FY23 Q2 Quarterly Stakeholder Script (April 27, 2023)

Time (p.m. ET)	**Topic**	**Speaker(s)**	**Slide # and Talking Points**
1:30-1:31	Log-in period		N/A
1:31-1:32	Welcome	Sudeep	**Slide 1:** Good afternoon, everyone—or good morning or evening, depending on where you are! I'm Dr. Sudeep Kanungo, and I'll be your host and moderator today. I am a Science and Technology Policy Fellow from AAAS, which is the American Association for the Advancement of Science, doing my first year of fellowship at the Geothermal Technologies Office in Washington, D.C. I am a geoscientist from the oil and gas industry, with a domain of expertise in integrated stratigraphy, paleoenvironments, and paleoclimate studies. Before joining GTO, I was a Research Asst. Professor at the Energy and Geoscience Institute in the University of Utah, Salt Lake City. I am excited to be working in the geothermal space in GTO and grateful for this opportunity to interact with all of you through this webinar. On behalf of the entire GTO team, I'd like to thank you for joining our quarterly webinar. We look forward to these webinars and the opportunity to share all the great things happening around GTO and in geothermal energy.
1:32-1:33	Agenda Overview	Sudeep	**Slide 2:** Here is our agenda for today. We'll start off with news and updates from the Department of Energy and the Office of Energy Efficiency and Renewable Energy, and then move on to GTO-specific news and updates. We'll highlight some fiscal year 2024 budget requests and then get program and project updates from our GTO program managers. We'll finish off with a question-and-answer session, so be sure to enter questions any time in the Q&A tab of Zoom so we can address them at the end. We have a lot of great updates to share today, so let's jump right in!

1:33-:135	DOE/EERE News Updates	Sudeep	**Slide 3:** First, some highlights from the Department of Energy, DOE, and the Office of Energy Efficiency and Renewable Energy, or EERE, of which GTO is part. First, some highlights from DOE's Office of Clean Energy Demonstrations, or OCED. The office currently has several initiatives open that include geothermal as eligible technologies. The first is a funding opportunity to demonstrate the technical and economic viability of deploying clean energy on operating mine lands, as well as those that are abandoned or inactive. They intend to fund up to five clean energy projects. OCED also has two initiatives underway to help support rural and remote communities. The first is an open funding opportunity that will provide $5 million to $10 million to help rural or remote communities invest in their energy infrastructure. The second is a $15 million prize that challenges individuals and organizations to develop partnerships or innovative financing that can help rural and remote communities improve their energy systems and advance clean energy demonstrations. DOE's Office of Manufacturing and Energy Supply Chains also has an open $250 million funding opportunity aimed at accelerating electric heat pump manufacturing in America. This is the first funding opportunity announcement stemming from DOE's new authorization, invoked by President Biden last summer, to use the Defense Production Act to increase domestic production of five key clean energy technologies, including heat pumps. Deputy Secretary of Energy David Turk announced the funding opportunity while on a tour of Benjamin Banneker High School in an underserved community in Washington, D.C., where geothermal provides heating and cooling for the 178,000-square-foot magnet school. Eligible projects include those that construct new facilities for manufacturing as well as those that expand or retrofit existing facilities, so definitely check it out if you are in the manufacturing space. Finally, we wanted to note that DOE published an Earth Day retrospective last week—check it out for updates on more of the initiatives and activities DOE and the Administration are taking to support the country's clean energy future!
1:35	DOE/EERE News Updates	Sudeep	**Slide 4:** And just a note that you can stay informed regularly about all the news coming out of DOE and EERE by signing up for EERE's Weekly Jolt and follow Secretary Granholm, DOE, and EERE on social media using the information and handles shown here. Also, don't forget to use GTO's hashtag, Geothermal Everywhere, when you post your news so that we can all stay connected.

