



**GEOHERMAL
RISING** CONFERENCE

Overview of the U.S. Department of Energy's Geothermal Technologies Office

Lauren Boyd, Acting Director and Enhanced Geothermal Systems Program Manager



Plenary

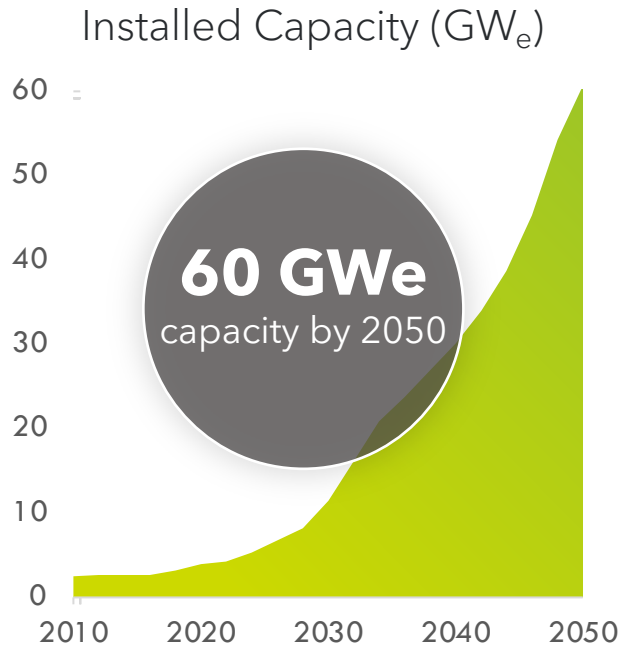
Overview of the U.S. Department of Energy's Geothermal Technologies Office

VISIT US AT BOOTH # 318 THIS WEEK!

