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

A) New Agreement # EPC-21-003 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Robin Goodhand		916-776-0766

C) Recipient's Legal Name	Federal ID Number
Electric Power Research Institute, Inc.	23-7175375

D) Title of Project
Mobile Hydrogen Fuel Cell Generation System

E) Term and Amount

Start Date	End Date	Amount
7/16/2021	3/31/2025	$ 1,999,953

F) Business Meeting Information

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

Proposed Business Meeting Date 7/15/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Quenby Lum Time Needed: 5 minutes

Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description:
Electric Power Research Institute, Inc.
ELECTRIC POWER RESEARCH INSTITUTE, INC. Proposed resolution approving Agreement EPC-21-003 with Electric Power Research Institute, Inc. for a $1,999,953 grant to demonstrate four resilience-enhancing mobile renewable backup generator (MORBUG) standby generation systems, and adopting staff's determination that this action is exempt from CEQA. The hybrid battery plus fuel cell MORBUG system acts as a backup energy source during grid outages due to public safety power shutoff events, wildfires or other natural disaster events. The project will validate the system's ability to increase the resiliency of the electricity system to climate change and extreme weather events while utilizing a renewable fuel supply. (EPIC funding) Contact: Robin Goodhand

G) California Environmental Quality Act (CEQA) Compliance

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

   Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:
   a) ☒ Agreement **IS** exempt.
      ☐ Statutory Exemption. List PRC and/or CCR section number:
      ☒ Categorical Exemption. List CCR section number: Cal. Code Regs., tit. 14, §§ 15301, 15303, 15306
      ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section: This project involves the deployment and testing of four mobile energy storage systems (MORBUGs) that can produce standby power from renewable sources through the use of a fuel cell and backup energy storage system. The MORBUGs can act as a backup energy source during grid outages due to public safety power shutoff events, wildfires, or other natural disaster events.

Under this project, the MORBUGs will be mounted on a wheeled trailer and towed by a truck using public highways from the grant recipient's subcontractor's leasing office to the project sites. The trailers will be parked on prepared ground and connected to the site's electrical services on the customer's side of the meter. The MORBUGs will be tested at each site to validate their performance in comparison to fossil-fuel based standby generators. The sites' existing electrical panels, cables, circuit breaker and switch gear may require minor customer side of the meter upgrades to enable the MORBUG to connect. Fire and explosion safety precautions will be taken regarding hydrogen storage, batteries and other project components. The leased equipment will be returned to the leasing office at the end of the agreement. There will not be any emissions impact from this project as the fuel cells are a clean power source. There will be no permanent installations or construction at the sites since the MORBUG is portable.

This project is therefore categorically exempt from environmental review pursuant to section 15301 of the CEQA Guidelines because it consists of the minor alteration of existing structures, facilities, mechanical equipment involving negligible or no expansion of existing or former use at the sites.

The project is also categorically exempt pursuant to section 15303 of the CEQA Guidelines because it consists of the installation of small new equipment in small structures with only minor modifications to the structures.

The project is also categorically exempt pursuant to section 15306 of the CEQA Guidelines because it consists of basic data collection, research and resource evaluation activities which will not result in a major disturbance to an environmental resource. The project does not involve any unusual circumstances, will not result in damage to any scenic resources within a highway officially designated as a state scenic highway, none of the sites are included on any list compiled pursuant to Government Code section 65962.5, and the project will not cause a substantial adverse change in the significance of a historical resource. The project, when considered as a whole, will not result in a cumulative impact that is significant on the environment. Therefore, none of the exceptions to exemptions listed in CEQA Guidelines section 15300.2 apply to this project and this project will not have a significant effect on the environment.

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
Institute of Gas Technology dba Gas Technology Institute	$ 70,000
The Energy Coalition	$ 69,000
INCHARGE ENERGY, INC.	$ 1,400,000
Renewable Innovations Inc.	$ 0
	$

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

Legal Company Name:
The Southern California Gas Company (SoCalGas)
Renewable Innovations Inc.
Institute of Gas Technology dba Gas Technology Institute
INCHARGE ENERGY, INC.

