DE-FOA-0001840 Solar Energy Technologies Office FY2018 FOA
Topic 3: Photovoltaic Research and Development
Webinar Script

SLIDE 1

Good afternoon everyone and welcome to our webinar. Thank you for your interest in the U.S. Department of Energy's efforts on renewable energy and energy efficiency. You are joining us for the Informational Webinar for Applicants and other interested parties for the Solar Energy Technologies Office, or "SETO", FY2018 Funding Opportunity Announcement, or FOA, which was issued on April 16, 2018. Specifically, this webinar is meant to cover the content of Topic 3: Photovoltaics Research and Development. My name is Jonathan Trinastic and I am a Fellow in the Solar Energy Technologies Office within the DOE's Office of Energy Efficiency and Renewable Energy. Dana Olson, a Technology Manager in SETO, is also joining me today, and we hope to cover the basic aspects of the Funding Opportunity Announcement during this webinar.

Before we begin, I'd like to draw your attention to the email address on the left hand side of this cover page. This is the official mailbox to direct all of your questions during the entire FOA process. Please do not contact EERE individuals directly with questions, including myself. 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 also be posted within 3 business days. Please be careful not to submit any language that might be business sensitive, proprietary or confidential.

We will handle Q&A offline after the webinars. Please type in your questions into the system as they come up and we will post answers to all questions on EERE Exchange. Please be careful not to submit any language that might be business sensitive, proprietary or confidential. After the webinar as questions come up feel free to use the email address on the slide.

Also, just to be clear, there are no particular advantages or disadvantages to the application evaluation process with respect to participating on the webinar today. Your participation is completely voluntary.

Let's get started!

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This slide shows the anticipated schedule for the FOA. The FOA has already been posted, and we are conducting the FOA Informational Webinar now. Please note that there are a few requirements that we will go over in the presentation that are different than in past FOAs, such as Replies to Reviewer Comments – we will cover all requirements for this FOA later in the presentation.

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The agenda for this presentation is as follows: READ SLIDE

We encourage you to have a copy of the FOA in front of you for reference as we go through the presentation.

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The FOA will support early-stage research that spans the SETO portfolio, seeking to advance both solar photovoltaic (PV) and concentrating solar thermal power (CSP) technologies and to facilitate the swift integration of those technologies into the nation's electricity grid.

It also is designed to support efforts that prepare the workforce for the solar industry's future needs.

Historically, SETO has released separate funding opportunities that address specific stages and types of solar research. For the first time, this funding program combines SETO funding efforts into one FOA for fiscal year 2018 (FY2018). By providing a more streamlined and consistent FOA strategy SETO hopes to further accelerate the advancement of solar research and reduce government overhead.

Lastly, the Innovative Pathways projects you will see in the FOA aim to fund projects that are different than typical DOE technology development projects in that they do not fund individual technologies along their pathway to market, but instead focus on improving the pathway itself for portfolios of technologies. The projects will seek to unlock private sector support for energy innovation and encourage private funding for later-stage technological development.

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The FOA contains 4 high level technical areas of interest.

Topic 1: Advanced Solar Systems Integration Technologies describes SETO research priorities in the seamless integration of high penetrations of solar energy onto the nation's electricity grid. Responsive projects would advance the prediction, monitoring, and control of solar power production, the capabilities of solar power electronics and the integration of solar energy with synergistic technologies.

Topic 2: Concentrating Solar Thermal Power Research and Development describes SETO research priorities that support solar technologies that focus sunlight to generate and store high-temperature heat for electricity generation and other end uses. Responsive projects would contribute to increasing solar power adoption and grid reliability often through combined power and storage.

Topic 3: Photovoltaic Research and Development describes SETO research priorities that support the further development of photovoltaic technologies that improve system reliability, annual energy yield, demonstrate performance of novel PV devices and develop new PV materials. Responsive projects would directly contribute to increasing PV affordability through continuous improvements in PV efficiency and reliability. SETO's work ensures that a pipeline of innovation continues to reduce PV system cost, increase power conversion efficiency, and reduce supply-chain capital expense.

Topic 4: Improving and Expanding the Solar Industry through Workforce Initiatives describes SETO research priorities that support solar workforce development. Responsive projects would focus on increasing the size of the pipeline of skilled workers being employed by the solar industry while simultaneously working to increase the proportion of industry participants from the talent pools of veterans and other communities, providing increased value to the solar industry as a whole.

