



## Geothermal Energy Demonstration Program Implementation Plan

Boston Gas Company  
d/b/a National Grid

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Submitted to:  
Massachusetts Department of Public Utilities

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## I. Executive Summary

On February 18, 2021, Boston Gas Company d/b/a National Grid (“National Grid” or the “Company”) filed a petition with the Department of Public Utilities (“Department”) for approval of a geothermal district energy demonstration program (“Geothermal Program”), submitted in compliance with Boston Gas Company, D.P.U. 20-120, Interlocutory Order on Proposed Demonstration Programs (Dec. 11, 2020). The Company proposed a \$15.6 million program spanning five years. On December 15, 2021, the Department approved the Company’s Geothermal Program, subject to certain directives. Boston Gas Company, D.P.U. 21-24, at 32 (2021) (“Order”). Consistent with the Department’s Order, the Company is submitting this Geothermal Energy Demonstration Program Implementation Plan (“Implementation Plan”) with details on the Geothermal Program.<sup>1</sup>

There are two primary developments that provide context for the Geothermal Program. First, the Company is actively participating in D.P.U. 20-80, the Department’s investigation into the role of local gas distribution companies as the Commonwealth achieves its 2050 climate goals. On March 18, 2022, the Company filed with the Department a Net Zero Enablement Plan with recommendations for achieving the Commonwealth’s 2050 net zero goals that included a role for networked geothermal. Second, on April 19, 2022, National Grid released its vision for an affordable, reliable, clean energy future. This vision consists of four pillars, one of which is targeted electrification, including networked geothermal.

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<sup>1</sup> Order at 28-30.

Through the Geothermal Program, the Company is exploring the use of geothermal energy, both to provide the technology as a low-carbon heating solution for customers, and as a technology that could be used to manage investments designed to meet peak day needs on the gas system, as well as avoiding leak prone pipe (“LPP”) replacement. The Company’s Geothermal Program will focus exclusively on shared-loop systems that will serve multiple independent residential and/or commercial customers. The Geothermal Program aims to validate the performance of shared loops and investigate how to optimally deploy shared loops to create the best value for customers, leveraging the renewable and bi-directional nature of geothermal heating.

The Geothermal Program will provide funding for the installation of geothermal facilities, related geothermal equipment, and certain electric appliances to customers accepted into the program. Geothermal Program participants will enter into a standard customer participation agreement (“Customer Agreement”) with the Company. The Company will develop a website where interested parties can obtain information about the Geothermal Program, the criteria for potentially participating in the program, and contact information for parties interested in submitting geothermal project proposals. The Company will prioritize projects involving existing gas customers or new customers seeking natural gas service and will initially screen project proposals for one of the four main criteria as follows: (1) diversity of load profile; (2) addresses existing gas system constraints; (3) replacement of LPP; and/or (4) located in an environmental justice or low-income community (together, “Site Concepts”).<sup>2</sup> Project proposals that satisfy at least one of the above Site Concepts will be screened further on other individual criteria including,

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<sup>2</sup> Order at 3-4.

but not limited to: (i) customer diversity (residential and commercial and industrial (“C&I”) mix); (ii) avoidance of under-appreciated asset replacement; (iii) customer willingness; (iv) whether project is part of a network and not a single facility; (v) ability to cut and cap the natural gas main; (vi) availability of space for geothermal equipment; (vii) ease of permitting; (viii) community stakeholder acceptance; (ix) proximity to cast iron; (x) construction challenges; and (xi) whether Company also is the electric provider to the customer(s).

Upon Department approval of the Company’s Implementation Plan and Customer Agreement, the Company plans to select at least one project within approximately two months following such approval. The Company is in the process of engaging a geothermal developer with experience in complex geothermal shared loop installation to assist the Company in: (1) determining site selection for a networked system; (2) developing an appropriate scope of work; and (3) providing detailed specifications for the engineering, design, and construction of selected project(s);

In addition to the Implementation Plan, the Company is providing as Attachments:

1. Attachment A: Customer Agreement;
2. Attachment B: Easement Agreement for Geothermal Facilities;
3. Attachment C: Site Evaluation and License Agreement;
4. Attachment D: Project Screening Matrix;
5. Attachment E: Marketing Materials; and
6. Attachment F: Customer Application.

## II. Project Background

The Company designed a five-year Geothermal Program in furtherance of the Commonwealth's greenhouse gas emissions ("GHG") reduction goals, specifically to: (1) reduce emissions resulting from customer energy usage; (2) promote non-pipe alternatives; (3) encourage the development of sustainable heating options; and (4) develop new technologies to advance low-carbon heating solutions. The Geothermal Program will provide funding of the costs of: (1) the geothermal shared loop; (2) the ground source heat pump ("GSHP") and associated equipment not covered by rebates or incentives; (3) replacement of gas water heaters with GSHP water heating; (4) conversion of certain customer appliances (such as gas stoves, ovens and dryers) from gas to electric in instances where customers are disconnecting from natural gas service; (5) new or upgraded radiators and or air ducts as needed; and (6) certain energy efficiency improvements not covered by rebates or incentives.

The Company's Geothermal Program involves the selection of approximately four (4) separate sites that may serve between 20-40 customers. Projects involving existing customers or new customers who have applied to convert to natural gas will be prioritized and projects will be selected on the basis of their ability to provide learnings and satisfy at least one of the following four criteria or Site Concepts: (1) assessing the thermal performance and economics of shared loops serving a larger number of customers with more diverse load profiles than the projected completed by the Company's affiliate in Long Island, New York; (2) switching gas customers to geothermal energy as an alternative to LPP replacements; (3) installing shared loops to manage local gas system constraints and peaks; and (4) installing shared loops to lower operating costs and

GHG emissions for low-income customers and environmental justice communities.<sup>2</sup> Ideally, the Company's goal is that the combination of the projects selected for the Geothermal Program will satisfy all four of the Site Concepts.

The Company committed to file its Implementation Plan for the Department's review within one year of the program approval, prior to commencing construction of any shared loops, and to include definitions of what will be owned by customers (also referred to as participants in this Implementation Plan) and what will be owned by the Company. The Department directed National Grid also to include a Customer Agreement that includes participant terms and conditions for Department review and approval. As required by the Department's Order, the Customer Agreement includes consumer protections, rights, and obligations, including but not limited to: (1) billing and termination procedures consistent with 220 CMR 25.00; (2) the Company's and participants' rights and obligations in the event the participant wishes to voluntarily leave the program and in the event of system performance failure; (3) how the rights and obligations of the Company and participants may change after the conclusion of the demonstration project with respect to the costs of geothermal service; (4) how the rights and obligations of the Company and participants might change if the Company terminates the Geothermal Project before the end of the five-year term; (5) an explanation of the customer charges and participation fees and effective time periods for each, as approved; and (6) a statement that National Grid may change any charges or fees associated with the geothermal networks only after notice to the customer and approval by the Department.<sup>3</sup>

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<sup>3</sup>Order at 29.

Additionally, the Implementation Plan includes: (1) copies of preliminary promotional and application materials prepared for prospective participants, with information about costs of participation and a representation that the Company will provide customers interested in participating in the Geothermal Program a high level estimate of their net energy costs; and (2) a detailed description of how the Company will prioritize the participation of existing gas customers in Section II.3 of this Implementation Plan.<sup>6</sup> This Section provides an overview of: (1) the Geothermal Program's key milestones; (2) the standard terms and conditions of the Customer Agreement; (3) the Project Evaluation process; and (4) Procurement for Consulting and Contractor Services.

## 1. Key Milestones for 2022-2023

After filing the Implementation Plan, the Company will continue to engage with key stakeholders and prospective participants to identify potential project locations. The Company anticipates that it will file a project selection update with the Department approximately (60) days after Department approval of the Implementation Plan and Customer Agreement outlining the next steps for the initial selected project and an update on additional prospective projects. Once the Company has selected the first project location and the Customer Agreements have been executed, the Company will proceed with initial site design, material procurement, and construction. Anticipated milestones are:



<b>Timing (estimated)</b>	<b>Action</b>
May 16, 2022	Implementation Plan, including Customer Agreement, filed with Department of Public Utilities
Present to November 30, 2022	Company to receive and evaluate potential projects on an ongoing basis. The Company may extend the deadline for accepting applications if it has not received adequate project proposals that enable the Company to satisfy the four Site Concepts
Ongoing	Company evaluation of project proposals until all 4 projects have been selected. <sup>4</sup> Ideally, the projects selected combined will satisfy all four Site Concepts
~ within 60 days after Department approval of Implementation Plan and Customer Agreement	File project selection update with Department for first project selected and other sites being considered
~ 60 days after initial project location selection	Customer agreements signed for initial site selected
~ 6-12 months after Department approval of Implementation Plan (subject to all permits having been obtained)	Construction commences on at least first project selected

## 2. Customer Agreement Standard Terms and Conditions

This Customer Agreement is included as Attachment A and was based largely on the agreement approved in NSTAR Gas Company d/b/a Eversource Energy, D.P.U. 21-53 for Eversource’s geothermal pilot program. National Grid modified the Customer Agreement to tailor it to elements unique to the Geothermal Program approved by the Department. Those modifications involve: (1) including electric appliances that will be funded by the Program; (2) a provision that addresses the discontinuance of gas service to customers participating in a program

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<sup>4</sup> The Company is targeting four separate projects of 20-40 customers. However, depending on participant applications and proposals, the Company may select less than 4 larger projects or more than 4 smaller projects as needed to achieve all four Site Concepts.

designed as an alternative to LPP replacement; (3) the reimbursement to Customers of agreed-upon energy efficiency measures not covered by available rebate programs; (4) a clear demarcation of ownership of the Company's geothermal facilities and the geothermal equipment owned by the Customer as established at the energy meter; and (5) a rate schedule that includes the Department-approved participant fee and customer charges. These items are further described below.

