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Statement of Joe Kastner
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U.S. House of Representatives Committee on Science and Technology,
Subcommittee on Energy and the Environment

Field Hearing: *Utility Scale Solar Power: Opportunities and Obstacles*

March 17, 2008

Good Morning. On behalf of my company, MMA Renewable Ventures, LLC and the solar industry, I am happy to provide the following comments related to the development and financing of utility scale solar projects.

In 2007, MMA Renewable Ventures completed the project development and financing of more solar photovoltaic projects in the United States than any other company in the U.S. as measured by total capacity installed (more than 22 MWp) from over 20 discrete projects. We are especially proud of the development and financing of the 14MWp solar photovoltaic (PV) project on Nellis Air Force Base – the largest such project ever built in North America and one of the largest in the world.

In a significant portion of these projects, the land owner and power purchaser has been a public entity such as a federal government department, municipality, or transit district. As you know, such entities cannot avail themselves of the federal investment tax credits (ITCs) and accelerated depreciation benefits offered under the Internal Revenue Code. In all of these transactions, MMA Renewable Ventures served as the third party project developer and financing party which develops the projects, negotiates the power purchase agreements, secures the necessary land rights, negotiates engineering, procurement, and construction contracts, negotiates interconnection agreements with distribution utilities, and obtains construction and permanent financing (debt and tax equity). Consequently, we are intimately knowledgeable and experienced with every aspect of project development and finance of solar PV projects.

In addition to solar PV projects, MMA Renewable Ventures is actively pursuing and developing wind, biomass, biofuel, and energy efficiency opportunities in the U.S. market. We expect to add energy efficiency projects to our portfolio of operational assets in 2008 and wind, biomass, and biofuel projects within the next two calendar years. Similar to solar, many of these opportunities are dependent upon an extension of

currently existing tax credit provisions, in this case the production tax credit (PTC) in Section 45 of the tax code.

MuniMae, the parent company of MMA Renewable Ventures, has built a business largely around sustainable and socially responsible investment opportunities. Historically, this has involved affordable housing and more recently renewable energy and sustainable land investments.

Description of the Solar Project at Nellis AFB

The development and financing of the solar project at Nellis Air Force Base (AFB) was based on the following commercial arrangements:

1. Nellis AFB has leased 140 acres of property to a special purpose entity called Solar Star NAFB, LLC, owned and operated by MMA Renewable Ventures, for a period of twenty years beginning January 1 following the start of commercial operation for the project;

2. Solar Star NAFB has in turn agreed to sell the power output of the plant to Nellis AFB for a coincident term;

3. Solar Star NAFB has also agreed to sell the renewable energy credits (RECs) – the tradable credits representing the environmental attributes, benefits and other values of renewable energy – to Nevada Power for the same 20 year term. Nevada Power purchases such credits in order to comply with the Renewable Portfolio Standard required under Nevada's Renewable Energy Law;

4. On behalf of Solar Star NAFB, MMA Renewable Ventures negotiated an engineering, procurement, and construction contract (EPC Contract) with PowerLight Corporation, which is now SunPower Corporation, Systems (SunPower). Under the EPC Contract, SunPower purchased more than 70,000 solar modules and 54 inverters, constructed the tracking systems, assembled racks of modules, transported equipment, arranged labor on the site, and interconnected all the system components;

5. On behalf of Solar Star NAFB, MMA Renewable Ventures arranged for construction financing from Merrill Lynch, debt financing from John Hancock Insurance Company, and equity financing from CitiCorp North America, Allstate Insurance Company, and MMA Financial.

The sum total of these complex legal and financial arrangements enabled the construction of the largest PV plant in North America. While the specifics of each party and arrangement may vary from project to project, we believe that this public-private partnership model provides a commercial approach that can be used at a variety of sites of varying size and scale.

Recommendations for Promoting Utility-Scale Solar Projects

Utility-scale solar projects represent the greatest opportunity for solar electric generation technologies to reach cost parity with conventional gas and coal-fueled electric generation. When equipment, labor, and capital are deployed to build solar projects at a

scale counted in tens of megawatts, gains from economies of scale including the spread of transaction costs can deliver lower cost solar power. Additionally, this will spur the cost efficiencies required to make the deployment of distributed generation more competitive with retail electricity rates requiring minimal subsidies.
In order to promote the development of projects of such scale, project developers and financial entities need to have a relatively stable financial, legal, and regulatory environment. All fuel-less electric generation technologies are more capital intensive than conventional combustion-based technologies, requiring long term stability in the business environment to mobilize capital. The following concepts/initiatives are key to the development and financing of utility-scale solar:

1. *Long-Term Federal Tax Incentives*

The current 30% investment tax credit (ITC) for solar projects expires at the end of 2008. At present, these federal incentives are critical to the development and financing of utility-scale solar projects. Without the federal tax benefits, utility-scale solar projects will not be viable because the cost of energy will simply be too high.

