

**Testimony before the House Committee on Natural Resources
Subcommittee on Energy and Mineral Resources
Josh Nordquist, Director of Business Development
Ormat Technologies, Inc.
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Introduction

Good afternoon Chairman Lamborn and Members of the Committee. I am Josh Nordquist, Director of Business Development, from Ormat Technologies, Inc.

Ormat Technologies, Inc. is a renewable energy company, with decades of experience in geothermal energy. Ormat's headquarters is in Reno, Nevada, in the heart of the U.S.'s geothermal activity. Ormat installed the first geothermal power plant in Nevada, in 1984, and also installed, and operates, the newest geothermal power plant in the U.S. late last year. Between the first and last, we have grown to operate over 700MW of clean and renewable energy production. Ormat is a vertically integrated geothermal company, so we play a role in every stage of the energy development process - from geothermal exploration and development through manufacturing, construction, ownership and operation of our geothermal power plants. We also design, manufacture and sell power units, other equipment and related engineering, procurement and construction (EPC) services to utilities and developers worldwide.

Geothermal power is "earth power" -- the production of electricity using the heat originating in the earth's core. Heat from the earth's core is transferred relatively close to the earth's surface where deep pockets of geothermal fluid exist. Geothermal fluid cannot be used as drinking or irrigation water. We drill into these deep pockets, extract geothermal fluid, convert heat from the fluid into electricity, and re-inject the fluid to be re-heated, and re-used. The power plants on the surface take on many forms, but the most advanced geothermal power plants today are air-cooled (they don't consume any water), emission free, and can provide both baseload and flexible electricity generation. These qualities make geothermal energy a rare type of zero-emission renewable that offers predictable, stable power like coal or natural gas, but can also complement intermittent generation sources such as wind and solar.

There are over 3,700 megawatts of geothermal installed in the United States today, and about 1,250 planned megawatts are in the development pipeline. These pending projects could be operational in 17-33 months or sooner with the appropriate power contracts.¹ The Department of Energy projects that there are over 30,000 megawatts of untapped geothermal resource in the United States that could be developed using the commercial technologies that exist today. Further, an MIT study found that 100 GWe of cost-competitive geothermal capacity could be

¹ Geothermal Energy Association. *2016 Annual U.S. & Global Geothermal Power Production Report*. March 2016. <http://geo-energy.org/reports/2016/2016%20Annual%20US%20Global%20Geothermal%20Power%20Production.pdf>

provided using a near-term next generation production technology, called EGS, in the next 50 years.² In short, geothermal has enormous growth potential in the United States.³

As I mentioned, Ormat owns and operates over 700 MW of clean and renewable energy production, most of which is here in the U.S. We have operating facilities in 8 states (Nevada, California, Colorado, Montana, North Dakota, South Dakota, and Minnesota). We are always happy to offer tours of our facilities to interested Members and staff.

I'm here today to testify on the positive impact H.R. 2663 could have on utility-scale geothermal development.

Background on Need for PLREDA

To understand why PLREDA is important to geothermal, you must first understand a bit about the industry. First, ninety percent of the known geothermal resources in the United States are located on federally managed lands today.⁴ These geothermal resources provide the qualities for commercially viable geothermal projects which provide long-term sustainable returns for the developer and, more importantly, long-term economic development through jobs and local investment that will last a lifetime.

Second, the process for locating and qualifying a geothermal resource is more complex than it is for some other types of renewables. Once extensive mapping, geological, and geophysical analysis has directed us to a finite geographical area, we then typically drill wells in order to test the geothermal reservoir directly, measuring temperature, permeability, conductivity, fluid chemistry and so on, before we determine commercial viability of a power plant. This process can require an investment between \$2-5 million for each project, and sometimes more. For comparison, similar activities for a solar or wind project cost thousands, with a maximum in the tens of thousands of dollars.

Because we develop geothermal projects on federal lands and our exploration process can itself cause environmental disturbance, we have a greater set of obligations to the federal permitting process. Between this and the expense of geothermal well testing itself, geothermal resource review usually requires a greater level of up-front investment than other types of renewable power.

PLREDA recognizes these qualities of the geothermal industry and helps address them directly.

Priority and Variance Areas and PEIS (*Section 202*)

² Massachusetts Institute of Technology (MIT). The future of geothermal energy. Cambridge, Massachusetts. 2006. http://geothermal.inel.gov/publications/future_of_geothermal_energy.pdf.

³ Further information is available on the National Renewable Energy Laboratory (NREL)'s Geothermal Resource Mapping Dashboard at <http://www.nrel.gov/gis/geothermal.html>.