- a. Conversion of Appliances: The Company agrees to reimburse the Customer for the costs of new appliances needed to convert from natural gas usage to electric for appliances agreed to between the Company and Customer up to a certain maximum amount as will be set forth in Exhibit C of the Customer Agreement;
- b. Disconnection from gas network if in lieu of LPP replacement: If the project is designed to satisfy the Site Concept of avoiding LPP replacement, the Customer Agreement will include a provision that, in order to participate in the Program, the Customer understands and agrees that the Customer shall be disconnected from Company's gas distribution system and will no longer be able to reconnect to natural gas service after the conclusion of the Service Period (defined in the Customer Agreement) without complying with the Company's Distribution Service Terms and Conditions, M.D.P.U. No. 61, as may be amended or superseded from time to time, to reconnect to the Company's gas system. This could require the Customer to pay a contribution in aid of construction to support the installation of new gas facilities, such as a gas line, to the Customer's building and other related connection costs. The Customer will be permitted to reconnect to the Company's gas distribution system and

resume gas service during the defined Service Period if Customer's Geothermal Energy Service is terminated in accordance with the terms of this Customer Agreement and Customer had selected Termination Alternative 1 that allows reconnection to the gas network.

c. Reimbursement of energy efficiency upgrades: The Customer Agreement requires the Customer to pursue appropriate energy efficiency programs to which it is entitled. Additionally, the Company will work with the Customer to support the Customer's participation in any and all available energy efficiency programs and will reimburse Customer its cost for the incremental percentage of available energy efficiency programs that are not covered by energy efficiency rebates or incentives as agreed to and set forth in in Exhibit H of the Customer Agreement.

d. Demarcation of Ownership: The Customer Agreement provides that the Company will own the Geothermal Facilities that are defined as the equipment and piping installed up to the Delivery Point that occurs at the energy meter. Customer Equipment is defined as all equipment and piping installed after the Delivery Point both outside and inside of Customer's building, including the GSHP.

e. Rate Schedule: The following rate schedule is included in the Customer Agreement as Exhibit E:

MONTHLY RATE SCHEDULE

<b>Rate Type</b>	<b>Participant Fee (per heat pump) (Monthly Charge)</b>	<b>Customer Charge (Monthly Charge)</b>
Residential	\$60.00	\$4.00
Residential Low Income	\$45.00	\$3.00
Commercial/Industrial	\$90.00	\$4.00

The billing rates in the rate schedule will be charged monthly and will be effective for the duration of the Geothermal Program. At the end of the Geothermal Program, the billing rates may change subject to Department approval.

As directed by the Department, the Customer Agreement also includes consumer protections, rights, and obligations, including but not limited to: (1) billing and termination procedures consistent with 220 CMR 25.00; (2) the Company's and participants' rights and obligations in the event a participant leaves the Geothermal Program as a result of poor system performance or complete system failure; (3) how the rights and obligations of the Company and participants may change after the conclusion of the demonstration project with respect to the costs of geothermal service; (4) how the rights and obligations of the Company and participants might change if the Company terminates the Geothermal Program before the end of the five-year term; (5) an explanation of the customer charges and participation fees and effective time periods for each, as approved; and (6) a statement that the Company may change any charges or fees

associated with the geothermal networks only after notice to the customer and approval by the Department.<sup>5</sup>

The Customer Agreement also provides three (3) options that are available to the Customer if the Customer or the Company terminates the Geothermal Program in accordance with the Customer Agreement prior to the end of the Service Period. The three termination alternatives are: (1) returning the Customer to its original heating system; (2) converting the Customer to an electric air source heat pump; or (3) converting to an individual ground source heating system. The Company will conduct a high-level analysis of the costs to be borne by the customer for the three alternatives prior to customers' termination alternative selection. Customer must select one of the three termination alternatives prior to the design of the geothermal system as the Customer's choice of termination alternative may affect the design of the geothermal system.

The Customer Agreement also provides that the Customer will execute an easement agreement as necessary to own, operate and maintain the Geothermal Facilities on the Customer's property to serve Customer and other customers on the geothermal network. In most instances, the Geothermal Facilities will be providing geothermal energy to the Customer's property. However, in certain cases, the Company will require easement rights for certain geothermal facilities, such as boreholes, on property other than that for which geothermal energy is provided. An Easement Agreement is provided as Attachment B.

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<sup>5</sup> Order at 29.

National Grid sought input from the Attorney General, Department of Energy Resources, and HEET on the Customer Agreement's form and content prior to this filing and made revisions where appropriate based on this feedback.

### 3. Project Evaluation Process

Potential projects will initially be screened for one of the four Site Concepts: (1) diversity of load profile; (2) location in an environmental justice or low-income community; (3) addresses existing gas system constraints; and (4) replacement of LPP resulting in reduction of Company Scope 1 emissions. These Site Concepts reflect key learnings the Company intends to achieve during this Geothermal Program.

If a proposed project meets at least one of these Site Concepts, the Company will then evaluate it on several criteria including: (i) customer diversity (residential and C&I mix); (ii) avoidance of under-appreciated asset replacement; (iii) customer willingness; (iv) project is a network, not a single facility; (v) ability to cut and cap the main versus a main that is required to be kept in service for other gas customers; (vi) certainty of property/ample space for geothermal equipment; (vii) ease of permitting; (viii) community stakeholder acceptance; (ix) proximity to cast iron; (x) construction challenges; (xi) Company also the electric provider; and (xii) if more than one Site Concept is met with a single proposal. Each criterion is given a weight score for how significant the criterion is to achieve the goals of the program. Weight scores rank from 1 (least significant) to 5 (most significant). Each criterion is then ranked for each proposed project from 1 (least ideal) to 3 (most ideal). Descriptors for scenarios that would be considered a 1 versus a 3 are provided in the Project Screening Matrix attached hereto as Attachment D. The Company

developed the evaluation criteria with an internal multi-disciplinary team from gas engineering, gas project management, gas asset management, gas planning and design, customer and stakeholder management, regulatory, and legal and also sought input from HEET.

Additional evaluation criteria will then be considered for the proposed project: (a) whether the project targets primarily existing gas customers and/or customers who have applied to be connected to natural gas service; (b) whether co-funding for this project is available; and (c) total cost of the project in relation to total approved Geothermal Program budget. Project scores will be ranked from highest to lowest, with the exception that lower scoring projects that target primarily existing customers or new customers who have applied to be connected to natural gas service will be prioritized over higher scoring projects that target primarily non-gas customers. The Company will utilize the scoring evaluation and rankings as one factor to guide its decision around which projects to consider further. If the Company requires access to the potential participating project site(s) to perform any evaluation or assessments to determine site suitability or for project design, it will require that the owner(s) of the site, and the customer(s) if not the owner, to execute the Site Evaluation and License Agreement attached hereto as Attachment C.

#### 4. Consulting and Contractor Services

The Company envisions that it will have to rely on external resources for almost all activities for the Geothermal Program projects' development and execution. Those activities include feasibility studies, field testing, preliminary engineering, final engineering, equipment, construction services, testing, commissioning, Evaluation, Measurement and Verification

(“EM&V”), and Operations & Maintenance (“O&M”). Supplier qualification and sourcing activities will conform to established Company procurement processes. The Company is assessing several strategies to determine which option will deliver the most value for customers. The Company has been conducting a market outreach effort focused on qualifying suppliers based on the subject matter expertise of their resources and experience safely completing similar geothermal projects. The Company’s intent is to gain geothermal experience to develop its internal capabilities and labor force for future geothermal installations.

The Company will evaluate potential candidates to ascertain the ability of a firm’s qualifications to support the needs of the Geothermal Program including, without limitation: (1) amount of experience in the sizing/design, installation and operation of geothermal systems; (2) experience in networked geothermal loop systems and their sizing/design, installation, and operation; (3) experience in determining ideal site selection for a networked system and ability to assist with project site selection of a networked geothermal loop; (4) level of engineering expertise needed to aid a utility in developing an appropriate scope; and (5) knowledge of vendors/manufacturers of heat pump system equipment and experience working with their products.

a. Evaluation, Measurement, and Verification

The Company intends to secure a vendor to evaluate the performance of each geothermal system once it has been installed. This evaluation will focus on the performance of each system relative to its design, specifically focusing on the temperature of the loop and whether there is any need for supplemental heating or cooling to avoid a drift condition (i.e., a condition when an



imbalance in the heating and cooling needs of the system result in the average temperature of the working fluid moving in a given direction). Additionally, the vendor will review total energy use for customers before and after the transition to geothermal service, assess bill impacts (both inclusive and exclusive of equipment costs), and measure the energy required to provide service to customers relative to the design of the system (e.g., is the capacity of the system sufficient for customer needs; is there excess capacity based on load diversity beyond what was incorporated into system design).

### III. Project Timing

There are several critical path items that will impact the timing of the project. The Company adopted the structure of the Eversource plan and Customer Agreement, to the extent possible. The Company will complete final project selection after the Department has approved the Company's Implementation Plan and Customer Agreement. The Company will provide potential customers the proposed Customer Agreement and provide any revisions upon Department approval and before Customer must decide whether to participate in the Geothermal Program. The Company also will share the Implementation Plan and attachments with potential customers for their review and information and will keep potential participants updated with any changes upon the Department's approval. The Company anticipates that it will have the signed agreements and permits needed to commence construction on the first project approximately 6-12 months after Department approval.

## IV. Stakeholder Engagement

The Company is collaborating with stakeholder groups and industry organizations on: (a) how the geothermal industry and utility workforce may evolve in the region; (b) the sharing of data and learnings from the Geothermal Program openly and transparently, including collaboration with Eversource, DOER, and the Attorney General to incorporate findings from their geothermal offerings; and (c) engaging with low-income customers, customers in environmental justice communities, community organizations, and advocacy groups to gather data on these customers' current energy needs and information on how best to engage these customers about the program.

To date, the Company has engaged several key stakeholders to inform the Geothermal Program requirements and held meetings with interested parties to discuss potential projects.

