QUESTIONS AND ANSWERS

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I. FREQUENTLY ASKED QUESTIONS:

Q1. If I have questions about this funding announcement, who do I contact?

ANSWER: Please see the FOA guidance on submitting FOA content questions and response publication. Applicants may submit questions regarding this ARPA-E's Funding Opportunity Announcement (FOA) to ARPA-E-CO@hq.doe.gov. All emails must include the FOA name and number in the subject line. The cover page and Executive Summary of the Funding Opportunity Announcement state the deadlines for submitting questions to ARPA-E-CO@hq.doe.gov.

Q2. How will I receive a response to questions submitted to arpa-e-co@hq.doe.gov about this FOA?

ANSWER: Responses are posted in the "Frequently Asked Questions" section of ARPA-E's website. There are general FAQs and a FAQ page for each FOA.

ARPA-E will post responses on a weekly basis to any questions that are received.

ARPA-E will cease to accept questions approximately 5 business days in advance of each submission deadline. Responses to questions received before the cutoff will be posted approximately one business day in advance of the submission deadline. ARPA-E may re-phrase questions or consolidate similar questions for administrative purposes.

Q3. Will ARPA-E post a response to every question submitted to arpa-e-co@hq.doe.gov?

ANSWER: No. ARPA-E will only post responses to questions that have not already been addressed by a published FAQ. Also, ARPA-E may consolidate similar questions for administrative purposes.

Q4. If I have questions about ARPA-E exchange, who do I contact?

ANSWER: Applicants may submit questions regarding ARPA-E's online application portal, ARPA-E eXCHANGE, to ExchangeHelp@hq.doe.gov. All emails must include the name and number of the Funding Opportunity Announcement in the subject line.

Q5. Can I speak or meet with the ARPA-E program director or other ARPA-E personnel about this funding opportunity announcement?

ANSWER: No. Upon the issuance of this Funding Opportunity Announcement (FOA), ARPA-E Programs and other ARPA-E personnel are prohibited from communicating (in writing or otherwise) with Applicants, or potential Applicants, regarding the FOA. This "quiet period" remains in effect until ARPA-E's public announcement of its project selections. During the "quiet period," Applicants may submit questions regarding the FOA to ARPA-E-CO@hq.doe.gov with the FOA name and number in the subject line. Applicants may also submit questions regarding ARPA-E's online application portal, ARPA-E eXCHANGE, to ExchangeHelp@hq.doe.gov with the FOA name and number in the subject line. ARPA-E will not accept or respond to communications received by other means (e.g., fax, telephone, mail, hand delivery). Emails sent to other email addresses will be disregarded.

Q6. Can a person be PI on one proposal and a CO-PI on a second separate proposal?

ANSWER: Yes, but the applications must be scientifically distinct from one another.

Q7. May applicants submit more than one concept paper to this funding opportunity?

ANSWER: Yes, but each Concept Paper submission must be scientifically distinct.

Q8. I have developed a technology that may be a good fit for this funding opportunity. Will ARPA-E please review the attached project information and let me know if I should make a submission to this funding opportunity.

ANSWER: No. Applicants must review the Technical Requirements of this funding opportunity to determine if their technology warrants a submission to ARPA-E.

II. Questions for week ending: JULY 19, 2013

Q9. The solar energy collector portion of the FOCUS teaming announcement is aimed at collecting waste heat in concentrated PV systems.
After the discussion on concentrated PV, there are a number of topics listed.
Are these all within the context of concentrated PV?
Inexpensive photonics and plasmonics. Are you looking for broader plasmonic applications?
Solar energy absorption materials and architectures. Are you looking for improved "black" surfaces for solar water heating or for enhancing light absorption in PV cells?
Electrolysis. You are looking for electrolysis, but say you are not interested in fuel application. Are you specifically looking for hydrogen production in conjunction with storage directly behind the array, or can this be a more general hydrolysis application?

ANSWER: Concepts for solar energy collectors that will be considered under Category 1a of the FOCUS FOA are **not** limited to systems in which waste heat is collected from concentrated photovoltaic systems. In Category 1, ARPA-E will consider all concepts that will enable development of advanced solar topping devices/cycles that go well beyond the current state-of-the-art to meet the technical targets established in Section I.F of the FOA, and do not fall under the "Categories specifically not of interest" in Section I.G.

Q10. Would an application comprising a solar thermal system linked to a [ ] engine for electricity production be allowable, provided it meets category 1A metrics?

ANSWER: ARPA-E will consider all concepts that propose to meet or exceed the technical targets set forth in Section I.F of the FOCUS FOA and do not fall under the "Categories specifically not of interest" in Section I.G. As described in Section I.A, ARPA-E seeks to fund transformational research and does not fund incremental improvements to the state-of-the-art.

Q11. I wanted to get some clarification on what types of storage units this FOA is suitable for / seeking?
Also wanted to get more information on an electric input into a storage system? Would a thermal energy storage technology using sensible heat storage be applicable?

ANSWER: ARPA-E will consider all storage concepts that propose to meet or exceed the technical targets for Category 2 awards set forth in Section I.F of the FOA and do not fall under the "Categories specifically not of interest" in Section I.G. Electricity input into the storage system is required by the Category 2 technical target 2.2.

Q12. Is it possible to apply to more than one project? In particular our project is well suited for both RFI-0000005 and DE-FOA-0000949: Full-spectrum Optimized Conversion and Utilization of Sunlight (FOCUS).

