STATE OF CALIFORNIA
GRANT REQUEST FORM (GRF)
CEC-270 (Revised 12/2019) CALIFORNIA ENERGY COMMISSION

A) New Agreement # PIR-19-008

B) Division	Agreement Manager:	MS-	Phone
ERDD	Bradley Meister	51	916-327-1722

C) Recipient's Legal Name	Federal ID Number
Institute of Gas Technology dba Gas Technology Institute	36-2170137

D) Title of Project
A Systems-Efficient Approach to Hospital De-carbonization

E) Term and Amount

Start Date	End Date	Amount
6/30/2020	3/31/2024	$ 1,424,704

F) Business Meeting Information

☐ ARFVTP agreements $75K and under delegated to Executive Director

Proposed Business Meeting Date 6/10/2020 ☐ Consent ☒ Discussion

Business Meeting Presenter Bradley Meister Time Needed: 5 minutes

Please select one list serve. NaturalGas (NG Research Program

Agenda Item Subject and Description:
Institute of Gas Technology dba Gas Technology Institute
GAS TECHNOLOGY INSTITUTE. Proposed resolution approving agreement PIR-19-008 with Institute of Gas Technology dba Gas Technology Institute for a $1,424,704 grant to demonstrate replicable emerging space and water heating solutions for large commercial buildings, resulting in increased deployment of such advanced technologies to decarbonize existing large commercial buildings and adopting Staff's determination that this action is exempt from CEQA. (PIER NG funding) Contact: Bradley Meister.

G) California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
   ☒ Yes (skip to question 2)
   ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

   Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:
   a) ☒ Agreement **IS** exempt.
   ☐ Statutory Exemption. List PRC and/or CCR section number:
   ☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit 14, § 15301 ; Cal. Code Regs., tit 14, § 15306
   ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

   Explain reason why Agreement is exempt under the above section: This project fits within Cal. Code Regs., tit. 14, sect. 15301 because it involves minor construction and equipment installation at an existing facility, with no expansion of

capacity. This installation is at an existing, developed urban site on land that is not environmentally sensitive. No historic resources or buildings will be affected. Noise and odors will not be generated by these installations in excess of existing permitted amounts. The installation will not increase traffic to the sites. The installation will not require permits for air, water, conditional use, building expansion, hazardous waste, or rezoning. In addition, this project fits within Cal. Code Regs., tit. 14, sect. 15306 because it involves basic data collection which will not result in a serious or major disturbance to an environmental resource.

b) Agreement **IS NOT** exempt. (consult with the legal office to determine next steps)

Check all that apply

- ☐ Initial Study
- ☐ Negative Declaration
- ☐ Mitigated Negative Declaration
- ☐ Environmental Impact Report
- ☐ Statement of Overriding Considerations

H) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	**Budget**
P2S Engineering	$ 646,426
Stok	$ 150,000
	$
	$

I) List all key partners: (attach additional sheets as necessary)

Legal Company Name:

J) Budget Information

Funding Source	**Funding Year of Appropriation**	**Budget List Number**	**Amount**
NG Subaccount, PIERDD	18-19	501.001M	$1,424,704
			$
			$

R&D Program Area: EERO: Buildings TOTAL: $ 1,424,704

Explanation for “Other” selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Isaac Mahderekal
Address: 123 C St

City, State, Zip: Davis, CA 95616-4632
Phone: 530-758-2392 x206
E-Mail: Isaac.Mahderekal@gastechnology.org

2. Recipient's Project Manager

Name: Issac Mahderekal
Address: 412 F St

City, State, Zip: Davis, CA 95616-4112
Phone: 530-330-4110
E-Mail: Imahderekal@gti.energy

L) Selection Process Used

☒ Competitive Solicitation Solicitation #: GFO-19-504
☐ First Come First Served Solicitation Solicitation #:

M) The following items should be attached to this GRF

1.	Exhibit A, Scope of Work		☒ Attached
2.	Exhibit B, Budget Detail		☒ Attached
3.	CEC 105, Questionnaire for Identifying Conflicts		☒ Attached
4.	Recipient Resolution	☒ N/A	☐ Attached
5.	CEQA Documentation	☐ N/A	☒ Attached

