

FOR IMMEDIATE RELEASE January 24th, 2023 at 12:00pm ET

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First-of-its-kind Cross-Collaborative Study Highlights Growing Momentum for Geothermal Energy in Texas

AUSTIN (January 24, 2023)—After a multi-year, multi-disciplinary, cross-collaborative effort, researchers at five Texas universities, the University Lands Office, and the International Energy Agency published a landmark study, "<u>The Future of Geothermal in Texas: The Coming Century of Growth & Prosperity in the Lone Star State.</u>" Collaborators include researchers from multiple research institutions across the State, including The University of Texas at Austin, Southern Methodist University, Rice University, Texas A&M University, and the University of Houston.

The fifteen-chapter study includes analyses of the location and quality of Texas geothermal resources, evaluations of technology developments, the role of the oil and gas industry in achieving growth and scale, as well as environmental, regulatory, economic, and legal issues pertinent to the growth of the geothermal industry, both in Texas and globally. The report is funded and supported by the <u>Cynthia and George Mitchell Foundation</u>, <u>The Educational Foundation of America</u>, and <u>Project InnerSpace</u>.

The study evaluates the size and potential scale of geothermal – the naturally occurring heat energy in the Earth's subsurface – as an abundant clean energy resource in the state of Texas, as well as its potential to scale globally over the coming decades. Most importantly, it provides a scientific basis for informed decision-making as entities begin to consider the increased development of geothermal in Texas.

Geothermal energy is ubiquitous within the Earth's subsurface. However, current geothermal energy production is limited to places where, by chance, the right conditions – heat, permeability, and the presence of substantial amounts of water – naturally occur near the surface. But geothermal resources are literally everywhere beneath the surface, and research shows that new



technologies and techniques can be leveraged to harvest this energy source anywhere in the world.

As the report details, a flourish of geothermal startups have launched in Texas in recent years. Buoyed by oil and gas investments and primarily led by lifelong oil and gas industry veterans, these companies are moving quickly to demonstrate entirely new scalable geothermal concepts. Several of these demonstrations are planned or are ongoing in Texas, and are supported by oil and gas majors via investments.

"Nabors views the geothermal opportunity as a possibility to repeat the scale and impact of unconventionals, but for decarbonized energy. Our investments, both internal and in our portfolio of startups, represent our commitment to innovating the future of energy while staying committed to our core competencies," noted Siggi Meissner, President, Energy Transition and Industrial Automation at Nabors Industries.

The increasing engagement of oil and gas entities in geothermal is both reflected in and explained by outcomes of the study. Authors report that oil and gas technology and knowledge transfer into geothermal is projected to deliver 20 to 43 percent in cost savings to geothermal, using existing technologies in use in the oil and gas industry today, and that nearly 70% of oil and gas entities engaged with the study reported that there are no geothermal related technical challenges that the oil and gas industry cannot solve.

"As an energy technology company, Baker Hughes has supported the geothermal sector for more than 40 years, providing technology and expertise for some of the world's most innovative projects. Baker Hughes continues its strategic focus on new energy frontiers, including geothermal – launching into the next 40 years and beyond," said Ajit Menon, Baker Hughes Vice President for Geothermal.

Researchers in the study calculated multiple growth scenarios for geothermal development, both globally and in Texas, placed in the context of the scale of the oil and gas industry. They concluded that drilling 1.4 million wells globally between 2030 and 2050 could meet 77 percent of the world's projected electricity demand, while enabling Texas to decarbonize 100 percent of its grid. "The outcomes of this study are big - but so is the oil and gas industry - and the role of the industry is what has been the missing link in prior assessments about geothermal and its potential to scale," noted Jamie Beard, Principal Investigator and Editor of the study. "To achieve the outcomes reported, we would need an Apollo-style mobilization of effort globally, but that is what climate change requires of us. We've done Apollo before - let's do it again."



Environmental and climate groups are increasingly engaging with geothermal as a potentially high-impact and fast path to global decarbonization. Clean Air Task Force, for example, launched a team focused on a type of deep geothermal called SuperHot Rock in 2022. "For too long, geothermal has been underestimated as a critical climate solution, noted Philip Ball, Chief of Geothermal Innovation at Clean Air Task Force. "Advanced, scalable geothermal concepts, like those discussed in this Report, can play a critical role in decarbonizing the global energy system and providing abundant carbon-free energy virtually everywhere in the world. It's time environmental groups recognize the opportunity geothermal presents, and put themselves in a position to seize it."

Geothermal sits in a rare political and social space in an increasingly polarized political and policy climate, where environmental and climate impact groups and oil and gas entities can get together and support the same cause.

"This geothermal study presents a rare opportunity in polarized debates about the future of energy where renewable energy proponents and the oil and gas industry can support the same cause," said David Monsma of the Austin-based Cynthia and George Mitchell Foundation, a study funder. "It presents an overdue energy policy pathway toward increasing firm clean electricity that should bring everyone to the table."

"The Future of Geothermal in Texas" will serve as a model for a program supported by Project InnerSpace to develop similar, state-specific geothermal roadmaps across the U.S. where there is current oil and gas industry engagement, and the presence of under-studied and overlooked geothermal resources. Projects in Idaho, Oklahoma, Louisiana, North Dakota, South Dakota, and Utah will launch in the first half of this year.

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About the Cynthia and George Mitchell Foundation: The Texas-based Cynthia and George Mitchell Foundation (CGMF) is a grantmaking foundation that seeks innovative, sustainable solutions for human and environmental challenges. The foundation works as an engine of change in policy and practice in Texas, supporting high-impact projects and practices at the nexus of environmental protection, social equity, and economic vibrancy. <u>cgmf.org</u>

About the Educational Foundation of America: The Educational Foundation of America is a family foundation that envisions a society in which every person has a meaningful voice in an inclusive democracy, with unrestricted access to full reproductive freedom, and lives in creative, thriving communities on a healthy, regenerative planet. <u>theefa.org</u>

About Project InnerSpace: Project InnerSpace is a 501(c)3 non-profit focused on expanding the use of geothermal energy globally. We combine the voices of visionaries, entrepreneurs, and disruptors with the breakthrough expertise of geologists, drilling experts, and well engineers to build a future where geothermal will enable the world to meet its climate and energy goals. <u>projectinnerspace.org</u>