

## 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](mailto: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](mailto:ARPA-E-CO@hq.doe.gov).

### Q2. How will I receive a response to questions submitted to [arpa-e-co@hq.doe.gov](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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: MARCH 22, 2013

**Q9.A Would a novel non-biological process to convert methane to a species that can be fed to organisms to create a fuel fit into the REMOTE program?**

**Q9.A. ANSWER:** Please see Section I.E.3 of the FOA. ARPA-E will evaluate hybrid approaches that are capable of meeting all primary technical target metrics described in Section I.E.3 of the FOA (“Category 3”).

**Q9.B. Would ARPA-E be interested in a self-standing project that converts the methane to a carbon source that microbes can metabolize but does not include a biological component. This project would conceivably enable several of the other performers in the program to succeed.**

**Q9.B. ANSWER:** Please see the answer for Question 8.

**Q10.A. Under Category 3 of the FOA, can a project propose to produce a fuel intermediate that is converted to fuel at a separate facility?**

**10.A. ANSWER:** Please see the answer for Question 9.A.

**Q10.B. How should we calculate our primary technical targets in this case?**

**10.B. ANSWER:** Please see Section 1.E of the FOA.

**Q11. Would a project using MMO would qualify for a category 1 proposal?**

**ANSWER:** Please see Section I.E.1 of the FOA. ARPA-E will evaluate approaches that are capable of meeting all primary technical target metrics described in Section I.E.1 of the FOA (“Category 1”).

**Q12.A. Would ARPA-E consider a hybrid approach that uses a non-biological methane oxidation with downstream biological conversion to liquid fuels?**

**12.A. ANSWER:** Please see the answer for Question 9.A.

**Q12.B. There is a stated desire for fuel targets at least as energy dense as butanol (26.8 MJ/L) but that do not require accumulation of biomass on the road to fuel production. Does this eliminate fuel molecules unless they are able to be excreted in some way?**

**12.B. ANSWER:** Please see Section I.F of the FOA, Calculation 2. ARPA-E will evaluate approaches that are capable of meeting all primary technical target metrics described in Section I.E of the FOA.

**III. Questions for week ending: MARCH 29, 2013**

**Q13.A. Can methanol be used as a starting molecule for a proposal that targets category 2?**

**13.A. ANSWER:** Please see Section I.E.2 of the FOA, Metric Description 2.1. ARPA-E will evaluate approaches that are capable of meeting all primary technical target metrics described in Section I.E.2 of the FOA.

**Q13.B. If technical target 2.3, as detailed in the FOA, is an unreasonable target for my proposed technology, how should I address the specification for this metric in my concept paper?**

**13.B. ANSWER:** Please see Section I.E.2 of the FOA, Metric Description 2.3.

**Q13.C. Page 13 of the FOA, does the "larger than or equal sign,  $\geq$  26.8 MJ/L " imply that n-Butanol or other Butanols are not acceptable or are they an acceptable choice of a liquid fuel?**

**13.C ANSWER:** Yes. Fuels with an energy density greater than or equal to that of n-butanol are responsive to this FOA.

**Q14.A. Referring to figure 4b (page 10 of FOA): can we propose biological process for C-C bond formation (production of fuel precursor) and chemical (non-biological) conversion of fuel precursor to fuel as long as we are > 85% of energy efficiency of these two processes combined?**

**14.A. ANSWER:** Please see Section I.E of the FOA. ARPA-E will evaluate approaches that are capable of meeting all primary technical target metrics described in Section I.E of the FOA.

**Q14.B. Can the proposal focus on category 2 by hypothesizing that category 1 requirements will be met elsewhere by producing a compound x (e.g. Methanol) that quantitatively meets the energy efficiency, turnover frequency and specific activity targets. Can our proposal begin with this compound X and going to a fuel?**

**14.B. ANSWER:** Please see the answer for Question 13.A.

**Q15. Would the restriction in Section 1.g apply to an integrated fuel-generation system wherein methanotrophic material is grown and then thermochemically converted into a liquid fuel output?**

**ANSWER:** Please see the answer for Question 12.B.

**Q16. Is a non-native Methanotroph responsive to this FOA; and can methanol be considered as a final fuel product?**

**ANSWER:** Any organism that is engineered to use methane as a feedstock should be considered methanotrophic. Final fuel products with an energy density greater than or equal to that of n-butanol are responsive to this FOA.