ANSWER: RFI-0000005 is not a FOA that solicits proposals. RFI-0000005 is a voluntary teaming list announcement aimed at facilitating formation of teams that can propose to the FOCUS FOA (DE-FOA-0000949). ARPA-E will accept proposals to more than one Funding Opportunity Announcement (FOA) so long as each project is scientifically distinct.

III. Questions for week ending: JULY 26, 2013

Q13. Is a given professor/investigator allowed to be on multiple Concept Paper submissions? If so, is there a restriction (e.g. you may lead one team proposal and be a team member on multiple other team proposals, but you cannot lead two team proposals)?

ANSWER: Yes, a professor/investigator may be on more than one Concept Paper submission – either as a lead or member of a Project Team – so long as each Concept Paper submission is scientifically distinct.

Q14. Section G of the FOA calls out specific technical areas not of interest. Bullet 5 and others limit the technology of interest to certain operating conditions. Should these limits be assumed to apply to seedling projects as well or will there be more flexibility for high-impact ideas that are in line with the overall full spectrum and dispatchability approach of the FOA but do not meet all the specific limits in Section G due to their unique nature.

ANSWER: Seedling proposals are subject to all the technology limits listed in Section G of the FOA, including Bullet 5 (temperature limits). As long as the proposal clearly describes how the thermal fluid temperature of a full-scale hybrid collector system would fall within the specified technology limits, an early-stage proof-of-concept may involve demonstrations at conditions outside these limits.

Q15. I work for a U.S. subsidiary of a Chinese company. We have significant experience in systems combining broadband electrical and thermal generation and we'd like to submit a proposal for the FOCUS program. Are there limitations to the types of organizations that can propose for ARPA-E funding? Would we be better off teaming with a U.S. company? Or is it sufficient that we are a U.S. subsidiary?

ANSWER: For eligibility criteria, please see Section III.A ("Eligible Applicants") of the FOA, including Section III.A.3 ("Foreign Entities").

IV. Questions for week ending: AUGUST 2, 2013

Q16. Is there any chance that ARPA-E would accept a concept paper less than 4 total pages but with a technology description section longer than 2 pages?

ANSWER: No. Per Section IV.C of the FOA, the Technology Description section can be no longer than 2 pages.

Q17. I do not have the 20% cost sharing capability. Is there a service that ARPA-E offers that can connect me to an organization willing to supply the required 20% cost sharing?

ANSWER: ARPA-E has set up a Teaming Partner List for the FOCUS FOA to help facilitate the formation of new project teams. The Teaming Partner List is available on ARPA-E eXCHANGE (http://arpa-e-foa.energy.gov), ARPA-E's online application portal, and will be updated periodically, until the close of the Full Application period, to reflect new Teaming Partners who have provided their information. Any organization that would like to be included on the list should read the full details of the FOCUS Teaming List Announcement (RFI-0000005) and submit their information using the link provided in the Announcement.

Q18. A non-U.S.-based company appears on the FOCUS Teaming List. Does this mean that this company is eligible to participate in this program? If not, what procedure (foreign entity waiver?) must be followed to determine if this company is eligible to participate?

ANSWER: For the eligibility criteria for Foreign Entities, please see Section III.A.3 of the FOA.

Q19. For Categories of Interest 1 and 2, is there any limit to the fraction of energy input into the system that is provided by non-solar sources, such as fossil fuel or biomass?

ANSWER: Category of Interest 1 requires systems with all inputs from solar energy, and the Targets in Table 1 and 2 of the FOA must be met assuming only solar inputs to the hybrid converter unit. Non-solar energy inputs, including fossil fuels or biomass derived sources of energy, cannot be used as energy inputs to the converter unit. Although, non-solar sources of energy are not the primary target of Category 1A or 1B, if such additional sources will further improve system performance or economics beyond the technical performance targets, this may be described in the proposal. This description should include an estimate of carbon emissions reductions compared to using the fossil fuels in state-of-the art electricity

production, in parallel with the solar system. See Section I.F.1 and I.F.2 (Category of Interest 1A and Category of Interest 1B).

Category of Interest 2 requires hybrid storage system concepts that accept both heat and electricity as inputs and output electricity, to meet the technical targets set forth in Table 3. The source of that heat and electricity is not relevant to the performance of the storage device. If the hybrid storage device utilizes additional fossil fuel or biofuels inputs in a form other than heat or electricity, the Applicant must include the exergy of this fuel as input when calculating Performance Targets 2.2 and 2.3. See Section I.F.3 (Category of Interest 2).

V. CONCEPT PAPER PHASE QUESTIONS PART 1: AUGUST 15, 2013

Q20. Can a person be a Co-PI on multiple Concept Papers if each proposal is scientifically distinct?

ANSWER: Yes. A person may be a Co-PI for multiple Concept Papers, so long as each Concept Paper is scientifically distinct. Please see Section III.C.3 (Limitation on Number of Applications).

Q21. I find the first efficiency goal (ID 1A.1) oddly structured in Table 1: Performance Targets for Technical Category 1A (page 22). The efficiency standard goes up as the temperature goes up (where of course we'd expect losses to grow). Can you please confirm whether this is an error and/or explain this standard?

