# DE-FOA-0002107 - DIFFERENTIATE

**Questions can be sent to** ARPA-E-CO@hq.doe.gov

FIRST DEADLINE FOR QUESTIONS TO ARPA-E-CO@HQ.DOE.GOV:
5 PM ET, FRIDAY, MAY 10, 2019
SECOND DEADLINE FOR QUESTIONS TO ARPA-E-CO@HQ.DOE.GOV:
5 PM ET, FRIDAY, AUGUST 16, 2019

## QUESTIONS AND ANSWERS

PLEASE REFER TO THE GENERAL FAQS SECTION OF ARPA-E'S WEBSITE (HTTP://ARPA-E.ENERGY.GOV/?Q=FAQ/GENERAL-QUESTIONS) FOR ANSWERS TO MANY GENERAL QUESTIONS ABOUT ARPA-E AND ARPA-E'S FUNDING OPPORTUNITY ANNOUNCEMENTS.  ADDITIONAL QUESTIONS SPECIFIC TO THIS FOA ONLY ARE INCLUDED BELOW.  PLEASE REVIEW ALL EXISTING GENERAL FAQS AND FOA-SPECIFIC QUESTIONS BEFORE SUBMITTING NEW QUESTIONS TO ARPA-E.

I.    **Concept Paper Phase Questions:**

**Q1.  … The research ideas we plan to propose are aligned with the goal of 'enhance the creativity and efficiency (i.e. productivity) of the energy technology design process' and the three topics of Hypothesis Generation, Hypothesis Evaluation, and Inverse Design, but not exactly fit with the eight example challenge problem areas. …  So our question would be: is there any chance to get funding if our proposed research topic is relevant to but maybe not exactly fit in the eight example challenge problem areas?**
   **ANSWER**:   Refer to the paragraph on the bottom of page 20 in the DIFFERENTIATE FOA.

**Q2.  In the FOA, it lists "Heterogeneous Catalysis" as one of the hypothesis evaluation categories. Within this category, is ARPA-E looking for machine learning guided electrocatalyst hypothesis evaluation? …**
   **ANSWER:**  Heterogeneous Catalysts are identified as a specific topic area that is of interest on page 20 of the FOA.  Electrocatalysts are included.

**Q3.   … We have a couple of questions regarding the call that we would like to clarify:**

**Q3.a  We need optical properties that are not readily available in the literature for some of the materials of interest to our problem. We would like to know if partnering with an industry company to experimentally measure the material properties we need for generating the training data is encouraged?**
   **ANSWER:**  Prospective applicants are responsible for assembling project teams that can best accomplish the work set forth in the corresponding application and any subsequent agreement. Applicant eligbility information is set forth at FOA Section III.A.  Also, refer to the third bullet in 'Submissions Specifically Not of Interest' on page 45 of the DIFFERENTIATE FOA.

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**Q3.b  We have some collaborators that could experimentally test the predictions from our [description omitted] applied to the problem we have in mind, which would increase the industrial impact of our proposal. However, it would also increase the project budget to cover for additional experimental components.  We wonder if an experimental validation of our computational designs is encouraged or if we should aim for a purely theoretical/computational research proposal?**

> **ANSWER:**  Experimental validation is of interest subject to the general budget limitations provided in the FOA.  Also, refer to the third bullet in 'Submissions Specifically Not of Interest' on page 45 of the DIFFERENTIATE FOA.

**Q4.  I'd like to reach out to get some more information on the DIFFERENTIATE grant guidelines, specifically as it relates to developing AI/ML systems for addressing energy reduction technologies. Is the grant tailored towards designing these systems for concept generation/iteration or is there space for tailored applications, like optimizing operation of HVAC&R systems to reduce energy consumption using said techniques?**

> **ANSWER**:  The focus of the DIFFERENTIATE program is the development of ML-enhanced tools that would be used in the engineering design process.  While several design challenge problem areas were listed in the FOA, applicants are free to select their own problem as long as they provide a rationale for why it is an important problem for ARPA-E to address.

**Q5.  … I am planning to propose an idea for [the] ARPA-E DIFFERENTIATE call. One of our possible partners … has been contacted by one more entity … for possible partnership. I am wondering if there is any restriction of one entity being part of two proposals (not as lead).**

> **ANSWER**:   Refer to General FAQ 7.39.

**Q6.  Could [ARPA-E] provide references with requirements for design of land-based turbines similar to the one provided for the air-borne turbines (refer to FOA Footnote 24)?**

> **ANSWER:**  We are not aware of any land based turbine references that are comparable to the one identified for aircraft engines in Footnote 24.