**Q17. Does the total anticipated funding amount of \$20 million refer to year 1 only, or is this the total available for all years (up to 3)? Is it likely that substantially more than \$20 million will be awarded over the course of 3 years?**

**ANSWER:** Please see Section II.A (Award Overview) of the FOA. The total anticipated funding amount for the REMOTE FOA is \$20 million for 3 years. At this time, ARPA-E has no plans to award additional funding for projects funded under the REMOTE FOA.

#### IV. Questions for week ending: APRIL 5, 2013

**Q18 I would like to know if a competitive proposal needs to address all of the technical categories of interest or if a proposal can address only one of the technical categories, and assume that other groups will solve the other two categories.**

**ANSWER:** Please see Section 1.D (Technical Categories of Interest) of the FOA.

- Q19.1. Is there opportunity to look at other products from Methanotrophy aside from liquid fuels?**  
**Q19.1. ANSWER:** Please see Section 1.E (Technical Performance Targets) of the FOA. ARPA-E is not interested in proposals where the final fuel is not a liquid fuel molecule with an energy density greater than or equal to 26.8 MJ/L (*n*-butanol)
- Q19.2. How restrictive in this funding call on the metric of cost per unit fuel for Biological Methane activation?**  
**Q19.2. ANSWER:** Please see Section 1.E.1 (Category 1) of the FOA, which does not include a metric of cost per unit fuel.
- Q19.3. How specific does our product production and recovery protocol have to be?**  
**Q19.3 ANSWER:** Please see Section I.E (Technical Performance Targets) of the FOA. ARPA-E will evaluate approaches that are capable of meeting all primary technical target metrics described in Section I.E of the FOA.
- Q19.4 Do we need an industrial partnership?**  
**Q19.4 ANSWER:** Please see Section II.A (Eligible Applicants) of the FOA.
- Q19.5 Two of us are at a Canadian Institution. Can either of us be PI on the proposal or only our us collaborator?**  
**Q19.5 ANSWER:** Please see Section III.A.3 (Eligible Applicants – Foreign Entities) of the FOA. Please be advised that ARPA-E awards are generally subject to: 1) the requirement that all work under the award is conducted in the United States - subject to a partial waiver application process (rarely submitted, and more rarely granted); 2) United States manufacturing requirements for subject inventions resulting from research conducted under the award; 3) export control and ITAR regulations, as applicable, for the research conducted under the award; and 4) other eligibility requirements that vary from FOA to FOA. Thus, Prime Recipients must expend 100% of the Total Project Cost in the United States. Applicants seeking a waiver of this requirement are required to include an explicit request in the Business Assurances Form, which is part of the Full Application submitted to ARPA-E. Such waivers are granted where there is a demonstrated need, as determined by ARPA-E.
- Q20.1 How do we obtain a control number?**  
**Q20.1. ANSWER:** Please see Section IV.H.1 (Use of ARPA-E eXCHANGE) of the FOA.

**Q20.2 Should we address the cost share commitments in the Concept Paper?**

**Q20.2. ANSWER:** Please see Section IV.C (Content and Form of Concept Papers) of the FOA.

**Q20.3 Shall we describe succinctly the budget, scope of work, and/or business plan?**

**Q20.3. ANSWER:** Please see the answer for Question 20.2.

**Q20.4. Can we provide main applicants' resumes as attachments/supportive materials during the submission of the Concept Paper?**

**Q20.4. ANSWER:** Please see the answer for Question 20.2.

**Q21 What is ARPA-E's definition of "scientifically distinct?"**

**ANSWER:** This term is used in Section III.C.3 (Limitation on Number of Applications) of the FOA. In this context, the term "scientifically distinct" is used to emphasize that, in the event an Applicant intends to submit multiple concept papers/application, the applicant should propose distinct technical approaches in each application. This prohibition on duplicative applications involves a fact-based determination by ARPA-E to ensure a focused review of each technical concept, and appropriate use of ARPA-E's limited time/resources.