Geothermal Can Do Big Things


ELECTRIC

 **8.5%** of all U.S. generation by 2050

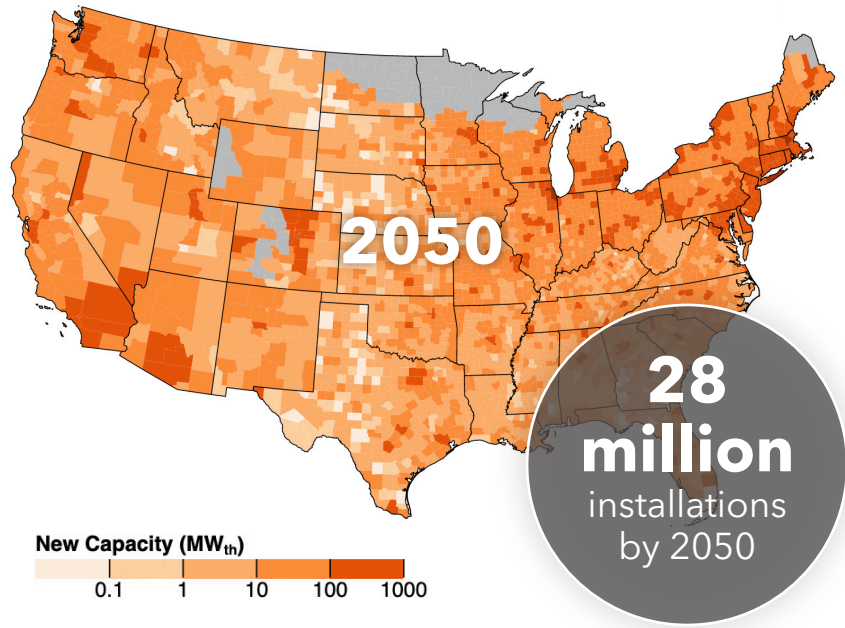


Source: Augustine et al. 2019

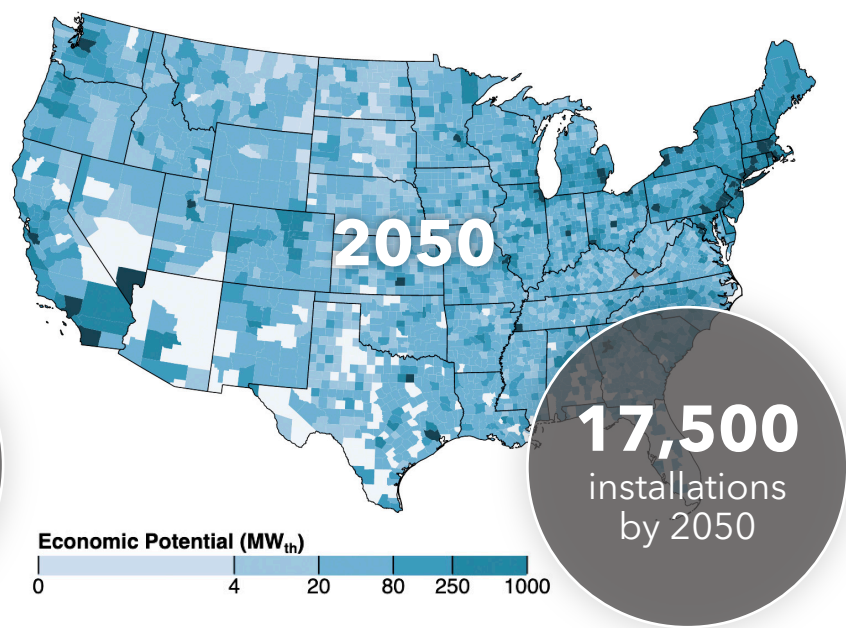
HEATING & COOLING

 **23%** of U.S. Heating and Cooling market by 2050

Geothermal Heat Pumps



District Heating



 up to **516 MMT**
of avoided CO₂e

 up to **1,281 MMT**
of avoided CO₂e

Total Emissions Reductions =
removal of **26 million** cars per year

Geothermal is So Hot Right Now!

[U.S. Energy Dept eyes \\$165 mln investment in geothermal, oil and gas group.](#)

Reuters. July 28, 2022.

[The \\$6 Million Plan: Department of Energy Invests in Geothermal.](#) *The Air*

Conditioning, Heating, and Refrigeration News. June 24, 2022.

[Yet Another Avenue for Trying To Make Federal Buildings Go Green.](#) *Federal News*

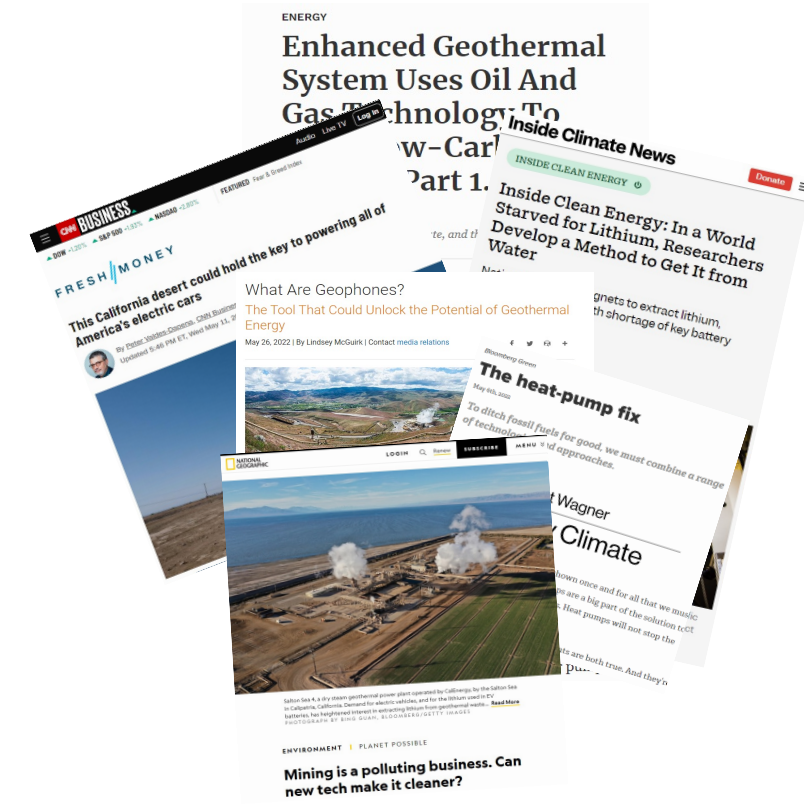
Network. July 11, 2022.

[US DOE Announces Funding for Community Geothermal Heating and Cooling.](#)

ThinkGeoEnergy. July 13, 2022.

[Five Finalists Announced for DOE Geothermal Lithium Extraction Prize.](#)

ThinkGeoEnergy. July 14, 2022.



