

SunShot Informational Webinar for ENabling Extreme Real-time Grid Integration of Solar Energy (ENERGISE)

5/19/2016

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Good afternoon everyone and welcome to our webinar. Thank you for your interest in the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE) funding opportunity DE-FOA-0001495. You are joining us for the Informational Webinar on EERE Funding Opportunity, titled ENabling Extreme Real-time Grid Integration of Solar Energy (ENERGISE). This Funding Opportunity Announcement (FOA) was issued on May 2, 2016. We will be covering the basic aspects of the FOA during this webinar.

Before we begin, I'd like to draw your attention to the email address on the lower right hand side of this cover page. This is the official mailbox to which you should direct all of your questions during the entire FOA process. Please do not contact EERE individuals directly with questions. All questions received at this mailbox are posted publicly at the Q&A section of the FOA page on EERE Exchange in an anonymous way. The official answers to your questions will typically be posted within 3 business days. Please be careful not to submit any language that might be business sensitive, proprietary or confidential.

We will NOT be holding a live Q&A period at the end of this webinar. Please record your questions as they come up and email them to the address shown. We will be posting all Q&As to EERE Exchange soon after the webinar. Questions that require further discussion with EERE staff will be addressed and posted once the proper response is determined. Please check EERE Exchange on a regular basis.

Also, please note that your participation to this webinar is NOT mandatory.

So, let's get started.

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Also, towards the end of the webinar, we will show some of the Q&A that are already posted on EERE Exchange.

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Here is the agenda for our Webinar today. We will start with an introduction to Department of Energy SunShot FOA, ENabling Extreme Real-time Grid Integration of Solar Energy (ENERGISE). Next, we will cover the target metrics that are required to be met by all awardees. We will go over the scope of work

for ENERGISE, and then the details for the concept paper and full application processes. We will finish our Webinar with a review on the EERE-Exchange Questions Process.

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This slide shows the anticipated schedule for the FOA. The FOA has already been posted, and we are conducting the Informational webinar today. The mandatory concept papers are due by 5 PM Eastern Time on June 17th. The submission deadline for full applications is 5 PM Eastern Time on August 26th. We expect the submission deadline for replies to comments by reviewers by October 14th. The selection notification target date is December 9th. The expected timeframe for award negotiations is 60 to 90 days. For more details, please refer to the FOA.

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The U.S. Department of Energy (DOE) has developed this Funding Opportunity Announcement (FOA) as a part of the Grid Modernization Initiative (GMI), taking into account the overall interests of both the Office of Energy Efficiency and Renewable Energy (EERE) and the Office of Electricity Delivery and Energy Reliability (OE). This FOA is issued by the EERE, Solar Energy Technologies Office; however it was prepared, and responses will be reviewed, in consultation and coordination with Office of Electricity.

The DOE's Grid Modernization Initiative (GMI) represents a comprehensive effort to help shape the future of our nation's grid and solve the challenges of integrating conventional and renewable sources while improving the reliability, resilience, affordability, flexibility, and security of the electric power grid. The GMI targets a transition that ensures the grid is resilient and secure enough to withstand growing cybersecurity and climate challenges through its Multi-Year Program Plan (MYPP).

The DOE SunShot Initiative is a collaborative national effort launched in 2011 that aggressively drives innovation to make solar energy cost competitive, without subsidies, with traditional energy sources before the end of the decade. SunShot supports efforts by private companies, universities, non-profit organizations, state and local governments, and national laboratories to drive down the cost of solar electricity to \$0.06 per kilowatt-hour, without incentives, by the year 2020.

As shown in this slide, the installed cost of solar energy systems is rapidly decreasing (left). And, the solar deployment is rapidly increasing (right).

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The SunShot Systems Integration (SI) subprogram seeks to enable the widespread deployment of high penetrations of safe, reliable, secure, and cost effective solar energy on the nation's electricity grid by addressing the associated technical and regulatory challenges through targeted technology research, development, and demonstration (R&D). The SunShot Systems Integration subprogram has identified four broad, inter-related technical areas, as depicted in the figure, namely Grid Performance and Reliability, Dispatchability, Power Electronics and Communications, Sensing, and Data Analytics.

Fundamental challenges to be addressed in this FOA are:

- Two-way (bi-directional) power flows
- Variable solar generation
- More dynamic interactions between T&D

- Lack of visibility & control
- Integration of information and communication technologies for PV system monitoring and control

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Here is another look at the FOA timeline. EERE's Evaluation and Selection Process is shown in orange boxes here. EERE will review Concept Papers, Full Applications, and Replies to Reviewer Comments. The gray boxes represent the actions that apply to applicants throughout the FOA process. Please note that some of the dates shown here are expected dates, and may shift. We will come back to the timeline later in our presentation. However, we advise you read each relevant section in the FOA carefully, because there are more details than we can cover in this webinar today.