1:35-:136	GeothermalEverywhere	Sudeep	**Slide 5:** Now, shifting gears a bit, we are excited to highlight our first Spanish-language news features, in Telemundo 48 in the Bay Area, California, and on The Weather Channel en Español. GTO's Jessica Quintanar was interviewed for the pieces, both of which feature overarching discussions of geothermal and its benefits to the nation. We also wanted to highlight a flurry of geothermal-related activity in DOE. In recent months, not only has Deputy Secretary Turk toured Benjamin Banneker High School, but Secretary Jennifer Granholm met with our FORGE team in Utah, Secretary Granholm and Second Gentleman Doug Emhoff hosted a geothermal roundtable with Tribal Nation representatives in Oklahoma, Deputy Secretary Turk toured the geothermal heat-pump system at St. Patrick's Cathedral in New York City, and Secretary Granholm attended CERAWeek, highlighting geothermal as an important technology in the clean energy transition. Geothermal is definitely a hot topic at DOE!
1:36-1:37	GeothermalEverywhere	Sudeep	**Slide 6:** We've also got news and happenings on the international front. In March, Secretary Granholm visited Croatia for the P-TECC (Partnership for Transatlantic Energy & Climate Cooperation) Ministerial Meeting, where she announced a new Geothermal Working Group that was spearheaded and developed by GTO's Data, Modeling, and Analysis Program Manager Sean Porse. Secretary Granholm also met with Japan's Trade & Industry Minister, Yasutoshi Nishimura, and signed an agreement for the two countries to collaborate on research, development, and exchange of information on geothermal projects in the United States, Japan, and other countries. And, finally, GTO Acting Director Lauren Boyd and Hydrothermal and Low-Temp Program Manager Alexis McKittrick attended the International Energy Agency's Geothermal Working Group meetings in the Netherlands, sharing updates about GTO's work, including efforts in reservoir thermal energy storage.
1:37-1:38	Geothermal in the News	Sudeep	**Slide 7:** Adding to all the DOE and GTO activities and news is a continued wave of media interest in geothermal. The articles listed here are just a handful of recent pieces, including one in Esquire that featured our own Lauren Boyd. One particularly great item to note about these articles is that they cover the electricity production as well as heating and cooling, showing that there's interest across the spectrum of geothermal technologies. If you'd like to stay apprised of geothermal in the news, you can sign up for GTO's Drill Down newsletter, where we feature geothermal news articles every month.

1:38-1:40	Events	Sudeep	**Slide 8:** Speaking of happenings, here are some highlights of recent and upcoming GTO events. In February, the Western Governors Association's Heat Beneath Our Feet Initiative held a meeting at the National Renewable Energy Lab in Golden, Colorado, where state and federal officials, industry leaders, and utility representatives convened to discuss the future of geothermal. The initiative has also hosted several webinars, the most recent of which featured GTO's Sean Porse discussing federal incentives and support for geothermal technologies, such as tax credits in the Inflation Reduction Act. The WGA will host its final webinar on May 3, discussing geothermal heat pumps, so look that up if you are interested in attending. We also want to note that GTO will host its Enhanced Geothermal Shot™ Virtual Summit on May 11, and registration is open. The Enhanced Geothermal Shot™ aims to reduce the cost of enhanced geothermal systems, or EGS by 90%, to $45/MWh by 2035. At the Summit, we'll convene a range of panelists and experts to provide an overview of EGS and why expanding it is essential, discuss how the geothermal community can work together towards this goal, and what technology pathways are essential to get there. The agenda includes: • Introductory plenaries • An overview of DOE's Energy Earthshots™ initiative • EGS in context • Environmental justice and geothermal energy • The geothermal energy workforce • DOE-wide efforts in support of the Enhanced Geothermal Shot™ and • The Enhanced Geothermal Shot™ roadmap We hope that you will join us! You can register and get more information about the agenda and speakers at the energy.gov link on the slide, or register directly at the bitly link. And, finally, GTO's Arlene Anderson will be presenting at this year's IDEA (International District Energy Association) annual conference in Chicago, in particular highlighting our community geothermal selections.
1:40	Fact Sheets	Sudeep	**Slide 9:** Finally, before we shift to GTO budget and program updates, we wanted to highlight the availability of two new fact sheets we've developed to help spread the word on geothermal. We have one focused on heat pumps and a second that provides a "geothermal 101" overview. You can access the fact sheets on our website and we hope you'll read them and share with others! With that, I'll turn things over to Triphelia Hunter from GTO's operations team to walk through some highlights from GTO's budget.

