

## 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. Full Application Phase Questions:

#### Q1. 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](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). E-mails sent to other e-mail addresses will be disregarded.

## Q2. COULD YOU PLEASE CLARIFY A COUPLE OF QUESTIONS BELOW?

- 1) **OPERATIONAL ENERGY MODELING FOR LCA OF OPERATIONAL IMPACTS OF WHOLE BUILDINGS DESIGNS: FOR A PROPOSED WHOLE BUILDINGS DESIGN, DOES THE LCA TOOL AND FRAMEWORK NEED TO CONNECT TO A BUILDING ENERGY MODEL SUCH AS ENERGY PLUS OR OPEN STUDIO TO ENDOGENOUSLY GENERATE BUILDING OPERATIONAL ENERGY CONSUMPTION, OR IS SUCH DATA SUPPOSED TO BE GENERATED BY THE RESEARCH TEAM THAT PROPOSES THE WHOLE BUILDING DESIGN AND PROVIDED TO THE LCA TEAM FOR EXOGENOUS LCA? SIMILARLY, DOES THE LCA TOOL AND FRAMEWORK NEED TO CONNECT TO A BUILDING INFORMATION MODELING (BIM) SOFTWARE TO ENDOGENOUSLY GENERATE BUILDING BILL OF MATERIALS, OR IS SUCH DATA SUPPOSED TO BE GENERATED BY THE RESEARCH TEAM AND PROVIDED TO THE LCA TEAM FOR EXOGENOUS LCA?**
- 2) **IMPACT CATEGORIES BEYOND GHG: IT SEEMS THAT IMPACT CATEGORIES BEYOND GHG ARE ALSO REQUIRED. COULD YOU PLEASE CLARIFY WHAT OTHER IMPACT CATEGORIES NEED TO BE ADDRESSED, SUCH AS FRESHWATER CONSUMPTION, CRITERIA AIR POLLUTANT EMISSIONS, AND MIDPOINT IMPACT CATEGORIES SUCH AS OZONE DEPLETION, EUTROPHICATION, ETC.?**

**ANSWER: 2.1:** Per Section I.G of DE-FOA-0002625, awarded Building Design teams will be required to provide data to the LCA team(s) (which are to be funded under a separate solicitation: DE-FOA-0001953). Teams awarded under DE-FOA-0002626 (the solicitation for SBIR/STTR eligible applicants) will be encouraged to provide data to the LCA team(s). Such data includes building bill of materials and energy data. Integration with existing tools is not a requirement of this solicitation, but per DE-FOA-0001953, Section XXII.2, "Continual development and use of the developed frameworks after the Program are also of interest." Designing a framework to enable integration with existing software tools is a possible pathway for meeting those objectives.

**2.2:** Per DE-FOA-0001953, Section XXII.2.E.1c.vii, the LCA team(s) will calculate at least five impact categories/indicators in addition to GWP; the specific categories may be chosen by the LCA team(s). Note that per Section XXII.3, comparative LCAs that focus only on GWP are specifically not of interest.

**Q3. WE ARE AN INTERNATIONAL GROUP WHO IS INTERESTED IN SUBMITTING A PROPOSAL TO DOE-0001953 : LIFE CYCLE ASSESSMENT FOR CARBON NEGATIVE BUILDINGS". WE HAVE THE TWO QUESTIONS:**

**1. WE WOULD LIKE TO HAVE A FOREIGN RESEARCHER ENTITY (UNIVERSITY) TO BE THE CO-PI OF THE PROPOSAL TOGETHER WITH A US UNIVERSITY. WHAT PROCESS SHOULD THE FOREIGN UNIVERSITY FOLLOW? AND WHAT DOCUMENTS ARE NEEDED? IT IS NOT CLEAR SINCE THE FOA STATES "ALL WORK UNDER THE ARPA-E AWARD MUST BE PERFORMED IN THE UNITED STATES", WE ARE NOT SURE HOW THE FOREIGN ENTITY CAN BE THE CO-PI WHILE THE WORK MUST BE PERFORMED IN THE US.**

**2. IN SECTION E, FOA STATES "FOR HESTIA PROGRAM CATEGORY A, BUILDING MATERIAL LCA FRAMEWORKS SHALL CONSIDER A1-A3 AND CRADLE-TO-GRAVE SYSTEM BOUNDARIES"... THIS SEEMS CONTRADICTIONARY TO EACH OTHER, CRADLE-TO-GRAVE REFERS TO A1-C4. CAN YOU PLEASE CLARIFY WHAT THE SYSTEM BOUNDARY REQUIREMENT IS?**

**ANSWER:** 3.1. Please refer to the ARPA-E website <http://ARPA-E.energy.gov> FAQ page General Question 3.1.

**3.2.** Both A1-A3 (i.e. cradle-to-gate) and A1-C4 (i.e. cradle-to-grave) system boundaries shall be considered over the course of the Program. Please refer to DE-FOA-0001953, Section XXII.2.C for further information on when the evaluation of each of these system boundaries is expected to occur for HESTIA Category A building materials development.

