GEOTHERMAL RISING POLICY
POWERING OUR RENEWABLE FUTURE.

March 20, 2023

The Honorable Kay Granger
Chair
U.S. House Appropriations Committee
Washington, D.C. 20515

The Honorable Rosa Delauro
Ranking Member
U.S. House Appropriations Subcommittee
Washington, D.C. 20515

The Honorable Chuck Fleischmann
Subcommittee Chair
U.S. House Appropriations Subcommittee
On Energy and Water Development
Washington, D.C. 20515

The Honorable Marcy Kaptur
Ranking Member
U.S. House Appropriations Subcommittee
On Energy and Water Development
Washington, D.C. 20515

The Honorable Mike Simpson
Subcommittee Chair
U.S. House Appropriations Subcommittee
On Interior and Environment
Washington, DC 20515

The Honorable Chellie Pingree
Ranking Member
U.S. House Appropriations Subcommittee
On Interior and Environment
Washington, DC 20515

The Honorable Hal Rogers
Subcommittee Chair
U.S. House Appropriations Subcommittee
On Commerce, Justice, and Science
Washington, DC 20515

The Honorable Matt Cartwright
Ranking Member
U.S. House Appropriations Subcommittee
On Commerce, Justice, and Science
Washington, DC 20515

The Honorable Robert Aderholt
Subcommittee Chair
U.S. House Appropriations Subcommittee
On Labor, HHS, and Education
Washington, DC 20515

The Honorable John Carter
Subcommittee Chair
U.S. House Appropriations Subcommittee
On Military Construction and Veterans Affairs
Washington, DC 20515

The Honorable Debbie Wasserman-Schultz
Ranking Member
U.S. House Appropriations Subcommittee
On Military Construction and Veterans Affairs
Washington, DC 20515

Dear Members of the House Appropriations Committees:

Geothermal energy brings the stability and resilience we all seek in an increasingly complicated world. Geothermal technologies and applications are the solution policymakers are seeking to empower the oil and gas workforce into the clean energy economy while simultaneously drawing down the climate crisis.

Geothermal Rising (GR) is a community of 7,000 individuals and over 100 companies. As a nonprofit professional and educational association, we promote all geothermal technologies from ground source heat pumps to super critical hot rock and everything in between. As a community of geologists, climate activists, oil and gas professionals, drill rig operators, environmentalists, geochemists, subsurface reservoir modelers and more, GR represents and speaks for a united geothermal industry.

If we are to draw down the climate crisis and protect the jobs of the hydrocarbon industry, then we need to raise up the profile of geothermal technologies within the United States government and in state capitols around the country. To do so, GR recommends a series of impactful policy solutions for consideration in the FY 2024 congressional appropriations process that will launch the geothermal decade.

Department of Energy (DOE)

1. Risk Mitigation Programs for Exploration - $500,000,000 loan authority

   Commercial investment in new technology hinges on risk assessment. Removing risk from new geothermal ventures will facilitate faster commercial-scale deployment and, in turn, lower risk as more projects are completed. DOE and the Loan Program Office (LPO) would benefit from a $500,000,000 risk mitigation program specific for district cooling/heating and electricity drilling, exploration, and deployment projects. This geothermal risk mitigation program would provide loans to cover a portion of the drilling cost that can be converted into grants if development of the geothermal field is unsuccessful. This is a convertible guaranteed loan program for unsuccessful exploratory wells. To minimize losses, a premium can be charged to ensure a positive return based on risk and set limits on total wells covered and monetary claims to limit losses. This risk mitigation and management structure has been successfully implemented for geothermal projects in Kenya, Iceland, and Costa Rica, countries in the top five of geothermal energy production per capita.

2. Raise the Profile All Geothermal Technologies Within DOE - $450,000,000 in FY 2024

   Together, Congress's Bipartisan Infrastructure Law (BIL, P.L. 117-58) and FY 2023 appropriations provided a total of $202 million for geothermal research, development, and demonstration (RD&D) projects. While these investments are substantial and important, significantly more funding is needed to deploy these technologies at commercial scale and bring these technologies to market.

   The reliable and secure energy source that America needs is right underneath our feet. We urge Congress to help transform these thermal resources into clean, firm heat and power by providing the Geothermal Technologies Office (GTO) with $300,000,000 for geothermal RD&D activities in FY 2024. These investments are necessary to translate GeoVision's vision on geothermal capacity, energy security and job creation into reality.

