EERE 205: FOA Applicant Webinar Presentation

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Solar Energy Technologies Office
FY2018 FOA – Topic 2

SETO.FOA@ee.doe.gov

FOA Webinar

DE-FOA-0001840

April 23, 2018

Anticipated Schedule:

FOA Issue Date:	April 17, 2018
Submission Deadline for Letter of Intent (MANDATORY):	May 4, 2018, 3:00pm ET
FOA Informational Webinar:	April 23, 2018
Submission Deadline for Concept Papers: • Applicants must submit a Concept Paper by 3:00pm ET on the due date listed above to be eligible to submit a Full Application. Topic Areas 2.1 and 3.1 SIPS applications must resubmit their LOI again as a concept paper by the concept paper deadline above to clear an administrative software restriction of EERE Exchange.	May 9, 2018, 3:00pm ET
Submission Deadline for Full Applications and SIPS Applications:	June 26, 2018, 3:00pm ET
Expected Submission Deadline for Replies to Reviewer Comments:	August 2, 2018, 3:00pm ET
Expected Timeframe for EERE Selection Notifications:	September 2018
Expected Timeframe for Award Negotiations:	September - November 2018

Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement DE-FOA-0001840 **("FOA")** and adhere to the stated submission requirements.
- This presentation summarizes the contents of FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the controlling document and applicants should rely on the FOA language and seek clarification from EERE.
- If you believe there is an inconsistency, please contact SETO.FOA@ee.doe.gov

Notice

- NO NEW INFORMATION OTHER THAN THAT PROVIDED IN THE FOA WILL BE DISCUSSED IN THE WEBINAR.

- 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.

Agenda

1) FOA Description
2) Topic Areas/Technical Areas of Interest
3) Award Information
4) Statement of Substantial Involvement
5) Cost Sharing
6) Pre-Selection Interviews
7) Letters of Intent
8) Concept Papers
9) Full Applications
10) Merit Review and Selection Process
11) Registration Requirements

FOA Description - High Level

- 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.
- **New Funding Strategy**: One Solar Energy Technologies Office (SETO) FOA for fiscal year 2018 (FY18)
- **Innovative Pathways**: Within each of the technology areas, the office is looking to fund projects that will develop and test new ways to accelerate the integration of emerging technologies into the solar industry and unlock private sector resources to support energy innovation.

FOA Description - Topics

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.

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.

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.

Topic 4: Improving and Expanding the Solar Industry through Workforce Initiatives describes SETO research priorities that support solar workforce development

Topic 2.1: Small, Innovative Projects in Solar (SIPS): CSP

- Focused projects in novel or emerging areas of photovoltaics research that involve significant technical risk but potential to reach SunShot CSP 2030 goal of $0.05 cents/kWh.

- Examples of emerging areas
  - Novel Optical Concentration
  - Active Optics, Self-Adaptive Optics
  - Novel Optical to Thermal Exchange
  - Environmental compatible, ultra-low or ultra-high thermal conducting materials
  - Novel Passive Thermal Transport control for the CSP application

FOA Description
Section I.B: Topic 2.1

- Abbreviated application process:
  - **Letter of Intent Phase:** submit Letter of Intent
  - **Concept Paper Phase**: resubmit Letter of Intent along with summary slide
  - **Full Application Phase:** submit SIPS Full Application (FOA Section IV.D)

Topic 2.2: Advanced CSP Collectors

- Novel collectors which improve the annualized efficiency, decrease the cost, and/or enhance the achievable average concentration ratio of CSP collectors to satisfy the below Figure of Merit:
- $FOM = \frac{Cost}{Eff + CR/50} \leq 0.65$

FOA Description
Section I.B: Topic 2.2

- Improve collector assembly and installation in support of the above figure of merit.

- Technologies addressing the operation and/or maintenance of CSP collectors. Such applications may address optical losses not generally dictated by the optical hardware (aiming technology, control systems, performance degradation, collector down time, wind mitigation, etc.) as well as operational cost of the collector field.

