



STATE OF CALIFORNIA

CONTRACT REQUEST FORM (CRF)

CEC-94 (Revised 12/2019)

CALIFORNIA ENERGY COMMISSION

A) New Agreement # 500-20-003 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Kevin Uy	43	916-776-0821

C) Contractor's Legal Name	Federal ID Number
Guidehouse, Inc.	36-4094854

D) Title of Project
Establishing a Long-Term Natural Gas Research Strategy to Achieve Aggressive Statewide Carbon Neutrality Goals

E) Term and Amount,23

Start Date	End Date	Amount
6/30/2021	6/30/2023	\$ 477,237

F) Business Meeting Information

☐ Operational agreement (see CAM Manual for list) to be approved by Executive Director

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

Proposed Business Meeting Date 6/9/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Kevin Uy Time Needed: 5 minutes

Please select one list serve. NaturalGas (NG Research Program

Agenda Item Subject and Description:**Guidehouse, Inc.**

GUIDEHOUSE, INC. Proposed resolution approving Agreement 500-20-003 with Guidehouse Inc. for a \$477,237 contract to produce a long-term natural gas research strategy to help achieve California's aggressive decarbonization goals and adopting staff's determination that this action is exempt from CEQA. The strategy will produce prioritized research recommendations which will inform the CEC's Natural Gas Research Program. Research conducted under this program will assist the State's transition to a net-zero carbon natural gas system. (PIER NG funding) Contact: Kevin Uy.

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, § 15306

☒ Common Sense Exemption. 14 CCR 15061 (b) (3)

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Explain reason why Agreement is exempt under the above section: This project is exempt under Section 15306 because the project will only be collecting data related natural gas generation, transmission, distribution, and end use to inform recommendations on future natural gas related research.

The project is exempt under the common sense exemption CCR 15061(b)(3) because it can be seen with certainty that there is no possibility that gathering data related to natural gas use and producing related research recommendations may have a significant effect on the environment.

Each exemption is an independent basis for finding the project exempt.

- 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
GC Green Incorporated	\$ 37,935
	\$

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	19-20	501.001N	\$477,237

R&D Program Area: Admin: General

TOTAL: \$477,237

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

**CONTRACT REQUEST FORM (CRF)****K) Contractor's Contact Information****1. Contractor's Administrator/Officer**

Name: Chris Rogers

Address: 333 S. Hope Street Suite 1125

City, State, Zip: Los Angeles, CA
90071-1406

Phone: 949-606-2144

E-Mail: crogers@guidehouse.com

2. Contractor's Project Manager

Name: Warren Wang

Address: 333 S. Hope Street Suite 1125

City, State, Zip: Los Angeles, CA
90071-1406

Phone: 213-618-9019

E-Mail: wwang@guidehouse.com

L) Selection Process Used

- ☒ Solicitation PON Solicitation #: RFP-20-501 # of Bids: 2 Low Bid ☒ No ☐ Yes
- ☐ Non Competitive Bid (Attach DGS-GSPD-09-007 <https://www.dgs.ca.gov/PD/Forms>)
- ☐ Exempt Select Exemption (see instructions)

M) Contractor Entity Type

- ☒ Private Company (including non-profits)
- ☐ CA State Agency (including UC and CSU)
- ☐ Government Entity (i.e. city, county, federal government, air/water/school district, joint power authorities, university from another state)

N) Is Contractor a certified Small Business (SB), Micro Business (MB) or DVBE?If yes, check appropriate box(es): ☐ SB ☐ MB ☐ DVBE**O) Civil Service Considerations**

- ☐ Not Applicable (Agreement is with a CA State Entity or a membership/co-sponsorship)
- ☐ Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER)
- ☒ The Services Contracted:
- ☐ are not available within civil service
 - ☐ cannot be performed satisfactorily by civil service employees
 - ☒ are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.
- ☒ The Services are of such an:
- ☒ urgent
 - ☐ temporary, or
 - ☐ occasional nature
- that the delay to implement under civil service would frustrate their very purpose.