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Here are some main details on the FOA ENERGISE:

- a) The period of performance will be up to 3 years.
- b) EERE expects to make approximately \$25 million of Federal funding available for new awards under this FOA, subject to the availability of appropriated funds.
- c) The cost share requirements for Topic Areas 1 & 2 are 50% and 20%, respectively.
- d) The minimum award amounts for Topic Areas 1 & 2 are both \$500K.
- e) The maximum award amount for Topic Area 1 is \$4M and Topic Area 2 is \$2M.
- f) We expect to award approximately 10 to 15 projects, Topic Areas 1 & 2 combined.

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This slide shows the high-level system requirements for ENERGISE. We list the ones for solar penetration levels, interconnection review and approval time, and the reliability requirements on this slide. Please review this table carefully. More detail is provided in the FOA document. Also note that the long-term requirements are much more aggressive. In addition, for the reliability requirement, there may be more than one IEEE or NERC standard that may be relevant.

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This slide shows some additional requirements that are required by ENERGISE solutions to be proposed. We list the network scalability, observability, predictability, controllability and optimization requirements on this slide. Again, more details are provided in the FOA document.

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This slide presents some of the technical specifications for the solution platform, and the relevant performance metrics required therein.

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We continue with the specifications and corresponding performance requirements for the platform and the device level on this slide.

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Here we list the requirements for device, communications, control and analytics. Please refer to the FOA document for more details. If you have any questions, please email them to the relevant email address.

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This slide and the following one cover analytics that are required for ENERGISE solutions.

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This slide has the final analytics component and its related metrics.

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This slide depicts the high-level conceptual hierarchy for ENERGISE. Note that these layers are only one particular representation of the highly integrated and coupled components of the electric power grid. Other representations may be considered as long as they meet the funding objectives. The solutions must have all the attributes described in the DOE Grid Modernization MYPP, including, reliability, resilience, sustainability, flexibility, affordability, and security. Innovations are sought in software, hardware, and system technologies in each layer, which integrate seamlessly into complete solutions.

Areas where critical challenges exist for high penetration solar generation are illustrated with different shades of orange in this figure. As indicated in the figure, ENERGISE is targeting several new analytical components at the Enhanced System Layer. However, there are significant challenges targeted at all levels.

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This slide describes who is eligible to apply to this funding opportunity.

For more details regarding these eligibility requirements, please review this slide and also see Section 3A of the FOA.

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Concept Papers are required to initiate your application process to this funding program. Concept Papers are brief descriptions of the proposed project or technology. The Concept Papers must conform to the content requirements outlined on page 42 of the FOA and are limited to 5 pages at the maximum. The concept paper phase allows applicants to submit their ideas with minimal time and expense. EERE SunShot office will provide feedback on the proposed project so the Applicant can make an informed decision whether or not to expend additional resources to prepare a full application. Carefully review Sections 4C and 5A.1 of the FOA for detailed information regarding the concept papers.

If an applicant fails to submit an eligible Concept Paper, the applicant is not eligible to submit a Full Application.

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Concept Papers are mandatory and are due June 17, 2016 by 5:00PM ET.

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EERE will provide applicants with either an Encourage or Discourage notification. A “Discourage” notification conveys EERE’s lack of programmatic interest in the proposed project. An applicant who receives a “Discourage” notification may still submit a Full Application.

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This slide provides an overview for the full applications. For more details on the Technical Review Criteria for Full Applications, please see Section 4A.2 of the FOA.

For fairness, the Full Application must conform to the content requirements of Section 4D.1 of the FOA.

Applicants will be provided with reviewer comments, following evaluation of all eligible Full Applications.

Applicants will have approximately three business days to prepare a short Reply to Reviewer Comments.

One or more applicants may be invited to participate in Pre-Selection Interviews.

Expected date for Selection Notifications is Dec. 9, 2016.

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Full Applications are due August 26, 2016 by 5:00PM ET.

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Here again is the timeline for ENERGISE.

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Finally some key submission points.

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Here are some questions and answers already posted on EERE Exchange, which you may look over at your leisure.

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DOE will be posting copies of these slides on EERE Exchange after this webinar. Questions that came up during this webinar, should be emailed to energise@ee.doe.gov. Answers will be posted to the EERE Exchange as soon as possible.

This concludes our presentation. Thank you again for your interest in this Department of Energy, SunShot ENERGISE FOA.