Topic 2.3: Advanced Power Cycles for CSP

- Innovations in power cycles compatible with cost competitive CSP.
- $900/kW$_e$ cost with a 50% Thermal to Electric conversion efficiency or power cycles which otherwise open new solutions in support of SunShot targets.
- Particular Emphasis on Supercritical CO_2 Cycles
  - Component Innovations
  - Materials and Manufacturing Innovations
  - Cycle Operation and Maintenance Technologies
- Also seek Novel Power Cycles Impacting CSP Market Viability

FOA Description
Section I.B: Topic 2.3

Topic 2.4: Advanced CSP Thermal Transport Systems and Components

- Innovations in the CSP receiver subsystem and thermal energy storage subsystem.
- This begins where the incident photon is converted to thermal energy, and ends immediately before the thermal energy is exchanged into the power cycle.
- Components in this section include
  - Receiver panel
  - heat transfer media (HTM)
  - HTM piping,
  - HTM structure (e.g. tower)
  - HTM movement (pump, circulator, elevator, *etc*.)
  - Thermal energy storage (TES) media
  - TES containment and heat exchange
  - Heat tracing, system sensors, controls

FOA Description
Section I.B: Topic 2.4

Topic 2.5: Innovative Pathways: Concentrating Solar Power

- Innovative approaches and models to **accelerate the transfer of CSP technologies** from the lab to the private sector
- Applicants must demonstrate a pathway to test, scale, and sustain the model by the end of the period of performance
- Example areas of interest
  - **Alternative capital** for technology R&D
  - Incentive structures for **industry-researcher collaboration**
  - Overcoming **barriers for new entrants** to leveraging existing facilities
  - Methods to **accelerate hardware validation and certification**
  - Models to expand **PV access to low- and moderate-income Americans**

FOA Description
Section I.B: Topic 3.4

Estimated Award Funding Information

Topic	2.1: SIPS	2.2: Collectors 2.3: Power Cycles 2.4: Thermal Transport	2.5: Innovative Pathways
Total Amount to be Awarded	$3M*	$20M*	$1M*
Anticipated Average Award Amount	$300K/award	$2M/award	$1M/award
Period of Performance (months)	18	36	36
Types of Funding Agreements	Cooperative Agreements, Grants, Technology Investment Agreements, Work Authorizations, Interagency Agreements		
Cost Share Requirement (of Total Project Costs)	20% minimum		

FOA Description
Section II.A

*Subject to the availability of appropriated funds

Who's Eligible to Apply?

Eligible applicants for this FOA include:

1. Individuals
2. Domestic Entities
3. Foreign Entities
4. Incorporated Consortia
5. Unincorporated Consortia

For more detail about each eligible applicant, please see Section III.A of the FOA for eligibility requirements

Note: DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) and Non-DOE/NNSA FFRDCs are eligible to apply for funding as a Subrecipient (receiving up to 49.9% of the award funding) but are not eligible to apply as a Prime Recipient.

Nonprofit organizations described in Section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

Non-Responsive Applications

The following types of applications will be deemed nonresponsive and will not be reviewed or considered for an award:

- Applications that fall outside the technical parameters specified in Section I.B of the FOA, including but not limited to :
  - Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the law of thermodynamics).
  - Undifferentiated research, products, and/or solutions
  - Projects lacking influential impact from federal funds
  - Re-funding the same idea at the same technology readiness level
  - Applications focusing exclusively on HVAC and water heating applications.
  - Products or solutions for systems which do not tie to a grid or micro-grid (i.e. wholly off-grid applications and portable power).
  - Fundamental electro-chemical battery materials research
  - Hydrogen and fuel cell technologies

Statement of Substantial Involvement

EERE has substantial involvement in work performed under Awards made following this FOA. EERE does not limit its involvement to the administrative requirements of the Award. Instead, EERE has substantial involvement in the direction and redirection of the technical aspects of the project as a whole. Substantial involvement includes, but is not limited to, the following:

- EERE shares responsibility with the Recipient for the management, control, direction, and performance of the Project.
- EERE may intervene in the conduct or performance of work under this Award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
- EERE may redirect or discontinue funding the Project based on the outcome of EERE's evaluation of the Project at that the Go/No Go decision point.
- EERE participates in major project decision-making processes.

Cost Sharing Requirements

Topics 1.1, 1.2, 1.3, 1.4 Topics 2.1, 2.2, 2.3, 2.4, 2.5 Topics 3.1, 3.2, 3.3, 3.4 Topic 4.2	Applicants must contribute a minimum of 20% of the total project costs for R&D projects.
Topic 4.1	Cost sharing is encouraged, but not required

Cost Share Contributions

- Contributions must be:
  - Specified in the project budget
  - Verifiable from the Prime Recipient's records
  - Necessary and reasonable for proper and efficient accomplishment of 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

Allowable Cost Share

- Cost Share must be allowable and must be verifiable upon submission of the Full Application
- Refer to the following applicable Federal cost principles:

Entity	Cost Principles
For-profit entities	FAR Part 31
All other non-federal entities	2 CFR Part 200 Subpart E - Cost Principles

Allowable Cost Share

- Cost Share
  - May be provided by the Prime Recipient, Subrecipients, or a Third Party
  - Vendors/Contractors may not provide cost share.
- Cash Contributions
  - Can include, but are not limited to: personnel costs, fringe costs, supply and equipment costs, indirect costs and other direct costs.
- In-Kind Contributions
  - Can include the donation of space or use of equipment.

