



Funding Opportunity Announcement: Performance and Potential Assessment for Networked Geothermal Demonstration Projects

Date of Issue: June 16, 2022
Proposals Due: August 12, 2022

All proposals must be submitted to:

buildings@masscec.com

I. SUMMARY

The Massachusetts Clean Energy Center (“MassCEC”) is soliciting applications (“Applications”) through this Funding Opportunity Announcement (“FOA”) from qualified applicants (“Applicant” or “Applicants”) with demonstrated experience in researching Networked Geothermal Systems. The selected Applicant (“Contractor”) will work to inform MassCEC and relevant stakeholders statewide on project performance, determine potential applicability of Networked Geothermal statewide, and support interested parties in pursuing similar projects elsewhere with the goal of furthering the Commonwealth’s achievement of reducing emissions in the building sector consistent with the limits set forth in the Global Warming Solutions Act and An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy.

II. ABOUT MASSCEC

MassCEC is a state economic development agency dedicated to accelerating the growth of the clean energy sector across the Commonwealth to spur job creation, deliver statewide environmental benefits and to secure long-term economic growth for the people of Massachusetts. MassCEC works to increase the adoption of clean energy while driving down costs and delivering financial, environmental, and economic development benefits to energy users and utility customers across the state.

MassCEC’s mission is to accelerate the clean energy and climate solution innovation that is critical to meeting the Commonwealth’s climate goals, advancing Massachusetts’ position as an international climate leader while growing the state’s clean energy economy.

MassCEC is committed to creating a diverse, equitable, and inclusive organization where everyone is welcomed, supported, respected, and valued. We are committed to incorporating principles of diversity, equity, inclusion, and environmental justice in all aspects of our work in order to promote the equitable distribution of the health and economic benefits of clean energy and support a diverse and inclusive clean energy industry. MassCEC strives to lead and innovate in equitable clean energy and climate solutions.

III. PROGRAM GOALS AND DESCRIPTION

Networked Geothermal Systems are promising low-emission technologies that can help the Commonwealth of Massachusetts meet its policy goals to pursue aggressive greenhouse gas (“GHG”) reductions in the buildings sector. Networked Geothermal Systems have the potential to deliver fully electric heating and cooling at scale via a utility-owned business model. Data collected through this effort might be used to inform regulatory development.

The Massachusetts Department of Public Utilities (“DPU”) has approved up to six demonstration projects^{1,2,3,4} to test the success and cost effectiveness of Networked Geothermal Systems in decarbonizing the building sector. In “An Act Relative to Immediate COVID-19 Recovery Needs” (the “Act”) the state legislature approved \$5,000,000 for MassCEC “to pay for a research team to oversee, collect, and analyze data related to the design and operation of networked geothermal demonstration projects.” MassCEC’s assessment will serve to evaluate performance, optimize shared-use design, assess state-wide potential, and engage with stakeholders to “prove out” Networked Geothermal Systems.

The Act further specifies that this research should:

1. Model the system design and operation of proposed Networked Geothermal demonstration project sites;
2. Monitor the thermal energy storage potential of sites;
3. Create a public data bank of normalized data, including data on costs, to compare sites;
4. Document and disseminate recommendations and best practices for rapid scaling and optimization;
5. Provide projections of scaled-up site impacts on heating, emissions, health, customer bills and other variables;
6. Engage and educate stakeholders in the host communities of potential sites; and
7. Perform feasibility studies for communities interested in serving as hosts for projects.

MassCEC is seeking proposals from “research, non-profit and university entities,” either as a sole investigator or in collaborative partnerships to undertake this research, as further described in Section VII below.

IV. ELIGIBILITY

Applicants may be sole proprietors, companies (for profit and non-profit, provided that for profit entities are predominantly research oriented) with multiple employees, non-profits, academic institutions, and/or governmental entities. Individual entities may apply as part of multiple Applicant teams. Applicant teams should have one entity that takes responsibility for organizing the team and proposal (“Lead Applicant”).

Applicants must have the experience and capabilities described below. See Section VIII for selection criteria.

