

SOLAR DESALINATION FUNDING OPPORTUNITY ANNOUNCEMENT

Funding Opportunity Announcement (FOA) Number: DE-FOA-0001778

Webinar Script 10/12/2017

Title Slide: Solar Desalination FOA Informational Webinar: Welcome, and thank you for joining us for the Solar desalination Funding Opportunity Announcement webinar. My name is Dr. Raj Vijaykumar (call me Vijay) and during this webinar, I will provide a brief overview of this Solar Desalination Funding Opportunity Announcement (FOA) and the concept paper, application and review process. This presentation will not be recorded and live questions will not be taken. Instructions for submitting questions on this presentation and for the Solar Desalination FOA, will be provided at the end of the webinar.

Slide 1: Please bear in mind that the content included in the webinar is only intended to summarize the contents of the Solar Desalination FOA. Therefore, please note that any content within this presentation that appears discrepant from the FOA language is superseded by the language in the FOA. All Applicants are strongly encouraged to carefully read the FOA guidelines and adhere to them. Neither the U.S. Department of Energy (DOE) nor the employees associated with DOE working on this presentation shall be held liable for errors committed by applicants based on potentially incorrect or inaccurate information presented herein.

Slide 2:-Agenda: The agenda for this presentation is as follows: To start things off, I will present an overview of the solar desalination FOA. We will discuss the objectives of the solar desalination Funding Opportunity Announcement, overview cost and energy consumption targets, and discuss the way the FOA topics are structured. Then we will briefly go over the mandatory Concept Paper submission process, the application and review schedule. Finally, I will close the webinar by reviewing how an Applicant can submit questions regarding this FOA. Once again, applicants should read the FOA for more information on its objectives.

Slide 3 Solar desalination Overview: The solar desalination FOA aims to decrease the levelized cost of water by increasing efficiency of energy use in desalination, reducing capital cost of thermal desalination systems, and reduce the levelized cost of heat generated using concentrated solar power systems. The solar desalination FOA focuses on using “Solar Thermal” energy, which uses concentrators to convert photons to heat, with thermal energy storage typically as part of the thermal system. Current state of the art desalination systems are membrane-based reverse osmosis systems that are still expensive. The present FOA seeks the use of “solar thermal systems” for the reduction of LCOW to 0.5 \$/m³, for large scale systems, and 1.5 \$/m³ for small scale systems. Small scale systems should also aim towards zero liquid discharge target, and be able to tolerate an input concentration of total dissolved solids (TDS) of >100,000 ppm.

Slide 4 Some definitions: Levelized Cost of Water and Levelized Cost of Heat are two key metrics that are defined here. These metrics describe the unit cost of generating either water, or heat – at a given temperature – over the entire expected lifetime of a system.

Slide 5 Levelized Cost targets: The FOA differentiates between large (>10,000 m³/day) and small (<2,000 m³/day) desalination systems and TDS input to target two LCOW costs. The small desalination systems are more appropriate for applications like purifying water produced from oil and gas wells where the input TDS can be high, and disposal of spent brine may be costly. Hence, small systems should consider zero liquid discharge.

Topic Areas and FOA Structure: The present FOA is made up of four topic areas.

Slide 6 Topic Area 1 (TA1) calls for innovations in thermal desalination techniques. Thermal energy is used to convert saline water into desalted water.

Slide 7: For this topic area, the applicant is expected to assume a LCOH of 1¢/kWh_{th}, and work on innovations in thermal desalination technologies that can lead to LCOW of 50¢/m³ (large scale desalination systems) or 1.5\$/m³. To attain the LCOW target, two approaches may be pursued:

- dramatic improvements in established technologies and components that can lead to the achievement of the FOA cost targets proposed in Slide 4;
- Development low TRL novel thermal desalination techniques that, if further developed, can achieve the FOA targets.

Slide 8 Improvements in capital cost and thermal energy consumption (kWh_{th}/m³) are required to attain the LCOW targets; these improvements are outlined in the figure on slide 8. The chart presents the amortized capital cost and thermal energy consumption on the two axes; present day plants are situated in the intersection region on the top right with amortized capital cost 20-25 ¢/m³, and thermal energy consumption in the region of 60-75 kWh_{th}/m³. The LCOW=0.5 \$/m³ is shown in red, and capital cost/energy consumption combinations of interest are located below the red line.