The effectiveness of existing incentives is significantly limited in driving development of utility scale projects with long lead time particularly given the pace of development and consumer adoption of energy technologies. The existing tax credits or incentives are short-term, piecemeal programs subject to the uncertainty of the Congressional reauthorization and/or appropriations processes. For example, the production tax credit for wind and other types of renewable energy, established in 1992, has been subject to three expirations and several short-term extensions (some retroactive). Uncertainty around the ITC extension increases the cost of capital due to the risk of meeting a deadline and leads to a boom and bust cycle which has caused the inflation of equipment costs purely from supply constraints.

Congress should pass a long term ITC to drive substantial private sector investment in clean energy technologies. Investors need stable, long-term, and predictable incentives. MMA Renewable Ventures supports a minimum 7-year timeframe for clean energy tax credits because this is the minimum period necessary to enable rational investment decisions and deployment of resources in utility scale projects. The federal regulatory environment's support for energy technologies can be significantly improved by establishing consistency and predictability.

At the bottom line, those of us who are actually building and financing utility-scale solar projects need greater certainty of the federal tax benefits. In addition, the ITC could benefit from the amendment of several rules within the IRS code:

- Eliminate the basis adjustment so that ½ of ITC is not "recaptured";

- Make renewable energy investments eligible for Community Reinvestment Act (CRA) consideration. Structured correctly, this could serve to catalyze both distributed and utility-scale solar projects in low and moderate-income communities and/or serving public facilities. It would also serve to attract additional institutional investors into the space and help to create "green-collar" jobs in lower-income communities;

• Create an "economic substance" carve-out for solar tax credits similar to what was done for low-income housing tax credits;

• Raise the production tax credit (PTC) for solar to make it competitive with the ITC and give investors a choice of either one. The PTC structure is a better fit for some investors and will encourage more capital to enter the solar space;

• Match the residual value exemption currently available to the low income housing sector, allowing for no constraints at resale after the tax benefits have been monetized;

• Abolish the possibility for ITC recapture in the event of a catastrophic loss without replacement by the end of a calendar year;

• Allow tax equity to enter project after the system as reached commercial operation under any financing structure.

2. *A Stable Legal Framework*

One of the important prerequisites for investors in utility-scale solar projects is certainty the commercial arrangements will remain intact for the full term of the financing. Utility purchasers, commissions, and state and federal regulations all need to provide certainty and assurances that the various commercial arrangements will not materially change throughout the life of the project.

For instance, in reviewing the standard contracts proposed for the Nellis AFB project it was determined that certain elements in the site lease and the streams of revenues from the power purchase arrangement with Nellis AFB and the REC Agreement with Nevada Power made the project somewhat less than financeable. The most significant instance involved the change-in-law risk associated with the REC agreement. If the Public Utility Commission of Nevada had not issued an order that approved the contract and an associated stipulation that provided assurances regarding change-in-law risk, the project might not have been financed.

3. *A National Renewable Portfolio Standard*

Today, renewable energy resources provide a fraction of total U.S. energy, with the potential for significant growth. More than twenty-seven states and the District of Columbia utilize a wide variety of renewable portfolio standard (RPS) mechanisms to drive a greater reliance on renewable energy. A basic RPS requires the electric utilities (investor-owned utilities and publicly-owned utilities) within a state to procure a percentage of their electricity output necessary to meet load from renewable energy sources in a specified timeframe. Current state policies require varying percentages of renewables, typically targeting a goal of 1% to 5% in the first year, increasing each year to achieve a goal of 5% to 20% over approximately 10-15 years.

In general, a utility can meet RPS requirements by incorporating renewable energy into its fuel mix in one of four ways: (1) building renewable energy facilities; (2) purchasing power directly from an existing renewable energy source; (3) buying RECs; or (4) by encouraging production of distributed renewable energy, efficiency, or conservation. The

specifics of each RPS program vary widely State to State from the goal, to the criteria, to the method of implementation. Many State programs set standards for specific technologies to ensure diversity of electricity supply by supporting the development of promising technologies that may not currently be the most economic.

A national RPS would set the minimum standard for wholesale renewable energy usage throughout the United States. This would serve the important function of guaranteeing a minimum degree of market demand for renewable energy generation. Every state would be required to develop an energy regulatory strategy that includes a base level RPS with performance-based metrics that would drive investment in, and adoption of, viable, cost effective renewable energy technologies. Specifically, Congress would mandate the establishment of minimum state renewable energy procurement standards with ample flexibility for state programs that surpass the federal minimum standards, encouraging dissemination of best regulatory and utility procurement practices, and providing states with incentives to increase reliance on renewable energy, reward energy efficiency, and to provide for a national REC market. For the reasons stated previously regarding stability, it is important that a national RPS is cognizant of existing state programs to ensure long-term investments already undertaken are not adversely affected. The federal RPS would require sufficient non-compliance measures in order to provide a strong incentive for utility compliance.