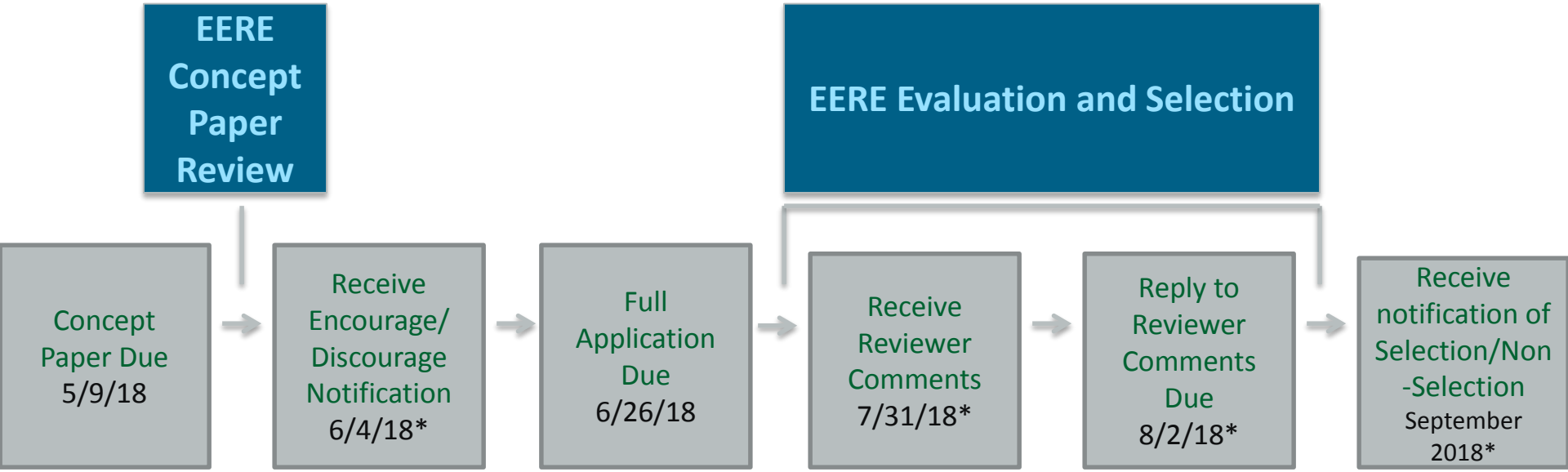
Unallowable Cost Share

- The Prime Recipient may not use the following sources to meet its cost share obligations including, but not limited to:
  - Revenues or royalties from the prospective operation of an activity beyond the project period
  - Proceeds from the prospective sale of an asset of an activity
  - Federal funding or property
  - Expenditures reimbursed under a separate Federal Technology Office
  - The same cash or in-kind contributions for more than one project or program

Cost Share Payment

- Recipients must provide documentation of the cost share contribution, incrementally over the life of the award
- The cumulative cost share percentage provided on each invoice must reflect, at a minimum, the cost sharing percentage negotiated
- In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. See Section III.B.vi of the FOA.

FOA Timeline



*Estimate date

EERE anticipates making awards by September 2018

Pre-Selection Interviews

- EERE may invite one or more applicants to participate in Pre-Selection Interviews
- All interviews will be conducted in the same format
- 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
- Participation in Pre-Selection Interviews with EERE does not signify that applicants have been selected for award negotiations

Letters of Intent

- Letters of Intent ("LOIs") are **REQUIRED** in order to be eligible to submit a Concept Paper and Full Application
- To be considered:
  - The LOI must comply with the content and form requirements of Section IV.B.i of the FOA, and
  - The applicant must enter all required information and click the "Create Submission" button in EERE Exchange by the deadline stated in the FOA.
- The LOIs should not contain any proprietary or sensitive business information
- EERE will not provide notification of acceptance for Letters of Intent

Concept Papers

- Applicants must submit a Concept Paper
  - Each Concept Paper must be limited to a single concept or technology
- The Concept Paper submission must include a technology description narrative and a summary slide (See Section IV.C of the FOA)
  - The technology description is limited to 4 pages
  - The submission can include graphs, charts, or other data (as long as it fits within the formatting constraints)
- Concept Papers must be submitted by May 9th, 2018, 3:00pm ET through EERE Exchange, and must comply with the content and form requirements in Section IV.C of the FOA
- EERE provides applicants with: (1) an “encouraged” or “discouraged” notification, and (2) the reviewer comments

Concept Paper Review

Concept Papers are evaluated based on consideration the following factors. All sub-criteria are of equal weight.

