STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 02/13) CALIFORNIA ENERGY COMMISSION

New Agreement PIR-15-004 (To be completed by CGL Office)

Division	Agreement Manager:	MS-	Phone
ERDD	Yu Hou	43	916-327-1544

Recipient's Legal Name	Federal ID Number
ICF Incorporated, L.L.C.	52-0893615

Title of Project

Investigate Climate Vulnerability of the Natural Gas Energy System and Identify Resilience Options in the San Diego Area

Term and Amount	Start Date	End Date	Amount
	12/4/2015	5/30/2018	$ 456,703

Business Meeting Information

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

Proposed Business Meeting Date	11/10/2015	☐ Consent	☒ Discussion
Business Meeting Presenter	Yu Hou	Time Needed:	5 minutes

Please select one list serve. NaturalGas (NG Research Program)

Agenda Item Subject and Description

ICF INCORPORATED, L.L.C. Proposed resolution approving Agreement PIR-15-004 with ICF Incorporated, L.L.C. for a $456,703 grant to conduct a detailed, robust, climate change vulnerability assessment and identify and evaluate appropriate adaptation measures. This will provide a suite of practical, actionable climate change adaptation measures optimized to San Diego Gas & Electric's natural gas system and customer needs. (PIER funding) Contact: Yu Hou (Staff Presentation: 5 minutes)

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":
   Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because the recipient will conduct a paper study that includes literature search, information gathering workshops, and analysis.
2. If Agreement is considered a "Project" under CEQA:
   ☐ a) Agreement **IS** exempt. (Attach draft NOE)
   - ☐ Statutory Exemption. List PRC and/or CCR section number: _____
   - ☐ Categorical Exemption. List CCR section number: _____
   - ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

   Explain reason why Agreement is exempt under the above section:

   ☐ 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

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

Legal Company Name:	Budget
Revell Coastal, LLC	$ 38,430
	$

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

Legal Company Name:
San Diego Gas & Electric Company

Budget Information

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
NG Subaccount, PIERDD	14-15	501.001I	$456,703
			$
R&D Program Area: EGRO: EA		TOTAL:	$456,703

Explanation for "Other" selection	
Reimbursement Contract #:	Federal Agreement #:

Recipient's Administrator/ Officer				Recipient's Project Manager			
Name:	Jodi Young			Name:	Andrew Petrow		
Address:	PO Box 654			Address:	1 Ada Suite 100		
City, State, Zip:	Penngrove, CA 94951-0654			City, State, Zip:	Irvine, CA 92618-5339		
Phone:	707-992-0768 /	Fax:	- -	Phone:	818-294-5472 /	Fax:	- -
E-Mail:	Jodi.Young@icfi.com			E-Mail:	Andrew.Petrow@icfi.com		

Selection Process Used

☒ Competitive Solicitation — Solicitation #: PON-14-507
☐ First Come First Served Solicitation

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

TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1	N/A	General Project Tasks
2		Foundational Literature Review and Expert Interviews
3		Sea Level Rise, Coastal Flooding, and Inland Hazard Exposure Modeling
4	X	Assessment of Direct Impacts of SLR, Coastal Storms, and Inland Hazards
5		Assessment of Indirect Impacts of SLR, Coastal Storms and Inland Hazards
6		Identification and Evaluation of Adaptation Measures
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
GMM	Gas Market Model
IOUs	Investor Owned Utilities
RIAMS	Regional Infrastructure Assessment and Model System
SDG&E	San Diego Gas & Electric
SLR	Sea Level Rise
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

The purpose of this Agreement is to conduct research on climate-related hazard vulnerability (looking at both sea level rise and inland hazards such as inland flooding, landslides, and wildfire) and adaptation options in the San Diego Gas & Electric (SDG&E) service area, at a level of detail appropriate for informing energy sector policy and planning, particularly that related to natural gas systems.

B. Problem/ Solution Statement

Problem

Previous work related to climate vulnerability and adaptation options resulted in findings and recommendations that were too general or had too many limitations for policymakers and planners to use to inform many of their climate-sensitive decisions. Discussions of potential impacts and adaptation measures have been generally too broad to meaningfully inform policy and planning decisions.

[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.