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In this webinar, we'll focus on specific descriptions of Topic 3 subareas relevant to photovoltaic research and development. Topic 3.1 will fund small, innovative projects in novel and/or emerging areas of photovoltaics research, known as SIPS, which inherently involve significant technical risk but have the potential to produce dramatic progress towards a solar LCOE of 3 cents per kWh by 2030. Along with the topics of interest motivated by the background summary of Topic 3 in the funding opportunity, examples of emerging areas of interest include rapid growth techniques not previously demonstrated for PV absorber materials, novel metallization methods, alternate wafering processes, low-cost and high-efficiency cell and module concepts, improved reliability of PV materials and modules, and life cycle analyses for emerging recycling technologies in PV.

SIPS proposals will use an abbreviated application process to limit the resources required by applicants to apply. The process is described in more detail in Section IV.D of the FOA document. Following the submission of a Letter of Intent, SIPS proposals have an expedited concept paper phase: instead of submitting a Concept Paper, SIPS applicants will resubmit the same Letter of Intent along with a summary slide of the proposal. Then, SIPS applicants submit a SIPS Full Application at the Full Application deadline for the FOA. Failure to complete these required process steps will result in an inability to submit a SIPS application for review.

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In contrast to SIPS, Topic 3.2 will fund multi-year efforts in PV cell, module, and system-level research that aim for substantial improvements in performance and reliability while reducing costs related to PV materials, components, manufacturing, installation, or operations and maintenance. Successful projects will improve upon the state-of-the-art in cell, module, or system technology to improve performance, reliability, or manufacturability and advance toward the SunShot 2030 cost targets, shown in the Figure on the right for utility-scale systems as an example. This Figure, along with a more in-depth discussion of relevant research areas, can be found in the funding opportunity in Section I.B, Topic 3.2.

Some examples of areas of interest for this topic include: reducing material and supply chain costs, improving durability and stability of perovskite solar cells, mitigating degradation modes and manufacturing costs for heterojunction or other advanced silicon architectures, optimizing defect and dopant controls in thin films, and advanced metrology to characterize optical and electrical aspects of materials and devices. Other areas of interest include early-stage research into novel module form factors, module level power electronics, system architecture, or tracker technologies that improve the affordability of installed PV systems, as well as advanced machine learning and data analytics efforts to transform how PV system data can be leveraged to understand performance, inform module research, and maximize energy yield.

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Topic 3.3 is different from 3.1 and 3.2 in that it will fund research projects that form interdisciplinary teams to investigate scientific concepts and challenges that extend beyond traditional PV absorber technologies. Teams formed for these research projects should demonstrate distinct and complementary capabilities from at least two research groups to solve PV research challenges using technologies adjacent to or underutilized in PV research. In order to be successful, project teams should demonstrate existing expertise in the proposed research area and have clearly defined research goals with measurable impacts on the state-of-the-art within the multi-year project timeframe. Each project should include a lead investigator who coordinates communication within the team and ensures that individual contributors make progress toward the overall project objectives. When relevant, teams are encouraged to leverage characterization, modeling, or other methods from research areas beyond the PV research community.

Some examples of functional areas crossing absorber technologies that could be of interest include surface passivation, carrier-selective contracts, metallization techniques, wafer or thin film processing and fabrication, cell interconnection, module design, cell or module reliability, and multi-junction devices. Again, successful projects will be those that improve the state-of-the-art in module performance, reliability, or manufacturability only by integrating non-overlapping expertise from multiple research groups to tackle PV research challenges in areas such as these.

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The final subtopic in Topic 3 is known as Innovative Pathways. This topic area will fund innovative approaches and models to accelerate the transfer of photovoltaic and related technologies from the lab to the private sector. Instead of direct technology solutions, successful applicants will research and develop new methods to advance solar research portfolios and overcome challenges endemic to the solar technology transfer space. These challenges could include knowledge gaps between research and industrial communities, or constraints on access to necessary resources.

Some areas of interest include, but are not limited to: alternative capital for technology transfer, new ways to incentivize industry-researcher collaboration, methods to reduce barriers for new entrants in the industry to leverage existing facilities, data and build capacity, and methods to drive down the cost or accelerate hardware validation and certification processes. Models and efforts that expand PV access to low and moderate income Americans are also of interest, such as new alternatives to creditworthiness and information asymmetry challenges.

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Projects within each subtopic of Topic 3 will be provided different amounts of estimated funding and will last for different lengths of time. For SIPS Topic 3.1, EERE expects to make approximately $2 million of Federal funding available for new awards under this FOA subject to the availability of appropriated funds. The average award amount is anticipated to be around 200,000 dollars and each award will last around 18 months.

