

**Statement of Daniel Kunz, President and Chief Executive Officer of US Geothermal Inc.
Before the
Subcommittee on Energy and Minerals
Committee on Natural Resources
US House of Representatives
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Mr. Chairman and Members of the Subcommittee, I appreciate the Committee's interest in geothermal energy, its oversight on renewable energy opportunities and issues on Federal lands and its review of Title II, Subtitle B – Geothermal Energy of the EPAct.

I have knowledge that the Geothermal Energy Association (“GEA”) submitted a Statement for the Record of this hearing. As a member of the board of directors of the GEA, I endorse that Statement of Record. To avoid duplication with GEA's statement, my testimony that follows comes from the viewpoint of a small but experienced geothermal developer who already has a new geothermal power plant under construction in Idaho and has the skill and ambition to construct and operate more geothermal power plants in the future. My testimony covers the issues that impact development of geothermal resources on public lands, some of which may be beyond the Bureau of Land Management's area of responsibility.

Geothermal has a unique and growing importance in the supply of green energy because it can supply clean, reliable, low emission power 24 hours a day, 365 days a year. Geothermal energy could also support our national hydrogen initiative and national biofuels goals, both of which will require significant amounts of energy to produce alternative domestic transportation fuels. Geothermal energy currently provides nearly 3,000 MW of reliable electric power in the US. But, according to the US Geological Survey (USGS), this represents only a small fraction of US resource potential. Representatives from the USGS testified before the Subcommittee on Energy and Mineral Resources of the House Resources Committee, U.S. House of Representatives, on May 3, 2001 that their 1978 report still represents the best available resource estimate. According to that report, there is an identified geothermal resource potential of 22,000 MW, and an undiscovered, unidentified geothermal resource potential of an additional 72,000 to 127,000 MW. This estimate totals some 150,000 MW of geothermal potential.

Recent reports issued by the GEA, National Renewable Energy Laboratory and Massachusetts Institute of Technology (“MIT”) have identified the substantial potential for geothermal energy production from a range of technology applications. Each of these studies supports the potential to achieve 100,000 MW or more from the geothermal resource base.

A recent report published by MIT on Enhanced Geothermal Systems (“EGS”), called the “future of geothermal energy”, highlights the fact that there is an enormous energy potential right beneath our feet within the rock of our earth. The technology needed to convert this heat to electricity is tried and true as it relates to the above-ground aspects of project development: the power plant, turbines, generators, control systems and the electrical distribution equipment. The technology risks related to the development of EGS power sources are limited to deep drilling and fracturing of rock. Deep drilling technology has already been advanced a long way by the oil and gas industry. That know-how can be transferred to the geothermal industry and,

with some additional work on better drill bits and faster drilling technology, we can assume that deep drilling will become a low risk aspect of EGS development. That leaves rock fracturing for reservoir development as the main risk area that requires advancement. The only way to reduce the development risk of rock fracturing is to create sites where the technologies can be advanced. It would be most desirable to provide proper investment incentives to private enterprise with funding support from the US government.

I mention the future of geothermal energy first because the United States will not get to the future of geothermal power production – a future that holds the promise of delivering clean, renewable energy to drive economic development and quality of life -- without initially fully understanding the present geothermal condition.

Geothermal energy is currently available with low technology risk. What is needed is a full appreciation of and recognizable way to finance the significant exploration and geologic risks related to this type of energy. Conventional and binary cycle geothermal energy under development and production today is based on geologic investigations that took place decades ago. What is needed to significantly move geothermal energy forward? Much more current and future expenditures on exploration and geologic investigations in the U.S. on public and private lands. Thermal gradient and geofluid exploration well drilling is desperately so that our nation can have harder information about the extent of geothermal resources suitable for power production.

Geothermal projects are unique because of the early capital costs involved prior to project confirmation. The exploration technologies available require confirmation of the resource by drilling, and drilling geothermal wells is expensive, with costs ranging from a few million to over ten million dollars for a single well. Exploration is usually financed with high cost equity that takes a long time to be paid back. Exploration can take place up to a decade before any power is produced. The cost and risk of exploration for new geothermal resources is as high as or higher than those in the oil and gas industry, and the ability to attract capital to finance geothermal exploration is far more difficult.

Once an oil or gas discovery well is drilled, it can immediately be turned into a profitable cash flow generator. Geothermal wells are just the beginning of significant capital investment. A geothermal well cannot become profitable without an additional well drilled for injection of the fluids back into the reservoir. Then there is a requirement to drill more well pairs, build a plant, construct fluid pipelines, make transmission connections and deploy system controls. After that, the project can begin to generate income. So the geothermal drilling risks need to be recognized in a much different way than oil and gas drilling.

Robust investment incentives, grants, cost sharing and other methods that will reward risk takers for geothermal drilling for conventional and EGS geothermal development on Federal and other lands are needed to stimulate this area. I ask that Congress consider these:

- 1) Geothermal receives little support from the federal government relative to other forms of renewable energy and its untapped potential is vast. It is an indigenous and baseload energy supply with the highest availability of any renewable power source.