ANSWER: Table 1 and Performance Target 1A.1 are correct as written in Section I.F.1 (Category of Interest 1A) of the FOA. As stated in the table, the target is for *exergy* efficiency, not *energy* efficiency. Please see Sections I.D.3 (Exergy and Hybrid Solar Converters) and I.D.4 (Example: PV Topping Devices and System Efficiency) of the FOA for background information.

Q22. Is it necessary to generate and store heat as part of this proposal?

ANSWER: No technical Category of Interest of this FOA requires both generation and storage of heat. However, each Category of Interest has different technical requirements and performance targets. Please see Sections I.E (Technical Categories of Interest) and I.F (Technical Performance Targets) of the FOA which describe the specific technical targets that proposed technologies must meet for both Categories of Interest. Applicants must review the Technical Requirements of this funding opportunity to determine if their technology warrants a submission to ARPA-E.

Q23. We are a FFRDC looking to team with a yet-to-be-determined partner. As a FFRDC, we cannot put up a monetary cost share. Can we place a cost value on our equipment (e.g. Optics laboratory) and experience/knowledge to use towards the FOA cost share requirement?

ANSWER: FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or a non-Federal source. Therefore, a Prime Recipient may not use Federal funding or property (e.g., equipment owned by the Federal Government) as a source to meet its cost share obligations. See Section III.B.6 (Cost Share Types and Allowability) and Section III.B.7 (Cost Share Contributions by FFRDCs and GOGOs) of the FOA.

Project Teams may provide cost share in the form of cash or in-kind contributions, however, every cost share contribution must be allowable under the applicable Federal cost principles. See Section III.B.6 (Cost Share Types and Allowability) of the FOA.

Q24. I would like to know what information should be covered in the abstract in eXCHANGE. Will this be reviewed by the same person as the concept paper and application? We are unsure if it is to be a stand-alone brief or a supplement to the other required documents.

ANSWER: Please provide a brief description (not to exceed 4000 characters [spaces included]) in the ARPA-E Exchange Concept Paper Details form on the General tab. This information provides the funding opportunity manager and each reviewer a brief overview of the proposed project.

Q25.A. What is the cost share requirement for a seedling project team collaborating with a domestic university that is doing at least 80% of the work effort?

ANSWER: Please see section III.B.3 (reduced cost share requirement) of the FOA.

Q25.B. Is there a cost-sharing burden on the university, or can the private company partner shoulder the full cost-share?

ANSWER: As stated in Section III.B.5 (Cost Share Allocation) of the FOA, each Project Team is free to determine how much each Project Team member will contribute towards the cost share requirement. The amount contributed by individual Project Team members may vary, as long as the cost share requirement for the project as a whole is met. Although the cost share requirement applies to the Project Team as a whole, the funding agreement makes the Prime Recipient legally responsible for the entire cost share. In addition, Section III.B.3 (Reduced Cost Share Request) of the FOA addresses the individual cost share obligations of large businesses that receive patent rights under a class waiver, or other patent waiver.

Q26. What is the assignment of rights in a domestic educational - private company partnership, in the situation of IP arising from a seedling research and development project under this funding opportunity? University policies require IP resulting even from collaborations to be owned by the university - can ARPA-E provide a boilerplate agreement clarifying IP assignment?

ANSWER: Within 6 weeks of award, ARPA-E requires each Project Team to negotiate and submit an Intellectual Property (IP) Management Plan for the management and disposition of intellectual property used in, or arising from the project. ARPA-E has developed a template for Intellectual Property Management Plans (http://www.arpa-e.energy.gov/arpa-e-site-page/award-guidance) that Recipients may choose to utilize as a starting point for their IP Management Plans. ARPA-E does not mandate the use of this template and cannot make modifications to this template for individual situations. ARPA-E and DOE do not make any warranty (express or implied) or assume any liability or responsibility for the accuracy, completeness, or usefulness of the template. ARPA-E and DOE strongly encourage Project Teams to consult independent legal counsel before using the template.

Q27. How will participating with a corporate partner change the cost share requirement if that corporation incurs no cost and does not require any DOE funding? Would the team be eligible for the 5% reduced cost share requirement?

ANSWER: In this context, "a corporate partner" is interpreted to be a member of the Project Team that is participating in the performance of the ARPA-E award. As a participant in the ARPA-E award, the corporation's work or contribution, even if "donated" by the corporation to the project or not reimbursed by ARPA-E, would count toward the percentage of work calculation to determine the minimum cost share requirement for the project as a whole. Please see Section III.B.3 (Reduced Cost Share Requirement) of the FOA for more details.

Q28.A. We believe we have a superior concept for a technology and would appreciate your careful reading of the attached confidential plan that is sent as privileged information not to be shared with other engineers or scientists. Does the draft proposal fit the requirements for possible funding under the subject FOA?

ANSWER: ARPA-E will not provide a pre-submission assessment of an applicant's technology or proposed project.

To apply to this FOA, Applicants must register with and submit application materials through ARPA-E eXCHANGE (http://arpa-e-foa.energy.gov). Please see Section IV.H.1 (Use of ARPA-E eXCHANGE) of the FOA for detailed guidance on using ARPA-E eXCHANGE.

Q28.B. Is there another FOA program manager we should consider corresponding with?

ANSWER: After issuance of a FOA, ARPA-E personnel may not communicate with Applicants regarding the FOA. This is called a "quiet period." Currently, ARPA-E's "quiet period" is in effect for this FOA; therefore, ARPA-E personnel cannot communicate with Applicants about their concepts for the FOCUS FOA. See Section VII.A (Communications with ARPA-E) of the FOA. You must submit your questions regarding this FOA to ARPA-E-CO@hq.doe.gov.