Please see below table for further details on major stakeholder outreach:

### STAKEHOLDER OUTREACH

<b>Stakeholder</b>	<b>Outreach Plan</b>
Prospective Geothermal Customers	The Company held meetings with approximately 15 interested parties to discuss potential projects. The Company is developing a website and marketing materials for prospective customers to learn more about the Geothermal Program.
Eversource	Prior to Program approval, the Company met with Eversource quarterly. The Company is now increasing the frequency of these meetings to monthly to share additional project information. The Company also regularly participates in public sessions with Eversource (e.g., geothermal industry conferences) and seeks opportunities to meet with stakeholders together.
AGO & DOER	The Company provided the AGO and DOER with a draft of the Customer Agreement for review and comment. Going forward, the Company is committed to periodically sharing information throughout program implementation and learnings from the Program with the AGO and DOER.
HEET	The Company communicates with HEET periodically. Prior to the Implementation Plan filing, the Company obtained feedback on the initial projects screening criteria and provided the Customer Agreement for their review and comment. The Company will continue to consult with HEET regarding the pilot program throughout the implementation plan period
Municipalities	The Company discussed the Geothermal Program with several municipalities and plans to provide them an application and will also provide applications to other municipalities in their service territory.
Department Pipeline Safety	The Company meets quarterly with the Pipeline Safety Division during which updates on geothermal program can be added to the agenda.
Unions	The Company meets with its unions quarterly to discuss and provide updates on the future of the gas business including the Geothermal Program.
Northeast Gas Association (“NGA”)	Along with other gas companies, the Company has discussed the possibility of NGA establishing common training programs for future of heat technologies including geothermal service.
New England Geothermal Professional Organization (“NEGPA”)	The Company met with board members of NEGPA during 2021, while the Program was still under consideration by the Department. Since Program approval, the Company has contacted NEGPA and is planning to attend an upcoming board meeting. The Company will present the approved Program, discuss next steps for site selection and procurement, and ascertain the interest of NEGPA members as it relates to participating in the Program, either in terms of identifying project sites or in terms of responding to future RFPs. Regardless of whether a NEGPA company is selected for a vendor role in the Program, the Company will continue to engage with NEGPA, providing updates as appropriate.

The Company may need to collaborate with other stakeholders during the execution of the Geothermal Program and will engage those entities as needed on a case-by-case basis.

## V. Internal Engagement

Although networked geothermal service is a new venture, the Company has an established Network Delivery process, including a complex construction process, that the Company, will utilize to implement the Geothermal Program. The Network Delivery process commences with project conception and involves appropriate internal and external stakeholders through the design and construction of a project. The process analyzes a project from a scope, cost, schedule, and risk perspective and considers customer-driven requirements. A plan is developed for execution of a project, available resources, risk management, stakeholder management, and contract management strategy. Projects are designed and reviewed before construction, and appropriate resources are designated for asset ownership through the lifecycle of the asset including plans for future funding and maintenance responsibilities. This process is carried out with the involvement and support of Gas Asset Management, Construction, Engineering, Estimating, Gas Project Development and Project Management, Process Safety, Resource Planning, Legal, Real Estate, Permitting, Procurement, Community and Customer Relations, Energy Sales, and other internal departments as needed. Although the Company will be using experienced geothermal contractors to construct the projects, the Company also will gain learnings and experience for training its labor force.

## VI. Participant Recruitment

The Company has received inquiries from approximately 15 potential project applicants and intends to conduct additional outreach to attract a diverse set of potential projects that may satisfy one or more of the Geothermal Program learnings from the four Site Concepts.

The Company's draft informational flyer is provided as Exhibit E. The flyer will provide a summary of the Geothermal Program, its mission, goals and learnings and an e-mail address, telephone number, and website link that will be designated for the Geothermal Program, where customers can express their interest in participating and apply. The Company will provide to the Department the final version of the flyer once developed. Potential participants will be provided with an initial application form that will seek details such as site size, customer class, location, monthly Btu usage, and number of buildings, to allow for an initial determination by the Company on whether the project can move to the next stage and be further evaluated for participation in the Program. An illustrative customer application is provided as Attachment F.

## VII. Potential Projects

To date, the Company has discussed potential projects in the cities of: Acton, Boston, Brookline, Lowell, Medford, Swampscott, Watertown, and Wellesley. These potential projects include proposals from municipalities, universities, and residential developments. The Company's project search is ongoing and the Company continues to hold meetings with these and other potential projects. The Company will continue to accept project proposals until

November 30, 2022 and may extend this deadline if in its judgment it has not received an adequate number of proposals that have the potential to satisfy all four of the Site Concepts.

## VIII. Budget and Cost Tracking

As part of the Department proceeding for approval of the Geothermal Program, the Company calculated the average increase in electric bills customers may anticipate from their new geothermal service. To the extent that the Company has available usage information, the Company will prepare a high-level estimate to allow potential participants to understand their full energy costs prior to deciding whether to participate in the Geothermal Program that will include: (1) the monthly fixed participant fee and customer charge to participate in the Geothermal Program; (2) the increase in electric costs; and (3) the decrease in gas costs as a result of the customers' conversion to geothermal energy. The Company's high-level analysis will assume the same customer usage behavior and will not factor in potential energy usage reductions from energy efficiency improvements. To gain a better understanding of the actual full energy costs to customers, the Company intends to perform the following analyses as part of the learnings from the Geothermal Program using actual customer usage data after the installation of the geothermal system:

<b>Measure</b>	<b>Description</b>
Average monthly GSHP electricity consumption	Analysis of monthly GSHP electricity usage over a minimum of two heating and cooling seasons per GSHP
Peak heating GSHP electricity consumption	Analysis of monthly GSHP electricity usage over a minimum of two heating and cooling seasons per GSHP
Peak cooling GSHP electricity consumption	Analysis of monthly GSHP electricity usage over a minimum of two heating and cooling seasons per GSHP
Average monthly GSHP electricity costs for participants	Analysis of participant electric bills and GSHP electricity usage over a minimum of two heating and cooling seasons per GSHP

Separate work orders for each project will be created to track specific costs, and projects will be reviewed and approved in accordance with the Company’s project sanctioning process. The Company will pursue other sources of funding for projects including investment tax credits and co-funding from large customers that would reduce the cost of the overall project

## Attachments

Attachment A – Customer Agreement

Attachment B – Easement Agreement for Geothermal Facilities

Attachment C – Site Evaluation and License Agreement

Attachment D – Project Screening Matrix (Draft)

Attachment E – Marketing Materials (Draft)

Attachment F – Customer Application



**ATTACHMENT A  
CUSTOMER AGREEMENT**

## **GEOHERMAL ENERGY DEMONSTRATION PROGRAM SERVICE AGREEMENT**

### **THIS GEOHERMAL DEMONSTRATION PROGRAM SERVICE AGREEMENT**

(“Agreement”) is entered into as of the \_\_\_\_ day of \_\_\_\_, 202\_\_ (“Effective Date”), by and between Boston Gas Company d/b/a National Grid, a Massachusetts corporation, with an address at 40 Sylvan Road, Waltham, Massachusetts 02451 (“Company”) and \_\_\_\_\_, \_\_\_\_\_, with an address at \_\_\_\_\_,

Massachusetts \_\_\_\_ (“Customer”). The Company and Customer are each referred to herein singularly as a “Party” and collectively as “Parties”.

#### Background:

The Company received approval of the Massachusetts Department of Public Utilities (“DPU” or “Department”) for a pilot program for the installation and operation of a geothermal network in D.P.U. 21-24 (the “Program”). Pursuant to the Program, the Company is to install, own and operate certain geothermal network equipment (defined below as the “Geothermal Facilities”), which would provide the primary heating service at a location selected by the Company during the Program demonstration period.

Customer is the owner or has a long-term lease (i.e., a lease term for at least the duration of the Service Period defined below) for that entire property located at \_\_\_\_\_ (“Site”), and desires to participate in the Program.

The Parties hereby agree as follows:

- 1.0 The Company agrees to provide, and the Customer agrees to utilize, a geothermal-based heating service (referred to herein as the “Geothermal Energy Service”) for the Site using the Geothermal Facilities to be installed by the Company and described in Exhibit A hereto, and the Customer’s air handling, distribution, and ventilation system (the “Customer Equipment”) described in Exhibit B hereto (the Geothermal Facilities and the Customer Equipment are collectively referred to herein as the “Geothermal Network”), for a [##] month period commencing on the In-Service Date (the “Service Period”). The Company agrees to provide Customer reimbursement for the costs of new appliances needed to convert from natural gas usage to electric up to the amount described in Exhibit C attached hereto (“Customer Appliances”). The Customer will own the Customer Equipment and Customer Appliances and the Company will own the Geothermal Facilities. Depending on the adequacy of the Customer Equipment and the configuration of the Geothermal Network, the Geothermal Network may also have the capability to provide cooling, but

cooling service is not guaranteed and may be dependent upon the Customer's existing ductwork. The In-Service Date shall be agreed to and established by the Parties following the completion, testing, inspection, and acceptance of the Geothermal Network by the Company. Upon the expiration of the Service Period the Company may, but is not obligated to, continue to provide Geothermal Energy Service on terms acceptable to the Company and Customer. In the event the Company elects not to continue to offer the Geothermal Energy Service, the Company will work cooperatively with the Customer to either find a third party to assume responsibility for the ownership and operation of the Geothermal Facilities or otherwise ensure the Site has heating service in accordance with Exhibit F hereto ("Customer Options at Termination

- 2.0 The terms and conditions applicable to the Geothermal Energy Service shall include the provisions of this Agreement and the following provisions of the Company's Terms and Conditions for Distribution Service (Exhibit D hereto), which are incorporated herein by reference, with the understanding that for the purposes of this Agreement Geothermal Energy Service shall be substituted for references to gas service and the provisions of the Terms and Conditions for Distribution Service have been modified consistent with the provisions and characteristics of the Program:
- Customer Installation (#6)
  - Company Installation (#7)
  - Possession of Gas (#9)
  - Metering and Determination of Deliveries (#11.5)
  - Discontinuance of Service (#18.1 and 18.2)
  - Force Majeure and Limitation of Liability (#20.1 and 20.2)
  - Taxes (#22.1 and 22.2)
- 3.0 The specific location of the Geothermal Facilities and the schedule for installation of the Geothermal Facilities shall be determined by the Company in coordination with the Customer. The delivery point for the Geothermal Energy Service shall be at the energy meter ("Delivery Point"). The Geothermal Facilities are defined as the equipment and piping installed up to the Delivery Point. Customer Equipment is defined as all equipment and piping installed after the Delivery Point both outside and inside of Customer's building(s) including the ground source heat pump(s). The Company agrees, at the Company's expense, to install the Geothermal Facilities and to operate and maintain the Geothermal Facilities for the duration of the Service Period. The Company shall obtain all permits and approvals required for the installation of the Geothermal Facilities. The Company may use contractors to perform installation and maintenance/ repair work and assessment services, and all personnel shall carry proper identification, which shall be shown to the Customer.

