

## QUESTIONS AND ANSWERS

PLEASE REFER TO THE GENERAL FAQs SECTION OF ARPA-E'S WEBSITE ([http://arpa-e.energy.gov/?q=faq/general-questions](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. For the subject FOA will you consider proposals for development in specific technology areas such as those described in [S]ection I.C (motor topologies, insulating materials, etc.), or are you interested only in proposals for the whole motor/drive/TMS subsystem?**

**ANSWER:** As stated in the ASCEND FOA Section III.C.3, responsive proposals must propose the development of the whole all-electric integrated powertrain (motor/drive/TMS system) as the final deliverable. Electric motors, or thermal management systems or motor drive/power electronics development alone without integration into the targeted system or sub-system(s) are NOT of interest and will not be merit reviewed or considered.

**Q2. Question regarding DE-FOA-0002238 ASCEND and DE-FOA-0002240 REEACH ASCEND and REEACH both call for the use of Carbon Neutral Liquid Fuels (CNLF). REEACH has a list of CNLF fuels. On the list is liquid hydrogen as a CNLF. However, the REEACH solicitation, it says not of interest (for combustion generators or fuel cells) are proposals that would use liquid hydrogen as a CNLF fuel. However, in ASCEND, there is no mention of liquid hydrogen fuels (CNLF) not being of interest.**

**Question?** For ASCEND solicitation, is it responsive to submit a superconducting motor and drive proposal, and use liquid hydrogen fuel for thermal management of the motor and drive. There would be the assumption that the electricity feeding the drive and motor would be coming from a turbo generator (not part of the ASCEND program) that is running on liquid hydrogen fuel for the liquid hydrogen to be available to use for thermal management (in the ASCEND drive and motor program proposal) before the hydrogen gas would be consumed in gaseous form in the combustion process for the turbine generator.

**ANSWER:** The ASCEND FOA does not limit the choice of cooling fluids. However, if a design relies on use of a fuel that is used in the REEACH FOA, then that fuel needs to meet the requirements of the REEACH FOA, because the two FOAs (ASCEND and REEACH) are complementary in support of a larger integrated system for decarbonized electric powertrain for aviation.

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### Q3. Please consider the following questions specific to the ASCEND FOA.

#### Q3.a Shall the Concept Paper including the technical scope and budget, be written exclusive to Phase 1 only, or inclusive of Phase 1 and 2?

**ANSWER:** As stated in Section I.D.3, applicants will need to provide detailed budgets and task descriptions that cover both Phase I and Phase II. As such, concept papers must also address both Phase I and Phase II.

#### Q3.b P. 16 [refer to Section I.D.2 under the heading *Metrics definitions – Cost*] in the FOA reads, “Applicants will provide a high-level Bill of Materials (BOM) for their proposed technology.” Is the BOM required for the concept paper, or only the full application?

**ANSWER:** The BOM is required only at the full application phase. However, at the Concept Paper stage applicants are expected to include an estimate of the projected cost at 5,000 units/year for the complete powertrain (motor, drive, and TMS), expressed in \$/kW in their submission – see Table 2.a.

#### Q3.c P. 18 [refer to Section I.D.3, Table 2a] of the FOA shows a table to be provided. Specifically, the TMS COP is a required line item for the motor drive. Is the TMS COP also required for the electric motor even though it is not shown in this chart?

**ANSWER:** For the Concept Paper phase, only the TMS COP for the motor drive is required.

### Q4. I’m contacting you to ask about the funding opportunity “AVIATION-CLASS SYNERGISTICALLY COOLED ELECTRIC-MOTORS WITH INTEGRATED DRIVES (ASCEND).” Program boundary shows development and testing of a $\geq 250$ kW-scale, integrated motor and drive system [refer to Section I.D.3, Figure 3]. I have questions about this program's scope.

#### Q4.1 Can I apply only for the motor drive?

**ANSWER:** Refer to FAQ 1.

#### Q4.2 Is 25kW- scale acceptable in this program?

**ANSWER:** As stated in Table 1 ID 1.1, Mechanical Power output of the proposed system should be greater than or equal to 250kW.

### Q5. I have following questions regarding DE-FOA-0002238. Would you please let me know:

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**Q5.1 Whether the [a]nnounced \$35 million funding is for both phase 1 and phase 2 together? Or is it only for phase 1? If phase 1 and phase 2 together, is it decided how much of funding allocated for phase 1 and phase 2?**

**ANSWER:** \$35 million is available for Phase I awards. Monies for Phase II are subject to the availability of appropriated funds (refer to FOA Section I.D.3).

**Q5.2 Whether we should specify how much budget is requested for each of phase 1 and phase 2? If so, what weighting factor we should consider for phase 1 and phase 2 funding?**

**ANSWER:** As set forth at FOA Section I.D.3, applicants must provide detailed budgets and task descriptions that cover both Phase I and Phase II.