Q29.A. Will a high temperature fluid at any temperature greater than 150 C be a sufficient demonstration for a type 1A project?

ANSWER: As stated in Section I.E.2 (Details on Each Technical Category of Interest) of the FOA, Category 1A should demonstrate critical technology improvements in which the highest temperature of the thermal energy collection is *between* 150°C and 600°C.

Q29.B For Category 1A, Is electricity generation using the fluid also required as part of the demonstration?

ANSWER: Yes. Please see Section I.E.2 (Details on Each Technical Category of Interest) of the FOA for more information. In addition, proposed systems must be designed to demonstrate the achievement of the Technical Performance Targets set forth in Section I.F.1 (Category of Interest 1A) of the FOA.

Q30. Can we make changes to our Project Team between the Concept Paper submission and Full Application submission?

ANSWER: Yes. Applicants may expand or otherwise modify the proposed Project Team for their Full Applications.

VI. CONCEPT PAPER PHASE QUESTIONS PART 2: AUGUST 15, 2013

Q31. The target capital cost level for storage system is listed in table 3 to be < 100$ /kwh$_e$. I assume this is the LEVELIZED cost target over 25 years of operation? (E.g. I mean if the capital cost of the system is $100 k for 10 kwh system, the levelized cost over 25 years will be ($100,000/ (10kwh*25yr*10 hr of operation per day)) Is this correct?

ANSWER: Table 3 and accompanying Supplementary Explanation 2.6 describe how to calculate the projected capital cost of the storage device at scale. A Levelized Cost of Electricity (LCOE) calculation over the course of the targeted 25 year lifetime is not expected at this time. Applicants need only determine the capital cost of the storage device at scale, which is not a 'levelized' calculation. Please see Section 1.F.3 (Supplementary Explanations of Category 2 Metrics) of the FOA.

Q32.A Can different designs/implementations of the same high-level concept be investigated during the initial phase of the project?

ANSWER: Yes. Several possible designs or implementations (e.g., order of components, choice of materials, fabrication techniques) for the same high-level concept or scheme may be investigated in the initial phase of a project.

Q32.B. Can several high-level concepts that are scientifically distinct be explored in the same concept paper?

ANSWER: No. Concept papers should be limited to a single concept or technology. Please see Section IV.C (Content and Form of Concept Papers) of the FOA.

Q33. Can funding requirements increase or decrease during the project and what are the limits to such a change?

ANSWER: No. During the Concept paper stage, Applicants must state whether the proposed budget for their project falls into the first or second funding award type (Proof-of-Concept Seedling Project or Technology Development Project). In addition, during the Full Application stage of the FOA, ARPA-E requires all Applicants, to the best of their ability, to justify the cost of their project as a whole by completing the Budget Justification Workbook. If selected for negotiations, Applicants will be required to agree to a final budget based on the final milestones and deliverables that are selected by ARPA-E.

Q34. Can prototype components or parts already developed outside the US be shipped into the US to save fabrication time?

ANSWER: All new equipment purchased under ARPA-E funding agreements must be made or manufactured in the United States, to the maximum extent practicable. Project Teams may purchase foreign-made equipment where comparable domestic equipment is not reasonably available.

In addition, Prime Recipients must expend 100% of their Total Project Cost in the United States. Applicants may request a waiver of this requirement during the Full Application phase where their project would materially benefit from, or otherwise requires, certain work to be performed overseas.

Q35. Can the Principle Investigator and Project Manager be different people?

ANSWER: Yes. Applicants may independently determine the roles for individual members of their proposed Project Team.

Q36. Our current team does not possess any expertise in building and implementing solar concentrators. Would it be advantageous to partner with someone in this area or is it best to focus on a partial solution/seedling? If so, where can I find a list of such partners?

ANSWER: ARPA-E will not provide a pre-submission assessment of an Applicant's Project Team and/or proposed project. It is the Applicant's responsibility to identify the staff and teaming partners necessary to meet the demands of the funding opportunity and proposed project. Applicants seeking potential teaming partners for the FOCUS FOA can view ARPA-E's FOCUS Teaming List posted in the "FOA Documents" section on ARPA-E eXCHANGE (http://arpa-e-foa.energy.gov). Note that ARPA-E does not require teaming, and that persons or entities listed on the Teaming List are self-identified for placement on the list. ARPA-E does not endorse or otherwise evaluate the qualifications of entities that appear on the Teaming List.

Q37. If the proof of concept work is successful, is there any means to expand it into a development project?

ANSWER: Yes. However, ARPA-E will not support technology development for extended periods of time. ARPA-E supports the initial creation of technology and initial testing of the first prototype of a device, system, or process. Please see Section I.A (Agency Overview) of the FOA.

Q38. One of the work places will be at CINT, which is a structure of the Sandia National Laboratories". We are user project and we have a lab at CINT. None of us, however, is affiliated or is paid by the DOE, or by Sandia National Laboratories. Can we use the CINT facility and the equipment to carry out our research?

ANSWER: The Center for Integrated Nanotechnologies (CINT) is a research center user program offered by the Department of Energy at Sandia National Laboratories. ARPA-E is not part of the CINT program, and therefore, cannot make commitments or representations on behalf of the CINT program regarding the terms of its user agreements. Applicants that wish to utilize their current user

access to carry out ARPA-E project work must confer with the CINT user program to determine whether such use is permissible.