¹ <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/14368745>

² <https://www.mass.gov/news/departments-of-public-utilities-and-energy-services-approves-national-grid-geothermal-demonstration-project>

³ <https://www.nationalgridus.com/News/2022/05/National-Grid-Files-Geothermal-Program-Implementation-Plan/>

⁴ <https://www.mass.gov/doc/columbia-gas-settlement-agreement/download>

- **Measurement and Verification:** Proven track record of undertaking rigorous, novel, and highly complex scientific evaluation; experience and familiarity with geothermal sites.
- **Data Storage, Analysis, and Sharing:** Ability to undertake original and in-depth analysis in order to draw insights from large datasets; capacity to provide a public portal to those data.
- **Communication and Facilitation:** Demonstrated capacity to document and publish findings in scientific, academic, and/or industry mediums (such as journals, conferences, articles, published reports, etc.), share research outcomes effectively with public, and facilitate practical application through stakeholder education and engagement, ability and experience engaging with utilities.
- **Fluency in Public Policy:** Detailed understanding of applicable state regulatory environments and process as well as relevant policies, including the [Global Warming Solutions Act \(GWSA\)](#), the [Clean Energy and Climate Plan \(CECP\)](#), and the [Decarbonization Roadmap](#).

MassCEC strives to partner with organizations, companies, and entities that consciously work to create a diverse, equal, and inclusive work environment. MassCEC encourages such partners to have Diversity, Equity & Inclusion (“DEI”) policies that encourage hiring a diverse team, provide equal and fair treatment for all team members, and ensure a workplace environment where all team members feel valued and have the opportunity to fully participate in creating organizational success.

V. ESTIMATED TIMELINE

This timeline is subject to change at MassCEC’s discretion.

Release of Funding Opportunity Announcement	Thursday, June 16, 2022
Questions due to MassCEC via email to buildings@masscec.com	Thursday, June 30, 2022
Questions with Answers Posted to MassCEC Website (note: this date has changed)	Thursday, July 21, 2022 , Wednesday, July 13, 2022
Proposals Due	Friday, August 12, 2022
Interviews of Top Applicants	August, 2022
Notification of Award	September, 2022

VI. SCOPE OF WORK

This initiative will require a diverse and highly qualified team that can bring:

- Strong project management and collaboration skills;
- Scientifically rigorous capacity for advanced measurement techniques, complex heat transfer and flow modelling, and analytical analysis of novel systems; and
- Proven experience in stakeholder engagement, information dissemination, and knowledge sharing.

The primary scope of work is provided below. The project scope is complex and may require implementation of novel measurement, analytical, and computational strategies to effectively achieve the goals of this effort. Furthermore, unique and/or proprietary modelling approaches may be needed to successfully characterize and optimize the projects under assessment and assess applicability and potential of Networked Geothermal Systems across the state.

In order to ensure success throughout the project, the Contractor will work with MassCEC and a Networked Geothermal Technical Advisory Group (TAG) comprised of external experts and relevant collaborators from outside of MassCEC.

Due to the time sensitive nature of Program Area 1, MassCEC may award the Program Areas as a series of awards to one or multiple Applicants. Alternatively, at MassCEC's discretion, it may award the entire scope to a single Applicant proposal.

Specifically, the Contractor will complete the following tasks, with required scope (as designated by the legislature) in **bold** and recommended scope and/or specificity not bolded:

Program Area 1: Site Evaluation, Measurement, Verification, and Assessment: Applicant should familiarize itself with currently approved Networked Geothermal projects in Massachusetts. Applicant should propose the breadth of work to be completed per project and suggest the total number of projects to be included in the effort. MassCEC is seeking to ensure that the first project to begin construction in the state (the [Eversource Framingham project](#)) is included in this effort. Please note the timeframes of project implementation. MassCEC seeks to conduct the Program Area 1 evaluation for multiple, large-scale projects in the state, but the applicable number will depend on costs. Some customer data may be anonymized, not available, and/or aggregated.

- **Monitor the thermal energy storage potential of sites.** This should likely include both underground thermal energy extraction, transfer, and storage as well as system-wide storage and capacity. This may also include monitoring of thermal energy delivery (and extraction) at applicable buildings and ability to meet customer heating and cooling demands.

