

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. I WOULD APPRECIATE CLARIFICATION ON THE FOLLOWING QUESTION VIS-À-VIS THE RECENTLY RELEASED GREENWELLS FOA:

IN SECTION E, TABLE 1, M3 AND M4 MILESTONES STATE – ‘...SYSTEMS MUST RUN FOLLOWING THE 72 HOURS (H) ELECTRICITY AVAILABILITY PROFILE FROM RENEWABLE SOURCES...’ AND ‘...AFTER 3 DAYS OF NO ELECTRICITY, PLANT CAN RESTART AND ACHIEVE M1 EFFICIENCY...’. IN THE CASE OF A PROPOSED BIOREACTOR DESIGN, WOULD IT BE POSSIBLE TO STILL HAVE SUPPLY OF NUTRIENTS FOR THE CELLS/SYNTHETIC MICROBES DURING THE ‘SHUTDOWN’ PHASE (72 HOURS OR 3 DAYS) OF THE REACTOR?

ANSWER: Please refer to Section I.E of the FOA. **Table 1, M4** states “any storage necessary to achieve this target must be included in the TEA.” Nutrient storage (and use) is permitted, but must be included in the system TEA.

Q2. CAN BIOMASS BE USED DIRECTLY AS A CARBON SOURCE OR MUST IT FIRST BE CONVERTED TO CO₂?

ANSWER: Please refer to Section III.C.3 of the FOA. “Approaches that use any carbon source other than CO₂” will be deemed non-responsive and will not be merit reviewed or considered.

Q3. I AM WRITING WITH A COUPLE QUESTIONS REGARDING THE GRID-FREE RENEWABLE ENERGY ENABLING NEW WAYS TO ECONOMICAL LIQUIDS AND LONG-TERM STORAGE (GREENWELLS) PROGRAM.

- 1. DOES THIS PROGRAM PRIMARILY SEEK APPLICATIONS FROM COLLABORATIVE TEAMS, OR ARE SINGLE-PI PROPOSALS ENCOURAGED AS WELL?**
- 2. ARE PROJECTS THAT INVOLVE COMBINED CAPTURE-CONVERSION SYSTEMS (I.E., CONVERSION OF CO₂ DISSOLVED IN NATURAL SURFACE WATERS OR WASTEWATER STREAMS) OF INTEREST, OR DOES THIS PROGRAM PREFERENTIALLY FOCUS ON CONVERSION-ONLY SYSTEMS?**

ANSWER: 1) Please refer to Section III.A of the FOA, Eligible Applicants. All eligible applicants are encouraged to apply.

2) Please refer to Sections I.C and I.D of the FOA. Other than the program objectives and technical approaches of interest described in these Sections, there is no "preferential focus" of the FOA.

Q4. MY NAME IS *REDACTED*, A JUNIOR FACULTY AT *REDACTED*. I AM WRITING TO CONSULT MY ELIGIBILITY FOR APPLYING TO FUNDING NO. DE-FOA-0003234. MY CURRENT CITIZENSHIP IS [FOREIGN COUNTRY OF CONCERN] AND I DO NOT HAVE PERMANENT RESIDENCY YET. CAN I STILL APPLY AS THE PI FROM DOMESTIC ENTITIES AS LISTED IN THE CALL FOR PROPOSAL, III.A.2 (DESCRIPTION ATTACHED)?

"2. DOMESTIC ENTITIES FOR-PROFIT ENTITIES (INCLUDING LARGE BUSINESSES AND SMALL BUSINESSES), EDUCATIONAL INSTITUTIONS, AND NONPROFITS THAT ARE INCORPORATED IN THE UNITED STATES, INCLUDING U.S. TERRITORIES, ARE ELIGIBLE TO APPLY FOR FUNDING AS A STANDALONE APPLICANT, AS THE LEAD ORGANIZATION FOR A PROJECT TEAM, OR AS A MEMBER OF A PROJECT TEAM."

ANSWER: Please refer to Section III.A, Eligible Applicants – showing broad applicant eligibility, including foreign researchers – and Section VI.B.10, Applicant Risk Analysis, of the FOA. However, at the Full Application phase, all covered individuals will be required to certify and disclose certain information related to foreign relationships, including current/former participation in any malign foreign talent recruitment program, and any support received from a country of concern or entity owned or controlled by a country of concern.

Q5. IS THE DEPLOYMENT OF BIOLOGICAL PHOTOSYNTHETIC MICROBIAL SYSTEMS OF INTEREST AND COMPLIANT WITH THE FOA GUIDELINES?

