WRITTEN TESTIMONY OF
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Before the House Committee on Oversight and Government Reform
Subcommittee on Regulatory Affairs,
Stimulus Oversight and Government Spending
May 16, 2012

Introduction

Good morning, Mr. Chairman, Mr. Ranking Member and Members of the Subcommittee. My name is John Woolard, and I am President and CEO of BrightSource Energy, Inc. In this role, I bring two decades of experience in the energy and environmental sectors as an executive, entrepreneur and investor. Prior to joining BrightSource Energy, I co-founded Silicon Energy and served as its President, Chief Executive Officer and Chairman of the Board from 1997 to 2003. I joined the executive team at Itron, Inc. in 2003 following its acquisition of Silicon Energy. In 2006, I joined the newly-formed BrightSource Energy. BrightSource Energy, which is based in Oakland, CA, designs, develops and deploys large-scale concentrating solar thermal technology to produce high-value steam for electric power, petroleum and industrial-process markets worldwide. Our technology is uniquely qualified to provide our customers with reliable, cost-effective and clean energy. I consider large-scale solar thermal power to be a keystone of our nation's future energy supply.

Our technology is different from photovoltaic (PV) energy – the kind you typically find on rooftops. We generate power similar to traditional power plants – by creating high temperature steam to turn a turbine. However, instead of using fossil fuels or nuclear power to create that steam, BrightSource uses the sun's energy. We believe that our technology is producing the world's highest temperature and pressure steam from solar energy. Our technology has been tested and proven in the field at two facilities, in our Research & Development facility and at a project that we built for Chevron. These facilities have been closely examined, tested and validated by several independent engineering firms, including Parsons and RW Beck.

We have partnered with several of the world's leading energy companies, which has been a key to our success. These partnerships result from several factors, including our proven engineering experience; the ability of our technology to provide the quality of power the grid needs and its operators are familiar with, rather than leaning on the grid for support; and our technology's ability to work well with our existing energy system, including its fossil fuel components. The facility that we built for Chevron is one good example: Chevron is using our solar thermal technology to produce the steam it needs for enhanced oil recovery in California's Central Valley. Chevron's Coalinga field began operations in the 1890s, and is one of America's oldest oil fields. Because the heavy crude produced at the field does not flow readily, steam is injected into heavy-oil reservoirs to loosen the crude, making it possible to pump the crude to the surface. We also have close working relationships with such companies as NRG Energy, one of the country's leading producers of power, and Bechtel, one of the world's leading designers and builders of power plants of all types. These relationships help us to continue to advance our technology and drive costs down.

Chevron is also an investor in our company, along with other world-class companies ranging from Morgan Stanley, Goldman Sachs, and top venture capital and private equity firms, to strategic investors such as BP and Alstom.

We employ more than 400 people in our Oakland and worldwide offices. Since our founding in 2006, we have executed 13 long-term power purchase agreements (PPAs) with two of the largest electric utilities in the United States, Pacific Gas and Electric Company (PG&E) and Southern California Edison (SCE), to deliver approximately 2.4 GW of installed capacity by 2017. We believe that these PPAs are the largest solar contracts in the world, and represent one of the largest utility-scale solar pipelines in the United States.

The loan guarantee program was an important part of moving our innovative technology beyond pilot and demonstration scale to utility scale. It's this scale that allows us to drive down future costs. As we look forward to constructing the additional projects in our pipeline, and having established operational experience, we will look to private debt markets for financing.

Before talking further about our experience with the loan guarantee program, I'd like to provide an update on Ivanpah.

Ivanpah Project Overview

I'd like to briefly explain how our technology works. At the heart of each power plant is a turbine, which is driven by steam to make electricity, just like the turbines used in coal, natural gas or nuclear power plants. With our technology, the heat source is the sun, instead of fossil fuel or nuclear fission. At our solar thermal plants, thousands of mirrors, called "heliostats," continuously track the sun throughout the day, and focus light on to a solar receiver. At the top of the tower is a boiler, much like at a coal or natural gas power plant, where water is heated to make the steam that drives the turbine. The power generated from the turbine has the same qualities as power from conventional power plants, and is much easier to integrate into the grid.

In 2007 we commenced the permitting and financing of our Ivanpah Solar Electric Generating System, located in California's Mojave Desert. The purpose of the Ivanpah project is to generate power to sell to PG&E and SCE under three of the power purchase agreements that we signed with those two utilities. In total, the Ivanpah project will cost about $2.2 billion to build and, at 392 megawatts, will produce enough power for 140,000 homes. The Ivanpah project is already providing substantial economic benefits not just to California and the region, but to the nation, as our plants depend on the traditional supplies needed for conventional power plants as well as commercial mirrors and equipment needed to provide its solar "fuel". In fact, we procure from a supply chain that stretches across 17 states. The majority of the materials are procured domestically and we estimate that approximately 70 percent of the project's value will be captured in the United States.

