Statement for the Record of Mark A. McCall

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Introduction

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to submit a statement for the record for today's hearing on "The Status of Ivanpah and Other Federal Loan-Guaranteed Solar Energy Projects on Bureau of Land Management Lands."

Overview of the Loan Programs Office

The LPO issues loans and loan guarantees to accelerate the commercial deployment of clean energy projects and advanced technology vehicle manufacturing in the U.S. under two programs: the Title XVII loan guarantee program and the Advanced Technology Vehicles Manufacturing (ATVM) loan program.

The Title XVII loan guarantee program was authorized by the Energy Policy Act of 2005 and signed into law by President George W. Bush. It directs the Department to issue loan guarantees to support the commercial deployment of clean energy projects that utilize innovative technology and reduce, avoid, or sequester greenhouse gases. The program covers a number of eligible technology areas including advanced fossil energy, advanced nuclear energy, renewable energy, and energy efficiency.

The ATVM loan program was authorized under Section 136 of the Energy Independence and Security Act of 2007. It directs the Department to issue direct loans to auto manufacturers and component suppliers to manufacture fuel-efficient vehicles and components in the U.S.

The Importance of the Loan Programs Office

Deploying clean energy technologies at commercial scale for the first time entails both technology and market risk. Advancing these technologies requires significant amounts of capital. Commercial lenders and bondholders are often unwilling to fully finance projects that use new technologies because those technologies have not been deployed at full commercial-scale and do not yet have a history of performance.

The Title XVII program fills a critical gap in the marketplace, providing project developers sufficient full-term debt financing to design and construct projects. Congress has recognized this market gap and LPO's unique ability to address it by issuing loan and loan guarantees in situations where traditional debt providers are either unwilling or unable to provide loans.

Even as LPO addresses market gaps, every transaction is a public-private partnership. While the Department issues loans and loan guarantees to provide the necessary debt financing for these projects, project sponsors must provide significant equity investments. Equity invested from private sources must represent at least 20 percent of the total cost of every project, and is frequently more. The LPO has a portfolio of more than $30 billion in loans, loan guarantees, and conditional commitments, which supports about $50 billion in total project costs. To that end, at financial close of these loans and loan guarantees, sponsors and borrowers will have provided over $18 billion in financing to support their LPO-financed projects. In other words, the sponsors and borrowers with which the LPO works have significant "skin in the game" because they have contributed substantial amounts of financing.

Advancing Clean Energy Technologies

To date, the LPO has been successful in advancing its mission of accelerating the commercialization of new technologies and advancing an energy strategy that avoids, reduces, and sequesters greenhouse gases. In achieving its mission to finance innovative technology, LPO has helped finance some of the world's largest and most innovative clean energy projects, including: the first new nuclear reactors to begin construction in the U.S. in 30 years; one of the world's largest wind farms; multiple large, utility-scale solar generation projects, several of the world's largest concentrating solar power (CSP) systems; and more than a dozen new or retooled advanced technology vehicle manufacturing plants across the country.

As of April 2016, LPO projects have avoided 30 million metric tons of carbon dioxide (CO2) emissions, and the amount of CO2 avoided will continue to grow as projects achieve full commercial operation. In addition, LPO projects have boosted local economies, supporting 56,000 good-paying American jobs across 16 states.

These operating projects are repaying their loans. LPO-supported projects have already repaid $7.1 billion, including nearly $1.4 billion in interest payments. These amounts will continue to increase as the loans are repaid over the coming years.

LPO's support of utility-scale photovoltaic (PV) solar and CSP illustrate LPO's ability to successfully bridge the commercial deployment funding gap and support the establishment of new clean energy technologies.

Launching Utility-Scale PV Solar in the U.S.

In 2009, there were no photovoltaic solar facilities larger than 100 megawatts (MW) in the U.S. A number of project developers with long-term power purchase agreements (PPAs) were

interested in building large, utility-scale projects, but were unable to secure the necessary debt financing due to the scale and innovative nature of the projects. LPO helped to address this market roadblock by providing $4.6 billion in loan guarantees to support the first five utility-scale PV projects larger than 100 MW (one of which – Desert Sunlight – is located on public land), representing more than 1,500 MW of capacity. With the loan guarantee for the Desert Sunlight project, LPO worked with a number of commercial lenders through the Financial Institution Partnerships Program (FIPP), enabling them to build experience with utility-scale PV projects.

Following these five projects, at least 28 additional PV projects larger than 100 MW have been financed solely by commercial lenders in the U.S, illustrating how LPO helped launch the utility-scale PV market and facilitated private lenders taking over debt financing for this new market. Today, solar projects at this scale are readily financed by private lenders – many of whom began their participation in the solar sector working with the LPO through FIPP. These lending partners include leading financial institutions, such as John Hancock, Bank of America, and Citigroup.