1:40-1:42	GTO Budget Highlights	Triphelia	**Slide 10:** Thanks Sudeep, and hello everyone—I'm happy to be here to discuss GTO's budget. First, I'll cover our current fiscal year, where we've received an enacted budget of $118 million, split amongst GTO's four program areas as shown here. We have a number of crucial initiatives under way or planned with this FY23 budget including: • the Geothermal Energy from Oil and gas Demonstrated Engineering, or GEODE initiative • continued work on the Federal Geothermal **Partnerships** project and • research on lithium from geothermal brines, • our community geother**mal** heating and cooling initiative and • research on reservoir thermal energy storage, • and strategic analysis and permitting work. For fiscal year 2024, GTO has requested $216 million. Pending Congressional appropriations on that request, **work** we hope to accomplish in FY24 would include: • Enhanced Geothermal Shot well construction research, • Enhanced Geothermal Shot R&D on hardened materials, • expanded exploration for hidden geothermal systems, • thermal energy storage resource assessments; and • work to better represent geothermal technologies in modeling platforms, to ensure we can accurately assess the value and impact of geothermal power generation as well as heating and cooling.
1:42		Triphelia	**Slide 11:** Now I'll turn things over to GTO's acting EGS program manager, Kevin Jones, for an update on our enhanced geothermal systems research.

1:42-1:43	EGS: FORGE	Kevin	**Slide 12:** Thank you, Triphelia. I'm happy to be here to cover a few quick updates for the EGS program. I'm gonna start with the ongoing work at the Frontier Observatory for Research in Geothermal Energy, or FORGE. I'm pleased to announce that the FORGE team just spudded its 16B producer well yesterday. This well is planned to follow a very similar trajectory to the 16A injector well, but will be offset vertically by approximately 300ft. The 16B well will intersect the fractures from the previous stimulation of the 16A well that took place ~ 1 year ago. The completion of the 16B well will create an EGS injector-producer well pair at FORGE. The FORGE team will also conduct some interference tests to evaluate the subsurface connections between these two wells. Future operations at the FORGE site that will occur later this year, or early next year, include additional stimulations of the injector well, 16A, and the new producer well, 16B. These additional stimulations will allow the FORGE team to improve subsurface flow pathways and do flow testing between the two wells to measure heat extraction and power production potentials. The drilling is an exciting development and will add substantially to our understanding of EGS wells and reservoirs, so stay tuned as GTO and FORGE report outcomes. The FORGE team is also reviewing applications to its second R&D solicitation, targeting topics like induced seismicity protocols, high temperature proppants, and other topics. Selections are expected around June.
1:43-1:44	EGS: BIL EGS Demos and Datathon		**Slide 13:** As many of you know, our Bipartisan Infrastructure Law EGS pilot demos funding opportunity is currently open and we wanted to remind anyone who submitted a letter of intent that full applications are due June 16. Also, remember that these demos are on a rolling funding opportunity, so sign up for GTO's Drill Down newsletter to ensure you receive notice when the next round opens. Finally, I wanted to quickly mention that the 2023 Society of Petroleum Engineers Geothermal Datathon is under way. The Datathon challenges participants to use machine learning methods to create predictive models that can aid future geothermal energy production, using one of the largest geothermal datasets assembled and never-before-analyzed data from the FORGE site. This year's Datathon runs through May 31.
1:44		Kevin	**Slide 14:** Speaking of the Datathon, I'll now turn things over to Sean Porse, program manager for our data, modeling, and analysis team—which spearheads GTO's role in the challenge.