For Topics 3.2 and 3.3, EERE expects in total to make approximately 15 million dollars of Federal funding available for new awards, with around 1.5 million per award, and the average project lasting about 3 years. For Innovative Pathways, Topic 3.4, EERE expects to make about 2 million dollars of Federal funding available, with around 1 million going to each award and each award lasting about 3 years.

EERE intends to fund mostly cooperative agreements under this FOA, but may also fund Grants, TIAs, Work Authorizations, and Interagency Agreements. Cooperative Agreements include Substantial Involvement, which we will discuss next. A minimum of 20% cost share is required across all subtopic areas for Topic 3.

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Please note that nonprofit organizations described in Section 501(c)(3) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

Also, note that all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the Prime Recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

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The following types of applications will be deemed nonresponsive and will not be reviewed or considered for an award. Examples of non-responsive applications include:
Undifferentiated research, products, and/or solutions: This FOA seeks innovative solutions that help achieve SETO goals. Incremental advancement of undifferentiated or duplicative efforts is insufficient to meet SETO goals and is not of interest to this FOA.

Projects lacking influential impact from federal funds: This FOA intends to fund projects where Federal funds will provide a clear and measurable impact, (e.g. retiring risk sufficiently for follow-on investment or catalyzing development.) Projects that have sufficient monies and resources to be executed regardless of federal funds are not of interest.

Re-funding the same idea at the same technology readiness level: This FOA does not intend to re-fund prior SETO awardees for the same idea at the same technology readiness level.

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Under cooperative agreements, there will be what is known as “substantial involvement” between EERE and the Recipient during the performance of the project.

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The total budget presented in the application must include both Federal (DOE), and Non-Federal (cost share) portions, thereby reflecting TOTAL PROJECT COSTS proposed. All costs must be verifiable from the Recipient's records and be necessary and reasonable for the accomplishment of the project.

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Cost Share must be allowable and must be verifiable upon submission of the Full Application. Please refer to this chart for your entity's applicable cost principles. It is imperative that you follow the applicable cost principles when creating your budget for the full application.

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Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.J.1 of the FOA.

Project Teams may provide cost share in the form of cash or in-kind contributions. Cost share may be provided by the Prime Recipient, Subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/Contractors may not provide cost share.

Cash contributions include, but are not limited to: personnel costs, fringe costs, supply and equipment costs, indirect costs and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include, but are not limited to: the donation of space or use of equipment.

Cost share contributions must be specified in the project budget, verifiable from the Prime Recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same Federal regulations as Federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 & 10 CFR 603.525-555 for additional guidance on cost sharing.

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Be aware that there are items that are considered unallowable cost share. If a cost is considered unallowable, it cannot be counted as cost share. This slide provides some examples of cost share that is unallowable.

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Cost Share must be provided on an invoice basis, unless a waiver is requested and approved by the DOE Contracting Officer.

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EERE's Evaluation and Selection Process is shown in blue here. EERE will review Concept Papers, Replies to Reviewer Comments (which we will cover later in the presentation), and Full Applications. The gray boxes represent the actions that apply to applicants throughout the FOA process. After the entire proposal and review process, EERE anticipates making awards by September 2018.

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As part of the merit review process, EERE may invite certain applicants to participate in Pre-Selection Interviews. The invited applicants will meet with EERE to allow the Merit Review Panel to seek clarification on the contents of the Full Applications and otherwise ask questions regarding the proposed project. The information provided by applicants to EERE through Pre-Selection Interviews contributes to EERE's selection decisions.

EERE will arrange to meet with the invited applicants in person at EERE's offices or a mutually agreed upon location. EERE may also arrange site visits at certain Applicants' facilities. As an the alternative, EERE may invite certain applicants to participate in a one-on-one conference with EERE via webinar, videoconference, or conference call.

EERE will not reimburse applicants for travel and other expenses relating to the Pre-Selection Interviews, nor will these costs be eligible for reimbursement as pre-award costs.

EERE may obtain additional information through Pre-Selection Interviews that will be used to make a final selection determination. EERE may select applications for funding and make awards without Pre-Selection Interviews. Participation in Pre-Selection Interviews with EERE does not signify that applicants have been selected for award negotiations.

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Letters of Intent will be used by EERE to plan for the merit review process. In order to submit a Concept Paper and Full Application, applicants are REQUIRED to submit a Letter of Intent by May 4, 2018.

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Concept Papers are required for this FOA. Concept Papers are brief descriptions of the proposed project. It allows applicants to submit their ideas with minimal time and expense. EERE will provide feedback on the proposed project so the Applicant can make an informed decision whether to expend additional resources to prepare a full application.

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

Concept Papers must be submitted by May 9th, 2018 at 3:00pm Eastern, through EERE Exchange.