**Q4. WE HAVE TWO ADDITIONAL QUESTIONS:**

**A. GUIDELINES STATE 'ARPA-E GENERALLY DOES NOT FUND PROJECTS THAT INVOLVE FOREIGN TRAVEL.' THIS SEEMS DIFFICULT WHEN IT'S POSSIBLE TO ENGAGE WITH INTERNATIONAL PARTNERS. CAN YOU PLEASE CLARIFY HOW DOE IMAGINES THE INTERNATIONAL COLLABORATION TAKING PLACE? COMPLETELY ONLINE?**

**ANSWER:** Please refer to the ARPA-E website <http://ARPA-E.energ.gov> FAQ page General Question 3.1.

**B. IN THE CALL SECTION B, IT STATES "AN IDEAL OUTCOME OF THIS ANNOUNCEMENT IS DEVELOPMENT OF NEW TOOLS THAT WILL BE UPDATED, EXPANDED, AND USED BY OTHER INTERESTED PARTIES AFTER THE PERFORMANCE PERIOD." CAN YOU PLEASE ELABORATE ON WHY A NEW TOOL IS IDEAL COMPARED TO FURTHER DEVELOPING AN EXISTING LCA TOOL. ARE THERE FUNDAMENTAL SHORTCOMINGS OF EXISTING TOOLS DOE WANTS TO AVOID?**

**ANSWER:** Existing LCA software does not possess all features that are of interest to this funding opportunity announcement: development of those features would constitute "new tools". Existing LCA software may be further developed to meet all metrics and goals outlined in DE-FOA-0001953, Section XXII.

**Q5. COULD YOU PLEASE CLARIFY ANOTHER QUESTION I HAVE: THE DE-FOA-0001953 FUNDING OPPORTUNITY TOPIC V DOES NOT EXPLICITLY MENTION THAT A COST SHARE IS REQUIRED OR NOT FOR THE LCA TEAM(S). COULD YOU PLEASE CONFIRM IF A COST SHARE IS NOT REQUIRED TO RESPOND TO THIS CALL?**

**ANSWER:** Please refer to Section III.B (Cost Sharing) of the FOA for information related to cost share requirements applicable to Topic V.

**Q6. WE HAVE A QUESTION ABOUT PERIOD OF PERFORMANCE AND BUDGET PERIODS: THIS OPPORTUNITY STATES A: MAXIMUM PERIOD OF PERFORMANCE 48 MONTHS AND REQUIRES TASKS PER: TOTAL FUNDING AVAILABLE IS \$4M WITH THE FOLLOWING ANTICIPATED 48-MONTH TIMELINE:**

**HOWEVER, THE BUDGET JUSTIFICATION WORKBOOK SF 424A IS ONLY SET UP FOR 3 YEARS AND WE ARE NOT TO ALTER THE FORM, SO HOW DO YOU RECOMMEND WE COMPLETE THE FORM TO INCLUDE 48 MONTHS?**

**ANSWER:** ARPA-E added a 5-year version of the Budget Justification workbook to the "Required Application Documents - Full Application" section of the DE-FOA-0001953 funding opportunity announcement to support a 48+ month period of performance.

**Q7. ARE WE ABLE TO WORK WITH OUTSIDE PARTIES WHO ARE RESEARCHING ALTERNATIVE (CARBON NEGATIVE) MATERIALS TO CREATE THE DATASET OF MATERIALS OR ARE WE ONLY GATHERING THE CARBON NEGATIVE MATERIALS FROM THE HESTIA PROJECT TEAMS?**

**ANSWER:** Development of the tools will likely require additional information than can be obtained from the HESTIA Development Teams funded under DE-FOA-0002625 and DE-FOA-0002626, and the gathering of such additional information is encouraged.