_____ _____
Agreement Manager **Date**

_____ _____
Office Manager **Date**

_____ _____
Deputy Director **Date**

EXHIBIT A
Scope of Work
Gas Technology Institute

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Site Baseline Characterization
3	X	System Design and Engineering
4	X	Installation and Commissioning
5		Measurement and Verification
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AHU	Air Handler Unit
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CAV	Constant Air Volume
CO2e	Carbon Dioxide Equivalent
CPR	Critical Project Review
CUP	Central Utility Plant
DHW	Domestic Hot Water
ft^2	Square Feet
GHG	Greenhouse Gas
HHW	Heating Hot Water
HVAC	Heating, Ventilation and Air Conditioning
IESVE	IES Virtual Environment
kBtu	Thousand British thermal units
LCCA	Life Cycle Cost Analysis
M&V	Measurement and Verification
MM	Million
MT	Metric ton
MWh	Megawatt-hour
NOx	Nitrogen oxides
SQL	Structured Query Language
TAC	Technical Advisory Committee
TRL	Technology Readiness Level
VAV	Variable Air Volume

[1] Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

EXHIBIT A
Scope of Work
Gas Technology Institute

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to demonstrate an integrated suite of advanced measures that include heat recovery in the central utility plant, improvements to air handlers and optimized control strategies and system design. Integration of these measures can be replicable to other hospitals and large commercial buildings and can reduce heating and hot water loads and significantly reduce energy use and greenhouse gas emissions.

B. Problem/ Solution Statement

Problem

Large commercial buildings such as hospitals, institutional buildings, offices, and correctional facilities use large amounts of natural gas for space and water heating, and other large loads such as cooking and production of steam for sterilization. Hospitals, due to the nature of their work and running on a 24-hour basis, have higher energy intensity per square foot than any other building in the commercial sector. They use an average of 234.1 kBtu/ft2 of energy, which is 2.6 times higher than the typical commercial building at 78 kBtu/ft2. In the United States, the health care industry accounts for nearly 10% of total greenhouse gas (GHG) emissions, with emissions increasing by 30% between 2006 and 2016. For California to meet its GHG reduction goals, significant strides must be made in this sector.

Systems to provide heating hot water (HHW) and domestic hot water (DHW) consume a large portion of the total site energy. According to the University of Washington, the average U.S. hospital uses 42.3% of its total source energy draw for the reheat system and 10.6% for Heating, Ventilation and Air Conditioning (HVAC) units. Hospital design requirements and the current practice of relying on relatively old standards in this sector contribute to large energy requirements by HVAC systems in U.S. hospitals. As a result, hospitals over-ventilate most of their spaces. The demonstration site for this project is an example of this. Built in 1994, Kaiser Permanente Baldwin Park uses the typical space and water heating system for its era. They use a chiller/boiler hydronic system with constant volume (CAV) air handlers (AHU) providing 24-hour ventilation with significant reheat. Innovative whole-building systems approaches are necessary to reduce the GHG footprint of existing buildings such as this one.

Solution

Although concentrating on incremental component efficiency has yielded strong results to date, and may yield further incremental, small improvements, a holistic systems-efficient building or whole-building strategy for existing buildings promises to be the path to significant building energy efficiency. To achieve a systems-efficient building, multiple systems must be designed, installed, and operated to optimize performance collectively with other energy systems both within and outside of the building. This project has identified a suite of measures that together represent a cost-effective and successful reduction in natural gas use and therefore a significant reduction in GHG emissions from the subject hospital.

The goal of the proposed integrated technologies and system design approach is to reduce the natural gas consumption and GHG emissions of the host site by over 30%. This will be primarily

accomplished by heat recovery measures in the central utility plant (CUP) to save heat energy on the domestic hot water and heating hot water systems including a heat recovery chiller and integrating stack economizers to reduce steam boiler fuel requirements, implementation of variable air volume system (VAV), designing air handlers with separate cold and hot decks to optimize economizer mode, and model-based optimal control strategy to minimize building HVAC energy consumption. These integrated technologies were selected based on preliminary whole building modeling and evaluation of historical energy consumption of the Baldwin Park medical center.

Implementation of this project will overcome barriers for decarbonization of large commercial buildings by demonstrating an integrated solution for reducing heating and hot water loads to significantly reduce the energy use and emissions from the hospital host-site.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to reduce natural gas usage by at least 30% in hospitals and other large commercial buildings in California using replicable emerging technologies with a simple payback of less than 7 years.