- 4.0 The Customer agrees, at the Customer's expense, to maintain the Customer Equipment, including piping, beyond the Delivery Point. The Company has no obligation to operate or maintain the Customer Equipment or Customer Appliances, or to correct any code violations or other deficiencies with the Customer Equipment or Customer Appliances or at the Site.
- 4.1 *[Note: to be inserted if program is in lieu of LPP replacement]* In order to participate in the Program, the Customer understands and agrees that the Customer shall be disconnected from Company's gas distribution system and will no longer have natural gas service for heating, hot water, cooking, clothes drying or any other purpose. The Customer shall be able to reconnect to the Company's gas distribution system and resume gas service during the Service Period if Customer's Geothermal Energy Service is terminated in accordance with the terms of this Agreement and Customer had selected Termination Alternative 1 set forth in Exhibit F. If after the Service Period, the Customer wishes to resume gas service, the Customer will have to comply with the Company's requirements of the Distribution Service Terms and Conditions, M.D.P.U. No. 61, as may be amended or superseded from time to time, to reconnect to the Company's gas system.
- 5.0 The Customer warrants and represents that to the best of the Customer's knowledge there are no obstructions or conditions that would impair the installation or operation of the Geothermal Facilities at the Site, and that there are no hazardous substances or materials, as defined under State or Federal law, located in the area where the Geothermal Facilities are to be installed. In the event such conditions are found, the Company shall have the right to suspend work and to terminate this Agreement, without any further liability to Customer other than restoration of the area disturbed by the Company.
- 6.0 The Customer and the Company shall, prior to the date set for the installation of Geothermal Facilities, coordinate to mark out any private utilities (including, but not limited to, underground electric, sewer, water and septic lines and systems) which are located on the premises where Geothermal Facilities are to be installed in compliance with the Commonwealth of Massachusetts "Dig Safe" law.
- 7.0 The Customer agrees to pay the monthly participant fee and customer charge specified in Exhibit E. The foregoing rates are for the Service Period only and shall not apply to any Geothermal Energy Service offered following the Service Period. The Company may change any fees and charges listed in Exhibit E only after providing notice to Customer and receiving approval from the DPU.
- 7.1 The Company shall render to Customer a statement of charges for the Service Period hereunder for the preceding month. The bill is due and payable upon receipt. The Customer shall be deemed to have received its bill three (3) days after the date of mailing.

- 7.2 All amounts due for sixty (60) days will be considered overdue and thereafter subject to a late payment charge calculated in accordance with the provisions of 220 C.M.R. 26.10, to the extent applicable and as from time to time amended.
- 8.0 Customer grants to the Company and its contractors the right and access to install, repair, replace, maintain, and remove the Geothermal Facilities, the Customer Equipment, if necessary, and communication lines for control and metering purposes at the Site, and to monitor, evaluate and enhance the performance of the Geothermal Network. The Company shall provide advance notice of work at the Site. The Customer agrees to execute easement, lease or license agreements as are necessary to document the Company's right to access the Site, to locate the Geothermal Network at the Site, or to own, operate and maintain the Geothermal Facilities at the Site as provided in this Agreement.
- 9.0 This Agreement must be signed by the Customer or an authorized representative of the Customer, and the Customer agrees to provide documentation of that authority if requested by the Company. In the event the Customer is not the exclusive owner of the Site or is a tenant at the Site, Customer shall notify the Company, and the Company's obligations under this Agreement are subject to obtaining all necessary consents from all applicable owners and tenants. The Customer agrees to cooperate with the Company in obtaining those consents. In the event that the Customer is a tenant, the Customer represents that the Customer's lease rights extend through at least the end of the Service Period. If the Customer owns the Site and desires to sell the Site during the Service Period, the Customer shall notify the Company, and further agrees that this Agreement shall be binding on any successor owner until the end of the Service Period. The Customer agrees to obtain and provide to the Company an assignment and assumption by the successor owner of Customer's obligations under this Agreement. Any other assignment by the Customer of its rights or obligations under this Agreement shall require the advance written consent of the Company.
- 10.0 The Company shall be entitled to any and all energy efficiency program rebates and incentives related to the Geothermal Facilities and Geothermal Energy Service. The Customer agrees to pursue energy efficiency programs to which it is entitled and will have the right to claim energy efficiency program rebates and incentives unrelated to the Geothermal Facilities and Geothermal Energy Service, if any. The Company will work with the Customer to support the Customer's participation in any and all available energy efficiency programs and will reimburse Customer its cost for the incremental percentage of available energy efficiency program costs that are not covered by energy efficiency rebates or incentives set forth in Exhibit H attached hereto.
- 11.0 The Customer agrees to provide information and documentation that the Company may request regarding the installation, repair, maintenance, operation, and performance of the

Geothermal Network, and regarding the Customer's other utility and fuel usage, and further agrees to complete customer satisfaction surveys regarding the Geothermal Energy Service. The Customer further consents to the Company obtaining historically, current, and future electric usage information as needed from the Customer's electric distribution company. Further, the Customer consents to the Company sharing any of this information with the Company's geothermal program contractors and the Customer's electric distribution provider as needed.

12.0 This Agreement embodies the entire agreement between the Parties with respect to the subject matter hereof. There are no third-party beneficiaries to this Agreement. All exhibits to this Agreement are hereby incorporated by this reference into this Agreement. This Agreement may be executed in counterparts, each of which shall be deemed an original.

13.0 Any notice to the Company shall be directed to:

Boston Gas Company d/b/a National Grid  
40 Sylvan Road  
Waltham, MA 02451  
Attn: Owen Brady-Traczyk, Engineering Manager, Distributed Gas Solutions  
Email: [Owen.Brady@nationalgrid.com](mailto:Owen.Brady@nationalgrid.com)

Any notice to the Customer shall be directed to:

[Add]

or such other address as either party may designate by formal written notice.

14.0 The Company is a public utility subject to regulation by the DPU. Compliance by the Company with any order or rule of the DPU or any other regulatory or legislative authority with jurisdiction shall not constitute a breach hereof.

15.0 This Agreement is subject to the laws of the Commonwealth of Massachusetts, without regard to principles of conflicts of law, and shall be subject to the jurisdiction of the DPU and any other governmental entity having jurisdiction over a Party or the subject matter of this Agreement. The sole venue and jurisdiction for any action related to this Agreement shall be in Boston, Massachusetts.

ACCEPTANCE OF THE ABOVE TERMS BY THE AUTHORIZED REPRESENTATIVES  
OF THE PARTIES:

BOSTON GAS COMPANY

By: \_\_\_\_\_

Name:

Title:

[CUSTOMER]

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title (*if applicable*):

EXHIBIT A  
GEOHERMAL FACILITIES  
TO BE INSTALLED BY THE COMPANY



EXHIBIT B

CUSTOMER EQUIPMENT

1. Customer Equipment that preexisted the Program

[Describe the Customer equipment and heating distribution system that pre-existed the Program]

2. Customer Equipment to be installed as part of the Program

EXHIBIT C

NEW CUSTOMER APPLIANCES

The Company will reimburse Customer for the following electric appliances needed to replace Customer's existing gas appliances upon receipt of an invoice and proof of payment by Customer. (For example)

1. Electric Range (including Induction Range) up to \$\_\_\_\_\_ (insert maximum cost)
2. Electric Dryer up to \$\_\_\_\_\_ (insert maximum cost)
3. Electric Water Heater (including Heat Pump Water Heater) up to \$\_\_\_\_\_ (insert maximum cost)

EXHIBIT D  
ADDITIONAL TERMS AND CONDITIONS

## **6.0 CUSTOMER INSTALLATION**

- 6.1 The Company shall furnish and install at its expense any Customer Equipment necessary for Geothermal Energy Service and the Customer shall own, operate and maintain the Customer Equipment, unless otherwise agreed upon in writing by the Company and Customer.
- 6.2 The Company reserves the right to disconnect the Geothermal Energy Service at any time without notice or to refuse to connect its service if, to its knowledge and in its judgment, the Customer's installation has become or is dangerous, defective or in violation of the Company's requirements.
- 6.3 The Company shall not be required to commence or continue Geothermal Energy Service unless and until the Customer has complied with all requirements of any and all governmental authorities and the Company with reference to the use of Geothermal Energy Service on the premises. All inspections, reports, and approvals (where required) must be received in writing by the Company before service shall be commenced or reconnected.
- 6.4 The Customer assumes full responsibility for the proper use of Geothermal Energy Service delivered by the Company and for the condition, suitability and safety of any and all equipment and appliances on the Customer's premises or owned or controlled by the Customer which is not the Company's property. The Customer shall indemnify and save harmless the Company from and against any and all claims, expenses, legal fees, losses, suits, awards or judgments for injuries to or deaths of persons or damage of any kind, whether to property or otherwise, arising directly or indirectly by reason of: (i) the routine presence in or use of Geothermal Energy Service from pipes owned or controlled by the Customer; or (ii) the failure of the Customer to perform any of its duties and obligations as set forth herein where such failure creates safety hazards; or (iii) the Customer's improper use of Geothermal Energy Service or facilities. The Company shall be liable only for direct damages resulting from the Company's conduct of its business pursuant to this section to the extent set forth in Section 20.2.
- 6.5 The Customer shall notify the Company in writing before making any significant change in the Customer's Geothermal Energy Service equipment that would affect the Company's Geothermal Energy Service facilities required to serve the Customer. The Customer shall be liable for any damage to the Company's property caused by Customer's additional or changed installation if made without prior notification to the Company.
- 6.6 The Customer shall not install, own or maintain Geothermal Energy Service piping across or in the public way or any recorded private way without the prior written consent of the Company in each case obtained.