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**Q7. In the DIFFERENTIATE FOA (and ARPA-E FOA's in general), the eligibility text (FOA page) says:**

> *FFRDCs/DOE Labs are eligible to apply for funding as the lead organization for a Project Team or as a member of a Project Team that includes institutions of higher education, companies, research foundations, or trade and industry research collaborations, but not as a Standalone Applicant.*

**So it is clear that a single FFRDC can't apply by itself since this would clearly make it a "Standalone Applicant". Can a team comprised of only two or more FFRDC's apply ?**

**ANSWER**:  No.  As set forth in pertinent part at FOA Section III.A.2 (i.e., the text quoted above), *FFRDCs/DOE Labs are eligible to apply… as a member of a Project Team that includes institutions of higher education, companies, research foundations, or trade and industry research collaborations* (emphasis added) … .  This does not preclude the participation of two or more FFRDCs/DOE laboratories on a project team in an application to ARPA-E, but that project team must also include one or more of the types of entities described above.

**Q8.  The guidelines and template for DE-FOA-0002107 state that an Assigned Control Number must be included in the header for the concept paper.  I did not receive a control number when I registered myself in the ARPA-E eXCHANGE site.  Could you please let me know when the Control Number is provided?**

**ANSWER**:  The ARPA-E Funding Opportunity Exchange website assigns a Control Number to a submission record when an applicant does the following:

1. Log into the website.
2. Locate the funding opportunity announcement
3. Click on the Apply button to open the Concept Paper Details page.
4. Fill in the Concept paper Details page.
5. Click the Create Concept Paper button.

For any additional questions or if you need help using eXCHANGE, please email ExchangeHelp@hq.doe.gov (with FOA name and number in subject line).

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**Q9.  Our team … is responding with a concept paper to the DIFFERENTIATE FOA call … .  We have one question [about] the FOA.  In topic area 3 of the FOA (inverse design), Deep Neural Networks are mentioned as the machine learning algorithm (page 28, e.g.).  Is the usage of Deep Neural Networks (or ANN's in general) a requirement for our approach or can we propose other kinds of Machine Learning methods and algorithms for inverse design?**

**ANSWER**:  The use of DNNs/ANNs is not required.  Any type of Machine Learning may be employed in a proposed solution approach.

**Q10.  I have the following questions regarding DE-FOA-0002107:**

**Q10.1  … The FOA is soliciting submissions related to the 7 defined challenge problem areas or a challenge problem developed by the proposing team. Would Intelligent Autonomous Systems for Building Energy Efficiency be a challenge problem area that fits within this FOA (or is of interest)?**

**ANSWER:**  Refer to FAQ 6.19.

**Q10.2  … Would a robotic autonomous system/tool for energy-efficient building management be a tool that fits within the scope of this FOA? … .**

**ANSWER**:  Refer to FAQ 6.19.

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II.    **Full Application Phase Questions:**

**Q11.  What are requirements for using data as a cost share under ARPA-E?**
**ANSWER**:  The criteria for accepting and valuing in-kind contributions are found at 2 C.F.R. § 200.306(b)(1)-(7).  These include 2 C.F.R. § 200.306(b)(5), which bars contributions paid or reimbursed by the Federal Government under another Federal award.

**Q12.  Are we allowed one page for cover and executive summary or are we allowed a cover page and one page maximum executive summary.**
**ANSWER**:   Applicants are allowed a cover page, plus an executive summary not to exceed an additional one page in length.

**Q13.  I have a pending proposal for DE-FOA-0002107 and the SUBK is concerned with the clause that "any payment of $200K to an individual is unallowable. Can you please verify that you are indicating payment to one individual and not per SUBK budget?**
**ANSWER**:  Please refer to questions 10.9 and 10.10 of the ARPA-E FAQ page General Questions section.

**Q14.  I am assisting a PI with their DIFFERENTIATE application and would like to clarify/confirm cost share requirement.**
**ANSWER**:  ARPA-E does not provide pre-submission assessments on a project team's specific cost sharing requirement. Applicants should carefully review the cost sharing requirements for the specific FOA to which they intend to submit a Concept Paper or Full Application.

**Q16.  The RFP indicates the submission deadline for full applications is 9:30am ET, Monday, August 26, 2019, however the deadline stated in the ARPA-E Notification Letter reflects 5pm ET, Monday, August 26, 2019.  Can you please confirm which deadline we should abide by?**

**ANSWER**:   The time and date for submission of full applications as set forth in the Funding Opportunity Announcement Mod 02, 5:00 PM Eastern time, August 26, 2019, is correct.