⁴ U.S. Department of Interior, Bureau of Land Management. *Kemphorne Launches Initiative to Spur Geothermal Energy and Power Generation on Federal Lands*. October 22, 2008. http://www.doi.gov/news/archive/08_News_Releases/102208b.html

First, the bill requires the Department of Interior (DOI) to establish priority areas on BLM lands for geothermal, wind and solar development. DOI has established priority zones for solar in the past, but never for geothermal. DOI would also update their Programmatic Environmental Impact Statements (PEIS's) for geothermal and other technologies, and amend their land use plans to conform with the updated PEIS's in order to support renewable development.

These provisions will help cut development timelines on the vast majority of the geothermal-rich lands in the United States, because it will ensure developers target only those lands that are most suitable to develop according to resource availability, environmental concerns, the availability of infrastructure, socioeconomic issues, wildlife habitat, and so on.

We know this is true because we have results from the last geothermal PEIS. In October 2008, the DOI issued its PEIS for Geothermal Leasing in the Western United States in order to reduce the backlog of geothermal lease applications and facilitate more efficient processing. Prior to the implementation of the PEIS, geothermal lease processing took 2 – 3 years.^[i] However, in the period between October 2008 and fall 2010, approximately 230 of the 271 lease parcels offered for sale were processed using a Determination of NEPA Adequacy (DNA). A DNA can be executed in just 3-4 months on average. This program helped improve the pace of geothermal development markedly while maintaining appropriate environmental protections.

NEPA Relief when PEIS is Deemed Sufficient (*Section 203*)

PLREDA also eliminates duplicative environmental review under the National Environmental Policy Act. If the BLM determines the Programmatic EIS is sufficient for understanding the potential impacts of geothermal exploration on BLM land, companies like Ormat will not be required to conduct a second, independent NEPA review before beginning exploration on leased lands.

The way we envision this provision working is this: Once the BLM receives a nominated lease parcel they can review it against the new PEIS to see if the nominated land resides in an “open” or “closed” to geothermal leasing area. They are then able to check with the appropriate field office's interdisciplinary team, such as biologists and realty specialists, to see if there are any site specific resources that need to be protected. It is during this review that BLM identifies stipulations such as controlled surface use, timing limitations, and No Surface Occupancy (NSO) to attach to the lease. The BLM then decides whether or not to assign the lease a determination of NEPA adequacy (DNA). Once a lease receives a DNA it is ready to go to auction. Without the PEIS and this elimination of duplicative NEPA review, the BLM performs an environmental assessment (EA) to evaluate parcels nominated for leasing, and will often wait to conduct an EA until they had received a substantial number of nominations, resulting in project delays a backlog of nominated leases.⁵

PLREDA would not change the NEPA obligation once a resource has been identified and commercial development is officially being considered. This is a targeted and common-sense

⁵ Informed by GEA discussion with Andrew Gentile, Environmental Management and Planning Solutions, Inc., July 2011.

strategy for reducing development timelines with environmental safeguards.

Coordination (*Section 204*)

Ormat also supports PLREDA's mission to coordinate permits for renewable energy projects between federal agencies. A typical geothermal project has to consider and plan for a variety of environmental statutes outside of NEPA, particularly the Endangered Species Act, and we work with multiple agencies on our environmental reviews. Improved coordination will help our industry achieve environmental compliance more quickly and more cost-effectively for the industry and the taxpayer.

Royalties (*Subtitle B*)

Geothermal projects on federal lands already pay royalties to the BLM based on electricity production. These royalties are distributed as follows:

- 50% to the state in which the project operates
- 25% to the county in which the project operates
- 25% to the federal government.

The federal government's share of geothermal royalties have been used by DOI to directly support the implementation of the Geothermal Steam Act, Energy Policy Act of 2005, and specifically the development of the 2008 Programmatic EIS.

In addition, prior to a geothermal project achieving commercial operation, the developer pays a rental on federal leases. These lease payments are minimal (\$1-5 per acre) compared to the potential royalties.

While Subtitle B does not address geothermal royalties, we support a production royalty for wind and solar because it will produce more revenues to rural counties, states and the federal government. These revenues can be put to use to promote even more renewable energy development on federal land. This will also help level the playing field between geothermal, wind and solar. Right now only geothermal is subject to royalty obligation, putting us at a disadvantage as we compete in the energy market against these other technologies.