Find out what Energy Secretary Jennifer Granholm thinks about geothermal in her geyser-side chat with GTO Director Susan Hamm (Spoiler alert: she wants deployment, deployment, deployment!) <https://bit.ly/GeyserSide>

[#GeothermallSoHotRightNow](#)

DOE/EERE News & Updates

Jolt Newsletter



• Sign up for the Weekly Jolt for the latest articles, announcements, and upcoming events from EERE!

energy.gov/eere/eere-news

Stay in the Know

- Follow DOE/Secretary Granholm/EERE on social
- Use #GeothermallSoHotRightNow

Get the hottest geothermal news from The Drill Down, the monthly newsletter from GTO! Sign up at geothermal.energy.gov



U.S. Department of Energy

- Twitter: [@ENERGY](https://twitter.com/ENERGY)
- Facebook: [@energygov](https://facebook.com/energygov)
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- Instagram: [@energy](https://instagram.com/energy)

Secretary of Energy

- Twitter: [@SecGranholm](https://twitter.com/SecGranholm)
- Facebook: [@SecGranholm](https://facebook.com/SecGranholm)
- Instagram: [@secgranholm](https://instagram.com/secgranholm)

DOE Office of Energy Efficiency and Renewable Energy

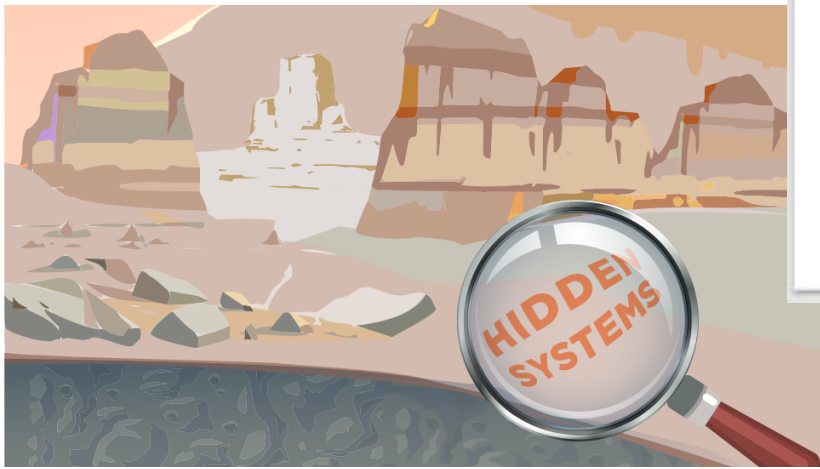
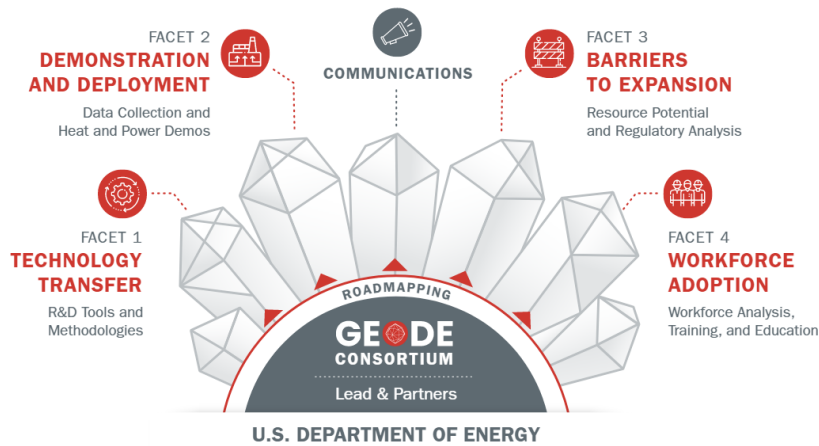
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Outreach and Stakeholder Engagement

GTO is using multiple tools and resources to help spread the word about geothermal energy and engage with stakeholders!

- Lithium Storymap
- Updated Website
- Stakeholder Toolkits
- Infographics
- Project Postcards
- Funding Opportunity Quick Guides
- The Drill Down



QUICK GUIDE
Community Geothermal Heating and Cooling Design and Deployment Funding Opportunity

Is Your Community Ready for Geothermal Energy?
Let's find out with a quick guide to navigate the Community Geothermal Heating and Cooling Design and Deployment Funding Opportunity Announcement (FOA)

The FOA will support the formation of U.S.-based community coalitions to develop, design, and install community geothermal heating and cooling systems, as well as to create related workforce training and identify and address environmental justice concerns. Applicants should be diverse teams with representatives for four key roles: community value, analysis and design, workforce, and deployment. Coalitions can be from urban, suburban, rural, remote, island, or island communities where geothermal can reduce dependence on fossil fuels such as natural gas or heating oil.