- **Criterion 1 Innovation and Impact (Weight: 50%)**

  How innovative and impactful is the project, assuming the stated outcomes can be achieved as written?

  - **Innovative** – Extent to which the proposed project or solution is well beyond the state of the art.
  - **Impactful** – Extent to which the proposed project or solution, if successful, impacts the core goals outlined in the FOA in Topics and Areas of Interest (FOA Section #...). Extent to which the claimed impacts are feasible and justified.
  - **Differentiated** – Extent of differentiation with respect to existing commercial products, solutions, programs, or technologies.
  - **Scalable** – Likelihood the proposed solution, if successful, could be scaled to have a broader impact or be maintained at a sufficiently large scale after project completion.

Concept Paper Review (continued)

- **Criterion 3: Capability and Resources of the Applicant/Project Team (Weight: 50%)**

  Is the team well qualified and positioned to successfully complete this project?

  - C**apable** –The training, capabilities, and experience of the assembled team to address all aspects of the proposed work with a high probability of success. Extent to which this team (including proposed Subrecipients) will be able to achieve the final results on time and to specification.
  - **Participation** – The level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Team Qualifications and Resources section of the Technical Volume.
  - **Commitment** – Extent to which the final team required to complete this project is fully assembled and committed to the project (e.g., Are there any key members that are "to be hired at a later date")
  - **Past Performance** – Extent to which the assembled team has shown success in the past. DOE encourages new entrants and new ideas, but past successes and/or failures will be noted.
  - **Access** – Extent to which the team has access to facilities, equipment, people, expertise, data, knowledge, and any other resources required to complete the proposed project.

SIPS Applications

- SIPS Applicants must submit an abbreviated Concept Paper submission
  - **Resubmit the Letter of Intent** as the concept paper in EERE Exchange
  - Include a **summary slide of the proposal** by the Concept Paper deadline
  - No additional Concept Paper document is required for SIPS applicants

- The SIPS Full Application is due at the same time as all other Full Applications but has different content requirements (see Section IV.D of the FOA for details)
  - **Cover Page** includes title, team, and high-level budget
  - **Project Description** includes technical content, resumes, and letters of support
  - **Summary Slide** can be created using PPT template on EERE Exchange

Full Applications

- The Full Application includes:
  - **Technical Volume**: The key technical submission - info relating 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.
  - **Summary Slide**
  - **Administrative Documents:**
    - Disclosure of Lobbying Activities
    - FFRDC Authorization (if applicable)
    - Waiver requests: Foreign Entities and Performance of Work in the United States (if applicable)

Full Application Streamlining

- Documents that may be requested at a later time, for example upon notification of Selection for Negotiations (see Section IV.G of the FOA)
  - Statement of Project Objectives
  - Budget Justification Workbook (EERE 335)
  - Subaward Budget Justification (EERE 335) (if applicable)
  - Summary/Abstract for Public Release
  - Budget for FFRDC (if applicable)
  - U.S. Manufacturing Commitments
  - Data Management Plan
- Other documents or clarifying information that can be requested at the time of Selection for Negotiation include:
  - Indirect cost information; Other budget information; Commitment Letters from Third Parties Contributing to Cost Share, if applicable; Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5); Representation of Limited Rights Data and Restricted Software, if applicable; Environmental Questionnaire

Full Applications: Technical Volume Content

- **Technical Volume:** the key technical component of the Full Application
- **Contents:**
  - Cover Page
  - Project Overview
  - Project Description, Innovation, and Impact
  - Summary Statement of Project Objectives (SOPO)
  - Team Qualifications and Resources
  - Appendices
- Note: 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

Full Application Eligibility Requirements

- Applicants must submit a Full Application by June 26th, 2018, 3:00pm ET
- Full Applications are eligible for review if:
  - The Applicant is an eligible entity Section III.A of FOA;
  - The Applicant submitted an eligible Concept Paper;
  - The Cost Share requirement is satisfied Section III.B of FOA;
  - The Full Application is compliant Section III.C of FOA; and
  - The proposed project is responsive to the FOA Section III.D of FOA
  - The Full Application meets any other eligibility requirements listed in Section III of the FOA.