- (i) Nevertheless, the pace of growth of geothermal energy can benefit greatly from federal government improvements and deployment of human and other resources in federal land leasing programs, specific technology commercialization support, and the extension of critical high voltage transmission infrastructure in the West.
- 2) The federal government should extend its support to geothermal energy with a multi billion dollar program over five years that provides:
 - (i) An enhanced Investment Tax Credit (“ITC”) for all geothermal drilling that is not offset against any other federal credits. The ITC is intended to address a crucial and very different set of risks and attract capital to the early and highest risk stages of geothermal development involving drilling and proving the productive capacity of the geothermal resource.
 - (ii) Enhanced funding of \$25 million to \$50 million per year to the Department of the Interior (BLM, US Geological Survey and Forest Service) to allow these agencies to accelerate land and resource management plans, identify highest priority areas for geothermal exploration and new lease auctions and clear existing 10+ year backlog and institutional roadblocks to the growth of geothermal exploration and project development.
 - (iii) Committed research funding of \$75 million to \$100 million per year administered by the Department of Energy with research focused on EGS, conventional geothermal resource discovery and evaluation, drilling technology, and low to medium temperature energy conversion (which will lead to additional applications in waste heat to energy conversion at industrial sites)
 - 3) A \$1 billion to \$2 billion dollar program in support of geothermal power over five years could generate:
 - (i) Tens of thousands of megawatts of new geothermal power generation over the next 10 years;
 - (ii) Tens of billions of dollars of capital investment in renewable infrastructure;
 - (iii) Multibillion dollars in tax receipts associated with profits on capital spent;
 - (iv) Important rural development and thousands of good permanent jobs; and
 - (v) Multibillion dollars per year of tax receipts associated with operating profits.

Public Land Leasing System

US Geothermal Inc. was not entirely in favor of the rule changes for federal geothermal land leasing resulting in a competitive auction environment. There are significant risks already embedded in the geothermal exploration and development effort and the new rules will add more risk for a developer. A leasing system similar to gold mineral exploration would have been more appropriate because of the intellectual and monetary capital required to advance geothermal lands to a stage where leasing or claim staking is merited. People will develop geologic ideas and theories about the possibility of the existence of a geothermal resource using their own capital and know-how. When the new BLM leasing rules are completed, they will be required to offer those ideas to a system that will create a public auction of their ideas.

I am not advocating changing the auction/leasing system now under way because it will mean that the entire process will again grind to a halt while rules are changed. BLM must keep pushing the current rule change process forward as efficiently as possible and make the new rules available so that people can plan accordingly. BLM should move ahead and set up the auction processes and get them going. It has been two years since any activity has resulted in new leases. We need to have access to the public lands so that risk expenditures can begin.

The only prescription for this particular discussion I would offer is this: when changes are being made to a leasing system like this, it would be more productive to avoid creating a logjam by stopping the requests already in the system. In the case of geothermal development the protracted lead-time for permitting, discovery, development and production of power is already much longer than desired. With the BLM rules, we have added another two years or more to the already long timeline. Given that new rules will now exist, I think more human resources need to be committed to the BLM and Dept of Interior specifically for the geothermal energy lease situation to implement the changes and accelerate the process.

Production Tax Credit

The Energy Policy Act of 2005 (EPAAct) has already provided a significant and positive impact on the geothermal energy industry. To be specific, my company, US Geothermal Inc.'s Raft River geothermal project currently under construction in southeast Idaho is the first new installation that will qualify for the all-important Section 45 Production Tax Credit (PTC). This PTC, previously available only to wind and closed-loop biomass projects, was finally made available to the geothermal energy sector as part of the 2005 EPAAct. To qualify, US Geothermal Inc. scrambled to fast track the development of the Raft River project to be constructed and online before the end of 2007. This is because the 2005 EPAAct initially set that 2007 limit on the projects that could qualify. The deadline was subsequently extended one year so that any project coming online before the end of 2008 now can qualify.

This is good but geothermal projects require many more years to develop than most other renewable energy projects and I believe that the Production Tax Credit should be extended in a much more significant way for geothermal projects. Other renewable energy technologies have had the PTC for about a decade. Geothermal needs a similar period to benefit from a shift of capital investment into the geothermal sector. The PTC should be preserved for geothermal for a period of time at least equal to the time the tax credit has been available to the wind industry before any changes or reductions are made to it. This preservation of the existing PTC will allow capital planners the time needed to shift investment to the sector and gain the longer-term returns on investment needed to make the shift.

I urge Congress to extend the credit five to ten years. We also urge Congress to allow geothermal and other baseload projects to qualify once they have binding contracts and are under construction.

Build and sustain the momentum that EPAAct has given geothermal energy and it will become a major US energy source with an environmental profile we can be proud to promote.

Conclusion

I thank the Subcommittee for scheduling this important hearing and inviting me to present testimony on our public lands' potentially vast stores of geothermal energy that can help our nation address its energy and environmental needs.

The production tax credit is helping to spur renewed geothermal energy development. I urge Congress to support the BLM in its efforts to complete the new rules for public land leasing and provide the human resources needed to focus much more effort on geothermal energy. I also urge Congress to boldly support this domestic energy source by enacting a long-term extension of the production tax credit, modifying placed in service treatment for baseload power plants, and providing specific incentives for new geothermal exploration.