1:44-:146	DMA: Nontechnical Barriers	Sean	**Slide 15:** Thanks, Kevin. I'll start by covering some recent activities related to nontechnical barriers to geothermal deployment, such as permitting, land access, and valuation of geothermal. GTO has supported several recent national lab projects to analyze some of these barriers, and the resulting reports are highlighted here. These include the National Renewable Energy Lab's fact sheet and report summarizing findings and best practices to reduce project delays, as well as a report from Lawrence Berkeley National Lab detailing analysis of price data from power purchase agreements and wholesale energy and capacity markets to understand geothermal's relative value trend in the electricity sector. We also just released the summary of findings from our Geothermal Interagency Collaboration Task Force. The report captures key themes from the Task Force's work on geothermal permitting, extracted from listening sessions with Tribal Governments, and in meetings and stakeholder forums with environmental groups, industry, and state and federal agencies. The follow-on from this work is a newly formed Bureau of Land Management and GTO-co-led Interagency Geothermal Permitting Working Group, which will work on creating action for improving geothermal project permit coordination. We look forward to discussing progress of this Working Group at future Quarterly Webinars!
1:46-1:47	DMA: Geothermal Collegiate Competition	Sean	**Slide 16:** I also want to highlight our next Geothermal Collegiate Competition, or GCC. In the GCC, students address a geothermal topic that changes with each competition. Previous competitions have covered topics ranging from direct-use and community geothermal, to geospatial mapping and infographics about geothermal. The goal of the competition is to give students real-world exposure to the geothermal field and a chance to engage with industry and their local communities. Students from all majors and career paths are encouraged to participate. Registration will open this summer for the fall competition, so keep your eyes peeled for an announcement soon and be sure to register or share the info with interested students.
1:47		Sean	**Slide 17:** And now I'll turn it to Alexis McKittrick, program manager for both our hydrothermal program and our low-temperature and coproduced resources program.
1:47-1:48	Hydrothermal: GEODE and Drilling Demos	Alexis	**Slide 18:** Thanks, Sean. Happy to be here and I'll cover some updates from the hydrothermal program first. I know many of you are probably waiting for an update on our Geothermal Energy from Demonstrated Oil and gas Engineering, or GEODE, funding opportunity. I'm not able to share any specifics about exactly when, but I can update you that we expect an announcement soon. If you haven't already, please sign up for our email updates or The Drill Down newsletter so that you won't miss the news! And our drilling demonstrations projects, which we selected in December, are nearing kick off. Under this initiative, we are funding two projects—one in Colorado and one in California—up to $20 million to reduce the cost of developing geothermal by improving drilling rates at least 25%. We're looking forward to seeing these projects get underway and keeping you all updated on their work.

1:48		Alexis	**Slide 19:** Okay, now we'll shift to the low-temperature portfolio, where we have exciting news that I know many of you have been waiting for.
1:48-1:49	Low-Temp: FedGeo Partnerships	Alexis	**Slide 20:** First, a quick update on our Federal Geothermal Partnerships initiative, or FedGeo. Under FedGeo, we've partnered with the Federal Energy Management Program—or FEMP—to help expand geothermal heating and cooling at federal sites nationwide. In March, we announced the first two federal sites selected to participate—the U.S. Army Garrison Detroit Arsenal in Michigan and the U.S. Military Academy at West Point in New York. With support from a team led by Oak Ridge National Lab, both sites will assess whether to pursue a geothermal heating and cooling system at these locations. FEMP - can then provide support related to identifying the optimal financing mechanism for on-site project development.
1:49-1:50	Low-Temp: Community Geothermal Overview	Alexis	**Slide 21:** Okay, now on to some really big news that we know stakeholders have been waiting for! Many of you are aware of our community geothermal funding opportunity, which we released last July. As this slide highlights, we have numerous goals for this work, including: • Deploying new or retrofitted community-scale geothermal or geothermal-hybrid heating and cooling systems • Addressing environmental justice conditions that exist in communities • Supporting communities to develop career and technical education for geothermal systems • Developing a base of U.S. case studies about community-scale geothermal projects, which we can then leverage to help communities nationwide deploy these systems, and • Publishing data about domestic geothermal district- and community-scale heating and cooling systems that helps us illustrate the success of these systems in different environments and geographies.
1:50-1:51	Low-Temp: Community Geothermal Overview		**Slide 22:** As indicated in the graphic here, this funding opportunity required coalitions that included community voice, design and analysis, workforce, and deployment expertise; the coalitions came together to propose geothermal heating and cooling systems that supply at least 25% of the heating and cooling load in their proposed community. GTO will help the selected coalitions implement community-scale geothermal systems that can reduce energy burdens, fossil fuel use, and carbon emissions, while creating local jobs. The work is also part of President Biden's Justice40 initiative, which calls for federal agencies to work with states and local communities to deliver at least 40 percent of the overall benefits from federal investments in climate and clean energy to disadvantaged communities. This initiative is a first of its kind for GTO, working directly with communities to deploy geothermal heating and cooling systems, and we've been working feverishly to get through the review process and make selections for this exciting initiative.