**CONTRACT REQUEST FORM (CRF)****Justification:**

Work for this contract is highly specialized and technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.

P) Payment Method

1. ☒ Reimbursement in arrears based on:
 - ☒ Itemized Monthly ☐ Itemized Quarterly ☐ Flat Rate ☐ One-time
2. ☐ Advanced Payment
3. ☐ Other, explain:

Q) Retention

Is Agreement subject to retention? ☐ No ☒ Yes

If Yes, Will retention be released prior to Agreement termination? ☐ No ☒ Yes

R) Justification of Rates

Based on expected hours by task and classifications required to perform the tasks.

S) Disabled Veteran Business Enterprise Program (DVBE)

1. ☐ Exempt (Interagency/Other Government Entity)
2. ☒ Meets DVBE Requirements DVBE Amount: \$ 37,935.00 DVBE %:7.95
 - a. ☐ Contractor is Certified DVBE
 - b. ☒ Contractor is Subcontracting with a DVBE: GC Green, Inc.
3. ☐ Contractor selected through CMAS or MSA with no DVBE participation
4. ☐ Requesting DVBE Exemption (attach CEC 95)

T) Miscellaneous Agreement Information

1. Will there be Work Authorizations? ☒ No ☐ Yes
2. Is the Contractor providing confidential information? ☒ No ☐ Yes
3. Is the contractor going to purchase equipment? ☒ No ☐ Yes
4. Check frequency of progress reports
 - ☒ Monthly ☐ Quarterly ☐ Other
5. Will a final report be required? ☐ No ☒ Yes
6. Is the Agreement, with amendments, longer than three years? If yes, why?
 - ☐ No ☒ Yes

The Department of General Services has agreed to give the Commission blanket authority to execute multi-year contracts to support the Commission's RD&D Programs.

U) The following items should be attached to this CRF (as applicable)

- | | | |
|---|---|--|
| 1. Exhibit A, Scope of Work | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> Attached |
| 2. Exhibit B, Budget Detail | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> Attached |
| 3. DGS-GSPD-09-007, NCB Request | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Attached |
| 4. CEC 95, DVBE Exemption Request | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Attached |
| 5. CEQA Documentation | <input type="checkbox"/> N/A | <input checked="" type="checkbox"/> Attached |
| 6. Resumes | <input checked="" type="checkbox"/> N/A | <input type="checkbox"/> Attached |
| 7. CEC 105, Questionnaire for Identifying Conflicts | | <input checked="" type="checkbox"/> Attached |



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CALIFORNIA ENERGY COMMISSION

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

**EXHIBIT A
SCOPE OF WORK
GUIDEHOUSE, INC.**

I. TASK ACRONYM/TERM LISTS

TASK LIST

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Conduct a Baseline Assessment
3	X	Evaluate Decarbonization Technologies and Barriers
4		Gather and Analyze Stakeholder Input
5		Recommend Long-Term Research Strategies
6		Technology and Knowledge Transfer

ACRONYMS/GLOSSARY

Specific acronyms and terms used throughout this scope of work are defined as follows:

Acronym	Definition
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
Decarbonization technologies	Technologies which could enable currently fossil fueled energy systems to become net-zero carbon on a lifecycle basis.
Disadvantaged Community	Communities in the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations. (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30)
GHG	Greenhouse Gas
Low carbon fuels ²	Fuels with a lower carbon intensity compared to natural gas.
Low-Income Community	Communities within census tracts with median household incomes at or below 80 percent of the statewide median income or the applicable low-income threshold listed in the state income limits updated by the Department of Housing and Community Development. (https://www.hcd.ca.gov/grants-funding/income-limits/state-and-federal-income-limits.shtml)

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.

² See the [Low Carbon Fuel Standard](https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard) resources for more information (<https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>).