Slide 9: Topic Area 2(TA2) calls for innovations in low cost solar thermal energy.

Slide 10: Topic Area 2 focuses on low cost solar energy and thermal energy storage alone. Present day industrial process heat costs are of the order of 3¢/kWh_{th}. This topic focuses on 50-66% reduction to 1-1.5¢/kWh_{th}. Thermal energy storage in 120-180 C range is likely necessary.

Slide 11: Correspondingly, significant reductions in direct installed cost, O&M cost, and storage cost are indicated. The most important metric is reduction of LCOH from 0.027 \$/kWh_{th} to \$0.01-0.015/kWh_{th}.

Slide 12 Topic Area 3(TA3) calls for integration of low cost solar thermal energy with low cost solar thermal desalination, with a LCOW target of 0.5\$/m³.

Slide 13: Demonstration of integrated solar thermal desalination is a possible activity under TA3. Integrated systems that are not demonstration activities may also be considered. Applicants should justify how their proposal can achieve the target LCOW and thermal desalination Capital Cost/Energy Consumption discussed in the previous two topics. Integrated Demonstration should be a model for scale-up to a large scale system. Applicants should justify that the targeted LCOW, capital cost, and LCOH targets can be achieved in a commercially operating system with solar as primary energy source. Demonstration activities will be subject to 50% cost share.

Integration activities that are not full demonstrations but still target the energy efficiency of coupling solar thermal collection to thermal desalination will also be considered under this topic area

Slide 14 Topic Area 4 “Analysis”:

Slide 15 Topic Area 4 seeks proposals to develop analytical tools that will simplify the planning, design, and valuation of solar thermal desalination systems. Areas of interest in Topic Area 4 include the development of User-friendly software that identifies and models high-value opportunities where solar desalination may have the most impact. This could take into consideration the water needs of local regions, irradiance, natural or waste heat sources, access to ocean or brine water, agriculture development, and produced water wells. Applicants should leverage existing tools in their proposed work – for example, NREL’s System Advisor Model (SAM), for modeling solar thermal energy generation for process heat applications. Another area of interest is integration with advanced power cycles well-suited to concentrating solar power, e.g., supercritical CO2 cycles.

Slide 16: Awards Overview: To accomplish the goals of this funding opportunity, SunShot has made \$15 million dollars of funding available, and anticipates making between 6 and 12 awards for this funding opportunity. The number of awards can vary depending on the amount of money requested by the awards selected for negotiation and funds availability. The funding agreements will take the form of Cooperative Agreements. A Cooperative Agreement is a funding mechanism that means that there will be substantial involvement from DOE throughout the course of a project. More information on this can be found in Section II.B.1 of the funding opportunity. Awards are expected to have periods of performance of up to three years, and have a minimum required cost share of 20%. Topic Area 3 awards which fall into the category of demonstration of integrated solar thermal desalination have a minimum required cost share of 50%. Required cost share is summarized as follows:

- 20% of R&D activities
- 50% of demonstration and commercial activities

For further detail distinguishing R&D from demonstration and commercial activities please see the FOA.

Slide 17 Cost Share: There is often a bit of confusion when people calculate cost share. Therefore, the cost share equations have been displayed here. Take note that the cost share is a percentage of the *Total Costs* for each Task. The Total Task Cost includes the Federal and non-Federal contributions. Not proposing enough cost share, even due to a miscalculation of cost share, can render an application non-compliant. Therefore, Applicants should take care in accurately determining the cost share of their proposed budget.

Slide 18 Eligible Applicants: The eligible applicants to this funding opportunity are detailed in the full FOA text in Section III.A, which is summarized on this slide. This FOA is open to both for-profit and non-profit entities, including all National Laboratories and FFRDCs. Also note that Applicants may submit multiple concept papers, but each submission must be a unique and distinct project concept.

