

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 Program Directors 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 announcement to determine if their technology warrants a submission to ARPA-E. See e.g. Section I.D (“Technical Categories of Interest”) and Section I.F (Applications Specifically Not of Interest) of the FOA.

Q9. My concept will produce a plasma with a density lower than 10^{18} ions/cm³. May I apply?

ANSWER: Yes. The ion density range of interest specified in Table 1 of the FOA describes the long-term objective for the envisioned reactors based on the tools developed in this program. Target formation concepts that are compatible with those long-term objectives are sought. This may include some tools that form lower density plasmas, provided that they offer a route to access Lawson conditions in the density range of interest specified in Table 1.

Q10. Can I plan to use equipment in my lab as part of this project, even if it does not meet the performance requirements in the FOA?

ANSWER: Yes. Applicants may leverage existing suboptimal equipment to validate an approach if there is a clear pathway to achieving the required performance levels with known technologies. For example, if a team has access to a pulsed-power system that is appropriate to validate performance of a proposed driver, but the pulsed-power system only allows for 15% driver efficiency, it is acceptable to use that system to conduct the research and development project under ALPHA, provided that the team can show that a machine with the same performance and >20% driver efficiency can be built with known technologies and that it would be feasible to incorporate the higher efficiency driver back into the system.

Q11. What is the difference between a “tool” and a “component”?

ANSWER: The ALPHA FOA uses the terms “tool” and “component” interchangeably, but “component” is typically used in the context of an operating reactor, whereas “tool” typically refers to prototype technology that can be used for experimentation or fusion reactor development. In this context, a tool developed under the ALPHA Program may be combined in the future with other tools for an integrated demonstration that may lead to an operating reactor.

Q12. May entities outside of the US apply?

ANSWER: Foreign entities are eligible to apply for funding. See Section III.A.3 (Eligibility Information- Foreign Entities) of the FOA. However, if the project is selected for award negotiations and an award is made, all work must be performed in the United States by subsidiaries or affiliates incorporated in the United States or U.S. territories (unless ARPA-E grants a foreign work waiver to

allow performance of part of the work outside of the United States). ARPA-E's grant of a foreign work waiver is a fact dependent, case-by-case determination that is made only in exceptional circumstances and only for discrete parts of an award that necessitate foreign work. Applicants that anticipate needing to request a foreign work waiver to perform some work outside of the U.S. should review Section 5 of the Business Assurances & Disclosures Form.

II. Questions for week ending: SEPTEMBER 5, 2014

Q13. Will additional specifications be provided for a partial solution/proof of concept submission for the concept paper or full proposal stage? Will there be specified values that a partial solution submission must include?

ANSWER: Applicants submitting partial solution/proof-of-concept ideas for plasma formation technologies or low-cost drivers that are not yet fully integrated into a conceptual fusion approach are not required to fully quantify the performance levels and constraints on all components of the conceptual fusion system. However, as stated in Section II.A (Award Overview) of the FOA, Applicants who submit partial solutions are required to provide a convincing vision of how these partial solutions can enable the realization of the program metrics with further development. (e.g. make a persuasive case that their approach, if further developed beyond proof of concept, will enable fusion reactors that will meet the metrics in Table 1 of the FOA).

Q14. What are typical proof-of-concept funding levels?

ANSWER: Typically, proof-of-concept funding levels are smaller than the average funding levels for "full" projects, and depending on the scope and complexity of the particular work proposed, project duration may be shorter than 36 months. As there is no pre-defined funding level for proof-of-concept efforts, applicants should propose based on the time and resources required to successfully perform the particular proof-of-concept project.

Q15. My idea does not exactly fit this FOA, but I still believe it is relevant. Should I submit a concept paper to this FOA or should I wait for a forthcoming FOA on other fusion topics?

ANSWER: Applicants should carefully review the FOA for all of the compliance and responsiveness criteria. See, e.g., Sections I.D (Technical Categories of Interest), I.E (Technical Performance Targets), I.F (Applications Specifically Not of Interest), III.C.1 and III.C.2 (Compliant Criteria and Responsiveness Criteria) to determine whether to submit the idea under this FOA. In addition, please see the answer to Question 8 above

Q16. Why is there a minimum η_G requirement of 5?

ANSWER: The η_G requirement is intended to enable a practical recirculating electrical power ratio after conversion of thermal energy to electricity. If a proposed concept can achieve higher efficiency conversion (for example, through direct conversion of charged products), or if energy recovery can reduce the required recirculating power, lower η_G systems may still be considered provided that no more than half of the generated electricity from a reactor must be recirculated. Teams proposing a relaxed η_G requirement must demonstrate quantitatively, with references where

appropriate, that the proposed energy conversion or recovery systems are based on proven technologies.

FOA Modification 02 will be issued to reflect this clarification.