**Q8. THE METHODOLOGY THAT WE ARE PROPOSING FOR THIS PROJECT WOULD BE PART OF AN OPEN-SOURCE PROJECT (BHOM). GIVEN THE POTENTIALLY SENSITIVE NATURE OF THE HESTIA STUDIES, WE DO HAVE THE OPTION OF COLLATING RESULTS DATABASES IN A CLOSED ENVIRONMENT, AS WELL AS ANY MATERIAL DATABASES THAT ARE GATHERED AS A RESULT OF THE HESTIA PROJECT. IS THE DIVISION BETWEEN OPEN SOURCE AND CLOSED SOURCE REQUIRED FOR THIS PROJECT? IF SO, WHICH PIECES OF INFORMATION SHOULD REMAIN IN A CLOSED SOURCE REPOSITORY?**

**ANSWER:** Kindly refer to DE-FOA-0001953, Section XXII.2.B, for information regarding the protection of data from HESTIA teams awarded under DE-FOA-0002625 and DE-FOA-0002626.

**Q9. GIVEN THE LACK OF US-SPECIFIC ENVIRONMENTAL PRODUCT DECLARATIONS AVAILABLE (AND THE URGENCY OF CLIMATE EMERGENCY), WE MAY NEED TO UTILIZE GLOBAL DATASETS IN LIEU OF INFORMATION WHEN NOT AVAILABLE. CAN WE ASSUME THAT THE INFORMATION IN LIEU IS SUITABLE?**

**ANSWER:** Per DE-FOA-0001953, Section XXII.2.D, teams are welcome to deviate from the default assumptions if they justify their deviation. Note that frameworks leveraging primarily global or non-US datasets are specifically not of interest (See DE-FOA-0001953, Section XXII.3)

**Q10. DOES THIS PROJECT INCLUDE THE STUDY OF WHOLE BUILDINGS (STRUCTURES, FOUNDATIONS, ENCLOSURES, MEP AND INTERIORS) OR JUST ITS STRUCTURAL SYSTEMS?**

**ANSWER:** Section XXII.2.C references the Carbon Leadership Forum LCA Practice guide which notes, "The physical scope of a whole building LCA typically includes at least the structure, enclosure, and foundations. Ideally, it should also include the impacts of building operations (electricity, fuel and water use), as well as internal finishes, furnishings, mechanical, electrical, and plumbing (MEP) systems, but these components are often excluded due to the difficulty in collecting the necessary data." We anticipate that solutions may vary based on available data.

**Q11. AS SUBJECT MATTER EXPERTS IN THIS SPACE, WE BELIEVE THAT THE ISSUE OF LACK OF OBJECT ORIENTED RESULTS, DATA TRANSPARENCY AND INTEROPERABILITY IS CAUSING A LACK OF MOVEMENT TOWARD ACHIEVING CARBON NEGATIVE RESULTS FOR BUILDINGS. WE UNDERSTAND THAT IT MAY BE OUTSIDE OF THE SCOPE OF THIS PROJECT, BUT WE WOULD LIKE TO PROPOSE INTEROPERABILITY WITH THE RESULTS PRODUCED BY TALLY AND ONE CLICK LCA (COMMON TOOLS UTILIZED FOR LCA STUDIES IN THE US)- MEANING THAT THEIR RESULTS WOULD BE MORE OBJECT ORIENTED AND ALLOW SPECIFIC CONCLUSIONS TO BE DRAWN (WHICH MATERIALS/CATEGORIES PRODUCED BETTER RESULTS.) ADDITIONALLY, COMMITMENTS LIKE ARCHITECTURE 2030, SE 2050 AND MEP 2040 ARE ENFORCING PUBLICATION OF RESULTS OF LCA STUDIES, AS SUCH WE WOULD ALSO LIKE TO PROPOSE A STANDARDIZATION TO THE FORMATTING OF THOSE RESULTS TO ALLOW MEANINGFUL COMPARISONS FOR BETTER CHOICES IN BUILDING DESIGN. THESE STEP CHANGES WOULD ALLOW MEANINGFUL BENCHMARK COMPARISONS ACROSS THE INDUSTRY IN THE US. CONSIDERING THAT THIS IS OUTSIDE OF THE SCOPE OF THIS PROJECT, SHOULD WE INCLUDE IT ANYWAY, CONSIDERING ITS POTENTIAL INDUSTRY WIDE IMPACT?**

**ANSWER:** On integration, please see Q2.1 above. Per DE-FOA-0001953, Section XXII.2.B, further considerations or modeling features in addition to those explicitly listed in Sections XXII.2.C through XXII.2.F are encouraged.