   Geothermal's potential to address the climate crisis and become a significant part of the cooling/heating and electricity mix in the United States requires significant amplification of support within the federal government. We urge Congress to appropriate $50,000,000 to the Building Technologies Office (BTO) to promote the deployment of geothermal

(ground source) heat pumps. This funding will help remove institutional barriers within DOE that artificially separate and create unnecessary competition between air source and geothermal heat pumps.

Fund opportunities to secure the domestic supply chain for Organic Rankine Cycle (ORC) or turbine manufacturing through the Office of Manufacturing and Energy Supply Chains (MESC). A $100,000,000 program run through MESC would help initiate the process to secure this important energy manufacturing and supply chain limitation that exposes the United States to geopolitical risks.

Increased promotion and support through GTO, BTO, and MESC are essential to spearhead geothermal development. Raising the awareness and profile of geothermal within the government requires a broader view of geothermal technologies across DOE.

3. Office of Clean Energy Demonstrations Funding Expressly for Geothermal

   The Infrastructure Investment and Jobs Act (IIJA) appropriated $20 billion for demonstration projects, including those for hydrogen, direct air capture, and large-scale carbon capture through a newly established Office of Clean Energy Demonstrations (OCED). This funding provides vital capital to incentivize, commercialize, and scale public-private partnerships using the benefits of the free market to build major infrastructure projects that will expand clean energy and advance the energy transformation.

   The IIJA did not direct any funding specifically for geothermal technologies; yet geothermal provides the critical clean firm and renewable baseload energy that complements intermittent technologies, can be coupled to produce green hydrogen, and empowers direct air capture infrastructure. As part of its criteria for selecting applications for demonstration project funding, Congress should expressly clarify that OCED funding include all geothermal technology and applications as eligible to receive significant demonstration appropriations funded through the IIJA and OCED.

   We urge Congress to direct DOE that one of the hydrogen hubs be geothermal or create geothermal-specific funding opportunities for the demonstration of geothermal technologies including innovations for hydrothermal systems, enhanced (engineered) geothermal systems, closed-loop systems, supercritical hot rock systems, and deep drilling technologies with previously appropriated OCED funds.

4. Repurposing Abandoned Oil and Gas Wells - $12,000,000 in FY 2024

   Oil and gas wells can be retrofitted or reworked to provide geothermal cooling/heating for low-to-no-carbon direct use opportunities or generate power. $12,000,000 appropriated to the Office of Fossil Energy and Carbon Management (FECM) for grants to companies to repurpose oil and gas assets such as abandoned wells. Due to the years of development at these sites, the reservoir is well understood, thereby lowering risks and cost of exploration. This program could be managed and funded through FECM at DOE or the Environmental Protection Agency.

5. Center of Geothermal Excellence - $100,000,000 in FY 2024

   Create a public-private Geothermal Center of Excellence (GeoExcel) at a DOE national lab or establish a flagship national lab to rally geothermal research. A sustained and robust public-private research program is essential for innovation, and many agencies leverage private sector investment through publicly funded centers of excellence. Funding to establish a coordinated and cohesive geothermal research strategy. Currently, geothermal research is conducted haphazardly and incoherently across U.S. government agencies and DOE national labs such as Idaho National Lab, Sandia National Labs, Lawrence Berkeley Lab, U.S. Geological Survey, National Renewable Energy Lab, Brookhaven National Lab, Argonne National Lab, National Energy Technology Lab, and many more.

   To augment research within its national lab apparatus, DOE should establish GeoExcel to develop the technology necessary to produce low-cost geothermal power, cooling/heating, and mineral recovery such as lithium, manganese, gold, and silica. GeoExcel would also conduct education outreach and workforce development. GeoExcel would be a multibillion-dollar public-private partnership competitively awarded with multi-year funding. GeoExcel could interact closely with one or two DOE national labs as well as federal, state, regional, and municipal government agencies, research universities, community college, nonprofits, and the private sector.