After receiving our permits from the State of California and the Department of Interior, we initiated construction of Ivanpah in October 2010. Bechtel serves as the engineering, procurement and construction (EPC) contractor.

Ivanpah Project Benefits

The Ivanpah project is one of the largest infrastructure projects in the nation and the largest solar thermal plant under construction in the world. When completed it will increase the amount of solar thermal energy produced in the US today by 70 percent. The project is being built over a three year period and is creating 1,400 construction jobs alone at peak. The project will generate $250 million in earnings for these construction workers and over its 30 year life will produce $650 million in earnings for workers on the site, including the 90 permanent jobs required to operate the plant. In addition to the supply chain investment and labor wages created, the project will also generate $300 million in state and local tax revenues over its life.

On occasion we've heard these jobs described as "temporary" jobs. Nothing could be further from the truth. Anyone familiar with the trades knows that members of the construction industry proudly "work themselves out of jobs" with every successful project. What's truly notable are three things: (1) these are family-wage, highly-skilled trade, manufacturing and engineering jobs being created in an area with one of the nation's highest

unemployment rates; (2) the project includes training and deploying skilled pipefitters, electricians, engineers, welders, technicians, heavy equipment operators, mechanics, technicians, insulators and millwrights; and (3) as BrightSource and our competitors work to complete our pipeline of projects, these workers are assured of employment opportunities – and the skills they are gaining from this project will be in demand – well into the future.

We are also doing our part to help America's brave veterans. Through Bechtel's "Helmets to Hard Hats" program, returning soldiers from Iraq and Afghanistan are enrolled in an apprenticeship program on the project, and are put to work, using their new skills. We are very proud to be a part of this program, and hope to increase the numbers veterans working on our next projects.

This project doesn't simply create jobs at the site; it is generating jobs throughout its 17-state manufacturing and supply chain. This $2.2 billion project is truly an investment in America's future, creating and maintaining jobs locally and across the nation. These jobs are providing the equipment and materials we need for construction at Ivanpah now—and will continue to need for the projects now undergoing permitting, as well as for our the next generation of projects, which are already under contract.

For example, one of our suppliers is an 85 year old gear drive company, called ConeDrive, located in Traverse City Michigan. To serve the Ivanpah project, they have hired roughly 20 additional workers to their existing 163 member team.

Last year, in Surprise, Arizona, a company called Gestamp broke ground on a new facility to manufacture steel for the Ivanpah project and several other solar projects. The first phase of this facility covers 75,000 square feet and will employ 50 people. Just last week Gestamp announced another expansion with plans to add 80 new jobs. The company is starting the second phase of its construction this week, which would add 36,000 square feet to the facility. A third phase of 140,000 square feet will be added starting later this year. According to the company, Gestamp has invested $10 million and plans to invest up to $40 million and quadruple the size of the facility over the next few years. This is just one example of "in-sourcing," with a European company locating a production facility in the United States, close to demand centers like the desert southwest.

As the solar energy market continues to grow, job-creation ripple effects such as this will be seen throughout the manufacturing sector.

Ivanpah Project Update

Today, the Ivanpah project is nearly one-third complete and is currently on schedule. Each day, we are meeting critical milestones and are moving ever closer to project completion. In fact, we will start to deliver power to the grid by early 2013. Construction continues to advance at a strong pace, with Bechtel, one of the most experienced and successful engineering, procurement and construction contractors, helping to assure its continued progress on schedule and on budget.

The power tower for the first Ivanpah unit has already reached its full height of 459 feet (or "topped out," as it's referred to in construction). Boilermakers are now welding the interconnecting boiler piping in preparation for hydro tests and the first steam "blow" later this summer. The air-cooled condenser, which efficiently converts steam back into water for return to the boiler, is also being assembled at the base of the tower. The 150+ workers employed in our on-site heliostat manufacturing facility have reached our production target of 500 heliostats per day, and are on their way towards producing the 173,500 heliostats needed for the project. In the solar fields, we're installing the heliostats at a record rate, and have now installed over 23,000 heliostats in Unit #1 alone. Electricians are wiring the heliostats to a central control system that will direct the sun's rays with extreme precision. Units #2 and #3 are also well underway, and all three units will be complete and operational in 2013.