The new projects that will be expedited by PLREDA will not only result in important royalty payments to our local states and counties, they will provide continued support for the important activities at the Bureau of Land Management that enable safe, environmentally-conscious development of even more geothermal power.

Geothermal Steam Act (*Section 101*)

I will also note that PLREDA extends the Geothermal Steam Act of 1970, which allows for the leasing of BLM lands for geothermal development in the first place. This program and the hardworking BLM staff that administer it are at the very foundation of our industry.

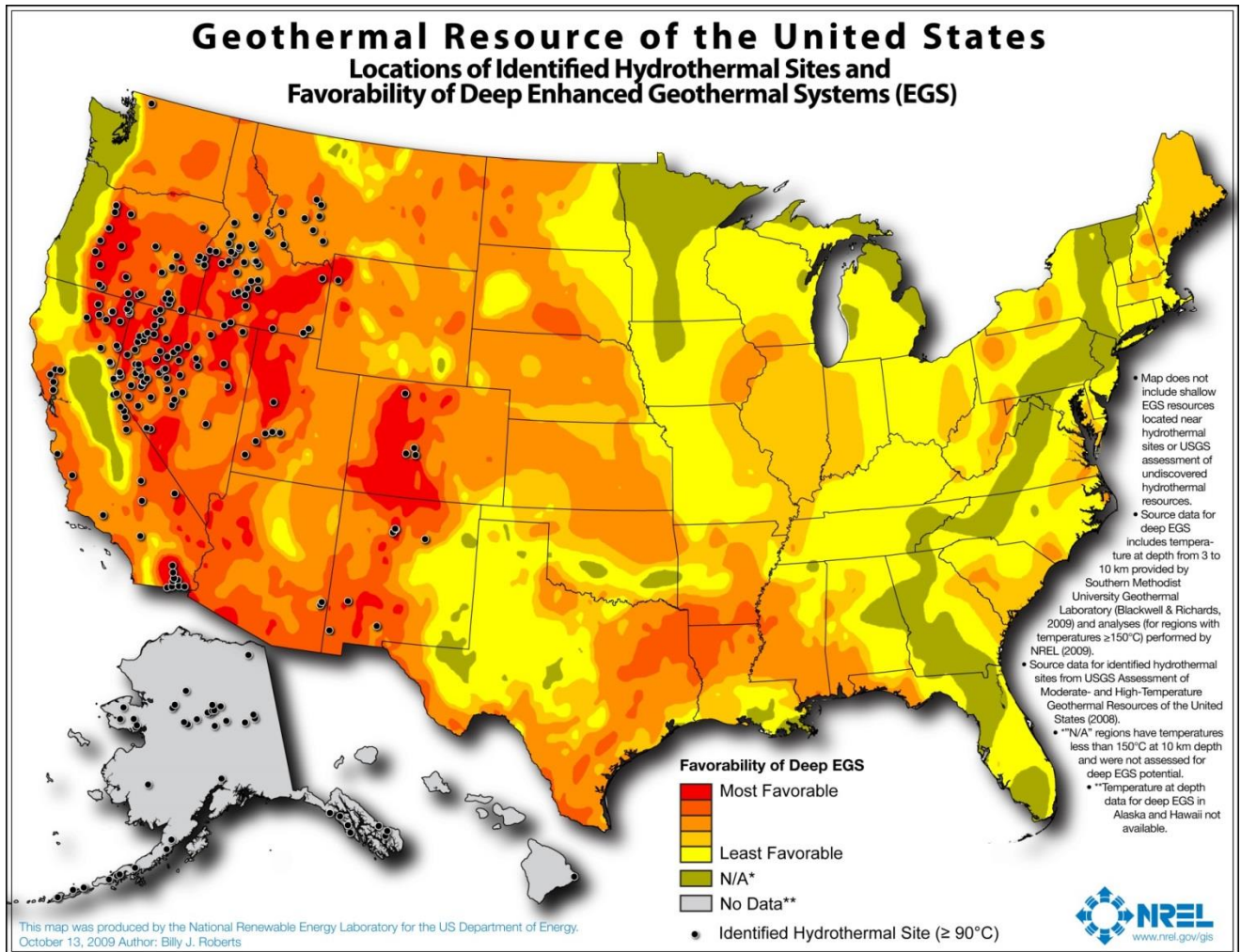
Potential Improvements

If there is an opportunity to improve this already strong legislation, I would recommend the Committee consider including several public lands provisions that already passed the Senate as part of S. 2012, the Energy Policy Modernization Act. Sections 3005-3012 of S. 2012 are dedicated to geothermal, and parts of PLREDA are already accommodated in Section 3011. In particular we direct your attention to Section 3012, which makes further improvements to the permitting process for geothermal exploration test wells.