Solution
The recipient is partnering with SDG&E to focus work on climate vulnerability and adaptation in a geographic sub-region (the SDG&E service territory), and to access Investor Owned Utility (IOU) information and knowledge, allowing for a novel and detailed analysis providing important new decision-relevant information. By building on and coordinating with several local, regional, and national efforts—both private and public—this project has the opportunity to further the state of knowledge to a level of detail and comprehensiveness that is unprecedented. SDG&E will provide match funding in the form of in-kind labor costs consisting of SDG&E's senior meteorologist and other staff members' support of this project. Efforts by SDG&E will include frequent meetings and discussions with the recipient to ensure they have the appropriate information, gathering data to be used in the analyses, reviewing and providing input on the recipient's work, and participating in workshops and meetings with the recipient and relevant stakeholders.

The recipient will use advanced sea level rise and hazard modeling to obtain a clearer understanding of which specific infrastructure could be exposed to climate change hazards. The recipient will then utilize a literature review, interviews and workshops with energy experts and stakeholders, and additional analyses, to obtain a deep understanding of how this exposure could impact SDG&E's natural gas infrastructure and services.

C. Goals and Objectives of the Agreement

Agreement Goals
The goal of this Agreement is to:

- Develop an understanding of climate-related hazard vulnerability for natural gas infrastructure and services in SDG&E territory and adaptation options for that infrastructure at a level of detail appropriate for informing energy sector policy and planning.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefit[s] of: greater reliability and lower costs by establishing a better understanding of vulnerabilities and adaptation measures for SDG&E's natural gas system, the San Diego area, as well as other IOUs in California and the United States, such that appropriate policy and planning decisions can be made. Reliability will be increased through proper planning, while costs will be reduced by (a) avoiding costly service disruptions and damage to infrastructure, and (b) avoiding costs associated with *over*protecting infrastructure.

The recipient will accomplish this by developing robust and compelling order of magnitude estimates of the costs of service disruptions and infrastructure repair, and by making assumptions about the frequency in which coastal flooding and inland hazards could occur in the future. The recipient will use these values to estimate the approximate savings to ratepayers from avoided service disruptions and infrastructure repair that would result from the adaptation actions for natural gas infrastructure that are explored in this analysis. These costs will be

[2] California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See California Public Utilities Commission "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

estimated through cost estimates being developed by the U.S. Department of Energy, results from modeling work conducted under this project, as well as input from SDG&E.

Technological Advancement and Breakthroughs:[3] This Agreement will advance the state of the knowledge to help overcome key information gaps. For example, the sea level rise modeling will be more accurate to SDG&E's natural gas infrastructure than previous studies, taking into account levees and other protective structures. It will also consider the distribution network, the study of which has been thin as it relates to climate change exposure. Finally, this Agreement will identify the potential implications of, and adaptation measure for, the climate hazards at a level specific to an IOU service territory, whereas previous studies have been more general in nature.

Agreement Objectives

The objectives of this Agreement are to:

- Increase SDG&E's and the San Diego area's resiliency to climate change by developing an in-depth understanding of the vulnerabilities of, and potential adaptation measures for, SDG&E's natural gas system.
- Provide knowledge that is currently lacking on the specifics of how natural gas infrastructure could be affected by sea level rise and inland hazards, as well as potential adaptation measures that should be implemented. This knowledge will inform California's 4th Climate Change Assessment as well as provide insights into vulnerabilities and adaptation measures that benefit other IOUs in California and the United States, and inform policy and planning decisions at both the state and local levels.

[3] California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

Exhibit A
Scope of Work

II. 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 (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 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 <u>administrative portion</u> 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.

Exhibit A
Scope of Work

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.

Exhibit A
Scope of Work

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
- Approval 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 Final Report* to the CAM for review and comment. The CAM will provide *Written Comments on the Draft Final Report* to the Recipient within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a *Written Responses to Comments on the Draft Final Report* explaining why the comment was not incorporated into the final product
- Submit the revised Final Report along with *Written Responses to Comments on the Draft Final Report* 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.

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

CAM Product:
- Written Comments on the Draft Final Report
- Approval of 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.
  - 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.
- 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.

Exhibit A
Scope of Work

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)

Exhibit A
Scope of Work

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.

Exhibit A
Scope of Work

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.

Products:

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

Exhibit A
Scope of Work

III. TECHNICAL TASKS

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.* ***Subtask 1.1 (Products)*** *describes the procedure for submitting products to the CAM.*

The Commission has recently awarded Recipient a grant under its Electric Program Investment Charge Program (EPC-15-005). Some savings or leveraging of effort might occur between the two grants. For example, some data collected for both agreements could be similar. In addition, the Recipient might schedule meetings at the Commission concurrently on the same date, which might mean only one cost for travel for people attending both meetings. But Recipient might need different staff at the meetings for each grant since the work, and thus the skills needed, differ. Even if some savings or leveraging of effort might occur, the Recipient is not allowed to double-bill for work under the agreements.