J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	20-21	301.001H	$1,999,953

R&D Program Area: ESRO: ETSI TOTAL: $ 1,999,953

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Erin Jones

Address: 3420 Hillview Ave

City, State, Zip: Palo Alto, CA 94304-1355

Phone: 650-855-2148

E-Mail: ejones@epri.com

2. Recipient's Project Manager

Name: Peggy Ip

Address: 3420 Hillview Ave

City, State, Zip: Palo Alto, CA 94304-1355

Phone: 650-855-2148

E-Mail: pip@epri.com

L) Selection Process Used

☒ Competitive Solicitation Solicitation #: GFO-20-310

☐ First Come First Served Solicitation Solicitation #:

☐ Non-Competitive Bid Follow-on Funding (SB 115)

M) The following items should be attached to this GRF

1. Exhibit A, Scope of Work ☒ Attached
2. Exhibit B, Budget Detail ☒ Attached

3. CEC 105, Questionnaire for Identifying Conflicts		☒ Attached
4. Recipient Resolution	☒ N/A	☐ Attached
5. CEQA Documentation	☐ N/A	☒ Attached

Agreement Manager **Date**

Office Manager **Date**

Deputy Director **Date**

EXHIBIT A
Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	X	Define Requirements and Develop a System Design
3	X	Deploy, Integrate, Test and Commission MORBUG
4		Operate MORBUG Units, Collect and Analyze M&V and Performance Data
5		Engage Disadvantaged, Low-Income and Tribal Communities
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
DAC	Disadvantaged Community. These are 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)
EV	Electrical Vehicle
GFIA	Generating Facility Interconnection Agreement
LIC	Low Income Community. These are defined as 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)
M&V	Measurement & Verification
MORBUG	**Mo**bile **R**enewable **B**ack**U**p **G**enerator
PSPS	Public Safety Power Shutoff
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

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

EXHIBIT A
Scope of Work

The purpose of this Agreement is for Recipient (Electric Power Research Institute, Inc.) to demonstrate advanced clean energy mobile backup systems or Mobile Renewable Backup Generation Systems (MORBUGs) above 10kW that create a standalone power source for an emergency facility and postpone the use of fossil-based backup power sources as long as possible, validating the system's ability to increase the resiliency of the electricity system to climate change and extreme weather events while utilizing a renewable fuel supply.

B. Problem/ Solution Statement

Problem

The emergence of Public Safety Power Shutoffs (PSPSs) has exposed the vulnerability of resiliency-enhancing technologies that rely on fossil-fueled generation. Fossil fuel-based fuels require replenishing during extended PSPS events; in emergency situations such as a wildfire or an extreme weather event the refueling supply chains or delivery routes may be compromised. Additionally, fossil fuel-based standby generators create adverse pollution with impacts on public health. Renewable power sources such as small kW power rated solar + storage solutions can provide standby power or even continuous power for stationary applications such as for telecommunications equipment (mobile phones, routers, etc), without making a material impact on site operations. However, not enough attention has been devoted to mobile renewable standby backup generators that can provide emergency power to a residential building or a commercial facility. Heretofore, the data on mobile renewable power sources has been scant and the resiliency need undefined.

Solution

The Recipient and their subcontracted project partners have developed a mobile backup power solution that addresses major barriers to implementation by:

- Providing access to clean, emergency power from a safe, quiet and reliable system in the form of a fully integrated Direct Hydrogen Fuel Cell and EV battery backup based mobile renewable backup generation MORBUG system,
- Collecting operational system data to validate the MORBUG performance for comparison with fossil fuel-based standby power generators,
- Integrating robust and cost-effective fuel cell and energy storage systems from an automotive fuel cell vehicle powertrain, with the participation of a mainline Original Equipment Manufacturer,
- Gathering operational know-how of the integrated MORBUG system, evaluating community impacts and benefits, and sharing lessons learned.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to demonstrate resilience-enhancing standby generation technologies and MORBUG systems that operate on renewable energy and are transportable to operate standalone for extended periods of time during a PSPS event, as well as to create economic value when grid-connected during non-outage conditions.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity reliability, lower economic and societal costs, and increased electrical and physical safety by the following means:
The project will demonstrate improved electricity reliability by producing standby power from renewable sources (e.g., renewable hydrogen) through the use of a fuel cell and backup energy storage system, which act as a backup energy source during grid outages due to public safety power shutoff events, wildfires or other natural disaster events.

The project will lower economic costs through preventing lost productivity due to loss of power during an outage, and creating grid services revenue when the system is grid-connected. Granted the initial cost of such systems are higher due to their early stage, but significant cost reduction potential exists to bring their costs in line with existing standby generation systems, which cannot be operated during a non-outage condition due to the pollution and fuel costs that result. The project will deliver reduced societal costs by removing the polluting diesel generator emissions from the community air, including Nitrous Oxide and CO2.

The project will improve electrical and physical safety by demonstrating a self-contained system and operating it according to the utility and local facility safety protocols (avoiding any makeshift and unknown interconnection, with safety hazards typical during emergency events) and also creating the energy to provide for safety, lighting and other communications to connect with first responder personnel.