Multiple Applications

Applicants may submit more than one application to this FOA, provided that each application describes a unique, scientifically distinct project

Merit Review and Selection Process (Full Applications)

- The Merit Review process consists of multiple phases that each include an initial eligibility review and a thorough technical review
- Rigorous technical reviews are conducted by reviewers that are experts in the subject matter of the FOA
- Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, to make the selection decisions

Technical Merit Review Criteria

- **Criterion 1 Innovation and Impact (Weight: 34%)**

  How innovative and impactful is the project, assuming the stated outcomes can be achieved as written?

  - **Innovative** – Extent to which the proposed project or solution is well beyond the state of the art.
  - **Impactful** – Extent to which the proposed project or solution, if successful, impacts the core goals outlined in the FOA in Topics and Areas of Interest (FOA Section #...). Extent to which the claimed impacts are feasible and justified.
  - **Differentiated** – Extent of differentiation with respect to existing commercial products, solutions, programs, or technologies.
  - **Scalable** – Likelihood the proposed solution, if successful, could be scaled to have a broader impact or be maintained at a sufficiently large scale after project completion.

Technical Merit Review Criteria (continued)

- **Criterion 2: Quality and Feasibility of the Project Plan (Weight: 33%)**

  Are the stated goals of the project SMART (Specific, Measurable, Aggressive (but achievable), Relevant, and Timely), are they likely to be accomplished within the scope of this project, and does the proposal show a clear path for growth and improvement over time?

  - **Measurable** – Extent to which the applicant shows a clear understanding of the importance of SMART verifiable milestones and proposes milestones that demonstrate clear progress, are aggressive but achievable, and are quantitative.
  - **Risks mitigated** – Extent to which the applicant understands and discusses the project risks and challenges the proposed work will face, and the soundness of the strategies and methods that will be used to mitigate risks.
  - **Validated** – Level of validation (letters of support/interest, partners, customer trials, data from prior work, report references, technical baselines established, etc.).
  - **Reasonable assumptions** – Reasonableness of the assumptions used to form the execution strategy, (e.g., market size, customer participation, costs, throughput at full scale, speed of proposed scale-up or adoption, and mode of funding).
  - **Reasonable budget** – The reasonableness of the overall funding requested to achieve the proposed project and objectives.

Technical Merit Review Criteria

- **Criterion 3: Capability and Resources of the Applicant/Project Team (Weight: 33%)**

  Is the team well qualified and positioned to successfully complete this project?

  - C**apable** –The training, capabilities, and experience of the assembled team to address all aspects of the proposed work with a high probability of success. Extent to which this team (including proposed Subrecipients) will be able to achieve the final results on time and to specification.
  - **Participation** – The level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Team Qualifications and Resources section of the Technical Volume.
  - **Commitment** – Extent to which the final team required to complete this project is fully assembled and committed to the project (e.g., Are there any key members that are "to be hired at a later date")
  - **Past Performance** – Extent to which the assembled team has shown success in the past. DOE encourages new entrants and new ideas, but past successes and/or failures will be noted.
  - **Access** – Extent to which the team has access to facilities, equipment, people, expertise, data, knowledge, and any other resources required to complete the proposed project.

Replies to Reviewer Comments

- EERE provides applicants with reviewer comments
- Applicants are not required to submit a Reply - it is optional
- To be considered by EERE, it is expected that a Reply must be submitted by August 2nd, 2018, 3:00pm ET through EERE Exchange
- Content and form requirements:

Section	Page Limit	Description
Text	2 pages max	Applicants may respond to one or more reviewer comments or supplement their Full Application.
Optional	1 page max	Applicants may use this page however they wish; text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable.

Selection Factors

The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available in arriving at selections for this FOA

Program Policy Factors

- The Selection Official may consider the following program policy factors in making his/her selection decisions:
  - The degree to which the proposed project exhibits technological or programmatic diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA.
  - The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives.
  - The level of industry involvement and demonstrated ability to accelerate commercialization and overcome key market barriers.
  - Based on the commitments made in the U.S. Manufacturing Plan, the degree to which the proposed project is likely to lead to increased employment and manufacturing in the United States or provide other economic benefit to U.S. taxpayers.
  - The degree to which the proposed project will accelerate transformational technological, financial, or workforce advances in areas that industry by itself is not likely to undertake because of technical or financial uncertainty.