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Natural Gas System	The entire supply chain of natural gas, including production, transmission, storage, distribution, and end use equipment. For the purpose of this study, utility-scale power generation is excluded from end use equipment as decarbonization of this sector is being thoroughly investigated through SB 100.
SB 100	Senate Bill 100 (De León, Chapter 312, Statutes of 2018)
Sector	The residential, commercial, industrial, agricultural, and transportation economic sectors.
Sub-sectors	Specified segments of the natural gas economic sectors are to be defined within the study for the purposes of categorizing the research recommendations (e.g., research recommendations for medium-duty and heavy-duty transportation sub-sectors).
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

The purpose of this Agreement is to produce a long-term natural gas research strategy to help decarbonize California by 2045. The strategy is expected to produce prioritized research recommendations that include all stages in the supply chain (production, transmission, storage, and distribution for low carbon fuels) and all natural gas end use sectors, except for utility-scale power generation. These recommendations will inform future research on technology development, deployment, and demonstration in the California Energy Commission's (CEC) Natural Gas Research Program to help transition to a net-zero carbon natural gas system.

B. Background

Policy Drivers

The CEC's Natural Gas Research Program invests in technologies and solutions that promote a more reliable, cost-effective, safe, and equitable energy service for natural gas sector ratepayers and supports California's energy and environmental goals. In September 2018, Governor Edmund G Brown Jr. set in motion two of the most ambitious climate targets in history by signing Senate Bill 100 (De León, Chapter 312, Statutes of 2018) (SB 100), and issuing Executive Order B-55-18. SB 100 requires that all retail sales of electricity in California be renewable or zero-carbon while Executive Order B-55-18 sets a goal that the entire California economy achieve carbon neutrality. The target dates for both goals is 2045. Consistent with program goals and previous research planning, the CEC must explore the role of the Natural Gas Research Program in meeting these new landmark climate goals. These goals require an aggressive and targeted approach.

New energy technologies and strategies will need to be developed to achieve these aggressive goals, and with limited research funding, investments will need to be strategically targeted.

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Natural Gas Strategic Planning Research

In response to these policy goals and corresponding California Public Utilities Commission direction³, the CEC established a new Strategic Planning Research area in its 2019-2020 Natural Gas Budget Plan. This new research area aims to be crosscutting and forward-looking, examining natural gas use in every sector (residential, commercial, industrial, infrastructure, and transportation), reviewing the potential alternatives, and charting a pathway for how to achieve the state's ambitious energy policy goals.

Strategic Planning Research supports studies that examine the Long-Term Research Strategy for natural gas use in California within the context of the state's renewable energy and carbon neutrality goals. With only slightly more than two decades to affect this transition, planning must begin now for the state to transition toward these goals while minimizing costs and burdens to natural gas ratepayers.

Scope of the Long-Term Research Strategy

The long-term research strategy is expected to produce prioritized research recommendations that would enable the transition to a net-zero carbon natural gas system by 2045. The recommendations should include all stages in the supply chain (production, transmission, storage, and distribution for low carbon fuels) and all-natural gas end use sectors, except for utility-scale power generation. In addition, while net-zero carbon emissions is the end goal, technologies and strategies which reduce greenhouse gas (GHG) emissions in the interim and help enable the transition to decarbonization (e.g., energy efficiency) are within the scope of the study. Further details on the scope of the study are provided below:

- Research Categories: Research funded by the Natural Gas Research Program generally falls into three research categories. Research recommendations produced by the contractor must include all of the following:
 - Scientific and Techno-Economic Analysis - Developing new knowledge and tools that can inform energy policy and planning decisions
 - Technology Development - Developing early stage technologies at lab or prototype level (TRL 3-5). These technologies should have the potential for scale-up and wide deployment within 10-15 years after successful demonstration.
 - Technology Demonstration and Deployment - Demonstrating later stage technologies or systems at a scale that will reflect actual operating, performance, and financial characteristics and risk (TRL 6-9). These technologies should have the potential for scale-up and wide deployment within 1-10 years after successful demonstration.
- Research Areas: The Natural Gas Research Program funds research in distinct topic areas. Research recommendations produced by the selected contractor must be within all the following research areas:
 - Resiliency, Health, and Safety
 - Building Decarbonization
 - Pipeline Decarbonization

³ California Public Utilities Commission. 2019. [Resolution G-3546 Approving the California Energy Commission 2018-2019 Natural Gas Research Budget](http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M260/K830/260830320.PDF).