Q39. Is it possible to have 2 leading institutions?

ANSWER: We are unsure whether by "leading institution" you mean Prime Recipient or Co-PI. ARPA-E requires one Prime Recipient for each award which will be legally responsible for paying the entire cost share. However, Project Teams may have multiple Co-PIs perform research under a single ARPA-E award.

Q40. The PI should have a strong publication records in the area? Or it is enough that the Co-PIs have a good record of publication/patents in the area and on the material/devices we intend to fabricate.

ANSWER: ARPA-E will not provide a pre-submission assessment of an Applicant's Project Team and/or proposed project. It is the Applicant's responsibility to identify the staff and teaming partners necessary to meet the demands of the funding opportunity and proposed project.

Q41. The addendum requires some project budget description. How detailed does it need to be? It will be enough to mention that we are aiming for ~3 million among the institutions?

ANSWER: Section IV.C (Content and Form of Concept Papers) only requires that Applicants state only whether the proposed budget for their project falls into the first or second funding award type (Proof-of-Concept Seedling Project or Technology Development Project). Please see Section II.A (Award Overview) of the FOA for more information on ARPA-E award types.

Q42.A. In the FOA mentions that category 2 applicants should propose innovative systems that co-store heat and electricity and later output electricity, while demonstrating the performance of critical enabling components for the system. Using the * to sink heat and *** to harvest the solar visible light into electricity can be considered a co-store system?**

ANSWER: ARPA-E will not provide pre-submission assessments of potential Applicant proposals. Each Category of Interest has different technical requirements and performance targets. Please see Sections I.E (Technical Categories of Interest) and I.F (Technical Performance Targets) of the FOA which describe the specific technical targets that proposed technologies must meet for all Categories of Interest. ARPA-E strongly recommends that Applicants read the funding opportunity Technical Requirements to determine if their technology warrants a submission to ARPA-E.

Q42.B. Is storage like an electrochemical battery required, and if so, how critical to the project is the electrochemical battery component for the ''Technical Category of interest 2''?

ANSWER: ARPA-E will consider any concept paper that advances the program objectives of the FOA described in Section I.C (Program Objectives) of the FOA and meets the technical

performance targets for storage devices proposed under Category of Interest 2 in Section I.F (Technical Performance Targets) of the FOA.

Q43. On page 24 of the DE-FOA-0000949 document, within table 3, section 2.3, the applicant is asked to report "round-trip exergy efficiency X_{out}/X_{in} of system." Could you please define clearly X_{out}? Is X_{out} simply the electrical output energy to the grid, or is X_{out} a different value?

ANSWER: In Table 3, Section 2.3, output exergy (X_{out}) is equivalent to the electrical output energy of the designed storage device for Category 2 proposals.

Q68. Regarding the technical category 1B ("High Temperature Topping Devices"), the initial two criteria are for operating temperature >400C and sunlight-to-electricity efficiency of >25%. However, the example of a single junction PV at 100x shown in figure 3 exhibits a PV sunlight-to-electricity efficiency of ~26% at 400C, assuming the S-Q limit. The inclusion of practical levels of non-radiative recombination drops the efficiency to ~15%. With this, it seems the primary criteria for success are unrealistic unless significant fundamental research were undertaken to devise novel high temperature conversion schemes. Yet, the nature of ARPA-E is to NOT fund fundamental science, but rather applied research. This seems to be a bit of a contradiction. Can you please clarify the technical performance targets for category 1B?

ANSWER: Category 1B concepts can propose to utilize any technology to serve as the topping device, including but not limited to photovoltaics, provided that the technology can meet or exceed the Technical Performance Targets set forth in Section I.F.2 (Category of Interest 1B) of the FOA.

VII. Questions for week ending: OCTOBER 7, 2013

Q45.A Generally, what are the duties, rights, and responsibilities of an ARPA_E project Primary Investigator (PI), Co-PI, and program manager?

ANSWER: The duties, rights, and responsibilities of the Prime Recipient are described in Attachment 1 (Special Terms and Conditions) to ARPA-E Cooperative Agreement. The Prime Recipient and the Project Team are free to allocate the specific project-related day to day duties among the various Project Team members (PI, Co-PI, and Program Managers) working on the award, but the Prime Recipient is ultimately responsible for ensuring the terms and conditions of the ARPA-E award are met. To review ARPA-E's Model Cooperative Agreement documents, including Attachment 1, please visit http://arpa-e.energy.gov/arpa-e-site-page/award-guidance.

Q45.B Which position is the primary contact with ARPA-E, and is this the same on all projects or can this vary from project to project?

ANSWER: The Prime Recipient may make the initial determination regarding which member of the Project Team should be proposed as the primary contact(s) with ARPA-E. Usually, Project Teams establish two points of contact (POC) for a project: (1) a technical POC and (2) an administrative POC to manage business matters related to the award, such as invoicing and reporting. Often, the PI will serve as the technical POC and another individual within the Prime Recipient's organization

will serve as the administrative POC. However, it is possible for the technical POC and administrative POC to be the same person. Points of contact may vary from project to project.

Q46. Is there a limit on the number of PIs and/or on the number of Co-PIs that can work on an ARPA_E award?

ANSWER: ARPA-E does not limit the number of PIs and/or Co-PIs that can be proposed on a project.

