**Questions and Answers**

**GFO-22-503**

**Gas Pipeline Safety and Integrity Research to Support Decarbonization**

**January 18, 2022**

The following answers are based on California Energy Commission (CEC) staff’s interpretation of the questions received. It is the Applicant’s responsibility to review the purpose of the solicitation and to determine whether their proposed project is eligible for funding by reviewing the Eligibility Requirements within the solicitation. The CEC cannot give advice as to whether a particular project is eligible for funding, because not all proposal details are known.

**Section 1: Questions on Technical Requirements**

**Q1:** The field monitoring period should be much longer than 12 months due to the very slow change most of the time. Three to five years of monitoring is the minimum needed. One reason for this is that future natural force events are not predictable, therefore, it is necessary to allow more time for monitoring. Can the field monitoring be longer than 12 months?

**A1:** Per Section I.C., *Project Focus*, of the Solicitation Manual, Group 1 projects must conduct field demonstrations for at least 12 months. Applicants may propose demonstration periods longer than 12 months to collect more data. Additionally, the Technical Approach section of the Project Narrative should describe a plan or strategy for how the applicant will continue demonstrating the technology, collecting data, and operating the system after the completion of the project.

Section I.E., *Key Activities Schedule*, of the Solicitation Manual identifies an Anticipated Agreement End Date of June 30, 2026. Applicants can propose projects with schedules beyond this Anticipated Agreement End Date.

**Q2:** The solicitation states that the project must: “*Demonstrate the sensors and monitoring technologies in the field for at least 12 months or more.*”  Is the 12-month field monitoring within the three years duration of the contract? If yes, that means the duration of the research part of the project will be effectively two years because year 3 will be dedicated to the field monitoring. If that is the case, it seems the duration of the research part is too short. Is it possible to have a four-year contract and the last year of the project (year 4) be dedicated to the field demonstration and monitoring?

**A2:** Group 1 projects must include at least 12 months of field demonstration within the proposed project term.

Please see the answer to Q1 for additional information.

**Q3:** Can you please elaborate on the duration of field demonstration? The project has duration of three years?

**A3:** Please see the answers to Q1 and Q2.

**Q4:** Will test/validation data from other sites outside of California and outside the US be accepted?

**A4:** Testing and validation is allowed outside of California; however, the demonstration/deployment must be applicable to California pipeline systems. Applicants who spend a greater amount of CEC funds in California may be awarded more points as described in the Funds Spent in California and California Based Entities scoring criteria in Section IV.F. of the Solicitation Manual. All CEC funds must be spent in the United States, therefore out-of-country testing and validation is only allowed through non-CEC funding sources such as match funding.

**Q5:** For Group 1, can you please clarify the requirement of "complete system approach?

**A5:** As described in Section I.C., *Project Focus*, the project must demonstrate a complete and comprehensive approach to the sensor deployment that includes the field data collection, data processing, management and analysis, and providing a risk assessment and profile of the gas pipeline.

**Q6:** For Group 1, the solicitation states that: “*Evaluate and demonstrate sensors and monitoring technologies at a Technology Readiness Level (TRL) of 7 or higher at the beginning of the project, with the potential to reach a TRL of 9 by the end of the project.*”  This would exclude some emerging technologies that are relatively mature but not at the level of TRL 7. Is it possible to relax the TRL 7 requirement?

**A6:** See Addendum 1 for updates to the Solicitation Manual including revised language in Section I.C., *Project Focus*, that now requires Group 1 projects to evaluate and demonstrate sensors and monitoring technologies at a Technology Readiness Level (TRL) between 5 and 7 or higher at the beginning of the project, with the potential to reach a TRL of 8 or 9 by the end of the project.

**Q7:** There was a lot of talk about development, but TRL 7 is already at deployment, while demonstration is at TRL 5?

**A7:** The Solicitation Manual references the United States Department of Energy (DOE) definition of TRL.[[1]](#footnote-2) According to DOE, a TRL 5 technology is undergoing technology development at laboratory scale and has had a similar system validation in a relevant environment. A TRL 7 technology is undergoing system commissioning at full-scale, and a similar (prototypical) system has been demonstrated in a relevant environment.

**Q8:** For Group 1, do the TRL levels still apply if the only technology options are not 'American Made'? All fiber optic interrogators (Strain) are foreign made? When targeting pipeline monitoring, problems need immediate action. All commercially available fiber optic interrogators that would meet TRL 7 are foreign made. None of them are American made, and therefore, none of the support is available immediately. Therefore, if we really seek to monitor pipelines with this technology, there needs to be American made TRL 7 fiber optic interrogators. American made technologies are bench scale, TRL 5.