**Q6. Does the power density technical performance target include the entire thermal management loop (coolant pump, heat exchanger, filter, coolant lines, valves and fluid)?**

**ANSWER:** As stated in FOA Section I.D.1 (p.14) – *the specific power of the electric motor and motor drive components should account for the mass of their respective or shared TMS, including the associated coolant weight, as applicable.* Therefore, the specific power should include the entire thermal management loop.

**Q7. If the Prime awardee receives a [Cooperative] Agreement, can a Sub-Recipient thereunder receive a sub award if its cost match contribution is based on its use of IR&D rates for the cost share contribution portion of its effort?**

**ANSWER:** As set forth at FOA Section III.B.6, Project Teams may not use independent research and development (IR&D) funds to meet their cost share obligations under Cooperative Agreements. The term “Project Teams,” as defined in FOA Section IX, includes subrecipients.

**Q8. Is the ~\$35M budget for FOAs DE-FOA-0002238 and DE-FOA-0002239 the total for all Phases of each of the programs? In other words, if \$x is for DE-FOA-0002238 would that amount be for both Phase 1 and 2?**

**ANSWER:** \$35 million is the total available for Phase I awards under the the two FOAs, combined. Funding for Phase II of the ASCEND Program would be in addition to this \$35 million and is subject to the availability of appropriated funds.

**Q9.1 We have substantial or disruptive technological improvements in each of the following electric motor areas [description omitted]:**

**[T]he basic concept and main thrust of our research is the selection and integration of these concepts into the best and most efficient unit possible[.] Do you need a concept paper on each one of the concepts as they are related in function to each other[?]**

**ANSWER:** No. Refer to General FAQ 6.4. ARPA-E will accept multiple Concept Papers from the same applicant; however, each Concept Paper’s subject matter must be scientifically distinct as set forth at FOA Section III,C.4. Submissions that are not scientifically distinct from applications submitted

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in response to currently issued ARPA-E FOAs will be considered non-responsive and may not be subject to Merit Review as stated at FOA Section III.C.2.

**Q9.2 We have patents and patent pending status with prototype proof of concept in each of the above areas [corresponding descriptions omitted from Q9.1] or will have prior to the award of any grant under this program. By utilizing this technology in the grant program do we in turn grant the Government the right to use our patented or patent pending technology or is such right on the part of the government related solely to the concepts developed and patented under the grant program.**

**ANSWER:** Refer to FOA Section VIII for a discussion on Government Rights in Subject Inventions and the definition of “subject invention” in FOA Section IX.

**Q9.3 If the government receives a right to use the technology used in the grant, when does that right begin? On submission of the Concept Papers, the submission of the final proposal or the award of the grant?**

**ANSWER:** Refer to Q9.2 above. The Government retains certain rights to “subject inventions.” A subject invention, as defined in FOA Section IX, is “any invention conceived or first actually reduced to practice under an ARPA-E funding agreement.”

**Q9.4 What do you mean by TMS?**

**ANSWER:** Thermal Management System. Refer to FOA Section I.B.1 (p.4).

**Q10. Regarding the Concept Paper for FOA DE-FOA-0002238 (ASCEND), can any additional information be provided about citations? Are they part of the 4 page limit, and is there any specific format that should be used?**

**ANSWER:** Refer to General FAQ 6.21.

**Q11. Table 1, ID 1.2 lists the maximum rotational speed at take-off as 5000rpm. Is the maximum speed 5000rpm or less? Or shall the concept be capable of 5000rpm, but not less?**

**ANSWER:** Per Table 1, ID 1.2, the rotational speed at takeoff is 5000 rpm, and ID 1.6, the cruise rotational speed is 3,500 rpm – 4,500 rpm. As stated in FOA Section I.D.1 (p.13), *[t]he projected specific power for the electric motor subsystem should include any necessary torque amplifier or speed reducer, such as a gearbox, to keep the propulsor speed below 5,000 RPM.*

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### II. Full Application Phase Questions:

**Q12. Can you please provide instructions on how to split the costs into the file by Years for each phase?**

The file has columns for Year 1, Year 2, Year 3, Year 4, Year 5  
**ASCEND**

**42 months starting November 2020**

**Phase 1 – 18 months – Nov 20 to Apr 22**

**Phase 2 – 24 months – May 22 to Apr 24**

**ANSWER:** Applicants may use the columns titled *Year 1* and *Year 2* to estimated Phase 1 costs. The columns titled *Year 3*, *Year 4* and *Year 5* can be used to estimate Phase 2 costs.

**Q13. Relative to the concept paper, are justified changes to schedule, budget, or team allowed?**

**ANSWER:** Changes to schedule, budget and/or project team are permitted. Also refer to General FAQs 7.11, 7.13, 7.14 and 7.23 for additional information.