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M260/K830/260830320.PDF>

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- Industrial and Agricultural Innovation
- Renewable Energy and Advanced Generation
- Low-emission Transportation

Areas not listed above, including natural gas-fueled utility-scale power generation, are not included in the scope of this study.

- Decarbonization technology categories: There are many technologies to decarbonize natural gas and they generally fall into four technology categories. Research recommendations should generally fall within the bounds of all these categories:
 - Electrification of end-use equipment
 - Utilization of solar thermal and/or thermal storage
 - Utilization of low carbon fuels such as renewable gas, biofuels, and hydrogen
 - Utilization of natural gas in conjunction with carbon capture, sequestration, and utilization
- Established Decarbonization Scenarios: The CEC has funded and co-authored several recent studies focused on possible ways to decarbonize California's energy system. These studies, focused on deep decarbonization⁴, the future of natural gas⁵, and meeting the goals of SB 100⁶, present pathways and scenarios by which California could meet its carbon neutrality goals. The long-term research study should leverage these studies and present its research recommendations within the bounds of these scenarios. This study is not expected to perform new modeling or analysis to determine additional scenarios, nor is it expected to make policy recommendations regarding which scenarios the state should follow.

The contractor will consider the information above and provide recommendations which fit within the bounds of each. Each recommendation produced should clearly indicate what research category, research area, decarbonization technology category, and decarbonization scenario the recommendation falls under (e.g., technology development of electrification equipment for industrial application in a high electrification scenario).

⁴ Energy and Environmental Economics. 2018. [Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model](https://ww2.energy.ca.gov/2018publications/CEC-500-2018-012/CEC-500-2018-012.pdf). California Energy Commission. Publication Number: CEC-500-2018-012. <https://ww2.energy.ca.gov/2018publications/CEC-500-2018-012/CEC-500-2018-012.pdf>

⁵ Energy and Environmental Economics. 2019. [The Challenge of Retail Gas in California's Low-Carbon Future: Technology Options, Customer Costs and Public Health Benefits](https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf). California Energy Commission. Publication Number: CEC-500-2019-055-F. <https://ww2.energy.ca.gov/2019publications/CEC-500-2019-055/CEC-500-2019-055-F.pdf>

⁶ California Energy Commission. 2020. [2021 SB 100 Joint Agency Report](https://www.energy.ca.gov/sb100#anchor_report). https://www.energy.ca.gov/sb100#anchor_report

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C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this agreement is to develop a long-term research strategy which would enable a decarbonized natural gas system in California by 2045. The key outputs of this strategy will be research recommendations which will inform the CEC's Natural Gas Research Program and its complementary initiatives. The strategy must be developed in consultation with key stakeholders and subject matter experts, including the CEC and the Technical Advisory Committee (TAC) created per Subtask 1.10 in this project.

Agreement Objectives

The objectives of this Agreement are to:

1. Conduct a baseline assessment.
 - a. Perform a comprehensive literature review in order to build on the results of previous similar reports^{7,8}, especially recent CEC studies on deep decarbonization, the future of natural gas, and SB 100.
 - b. Examine existing natural gas system-wide scenarios for a carbon neutral energy system, such as high electrification, high hydrogen, and others and consider the role of energy efficiency and other low-carbon pathways.
 - c. Select at least three existing scenarios to base future research recommendations on.
 - d. Perform a comprehensive technology assessment in order to determine the current baseline (in-use today, e.g., heat pump water heaters) and state-of-the-art natural gas decarbonization technologies for each sector.
2. Identify sectors and sub-sectors.
 - a. Identify the sectors and sub-sectors including their current demand for natural gas.
 - b. Develop a methodology for prioritizing which sectors and sub-sectors to research to achieve decarbonization, including sectors with the highest GHG reduction potential
 - c. Evaluate and screen the sectors and sub-sectors which will be the focus of the long-term strategy based on the established methodology.
3. Perform a technology evaluation.
 - a. Develop a methodology for categorizing and prioritizing emerging decarbonization technologies.
 - b. Establish criteria by which to evaluate early stage and emerging decarbonization technologies (e.g., maturity, capital, and infrastructure cost to decarbonize, carbon intensity, equity considerations, impacts on vulnerable populations, timeline for conversion, cost effectiveness).
 - c. Screen and evaluate emerging decarbonization technologies based on the established criteria and methodology.

⁷ Energy Futures Initiative. 2019. [Optionality, Flexibility, & Innovation: Pathways for Deep Decarbonization in California](https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf). https://energyfuturesinitiative.org/s/EFI_CA_Decarbonization_Full-b3at.pdf

⁸ Lawrence Livermore National Laboratory. 2020. [Getting to Neutral: Options for Negative Carbon Emissions in California](https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf). https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf

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- d. Identify barriers to adoption of decarbonized natural gas technologies (e.g., cost and performance, maturity, consumer acceptance) and the research needed to address these barriers
- 4. Identify research gaps and performance metrics.
 - a. Identify technology and strategy research gaps which may be addressed through the Natural Gas Research Program.
 - b. Develop performance and cost targets, and other metrics to be critical indicators of research success and increase probability of market adoption.
- 5. Gather and analyze stakeholder input.
 - a. Establish a TAC of key stakeholders and subject-matter experts to provide input throughout the project. The TAC should represent both technical experts (e.g., technology manufacturers, research institutions) and end users (e.g., technology adopters, disadvantaged and/or low-income communities and representative community-based organizations).
 - b. Conduct interviews with additional subject matter experts as needed throughout the project.
 - c. Conduct two or more public workshops to present intermediate results and solicit input from experts and stakeholders.
- 6. Provide comprehensive, prioritized recommendations.
 - a. Recommend a timeline to make key planning decisions in a natural gas transition and the associated research portfolio.
 - b. Recommend near-term technology deployment strategies for sectors and subsectors which could readily decarbonize (e.g., new residential construction), including goals and metrics, and strategies for addressing cost, funding, market/ manufacturing readiness and other challenges.
 - c. Provide research recommendations for all sectors which will enable the transition to a decarbonized natural gas system.
 - d. Categorize research recommendations by near (1-5 years), mid (5-10 years), long (10-15 years) and very long (>15 years) term and what research can accelerate the implementation timeline.
 - e. Prioritize research recommendations by low, medium, and high priority for the Natural Gas Research Program and why.

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III. TASK 1 GENERAL PROJECT TASKS

DELIVERABLES

Subtask 1.1 Deliverables

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

The Contractor shall:

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

- Submit all draft deliverables to the CAM for review and comment in accordance with the Schedule of Deliverables (Part V). The CAM will provide written comments to the Contractor on the draft deliverable within 15 days of receipt, unless otherwise specified in the task/subtask for which the deliverable is required.
- Consider incorporating all CAM comments into the final deliverable. If the Contractor disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final deliverable.
- Submit the revised deliverable with responses and 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 deliverables that require a final version only

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

For all deliverables

- Submit all data and documents required as deliverables in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

○ **Electronic File Format**

Submit all data and documents required as deliverables 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 deliverables under this Agreement, and establishes the software versions that will be required to review and approve all software deliverables:

- 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 Contractor must also provide the native Microsoft file format.