Ratepayer Benefits: This Agreement will result in the ratepayer benefits of lower natural gas use and costs and reduced GHG emissions by replacing existing systems with proposed retrofit options developed for this project.

Site level benefits:

There are significant potential site-level benefits for hospitals and other large buildings by replacing existing equipment with emerging high efficiency systems and demonstrating cost effectiveness.. For the Kaiser Permanente Baldwin Park Medical Center, site level annual gas and electricity savings can be as high as 285,000 therms and 8,000 MWh, respectively. This presents the potential for savings of over $1.5 MM in utility cost and close to 3,400 MT CO2e avoided by the site every year.

Statewide Benefits:

Cumulative statewide benefits after 10 years for proposed solutions are likewise very promising. Projecting total gas savings and avoided emissions from 2025-2034 from just the hospital market (341 hospitals in California), the potential benefits accumulate to close to 245 MMtherms and 7 million MWh. This represents almost 2.9 million metric tons of CO2e and 1,900 metric tons of NOx avoided. These numbers represent the potential benefits assuming 25% adoption of these measures, with adoption focused in older vintage hospitals with high energy intensity.

These measures can also benefit market segments such as large offices, hotels and other large buildings with high HVAC and water heating loads. Expanding the potential benefits to include hospitals, hotels, and large offices, an assumed 10% penetration would affect 1,141 buildings and has the potential to result in almost 3.28 billion therms of natural gas savings and 9.28 million MWh of electricity savings over 10 years. This represents up to 19.5 million MT CO2e and 20,800 MT NOx avoided.

Technological Advancement and Breakthroughs: This project leads to technological advancements through the development and demonstration of a novel integrated HVAC/water

heating technologies and a model based control system that can significantly reduce natural gas use. This project is expected to demonstrate a technically and economically feasible method for existing hospital and commercial building stock, currently using conventional chiller/boiler hydronic systems with constant volume air handlers, to achieve a systems-efficient building, with multiple systems designed, installed, and operated to optimize performance collectively with other energy systems both within and outside of the building. This integrated approach will overcome the challenges and barriers of implementing energy efficiency measures by providing greater energy cost savings and shorter payback periods than single component efficiency approaches.

Agreement Objectives

The objectives of this Agreement are to:

- Design, model, implement and demonstrate novel integrated HVAC technologies and model-based control system for large hospital building application to significantly reduce energy use and GHG emissions.
- Advance the technologies integrated with model-based optimal control from TRL7 to TRL9 by the end of the project.
- Monitor and report actual annual energy and cost savings and GHG reductions from the installation of advanced technologies at the demonstration site
- Demonstrate that the heat recovery measures in the central utility plant, including a heat recovery chiller and integrating stack economizers to reduce steam boiler fuel requirements, implementation of variable air volume system, designing air handlers with separate cold and hot decks to optimize economizer mode, and model-based optimal control strategy to minimize building HVAC energy consumption will reduce overall natural gas use at the demonstration site by 30% result in an average simple payback of 7 years based on energy costs.
- Showcase the retrofit measures and energy savings through outreach to encourage similar implementation of energy saving measures at other hospitals and large commercial buildings.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V).** Products that require a draft version are indicated by marking **"(draft and final)"** after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, **"days"** means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the

draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.

- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following Instructions for Submitting Electronic Files and Developing Software:

  - **Electronic File Format**
    - Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission's software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

    The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:
    - Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
    - Text documents will be in MS Word file format, version 2007 or later.
    - Documents intended for public distribution will be in PDF file format.
    - The Recipient must also provide the native Microsoft file format.
    - Project management documents will be in Microsoft Project file format, version 2007 or later.

  - **Software Application Development**

    Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
    - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
    - Microsoft Internet Information Services, (version 6 and up) Recommend 7.5.
    - Visual Studio.NET (version 2008 and up). Recommend 2010.

- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The administrative portion of the meeting will include discussion of the following:
  - Terms and conditions of the Agreement;
  - Administrative products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Match fund documentation (subtask 1.7);
  - Permit documentation (subtask 1.8);
  - Subcontracts (subtask 1.9); and
  - Any other relevant topics.