TASK 2: Foundational Literature Review and Expert Interviews
The goal of this task is to conduct a foundational literature review and expert interviews to ensure that the project is built on the latest research.

The Recipient shall:

- Review previous sea level rise modeling efforts in the San Diego region and possibly conduct interviews to identify the types of assets that could possibly be exposed to sea level rise in the San Diego region.
- Explore the details of sea level rise scenarios in use by other organizations in San Diego and beyond and possibly conduct interviews to compare the difference with proposed scenarios.
- Evaluate previous findings related to the potential exposure of SDG&E's natural gas assets to inland climate-related hazards.
- Develop a detailed knowledge of the sensitivity of specific natural gas infrastructure assets and operations, and their implications on the broader system.
- Collect information and possibly conduct interviews on adaptation measures that have already been identified or considered elsewhere in the United States for natural gas infrastructure.
- Develop a matrix that lists natural gas asset and service categories, and findings about how they may be affected by sea level rise and other hazards, and potential adaptation strategies. This matrix will be part of the Final Report and serve as a resource for IOUs and other stakeholders across the country.
- Conduct other interviews with experts in natural gas, sea level rise, and the San Diego area to gain greater insight and perspective
- Hold meeting in northern California with energy stakeholders
- Hold meeting in San Diego with local stakeholders
- Prepare *Memoranda on Sea Level Rise Studies and Inland Climate-Related Hazards that affect Natural Gas Infrastructure in the SDG&E region* to concisely summarize task findings for delivery to the CEC.

Exhibit A
Scope of Work

Products:

- Memorandum on Sea Level Rise Studies and Inland Climate-Related Hazards that affect Natural Gas Infrastructure in the SDG&E region (draft and final)

TASK 3: Sea Level Rise, Coastal Flooding, and Inland Hazard Exposure Modeling

The goals of this task are to identify and develop modeling needed to complete a Sea Level Rise (SLR) and coastal flooding exposure analysis that will provide information for planning and regulatory decision-support in the study area This will include new backshore characterization modeling with reinterpretation of data and results from previous studies, as well as an inland hazard analysis that will provide a multi-hazard perspective on exposure of the natural gas system.

The Recipient shall:

- Identify available data and results of relevant studies.
- Conduct SLR, coastal flooding, and inland hazard exposure analysis to determine exposed assets.
- Conduct inland hazard analysis (inland flooding, landslides/mudslides, wildfire, and extreme heat) to determine exposed assets.
- Hold meeting that vets the results of Task 2 and 3.
- Prepare *SLR, Coastal Flooding, and Inland Hazard Modeling Report* that summarizes the findings of this task
- Create and maintain Online Visualization possibly using the Environmental Systems Research Institute Story Map and webmaps of SLR, Coastal Flooding, and Inland Hazard Modeling Results.

Products:

- SLR, Coastal Flooding, and Inland Hazard Modeling Report (draft and final).

TASK 4: Assessment of Direct Impacts of Sea Level Rise, Coastal Storms, and Inland Hazards

The goal of this task is to assess how SDG&E's natural gas infrastructure and services could be directly affected (i.e., damage to infrastructure, property, equipment) by sea level rise, coastal storms, and inland hazards.

The Recipient shall:

- Convene a one day workshop at SDG&E to engage stakeholders on which specific natural gas assets could be exposed, what that would mean from the perspective of damage to the natural gas infrastructure, the extent to which natural gas services could be affected, and what measures are reasonable to mitigate these risks. The target stakeholders for this workshop will be different than the target stakeholders for electricity, so this workshop will be distinct from the electricity workshop that Recipient will be convening for agreement EPC-15-005. However, Recipient will seek out opportunities to realize efficiencies across the workshops, such as by holding the workshops back-to-back to minimize travel costs.
- Summarize key findings of the SDG&E stakeholder workshop
- Use dynamic mapping to demonstrate which natural gas infrastructure could be exposed to future sea level rise, coastal storms, and inland hazards.
- Conduct follow-up interviews with experts unable to attend the workshop.