We are working closely with federal and state agencies to provide the appropriate care of the desert plants and animal species found on the Ivanpah project site. As part of our mitigation requirements, we estimate that we will invest nearly $56 million in caring for desert tortoises. This includes $22 million in protection, care and translocation of the tortoises, as well as $34 million in land acquisition costs for the three-to-one mitigation required by the California Energy Commission (which incorporates the one-to-one mitigation required by the U.S. BLM).

Last month, desert tortoise biologists began the planned translocation of tortoises that had been on the project site. Over fifty desert tortoises were moved from temporary pens into areas just outside boundaries of the project site. These tortoises will remain within their "home range," in habitat with familiar soil composition, food sources, weather and terrain. Project biologists will monitor these tortoises and other tortoise within the area for up to five years to ensure a seamless transition.

We expect to return more desert tortoises to the wild than were captured on site, as we have had over 50 new hatchling tortoises born in captivity at Ivanpah in the temporary pens last fall. These hatchlings, which have a very low survival rate in the wild (1%-2%), have been thriving under the care of project biologists at our "Head-Start" program facility. These hatchlings, and other young tortoises found under a certain size, will be cared for at our facility for about five years, or until they are large enough to resist ravens, coyotes, kit foxes and other predators. The valuable information about desert tortoise gained at the Ivanpah project will help desert tortoise biologists learn more about the species and determine additional ways to help the population recover.

We are proud of the fact that we're incorporating features and strategies into Ivanpah that both reduce our environmental impacts and, at the same time, reduce project costs. For example, we insert the heliostat pylons directly into the ground, and do not need to level the solar field or pour concrete foundations in it; this allows us to leave natural contours and vegetation in place in all but a fraction of the site, limiting grading and major earthwork primarily to the powerblock areas. These efforts are just one example of our responsible stewardship of the public land that we use.

The Project Finance Model, Common to Large Energy Generator Projects of All Kinds, Reduces Risk

Large energy infrastructure projects of all kinds, including fossil fuel and renewable energy plants, generally utilize project finance to provide the funds they need for construction. Project finance is a well-established financing structure that provides the debt and equity necessary to execute capital intensive ventures. The goal is to balance risks and rewards between project participants and to allocate risks consistent with capability, risk appetite, and credit capacity of the stakeholders. In order for a project financing structure to be successful, there must be a well conceived business plan that is both economically viable and technically feasible.

BrightSource employed the project financing model for the Ivanpah project. Consistent with that model, BrightSource was the project sponsor of Ivanpah, but is not the loan recipient. Let me repeat that – the borrower under the DOE-guaranteed loan is the special purpose project company itself, which is owned by NRG, Google, and BrightSource. The project company holds the long-term, fixed price power purchase agreement. For a 20 or 25 year period, so long as the project continues to produce energy, it has purchasers for all of the energy it produces at a price that has already been agreed. The project company also owns the infrastructure that will be producing that energy. The underlying loan is fully secured by all of the project company's physical assets and contracts, and the borrower pays interest that will earn a return for the lender. In the case of Ivanpah, the project companies own the three power sales contracts, each with a major credit-worthy utility and for a minimum of 20 years, and also own the assets that will produce clean power under those contracts. This is analogous to building a new hotel and having its mortgage backed not only by the property, but by the income that will result from guaranteed, 100% occupancy for 20+ years.

Under the project financing model, equity owners provide the portion of the project costs that is not served by the loan—again, much like the down payment for property that goes along with a mortgage. An escrow account is established to hold all of the equity funds not used in construction to date, as well as detailed engineering and operational information required to successfully implement and operate the technology, so that the project can continue successfully even if one or more of the equity partners becomes financially insolvent. For Ivanpah, equity investors have committed $598 million to the project, consisting of $300 million from NRG, $168 million from a Google Inc. affiliate, and $130 million from BrightSource Energy. BrightSource maintains an equity share of the project, and as the technology provider, the company is also committed to supporting the project and technology. We will remain an integral partner in ensuring project success and performance.

In April 2011, the Federal Financing Bank extended the Ivanpah project companies a $1.6 billion loan, which was guaranteed by the DOE. Each month, NRG as managing member of the project companies submits a draw request to the DOE, which itemizes the payments to be made for that month. The draw requests are reviewed and approved by an independent engineering firm that was selected by DOE. The funds drawn under the loan are paid directly by the Federal Financing Bank to the intended recipients, which include Bechtel and other suppliers and subcontractors to the project, rather than going first to the project companies. This helps ensure that suppliers are paid in a timely manner, and protects the value of the assets that secure the loan.

Ivanpah and the DOE Loan Guarantee Program

BrightSource first applied for a loan guarantee in 2006 and achieved financial close of the loan in April 2011. Following is a high level timeline of the company's loan guarantee process:

- December 2006: BrightSource applies for pre-qualification to the DOE 1703 Loan Guarantee Program, which was established by the 2005 Energy Policy Act under President Bush, for the Ivanpah project.