6. Geothermal Public Private Partnership Venture Capital - $36,000,000 in FY 2024

   Create a new venture capital entity to accelerate commercialization of geothermal innovations by aggressively investing in geothermal-related technologies within the Office of Technology Transitions or the Advanced Research Projects Agency–Energy (ARPA-E). Initial public sector investment of $36,000,000 to begin the public-private partnership. Model it on the existing In-Q-Tel organization that has been very successful in driving national security technology development. This would be a new venture capital funding entity focused on commercializing Earth power technology innovation from U.S. government-funded research and development initiatives and on exploring technology solutions to problems that remain unsolved across government, industry, and society yet are critically important for dealing with climate change.

Department of the Interior (DOI)

- National Center to Review Geothermal Permit Applications - $15,000,000 in FY 2024

  Applications to conduct geophysical exploration are currently reviewed by the district office within the Bureau of Land Management (BLM) at DOI that has geographic jurisdiction over the specific geothermal project. Yet many district offices are unfamiliar with the technical aspects of geothermal development, causing significant delays in the review process. Fund $15,000,000 for a national office with a dedicated geothermal team to develop training materials and standard operating procedures and to provide technical support to district offices to ensure timely review of geothermal power and cooling/heating projects on federal lands. Programs that cross-train staff will also improve the ability to coordinate between different agencies and offices.

- Bureau of Indian Affairs (BIA) - $5,000,000 in FY 2024

  Develop a grant program for Tribal nations to develop geothermal resources on their lands, such as electricity generation, industrial and agricultural decarbonization, residential and commercial geothermal heat pumps or district cooling/heating installations, and recreation. $5,000,000 could be used to generate electricity or thermal energy for use by Tribes on their Tribal lands. Native Americans used geothermal resources for thousands of years before European settlement. Today, Tribal lands are the backbone of agriculture, industry, and power production in America. These BIA funds will facilitate the clean energy transition on Tribal lands using geothermal resources.

Department of Defense

- Military Construction - $20,000,000 in FY 2024

  In an increasingly contested clean energy economy, we should build secure and resilient military infrastructure using local Earth energy technologies directly on military installations. Develop geothermal power and cooling/heating projects on military installations across the United States and abroad through a $20,000,000 investment to support geothermal deployment on military installations. DOD can use the funding to offset its massive carbon footprint from 500 fixed installations, which includes 300,000 buildings. This investment will help all service branches and DOD reach the Biden Administration's renewable energy generation goals. The Air Force recently selected two military installations to deploy geothermal energy with the understanding that energy and mineral security are paramount for our national security. This funding begins the vital transformation to secure the energy infrastructure of military installations through energy independence and protect our national security interests.

Department of Commerce

- Economic Development - $10,000,000 in FY 2024

  Establish a $10,000,000 grant program to be implemented by the Department of Commerce Economic Development Administration. Grants would be made for high- and low-temperature geothermal developers to partner with municipalities, electric or energy cooperatives, community choice aggregators, and public utilities servicing America's communities to develop geothermal resources. It is important that the clean energy transition equitably and justly empower rural America along with urban communities.

Department of Agriculture

- Rural Development - $15,000,000 in FY 2024

  Establish a $15,000,000 Department of Agriculture Rural Development grant program to transition agricultural and industrial cool/heat applications to geothermal resources. This funding can be used to decarbonize cooling and heating systems used in the agricultural sector (e.g., food processing, pulp and paper manufacturing, vegetable dehydration,

dairy and sugar processing, aquaculture, greenhouses).

Department of Education

- Community Colleges - $9,000,000 in FY 2024

  The future of the clean energy transformation rests in the education of Americans and a smooth workforce transition of oil and gas professionals into the clean energy economy. Community colleges play a vital role in this transition. Allocate $9,000,000 for the Department of Education to create a pilot grant program for technical and vocational programs to develop and build geothermal-specific skill sets and needs into curriculums. These geothermal programs will build upon and expand existing programs such as drill rig crew member training programs like that at Houston Community College in Texas or cooling/heating apprenticeship programs like those at Mercer Community College in New Jersey or Foothills College in California. The objective of these grants is to amplify the capabilities of geothermal technologies and deepen the knowledge of professionals who install, sell, market, or manufacture products that could transition to geothermal technologies and away from burning fossil fuels.

Smithsonian Institution

- Smithsonian Institution - $3,000,000 in FY 2024

  The story of geothermal runs deep in the United States, yet is missing in history books and museum exhibits. Funding to properly and accurately share the geothermal narrative at the Smithsonian Institution is critical to familiarize the public with the history and myriad of applications from this renewable and clean energy technology. Accurate depictions of geothermal should be developed in multiple museums and reflect the latest innovations as well as historical history of geothermal technologies in the United States.

