STATEMENT OF CONSIDERATIONS

REQUEST BY AE SOLAR ENERGY INC. ("AE SOLAR") FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN PATENT RIGHTS UNDER DOE AWARD NO. DE-EE0005340; W(A) 2012-009

AE SOLAR has requested a waiver of domestic and foreign patent rights of the United States of America in all subject inventions arising from its participation under the above referenced cooperative agreement entitled "Transforming PV Installations Toward Dispatchable, Schedulable Energy Solutions."

The cooperative agreement was made under the Solar Energy Grid Integration Systems – Advanced Concepts (SEGIS-AC) Funding Opportunity Announcement (DE-FOA-0000479). The objectives of SEGIS-AC are to support the development and demonstration of technologies in power electronics that reduce the overall PV system costs, allow high penetrations of solar technologies onto the grid (*e.g.*, reactive power, energy storage, advanced functionalities), and enhance the performance, reliability, and safety of the PV system.

The project funded by the cooperative agreement to AE SOLAR is to (i) develop, demonstrate and commercialize an island detection strategy that overcomes the power quality challenges associated with techniques commonly deployed today, performs reliably under high penetration scenarios, and will not false trip under normal grid events; (ii) develop, demonstrate, and commercialize a set of control algorithms for inverter VAr (volt-ampere reactive) and output power control which optimize feeder efficiency, reduce cycles on electromechanical voltage regulation equipment, and improve voltage stability throughout distribution feeders; and (iii) develop, demonstrate and commercialize a ramp rate controller that is effective at reducing the photovoltaic (PV) output ramp rates caused by cloud induced transients at the distribution feeder level under a high penetration of PV.

All three of the project's objectives are targeted at improving the viability and allowable penetration levels of commercial PV through large scale utility PV installations tied into distribution feeders. The islanding technique developed will be tested, demonstrated, and proven on both an east coast feeder as well as a west coast feeder. The two sites will represent two widely disparate operating environments. Further, the islanding detection technique will be tested in conjunction with multiple inverter installations, installations coupled closely with synchronous generators, and installations closely coupled to large motor loads (representing a ride-through grid event at motor start). The "smart feeder" control project will be tested on Northeast and Northwest feeder lines owned and operated by two separate utilities. These feeders will be significantly different in both design and control operation, which is motivated by the objective of demonstrating the robustness of the developed algorithms as well as the tunable nature of the controlling inverter logic. Lastly, the team's storage solution will be shown to address feeder-wide cloud induced intermittency under high penetration scenarios.

The cooperative agreement has two phases. The total anticipated cost of the cooperative agreement is $5,224,000. The total anticipated cost for phase I is $1,875,000 with AE SOLAR providing $375,000 as cost share for a cost percentage of 20%. The total anticipated cost for phase II is $3,349,000 with AE SOLAR providing $1,674,500 as cost share for a cost share

percentage of 50%. This waiver is contingent upon AE SOLAR maintaining at least a 20% cost share for Phase I and at least a 50% cost share for Phase II.

As set forth in its petition, Advanced Energy Industries bought PV Powered, Inc., now named AE SOLAR, in 2010. The combined organization of Advanced Energy Industries and AE SOLAR "represents one of the largest solar inverter manufacturing companies in the United States. Advanced Energy Industries, Inc, and AE Solar, Inc. hold well over than 10 technical patents spanning the technical space associated with grid-tied PV inventers. Advanced Energy Industries, Inc. and AE Solar Inc. employ hundreds of engineers focused on developing next generation designs to drive inverter functionality into the future of distribution grid, while lowering costs for widespread adoption. Advanced Energy Industries, Inc. has facilities throughout the United States, including a design hub and wholly owned subsidiary, AE Solar, Inc. in Bend Oregon, as well as a design hub in Ft Collins Colorado. Each of these facilities has substantial investment to continue to drive platforms, solutions, and products into the solar energy market. Additionally, each of these facilities represents a manufacturing center for continued product manufacturing to meet the U.S. market needs. Advanced Energy Industries, Inc. and AE Solar, Inc. have numerous patents and patent applications related to the work that is proposed as part of the [cooperative agreement]."

In addition to the committed cost share, Advanced Energy Industries has made substantial investments in the technology being used under the cooperative agreement. Overall, Advanced Energy Industries, Inc. has invested over $130,000,000 in related research and development, infrastructure and technology acquisitions. Specifically, Advanced Energy has spent $26,000,000 on research and development and $14,000,000 on facility and equipment improvements and upgrades, and Advanced Energy Industries Inc. spent $90,000,000 in the acquisition of [AE SOLAR]."

AE SOLAR has agreed that this waiver shall be subject to the march-in and preference for U.S. industry provisions, as well as the U.S. Government license, comparable to those set out in 35 U.S.C. 202-204. Further, AE SOLAR has agreed to the U.S. competitiveness provision as attached to this Statement. In brief, AE SOLAR has agreed that products embodying any waived invention or made through the use of any waived invention shall be substantially manufactured in the United States, and that AE SOLAR will not license, assign, or otherwise transfer any waived invention to any entity unless that entity agrees to these same requirements.

Referring to item 10 of the waiver petition, AE SOLAR does not expect that the granting of the waiver will have an anti-competitive effect. According to AE SOLAR, "IP to be developed will likely be related to utilization of synchrophasors for distributed generation protection and control. Alternate technologies exist to enable similar capability (e.g. Power line carrier, direct communications techniques). By granted the waiver, Advanced Energy may have an opportunity to be recognized as an industry leader in this area. This is not likely to create any kind of monopoly, only to give [Advanced Energy] an opportunity to preserve a 'first' position in this emerging market. AE Solar, Inc., will move to commercialize the developed technologies allowing for increased PV penetration on distribution circuits throughout the United States. Competitors can compete with alternate technologies aimed to perform the same end result."

Considering the foregoing, it is believed that granting this waiver will provide AE SOLAR and its parent, Advanced Energy Industries, with the necessary incentive to invest its resources in commercializing the results of the cooperative agreement in a manner that will make the above technology available to the public in the shortest time. Therefore, upon evaluation of the waiver petition and in view of the objectives and considerations set forth in 10 CFR 784, all of which have been considered, it is recommended that the requested waiver be granted.

[redacted]

Glen R. Drysdale
Patent Attorney
Golden Field Office

Date: 9/17/12

Based upon the foregoing Statement of Considerations and representations in the attached waiver petition, it is determined that the interests of the United States and the general public will best be served by a waiver of patent rights of the scope determined above, and therefore the waiver is granted. This waiver shall not apply to any modification or extension of the cooperative agreement, where through such modification or extension, the purpose, scope, or cost of the agreement has been substantially altered.

CONCURRENCE:

[redacted]

Minh Le
Acting Program Manager
Solar Energy Technologies Program

Date: Oct 1 2012

APPROVAL:

[redacted]

John T. Lucas
Assistant General Counsel for Technology
Transfer and Intellectual Property

Date: Oct 2 2012

U.S. COMPETITIVENESS

The Contractor agrees that any products embodying any waived invention or produced through the use of any waived invention will be manufactured substantially in the United States, unless the Contractor can show to the satisfaction of DOE that it is not commercially feasible to do so. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., recoupment of the Government's investment, etc. The Contractor further agrees to make the above condition binding on any assignee or licensee or any entity otherwise acquiring rights to any waived invention, including subsequent assignees or licensees. Should the Contractor or other such entity receiving rights in any waived invention undergo a change in ownership amounting to a controlling interest, then the waiver, assignment, license, or other transfer of rights in any waived invention is suspended until approved in writing by DOE.