III. Questions for week ending: SEPTEMBER 26, 2014

Q17. Would a team consisting of an FFRDC (**), one or more universities, and one or more small businesses (where the small businesses perform >20% but less than 80% of the total work as measured by project cost), qualify for the 10% reduced cost sharing requirement?**

ANSWER: ARPA-E may not provide pre-submission assessments on a project team's specific cost sharing requirement. See Section III.B.3 (Reduced Cost Share Requirement) of the FOA for more details on the cost sharing requirements for this FOA. To qualify for reduced cost share of 10%, domestic educational institutions, domestic nonprofits, and/or FFRDCs must perform greater than or equal to 80%, but less than 100%, of the total work under the funding agreement (as measured by the Total Project Cost). Projects that do not meet the this criteria, or any other criteria set forth in the FOA to receive reduced cost share, are subject to the minimum cost share requirement of 20% of the Total Project Cost.

Q18. Is the entire project team (Prime Recipient and all Subrecipients) required to sign up on ARPA-E's Teaming List for this FOA?

ANSWER: No. ARPA-E set up the ALPHA Teaming Partner List to help facilitate formation of new project teams. There is no requirement for applicants or any team member to sign up/register for the Teaming Partner List. In addition, ARPA-E does not endorse or otherwise evaluate the qualifications of the entities that self-identify themselves for placement on the Teaming Partner List.

Q19. Under what conditions will a small business be able to charge a fee? If so, what maximum fee is allowed?

ANSWER: DOE Regulation 10 C.F.R. § 600.318 prohibits ARPA-E from paying a fee or profit on grants or cooperative agreements to recipients or subrecipients.

Q20. If a small business waives or reduces the license cost of using their computer software (e.g., a simulation code) to other team members, can this count toward cost-sharing, and how would the value of this be calculated?

ANSWER: Every cost share contribution (e.g., amount, type, and source of cost share), must be approved in advance by the Contracting Officer during award negotiations and incorporated into the project budget before the expenditures are incurred. If approved by the Contracting

Officer during award negotiations, the value of the cost share contribution would be the fair market value/established commercial price of the license less the cost actually charged.

Q21. How are payments made to each team member? What kind of delays are to be expected between spending, invoicing, and reimbursement?

ANSWER: ARPA-E reimburses the Prime Recipient by electronic funds transfer. The Prime Recipient is responsible for reimbursing other project team members. ARPA-E typically approves properly submitted invoices within 30 calendar days.

Q22. Who will select reviewers of proposals, and what criteria will be applied to the selection of reviewers?

ANSWER: Please see Section V.B.2 (ARPA-E Reviewers) of the FOA.

IV. Questions through week ending: OCTOBER 10, 2014

Q23. Will there be external reviewers (i.e. members of the plasma physics community not submitting a proposal) for the concept paper and/or full proposal submissions, or are reviewers of these projects entirely internal?

ANSWER: Please see Section V.B.2 (ARPA-E Reviewers) of the FOA

Q24. The template for the concept paper includes a boxed disclaimer. If the concept paper contains no proprietary information, is the disclaimer still required?

ANSWER: No. However, applicant should carefully read Section VIII.E (Marking of Confidential Information) of the FOA for full details on including confidential and proprietary information in Concept Paper submissions.

Q25. How is “solid liner” defined? Do thin liners that become plasmas during the implosion qualify? Or does it refer to concepts that use liners that remain solid thru out the implosion?

ANSWER: In the context of the ALPHA FOA, “solid liner” refers to a liner that begins as solid prior to implosion.

Q26. How important are “spin-offs” (i.e. early markets for technology) to the ranking of the proposals?

ANSWER: See Section V of the FOA for criteria to be used to evaluate submissions.

Q27. Given the uncertainty of the cost fusion reactors and the produced COE what do you define as “low cost?” metrics given in the FOA state: driver cost (<\$0.05 /MJ amortized over its lifetime) and target cost< \$0.05/MJ (of fusion energy produced per target) but COE is real metric. Given that, do you have a cost of production of electricity (COE) goal? Must that metric also include a return of investment (ROI)?

ANSWER: Cost of electricity (COE) or return on investment (ROI) analysis is not required at this stage. Applicants are welcome to share COE analysis if desired, but it is not a requirement.

Q28. Since a proposal may utilize several experimental platforms, does shot rate “count” sum over all of these?

ANSWER: No. The number of shots required in Tables 2 and 3 in Section I.E of the FOA are not cumulative across multiple tools.

Q29. Metric of rep-rate>1 Hz is limiting to some concepts-how serious is this limitation? Will concepts that are <1 Hz be eliminated from consideration even if they project to meet the economic goals of the FOA?

ANSWER: Rep rate is the long term goal, but it is not necessary to demonstrate in a three year project. However, the concept should have a clearly described path to a rep-rate >1 Hz.

Q30. If a driver technology can pair with multiple targets, must each target be described?

ANSWER: This is at the discretion of the applicant. Applicants may choose to focus on a single driver and a single target, or a single driver and multiple targets.

Q31. Does concept paper length requirement include references?

ANSWER: Yes. See Section IV.C (Content and Form of Concept Papers) of the FOA.

Q32. If we submit one concept paper for ALPHA, and it is later invited for full proposal, will it be possible to break up the scope of work described in the successful concept paper into two separate full proposals?

ANSWER: No. To have a compliant Full Application you must have first submitted a compliant Concept Paper. See Section III.C.1 (Compliant Criteria) of the FOA for the Full Application compliance criteria.