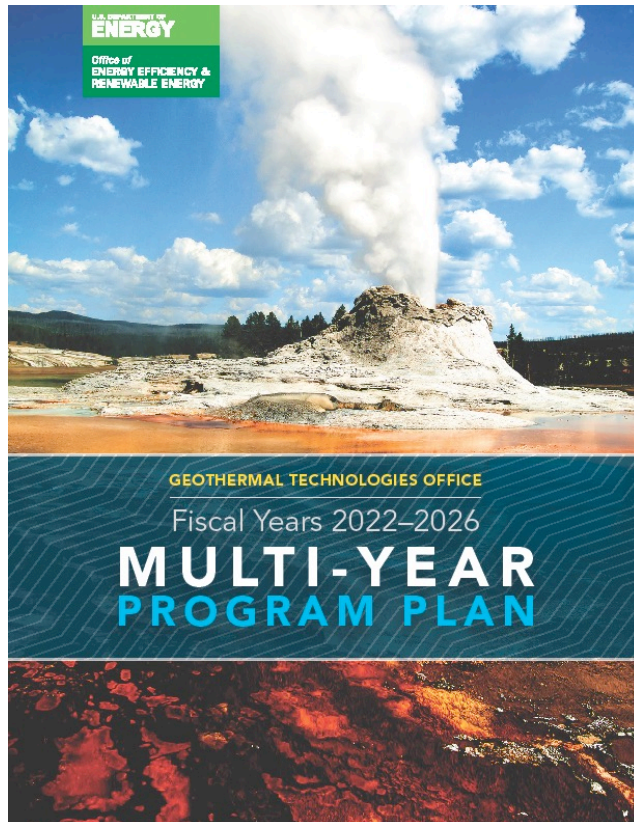
Key Dates:
- **FOA Period:** September 15, 2022 to October 11, 2022
- **Application Deadline:** October 11, 2022, 5:00 p.m. ET

Submit Your Application!
In BERE ARRANGE by 5:00 p.m. ET on October 11, 2022.

ENERGY | OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY
COMMUNITY TECHNOLOGIES OFFICE

Decarbonization Priorities: 5-Year Strategy for GTO

The **Multi-Year Program Plan** is a 5-year plan of activities GTO will pursue to support the growth and long-term contribution of geothermal energy to the U.S. electricity grid and American homes and buildings.



STRATEGIC GOAL 1

Drive toward a carbon-free electricity grid by supplying 60 GW of EGS and hydrothermal resource deployment by 2050.

STRATEGIC GOAL 2

Decarbonize building heating and cooling loads by capturing the economic potential for 17,500 GDH installations and by installing GHPs in 28 million households nationwide by 2050.

STRATEGIC GOAL 3

Deliver economic, environmental, and social justice advancements through increased geothermal technology development.

GTO's Multi-Year Program Plan



Exploration and Characterization

- Geophysics and Remote Sensing
- Geochemistry
- Geology



Accessing the Resource

- Drilling Time
- Well Components
- Enabling Technologies




Subsurface Enhancement & Sustainability

- Reservoir Response
- Reservoir Development and Management Technologies
- Reservoir Characterization and Monitoring




Resource Maximization

- Heating and Cooling
- Grid Valuation
- Thermal Storage and Utilization
- Value Streams



Data Modeling and Analysis

- Economic Analysis and Validation
- Data Collection, Access, and Analysis Tools
- Policy and Regulatory Analysis



Geothermal Integration & Awareness

- Machine Learning
- Advanced Manufacturing
- Technology Commercialization
- Energy Transitions
- Stakeholder Engagement

BIL EGS Demonstration projects

FORGE

Drilling Demos

FORGE

Drilling Demos

GTO Mission and Program Areas

The GTO mission is to increase geothermal energy deployment through research, development, and demonstration of innovative technologies that enhance exploration and production.



DATA, MODELING & ANALYSIS

Addresses non-technical barriers to geothermal deployment through environmental and resource assessments, data stewardship, and analytical tools that advance geothermal exploration and development.



LOW TEMPERATURE AND CO-PRODUCED RESOURCES

Focuses on applications used with lower-temperature (<300° F) geothermal resources. Investigates opportunities in hybrid systems, direct use, and geothermal energy storage.



HYDROTHERMAL

Aims to increase exploration and confirmation success rates and accelerate the identification and use of undiscovered geothermal resources in the United States.