**A8:** Where the technology is made does not necessarily affect the TRL. As described in the response to Q6, see the DOE definition of TRL referenced in the Solicitation Manual. Also see Addendum 1 for updates to the Solicitation Manual including revised language in Section I.C., *Project Focus*, pertaining to TRL requirements for Group 1 projects.

**Q9:** Is the ability to predict a potential failure, such as a leak, a major expected outcome of the Group 1 work?

**A9:** Yes, Group 1 projects must employ sensors and field sensor data to measure or predict mechanical loads and assess potential damages or failures, including leaks, before they occur. The data collected from the sensors should also give an idea of the risk profile of the infrastructure and the potential mitigation strategies that can be used to prevent, avoid, or minimize the potential impact or failure.

**Q10:** For Group 1, one of the slides mentioned satellite/UAV imagery, LIDAR, and fiber optic sensors. Is it correct to assume that this does not preclude the use of additional sensor types not mentioned here?

**A10:** Yes, that is correct. Group 1 does not preclude other types of remote sensing or embedded sensing technologies beyond those outlined in the solicitation.

**Q11:** The presentation described two vastly different sensor technologies for Group 1: remote or embedded sensing. Does that mean the CEC is going to make a choice of which technology it thinks is best? Do applicants need to use both sensing technologies? If there is only one recipient awarded, how will both sensor technology types be deployed?

**A11:** As described in Section C., *Project Focus*, of the Solicitation Manual, Group 1 projects must include direct measurement of stress/strain change along pipelines (i.e., embedded sensing), or indirect measurement of ground movement surrounding pipelines (i.e., remote sensing), or a combination of both. Please see the response to Q10 for more information.

**Q12:** For Group 2, do you have a preference between large diameter transmission pipelines versus smaller diameter distribution pipelines?

**A12:** No, there is no preference between demonstrating technologies for large diameter transition lines versus smaller diameter distribution lines as both meet the Group 2 requirements. As described in Section C., *Project Focus*, of the Solicitation Manual, Group 2 projects should demonstrate the advanced non-destructive evaluation inspection technology’s capability for measuring pipes across a range of diameters typical of gas distribution mains.

**Section 2: Questions on Administrative Requirements**

**Q13:** Could you post a link to the partnership website?

**A13:** GFO-22-503 can be accessed on the Empower Innovation website through: <https://www.empowerinnovation.net/en/custom/funding/view/36461>. Prospective applicants may sign up as an Empower Innovation member and create (or join) an organization’s profile. The “Find a Partner” function can be used to show your interest in this opportunity and view and message other interested members.

**Q14:** Will each Group (1 and 2) have its own independent proposal?

**A14:** Yes, if an applicant intends to apply for both Groups 1 and 2, independent separate proposals will need to be submitted individually. Applications must be separate and distinct from each other.

**Q15:** Is the deadline for submission in 2023?

**A15:** Yes, the deadline for application submittal is February 28th, 2023 at 11:59 PM.

**Q16:** How many awards are expected for each Group?

**A16:** The CEC anticipates funding one to two awards for Group 1 and one award for Group 2. In addition to any of its other rights, the CEC reserves the right to allocate any additional funds to passing applications, in rank order, see Section IV.B., *Ranking, Notice of Proposed Award, and Agreement Development*, of the Solicitation Manual.

**Q17:** Is any California partner required?

**A17:** A California partner is not required. However, applicants who spend a greater amount of CEC funds in California and on California Based Entities may be awarded additional points as described in the Funds Spent in California and California Based Entities scoring criteria in Section IV.F. of the Solicitation Manual.

**Q18:** Can we use federal project funding as cost share (match funding) if it is related?

**A18:** Yes. Match funds may come from federal funding entities. See Section I.J., *Match Funding,* of the Solicitation Manual that describes match funding definitions.

Federal project funding in the form of match share would need to be expended within the agreement term and used in the performance of the proposed project. Match funds do not include future/contingent awards from federal entities.

**Q19:** The presentation described $24 million in available funding, why is there only one award per Group?

**A19:** $24 million is the total annual funding available for the entire Gas Research and Development Program. The total allocated funding under this solicitation is $4 million.

1. U.S. Department of Energy, 2011, Technology Readiness Assessment Guide. Available online at https://www2.lbl.gov/dir/assets/docs/TRL%20guide.pdf. [↑](#footnote-ref-2)