Export–Import Bank

- Exporting Geothermal Services - $10,000,000 loan authority

  The United States could position itself as an exporter of geothermal technologies, services, and knowledge. Over two dozen geothermal startups have been founded in the United States since 2020. This startup ecosystem can be leveraged and promoted by building geothermal knowledge within agencies such as the Ex-Im Bank to empower geothermal development and deployment in America and abroad.

Conclusion

Geothermal Rising is the global leader for the advancement of geothermal energy. Our mission is to support the advancement of American-made geothermal energy, leveraging underground thermal resources to generate 24/7 clean power; creating well-paying jobs; and growing a key part of the strong, secure, and reliable grid of the future. Geothermal Rising members include individuals, corporations, universities, national laboratories, government, and other nongovernmental organizations. Our members are addressing energy security by adding more domestically-produced energy to the grid every year.

Geothermal can be an indispensable part of our electricity mix of the future, providing firm clean power and complementing variable generation sources such as solar and wind to provide Americans with constant, affordable, and clean electricity. According to GTO's 2019 GeoVision study, with federal investment and public private partnership, American geothermal energy generation capacity could top 120 GW, or nearly 20% of the country's total electricity generation, by 2050.

And, in early 2023, the National Renewable Energy Laboratory released a new report that increased this potential geothermal generation capacity to roughly 230 GW, reflecting major progress in geothermal technologies across just the last few years. These advances reflect the value and potential impact of federal investment and public-private partnership focused on geothermal technology development.[1]

Investments in geothermal will pay off for generations. The oldest thermal energy network, built in 1892, is still in operation today in Boise, Idaho. Electricity is still being produced both at the Larderello, Italy power plant, 120 years after this power plant first lit five light bulbs, and 63 years after electricity was first generated at the Geysers power plant in Santa Rosa County, California. Investments in geothermal today will benefit American generations decades into the future.

We appreciate your continued support for geothermal energy and look forward to working with you to support the investments necessary to create jobs by bringing these innovative and reliable technologies to market.

Sincerely,

Bryant Jones
Executive Director
Geothermal Rising
www.geothermal.org
+1 (530) 758-2360
bryant@geothermal.com

About Geothermal Rising: *Geothermal Rising (GR) is the largest and oldest geothermal membership organization in the world. GR serves to build community and empower the geothermal industry by representing all geothermal technologies and applications from ground source heat pumps to supercritical hot rock and everything in between. GR is a nonprofit educational association, community organizer, and think tank. GR actively seeks to amplify its role as a primary professional and educational association for the international geothermal community and serve as a focal point for continuing professional development for its members and external audiences through its outreach, education, information transfer and education services. https://geothermal.org/*

[1] https://www.nrel.gov/docs/fy23osti/84822.pdf

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The Honorable Susan Collins
Vice Chair
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The Honorable Dianne Feinstein
Subcommittee Chair
U.S. Senate Appropriations Subcommittee
On Energy and Water Development
Washington, D.C. 20510

The Honorable John Kennedy
Ranking Member
U.S. Senate Appropriations Subcommittee
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The Honorable Jeff Merkley
Subcommittee Chair
U.S. Senate Appropriations Committee
On Interior and Environment
Washington, DC 20510

The Honorable Lisa Murkowski
Ranking Member
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Washington, DC 20510

The Honorable Jeanne Shaheen
Subcommittee Chair
U.S. Senate Appropriations Subcommittee
On Commerce, Justice, and Science
Washington, DC 20510

The Honorable Jerry Moran
Ranking Member
U.S. Senate Appropriations Subcommittee
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Washington, DC 20510

The Honorable Tammy Baldwin
Subcommittee Chair
U.S. Senate Appropriations Subcommittee
On Labor, HHS, and Education
Washington, DC 20510

The Honorable Shelly Moore Capito
Ranking Member
U.S. Senate Appropriations Subcommittee
On Labor, HHS, and Education
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The Honorable John Boozman
Ranking Member
U.S. Senate Appropriations Subcommittee
On Military Construction and Veterans
Affairs
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domestically-produced energy to the grid every year.

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