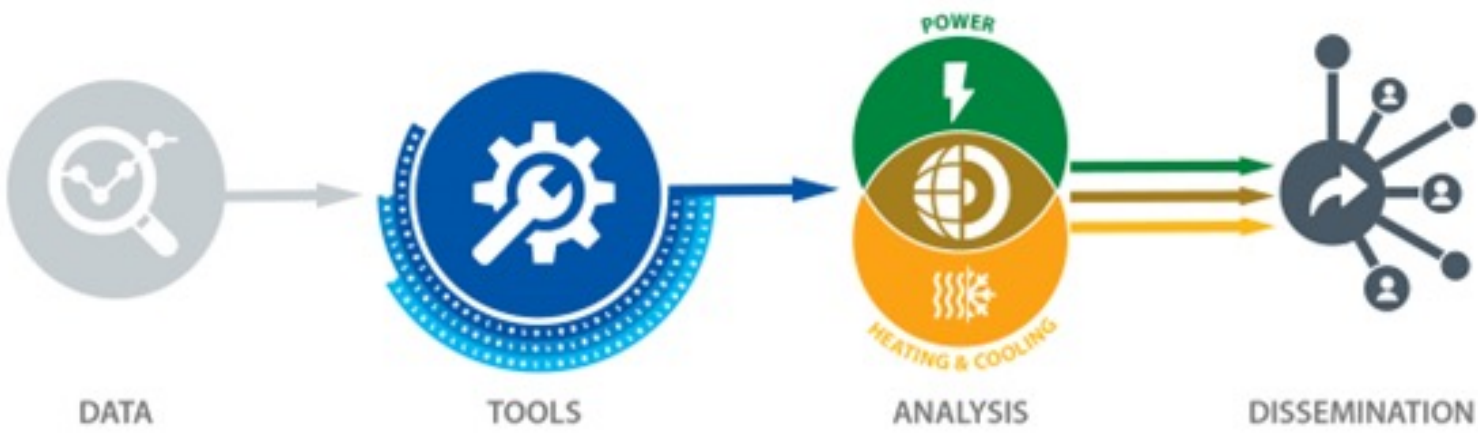


ENHANCED GEOTHERMAL SYSTEMS

Focuses on advancing EGS through reservoir characterization, enhancement, and sustainability.

GTO Data, Modeling, and Analysis

GTO's Data, Modeling, and Analysis (DMA) subprogram works to identify and address barriers to geothermal adoption and to validate and assess technical progress across the geothermal sector to inform the direction and prioritization of RD&D.



DMA R&D Priorities

- Grid value
- Analysis
- Data
- Outreach

GTO Data, Modeling, and Analysis

Key Activities

- Multiyear Analysis: Geothermal Valuation, Deployment, and Techno-Economic Analysis
- Hybrids Lab Call
- Improving Geothermal Permitting Timelines