Slide 19 Concept Paper Overview: I will now go over the mandatory Concept Paper for applications. The purpose of the concept paper is to provide an early indication of the relevance of the proposal to the FOA. SunShot will make an assessment of each Concept Paper based on the criteria in Section V.A.1 of the funding announcement. SunShot will then either encourage or discourage Applicants to submit Full Applications

An applicant who receives a “discouraged” notification may still submit a Full Application. SunShot will review all compliant and responsive Full Applications. However, by discouraging the submission of a Full Application, SunShot intends to convey its lack of programmatic interest in the proposed project in an effort to save the Applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

Reviewer comments from the Concept Paper will be provided to the applicant. The reviewers that are used for Concept Papers may differ from those used for the Full Application phases.

Again, as stated in the FOA, only applicants that submit a compliant concept paper are eligible to submit a Full Application. Being discouraged at the Concept Paper phase does not prohibit an Applicant from submitting a Full Application. However, an Applicant must submit a Concept Paper in order to submit a Full Application.

Slide 20 Concept Paper Contents: The Concept paper is broken into two sections: One section is for the Technology Description and one section for the Team Description. The Technology Description section is limited to 3 pages and the Team Description is limited to 2 pages. I’ve included the specific components that are requested in the two sections in these slides. The 3-page technology description should address the novelty of the proposed concepts and its potential impact. The team description should describe the ability of the team to support the proposed research plan.

Please review Section IV.C of the funding opportunity for more information on the required content of the Concept Paper.

Slide 21 Key Points: When constructing an application, please ensure that all the submitted materials adhere to the formatting criteria and page lengths stated in the FOA. Do not submit applications that are in excess of the stated page limits.

Of course, triple check your entries in Exchange and make sure that you click the submit button.

Also, when using the EERE Exchange system, please note that if you make any changes to your application after it has been submitted, the application becomes un-submitted in Exchange. If this occurs, the Applicant needs to ensure the Concept Paper is resubmitted before 5pm Eastern Time on December 4th by clicking the submit button again.

Slide 22 Mandatory Concept Paper Deadline: Concept papers are due December 4th at 5pm Eastern Time. Applicants are strongly encouraged to submit all application documents 1-2 days prior to the deadline to avoid and/or resolve any issues that may occur with EERE Exchange. If an Applicant has difficulties with EERE Exchange, the EERE Exchange support team can be contacted by email at EERE-ExchangeSupport@hq.doe.gov, as described in section VII of the FOA.

Slide 23 Concept Paper Review Criteria: Concept papers will be reviewed according to the specific review criteria listed in Section V.A.1 of the FOA. The sole criterion is overall responsiveness and project viability. Applicants are strongly encouraged to consider these criteria when constructing an Application, as they will be used by the reviewers when evaluating submitted Applications.

Slide 24 Concept Paper Review Process: After the Concept Paper review is complete, the applicants will be provided with the reviewer comments. SunShot expects to release these comments no later than January 1st, 2018. Full applications are due about two months later on March 16th, 2018. Please bear in mind that Concept Paper reviewers and Full Application reviewers may not be the same.

Slide 25 Full Application Review Process 1: Criterion 1 is technical merit and impact 50%

Slide 26 Full Application Review Process 2: Criterion 2 is project research and market transformational plan 30%

Slide 27 Full Application Review Process 3: Criterion 3 is project research team and resources 20%

Slide 28 Timeline: I will now briefly go over the application timeline. Submitted concept papers will be reviewed and will either be encouraged or discouraged. Full applications will be due at 5pm eastern time on March 16th, 2018. After all submissions are received, Full Applications will be reviewed by at least 3 expert reviewers. The applicant will then have a short period of time (the funding announcement states at least 3 business days) to prepare a Reply to Reviewer Comments. The replies are then considered along with the applications when making selections.

A subset of Applicants may be selected for pre-selection clarification meetings. Selection for clarification does not mean that the Applicant has been selected for an award. Applicants may only receive a few days' notice before such clarifications, which may take the form of written responses to questions, video or conference calls with DOE representatives and/or merit reviewers, in person-meetings, or presentations.

Slide 29 Questions: Any questions about this FOA need to be sent to SolarDesalinationCSP@ee.doe.gov so that they can be answered in an equitable manner and posted online in the FAQ section for this funding announcement in EERE exchange. Please send all questions to this email address and EERE will attempt to answer questions within 3 business days.

The script and slides for this webinar will be posted in EERE Exchange shortly in the section for this FOA.

Thank you and have a good day.