- 6.7 The Customer shall furnish and maintain, at no cost to the Company, the necessary space for housing, fencing, barriers and foundations, as applicable, for Geothermal Energy Services, installed upon the Customer's premises, whether such is furnished by the Customer or the Company. If the Customer refuses, the Company may at its option charge the Customer for acquisition of space needed for furnishing and maintaining the necessary protection of the equipment. Such space, housing, fencing, barriers and foundations shall be in conformity with applicable laws and regulations and subject to the Company's specifications and approval. The Company may also request that Customer bear the cost of the housing, fencing, barriers and foundations as a condition to participation in the Program if such costs are excessive and a result of unique characteristics or conditions peculiar to Customer's premises.

## 7.0 **COMPANY INSTALLATION**

- 7.1 The Company shall install, own, operate and maintain, at its expense, the Geothermal Facilities to the Delivery Point.
- 7.2 Unless otherwise specified herein, the Company will furnish and install, at locations it designates, one or more meters for the purpose of measuring the Geothermal Energy Service delivered.
- 7.3 Whenever the Company determines that an unauthorized use of Geothermal Energy Service is being made on the premises of a Customer, the Company may make such changes in its meters, appliances or other equipment on said premises or take such other corrective action as may be appropriate to ensure the safety and security of the equipment and its installation under the circumstances. Any such changes shall be made at the Customer's expense. Nothing in this paragraph shall be deemed to constitute a waiver of any other rights of redress that may be available to the Company or to limit in any way any legal recourse that may be open to the Company.
- 7.4 Any properly identified employee of the Company shall have access to the premises of the Customer at all reasonable times for the purposes of reading meters, testing the Customer's load, inspecting the Customer's premises and equipment, or of repairing, removing or exchanging any or all equipment belonging to the Company and for the purpose of removing its property on the termination of any service agreement or the discontinuance of service.
- 7.5 The Company will notify the Customer whenever it obtains information indicating that Geothermal Energy Service is being diverted from the Customer's service or that the meter has been tampered with. Unless there is a violation of the Massachusetts Sanitary Code 105 C.M.R. 410.354 for which the Customer is not responsible, the Customer will be held responsible to the Company for any theft of Geothermal Energy Service which may occur beyond the point of the meter installation.
- 7.6 Prior to the installation of the Geothermal Facilities and Customer Equipment, if requested by the Company the Customer shall convey to the Company a perpetual easement or similar property interest for the Geothermal Facilities owned by Company to the Delivery Point
- 7.7 The Company shall not be required to install the equipment necessary to provide its service unless the Customer shall have obtained and provided to the Company at its request all certificates, permits (except street permits) and licenses from governmental authorities and such grants of rights-of-way easements as may be requisite to enable the Company to install and furnish the requested service. The subsequent termination of any certificate, permit, license or right-of-way requisite for such service shall terminate any contract then existing

for such service without any liability on the Company for breach of such contract or failure to furnish service.

- 7.8 The Company shall make, or cause to be made, application for any necessary street permits and shall not be required to supply service until a reasonable time after such permits are granted.
- 7.9 All meters, services and other equipment owned by the Company shall be and will remain the property of the Company, and no one other than an employee or authorized agent of the Company shall be permitted to remove, operate, or maintain such property. The Customer shall not interfere with or alter the meter, seals or other property used in connection with the rendering of service or permit the same to be done by any person other than the authorized agents or employees of the Company. The Customer shall be responsible for all damage to, or loss of, such property unless occasioned by circumstances beyond the Customer's control. Such property shall be installed at points most convenient for the Company's access and service and in conformance with public regulations in force from time to time. The costs of relocating such property shall be borne by the Customer when done at the Customer's request, or for the Customer's convenience, or if necessary to remedy any violation of public law or regulation caused by the Customer.
- 7.10 Unless there is negligence on the part of the Company, the Company shall not be liable for damage to the person or property of the Customer or any other persons resulting from the use of Geothermal Energy Service or the presence of the Company's appliances and equipment on the Customer's premises. In no event shall the Company be liable to any party for any indirect, consequential, or special damages, whether arising in tort, contract or otherwise, by reason of any services performed, or undertaken to be performed, or actions taken by the Company, or its agents or employees, under the Agreement or in accordance with or required by law.
- 7.11 The Company shall maintain the accuracy of all metering equipment installed pursuant hereto by regular testing and calibration in comparison to recognized standards. Any meter tested and found to register less than or equal to 2% above or below the recognized comparative standard shall be considered correct and accurate. A Customer may request the Company to test the accuracy of any of its metering equipment installed upon the Customer's premises. The Company may remove and test its meters at no charge to residential Customers. The Company may charge nonresidential Customers for this testing if the meter tested is found to register less than or equal to 2% above or below the recognized comparative standard, and such test was conducted as part of an investigation into a high bill complaint by the Customer. Any such test shall be conducted according to the standards therefore as established by this paragraph.

In the event that any meter fails to register or registers incorrectly, the Company shall reasonably determine the length of the period during which such meter failed to register or registered incorrectly and the quantity of Geothermal Energy Service delivered during such period, based upon available information, including the Customer's records of Geothermal Energy Service Usage and operation at the Customer's facility. The Customer shall reimburse the Company for any unscheduled maintenance or repairs to telemetering equipment that is required to restore meter operation as a result of faulty telephone or electrical connections, or as a result of the actions of the Customer. The Company shall be responsible for restoring telephone or electrical connections as a result of its actions.



**9.0 POSSESSION OF GEOTHERMAL ENERGY**

- 9.1 Geothermal Energy Service shall be deemed to be in the control and possession of the Company until the Geothermal Energy Service is delivered to the Customer at the Delivery Point. The Company shall not be responsible for the Geothermal Energy Service when the Geothermal Energy Service is not in the Company's control and possession.
- 9.2 The Company shall not be liable to the Customer for any loss arising from or out of Geothermal Energy Service, including loss of Geothermal Energy Service in the possession of the Company or for any other cause, except for the negligence of the Company's own employees or agents.

## **11.5 METERING AND DETERMINATION OF DELIVERIES**

- 11.5.1 If required by the design of the Program the Company shall furnish and install telemetering equipment and any related equipment for the purpose of measuring Geothermal Energy Service Usage at each Customer's Delivery Point. The Company shall require each Customer to install and maintain, at the Customer's expense, reliably available telephone lines, if necessary and feasible, and electrical connections that meet the Company's operating requirements. Telemetering equipment shall remain the property of the Company at all times.
- 11.5.2 Should a Customer request new telemetering equipment or request that a communication device be attached to the existing telemetering equipment, the Company shall provide, install, test, and maintain the requested telemetering equipment or communication device. The requested telemetering equipment or communication device must meet the Company's requirements. The Customer shall have electronic access to the Customer's Geothermal Energy Service Usage information. Upon installation, the telemetering equipment or communication device shall become the property of the Company and will be maintained by the Company. The Company shall complete installation of the telemetering equipment or communication device, if reasonably possible, within thirty (30) days of receiving a written request from the Customer provided that the Customer completes the installation of any required telephone or electrical connections within ten (10) days of such request. The Company shall bill the Customer upon installation.

**18.0 DISCONTINUANCE OF SERVICE**

- 18.1 The Company may discontinue the supply of Geothermal Energy Service and/or remove its equipment from the Customer's premises if the Customer fails to comply with the provisions of the Agreement or any supplementary or special agreement entered into with the Company, subject to any applicable billing and termination procedures of the M.D.P.U. In such event, the Company shall implement the designated Customer Service Termination option identified in Exhibit F of the executed Customer Agreement.
- 18.2 Whenever the Company reasonably determines that a Customer is diverting and/or stealing Geothermal Energy Service, the Company may discontinue its service to such Customer and remove the meter. In such event, the Company shall implement the designated Customer Service Termination option identified in Exhibit G of the executed Customer Agreement.

## **20.0 FORCE MAJEURE AND LIMITATION OF LIABILITY**

20.1 The Company will not be liable for any act, omission, or circumstance occasioned by or inconsequence of any event constituting Force Majeure, and unless it is otherwise expressly provided herein, the obligations of the Company then existing hereunder will be excused during the period thereof to the extent affected by such event of Force Majeure, provided that reasonable diligence is exercised to overcome such event. As used herein, Force Majeure will mean the inability of the Company to fulfill its contractual or regulatory obligations as a result of compliance by either party with an order, regulation, law, code or operating standard imposed by a governmental authority; by reason of any act of God or public enemy; by reason of storm, flood, fire, earthquake, explosion, civil disturbance, labor dispute, breakage or accident to machinery or pipeline (which breakage or accident is not the result of the Company's negligence or misconduct); by reason of any declaration of Force Majeure by upstream transporting pipelines ; or by reason of any other cause, whether the kind enumerated herein or otherwise, not within the control of the party claiming Force Majeure and which by the exercise of reasonable diligence such party is unable to prevent or overcome. Notwithstanding the foregoing, the Customer's obligation to make any payments required under the applicable tariff or by these Terms and Conditions will in no case be excused by an event of Force Majeure. Nor will a failure to settle or prevent any labor dispute or other controversy with employees or with anyone purporting or seeking to represent employees be considered to be a matter within the control of the party claiming excuse. The party claiming Force Majeure will, on request, provide the other party with a written explanation thereof, and of the remedy being undertaken.

20.2 The Company shall be liable only for direct damages resulting from the Company's conduct of business when the Company, its employees or agents have acted in a negligent or intentionally wrongful manner. In no event shall the Company be liable to any party for any indirect, consequential, or special damages, whether arising in tort, contract or otherwise, by reason of any services performed, or undertaken to be performed, or actions taken by the Company, or its agents or employees, under the Agreement or in accordance with or required by law, including, without limitation, termination of the Customer's service.

If the Company is unable to render firm Geothermal Energy Service to the Customer taking such service as contemplated by these Terms and Conditions as a result of Force Majeure, and such inability continues for a period of thirty (30) days, the Customer may provide written notice to the Company of its desire to terminate Geothermal Energy Service at the expiration of thirty (30) days from the Company's receipt of such notice, but no sooner than sixty (60) days following the outset of the Force Majeure. If the Company has not restored Geothermal Energy Service to the Customer at the end of such notice period, the Customer's Geothermal Energy Service will terminate and both parties will be released from further

performance hereunder, except for obligations to pay sums due and owing as of the date of termination. In the event that the Customer discontinues service, the Company shall implement the designated Customer Service Termination option identified in Exhibit F of the executed Customer Agreement.