Program Policy Factors (continued)

- The Selection Official may consider the following program policy factors in making his/her selection decisions:
  - The degree to which the proposed project collectively represents diverse types and sizes of applicant organizations.
  - The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).
  - The degree to which the proposed project avoids duplication/overlap with other publicly or privately funded work.
  - The degree to which the proposed project supports complementary efforts or projects, which, when taken together, will best achieve the research goals and objectives.
  - The degree to which the proposed project enables new and expanding market segments.
  - Whether the project promotes increased coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer.

Registration Requirements

- To apply to this FOA, Applicants must register with and submit application materials through EERE Exchange: https://eere-Exchange.energy.gov
- Obtain a “control number” at least 24 hours before the first submission deadline
- Although not required to submit an Application, the following registrations must be complete to received an award under this FOA:

Registration Requirement	Website
DUNS Number	http://fedgov.dnb.com/webform
SAM	https://www.sam.gov
FedConnect	https://www.fedconnect.net
Grants.gov	http://www.grants.gov

Means of Submission

- Letters of Intent, Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted through EERE Exchange at

  https://eere-Exchange.energy.gov

  - EERE will not review or consider applications submitted through other means
- The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements can be found at https://eere-Exchange.energy.gov/Manuals.aspx

Key Submission Points

- Check entries in EERE Exchange
  - Submissions could be deemed ineligible due to an incorrect entry
- EERE strongly encourages Applicants to submit 1-2 days prior to the deadline to allow for full upload of application documents and to avoid any potential technical glitches with EERE Exchange
- Make sure you hit the submit button
  - Any changes made after you hit submit will un-submit your application and you will need to hit the submit button again
- For your records, print out the EERE Exchange Confirmation page at each step, which contains the application's Control Number

Applicant Points-of-Contact

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations
- It is imperative that the Applicant/Selectee be responsive during award negotiations and meet negotiation deadlines
  - Failure to do so may result in cancellation of further award negotiations and rescission of the Selection

Questions

- Questions about this FOA? Email SETO.FOA@ee.doe.gov
  - All Q&As related to this FOA will be posted on EERE Exchange
    - You must select this specific FOA Number in order to view the Q&As
  - EERE will attempt to respond to a question within 3 business days, unless a similar Q&A has already been posted on the website
- Problems logging into EERE Exchange or uploading and submitting application documents with EERE Exchange? Email EERE-ExchangeSupport@hq.doe.gov.
  - Include FOA name and number in subject line
- All questions asked during this presentation will be posted on EERE Exchange

DE-FOA-0001840 Solar Energy Technologies Office FY2018 FOA
Topic 2: Concentrating Solar Thermal Power Research and Development
Webinar Script

Slide 1:

Good [afternoon/morning] 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 FY2018 Funding Opportunity Announcement, or FOA, which was issued on April 17th, 2018. Specifically, this webinar is meant to cover the content of Concentrating Solar Power Research and Development, which includes five subtopics. My name is Matthew Bauer and I am a Technology Manager in the solar office within the DOE's Office of Energy Efficiency and Renewable Energy.

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.

In addition to emailing this inbox, you may type in the chat bar any questions you have as they come up. Again, please be careful not to submit any language that might be business sensitive, proprietary or confidential. We will be posting answers to these questions to EERE Exchange as well; note that we will not be able to answer these today during the webinar.

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!

Slide 2: 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.

Slide 3: READ SLIDE

Slide 4: READ SLIDE

Slide 5: 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.

Slide 6: 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 topics you will see in the FOA aim to fund projects are different than typical DOE technology development projects. 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.

Slide 7: 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.

Slide 8: Topic 2.1 is titled "Small, Innovative Projects in Solar (SIPS): CSP"
This topic area will fund small, focused projects investigating the applicability of emerging thermal or optical manipulation processes, and related material systems, to the CSP application. The limitations to manipulating heat and light (both in terms of feasibility and cost) are core constraints to CSP plant design. Innovations for controlling energy in these forms may create an opportunity for novel solar thermal concepts and enable new types of CSP systems. Such concepts, if successfully proven, should support dramatic progress towards the CSP 2030 levelized cost of electricity (LCOE) goal of 5¢/kWh for baseload or 10¢/kWh for peaking power generation. Applications to this topic should propose projects that seek to prove or disprove a central hypothesis that would disruptively alter the design of CSP plants in such a way as to enable the targeted costs. Applicants must demonstrate an understanding of the major issues impeding the proposed technical approach, and clearly identify the particular barrier(s) that will be the target of the research effort.