EERE will provide applicants with either an encouraged or discouraged notification. A "discouraged" notification conveys EERE's lack of programmatic interest in the proposed project. An applicant who receives a "discouraged" notification may still submit a Full Application.

Please note that regardless of the date applicants receive the Encourage/Discourage notifications, the submission deadline for the Full Application remains the date stated on the FOA cover page

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SIPS applicants must submit an abbreviated Concept Paper submission. This submission includes 1) a resubmission of the Letter of Intent to EERE Exchange, and 2) a single slide summarizing the proposal. Both of these must be submitted by the same Concept Paper deadline as for other topics, but no additional Concept Paper document is required. The SIPS Full Application is due at the same time as other Full Applications as well, but has different content requirements – please see Section IV.D of the FOA for details about these different requirements.

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The normal, non-SIPS Full Application includes:

Technical Volume: The key technical submission. Applicants submit info pertaining to the technical content, project team members, etc.

SF-424 Application for Federal Assistance: The formal application signed by the authorized representative of the applicant. This includes cost share amounts and Federal certifications and assurances.

Summary Slide: Powerpoint slide that provides quick facts about the technology. Slide content requirements are provided in the FOA.

Other Administrative Documents will also be required, as detailed in the FOA.

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To streamline the application process for applicants, the documents listed on the slide will only be requested upon selection, including the Budget Justification Workbook (EERE 335) and US. Manufacturing Commitments.

Other documents or clarifying information that can be requested at the time of Selection for Negotiation can be found on the slide.

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The key technical component of the full application is the Technical Volume, which helps applicants frame the technical information that the application will be evaluated on. The Technical Volume provides information regarding what the project is, how the project tasks will be accomplished, and the project timetable.

The Technical Volume is comprised of the following:

- The Cover Page will be a one page document and provides basic information on their project, such as title, topic area, points of contact, etc.
- The Project Overview provides information on project background, goals, impact of EERE funding
- The Technical Description, Innovation, and Impact section provides information on project relevance and outcomes, feasibility, and innovation/impacts. This ultimately provides the justification as to why EERE should fund the project.
- The Summary Statement of Project Objectives (SOPO) or "Workplan" details the proposed milestones and project schedule. If selected for award negotiations, the Workplan serves as the starting point when negotiating the Statement of Project Objectives.
- The Technical Qualifications and Resources section provides applicants and opportunity to provide information about the proposed project team and demonstrate how the applicant will facilitate the successful completion of the proposed project.
- Appendices as needed

There are not strict page limits on sections to allow applicants the flexibility to structure the application in a way to best articulate the project and address the content requirements. The applicant should consider the weighting of each of the evaluation criteria (see Section V.A.2 of the FOA) when preparing the Technical Volume.

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Applicants must submit full applications by June 26, 2018, at 3:00 PM ET. EERE will conduct an eligibility review, and full application will be deemed eligible if:

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Applications will be evaluated against the following merit review criteria. For criterion 1,

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For criterion 2,

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For criterion 3,

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Full Applications are reviewed by experts in the FOA topic area(s). After those experts review the applications, EERE will provide applicants with reviewer comments. Applicants will have a brief opportunity to review the comments and prepare a short Reply to Reviewer Comments responding to comments however they desire. The Reply to Reviewer Comments is due by the date and time provided on this slide. Applicants should anticipate receiving the independent reviewer comments approximately three business days before this due date. The Reply to Reviewer Comments is an optional submission; applicants are not required to submit a Reply to Reviewer Comments.

This is a **customer centric** process that provides applicants with a unique opportunity to correct misunderstandings and misinterpretations and to provide additional data that might influence the selection process in their favor. The Replies are considered by the reviewers and the selection official.

Replies to Reviewer Comments must conform to the content and form requirements listed here, including maximum page lengths. If a Reply to Reviewer Comments is more than three pages in length, EERE will review only the first three pages and disregard any additional pages.

Please see Sections IV.F and V.A.3 for additional information regarding Replies to Reviewer Comments.

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After the Merit Review process, the Selection Official may consider program policy factors to come to a final selection decision. These can include:

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There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These steps include:

1) Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number.

2) Register with the System for Award Management (SAM). Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually. We specifically want to emphasize the importance of SAM registration as we have run into numerous problems in the past. Selections and Awards cannot be made without SAM registration.
3) Register in FedConnect. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at the FedConnect site.
4) Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that Letters of Intent, Concept Papers, and Full Applications will not be accepted through Grants.gov.

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All required submissions must come through EERE Exchange. EERE will not review or consider applications submitted through any other means.

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