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- 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 (IIS), (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 Contractor 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 Contractor 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;
- Deliverables (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;
- Deliverables (subtask 1.1);
- Progress reports and invoices (subtask 1.5);

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- Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Schedule of Deliverables*, *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 Contractor a *Kick-off Meeting Agenda*.

Contractor Deliverables:

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

CAM Deliverable:

- 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, deliverables, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Contractor. 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 Contractor 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 Contractor, 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 Contractor 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 Deliverables* 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 deliverables 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 Contractor's input.

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- Send the Contractor 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 Contractor 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, deliverables, 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 Contractor with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Contractor revise one or more deliverables.

Contractor Deliverables:

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

CAM Deliverables:

- 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 Contractor 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 Contractor 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 deliverables).
 - Need to document the Contractor's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential deliverables.
 - Final invoicing and release of retention.

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

Deliverables:

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

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 Contractor 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.

Deliverables:

- 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 Contractor must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Contractor 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 deliverables.*)

Contractor Deliverables:

- Final Report Outline (draft and final)

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CAM Deliverables:

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

Subtask 1.6.2 Final Report

The Contractor 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 Contractor on the draft deliverable within 15 days of receipt.
- Consider incorporating all CAM comments into the Final Report. If the Contractor disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final deliverable.
- 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.

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- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Deliverables:

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

CAM Deliverable:

- 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 Contractor 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 Contractor may spend match funds for this task. The Contractor 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 Contractor must obtain any associated commitments before incurring any costs for which the Contractor will request reimbursement.

The Contractor 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 Contractor must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
- A copy of 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.

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- 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.

Deliverables:

- 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 Contractors. Permits must be identified and obtained before the Contractor may incur any costs related to the use of the permit(s) for which the Contractor will request reimbursement.

The Contractor 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 Contractor 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.

Deliverables:

- 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 Contractor shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.

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- 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).

Deliverables:

- 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 deliverables and provide recommendations for needed deliverable 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 deliverables.

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.

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The Contractor 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.

Deliverables:

- 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 Contractor 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.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

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Deliverables:

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

IV. TECHNICAL TASKS

*Deliverables that require a draft version are indicated by marking “(draft and final)” after the deliverable name in the “Deliverables” section of the task/subtask. If “(draft and final)” does not appear after the deliverable name, only a final version of the deliverable is required. **Subtask 1.1 (Deliverables)** describes the procedure for submitting deliverables to the CAM.*

Task 2: Conduct a Baseline Assessment

The goals of this task are to 1) conduct a baseline assessment of natural gas decarbonization scenarios and state-of-the-art natural gas decarbonization technologies, and 2) to screen and identify the sectors and sub-sectors which will be the focus of the long-term strategy.

The Contractor shall:

- Perform a comprehensive literature review in order to build on the results of previous similar reports, especially recent CEC studies on deep decarbonization, the future of natural gas, and SB 100⁹.
- Examine existing system-wide scenarios for a carbon neutral energy system detailed in the above referenced CEC studies such as (1) high electrification, (2) high hydrogen, and others and consider the role of energy efficiency, and other low-carbon pathways.
- Select at least three existing scenarios to base future research recommendations on. All research recommendations should be made within the context of the selected scenarios.
- Prepare and provide a *Literature Review Summary* of peer reviewed technical journals, government reports, trade journals and other high-quality sources of information regarding performance specifications of state-of-the-art natural gas decarbonization technologies. Include references for all sources.
- Identify the sectors and sub-sectors including their current demand for natural gas. Sub-sectors could include, but are not limited to new residential buildings, new commercial buildings, existing single-family residential buildings, existing multi-family residential buildings, existing commercial buildings, light industrial, heavy industrial, agricultural, and light-, medium-, and heavy-duty transportation. Sub-sectors should be defined based on baseline assessments and for categorizing future research recommendations.
- In conjunction with CEC staff, develop a methodology, including criteria and reasons, for prioritizing which sectors and sub-sectors to research to achieve decarbonization.
- Evaluate and screen the sectors and sub-sectors which will be the focus of the long-term strategy based on the established methodology.
- Perform a comprehensive technology assessment in order to determine the current baseline (in use today, e.g., heat pump water heaters) and state-of-the-art natural gas decarbonization technologies for each sector and sub-sector.
- Prepare and provide a *Baseline Assessment of Natural Gas Decarbonization Technologies and Strategies* which includes a summary of key system-wide scenarios, state-of-the-art natural gas decarbonization technologies, and sector and sub-sector research prioritization.

