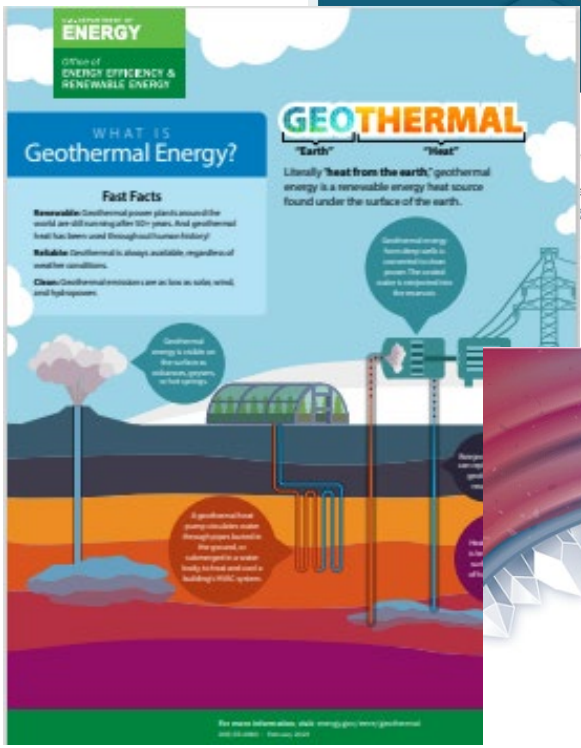
GTO has additional tools and resources available to learn about geothermal energy, find funding opportunities, and more.

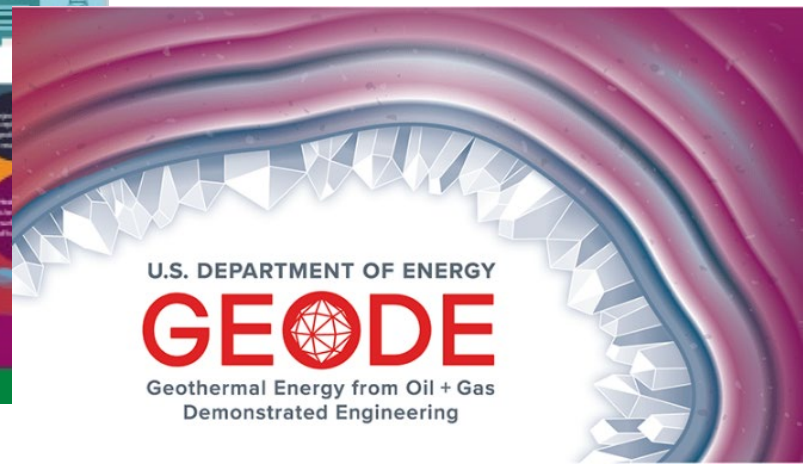
- Project Information
- Fact Sheets
- The Drill Down Newsletter
- Stakeholder Toolkits
- Infographics
- Lithium Storymap

Get the hottest geothermal news from ***The Drill Down***, GTO's monthly newsletter!

Sign up today: geothermal.energy.gov







Q&A

Get the hottest geothermal news from ***The Drill Down,*** GTO's monthly newsletter! *Sign up today*: geothermal.energy.gov

Interested in serving as a **merit reviewer** for GTO RD&D projects?

Send us your resume or CV:
doe.geothermal@ee.doe.gov

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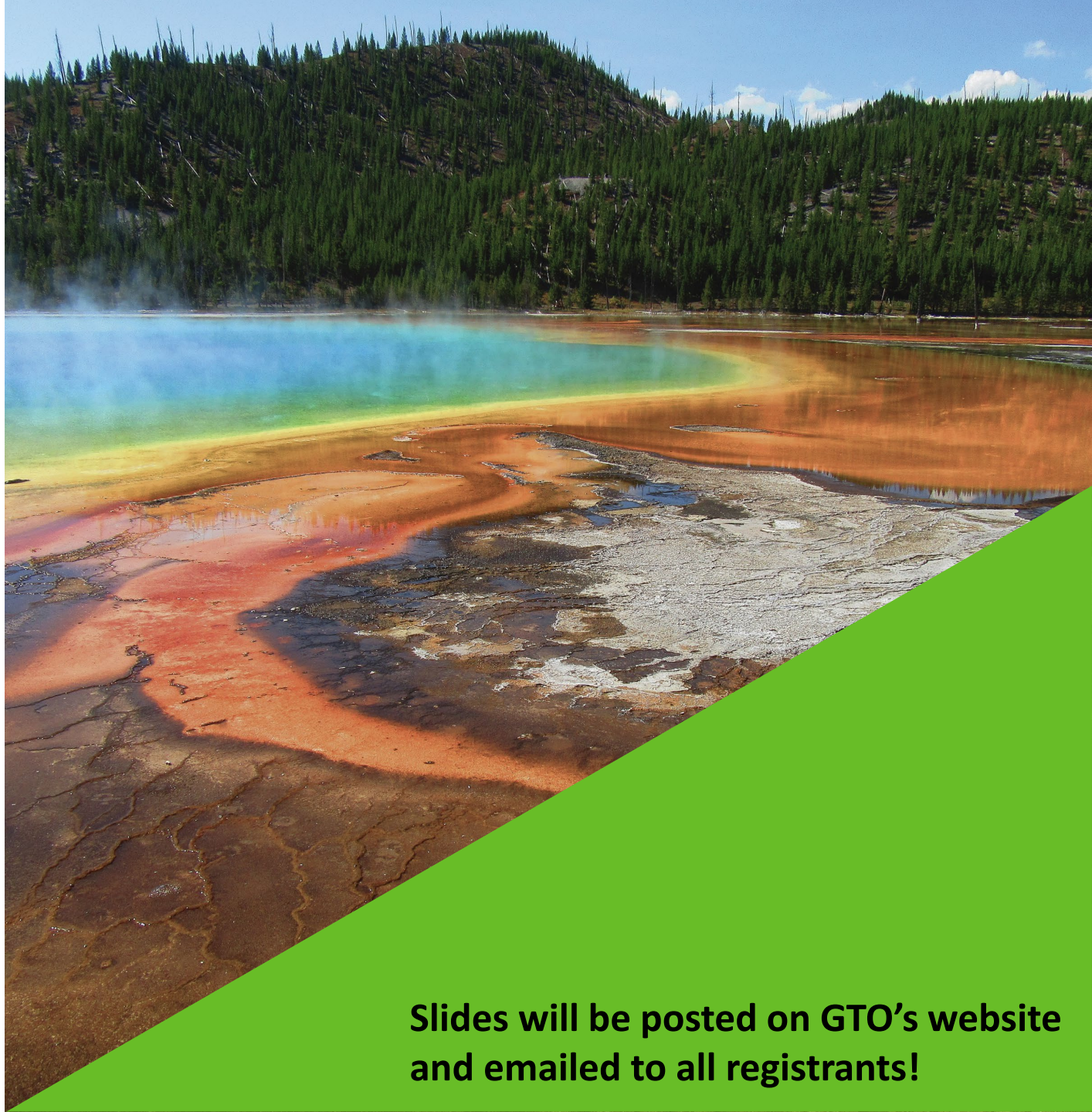

Slides will be posted on GTO's website and emailed to all registrants!

Thank you!

The **Geothermal Technologies Office (GTO)** works to reduce the cost and risk associated with geothermal development by supporting innovative technologies that address key exploration and operational challenges.

Scan the QR code to visit our website (energy.gov/eere/geothermal).