  The technical portion of the meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports and invoices (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide an *Updated Project Schedule, List of Match Funds,* and *List of Permits*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Updated Project Schedule *(if applicable)*
- Updated List of Match Funds *(if applicable)*
- Updated List of Permits *(if applicable)*

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive Energy Commission funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient, and may include the CAO and any other individuals selected by the CAM to provide support to the Energy Commission.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the Energy Commission, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM

concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:
- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

CAM Products:
- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting
The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:
- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.
  - The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
  - The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
    - Disposition of any state-owned equipment.
    - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
    - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
    - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
    - "Surviving" Agreement provisions such as repayment provisions and confidential products.
    - Final invoicing and release of retention.

- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:
- Final Meeting Agreement Summary *(if applicable)*
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:
- Submit a monthly *Progress Report* to the CAM. Each progress report must:
  - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions, including a financial report on Match Fund and in-state expenditures.

Products:
- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:
- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM. *(See Task 1.1 for requirements for draft and final products.)*

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (**required**)
    - Credits page on the reverse side of cover with legal disclaimer (**required**)
    - Acknowledgements page (optional)
    - Preface (**required**)
    - Abstract, keywords, and citation page (**required**)
    - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
    - Executive summary (**required**)
    - Body of the report (**required**)
    - References (if applicable)
    - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
    - Bibliography (if applicable)
    - Appendices (if applicable) (Create a separate volume if very large.)
    - Attachments (if applicable)
  - Ensure that the document is written in the third person.
  - Ensure that the Executive Summary is understandable to the lay public.
    - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
    - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
    - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
  - Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
  - Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
  - Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not

incorporated into the final product
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:
- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:
- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

The Recipient shall:
- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

  If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:
  - A list of the match funds that identifies:
    - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
    - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
    - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.

- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter *(if applicable)*
- Match Funds Reduction Notification Letter *(if applicable)*

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
    - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
    - The schedule the Recipient will follow in applying for and obtaining the permits.

  The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits *(if applicable)*
- Updated Schedule for Acquiring Permits *(if applicable)*
- Copy of Each Approved Permit *(if applicable)*

Subtask 1.9 Subcontracts

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.

- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts *(draft if required by the CAM)*

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be

discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Products:
- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings
The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:
- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project’s strategic goals.

Products:
- TAC Meeting Schedule (draft and final)

- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

IV. TECHNICAL TASKS

TASK 2 SITE BASELINE CHARACTERIZATION

The goal of this task is to characterize the current baseline energy use and emissions for the demonstration hospital site regarding natural gas use before implementation of the retrofit measures.

The Recipient shall:

- Develop a *Hospital Baseline Energy Usage Monitoring Plan* for collecting baseline energy usage data for space heating and water heating equipment. Information to be collected and measured may include, but is not limited to:
  - Description of the current facility, major energy using equipment, and instrumentation and controls
  - Macro-level site data, including 3 years of natural gas and electric and water utility bills, showing usage and cost.
  - Measurements and instrumentation of major equipment including boiler gas use, chiller electricity and gas use, and subset of AHU run time measurement
  - Procedure to determine and verify baseline energy usage for different end uses, specifically space heating and water heating
  - Description of the data analysis procedures to establish baseline energy use, including all assumptions
- Conduct two site visits for host site evaluation for baseline measurement and verification (M&V) instrumentation and to meet with the installation contractor prior to beginning installation of equipment to coordinate and review the installation scope of work.
- Collect detailed energy use data according to the Hospital Baseline Energy Usage Monitoring Plan
  - Install equipment and instrumentation according to the monitoring plan
  - Collect a minimum of 6 months of data to understand energy use during heating and cooling seasons
- Create a calibrated energy model of the facility based on the historic energy use data in a recognized software for commercial buildings, such as EnergyPlus or IES Virtual Environment (IESVE). This model will be an hourly energy simulation representing the current hospital floorplan and mechanical equipment calibrated to actual electrical and natural gas usage for the most recent year for which weather and utility data are available. Subsequently, create a baseline energy model by updating the calibrated model to reflect the floor plan expansion and baseline conditions to meet the host hospital minimum operating requirements for the facility, but excluding the energy efficiency upgrades planned for this project.
- Prepare a *Hospital Baseline Energy Usage and Modeling Report*, including, but not limited to, the following:
  - Description of the current hospital space and water heating equipment