22.0 **TAXES**

22.1 In the event a tax of any kind is imposed or removed by any governmental authority on the transportation of Geothermal Energy Service or on the gross revenues derived from the transportation of Geothermal Energy Service at retail (exclusive, however, of taxes based on the Company's net income), the rate for service herein stated will be adjusted to reflect said tax. Similarly, the effective rate for service hereunder will be adjusted to reflect any refund of imposition of any surcharges or penalties applicable to service hereunder which are imposed or authorized by any governmental or regulatory authorities.

22.2 The Customer will be responsible for all taxes or assessments that may now or hereafter be levied with respect to the Geothermal Energy Service or the handling or subsequent disposition thereof after its delivery to the Delivery Point. However, if the Company is required by law to collect and/or remit such taxes, the Customer will reimburse the Company for all amounts so paid. If the Customer claims exemption from any such taxes, the Customer will provide the Company in writing its tax exemption number and other appropriate documentation. If the Company collected any taxes or assessments from the Customer and is later informed by the Customer that the Customer is exempt from such taxes, it shall be the Customer's responsibility to obtain any refund from the appropriate governmental taxing agency.

EXHIBIT E

GEOTHERMAL DEMONSTRATION PROGRAM SERVICE AGREEMENT  
MONTHLY RATE SCHEDULE

<b>Rate Type</b>	<b>Participant Fee (per heat pump) (Monthly Charge)</b>	<b>Customer Charge (Monthly Charge)</b>
Residential	\$60.00	\$4.00
Residential Low Income	\$45.00	\$3.00
Commercial/Industrial	\$90.00	\$4.00

*\*Please note that these billing rates will be charged on a monthly basis and will be effective for the duration of the Program. Rate schedules at the end of the Program may change subject to Department approval.*

## EXHIBIT F

### CUSTOMER OPTIONS AT TERMINATION

Should the Customer or Company decide to terminate the Program in accordance with this Agreement during or at the end of the Service Period, the Customer shall have the following options (“Termination Alternatives”). Customer will have the ability to terminate its Geothermal Energy Service only if the conditions outlined in Section 20.2 provision have been met. The Company will provide to Customer a high-level estimate of the costs for Alternatives 1, 2 and 3 for which the Customer would be responsible prior to the Customer’s termination alternative selection. Customer must select one of the three (3) termination alternatives prior to the design of the geothermal system as the Customer’s choice of termination alternative may affect the design of the system as set forth in Section II below.

#### I. Termination Alternatives

##### Termination Alternative 1 – Return to Original Heating System

- a. The Customer will return to the non-ducted heating distribution system that pre-existed the Program (“Original Heating System”). The Company will remove all Program equipment that is no longer of use to the Customer, including the geothermal heat pump, and reconnect and ensure the functionality of the Original Heating System. The Company will not remove any new distribution ductwork installed for the Program. The Customer will incur no costs for this option.
- b. Alternatively, the Customer will return to the ducted Original Heating System. The Company will remove all Program equipment with the exception of any new distribution ductwork installed for the Program and will reuse other Program equipment to the extent possible. The Company will remove the geothermal heat pump and reconnect and ensure the functionality of the Original Heating System, including the installation of a natural gas or delivered fuels furnace (if it were removed during the Program) at no additional cost to the Customer.

Cooling services that were part of the Program will end with the selection of Termination Alternative 1. However, the new distribution ductwork installed for the Program will be available for new cooling services that can be installed at the Customer’s expense. The Customer will experience heating costs consistent with pre-Program participation. The Customer will be responsible for future operations and maintenance costs of the Original Heating System consistent with pre- Program participation.

##### Termination Alternative 2 – Shift to All Electric Air Source Heat Pump (“ASHP”) System



The Customer will move to an air source heat pump for heating and reuse Program equipment and facilities to the extent possible. The Customer will reuse the new distribution ductwork installed for the Program and the Company will replace the geothermal heat pump with a new central electric ASHP system.

Cooling services that were part of the Program will end with the selection of Termination Alternative 2. Cooling services are typically included as part of the ASHP system.

The Customer may be able to take advantage of energy efficiency incentives available for ASHPs. These costs were not included or contemplated by the Program. Selection of Alternative 2 would enable the customer to use the ASHP system for heating and cooling.

### Termination Alternative 3 – Shift to Individual Ground Source Heat Pump (GSHP) System

The Customer moves to an individual, non-networked ground source heating system with a private geothermal ground loop. Termination Alternative 3 is only available if, during the Program's design phase, the Company determines that a ground loop can be located on Customer property. For purposes of the Program, the Company, in its sole discretion, will determine the optimal location of the ground loop. If the Company identifies a viable location on the Customer's property for a ground loop and does not locate a ground loop on the Customer's property as part of the Program, as part of Termination Alternative 3, the Company will install a new private ground loop as soon as practicable upon termination of the Program. The Customer would keep the Program equipment inside the building. Cooling services that were part of the Program will continue with the selection of Termination Alternative 3.

The costs for this alternative are site specific and will be quantified for each customer. The Customer would likely experience operations and maintenance costs and heating and electricity consistent with Program participation. The Customer would be responsible for any future operations and maintenance costs of the geothermal system installed as part of the Program.

## II. Customer Selection and Notice of Termination Alternatives

The Termination Alternative selection will be included as Exhibit G to the existing Customer Agreement.

### Timing and Documentation of Customer Choice

In the design phase of the Program, the Company will explain the Termination Alternatives to the Customer and require a selection. Selecting the Termination Alternative during the design phase will minimize cost and disturbance to the Customer, ensure retention of the infrastructure necessary for the Termination Alternative selected and allow for the installation of Program equipment that, to the extent possible, is compatible with the selected Termination Alternative. The Company will use reasonable business judgment to accommodate Customer's subsequent

request to change a selected Termination Alternative but shall not be obligated to honor a request to change a Termination Alternative. For all customer alternatives, the Company will work to include all available energy efficiency incentives to help minimize costs.

The final Customer Agreement will document the Termination Alternative selected by the Customer. This selection will be included as Exhibit G to the Customer Agreement executed by the Company and the Customer.

EXHIBIT G  
CUSTOMER TERMINATION SELECTION

EXHIBIT H

ITEMIZED LIST OF ENERGY EFFICIENCY UPGRADES TO BE REIMBURSED

National Grid will reimburse Customer for the out-of-pocket costs not covered by rebates or incentives of the following energy efficiency upgrades:

<u>Upgrade</u>	<u>Out-of-pocket Customer costs reimbursed</u>
1.	
2.	
3.	

**ATTACHMENT B  
EASEMENT FOR GEOTHERMAL FACILITIES**

## GRANT OF EASEMENT

**THIS GRANT OF EASEMENT** (this "Easement") is made this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_, residing at \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ (hereinafter referred to as "Grantor"), being the owner of certain land in \_\_\_\_\_, \_\_\_\_\_ County, Massachusetts, more particularly described in a deed dated \_\_\_\_\_, \_\_\_\_\_, recorded with the \_\_\_\_\_ District Registry of Deeds (the "Registry") in Book \_\_\_\_\_, Page \_\_\_\_\_, being also shown as \_\_\_\_\_ on a Plan of Land recorded with the Registry as Plan No. \_\_\_\_ of \_\_\_\_\_ (the "Grantor's Land"), and **BOSTON GAS COMPANY d/b/a NATIONAL GRID**, a Massachusetts corporation, having its principal office at 40 Sylvan Road, Waltham, MA 02451 (hereinafter referred to as "Grantee"). Grantor and Grantee are collectively referred to herein as the "Parties."

**WITNESSETH**, that Grantor, in consideration of one (\$1.00) dollar, that Geothermal Energy Demonstration Program Service Agreement by and between Grantor and Grantee dated \_\_\_\_\_ pursuant to D.P.U. 22-62, and other good and valuable consideration paid by Grantee, does hereby grant and release unto Grantee, its successors and assigns, with quitclaim covenants, an affirmative and perpetual easement and right-of-way on, over, under, across, through and along certain portions of the Grantor's Land (the "Easement Area") for the purposes set forth in this Easement. A sketch showing the approximate location of the Easement Area herein granted is attached hereto and made a part hereof as "Exhibit A." Notwithstanding anything to the contrary in Exhibit A, the final and definitive location(s) of the Easement Area shall become established by and upon the construction and installation of the Geothermal Facilities, as defined herein, and the minimum width of the Easement Area shall be \_\_\_\_\_ feet at any given point along the entire length of the Easement Area, with the center point of the Easement Area being the center point of the Geothermal Facilities, as constructed.

Said easement and right-of-way herein granted include the following permanent, perpetual rights and privileges:

**FIRST:** The permanent and perpetual easement, right, privilege and authority to construct, reconstruct, relocate, operate, repair, maintain, replace, remove, inspect, patrol, abandon metering equipment and underground or grade level geothermal equipment including, but not

limited to, pipes, conduits, vaults, headers, manholes, housings, connectors, markers, anchors, fittings, braces, foundations, valves and vents together with any and all necessary appurtenances and accessories (collectively, the “Geothermal Facilities”) as said Grantee may now and from time-to-time deem necessary and reasonable, all within the Easement Area, to serve the Grantor and others.

**SECOND:** The right to attach to said Geothermal Facilities other geothermal appurtenant facilities, as described above, for the purpose of providing geothermal service to Grantee's other customers or otherwise in connection with Grantee’s distribution or transmission operations.

**THIRD:** The right to convey to other public utilities an interest in the easement and right-of-way herein granted for the purpose of constructing, relocating, operating, repairing, maintaining, replacing and removing other utility facilities including, but not limited to, electric, water, fiber and telecommunications facilities as needed to operate and maintain the Geothermal Facilities and provide Geothermal energy to the Grantor and others.

**FOURTH:** The right of access over Grantor’s remaining property from adjoining streets and other public rights-of-way to the Easement Area as is necessary, in Grantee’s reasonable discretion, for the use and enjoyment of the easement and right-of-way herein granted.