**Q14. We are a technology incubator and we are spinning out a NEWCO that will focus on work described in a concept paper that the incubator submitted to ARPA-E. If we submit the full proposal via NEWCO, how do we inform ARPA-E of our previous concept paper? Are there other approaches to handle the spin out?**

**ANSWER:** Refer to General FAQ 7.11.

**Q15. Would like to formally request that we be allowed to submit our cost estimates as part of our Full Application as follows:**

- For Phase 1 estimate, provide a firm cost estimate.
- For Phase 2 estimate, provide a ROM estimate since Phase 2 is not well defined yet and will not be awarded before Phase 1 is completed.

**ANSWER:** The content and form for Full Applications is specified at FOA Section IV.D. Full Applications that do not conform to these instructions may be found non-compliant as set forth at FOA Section III.C.1.

**Q16.1 Budget and Phase periods – Phase 1 is allowed to be 18 months and Phase 2 is allowed to be 24 months. However, the budget workbook identifies the budget to be entered by year. Should we delineate between phases in reporting the budget in the workbook (i.e. year two would only have six months, while years one, three and four would each have 12)? Or would we enter a combination of phase 1 and phase 2 in year two of the project (and leave the last year as 6 months)?**

**ANSWER:** Refer to FAQ 12.

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### **Q16.2 Statement of Proposal Objectives – can you confirm that this is not a required document for this proposal submission?**

**ANSWER:** The documents and templates necessary for the submission of Full Applications to the ASCEND program can be found on ARPA-E eXCHANGE.

### **Q17. The \$200,000/year salary cap is equivalent to \$96/hour. It is very difficult to attract top academic consultants at this rate. Can we request an exception to this rule?**

**ANSWER:** ARPA-E limits compensation for personal services (not the equivalent salary rate) to \$200,000 annually. This amount does not include properly allocated fringe benefits or indirect costs. Salary rates are limited by tests of reasonableness as described in the pertinent cost principles, in this instance 2 C.F.R. Part 200 – Subpart E.

### **Q18. We are a small business and may use the grace period to find investors to cover the cost share requirement. Is this acceptable, or do we need firm commitments at the time of contract negotiation?**

**ANSWER:** As set forth at FOA Section III.B.8 (p.29): *Upon selection for award negotiations, Applicants are required to provide information and documentation regarding their cost share contributions.*

### **Q19. The DE-FOA-0002238 states “A high voltage ( $\geq 1$ kV), fault resistant, DC electric bus distribution system is envisioned to transmit the electric power provided by the fuel conversion Energy Storage and Power Generation (ESPG) system to the electric drives and motors that drive the propulsors.” Does this mean that the power from the engine to electric drives and motors that drive the propulsors can only go through a DC bus and the aircraft system cannot use an AC bus?**

**ANSWER:** As stated in FOA Section I.D.2 (p.21): *Rail to rail bus voltage, electrical input: A high distribution, fault resistant, DC bus is envisioned, with rail to rail voltage potential difference  $\geq 1$  kV DC as to limit the distribution losses and reduce the weight penalty of the power cables between the power generation system and the electric propulsion system.* The power generated by the Energy Storage and Power Generation that is subsequently distributed to and used by the all-electric powertrain must be direct current (DC). As such, any proposed solution should include DC source only to comply with the FOA requirements.

### **Q20. We have been invited to submit a full proposal to the ASCEND FOA, and have a few questions.**

#### **Q20.1 We have partnered with ... . For this opportunity we intend to propose the development of a prototype with a power level suitable for helicopters. [We] would like to know the interest level of ARPA-E for developing helicopter technology in addition to fixed-wing aircraft.**

**ANSWER:** All proposed solutions must meet the objectives and performance metric requirements of the ASCEND FOA.



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**Q20.2 We are also wondering whether the proposal deadline might be extended due to COVID-19.**

**ANSWER:** ARPA-E is not contemplating a revision to the submission deadline.

**Q21.1 Can we upload versions of the Technical Application and SF-424 override it with a newer version before the due date?**

**ANSWER:** Applications previously submitted via ARPA-E eXCHANGE may be revised and re-submitted at any time prior to the deadline for submission of applications shown on the FOA Cover Page. The ARPA-E eXCHANGE system will allow applicants to reopen their papers in Edit mode at their discretion up to the deadline. This action has the effect of withdrawing a timely submitted application. Applicants who choose to reopen (i.e., withdraw) their application in this manner must resubmit it prior to the deadline to be considered for Merit Review.

**Q21.2 Is there a place to put in a Fixed Fee on the SF-424 – I didn't see anywhere but thought I would ask?**

**ANSWER:** Per 2 C.F.R. § 910.358(d), the Department of Energy does not pay profit or fee under its financial assistance programs.

**Q21.3 I am applying for fringe and overhead rates right now. If I don't receive them by the time the application goes in can the SF-424 be revised after the fact?**

**ANSWER:** ARPA-E will discuss the application of newly negotiated rates if a Full Application is selected for award negotiations.