The project will demonstrate energy resiliency during simulated or actual grid outages in customer side of the meter applications. The performance of the hydrogen energy system will be validated against the following key metrics:

- 35 kW continuous power for more than 24 hours.
- 80 kW of continuous power for more than 11 hours.
- Parallel operation of 2 or more MORBUG units, if sites allow.
- 150 kW direct-current fast charging (DCFC) for 2.5 hours.
- Battery energy storage AC electricity roundtrip conversion efficiency of at least 85% averaged over a time period representative of an emergency deployment in response to an extreme event use case.
- Fuel cell hydrogen to electricity conversion efficiency of at least 45%.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by demonstrating the techno-economic feasibility of a transportable, renewable energy-based emergency power source that generates electricity on-demand where needed, and can be easily moved around, as well as connected to the grid to provide grid services during healthy grid conditions. Furthermore, the work being conducted in the Agreement will show how such as system can be a key strategic component in expanding energy equity through distributed resiliency in underserved communities.

Agreement Objectives
The objectives of this Agreement are to:

[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 CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

- Demonstrate a MORBUG system that is transportable and adaptable to a broad set of operating scenarios.
- Operate the system in at least three locations, in at least three climate zones, and four seasons, as well as operate a system as mobile demonstrator to showcase its capabilities that improve energy resiliency while reducing emissions and creating value for the community.
- Engage underserved disadvantaged and low-income as well as tribal communities in the formulation, execution and socialization of the beneficial operation of the MORBUG systems in their midst.
- Collect operational data to inform planning for MORBUG cost-effective scale-up and commercialization.
- Create a technology transfer and manufacturing/commercialization plan that allows the technology providers to engage with key commercialization stakeholders and extend the commercial progress of the MORBUG system.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). 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.

EXHIBIT A
Scope of Work

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 California Energy Commission's (CEC) 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.

  The following describes the accepted formats for electronic data and documents provided to the CEC 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.
  - 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 CEC'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 CEC staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The administrative portion of the meeting will include discussion of the following:
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - 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 (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
  - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
  - Project schedule that identifies milestones
  - List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, 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:
- Kick-off Meeting Presentation
- Updated Project Schedule *(if applicable)*
- Match Funds Status Letter (subtask 1.7) *(if applicable)*
- Permit Status Letter (subtask 1.8) *(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 CEC 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 CEC 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 CEC.

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 CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare and submit 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.
- 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* with 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)

CAM Products:

- CPR Agenda
- 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 CEC 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 procured equipment.
    - The CEC'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 copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:
- Final Meeting Agreement Summary *(if applicable)*
- Schedule for Completing Agreement Closeout Activities
- All Final 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 Funds and in-state expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report
The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC 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 *Energy Commission Style Manual* provided by the CAM.

Recipient Products:
- Final Report Outline (draft and final)

CAM Product:
- Energy Commission Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:
- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Energy Commission 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)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
  - Comments the recipient proposes to incorporate.

  - Comments the recipient does propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:
- Summary of TAC Comments
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- Final Report

CAM Product:
- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds
The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of CEC 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 CEC 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 CEC awarding this Agreement, then provide in the letter:
  - A list of the match funds that identifies:
    - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
    - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where

the property is located.
    - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

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

Subtask 1.8 Permits
The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:
- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If <u>no permits</u> 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 each executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

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

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)
The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

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

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

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

The Recipient shall:

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

Products:

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

Subtask 1.11 TAC Meetings

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

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.

- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

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

Products:

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

Subtask 1.12 Project Performance Metrics

The goal of this subtask is to finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the project performance metrics from the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
  - TAC comments the Recipient proposes to incorporate into the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
  - TAC comments the Recipient does not propose to incorporate with and explanation why.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the Recipient met each of the performance metrics in the *Final Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:

- TAC Performance Metrics Summary
- Project Performance Metrics Results

TECHNICAL TASKS

TASK 2 DEFINE REQUIREMENTS AND DEVELOP A SYSTEM DESIGN
The goal of this task is to define the technical and business requirements for a fully integrated and packaged system that can be replicated at scale.