1:51-1:52	Low-Temp: Community Geothermal Projects	Alexis	**Slide 23:** And we did it! On Tuesday, we announced selections for the opportunity, and we are very excited about this portfolio. As you can see here, we'll be working with 11 communities in 10 states nationwide—from remote areas in Alaska to the urban streets of New York City. Across the 11 projects, there are more than 60 total coalition partners working on these projects— including city governments, utilities, nonprofits, community organizations, Tribal organizations, and universities. The community coalitions for these projects will be assessing a broad range of geothermal heating and cooling options, including geothermal heat pumps, direct use geothermal heating, and a system using municipal wastewater; and a number of systems are planned for underserved communities and for use in affordable housing and public buildings. As I mentioned, our goal is that this initiative both benefits these selected communities and helps us expand geothermal heating and cooling nationwide by providing examples and case studies for other communities to learn from.
1:52-1:53	Low-Temp: Community Geothermal Projects	Alexis	**Slide 24:** In the funding opportunity, the topic areas covered different community types, helping us classify where projects will be carried out. For the purposes of this initiative, we defined urban and suburban project topic area as cities or towns with populations of 10,000 or more, as well as all communities located within a metropolitan statistical area, as defined by the White House Office of Management and Budget. In the urban and suburban topic area, we've selected six projects, ranging from a shared community geothermal network that is expected to cover four city blocks in Chicago to a utility-managed community geothermal network in Framingham, Massachusetts, that is planned to meet 100% of the heating and cooling needs of the connected buildings. P
1:53-1:55	Low-Temp: Community Geothermal Projects	Alexis	**Slide 25:** Next, we have four rural communities, which are towns or unincorporated areas that do not meet the definition for being remote, have populations less than 10,000, and are located outside a metropolitan statistical area. Again, these projects represent a range, from a community geothermal system to meet at least half of the heating and cooling needs for a new affordable housing development in Middlebury, Vermont, to a hybrid solar-geothermal system that will provide heating and cooling to a community owned and operated by a Tribal Nation. We also selected one remote community, which is distinguished from rural communities given geographic isolation from reliable grid transmission or population centers. We'll be working with a coalition from Nome, Alaska, on a community-scale geothermal system to provide space heating and domestic hot water to buildings as well as cooling to food storage areas. In the first phase of the initiative, coalitions will fully flesh out their systems. This work will include finalizing project sites, assessing the geothermal resource, looking into environmental and permitting needs, conducting feasibility analysis and local engagement, and identifying workforce and training needs. Then, based on the phase 1 outcomes, DOE will select a subset of projects to advance to a second phase and deploy their systems. We've created a dedicated webpage for the initiative, which is shown on these slides, where you can get more details about these projects. We hope you will check them out and help us root for the success of these amazing community projects. Congratulations to all the projects that were selected!

1:55		Alexis	**Slide 26:** With that, I will turn things back over to Sudeep for Q&A.
1:55-1:56	Thank you	Sudeep	**Slide 26:** Thanks, Alexis. We hope you've enjoyed the webinar. If you haven't already, now would be a great time to enter any questions you have in the chat. While we gather those for Q&A, I want to thank you all again for attending today. I know I speak for everyone when I say it's been a pleasure to update you on GTO's activities. As we've mentioned throughout, the best way to stay on top of GTO events and news is by signing up for The Drill Down newsletter. And remember we want to hear from you! Email us at DOE.Geothermal@ee.doe.gov to send us your resumes and CVs to be a merit reviewer, ask questions, and just share ideas about the future of geothermal energy with us.
Through ~2:25	Questions	Sudeep	**Slide 27:** Okay, on to some questions. (Read Q&A in order. Answers will be populated in the Q&A document when ready to be answered.)
	Dismissal	Sudeep	**Slide 29:** Ok, we are out of time today. We will be distributing today's slides and script next week. If you have any follow-up questions, or if we didn't get to your question today, please email doe.geothermal@ee.doe.gov. Thank you and have a great rest of your day!