- Description of historical energy use
- Evaluation of 6+ months of monitoring data
- Description of the energy modeling results for the calibrated and baseline energy models, including all assumptions and the specific simulation program used
- Yearly baseline air emissions for the hospital, including criteria pollutants and GHG

Products:

- Hospital Baseline Energy Usage Monitoring Plan (draft and final)
- Hospital Baseline Energy Usage and Modeling Report (draft and final)

TASK 3 SYSTEM DESIGN AND ENGINEERING

The goals of this task are to develop an M&V plan for monitoring new systems and perform the design work for the efficiency upgrades.

Subtask 3.1 Demonstration Test Plan

The goal of this subtask is to prepare a detailed test plan to allow for field evaluation of the system performance relative to the demonstration performance objectives.

The Recipient shall:

- Prepare a detailed *Demonstration Test Plan*, including the M&V details to be fulfilled by the M&V subcontractor. The Test Plan will consist of, but is not limited to:
  - Performance objectives
  - Description of the facilities, equipment, and instrumentation required for the system evaluation including the diagrams necessary for installation, test point locations, equipment calibration certificates, and data for error calculations.
  - Description of the data analysis procedures to determine and verify savings
  - References
- Evaluate the Draft Demonstration Test Plan with the project team for appropriateness of instruments, parameters, duration of measurements, and procedures planned for comparing technical and economic performance and prepare the Final Demonstration Test Plan that incorporates comments from the project team.
- Prepare a *CPR Report* #1 and participate in a CPR meeting in accordance with subtask 1.3 (CPR Meetings).
-

Products:

- Demonstration Test Plan (draft and final)
- CPR Report #1

Subtask 3.2 Energy Modeling

The goal of this subtask is to create hourly energy models for each technology upgrade being performed to be used to evaluate potential energy savings and payback of proposed designs based on life cycle cost analysis (LCCA).

The Recipient shall:

- Prepare energy models in a recognized software for commercial buildings such as EnergyPlus or IESVE for proposed measures, including AHU upgrades to VAV and CUP upgrades (chiller plant configuration, heat recovery chiller, and boiler stack economizers).
- Provide input into LCCA studies including estimates of energy and cost savings from implementation of emerging technologies compared to the baseline model.
- Prepare *Hospital Energy Modeling Report* describing the results of initial modeling activities and LCCA studies including:
    - Description of baseline modeling assumptions and agreement with actual site data
    - Description of each upgrade case modeled with energy savings and LCCA, including methodology used in determining LCCA for each upgrade, assumptions used and how payback will be calculated

Products:

- Hospital Energy Modeling Report (draft and final)

Subtask 3.3 Design of Air Handler Upgrades

The goal of this subtask is to generate the demonstration site engineering package for the upgraded AHUs with VAV and advanced controls meeting California's Office of Statewide Health Planning and Development (OSHPD) requirements.

The Recipient shall:

- Evaluate facility ventilation and space heating load demand and prepare system specifications for new or retrofitted AHUs with VAV and upgraded controls, including:
    - Design of the upgraded direct digital control-controlled VAV boxes for the retrofit of CAV boxes
    - Specification of new semi-custom, premanufactured AHU units or AHU unit refurbishment with dual duct, dual mixing box, hot and cold deck draw-through fan array systems for better control, less fan energy consumption, more hours of economizer, and better operation.
    - Replace relevant exhaust fans, fan-coil units, and humidifiers with new pieces of equipment.
- Prepare *AHU Upgrade Basic Design Package,* which includes:
    - Site layout drawings indicating system integration with the existing host facility HVAC system and utility connections, and locations for installation of instrumentation in accordance with the Demonstration Test Plan.
    - Bill of materials identifying the ancillary equipment (pressure/flow regulators, valves, etc.) and materials (pipe, fittings, etc.) required for the installation.
    - Specifications for the instrumentation in accordance with the Demonstration Test Plan.
    - Description of any other activities and/or resources required to decommission and remove pre-existing equipment and support installation of the AHUs.
    - Discuss TRL at the start and conclusion of the AHU upgrades
    - Incorporation of comments and approval from OSHPD

Products:

- AHU Upgrade Site Basic Design Package

Subtask 3.4 Design of CUP Heat Recovery Systems
The goal of this subtask is to generate the demonstration site engineering package for the central utility plant heat recovery upgrades, including heat recovery chiller and boiler flue heat recovery.