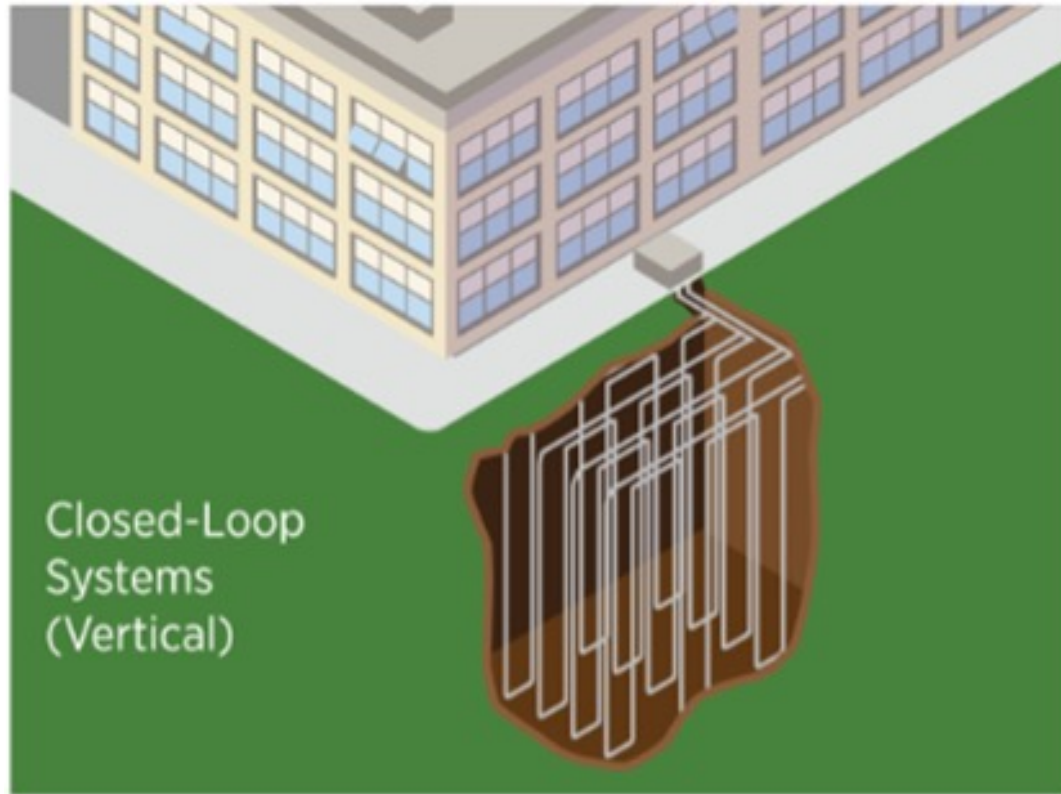
GTO Data, Modeling, and Analysis: GDR

- *Happy 10th Birthday, Geothermal Data Repository*
 - Publicly available resource for geothermal stakeholders to find data on reports and projects funded by GTO:
<https://gdr.openei.org/>
- Student Datathon Event
 - Participants solved a geothermal engineering problem using real field data from Frontier Observatory for Research in Geothermal Energy (FORGE)
 - Winners announced at PIVOT 2022





GTO's Low-Temperature and Co-Produced Resources subprogram focuses on the non-electric sector for heating and cooling as well as providing thermal storage for grid reliability.



Low-Temp and Co-Produced Resources R&D Priorities

- Deep Direct Use
- Energy Storage
- Collaboration with the Federal Energy Management Program and federal partners

GTO Low-Temperature and Co-Produced Resources

Key Activities

- Community Geothermal Heating and Cooling Design and Deployment Funding Opportunity
- FedGeo Partnerships (joint initiative with GTO's Data, Modeling, and Analysis subprogram)

GTO Hydrothermal Resources

GTO's Hydrothermal Resources subprogram focuses on R&D to accelerate the identification and utilization of the U.S. Geological Survey's estimated 30 GW of undiscovered hydrothermal resources in the western United States.



GTO's Hydrothermal R&D Priorities

- Exploration
- Drilling
- Critical materials

GTO Hydrothermal Resources

Key Activities

- GeoFlight
- Quantification of Lithium Resources in Salton Sea
- Drilling Technology Demonstrations
- INnovative Geothermal Exploration through Novel Investigations Of Undiscovered Systems (INGENIOUS)
- Basin & Range Investigations for Developing Geothermal Energy (BRIDGE)
- Lithium Prize



GTO Enhanced Geothermal Systems



GTO's Enhanced Geothermal Systems (EGS) subprogram focuses on engineering the subsurface to create geothermal reservoirs where they did not previously exist – unlocking untapped energy nationwide.



GTO's EGS R&D Priorities

- Frontier Observatory for Research in Geothermal Energy (FORGE)
- Zonal isolation
- EGS demonstrations

GTO Enhanced Geothermal Systems

Key Activities

- Frontier Observatory for Research in Geothermal Energy (FORGE)
- Geothermal Energy from Oil and gas Demonstrated Engineering (GEODE)
- Wells of Opportunity (WOO) / ReAmplify
- Geophone Prize
- Bipartisan Infrastructure Law EGS Demonstrations



EGS in the Bipartisan Infrastructure Law

SEC. 41007. Enhanced Geothermal Systems Demonstrations (\$84M)

- 4 demonstration projects, different geologic settings, potentially commercially viable locations
 - At least 1 east of the Mississippi River
- For power production or direct use (heating/cooling)



2022 Geothermal Rising Conference

Union Calendar No. 49
117TH CONGRESS
1ST SESSION
H. R. 3684
[Report No. 117-70]

To authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JUNE 4, 2021

Mr. DeFAZIO (for himself, Ms. NORTON, and Mr. PAYNE) introduced the following bill, which was referred to the Committee on Transportation and Infrastructure

JUNE 22, 2021

Additional sponsors: Mr. GARAMENDI, Ms. WILSON of Florida, and Ms. WILLIAMS of Georgia

JUNE 22, 2021

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italics*]

[For text of introduced bill, see copy of bill as introduced on June 4, 2021]





Thank You!

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