**FIFTH:** The right to clear and keep cleared, by physical, chemical, or other means, the Easement Area of any and all trees, vegetation, roots, aboveground or belowground structures, improvements, or other obstructions and trim and/or remove other trees, roots and vegetation adjacent to the Easement Area that, in the reasonable discretion of Grantee, may interfere with the construction, operation, and maintenance of the Geothermal Facilities. The first clearing may be for less than the full width of the Easement Area and may be widened from time to time to such full width.

**SIXTH:** The right to excavate or change the grade of the Easement Area as is necessary, in Grantee’s reasonable discretion, for any and all purposes described in this agreement; provided, however, that Grantee will, upon completion of such excavation or grading work, backfill and restore any excavated areas to reasonably the same condition as existed prior to such excavation or grading.

**SEVENTH:** Grantor agrees not to erect or maintain within the Easement Area any building, structure or other physical obstruction of any nature or kind including, but not limited to, trees and shrubbery, or permit the same to be so erected or maintained therein, except as Grantee may specifically consent to in writing, it being the Parties' intent to prohibit the longitudinal use or occupancy of the Easement Area by surface or subsurface activities or structures which might damage or interfere with the Geothermal Facilities. Grantor also agrees that the present grade or ground level of the Easement Area will not be changed by excavation, filling or other activity, and Grantor will not otherwise modify the Easement Area without Grantee's prior written consent.

**EIGHTH:** The Geothermal Facilities, as from time to time installed, constructed and maintained by Grantee in the Easement Area, shall at all times be and remain the property of Grantee, and be maintained and serviced exclusively by Grantee, its successors and/or assigns.

**NINTH:** Grantor and Grantee mutually agree to comply with all applicable codes, rules, regulations and laws.

**TENTH:** Grantor and Grantee mutually agree that the easement herein granted is non-exclusive, shall at all times be a continuing covenant running with the Grantor's Land, and shall be binding upon and inure to the benefit of their successors and assigns.

**ELEVENTH:** Grantee, its successors and assigns, are hereby expressly given and granted the right to assign or transfer this easement, or any part thereof, or interest therein, and the same shall be divisible between or among two or more parties, as to any right or rights created hereunder, so that each assignee or party shall have the full right, privilege and authority herein granted, to be owned and enjoyed either in common or severally.

For Grantor's title, see deed dated \_\_\_\_\_, recorded with the [applicable County Clerk's office, Registry of Deeds or Land Court Registry], Book \_\_\_\_\_, Page \_\_\_\_\_.



**IN WITNESS WHEREOF**, Grantor has caused these presents to be duly executed on the day and year first above written.

**{Grantor}**

\_\_\_\_\_

Name:

By: [as applicable]

Title: [as applicable]

COMMONWEALTH OF MASSACHUSETTS)

COUNTY OF \_\_\_\_\_)

On this the \_\_\_\_\_ day of \_\_\_\_\_, 2022, before me, the undersigned Notary Public, personally appeared \_\_\_\_\_ proved to me through satisfactory evidence of identity, which was/were \_\_\_\_\_, to be the person whose name is signed on the preceding Grant of Easement, and acknowledged to me that he signed it voluntarily for its stated purpose, as \_\_\_\_\_ of \_\_\_\_\_.

Signature of Notary Public

Printed Name of Notary

My Commission Expires \_\_\_\_\_

Place Notary Seal and/or Any Stamp Above

Easement  
**EXHIBIT A**

Sketch

## ATTACHMENT C

### SITE EVALUATION AND LICENSE AGREEMENT

**GEOHERMAL DEMONSTRATION PILOT  
SITE EVALUATION AND LICENSE AGREEMENT**

THIS SITE EVALUATION AND LICENSE AGREEMENT (“Agreement”) is entered into as of the \_\_\_\_ day of \_\_\_\_\_, 202\_\_ (“Effective Date”), by and between BOSTON GAS COMPANY, a Massachusetts corporation and gas company, with an address at [40 Sylvan Road, Waltham, MA 02145] (“Company”) and \_\_\_\_\_, a \_\_\_\_\_, with an address at \_\_\_\_\_ Massachusetts \_\_\_\_\_ (“Site Owner”). The Company and Site Owner are each referred to herein singularly as a “Party” and collectively as “Parties”.

**BACKGROUND**

- A. The Company has received approval from the Massachusetts Department of Public Utilities (“DPU”) for a pilot to evaluate the use of a geothermal network for heating and cooling in D.P.U. 21-24 (the “Pilot”).
- B. Site Owner has indicated its desire to participate in the Pilot and has offered to host geothermal network for heating and cooling on property owned or controlled by the Site Owner located at \_\_\_\_\_ in \_\_\_\_\_, Massachusetts, all as more particularly described in a deed dated \_\_\_\_\_ and recorded with the \_\_\_\_\_ Registry of Deeds in Book \_\_\_\_\_, Page \_\_\_\_\_ (“Site”).
- C. In order to determine the feasibility of installing a geothermal network at the Site, the Company needs to perform an assessment of the Site conditions as described in Exhibit A attached hereto and made a part hereof (the “Site Assessment”).
- D. In order to proceed with the Site Assessment, the Company requires permission, in the form of this Agreement, from the Site Owner, to access the Site.
- E. Consistent with the foregoing, the Parties desire to memorialize their mutual agreements and their respective obligations with respect to the Site Assessment.

NOW, THEREFORE, in consideration of the foregoing, the mutual promises set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the Parties hereby agree as follows:

1. The Site Owner hereby grants to the Company, its successors and assigns, the license and permission, from time to time as may be necessary to complete the Site Assessment in conformity with all applicable permits, licenses, ordinances, laws and regulations, and free from any liens for labor or materials, in a manner and location mutually and reasonably acceptable to the Site Owner and the Company. The Site Owner agrees that any field changes in the location of the Facilities shall be subject to prior review and written approval of the Company, which shall not be unreasonably withheld.

2. The Company shall indemnify, defend, and hold harmless the Site Owner from and against any claim, cost, loss, or liability incurred for physical damage or injury caused by the negligence or willful misconduct of the Company, its employees, agents, and contractors in the conduct of the Site Assessment; provided, however, that Company shall not be responsible for the negligent acts or omissions of Site Owner or its employees, agents or contractors at the Site.

3. The Site Owner will cooperate with the Site Assessment and provide such information regarding the Site and Site conditions as the Company requests and shall not obstruct the Site Assessment work.

4. The Company shall procure and maintain at its expense, at all times during the term of this Agreement, comprehensive general liability insurance in terms and amounts commercially reasonable covering any action which may occur or be claimed to have occurred on the Site as a result of the work on the Site by the Company or its contractors. The Site Owner acknowledges that Company may self-insure all or part of its insurance obligations hereunder.

5. In the event hazardous materials or substances are discovered at the Site during the course of the Site Assessment, the Company's sole obligation shall be to comply with the Utility Related Abatement Measures ("URAM") set forth in 310 CMR 40.0460 et seq. as amended from time to time, and all other responsibility and liability with respect to such hazardous materials or substances shall be assumed by the Site Owner.

6. Notices under this Agreement shall be in writing and sufficient if sent by (a) facsimile, with electronic confirmation of receipt (provided that an additional copy of the notice

shall be sent via first class mail, postage prepaid), or (b) by hand delivery or overnight courier delivery, in either case with written confirmation of delivery, to the following addresses:

If to the Company:

Boston Gas Company

40 Sylvan Road

Waltham, MA 02145

Attn: \_\_\_\_\_

If to the Site Owner:

[ADDRESS]

Attn:

Such notices shall be deemed delivered when received or when delivery is refused.

7. This Agreement contains the entire agreement of the parties with respect to the subject matter hereof. This Agreement shall be binding on the parties and their respective successors in title. This Agreement is solely for the benefit of said parties and their respective successors and assigns and may not be enforced by, nor shall it be construed for the benefit of, any third party. This Agreement can be modified only by an instrument in writing signed by both parties. If any term, provision, covenant, or condition of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the rest of this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

8. This Agreement shall be governed by the laws of the Commonwealth of Massachusetts and shall be specifically enforceable.

9. This Agreement may be executed in multiple counterparts, each of which shall have the force and effect of an original and all of which together shall constitute but one and the

same document. A signature sent by facsimile or electronically (pdf) shall have the same force as an original signature.

[Signature Page Follows]

ATTACHMENT D  
PROJECT SCREENING MATRIX



**Only Projects that satisfy at least one of the following four Site Concepts will be evaluated:**

**1. LPP Pipe Replacement; 2. In Constrained Area; 3. LI or EJ Community; or 4. Diverse Load Profile**

**SCORING 1, 2, 3**

<b>Criteria</b>	<b>1</b>	<b>2</b>	<b>3</b>
Customer Diversity (Residential/Multi-Family/C&I)	Only one facility type in a networked system	One multi-family/C&I in a networked system with the remainder residential	Multiple of each facility type in a networked system
Avoid Under-appreciated Asset Replacement	Replacing new steel/plastic mains	-----	Not replacing coated steel/new plastic mains
Customer Willingness	Customer willingness unknown; it would be difficult to convert most facilities' equipment to geothermal	Some customers known to be willing; mix of difficulty in converting facilities' equipment to geothermal	Customers willing; it would be easy to convert most facilities' equipment to geothermal
Not a Single Facility	Individual geothermal facility/campus	-----	Networked geothermal system
Ability to Cut and Cap (vs. Continued Need for Main to serve other gas customers)	Main needed to serve gas customers	-----	Isolated main - no longer needed to serve gas customers
Certainty of Property Availability	Not much property available for shared loop/equipment	Some potential property for shared loop/equipment	Ample property available for shared loop/equipment
Ease of permitting (includes ROWs)	High level of permitting complexity	Medium level of permitting complexity	Low level of permitting complexity
Community Stakeholder Acceptance	Low community stakeholder acceptance/hesitation to implement geothermal	Medium community stakeholder acceptance/desire to implement geothermal	High community stakeholder acceptance/strong desire to implement geothermal