The Recipient shall:

- Prepare a *Technical and Business Model Requirement Summary* that describes and summarizes the key performance criteria that the MORBUG system must achieve in order for the MORBUG system to be deployed as a fully integrated packaged product that is replicable at scale. The Recipient shall include, within the *Technical and Business Model Requirement Summary,* descriptions of lessons learned such as techno-economic trade-offs, key sensitivities and the relative significance of configuration choices. To inform the development of the *Technical and Business Model Requirement Summary* the Recipient shall undertake research activities as required that may include, but are not limited to:
    - Stakeholder consultations with community representatives, emergency site operators, and technology providers to prioritize permitting, technical and business requirements, as well as functional specifications and features.
    - Engage with applicable permitting authorities, including Authorities Having Jurisdiction (AHJs) and or first responders, to understand permitting requirements.
    - Primary research to define operational performance requirements for a variety of deployment scenarios and climate zones.
    - Evaluation of hydrogen and battery energy storage safety requirements.
    - Evaluation of business model requirements necessary to achieve deployment repeatability at scale.

- Prepare a *System Configuration Summary* to document and describe the overall technical configuration of the fully integrated packaged MORBUG product, its operating parameters and expected performance once it is fully deployed and commissioned. The Recipient shall include within the *System Configuration Summary* descriptions of the configuration choices and any lessons learned in the final selection of the system configuration, such as safety features, user interfaces, electrical connections, communications, charging and refueling. To inform the development of the *System Configuration Summary* the Recipient shall undertake research activities as required that may include, but is not limited to:
    - The assessment of MORBUG package service connection specifications.
    - The assessment of permitting considerations for the MORBUG and charging equipment (where applicable).
    - The assessment of control system, grid connection requirements, operation in islanded mode, options for utilizing the integrated electric vehicle charging port.
    - The assessment of functional and non-functional requirements for local energy management system.
    - Evaluation of the control system's management of the MORBUG system on blue-sky days and during outages.
    - The design of the service connection for the MORBUG package.
    - Development of a MORBUG system architecture suitable for a wide variety of deployment scenarios
    - Identification of any site modification requirements.
    - Prepare permit applications and secure permits in accordance with subtask 1.8 (Permits).

- Prepare a *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings)
    - Participate in CPR meeting #1

EXHIBIT A
Scope of Work

Products:

- Technical and Business Model Requirement Summary (Draft) (D201)
- Technical and Business Model Requirement Summary (Final) (D202)
- System Configuration Summary (Draft) (D203)
- System Configuration Summary (Final) (D204)
- CPR Report #1 (Draft) (D131)
- CPR Report #1 (Final) (D132)

TASK 3 DEPLOY, INTEGRATE, TEST AND COMMISSION MORBUG

The goal of this task is to deploy four MORBUG systems at specified locations (three at sites, fourth as a mobile demonstrator), in at least three climate zones, and four seasons.

The Recipient shall:

- Prepare an *Integration, Interconnection, and Commissioning Report* that describes and documents the four MORBUGs' initial commissioning, technical performance, and challenges encountered during leasing, delivery, integration, interconnection, and commissioning; as well as planned approaches to optimize the system, key lessons learned, best practice guidance and recommendations for streamlining future MORBUG deployments. In the preparation of the *Integration, Interconnection, and Commissioning Report* the Recipient shall perform associated project work as required to deploy four MORBUG packaged systems, that may include but is not limited to the following:
    - Configuration optimization of the four MORBUG packages for deployment on a mobile, towable platform.
    - Site preparations, permitting activity, integration, interconnection, commissioning, inspections, safety checks and electrical grid connections.
    - Configure a minimal facility operator interface for operational and monitoring purposes.
    - Prepare permit applications and secure permits in accordance with subtask 1.8 (Permits).
    - Submit Generating Facility Interconnection Agreement (GFIA) to utility, wherever applicable.
    - Secure written notice of practical completion, and utility permission to operate.
    - Test MORBUG functionality both during grid-connected normal operation and in islanded mode for site(s) identified as feasible for grid connection.
    - Validate MORBUG performance in Task 4 *M&V Plan*.

- Prepare *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings)
    - Participate in a CPR meeting

Products:

- Integration, Interconnection, and Commissioning Report (Draft) (D301)
- Integration, Interconnection, and Commissioning Report (Final) (D302)
- CPR Report #2 (Draft) (D133)
- CPR Report #2 (Final) (D134)

TASK 4: OPERATE MORBUG UNITS, COLLECT AND ANALYZE M&V AND PERFORMANCE DATA

The goal of this task is to generate operational data from the MORBUG system to inform the measurement and verification (M&V) assessments.