This sequence of events demonstrates the ability of the LPO to reduce the risk of new technology while supporting the entrance of commercial lenders into new markets.

Scaling Up Concentrating Solar Power

LPO has also been instrumental in launching some of the first commercial-scale CSP plants in the United States - including the first ever plant with thermal energy storage. Unlike PV solar panels that absorb sunlight to directly generate electricity, CSP uses mirrors to reflect the sun's rays onto a focal point that warms up a heat transfer fluid. The heat transfer fluid heats water to create steam to power a turbine that generates electricity, just like a conventional fossil fuel power plant. A benefit of thermal energy storage is that heat can be stored for later use, which allows CSP plants to continue to operate during cloud cover or even after the sun sets, helping provide energy on demand when the solar resource is not available.

Between 2010 and 2011, LPO financed five of the world's largest CSP projects. By integrating thermal energy storage, two of these projects brought the first utility-scale "nighttime solar" to the United States. An example of this technology is the 110 MW Crescent Dunes CSP facility near Tonopah, Nevada. LPO helped finance Crescent Dunes with a $737 million loan guarantee issued in 2011.

Crescent Dunes is the first deployment of solar power tower technology in the United States that uses molten salt as the primary heat transfer fluid. The innovative molten salt storage system allows the project to generate power at full load on call for up to 10 hours without additional sunlight.

The five utility-scale CSP plants that have received DOE loan guarantees will generate enough clean electricity to power 252,000 American homes. In addition to adding substantial clean

energy to the grid, constructing these projects in Arizona, California and Nevada has put thousands of Americans in the Southwest to work.

Update on LPO Solar Projects on Federal Land

Through the Title XVII program, LPO has debt-financed four solar projects on federal land. Following is a description and update on each of these projects. The job numbers cited below are based on projections submitted by projects sponsors at the time of their loan guarantee application.

Ivanpah Solar Energy Generating System

In April 2011, the Department of Energy issued $1.6 billion in loan guarantees to support construction of the Ivanpah Solar Energy Generating System—the world's largest CSP plant at the time and the first commercial-scale deployment of solar thermal tower technology in the United States. The project is owned by NRG Energy, BrightSource Energy, and Google and is located on public land managed by the Department of the Interior's Bureau of Lands Management (BLM) in southeastern California.

The Ivanpah facility is comprised of three separate CSP towers, which generate electricity by concentrating sunlight using large mirrors (heliostats) at a solar receiver located at the top of the tower. These receivers generate the necessary heat to create high-temperature steam, which then drives a turbine that generates electricity.

The facility has a nameplate capacity of 392 MW of clean electricity and will generate 940,000 megawatt-hours of clean energy annually. Each individual tower produces power sold under separate long-term power purchase agreements to Pacific Gas & Electric (PG&E) and Southern California Edison Company (SCE). The borrowers are current on their principal and interest repayments to DOE.

The Ivanpah project began construction in 2010 and achieved commercial operation in January 2014. Since that time, the project has been selling power under its PPAs and servicing its debt payments to DOE. With all LPO projects, as the plant continues to ramp up and deploy a first-of-its-kind technology at commercial-scale, LPO and its independent engineer are actively monitoring the project.

During construction, the project provided significant employment for workers in an area with one of the nation's highest unemployment rates. Specifically, the construction phase was expected to create 1,000 construction jobs and to support 61 permanent jobs. In addition, the majority of the project's supply chain was sourced in the U.S., with components and services coming from more than 18 states.

Crescent Dunes

In September 2011, the Department of Energy issued a $737 million loan guarantee to finance Crescent Dunes, a 110-MW CSP plant near Tonopah, Nevada. It uses power tower technology that concentrates solar energy to heat molten salt, converting that heat into electricity. The heat absorbed by the salt can be stored and produce electricity during times when direct sunlight is not available. Crescent Dunes is the largest molten salt power tower in the world.

Crescent Dunes was expected to create 600 construction jobs and to support 45 permanent jobs. Under the project's unique development agreement with Nye County, the project targeted filling 90% of construction jobs with Nevada residents, utilizing both union and non-union subcontractors. During operations, the project is expected to disburse more than $10 million per year in salaries and operating costs.

Crescent Dunes is expected to generate 482,000 megawatt-hours of clean energy per year while preventing 279,000 metric tons of carbon dioxide emissions annually.