- **Model the system design and operation of proposed Networked Geothermal demonstration project sites.** This should likely include coupling the underground heat transfer with the distribution system heat transfer, including modeling of:
 - Underground spatial and temporal temperature profiles, including seasonal variation;
 - Networked system temperatures and flows across the distribution system;
 - Delivered and rejected thermal energy (temperature and volumetric flow) to and from buildings; and
 - Points of system thermal recharge, if applicable.
- **Create a public data bank of normalized data, including data on costs, to compare sites.** This should likely build off data collected in Program Area 1 and be of sufficient detail for further research and evaluation. This should likely also include project site information, such as number and type of buildings served and be accessible to the public via a transparent and accessible portal.
- **Conduct evaluation of system performance and identify strategies and opportunities for system improvement and optimization of design, operational, and construction for cost and energy usage.** This should likely include:
 - An assessment of performance over different seasonal conditions, include peak heating and peak cooling periods, peak electricity and gas demand conditions, and performance during maximum and minimum distribution system temperature;
 - An assessment of efficiency/coefficient of performance, including variation against relevant variables (such as season, distribution temperature, etc.); and
 - An assessment of impacts of different optional scenarios, such as different levels of cooling.

Program Area 2: Statewide Assessment

- **Provide a high-level technical and economic potential analysis for scale-up of Networked Geothermal Systems throughout the Commonwealth, including an assessment of greenhouse gas reduction potential.** This should likely build off results and learnings from Program Area 1.
- Document and disseminate recommendations and best practices for rapid scaling and optimization.
- Provide projections of scaled-up site impacts on heating, emissions, health, customer bills and other variables.
- **Perform feasibility studies for communities interested in serving as hosts for projects.** MassCEC intends for these feasibility studies to be high-level assessments to serve as a first level evaluation of sites. MassCEC anticipates the need for 10-20 feasibility studies over the course of the project. This component should strive to establish a standardized and simplified (to the extent possible) method for researching and evaluating Networked Geothermal sites.

Program Area 3: Dissemination

- **Engage and educate stakeholders in the host communities of potential sites.**
- Document undertakings, results, conclusions, etc. in reports and presentations to be made available to the public. Seek opportunities to publish outcomes in scientific, academic, and/or industry mediums.

Applicants are encouraged to suggest additional tasks and/or expanded scope beyond the tasks listed above based on their understanding of the intentions of this effort or their expert recommendations. Applicants are also encouraged to provide expanded detail related to tasks above. Some potential additional tasks may include (but are not limited to):

- A study of cost of service with recommendations for geothermal ratemaking;
- Recommendations of possible incentive structures designed to facilitate the development of Networked Geothermal projects;
- Equity impacts including how to distribute the benefits of geothermal projects to low-income and/or environmental justice communities;
- Evaluation of electrical grid impacts at distribution station, household meter, and/or heat pump level, including winter peak conditions;
- Comparative analysis of distributed electrification grid impacts vs. Networked Geothermal Systems;
- Evaluation of system resiliency potential;
- Geographic analysis of most and least promising sites for network geothermal projects across the state, potentially up to a supply curve analysis of sites; and
- Applicability of research to other jurisdictions.

VII. HOW TO APPLY

Responses to this FOA must be received by MassCEC no later than Friday, August 12, 2022. Only complete, timely proposals will be considered. MassCEC, at its sole discretion, may determine whether an Application is complete and/or consider any requests for extending the deadline based on specific needs. The submission must be in electronic form and submitted via email to buildings@masscec.com. Proposals should be in a single PDF document. "Performance and Potential Assessment for Networked Geothermal Demonstration Projects" should appear in the email subject line.

Application packages must include the following:

1. Cover Page;
2. Applicant's Signature and Acceptance Form (Attachment A);
3. Proposal (see outline of Proposal Requirements below);
4. Team Member Resumes (as an appendix); and
5. Supplemental Materials (as optional appendices).

No additional materials should be submitted. Any additional materials will not be considered in the evaluation.

If Applicants require their own contract template to be used, please submit that as part of the proposal. Otherwise, MassCEC will provide the contract template.

Contact buildings@masscec.com with any questions.

PROPOSAL REQUIREMENTS

Proposals must contain the following sections. Do not exceed the specified page limits.