Q47. Please can you clarify whether focus applications for category 1b) require the block diagram and technology component costs table. If so, what do these entail if only a single component is proposed, i.e. The topping device?

ANSWER: Each Full Application, including Category 1B submissions, must provide: (1) A clear Block Diagram of the proposed technology with estimated component efficiencies and losses indicated and (2) a justification of the estimated cost, as described in Section IV.D ("First Component: Technical Volume – Block Diagram and Technology Costs") of the FOA. Category 1B Applicants do not need to submit cost tables in their Full Applications, but at a minimum, such applicants should submit a cost estimate with the Full Application that includes relevant cost data and/or justified cost assumptions to demonstrate how the technology would meet the Category 1B cost targets.

If a single topping device (*e.g.*, a photovoltaic device) is proposed under Category 1B, the required Block Diagram may include only one block, but should still include: loss mechanisms for input solar power, such as optical reflection; and also the output power as electricity and as heat at a specified temperature. A mechanism supporting the heat transfer rate should also be provided.

Q48. Where should I include supporting documentation for subrecipients incurring less than 10% of the total project costs in our submission?

ANSWER: Subrecipient budget justifications can be added to the Lead Organization budget justification as additional tabs in the Budget Justification Excel workbook. For additional information, please see the ARPA-E Budget Justification Guidance available on ARPA-E eXCHANGE (https://arpa-e-foa.energy.gov/).

VIII. Questions for week ending: OCTOBER 11, 2013

Q49. In table 1 the performance target 1A.2 states that the fraction, $f_{th}=x_{th}/x_{tot}$, of delivered exergy as heat must be $0.50 < f_{th} < 0.90$. In this statement the phrase "delivered exergy as heat" is causing confusion for us. Here the xth is not the exergy stored as heat, but the exergy resulting from the full solar-to-heat-to-electricity cycle, and would therefore include the carnot loss term $(1-t_c/t_h)$, correct?

ANSWER: Performance Target 1A.2 in Category of Interest 1a specifies the required fraction of exergy from the hybrid solar converter that is in the form of "delivered exergy as heat" (X_{th}) . As stated in Section 1.D.3 (Technical Background – Exergy and Hybrid Solar Converters) of the FOA, X_{th} is the maximum amount of useful work that could be obtained from the quantity of heat, Q, that is delivered by the converter at temperature T_h. This means that X_{th} is equal to the electricity produced from Q by an ideal heat engine operating at the Carnot limit. As stated in the Supplementary Explanation 1A.1, $X_{th}=Q(1-T_c/T_h)$, where the temperature of the heat reservoir used as the cold side of the ideal heat engine is T_c=37 °C. The total exergy in the denominator of f_{th} is $X_{tot} = X_{th}+X_{elec}$, where X_{elec} is simply the electrical energy produced by the converter in addition to the heat, Q.

Q50. Our project team consists of Universities and one industry partner. Over the three-year project period, the industry partner's share of total project costs is less than 20%. However, in year three only, the industry partner's share of total project costs is over 20%. Do we qualify for the reduced cost share amount of 10% of total project costs?

ANSWER: ARPA-E will not provide pre-submission assessments regarding an applicant's eligibility for reduced cost share. To qualify for reduced cost share of 10%, the domestic educational institutions on the Project Team must perform greater than or equal to 80%, but less than 100% of the ***total work*** under the funding agreement. Total work is measured by the total project costs over the entire project period. Applicants must review the cost share requirements of this funding opportunity to determine if their project may be eligible for reduced cost share. Please see Section III.B.3 ("Reduced Cost Share Requirement") of the FOA for more details.

Q51. Will ARPA-E extend the deadline to submit Full Application beyond November 4, 2013 due to government shutdown?

ANSWER: No, ARPA-E does not anticipate any changes to the Full Application submission deadline for the FOCUS FOA.

Q52. Does ARPA-E require that awardees work some set % of their time for the entity that is awarded the ARPA-E contract?

ANSWER: No.

Q53. We have been approached by entrepreneurs who have been invited to submit full solicitations to ARPA-E FOA's and plan to execute the ARPA-E award while continuing to hold "day jobs". The entrepreneurs have the consent of their employers. ******** would like to work with entrepreneurs, but before investing time in preparing a proposal we'd like to know if this team would be able to accept an ARPA-E award while they are also employed full time elsewhere.**

ANSWER: ARPA-E will not provide pre-submission assessments regarding an Applicant's eligibility to perform an ARPA-E award or an Applicant's staffing plans.

IX. Questions for week ending: OCTOBER 25, 2013

Q54. I am trying to upload my submission but for some reason my computer won't do it. What is your street address? I'll mail it to you.

ANSWER: Only applicants who have successfully submitted a Concept Paper in Exchange by the published deadline are eligible to submit a Full Application to the FOCUS FOA (DE-FOA-0000949). In addition, eligible applicants may only submit applications through the ARPA-E funding opportunity Exchange website http://ARPA-E-FOA.energy.gov. ARPA-E will not review or consider applications submitted through other means. Please e-mail exchangehelp@hq.doe.gov to resolve problems with ARPA-E eXCHANGE.

Q55A. For subcategory "H", is it acceptable to use some of the collected solar heat for electricity generation in addition to direct heat usage, such as industrial process heat, district heating, cooling, etc.? Or, are we only allowed to use collected heat for direct heat purposes (i.e., no electricity generation)?