- Analyze data on infrastructure costs to develop an understanding of financial and operational implications of these direct impacts.
- Prepare *Direct Impacts to Natural Gas Infrastructure from Sea Level Rise, Coastal Storms, and Inland Hazards Report* that summarizes the findings of this task.
- Participate in a CPR meeting and prepare a *CPR Report*, per Task 1.3.

Products:

- Workshop Agenda
- Summary of Key Findings of the SDG&E Natural Gas Stakeholder Workshop
- Direct Impacts from Sea Level Rise, Coastal Storms, and Inland Hazards Report (Draft and Final)
- CPR Report

TASK 5: Assessment of Indirect Impacts of Sea Level Rise, Coastal Storms, and Inland Hazards

The goal of this task is to assess how SDG&E's natural gas infrastructure and services could be indirectly affected by sea level rise, coastal storms, and inland hazards, such as from loss of natural gas service to industrial, commercial and residential customers (as a result of the direct impacts or other impairments to natural gas service delivery).

The Recipient shall:

- Conduct a workshop with SDG&E stakeholders to discuss potential indirect impacts of sea level rise, coastal storms, and inland hazards on SDG&E natural gas service, considering both downstream (i.e.. loss of natural gas service, loss of economic productivity of natural gas customers) and upstream (i.e., natural gas supply) impacts.
- Analyze market impacts of disruptions, working closely with SDG&E and either using Recipient's Gas Market Model (GMM) or the Regional Infrastructure Assessment and Modeling System (RIAMS).
- Analyze sectoral interdependencies to improve estimates of indirect costs by performing a qualitative assessment for the SDG&E service area on impacts to various indicative factors (e.g., number and type of consumers that could be potentially affected, impact to the regional economy, and other similar factors).
- Prepare *Indirect Impacts on Natural Gas Infrastructure and Supply due to Sea Level Rise, Coastal Storms, and Inland Hazards Report* that summarized the findings from the workshop, market impacts analysis, and sectoral interdependencies analysis.

Products:

- Indirect Impacts on Natural Gas Infrastructure and Supply due to Sea Level Rise, Coastal Storms, and Inland Hazards Report (Draft and Final)

TASK 6: Identification and Evaluation of Adaptation Measures

The goals of this task are to identify and evaluate adaptation measures related to infrastructure protection, long-term relocation or elevation of vulnerable assets, operational adjustments, and recovery efforts.

The Recipient shall:

- Conduct a literature review and interviews with experts to identify a list of generic adaptation measures, and the basic pros/cons or co-benefits associated with each for San Diego area.

- Work with SDG&E to identify adaptation measures that are most appropriate for natural gas assets most at-risk for sea level rise, coastal storms, and inland hazards.
- Develop an adaptation timeline with appropriate timeframes for implementation of natural gas related adaptation measures, placing particular emphasis on actions that must be taken within the next 10 to 30 years, while also identifying longer term actions.
- Develop and test a process for considering how sea level rise, coastal storms, and inland hazards could be incorporated in the planning and design process for new natural gas infrastructure by working with SDG&E.
- Coordinate with researchers conducting relevant research projects being funded by the California Natural Resources Agency to investigate natural gas infrastructure related adaptation options being considering and evaluate whether they would be appropriate for the natural gas infrastructure in SDG&E territory. This research will focus on adaptation measures that are relevant to natural gas specifically and address inland hazards as well as sea level rise..
- Hold Meeting that coordinates with California Natural Resources Agency grant focused on coastal erosion
- Hold Meeting to vet the results for Task 4-6, with key stakeholders and other participants included by the CAM.
- Prepare *Evaluation of Adaptation Measures Report* summarizing the findings in Task 6.

Products:

- Evaluation of Adaptation Measures Report (draft and final).

TASK 7: 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:

    - 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 8: 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 *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 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 on the results of the project.
- Prepare a *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)
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 15-1112-11c

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ICF INCORPORATED, L.L.C.

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

RESOLVED, that the Energy Commission approves Agreement PIR-15-004 from PON-14-507 with ICF Incorporated, L.L.C. for $456,703 grant to conduct a detailed, robust, climate change vulnerability assessment and identify and evaluate appropriate adaptation measures. This will provide a suite of practical, actionable climate change adaptation measures optimized to San Diego Gas & Electric's natural gas system and customer needs; and

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

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 California Energy Commission held on November 12, 2015.

AYE: [List of Commissioners]
NAY: [List of Commissioners]
ABSENT: [List of Commissioners]
ABSTAIN: [List of Commissioners]

_____
Tiffani Winter,
Secretariat