Executive Summary (maximum two (2) pages): Applicants should provide a summary of their organization, qualifications, their technical experience relevant to the Program and their proposed approach for working with MassCEC.

Statement of Qualifications (maximum five (5) pages): All responses must include a statement of qualifications, experience, and description of the Applicant, including:

- A brief description of organization(s) involved in the proposing team, including major subcontractors. Include history, size, project portfolio and location.
- Include an explanation of why the proposed organization or team is the best qualified to perform the work under the Program. Identify other organizational qualifications relevant to the proposed work. Include examples of related past work, particularly related to advanced monitoring and evaluation of Networked Geothermal Systems. Responses may include appendices with relevant supplemental material (see below).
- Describe the team's ability to work with key stakeholders such as Eversource and National Grid in alignment with MassCEC's Program goals. Please include materials on previous relevant work with utilities in appendices.
- Identify key individuals who will be involved in the tasks. Provide one- to two-paragraph summaries of relevant technical and business expertise of these individuals. Submit resumes (as appendices) of all key Applicant team members. Resumes should include education and experience that are relevant to the proposed work.
- If applicable, list MassCEC and other state or federal contracts awarded to the Applicant and/or any subcontractors in the past five years.

Workplan Narrative (maximum eight (8) pages per Program Area): The Workplan describes work activities, deliverables and timelines associated with completing Program Areas 1, 2, 3, and any additional proposed tasks, or a combination of phases described in Section VI. The Workplan shall describe each step or procedure required to accomplish each task, including who will perform it, how it will be performed, and its intended result. Provide a project plan for working collaboratively with relevant stakeholders (e.g., gathering necessary data, sharing findings and outcomes) and enlisting other sources of technical, financial, or regulatory expertise. Identify which components of the Workplan will require coordination with the

Project Team. The Workplan Narrative should explicitly address how the Applicant's proposed approach makes sense given the legislative mandate for this program in "An Act relative to immediate COVID-19 recovery needs." MassCEC will allow Program Area proposals to be as long as 8 pages, though Applicants should strive to limit Program Area proposals to 5 pages. Applicants should maintain the page limit for each Program Area.

Project Schedule (maximum two (2) pages): All responses must include an estimated project schedule which lays out all project milestones, deliverables, and length or date of completion. Identify any constraints or specific requirements for work scheduling. Propose a progress reporting schedule.

Budget and Rate Sheet (maximum (3) pages): Responses must include a detailed budget, including information on rates of all team members working on the project.⁵ Where Applicants anticipate using outside expertise for a task, the Applicant should include estimated rates. Budgets should be broken out by task and service provided and must be proposed on a per-Program Area basis.

References (maximum (2) pages): All responses must include references from at least three (3) clients of each of the Applicant parties, and preferably clients who have utilized the Applicant on matters related to the proposed technical services. These references must include a contact person, a full address, an email address, and a phone number. Current and former MassCEC staff may be included as supplementary references for previous work conducted on behalf of MassCEC, but do not count toward the three-reference requirement.

Supplemental Material (optional appendices): Responses may include relevant case studies, previous white papers, and journal publications.

VIII. SELECTION CRITERIA

MassCEC seeks to select a multi-faceted, advanced research and assessment team. Proposals will be evaluated by MassCEC and a Networked Geothermal Technical Advisory Group including experts outside of MassCEC on the criteria below:

⁵ Please note that Contractor rates are not considered confidential in the case of a public records request. Please see Section VI for additional information on the Massachusetts Public Records law.

- **Completeness of Proposed Approach**
 - Does the Applicant plan to provide services commensurate with all Tasks included within one or multiple Program Areas requested by MassCEC in Section VI? Does the Applicant demonstrate sufficient understanding of the goals/intentions of this effort and provide sufficient scope detail to ensure that the goals and intentions of the effort are met?
 - Has the Applicant's proposed approach demonstrated insight into additional needs in the Evaluation process or proposed additional tasks and/or valuable recommendations?
 - Has the Applicant demonstrated a sufficiently broad scale of scope and a high level of quality?
- **Experience and Qualifications**
 - To what extent does the Applicant demonstrate the eligibility criteria outlined in Section IV?
 - Has the Applicant successfully completed projects similar or relevant to the proposed work? Does the Applicant team have demonstrated success collaborating with applicable project partners, such as the implementing utilities? Has Applicant proposed a clear and promising plan to engage with project partners and stakeholders over the course of the project?
 - Does the Applicant have Supplier Diversity Office (SDO) certification as a diverse business enterprise or meet the criteria for any of the diverse business enterprises certified with the SDO but has not completed certification with the SDO?
 - Has the Applicant demonstrated that they do not have a conflict of interest or will appropriately manage any conflicts of interest?
- **Overall Quality of Proposal**
 - Does the Applicant demonstrate an understanding of the concepts and motivators underlying the effort?
- **Applicant Team (if applicable):**
 - Does the partnership have a history of collaboration?
 - Does the partnership have a clear structure for collaboration?