A national RPS can be a market driving, demand side solution for addressing the broader goals of energy policy through development of diverse, secure renewable energy sources and energy efficiency, while at the same time encouraging technological advances throughout the energy supply chain. The future of renewable energy production in the United States resides in this synergy of governmental policy and emerging technologies – and without each, the aim of diversified, sustainable, and efficient energy production is simply impossible in the foreseeable future. By setting these aggressive goals for renewable energy production targets, the government will drive innovation and the market will create solutions.

4. *Valuing Carbon Emissions and other Externalities*

The current cost of conventional fossil-fuel electricity does not include the environmental and social costs associated with the emission of carbon, mercury, and other pollutants into the atmosphere. Either a cap-and-trade system or emission specific taxes would complement long-term subsidies and the establishment of minimum market demand by internalizing the impact of burning fossil fuels into the price of electricity. This would tend to make solar energy more competitive with fossil fuel-fired electricity and further boost investment.

Market Differences in the Southwest

The southwestern portion of the U.S. including California, Nevada, Arizona, and New Mexico has the strongest solar resource in the country. The State of Nevada has an RPSdriven REC market that provides a large part of the economics for the Nellis solar project. The RPS rules for the state have specific requirements for solar and applies a multiplier to RECs (termed Portfolio Energy Credits under the Nevada RPS) produced by solar facilities. RPS programs in the other three states exist, but are not necessarily

structured properly for significant market penetration of utility-scale solar projects.

California
California has catalyzed solar development through the California Solar Initiative (CSI) program which utilizes a short-term production based incentive. This direct subsidy has spurred the development of distributed generation projects (mostly less than one megawatt), but is not applicable for utility-scale projects. It is expected that California will introduce a tradable REC program for the existing state RPS in the near future that will encourage distributed generation projects currently suffering from subsidy levels declining faster than capital costs for key equipment. California utilities have utilized a request for offer (RFO) process fulfilling their RPS requirements. Since there is no solar set-aside, most of these contracts have been awarded to other renewable technologies that are currently more cost effective than solar. Contracts which have been awarded to solar projects under the RFO process have largely gone to earlier stage solar technologies that have yet to be implemented. The California Public Utilities Commission recently announced a feed-in tariff based on the a revised calculation methodology for the "market price referent" that sets the ceiling price for contracts awarded in the RFO process. The new methodology attempts to take into account the time-of-use benefits associated with the solar production curve matching well with the state-wide demand in California. The current consensus is that the announced feed-in tariff does not provide adequate levels of compensation for solar PV projects.

Arizona
There are certain regulatory hurdles that impede the development of solar and other clean technologies in Arizona. Low energy rates and tariff structures that do not adequately incentivize the peak-producing benefit of solar negatively impacts the economics of solar. Net-metering policies are essential to opening up the market to more wide-spread adoption, instead of limiting potential customers only to those who have 365 day operations, and large load centers. Under the current net-metering rules only small systems are rewarded, otherwise solar generation that exceeds on-site usage is not compensated for. Like net-metering, interconnection standards must be standardized across the state and have a minimum of 2MW to sufficiently promote industry adoption. Lastly the available incentives are insufficient. APS has taken the lead in establishing a PBI program, which is an important step, and for the most part well-designed (20 year PBI structure), however the total available funding is only enough to fund a few MW per year – which is not enough to entice the solar PV industry to undertake the cost and risk of entering a new market.

New Mexico
New Mexico has shown true leadership in the aggressive RPS goals and high net metering limits. This includes solar specific requirements that must be fulfilled beginning in 2011. The law also includes a "Reasonable Cost Threshold" which limits the payment of power from solar installations to currently unfinanceable levels.

Conclusion

Investors are beginning to respond to the market driving incentives for solar energy provided by Federal and State governments. The Nellis AFB project is a great example of how these types of incentives can be combined to create a viable project opportunity when a third-party can enter and efficiently monetize the tax benefits. These types of

projects will only reach the volumes required to significantly reduce the cost of solar energy if the incentive programs are structured to ensure the creation of a stable, longterm market for project developers, installers, equipment manufacturers, and investors.

The geographic market for these opportunities could be expended greatly through several actions at the Federal level including a national RPS and the adoption of a market mechanism for internalizing the external costs of emissions from conventional sources of energy.