Crescent Dunes has a long-term PPA with NV Energy for the sale of the power generated by the project. The repayment of the loan guaranteed by DOE is based on the revenues from the contracted sale of this power to the utility.

Genesis

In August 2011, the Department of Energy issued an $852 million partial loan guarantee through FIPP to finance Genesis, a 250-MW parabolic trough CSP plant located in Blythe, California. The project was developed by NextEra Energy Sources, LLC (NextEra) and started commercial operations in April 2014.

Genesis utilizes parabolic trough solar collectors to concentrate sunlight to heat synthetic oil, which then heats water to create steam. The steam is piped to a steam turbine generator to produce electricity.

Genesis was expected to create 800 construction jobs and to support 47 permanent jobs. The plant is expected to generate 605,000 megawatt-hours of clean energy and prevent 332,000 metric tons of carbon dioxide annually.

The project is currently operating and selling power to PG&E under a 25-year PPA. It is current on in its principal and interest repayments to DOE.

Desert Sunlight

In September 2011, the Department issued two partial loan guarantees of $1.5 billion total under FIPP to finance Desert Sunlight, a 550-MW PV solar generation plant. The facility is jointly owned by NextEra, General Electric, and Sumitomo of America and reached commercial

operations in January 2015. Located in Riverside County, California, Desert Sunlight is one of the largest PV solar plants in the world.

LPO worked with 14 financial institutions to finance Desert Sunlight. The loan guarantees helped attract new lenders into the utility-scale PV market and provided them with experience financing utility-scale PV projects.

Desert Sunlight represents a major milestone in scaling up solar technology. The project deployed First Solar's commercially-available Series-3 thin-film cadmium-telluride solar modules.

The project was expected to create 550 construction jobs and to support 15 permanent jobs. It also used approximately 70,000 metric tons of American steel, with 8.9 million solar modules installed at the project.

Desert Sunlight is expected to generate 1,060,000 megawatt-hours of clean energy per year while preventing 614,000 metric tons of carbon dioxide annually.

The project is contracted through long-term PPAs with PG&E and SCE to sell its power, and is current on its principal and interest repayments to DOE.

LPO Environmental Review and Interagency Coordination

Before issuing a loan or loan guarantee, LPO conducts extensive due diligence on each application, which includes a rigorous environmental review of the project – in addition to financial, technical, legal, and market analysis -- by DOE's professional staff and outside experts. Compliance with environmental laws such as the National Environmental Policy Act (NEPA) is fully integrated into LPO's decision-making procedures, starting when an applicant applies to the program and extends throughout the life of each loan.

Ivanpah, Crescent Dunes, Genesis, and Desert Sunlight are all projects on lands managed by the BLM. For each of these projects, BLM was the lead agency for the preparation of an Environmental Impact Statement (EIS) required under NEPA, and DOE was a cooperating agency. In its role as a cooperating agency, DOE reviewed and contributed to the content of each EIS, was a party to and participated in cross-cutting regulatory consultations, and ensured that information required by DOE's NEPA regulations was included in the NEPA documentation. In all cases, the NEPA review must be completed before a loan guarantee can be issued.

LPO staff actively monitors environmental and safety compliance for the duration of the loan for each project in its portfolio. LPO monitors compliance with environmental laws, regulations, and covenants in the loan agreement; maintains relationships with project personnel and relevant federal, state, and local agencies; evaluates changes to project elements that may require additional environmental review; and provides quarterly, semi-annual, or annual assessments and reports that address non-compliance events or other environmental issues for each project.

For the four aforementioned solar projects, LPO continues to monitor operations to ensure they comply with all applicable environmental laws and approvals. Current efforts include, but are not limited to, avian and bat monitoring and management plans, Biological Opinions and Incidental Take Permits issued by the U.S. Fish and Wildlife Service for the desert tortoise, and Programmatic Agreements and Cultural Resources Monitoring Plans pursuant to the National Historic Preservation Act.

A key mandate of LPO under the Title XVII program is to reduce, avoid, or sequester greenhouse gas emissions through the deployment of innovative clean energy technologies. Consistent with this mandate is ensuring that energy projects supported by LPO are developed in an environmentally responsible manner that protects and preserves our natural resources, sensitive ecosystems and endangered species, especially on public land. In coordination with BLM and other agencies, LPO will continue to prioritize environmental compliance as one of its core functions.

Conclusion

With its unique mission to finance innovative energy projects, LPO is well-positioned to contribute meaningfully to our national objectives—including job creation; reducing dependency on fossil fuels; improving our environmental legacy; and enhancing American competitiveness in the global economy. I am confident that LPO programs can continue to play an important role in reaching these goals.