⁹ Ibid., 16-17.

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Deliverables:

- Literature Review Summary (draft and final)
- Baseline Assessment of Natural Gas Decarbonization Technologies and Strategies (draft and final)

Task 3: Evaluate Decarbonization Technologies and Barriers

The goals of this task is to perform a technology evaluation of emerging decarbonization technologies, and to identify barriers to adoption of these technologies.

The Contractor Shall:

- Develop a methodology for categorizing and prioritizing early stage and emerging decarbonization technologies.
- Establish criteria, in consultation with CEC staff, by which to evaluate emerging decarbonization technologies (e.g., maturity; capital and infrastructure cost to convert; operating costs carbon intensity; equity considerations; impacts on disadvantaged and/or low-income communities; timeline for conversion; cost effectiveness), while taking into account ongoing changes in energy building codes.
- Screen and evaluate emerging decarbonization technologies, in consultation with CEC staff, based on the established criteria and methodology.
- Prepare and provide an *Emerging Natural Gas Decarbonization Technologies Report* which describes the criteria and methodology used to evaluate the technologies, the technical characteristics of the selected technologies, and a prioritized list of most promising technologies for each sector and sub-sector.
- Identify barriers to adoption of decarbonized natural gas technologies (e.g., cost and performance, maturity, consumer acceptance) and the research needed to address these barriers.
- Identify research gaps which may be addressed through the Natural Gas Research Program. Identify other research gaps, such as impacts on the electrical system and demand, which should be addressed through other processes, such as the Integrated Energy Policy Report process.
- Develop performance and cost and benefit targets, and other metrics to be critical indicators of research success and increase probability of market adoption.
- Prepare and provide a *Natural Gas Decarbonization Opportunities Report* which describes the barriers to adoption of decarbonized technologies, research and policy recommendations which would address these barriers, and critical performance indicators and metrics for the decarbonization technologies.
- Prepare *CPR Report #1* in accordance with subtask 1.3.
- Participate in a CPR Meeting

Deliverables:

- Emerging Natural Gas Decarbonization Technologies Report (draft and final)
- Natural Gas Decarbonization Opportunities Report (draft and final)
- CPR Report #1

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Task 4: Gather and Analyze Stakeholder Input

The goal of this task is to gather and analyze stakeholder and subject-matter expert input throughout the project.

The Contractor shall:

- Prepare and submit a draft *List of Experts to Interview* regarding the current cost and performance attributes of natural gas decarbonization technologies; developing trends and opportunities of specific technologies and strategies to facilitate decarbonization of the natural gas system; and identify other critical indicators of success.
- Prepare and submit a draft list of *Interview Questions* to use when interviewing experts on topics listed above.
- Submit the final *List of Experts* and final *Interview Questions*, incorporating the CAM's comments.
- Conduct interviews with experts regarding pathways to decarbonizing the natural gas system, baseline and state-of-the-art decarbonization technologies and strategies, including cost and performance attributes of specific decarbonization technologies, current and anticipated research, and critical indicators of success.
- Prepare and submit an *Interview Summary* which includes a summary of the experts interviewed and their responses.
- In accordance with subtask 1.10, establish a TAC of key stakeholders and subject-matter experts to provide input throughout the project. The TAC should represent both technical experts (e.g., technology manufacturers, research institutions) and end users (e.g., technology adopters, disadvantaged and/or low-income communities and representative community-based organizations).
- Conduct at least two public workshops to present intermediate results and solicit input from experts and stakeholders.
- Prepare and provide a *Workshop Summary* which includes a summary of workshop topics, stakeholder feedback received, and response to stakeholder feedback.