ANSWER: System Subcategory H can use a portion of the collected solar heat for electricity generation but must also use generated heat for some other purpose. See the System Subcategories description in Section 2.1a of the FOA on pages 20-21 of the FOA.

Q55B. In contrast, it clearly states for subcategory "SE" that the complete system should only generate distributed electricity.

ANSWER: Correct. System Subcategory SE is for systems that provide only electricity. See the System Subcategories description in Section 2.1a of the FOA on pages 20-21 of the FOA.

Q56. The description of this FOA speaks singularly about energy conversion efficiency. Are ideas for reducing energy use through revolutionary technologies also an acceptable topic?

ANSWER: ARPA-E will not provide pre-submission assessments of concepts. Applicants must review the Technical Requirements of this funding opportunity to determine if their technology warrants a submission to ARPA-E.

Q57. Do applicants submitting for category 2 for the focus FOA have to submit a block diagram and technology costs section as described in section 1.H of the FOA? The requirement is only specified for category 1a. If it is required, are there any instructions given for content? Instructions are only given for category 1a.

ANSWER: As stated in Section IV.D.1 (Content and Form of Full Applications – Technical Volume) of the FOA, all Applicants are required to submit a Block Diagram and a cost estimate for the proposed technology at maturity. Section IV.D.1 also recommends looking at the Section I.H. example where an idea of the appropriate level of Block Diagram detail can be found.

Q58. The supplementary explanation for technical target 1A.1 (page 23) instructs the applicant to assume 1000W/m2 AM1.5D direct and 150W/m2 AM1.5G diffuse solar resource. Even in climates with very clear skies, this ratio of diffuse to direct insolation is far too low, disadvantaging systems which are able to utilize the diffuse component.
The FOA (page 34) references the NREL "solar radiation data manual." Data from this manual (reference 44) is used to justify the 6.5kW/m2/d direct insolation assumption for the illustrative parabolic trough/gaas example in block diagram 2. If the illustrative parabolic trough is tracked on a 1-D axis tilted to latitude (polar axis), this is correct. Most parabolic troughs, however, are tracked on a N-S horizontal axis, in which case 6.0kW/m2/d should be used (see attached). The diffuse component is found by subtracting the direct from the total (8.0kW/m2/d): the diffuse-only component is 2.0kW/m2/d. This 1:3 diffuse:direct ratio differs substantially from the ratio prescribed on page 23.
We have two questions:
1. Provided we include the above justification, are you ok with us using a 1:3 diffuse:direct ratio for both block diagrams?
2. Our inclination is then to use 1000 w/m2 direct (as per the instructions) and 333 w/m2 diffuse. Can you please confirm that this is acceptable?

ANSWER: As stated in the FOA Section I.H, the “First Block Diagram: Hybrid Solar Converter” for Technical Category 1a must use the solar input allocation described in the notes to Technical

Target 1a found in Section I.F.1. This allocation is 1000 W/m2 of direct sunlight and 150 W/m2 of diffuse sunlight.
The FOA Section I.H, the "Second Block Diagram: System Application," specifies the daily energy input to the example 1-axis tracker in Phoenix, at 6.5 h/day of 1000 W/m2 direct sunlight, but explicitly permits exceptions justified by special features of the technology. Therefore, if your technology utilizes diffuse sunlight, you may quantify the diffuse solar input in the System Application Block Diagram, with a clear explanation of the technology and expected use case in Phoenix that leads you to the inputs you assume.

Q59. Do seedling proposals require all the components and sections of the technical volume that full proposals require?

ANSWER: Seedling proposals must include all the components and sections of the Technical Volume, as detailed in Section I.H.

Q60. We have been encouraged to submit a full proposal (control number 0949-XXXX). We decided to submit budget to have budget periods. The first budget period covers first 24 months, and the second budget period covers the remaining 12 months (month 25 to 36). My question is on the SF-424a preparation: do we need to prepare the budget for the second period?

ANSWER: Yes. Applicants must complete the Budget Justification Workbook (SF-424A) for the project as a whole.

Q61. Our overall project includes work within technical categories 1a and 2. The 1a portion of the project relates to energy capture and would be performed within the U.S. Some of the category 2 work, which relates to Energy Storage would be more economically performed by our foreign (****) expert partner. While this work may not meet the restriction, it is critical to develop and test the two subsystems in concert.

Would ARPA-E provide a waiver and allow funding towards *** performing the storage system integration and testing work outside the U.S? If not, would ARPA-E provide a waiver for such work to be performed overseas as a part of the project, provided that **** contributed the funds for such work? Finally, in such case, would foreign expense incurred on the project count towards Grantee's cost share contribution?**

ANSWER: ARPA-E will not provide pre-submission assessments regarding the likelihood of an Applicant receiving a foreign work waiver from ARPA-E. The decision on whether to grant a foreign work waiver is a fact dependent, case-by-case determination made by ARPA-E. Applicants that may be interested in requesting a foreign work waiver should complete Section 4 of the Business Assurances Form and provide a detailed explanation of the circumstances that would necessitate performance of project work overseas.

Q62.A. We are a large multi-campus university with two large research universities as subawardees and need clarification regarding the scope of certain questions contained in the Business Assurances Form. Does question #1 and all its subquestions that start "is the proposed prime recipient, subrecipient(s), principal investigator (pi), or co-pi(s)…" request information relating to the entire university campus or just the pis/co-pis? If the former, does it require us to answer for all campus in our university system (which comprise our legal entity?)