ANSWER: Please refer to Sections I.C, I.D and I.E of the FOA. The energy input into the system must be either electricity or hydrogen. ARPA-E expects that a range of different reactor types (including thermal, electrochemical, plasmonic, photonic, biological, and other technical process approaches) may be applied to meet the technical performance targets described in Section I.E. The GREENWELLS program does not require submissions to align themselves to a technical category.

Q6. I AM REACHING REGARDING A QUESTION ON THE ABOVE REFERENCED FOA. PRESENTLY, OUR TEAM CONSISTS OF ONE DOMESTIC UNIVERSITY AND ONE NON-PROFIT (5% COST SHARE). IF WE HAD AN INTERNATIONAL LARGE COMPANY WITH A DOMESTIC BRANCH PROVIDE SOME COST SHARE (LIKELY IN THE FORM OF CASH), BUT THIS LARGE COMPANY WAS NOT A PARTNER PERFORMING ANY WORK ON THE PROJECT, WOULD THIS SHIFT THE OVERALL TEAM'S COST SHARE TO 20%?

A RELATED CLARIFICATION IS IF A THIRD-PARTY (NON-PROFIT) WANTED TO CONTRIBUTE CASH AS COST SHARE, IS THIS ALLOWABLE. IN THE FOA IT SAYS THAT CASH COST-SHARE IS FROM PRIME AND SUB-RECIPIENTS, BUT DOESN'T MENTION THIRD PARTIES.

ANSWER: Please refer to Section III.B of the FOA. A company contributing to cost share but not performing work on the project will not increase the required cost share percentage as they are not included in the budget as a member of the Project Team. A Project Team consists of the Prime

Recipient, Subrecipients, and others performing or otherwise supporting work under an ARPA-E funding agreement. Cost Share is calculated as a percentage of the Total Project Cost, which is the sum of the Prime Recipient (including the Project Team) share and the Federal Government share of total allowable costs.

Q7. *REDACTED* WE HAVE BEEN DISCUSSING A POSSIBLE TOPIC FOR THIS GREENWELLS FOA AND WANTED TO ASK IF IT WOULD BE CONSIDERED A RESPONSIVE TOPIC TO THIS FOA. THE TOPIC IS ON A NOVEL DEVELOPMENT AND METHOD OF RAPID AND EFFICIENT LIQUID HEATING FOR CHEMICAL REACTORS AS DISCUSSED IN THE FOA, BUT IT DOES NOT ENCOMPASS THE ENTIRE CHEMICAL REACTION OF CO2 TO CARBON CONTAINING LIQUIDS. THEREFORE WE COULD NOT ANSWER ALL OF THE REQUIRED CHEMICAL REACTION QUESTIONS FOUND IN THE CONCEPT PAPER TEMPLATE. HOWEVER, OUR TOPIC COULD BE EMPLOYED BY OTHERS FOCUSED ON THE COMPLETE PROCESS, POTENTIALLY IMPROVING THEM IN MULTIPLE WAYS. PLEASE LET ME KNOW IF SUCH A PROPOSAL WOULD BE CONSIDERED RESPONSIVE TO THIS FOA BY ARPA-E.

ANSWER: Please refer to Section I.C of the FOA. The design must account for the dynamic nature of streams through the entire process.

Q8. ONE OF THE FINAL DELIVERABLES FOR THIS FOA IS PRODUCTION OF 30 MJ LIQUID LHV PER DAY, BUT THERE IS NO PRODUCTION LENGTH GIVEN. SHOULD THE SYSTEM OPERATE FOR A SPECIFIED AMOUNT OF TIME? PERHAPS THE 80 HOURS GIVEN IN THE ELECTRICITY PROFILE DATA SHEET?

ANSWER: Per Section I.E of the FOA, the 30 MJ Liquid LHV/d target must meet the metrics in Table 1, which includes running for 72 hours under dynamic operation (M3).

II. Full Application Phase Questions:

Q9. WE HAVE A COUPLE OF QUESTIONS TO BETTER SHAPE OUR PROPOSAL.