The Recipient shall:

- Prepare a *M&V Plan* that identifies the specific sequence of tests that will be carried out to assess the project goals, specific to at least three host sites for the three MORBUG units in at least three climate zones, and four seasons, as well as one technology mobile demonstration per CAM written instruction. The *M&V Plan* will address requirements that shall include but not be limited to:
    - For each site, establish monitoring and control connectivity between MORBUG, charging equipment and the local operator site-specific interface.
    - Perform the field testing according to the plan.
    - Document the field test results for each of the sites, both during grid-connected and grid-isolated modes.
    - Perform data collection & verification of performance.
    - Process data for reporting.
    - Analysis of data and system performance.

- Prepare *M&V Report* that includes, but is not limited to:
    - Summary of MORBUG's operational data for each deployment.
    - Measurement and verification approach.
    - Summary of test results.

Products:
- M&V Plan (Draft) (D401)
- M&V Plan (Final) (D402)
- M&V Report (Draft) (D403)
- M&V Report (Final) (D404)

TASK 5: ENGAGE DISADVANTAGED, LOW-INCOME AND TRIBAL COMMUNITIES
The goal of this task is to engage DAC, LIC and Tribal Community stakeholders to raise their awareness of the benefits of the technology as well as increase their participation in the TD&D activity within their neighborhoods.

The Recipient shall:
- Prepare a *Community Engagement Plan* that identifies the goals, methods and anticipated outcomes of the engagement with communities where the host sites are located. The *Community Engagement Plan* shall include a list with budgetary allocations of outreach and educational materials and other specific activities that will be performed under the plan, that shall include focus on, but not be limited to:
    - Community outreach.
    - Education material in a culturally sensitive, multilingual format.
    - Benefits to the local community.
    - Public health benefits.
    - Economic benefits.

- Prepare a *Community Engagement Report* that describes and documents the activities and outcomes of the engagement with communities where the host sites are located.

Products:
- Community Engagement Plan (Draft) (D501)
- Community Engagement Plan (Final) (D502)
- Community Engagement Report (Draft) (D503)
- Community Engagement Report (Final) (D504)

TASK 6 EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete *the Initial Project Benefits Questionnaire*. The *Initial Project Benefits Questionnaire* shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by December 15th of each year. The Annual Survey includes but is not limited to the following information:
  - Technology commercialization progress
  - New media and publications
  - Company growth
  - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The *Final Project Benefits Questionnaire* shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

Products:

- Initial Project Benefits Questionnaire (D601)
- Annual Survey(s) (D602)
- Final Project Benefits Questionnaire (D603)
- Documentation of Project Profile on EnergizeInnovation.fund (D604)
- Documentation of Organization Profile on EnergizeInnovation.fund (D605)

TASK 7 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to conduct activities that will accelerate the commercial adoption of the technology being supported under this agreement. Eligible activities include, but are not limited to, the following:

- Scale-up analysis including manufacturing analysis, independent design verification, and process improvement efforts.
- Technology verification testing, or application to a test bed program located in California.
- Legal services or licensing to secure necessary intellectual property to further develop the technology
- Market research, business plan development, and cost-performance modeling.
- Entry into an incubator or accelerator program located in California.

The Recipient Shall:

- Develop and submit a *Technology Transfer Plan (Draft/Final)* that identifies the proposed activities the Recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the *Draft Technology 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 Technology Transfer Plan*. This document will identify:
  - TAC comments the Recipient proposes to incorporate into the *Final Technology Transfer Plan*.
  - TAC comments the Recipient does not propose to incorporate with and explanation why.
- Submit the *Final Technology Transfer Plan* to the CAM for approval.
- Implement activities identified in *Final Technology Transfer Plan.*
- Develop and submit a *Technology 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.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

Products:

- Technology Transfer Plan (Draft) (D701)
- Final Technology Transfer Plan (Final) (D702)
- Summary of TAC Comments (D703)
- Technology Transfer Summary Report (Draft) (D704)
- Technology Transfer Summary Report (Final) (D705)
- High Quality Digital Photographs (D706)

IV. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 21-0715-8c

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ELECTRIC POWER RESEARCH INSTITUTE, 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 EPC-21-003 with Electric Power Research Institute, Inc. for a $1,999,953 grant to demonstrate four resilience-enhancing mobile renewable backup generator (MORBUG) standby generation systems. The hybrid battery plus fuel cell MORBUG system acts as a backup energy source during grid outages due to public safety power shutoff events, wildfires, or other natural disaster events. The project will validate the system's ability to increase the resiliency of the electricity system to climate change and extreme weather events while utilizing a renewable fuel supply; 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 July 15, 2021.

AYE:
NAY:
ABSENT:
ABSTAIN:

_____
Liza Lopez
Secretariat