Slide 9: Topic 2.2 is titled "Advanced CSP Collectors"
This topic will fund research and development of innovations in novel CSP collectors,which direct solar flux to an absorber (receiver), where it is converted to heat., as well as technologies associated with collector installation and operation, The solar collector field is one of the single largest components of the cost of constructing a CSP plant (approximately 25% of the direct capital costs). The component must efficiently concentrate light while minimizing fabrication, installation, and operating costs. Collectors that are able to cost-effectively achieve high concentration ratios can directly improve the efficiency of the receiver. This effect becomes particularly

impactful at high receiver temperatures. With these factors in mind, R&D concepts supporting a significant decrease in CSP LCOE and satisfying the below figure of merit (FOM) by accounting for Cost per reflective surface area (in $/m2), efficiency times 100 (Eff), and concentration ratio (CR) are of primary interest.

$FOM=CostEff+CR/50<0.65$

For example, a heliostat with a cost of $60/m2, a 55% annualized optical efficiency, and ability to achieve a concentration ratio of 2000 suns, would satisfy the FOM: 0.631 < 0.65. Hardware of interest should be operable for 30 years or have a viable replacement strategy. Cost must account for all contributions to installed cost. Environmental impacts on the collector, particularly operable wind speeds and survivable wind speeds, should be considered.

Beyond development of the core collector hardware, applications which address collector assembly and installation in support of the above figure of merit will also be considered. A connection should be drawn between metrics that can be investigated in the project (such as time and motion studies) and their impact on the figure of merit.

Finally, applications which propose technologies addressing the operation and/or maintenance of CSP collectors are also sought. Such applications may address optical losses not generally dictated by the optical hardware (aiming technology, control systems, performance degradation, collector down time, wind mitigation, etc.) as well as operational cost of the collector field. Applicants may describe the effect of the proposed technology on avoided collector capital cost, annual efficiency improvement, or other variables relatable to the LCOE of a CSP plant.

Slide 10: Topic 2.3 is "Advanced Power Cycles for CSP"

This topic will fund innovations in power cycles compatible with cost competitive CSP. The power cycle subsystem converts collected thermal energy from the CSP receiver and/or thermal energy storage into electricity. Under this topic, applications developing advanced power cycles are sought. Appropriate power cycles must be able to convert thermal energy to electricity at an efficiency greater than 50%, must have a capital cost of less than $900/kW (including heat exchange into the power cycle), must be compatible with dry cooling, and support 30 years of CSP operation. While this topic is open to a variety of high-efficiency, low-cost thermal-to-electric power cycles, the supercritical CO2 (sCO2) cycle is of particular interest. EERE, with the Offices of Nuclear Energy and Fossil Energy, have collaboratively focused on the development of the sCO2 Brayton cycle.16 Shared research goals have accelerated the development of critical components and broadened the foundational knowledge related to this cycle.

Applicants proposing further R&D of the sCO2 cycle must be familiar with state of the art developments fostered by this initiative as well as external entities.

Supercritical CO2 Power Cycles

The supercritical CO2 (sCO2) cycle is a viable candidate to satisfy the cost and efficiency requirements stated above. It is advantageous for its high conversion efficiency, dry cooling compatibility, small size (influencing construction and O&M costs), and efficient integration with CSP heat transfer media. Applications of interest for this subtopic fall into 4 categories:
1. Component innovations supporting sCO2 cycle variations uniquely advantageous to operation of a complete CSP plant
2. Component innovations for the sCO2 Recompression Closed Brayton Cycle
3. Materials and Manufacturing Innovations supporting the cycle's use with CSP
   a. Emphasis is placed on innovations supporting the primary heater which couples the power cycle to a specific CSP HTF or TES system.Innovations relevant to other components throughout the cycle are encouraged
4. Cycle Operations and Maintenance Technology Innovations

Novel Power Cycles Impacting CSP Market Viability

Alternative thermal-to-electric conversion processes may offer improved performance, be more amenable to CSP, or allow a CSP system to operate in some superior embodiment. Research into such alternative cycles which enable a transformative step in CSP may be proposed as part of this topic. Proposals must indicate a power cycle efficiency target, cost target, and the constraints placed on other CSP subsystems. All proposed CSP configurations must be amenable to integration with thermal energy storage.