- 1- YOU HAVE PROVIDED WIND PROFILE DATA FROM IOWA STATE UNIVERSITY. IF WE HAVE OUR OWN DEDICATED SOLAR AND WIND, ARE WE ALLOWED TO USE OUR PERFORMANCE OUTPUT DATA TO DO THE PROCESS DESIGN AND PRELIMINARY TEA.
- 2- WE HAVE AN ISLANDED MICROGRID FACILITY THAT INCLUDES WIND, PV, LI-ION AND FLOW BATTERIES, AND DIESEL GENSET. ARE WE ALLOWED TO HAVE SOLAR+WIND AS THE SOURCE OF RENEWABLE ENERGY? CAN WE INCLUDE A STORAGE (BATTERY) AS PART OF OUR PROPOSED POWER SUPPLY TO RUN THE REACTOR, OR CONDUCT SENSITIVITY ANALYSIS ABOUT DIFFERENT SCENARIOS TO USE DIFFERENT ARRANGEMENTS FOR POWER AND STORAGE?
- 3- AS ONE OF THE QUESTIONS RAISED CONCERNS ABOUT ELECTRICITY-TO-FUEL EFFICIENCY, IT MIGHT BE DIFFICULT TO HEAT EFFICIENCIES ABOVE 50% WITH HYDROGEN FROM ELECTROLYSIS. FIGURE 1 IN THE FOA SUGGESTS CO₂ AND HYDROGEN FROM ELECTROLYSIS AS THE FEEDSTOCK TO THE REACTOR. IN RESPONSE TO Q3 OF SBIR FAQ, IT IS SAID THAT PROPOSERS ARE NOT REQUIRED TO USE HYDROGEN AS THE FEEDSTOCK. CAN WE USE METHANE TO SUPPLY THE HYDROGEN TO OUR PROCESS (WITH NO CO₂ EMISSIONS).

ANSWER:

1. Yes. According to Section I.C of the FOA, "Applicants may propose an alternative geographic location in the United States and use the wind and solar profile from that location."
2. Yes, hybrid solar and wind electricity sources are permitted, and storage may be included, but as stated in Section I.E of the FOA, all storage necessary to meet the metrics should be included in the preliminary TEA.
3. No, methane cannot be used. Per Section I.C of the FOA, the only allowable inputs are electricity (which may or may not be converted to H₂), CO₂, and water.

Q10. ARPA-E ENVISIONS SYSTEMS THAT WOULD OPERATE AT THE SITE OF STRANDED RENEWABLE ENERGY (I.E., WIND, SOLAR, OR HYBRID). IS THERE SOME ELECTRICITY BACKUP AVAILABLE FOR THE BALANCE OF THE PLANT WHEN THE ELECTRICITY SUPPLY GOES TO ZERO FOR SEVERAL HOURS? SHOULD WE ASSUME THAT THE ENTIRE PLANT GOES BLACK AND THE PROCESS NEEDS TO BE PLACED INTO A SAFE SHUTDOWN MODE WHILE POWER IS STILL AVAILABLE?

ANSWER: Applicants may propose to include back-up energy storage, which, as stated in Section I.E of the FOA, should be included in the preliminary TEA. How your system handles the prolonged absence of incoming electricity is left to each system design.

Q11. GOOD DAY. WOULD ARPAE CONSIDER A ONE WEEK EXTENSION?

ANSWER: No, we are unable to extend the deadline for Full Application submission. The deadline for Full Application submission is 9:30 AM ET, April 18, 2024.

Q12. WE ARE APPLYING AS A SUBRECIPIENT. AS AN FFRDC WE WILL COMPLETE FIELD WORK PROPOSAL FOR SUBMISSION WITH THE FULL APPLICATION. OUR BUDGET IS GREATER THAN 10% OF THE TOTAL PROJECT COST, ARE WE REQUIRED TO COMPLETE THE SUBRECIPIENT BUDGET JUSTIFICATION?

ANSWER: Yes, according to Section IV.D.3 of the FOA, each Subrecipient incurring greater than or equal to 10% of the Total Project Cost must complete a separate Budget Justification workbook to justify its proposed budget.

Q13. MY PI WILL BE APPLYING TO THIS SOLICITATION, AND IN THE BUDGET JUSTIFICATION WORKBOOK PERSONNEL TAB, IN THE INSTRUCTIONS IT SAYS TO ATTACH RESUMES. I COULDN'T FIND ANOTHER REFERENCE TO RESUMES IN THE SOLICITATION. I ASSUME A RESUME IS REQUIRED FOR EACH KEY PERSONNEL? IS THERE A PAGE LIMIT? ALSO, WHERE WILL THEY BE ATTACHED?

ANSWER: Yes, a resume should be submitted for all key personnel. There is no page limit. The resumes should be sent with the same package as the Budget Justification Workbook.