XI. BUDGET

MassCEC anticipates contracting with one (1) Contractor for each Program Area described in Section VI. MassCEC may contract with that same Contractor for multiple Program Areas. Applicants should submit a proposal and budget that provides services to meet all tasks within a given Program Area. Applicants may apply for a single or multiple Program Areas simultaneously.

Applicants are encouraged to propose additional tasks that they believe will enhance their ability to achieve the goals of this FOA. This additional scope and budget proposal should be reflected in Application.

MassCEC reserves the right to negotiate adjustments, expansion, or reduction of proposed tasks, modification of project partners, or additional tasks. MassCEC may also request clarifications or further detail on the proposal. Both MassCEC and the Applicant would be required to agree on such scope changes, which would be reflected in the contract. Proposals should not exceed the available budget of \$5,000,000. For areas of scope or budget uncertainty due to external factors (e.g., future project sites selected), Applicant should strive to provide a detailed and representative budget and scope and MassCEC and the project team can negotiate contract adjustments as needed once sufficient detail becomes available.

Applicants may propose the payment structure(s), including fee for service and/or time and materials basis with a not-to-exceed value for the Tasks described in Section VI (and any others mutually agreed upon).

X. CONTACT INFORMATION FOR QUESTIONS

MassCEC: buildings@masscec.com

XI. GENERAL FUNDING OPPORTUNITY ANNOUNCEMENT CONDITIONS

NOTICE OF PUBLIC DISCLOSURE

As a public entity, MassCEC is subject to Massachusetts' Public Records Law, codified at Chapter 66 of the Massachusetts General Laws ("Public Records Law"). Applicant acknowledges and agrees that any documentary material, data, or other information submitted to MassCEC is presumed to be public records. An exemption to the Public Records Law may apply to certain records, including materials that fall under certain categories under a statutory or common law exemption, including the limited exemption at Massachusetts General Laws Chapter 23J, Section 2(k) regarding certain types of confidential information submitted to MassCEC by an applicant for any form of assistance. Applicant acknowledges and agrees that MassCEC, in its sole discretion, shall determine whether any particular document, material, data or other information is exempt from or subject to public disclosure. Thus, MassCEC urges applicant to carefully consider what documents, materials, data and other information is submitted to MassCEC in connection with this FOA.

As a public entity, MassCEC is subject to Massachusetts' Public Records Law, codified at Chapter 66 of the Massachusetts General Laws. Thus, any documentary material, data, or other information received by MassCEC from an applicant is a public record subject to disclosure. Applicants shall not send MassCEC any confidential or sensitive information in response to this FOA.

DISCLAIMER & WAIVER AUTHORITY

This FOA does not commit MassCEC to award any funds, pay any costs incurred in preparing an application, or procure or contract for services or supplies. MassCEC reserves the right to accept or reject any or all applications received, waive minor irregularities in submittal requirements, modify the anticipated timeline, request modification of the application, negotiate with all qualified Applicants, cancel or modify this FOA in part or in its entirety, or change the application guidelines, when it is in its best interests.

This FOA has been distributed electronically using MassCEC's website. It is the responsibility of Applicants to check the website for any addenda or modifications to the FOA to which they intend to respond. MassCEC accepts no liability and will provide no accommodation to Applicants who submit an application based on an out-of-date FOA document.

CONTRACT REQUIREMENTS

Upon MassCEC's authorization to proceed with the proposal, MassCEC and the awarded applicant(s) will execute a contract which will set forth the respective roles and responsibilities of the parties.