Proximity to Cast Iron (safety/requirements)	Project would be in very close proximity to cast iron pipe existing on the system (high potential of encroachments)	Project would be in very close proximity to some cast iron pipe existing on the system (medium potential of encroachments)	Project not close to cast iron pipe existing on the system (low to no potential of encroachments)
Criteria	1	2	3
Construction Challenges	High level of construction complexity	Medium level of construction complexity	Low level of construction complexity
NG is Electric Provider	National Grid is only gas	-----	National Grid is both gas and electric utility
Existing/Newly applied Customers	No existing gas customers	Redevelopment projects	All existing gas customers
More Than One EJ Community Type Met	Near an EJ Community	1 EJ Community Types Met	2+ EJ Community Types Met
Covers Required Criteria	At least 2 required criteria are met	At least 3 required criteria are met	All 4 required criteria are met
Age of Equipment to Be Replaced	Most facilities in the area have newer equipment; least likely to need incentives and participate	Most facilities in the area have mid-aged equipment; not as likely to need incentives and participate	Most facilities in the area have older equipment; likely to take advantage of incentives and participate

ATTACHMENT E  
MARKETING MATERIALS

## Cost to Participate

Selected program participants will pay a participant fee (per heat pump) and customer charge for the geothermal energy service in accordance with the following rate schedule:

### Program Participant Monthly Charge Rate

Rate Type	Participant Fee	Customer Charge
Residential	\$60.00	\$4.00
Residential Low Income	\$45.00	\$3.00
Commercial /Industrial	\$90.00	\$4.00

### Timeframe

The Geothermal Program will last five years. National Grid anticipates selecting the first project location by early 2023. National Grid will maintain open communication and work with each customer to keep disturbance from construction to a minimum.

### Program Termination Options

National Grid is committed to advancing geothermal networks as part of its Clean Energy Vision. Under certain conditions, National Grid or the customer may decide to stop using geothermal energy during the term of the Geothermal Program. In those instances, the customer will be able to choose to return to their original heating system, shift to an all-electric air source heat pump, or disconnect from the geothermal network and shift to an individual ground source heat pump if site conditions allow. Estimates of costs of each termination alternative and the conditions that may result in termination will be provided prior to your agreement to participate.

Boston Gas Company  
d/b/a National Grid  
D.P.U. 22-62  
Attachment NG-1-E  
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## Contact

For further information, please contact us at [geothermal@nationalgrid.com](mailto:geothermal@nationalgrid.com) or visit the Geothermal Program website at *[to be inserted]*.

**Deadline for submitting  
an application is  
November 30, 2022.**

# Networked Geothermal Energy Demonstration Program

As part of National Grid's plan to achieve net zero greenhouse gas emissions by 2050, we are evaluating the potential for networked geothermal energy to provide highly efficient space heating and cooling to multiple customers connected to a networked system.

## About the Demonstration Program

The Massachusetts Department of Public Utilities approved National Grid's five-year Networked Geothermal Energy Demonstration Program ("Geothermal Program"). The Geothermal Program will explore if a geothermal network can be used to replace a customer's natural gas service. As part of the Geothermal Program, National Grid currently plans to install and operate geothermal networks to provide indoor heating and cooling at four separate locations each serving 20-40 residential and commercial customers. Priority for participation will be given to natural gas customers.

The Geothermal Program will allow National Grid to:

- assess the thermal performance and economics of shared loops serving a large number of customers with diverse load profiles;
- switch gas customers to geothermal energy as an alternative to leak prone pipe replacement;
- install shared loops to manage local gas system constraints and peaks; and
- install shared loops to lower operating costs and greenhouse gas emissions for low-income customers and environmental justice communities.

*Illustrative Diagram*

□

## What to Expect

### *Inside the Building*

National Grid will install a geothermal heat pump and associated equipment within the customer's building(s). If possible, existing heating and cooling systems will be reused; however, if conversion is needed (i.e. most hot water and all steam heating), National Grid will fund the installation of needed equipment (see below). National Grid will work with building owners to maintain in-building geothermal equipment during the Geothermal Program. After the Geothermal Program, the building owner will be responsible for in-building equipment operations and maintenance.

### *Outside the Building*

Vertical ground loops will be installed in the existing right-of-way and on private property within easement areas. During and after the Geothermal Program, National Grid will be responsible for the exterior equipment up to the customer's meter (piping, pumps, control panels, cooling towers).

### **Program Funding**

The Geothermal Program will provide funding for: 1) the geothermal shared loop, 2) the ground source heat pump and associated equipment not covered by rebates or incentives, 3) replacement of gas water heaters with ground source pump water heating, 4) conversion of certain customer appliances (i.e. gas stoves, ovens and dryers) from gas to electric in instances where customers are disconnecting from natural gas service, 5) new or upgraded radiators and or air ducts as needed, and 6) certain energy efficiency improvements not covered by rebates or incentives.

Boston Gas Company  
d/b/a National Grid  
D.P.U. 22-62  
Attachment NG-1-E  
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## How it Works

A geothermal system uses a buried piping network, which circulates water and a non-toxic additive to prevent freezing, to carry heat from the earth, concentrate it by a geothermal heat pump, and exchange it between the building and the ground. The constant temperature of the ground is used as a heat source during winter and a place to transfer indoor heat from the building to the ground for cooling during the summer.

*Illustrative diagram*

## Effect on Electricity Costs

Since customers will no longer be using natural gas to heat their building(s); and also possibly to operate their stove, oven or dryer, customers' natural gas bills will be reduced or eliminated. However, because the geothermal system is run by electricity, electric costs will increase. Existing networked geothermal systems show that total energy costs can decrease 40% due to the efficiency of the system. If selected as a potential program participant, National Grid will further evaluate your total energy costs from your participation in this program prior to your agreement to participate.

ATTACHMENT F  
CUSTOMER APPLICATION

## National Grid Massachusetts

### Networked Geothermal Energy Demonstration Program

#### Initial Screening Application



**National Grid is seeking applicants who are interested in submitting an initial application for Program consideration.**

#### **Background:**

National Grid has been approved by the Department of Public Utilities (DPU) to develop a networked geothermal energy demonstration program (“Program”) for a period spanning five years. The Program likely will involve the selection of four separate projects that may serve between 20-40 customers on a networked geothermal loop that will replace their existing building heating and cooling. Projects involving existing or potentially new customers looking to convert to natural gas will be prioritized and projects will be selected on the basis of their ability to provide learnings and satisfy at least one of the four main criteria approved by the DPU and described in the Screening Criteria section below.

#### **Screening Criteria:**

Only project proposals that satisfy at least one of the following four criteria as specified in the DPU’s Order will be considered for selection:

- (1) assessing the thermal performance and economics of shared loops serving a larger number of customers with more diverse load profiles than the project completed by National Grid in Long Island, New York, which evaluated a shared loop of 10 residential single family buildings;
- (2) switching gas customers to geothermal energy as an alternative to leak prone pipe replacement;
- (3) installing shared loops to manage local gas system constraints and peaks; and
- (4) installing shared loops to lower operating costs and greenhouse gas emissions for low-income customers and environmental justice communities.

Project proposals that satisfy at least one of the above four criteria will be evaluated on individual criteria\* including, but not limited to:

(i) customer diversity (residential and commercial & industrial mix), (ii) avoidance of under-appreciated asset replacement, (iii) customer willingness, (iv) whether project is part of a network and not a single facility, (v) ability to cut and cap the natural gas main, (vi) availability of space for geothermal equipment, (vii) ease of permitting, (viii) community stakeholder acceptance, (ix) proximity to cast iron, (x) construction challenges, (xi) potential or existing National Grid natural gas customers, and (xii) whether National Grid also is the electric provider to the customer(s).

*\*Note: These initial screening criteria may be modified during program development*

Question	Response
Organization name (if applicable), name, title (if applicable), telephone number, and email address of primary contact(s)	
Address (street, city, state, zip)	
Are you an existing National Grid natural gas customer?	
If you are not currently a National Grid gas customer, have you applied for natural gas service? If yes, please provide the current energy source for your heating and the date that you submitted your application.	
Description of project	
Names of Owner(s) of property within the project area	
Location of Project (include, town, all street addresses within the town included in the project area)	
Site size (square footage and number of buildings), site description and approximate age of infrastructure	
Description of customer and customer class (residential/commercial & industrial)	



Description of heating and cooling load; monthly Btu usage, if known; and current heating and cooling equipment. Will other appliances (i.e. gas dryer, gas stove, gas oven, gas water heater) require replacement?	
<b>Question</b>	<b>Response</b>
Will co-funding for this project be available?	
Has a geothermal feasibility study been done on this site previously? Please describe any existing operational geothermal equipment.	
Who is your current electric service provider?	
Additional comments	

Please submit your completed Initial Screening Application to [geothermal@nationalgrid.com](mailto:geothermal@nationalgrid.com). A representative from National Grid will reach out to discuss your project proposal.

**Program Cost Information:**

The Program will provide funding for the installation of geothermal facilities, related geothermal equipment, and certain electric appliances to customers accepted into the program. These include: (1) the geothermal shared loop, (2) the ground source heat pump (“GSHP”) and associated equipment not covered by rebates or incentives, (3) replacement of gas water heaters with GSHP water heating, (4) conversion of certain customer appliances (such as gas stoves, ovens and dryers) from gas to electric in instances where customers are disconnecting from natural gas service, (5) new or upgraded radiators and or air ducts as needed, and (6) certain energy efficiency improvements not covered by rebates or incentives.

Selected program participants will pay a participant fee and customer charge for the geothermal energy service in accordance with the following rate schedule:

**Program Participant Monthly Rate Schedule**

<b>Rate Type</b>	<b>Participant Fee (per heat pump) (Monthly Charge)</b>	<b>Customer Charge (Monthly Charge)</b>
Residential	\$60.00	\$4.00
Residential Low Income	\$45.00	\$3.00
Commercial/Industrial	\$90.00	\$4.00

Note: customer monthly electricity costs may increase due to operation of new heating and/or cooling equipment, although overall heating and/or cooling total energy costs may decrease. If selected as a potential program participant, National Grid will further evaluate your total energy costs from your participation in this program including the above monthly fees, your gas usage savings, and the increase in electric usage costs attributable to the geothermal system.