Closing

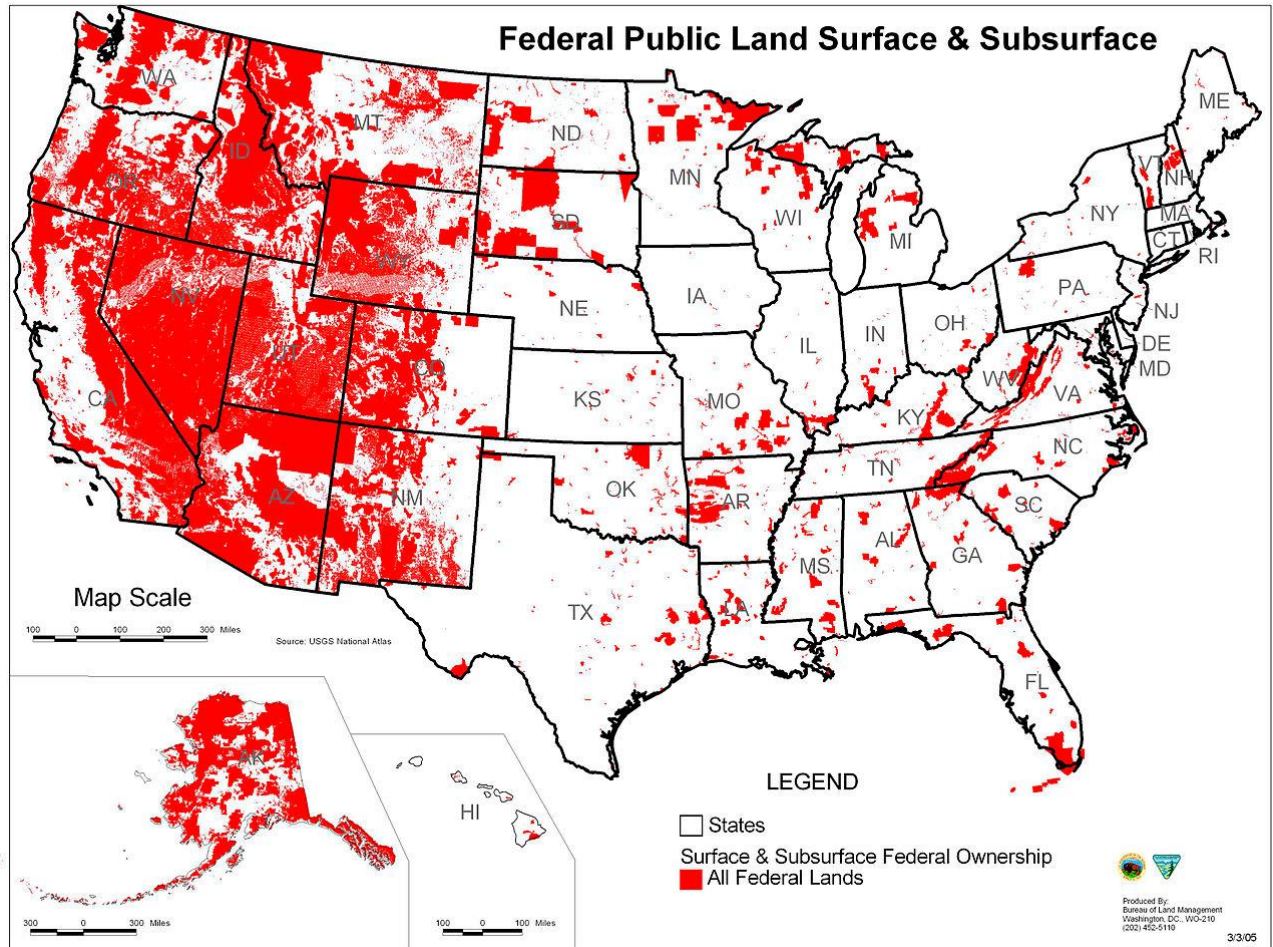
In closing, we believe that this bill can help unlock new projects to create high-paying, long term jobs and baseload, emission-free power production. These policy drivers will have a big impact on the industry, but will cost the federal government relatively little. Thank you for the opportunity to testify and I look forward to any questions the Committee may have.

Figure 1



NREL Geothermal Resource Map. <http://www.nrel.gov/gis/geothermal.html>

Figure 2



BLM Map of all Federal Lands