**V. Questions received by 5 PM: APRIL 15, 2013**

**Q22. Our proposal addresses category 1, 2 and part of 3. If we address a component of a category must we address all of the metrics (primary technical targets) of that category?**

**ANSWER:** Please see Section 1.D (Technical Categories of Interest) of the FOA.

**Q23. We were wondering whether the listed references count towards the 2 page limit for the technology plan and/or 2 page limit for the addendum.**

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

**Q24. The FOA specifies that times new roman 12 point font should be used, but the downloadable template has a different font (Calibri). Would you please clarify this issue?**

**ANSWER:** The Concept Paper template has been corrected on ARPA-E eXCHANGE (<https://arpa-e-foa.energy.gov/Registration.aspx>).

**Q25. It appears that a budget is not required for the concept paper. Is it correct that we only need to designate whether the project will require a 1 year seed fund or a 3 year budget?**

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

**Q26. Does this FOA include research based on a cell-free biosystem comprised of enzyme cascades?**

**ANSWER:** Please see the answer for Question 14.A.

**Q27. Is funding available for commercial implementation of existing methane to liquid diesel or gas (versus R&D proof of concepts)?**

**ANSWER:** No. Please see Section I.A (Agency Overview) and Section I.G (Applications Specifically Not of Interest) of the FOA.

**Q28. What technical information is required to be released if/when the project is funded? Is the technology public knowledge if/when funded?**

**ANSWER:** ARPA-E requires Full Applications (not Concept Papers) to include a "Summary for Public Release". If a Full Application is selected for award negotiations, this Summary will be used by ARPA-E to communicate to the public key technical features and the anticipated impact of the project. The Summary should not include confidential or proprietary information, technical or otherwise. In addition, under the terms of each negotiated award with ARPA-E, certain data ("protected data") generated under the project may be publicly released by DoE five years after the date such data is first produced. Note: Confidential/proprietary information in a Concept Paper or Full Application must be properly marked to ensure protection from release under the Freedom of Information Act. Please see Section V.III of the FOA (Marking of Confidential Information).

## VI. Questions for week ending: MAY 31, 2013

**Q29. Our Concept paper was discouraged and we would like to know if we should include additional modeling data and explanation for key aspects of our proposal, if that would make our proposal a better fit in with the programmatic goals of this FOA and if it would make our proposal responsive.**

**ANSWER:** The purpose of the Concept Paper phase is to save Applicants the time and expense of preparing a Full Application for technologies that are unlikely to be selected for award. However, Applicants that were discouraged during the Concept Paper phase may submit a Full Application. Applicants must review the technical requirements of this funding opportunity and independently determine what information to include in the Full Application.

**Q30. Can we add team members and increase our proposed budget from what was originally proposed in our Concept Paper?**

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

**Q31. The required gas transfer coefficient is calculated on pages 19-20 of the REMOTE FOA. Can you please explain how the values for partial pressures are calculated ( $p_{ch4} = 0.493$  bar &  $p_{o2} = 0.493$  bar), assuming an operating pressure of 1 atm? For a high conversion bioreactor the partial pressure of  $ch_4$  and  $o_2$  in the headspace will be much lower than the partial pressure of these gases in the feed (the latter of which was assumed to be used in the FOA calculation), especially when considering the  $co_2$  produced during the fermentation.**

**ANSWER:** Values provided for partial pressures were intended as examples, and derived from known values, to enable calculation of the required gas transfer coefficient. ARPA-E understands that partial pressure values may vary based on composition of gas mixtures, reactor design, and other variables. Applicants may independently determine partial pressure values and must justify these values in support of calculation of the required gas transfer coefficient in the Full Application.

**Q32. The REMOTE Calculator Tool is locked, therefore, I cannot make formatting changes. In addition, the calculator has limited functionality when considering new technologies and processes not captured under “Case 1.” Is it possible for ARPA-E to provide an unlocked version of the calculator for individual customization?**

**ANSWER:** No. The REMOTE Calculator Tool is not intended to be significantly modified or customized. Category 3 Applicants are required to submit a detailed cost and performance analysis using the REMOTE Calculator Tool template (or equivalent tool of comparable detail) tailored to the proposed technology. If submitting an equivalent tool, Category 3 Applicants must provide, at a minimum, the information identified on the “summary” tab of the REMOTE Calculator Tool template. Please see Section IV.D.9 (REMOTE Calculator Tool) of the FOA.