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**Q17.  I have a question about III.C.3.  SUBMISSIONS SPECIFICALLY NOT OF INTEREST in FOA "Efforts where the majority (>50%) of the proposed resources would be expended in the acquisition of experimental training data"**

**Does this apply to acquisition of experimental data regardless of utilization, or specifically just raw training data. For example, does it include 'validation data' to test models; data collected in active learning loops; or experiments carried out optimizing some process based on a trained model ?**

**Does this same reasoning jointly apply to acquisition of computational data (DFT, fluid dynamics, molecular dynamics)?**

> **ANSWER**:   The "experimental training data" cost constraint was intended to focus limited program resources on the development of ML-enhanced numerical algorithms.  The definition of "experimental training data" includes all data obtained in physical (not computational) experiments that would be used in the program (e.g. to train, test and validate the ML-enhanced algorithms).

**Q18.  I am trying to discern from your announcement if our team will be required to cost share. We are a team of exclusively domestic educational institutions and believe bullet #2 applies to us, but I'm having a hard time understanding what bullet point #5 means. Is the inclusion of small businesses the difference from #2?**

> **ANSWER**:  Refer to FAQ 14.

**Q19.  I am assisting a PI with her DOE ARPA-E application, and we are hoping to receive a response regarding the allowable TT&O cost.  She will be including a small technology company as part of her project team, can the cost allocated by this tech company also be considered for the TT&O category?**

> **ANSWER**:   Assuming the costs incurred by the company fulfill a project TT&O need and are otherwise allowable per the pertinent cost principles, they may be expensed to the agreement.

**Q20.  We are preparing a full proposal for topic 3 (Hypothesis Generation – Materials). We are wondering how critical it is to have a software company on the team.**

> **ANSWER**:   Prospective applicants are responsible for assembling project teams that can best accomplish the work set forth in the corresponding application and any subsequent agreement. Applicant eligibility information is set forth at FOA Section III.A.

**Q21.  We have been invited to submit a full proposal to DE FOA 00002107.  For the budget the FOA states "applicants are required to sub-divide their budget plans into two periods—one for the first nine months and the second for the final 15 months".  … Does the budget justification form need to be completed in this manner?  …**

> **ANSWER**:  Yes.

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**Q22.a  I am the contact PI for a DIFFERENTIATE [concept paper] that was invited for a full proposal. My team is comprised of two academic [institutions], one [national laboratory], and a … company that qualifies as a small business. …  Given our team composition, is [the small business] the only component that has to arrange for cost sharing?**
　　**ANSWER**:  Refer to General FAQ 4.17.

**Q22.b  If so, is that amount equal to at least 10% of the total project cost, since it is a small company?**
　　**ANSWER**:  Refer to General FAQ 4.21.

**Q23.  Would a hypothesis testing strategy that aims to use ML techniques to optimize the use of limited research resources while simultaneously optimizing composite material properties be within the scope of this call? The work would consist of both the use of surrogate models and high-fidelity models to identify material compositions that would yield potential improvements to desired materials properties and then determine, based on the amount of resources available to a future R&D project, which compositions should be experimentally tested first to both improve the composite material and most efficiently re-train the ML surrogate model.**
　　**ANSWER**:   The DIFFERENTIATE program seeks to enhance the pace of energy innovation by incorporating machine learning into the energy technology development process.  If the above proposed work is consistent with the stated objective of the DIFFERENTIATE program, it is a topic that is within the scope of the call.

**Q24.  The rig planned for use under this effort is located at a division of our corporation in Canada.  The solicitation specifies that no aspects of the effort may be conducted outside the US.  Please confirm whether testing at our rig facility in Canada would be allowed.**
　　**ANSWER**:   Refer to General FAQ 3.1.

**Q25.  We have 3 subcontractors on an upcoming proposal whose budgets are greater than 10% of total project costs and are completing their own separate budget justification workbooks. Should each of their budget justification workbooks be inserted into our (Prime) budget justification workbook? That would be a total of about 36 tabs (12 per workbook) in our budget justification workbook. Or should each budget justification workbook be uploaded separately?"**
　　**ANSWER**:   Per the Budget Justification SF424A Guidance: "All documents should be submitted as one package to ARPA-E."  Note: the ARPA-E Funding Opportunity Exchange will only allow applicants to submit one Budget justification document.

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**Q26.  We are submitting a proposal in response to DE-FOA-0002107-DIFFERENTIATE. Where should we upload PDF files of our Federally-approved F&A and fringe rate agreements in eXCHANGE?**

ANSWER:   This information is not required to submit an application.  ARPA-E will seek this information if the application is selected for award negotiations following merit review.