The Recipient shall:

- Evaluate facility DHW and HHW loads and prepare system specifications for CUP heat recovery system.
  - Design of the heat recovery chiller
  - Specifications for the economizers and draft fan to recover heat from the boiler flue gas
  - Design and optimization of the heat integration between the DHW and HHW systems to maximize savings.
- Prepare *CUP Heat Recovery Basic Design Package* which include:
  - Site layout drawings indicating system integration with the existing host facility CUP DHW, HHW, and chilled water systems and utility connections, and locations for installation of instrumentation in accordance with the Demonstration Test Plan.
  - Bill of materials identifying the ancillary equipment (pressure/flow regulators, valves, etc.) and materials (pipe, fittings, etc.) required for the installation.
  - Specifications for the instrumentation in accordance with the Demonstration Test Plan.
  - Description of any other activities and/or resources required to decommission and remove pre-existing equipment and support installation of the new heat recovery chiller and economizers.
  - Discuss TRL at the start and conclusion of the CUP Heat Recovery project
  - Incorporation of comments and approval from OSHPD

Products:

- CUP Heat Recovery Basic Design Package

TASK 4 INSTALLATION AND COMMISSIONING

Subtask 4.1 Air Handler Installation and Commissioning
The goal of this subtask is to procure equipment and instrumentation, complete the installation of a subset of the AHUs, and commission them for continued operation by the hospital host facility.

The Recipient shall:

- Confirm approved building applications and permits for the installation of the AHU upgrades at the host site
- Procure the major and ancillary equipment (pressure/flow regulators, valves, etc.) and materials (pipe, fittings, etc.) required for the installation through California-based vendors
- Procure the instrumentation required to satisfy Demonstration Test Plan through California-based vendors
- Conduct site visits and meet with the installation contractor prior to beginning installation of equipment to coordinate and review the installation scope of work

- Monitor the removal of any pre-existing equipment and supervise the installation of the AHU upgrades and the ancillary equipment required per the installation specifications
- Commission upgraded AHUs and controls for continued operation by the demonstration host facilities, ensuring the primary and ancillary components are operating properly within design specifications
- Prepare a *Notification Letter on AHU Installation*, which will include, but not be limited to, a summary of the work done in this task and a confirmation of all permits, equipment procured and commissioned, and the installation has been successfully completed.
- Prepare a *CPR Report #2* and participate in a CPR meeting in accordance with subtask 1.3 (CPR Meetings).

Products:

- Notification Letter on Installation
- CPR Report #2

Subtask 4.2 Central Utility Plant Heat Recovery Installation and Commissioning

The goal of this subtask is to procure equipment and instrumentation, complete the installation of the heat recovery chiller and boiler economizers, and commission them for continued operation by the hospital host facility.

The Recipient shall:

- Confirm approved building applications and permits for the installation of the CUP heat recovery chiller and boiler economizers at the host site are in place
- Procure the major (chiller, economizers, and draft fans) and ancillary equipment (pumps, pressure/flow regulators, control valves, etc.) and materials (pipe, fittings, etc.) required for the installation through California-based vendors
- Procure the instrumentation required to satisfy Demonstration Test Plan through California-based vendors
- Conduct site visits and meet with the installation contractor prior to beginning installation of equipment to coordinate and review the installation scope of work
- Monitor the removal of any pre-existing equipment and supervise the installation of the CUP upgrades and the ancillary equipment required per the installation specifications
- Commission the heat recovery chiller and boiler economizers and controls for continued operation by the demonstration host facilities, ensuring the primary and ancillary components are operating properly within design specifications
- Prepare a *Notification Letter on CUP Installation*, which will include, but not be limited to, a summary of the work done in this task and a confirmation of all permits, equipment procured and commissioned, and the installation has been successfully completed.

Products:

- Notification Letter on CUP Installation

Subtask 4.3 Model-based Control Optimization

The goals of this subtask are to optimize the performance of the upgraded AHU system through model-based control optimization to maximize energy savings while meeting all minimum ventilation requirements.