Slide 11: Topic 2.4 is "Advanced CSP Thermal Transport Systems and Components"

All CSP components between the collector field and the power cycle can be collectively labeled the thermal transport system. This begins where the incident photon is converted to thermal energy, and ends immediately before the thermal energy is exchanged into the power cycle. Components in this section include the receiver panel, heat transfer media (HTM), HTM piping, HTM structure (e.g. tower), HTM movement (pump, circulator, elevator, etc.), thermal energy storage (TES) media, TES containment and heat exchange, heat tracing, system sensors, and controls. To be compatible with the CSP LCOE target of 5¢/kWh, these systems must collectively cost less than $615/kWh while supporting a 50% efficient power cycle, a 90% efficient receiver panel, 14 hours of TES with 99% energetic efficiency and 95%

exergetic efficiency, and total parasitic losses no more than 6% of the turbine gross power. These targets must be met by a reliable system able to operate for 30 years at the temperature conditions required by the targeted power cycle.

Research and development applications are sought for individual components or collections of components compatible with the above cost and efficiency paradigm. Research projects can include sub-commercial scale versions of the component to test operational compatibility. Projects should include detailed cost modelling for the economic viability of the component at scale. Targeted power cycles must be identified (which determine the temperature of the thermal transport system). If a targeted power cycle has an efficiency below 50%, additional savings or performance improvements elsewhere must offset the performance loss in the power cycle.
As described in the introduction to Topic 2, concepts redundant with the Gen3 CSP initiative are not of interest.17 New opportunities to achieve cost competitive CSP are sought by exploring new temperature paradigms, new basic research solutions several steps from component integration, and innovations supporting system architectures unique from the described Gen3 system and pathways.

Slide 12: Topic 2.5 is "innovative pathways: Concentrating solar power"
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 CSP 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.

Slide 13: Projects within each subtopic of Topic 2 will be provided different amounts of estimated funding and will last for different lengths of time. For SIPS Topic 2.1, EERE expects to make approximately $3 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 $300,000 dollars and each award will last around 18 months.

For Topics 2.2, 2.3 and 2.4, EERE expects in total to make approximately 20 million dollars of Federal funding available for new awards, with around 2 million per award, and the average project lasting about 3 years.
For Innovative Pathways, Topic 2.5, EERE expects to make about 1 award with around 1 million dollars of Federal funding available. The award will last 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 2.

Slide 14: READ SLIDE

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.

Slide 15: 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.

Slide 16: Under cooperative agreements, there will be what is known as "substantial involvement" between EERE and the Recipient during the performance of the project.

READ SLIDE

Slide 17: READ SLIDE

Slide 18: 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.

Slide 19: 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.

Slide 20: 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.

Slide 21: 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.

Slide 22: Cost Share must be provided on an invoice basis, unless a waiver is requested and approved by the DOE Contracting Officer.

Slide 23: 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.

Slide 24: 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 l 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.

As part of the evaluation and selection process, EERE may invite one or more applicants to participate in Pre-Selection Interviews. Pre-Selection Interviews are distinct from and more formal than pre-selection clarifications (See Section V.D.3 of the FOA). The invited applicant(s) will meet with EERE representatives to provide clarification on the contents of the Full Applications and to provide EERE an opportunity to 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, a mutually agreed upon location, or virtually via web conference. EERE may also arrange site visits at certain Applicants' facilities.

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.

Slide 25: 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.

Slide 26: 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 applicants fails to submit an eligible Concept Paper, the applicant is not eligible to submit a Full Application.

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

EERE will provide applicants with either an encouraged or discouraged notification as well as reviewer comments. 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

Slide 27: READ SLIDE

Slide 28: READ SLIDE

Slide 29: READ SLIDE

Slide 30: The 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. 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.

And other Administrative Documents

Slide 31: 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.

Slide 32: 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 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.

And 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.

Slide 33: As we previously pointed out, applicants must submit full applications by June 26, 2018. EERE will conduct an eligibility review, and full application will be deemed eligible if:

READ SLIDE

Slide 34: READ SLIDE

Slide 35: READ SLIDE

Slide 36: Applications will be evaluated against the following merit review criteria:

READ SLIDE

Slide 37: READ SLIDE

Slide 38: READ SLIDE

Slide 39: The Full Application 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 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

Slide 40: READ SLIDE

Slide 41: After the Merit Review process, the Selection Official may consider program policy factors to come to a final selection decision.

READ SLIDE

Slide 42: READ SLIDE

Slide 43: 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.

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

S*ystem for Award Management*
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.

Fedconnect
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.

Grants.gov
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.

Slide 44: All required submissions must come through EERE Exchange. EERE will not review or consider applications submitted through any other means.

Slide 45: READ SLIDE

Slide 46: READ SLIDE

Slide 47: READ SLIDE