- October 2007: After 9 months of review, DOE names the BrightSource Ivanpah project as one of the sixteen projects invited to submit a formal application for a 1703 Loan Guarantee.

- November 2008: BrightSource submits the formal application for Ivanpah project.

- January 2010: After an additional fifteen months of technical, commercial, and legal review and negotiation, DOE issues a conditional loan guarantee commitment of $1.37B for the Ivanpah project.

- October 2010: Groundbreaking at Ivanpah; NRG commits to $300M equity stake in the project, conditioned, in part, on the successful close of the DOE loan guarantee. BrightSource continues to spend money in anticipation of successful close of financing.

- April 2011: Fourteen months after the term sheet was signed, following extensive additional technical, commercial, and legal review and negotiation, close of $1.6B DOE loan and Ivanpah financing. NRG and Google acquire an aggregate 86% ownership interest in the Ivanpah project companies, committing up to $468 million in equity.

Throughout the review period, BrightSource funded well over two million dollars of review work by world-class, independent consultants selected by and operating on behalf of the DOE, who closely examined the technical, commercial, and contractual aspects of the proposed projects.

In total, the DOE review process lasted more than four years. In our experience, the DOE's review process was extremely thorough and marked by thoughtful analysis.

Project development is a complex and capital intensive activity. Developers must locate sites suitable for construction of a solar thermal energy project, secure site control and obtain necessary governmental approvals and permits. Under normal circumstances, the developer can expect to incur site development expenses that total in the tens of millions of dollars, consisting primarily of land options, land leases, transmission access and integration costs, third-party engineering studies, environmental surveys, legal and consulting fees, and other direct costs associated with identification and ongoing development of suitable sites for our solar thermal power facilities. At Ivanpah, as the financial close did not occur until six months after construction began, we incurred substantial construction expenses as well, increasing the developer costs to hundreds of millions of dollars. Although it is unusual for developers to invest so much into a project before financial close, we felt it necessary to do so to keep the project on schedule, and were fortunate enough to have sufficient funds to do so.

Concentrating Solar Power: value and cost competitiveness

The 2005 Energy Policy Act created the DOE loan guarantee program as a way to help commercialize innovative energy technologies. The Ivanpah project serves as a successful example of the important and effective role that the government can and must play in deploying emerging energy technologies.

The BrightSource Power Tower technology being implemented at Ivanpah is a next-generation solar thermal system. BrightSource is advancing this important technology in order to drive costs down, with the goal of making utility-scale solar power a cost competitive resource. The concentrating solar power industry has a history of significant cost reductions when deploying new technologies. For example, the Solar Electric Generating Systems trough plants in California, which were built in the late 80s and early 90s and continue to produce power today, reduced costs by 50 percent over the construction of nine projects. We project similar cost reductions for our Power Tower technology, driven by four key areas:

- Economies of scale
- Improved efficiencies by reaching higher pressure and temperature steam levels
- Increasing capacity factor through storage
- Supply chain optimization

Due to their similarity to conventional power plants, concentrating solar plants deliver highly reliable power that is easy for the grid to integrate. These power plants can operate as hybrids by adding fossil fuel, like natural gas, as a heat source, or can add thermal storage—which is cost-effective under today's energy prices—to provide power and grid support services whenever they are needed. Concentrating solar power can reduce the total cost of electricity to customers by avoiding grid integration costs, enhancing grid reliability and providing flexibility to grid operators to help balance other intermittent resources. The addition of thermal energy adds even greater flexibility and value, while helping to lower average costs.

Concentrating solar also offers fuel diversity for our energy supply, providing a hedge against fossil fuel price volatility and security against shortages. Once the initial costs are invested in our power plants, the fuel is free for the lifetime of the project.

Conclusion

The Ivanpah project demonstrates that innovative technology, when supported with thoughtful policy, can help position the U.S. as a leader in a globally-vital industry, create thousands of jobs and strengthen our nation's energy security. Without the loan guarantee, this project may not have happened, and none of the positive developments I have described earlier would be occurring onsite and across the nation. Going forward, we expect to finance our future projects commercially. As such, the loan guarantee program served an important role in the market, allowing our project to achieve meaningful scale, drive down costs, validate our technology,

and enable a new industry to succeed—in short, creating the necessary conditions to allow commercial financing.

At BrightSource, we are proud of our company and we're proud of the Ivanpah project. I appreciate the opportunity to address the Subcommittee and welcome any questions you may have. Thank you.