ANSWER: Question 1 of the Business Assurances Form requests information regarding the legal entity submitting the application as the Prime Recipient, the legal entities and/or individuals that are proposed to be Subrecipients, and the PI/Co-PIs in their individual capacity. The Prime Recipient may submit one Business Assurances Form covering all of the Project Team members if it has authorization and information to answer on their behalf. The Prime Recipient may alternatively request Subrecipients to complete and sign individual Business Assurances Forms that the Prime Recipient will append to its Business Assurances Form.

Q62.B. If the business assurance form is asking for information related to violations, etc. For the entire campus or system, can the certification be modified to indicate we make the certification to the best of our abilities and knowledge?

ANSWER: The Business Assurances Form requires each FOCUS Applicant to disclose certain information, as necessary, regarding the Prime Recipient (i.e., the legal entity submitting the Full Application), Subrecipients, and the PI and Co-PIs. If the preparer of the Business Assurances form does not have personal knowledge sufficient to make such certification on behalf of those entities or individual, they may need to coordinate with others who do have access to such information in order to ensure that information disclosed in the Business Assurances Form is accurate and complete.

Q62.C. The other sources of funding form, section 3, requested information on all federal funds received by the prime recipient, subrecipient, pi, or co-pis. Is this asking for all federal funding received by just the pi and co-pis in the case of a large university, or is it asking for information on all federal funding received by the universities involved? If this latter, can we limit to the involved senior personnel? (we have hundreds of millions in federal funding.)

ANSWER: Section 3 of the Other Sources of Funding Form requires disclosure of all Federal funds currently being received, or that has been received within the last 5 years by the Prime Recipient, Subrecipients, PI, or any Co-PIs.

Q63. Do subrecipients need to fill out their own Business Assurances form or just the prime recipient?

ANSWER: the Prime Recipient is required to submit a Business Assurances Form on behalf of the entire Project Team. For more information, please see the answer for Question 62.A.

Q64. We have a question about TT&O costs. ARPA-E is required to contribute at least 5% of the federal funding to TT&O activities. My question is when we work on the budget, should we include the indirect cost or not. For example, I have federal funding $100k, 5% of federal funding is $5000. If we include the IDC (60.5%), the direct cost for TT&O is $3115 =$5000/1.605, and the indirect cost for TT&O is $1885=$3115*60.5%. If we shouldn't include the IDC, the direct cost for TT&O is $5000, and the indirect cost for TT&O is $3,025 =$5000*60.5%, so the total cost will be $8,025.

ANSWER: TT&O activities, including both direct and indirect costs, can both be included in Tab H ("Other Direct Costs") of the Budget Justification Workbook. For more information on how to enter TT&O expenses, please see Step 9 of ARPA-E's Budget Justification Guidance, available on ARPA-E eXCHANGE at https://arpa-e-foa.energy.gov/.

Q65. If a subrecipient will need to purchase a modest amount of supplies from an overseas vendor, does the waiver request- foreign work need to be filled in?

ANSWER: ARPA-E requires that 100% of project work be performed in the United States, based on Total Project Cost. In addition, it is the sense of congress that, to the maximum extent practicable, all equipment and products purchased under ARPA-E funding agreements should be made or manufactured in the U.S.

Whether either of these requirements are triggered is a fact-dependant determination that will be made by ARPA-E on a case-by-case basis. Please see Section IV.G.6 of the FOA (Performance of Work in the United States) and Section IV.G.7 (Purchase of New Equipment) of the FOA, and Attachment 1, Clauses 8 & 9 of ARPA-E's Model Cooperative Agreement available at http://arpa-e.energy.gov/arpa-e-site-page/award-guidance.

Q66. I am at a GOGO. We are thinking of applying for funding as a team member with a university. We want to know how we should cost share on that project, as all of our internal funds are government provided and our budgets are fluid.

ANSWER: ARPA-E will not provide pre-submission assessments or feedback regarding an applicant's proposed teaming structure or cost share allocation. Each Project Team is free to determine how much each Project Team member will contribute towards the cost share requirement. Please see Section III.B.5 (Cost Share Allocation) of the FOA.

X. Questions for week ending: OCTOBER 28, 2013

Q67. The FOA states an upper bound of 25 sq m for a type 1a proposal for a non utility application I would like to find out if a size larger than 25 sq m is acceptable for a distributed generation application demonstration? I would like to know if there is a size limit for the collector area.

ANSWER: As stated in Technical Target 1A.4 on p. 23, a prototype hybrid solar converter developed with a FOCUS Award must have a size less than 25 m2. As stated in Technical Target 1A.7 on p. 23, the intended application described in the FOA must be smaller than 1000 m2 for Subcategory SE and H (non-utility) systems.

Q68. In the "technical milestones and deliverables" document, how do you want us to differentiate between milestones and deliverables on both the Project Schedule and the formatted table with descriptions? There is only indication to put "M" in front of items that are milestones.

ANSWER: ARPA-E does not require a separate designation for deliverables in the "technical milestones and deliverables" document that is submitted as part of an Application, although Applicants may provide one if they wish. Therefore, for the purposes of "technical milestones and deliverables" document, a milestone which includes a deliverable may still be denoted by an "M." Please see the Technical Milestones and Deliverables Instructions available on ARPA-E eXCHANGE available at https://arpa-e-foa.energy.gov/.