The Recipient shall:

- Prepare energy models in EnergyPlus or IESVE for proposed controls optimization strategies and operational parameter variations.
- Provide energy and cost savings results for controls and operational options.
- Prepare a *Control Optimization Summary Report* to discuss the modeling assumptions and results and the TRL at the beginning and end of the control optimization project.

Products:

- Control Optimization Summary Report (draft and final)

TASK 5 MEASUREMENT AND VERIFICATION (M&V) OF ENERGY SAVINGS

The goal of this task is to monitor and report the energy saving performance of the new retrofit systems to gather data and information on the performance of the measures implemented.

The Recipient shall:

- Gather and analyze data on the performance of the retrofit systems as installed at the host facility in accordance with the M&V aspects of the Demonstration Test Plan.
- Evaluate the system performance and consider any possible improvements in performance of installation engineering that would be of benefit in future deployments.
- Measure retrofit energy usage over a minimum of nine months after completion of each energy upgrade, including but not limited to:
  - Boiler gas usage
  - Electricity consumption
  - Specific energy savings at subset of AHUs and CUP heat recovery equipment
- Manage M&V activities, including:
  - Maintaining instrumentation and data logger integrity
  - Maintaining data collection and data point integrity
  - Reducing data and prepare performance calculations
- Prepare monthly *Performance Summaries* to be included with monthly progress reports to document monthly energy usage, equipment performance, and any operational challenges starting with the month that retrofits have been installed and continuing for a minimum of nine months.
- Prepare and provide *a M&V Report* documenting and summarizing analysis, operational and performance data at the conclusion of the measurement and verification period and discussing whether the goals and objectives and technology advancements identified in Section II.C were achieved.
- Track the overall facility energy use over the course of the project using the Arc Skoru online platform. Apply for and receive recognition of energy savings with an Energy Improvement Certificate through the Arc Skoru system.

Products:

- Monthly Performance Summaries
- M&V Report (draft and final)

EXHIBIT A
Scope of Work
Gas Technology Institute

TASK 6 EVALUATION OF PROJECT BENEFITS
The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:

    - o <u>For Product Development Projects and Project Demonstrations:</u>
        - Published documents, including date, title, and periodical name.
        - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
        - Greenhouse gas and criteria emissions reductions.
        - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
        - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
        - A discussion of project product downloads from websites, and publications in technical journals.
        - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
        - <u>Additional Information for Product Development Projects</u>:
            - Outcome of product development efforts, such copyrights and license agreements.
            - Units sold or projected to be sold in California and outside of California.
            - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
            - Investment dollars/follow-on private funding as a result of Energy Commission funding.
            - Patent numbers and applications, along with dates and brief descriptions.
        - <u>Additional Information for Product Demonstrations</u>:
            - Outcome of demonstrations and status of technology.
            - Number of similar installations.
            - Jobs created/retained as a result of the Agreement.

    - o <u>For Information/Tools and Other Research Studies:</u>
        - Outcome of project.
        - Published documents, including date, title, and periodical name.
        - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.

  - The number of website downloads.
  - An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
  - An estimate of energy and non-energy benefits.
  - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
  - A discussion of project product downloads from websites, and publications in technical journals.
  - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 7 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
  - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
  - A description of the intended use(s) for and users of the project results.
  - Published documents, including date, title, and periodical name.
  - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
  - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
  - The number of website downloads or public requests for project results.
  - Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.

- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Presentation Materials (draft and final)
- High Quality Digital Photographs
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

V. PROJECT SCHEDULE

Please see Attachment 6a for the Project Schedule.

RESOLUTION NO: 20-0610-16a

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: INSTITUTE OF GAS TECHNOLOGY DBA GAS TECHNOLOGY INSTITUTE.

RESOLVED, that the State Energy Resources Conservation and Development Commission (CEC) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the CEC approves Agreement PIR-19-008 with Institute of Gas Technology dba Gas Technology Institute for a $1,424,704 grant to design and demonstrate an integrated HVAC/water heating system to reduce energy consumption and GHG emissions. This technology will be demonstrated in a large medical center in a disadvantaged community; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the CEC.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the CEC held on June 10, 2020.

AYE:
NAY:
ABSENT:

ABSTAIN:

_____
Cody Goldthrite
Secretariat