Deliverables:

- List of Experts to Interview (draft and final)
- Interview Questions (draft and final)
- Interview Summary (draft and final)
- Workshop Summary(s)

Task 5: Recommend Long-Term Research Strategies

The goal of this task is to utilize stakeholder feedback and the findings from previous tasks to recommend long-term research strategies and to provide comprehensive, prioritized research recommendations.

The Contractor Shall:

- Recommend a timeline to make key natural gas research planning decisions regarding the natural gas transition and the recommend the associated research portfolio.
- Recommend near-term deployment strategies for sectors which could readily decarbonize (e.g., new residential construction), including goals and metrics, and strategies for addressing cost and other challenges, and considering ongoing changes in energy building codes.
- Provide research recommendations for all sectors which will enable the full transition to a decarbonized natural gas system by 2045.

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- Categorize research recommendations by near (1-5 years), mid (5-10 years), long (10-15 years) and very long (>15 years) term for each sector.
- Prioritize research recommendations by low, medium, and high priority, in conjunction with CEC staff.
- In accordance with task 4, regularly analyze the stakeholder feedback (e.g., from TAC meetings, workshops, and expert interviews) to continually improve the research recommendations.
- Prepare and provide a *Long-Term Natural Gas Decarbonization Research Recommendations Report* which provides comprehensive, prioritized research recommendations.
- In accordance with subtask 1.6 incorporate the results of all previous reports into the Final Report.

Deliverables:

- Long-Term Natural Gas Decarbonization Research Recommendations Report (draft and final)

Task 6: Technology and Knowledge Transfer

The goal of this task is to ensure the Long-Term Research Strategy developed under this agreement is utilized in the energy policy, and/or planning decisions at the state and/or local levels, academic community and/or commercial sector.

The Contractor Shall:

- Develop and submit a *Knowledge Transfer Plan (Draft/Final)* that identifies the proposed activities the Contractor will conduct to meet the goal of the task. The *Knowledge Transfer Plan* should include at a minimum:
 - Specific policy and planning efforts this project is expected to inform.
 - Specific stakeholder groups and energy policy and planning practitioners who will utilize the results of this project.
 - Proposed activities the Contractor will conduct to ensure the tools and results from this project be utilized and adopted by the groups identified above.
- Present the *Draft Knowledge Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Knowledge Transfer Plan*. This document will identify:
 - TAC comments the Contractor proposes to incorporate into the *Final Knowledge Transfer Plan*.
 - TAC comments the Contractor does not propose to incorporate with and explanation why.
- Submit the *Final Knowledge Transfer Plan* to the CAM for approval.
- Implement the activities as described in the *Final Knowledge Transfer Plan*.
- Develop a *Knowledge Transfer Summary Report (Draft/Final)* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the *Final Technology Transfer Plan*. This report should not include any proprietary information.
- Develop *Presentation Materials (Draft/Final)* for a CEC-sponsored conference/workshop/webinar on the project.

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- Present in at least one CEC-sponsored conference/workshop/webinar to disseminate results of the Long-Term Research Strategy.

Deliverables:

- Knowledge Transfer Plan (Draft and Final)
- Summary of TAC Comments
- Technology Transfer Summary Report (Draft and Final)
- Presentation Materials (Draft and Final)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: GUIDEHOUSE INC.

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 500-20-003 with Guidehouse Inc. for a \$477,237 contract to produce a long-term natural gas research strategy to help achieve California's aggressive decarbonization goals. The strategy will produce prioritized research recommendations which will inform the CEC's Natural Gas Research Program. Research conducted under this program will assist the State's transition to a net-zero carbon natural gas system; 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 CEC 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 9, 2021.

AYE:

NAY:

ABSENT:

ABSTAIN:

Patricia Carlos
Secretariat