

GRANT REQUEST FORM (GRF)



New Agreement EPC-17-052 (To be completed by CGL Office)

ERDD	Qing Tian	916-327-1463
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Gridscape Solutions	46-1804754
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Urban Microgrids for Grid Resiliency and Disaster Readiness

7/18/2018	3/31/2023	\$ 4,995,498
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ARFVTP agreements under \$75K delegated to Executive Director.

Proposed Business Meeting Date	5/9/2018	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
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Business Meeting Presenter	Mike Gravely	Time Needed:	5 minutes
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Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description

GRIDScape SOLUTIONS, INC. Proposed resolution approving Agreement EPC-17-052 with Gridscape Solutions, Inc. for a \$4,995,498 grant to demonstrate a commercialization-capable, modular, and secure approach to accelerate adoption of microgrids in the state of California. The project will develop and deploy virtual wide-area microgrids within disadvantaged communities that span multiple investor owned utilities service territories and involve microgrids with different sizes for disaster-readiness, resiliency, and grid services

- 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
 - If Agreement is considered a "Project" under CEQA:
 - a) Agreement **IS** exempt. (Attach draft NOE)
 - Statutory Exemption. List PRC and/or CCR section number: PRC § 21080.35
 - Categorical Exemption. List CCR section number: _____
 - Common Sense Exemption. 14 CCR 15061 (b) (3)
 Explain reason why Agreement is exempt under the above section:
 The installation of the solar photovoltaic panels on the rooftop and/or parking lot is statutorily exempt under Public Resources Code 21080.35. The installations are on the roofs of existing buildings and parking lots. The associated equipment takes up less than 500 square feet of ground surface and will be located on the same or immediately adjacent parcel as the solar panels. The installation of the solar panels does not require any of the permits listed in Public Resources Code 21080.35(d).
 - b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)
- Check all that apply
- | | |
|---|---|
| <input type="checkbox"/> Initial Study | <input type="checkbox"/> Environmental Impact Report |
| <input type="checkbox"/> Negative Declaration | <input type="checkbox"/> Statement of Overriding Considerations |
| <input type="checkbox"/> Mitigated Negative Declaration | |

Legal Company Name:	Budget
Electric Power Research Institute, Inc.	\$ 1,205,431
TRC Energy Services	\$ 200,067
InTech Energy, Inc.	\$ 60,000
	\$
	\$
	\$

EXHIBIT A Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Perform Systems Engineering Tasks
3		Procure and Deploy Microgrid at Each Host Site
4	X	Initiate Field Integration and Tests to Verify Performance and Value
5		Operate Microgrid for Data Collection and Performance Assessment
6		Evaluation of Project Benefits (Mandatory task)
7		Technology and Knowledge Transfer Activities
8		Production Readiness Plan

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
CPUC	California Public Utilities Commission
DAC	Disadvantaged Communities
DER	Distributed Energy Resources
DR	Demand Response
Energy Commission	California Energy Commission
EE	Energy Efficiency
EV	Electric Vehicle
GHG	Greenhouse Gas
IOUs	Investor Owned Utilities
M&V	Measurement & Verification
PV	Photovoltaic
TAC	Technical Advisory Committee
V2G	Vehicle to Grid
V-WAM	Virtual Wide-Area Microgrid

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

A. Purpose of Agreement

The purpose of this agreement is to demonstrate a commercialization-capable, modular, and secure approach that accelerates adoption of microgrids in the state of California. The project will develop and deploy virtual wide-area microgrids (V-WAM) within disadvantaged

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.

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communities (DAC) that span multiple Investor Owned Utilities (IOU) service territories and involve microgrids with different sizes for disaster-readiness, resiliency, and grid services.

B. Problem/ Solution Statement

Problem

Microgrids can improve local power quality, reliability, and resiliency, and provide grid services to integrate higher levels of intermittent renewables. However, there are several challenges as listed below for widespread adoption of the microgrids: 1) Microgrids are costly and complex; 2) Uncoordinated high-penetration of renewables is causing integration challenges for IOUs; 3) Reliable and validated datasets are not available to make dependable cost/benefit assessments for microgrids; and 4) Regulatory and valuation frameworks are not mature enough to enable reliable value assessment or a basis for market participation.

Solution

This project will deploy a virtual wide-area urban microgrid network at five sites in DAC areas to demonstrate how each of the following key aspects is improved through an innovative approach: 1) Standardized microgrid configurations; 2) Adaptable business case; and 3) Virtual wide-area urban microgrid.

The key project activities include: 1) Assessing facility energy and distribution interconnection capacity requirements; 2) Accurately sizing the distributed energy resources (DER) systems for each facility, modifying the local electric system to island, constructing the V-WAM system; and 3) Implementing the microgrid controller and energy management system for coordination, energy data collection, measurement and verification, as well as real-time visualization.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this agreement are to:

- Demonstrate the integration, interoperability, end-to-end cybersecurity, and emergency communications features of microgrids with satellite backbone of DERs elements at sites within DAC.
- Demonstrate adaptable microgrid-as-a-service business models that can connect multiple end-customers and customer-owned behind-the-meter DER assets into virtual networks of microgrid via cloud-based controls and optimization platform.
- Demonstrate how standardized microgrid configurations and packages with integrated DER elements can cover multiple customer segments, multiple meters, and different IOU territories.
- Demonstrate how clean and resilient disaster-readiness virtual networks of urban microgrid systems at sites within DAC create values for the distribution grid while grid-tied or islanded mode using all available DERs.
- Demonstrate how the proposed V-WAM approach offers low operating and capital cost configurations and helps streamline the procurement process.

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- Demonstrate Rule 21² inverter functions by working with multiple DER aggregators with large-scale deployments across California, interfacing their control platforms with the utility distributed energy resource management system.
- Demonstrate economic benefits and greenhouse gas (GHG) reduction combined with grid integration benefits through the optimal use of stationary and transportable storage and electric vehicle (EV) car sharing integrated into the microgrid operations.

Ratepayer Benefits:³ This Agreement will result in the ratepayer benefits of greater electricity reliability and resiliency at lower costs by providing orderly and multi-purpose integration of renewable electricity generation at the sites within DAC and by participation in the available grid services through appropriate market mechanisms to maximize the value of the microgrid in the grid-tied mode to the distribution grid (including improved stability, reliability, intermittent renewable balancing and ramping support). The proposed microgrid will also shift the peak loads and peak generation so that net daily load will be predictably flattened, alleviating the local duck-curve effects.

Technological Advancement and Breakthroughs:⁴ 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 use of renewable solar photovoltaic (PV) electric generation to replace or offset diesel-based backup power generation. Additionally, the ability to island the fire stations during a utility outage or natural disaster such as an earthquake for more than three hours purely based on use of renewable solar PV electric generation and energy battery storage technology will be an important demonstration of technological advancement and breakthroughs available today.

Agreement Objectives

The objectives of this Agreement are to:

- Objective 1: Design, develop, implement, operate and support an advanced microgrid infrastructure at the DAC-based host sites spanning at least two different IOU territories.
- Objective 2: Provide no less than three hours of clean, renewable electrical power to the sites during a utility outage in an islanded mode.
- Objective 3: Implement a local and advanced V-WAM energy management and coordination system with accurate forecasting of renewable energy resources and loads to support both day-to-day energy optimization and islanded operation in the event of the utility outages.
- Objective 4: Develop an approach and lessons learned to support replicability at other facilities.

² Electric Rule 21 is a tariff that describes the interconnection, operating and metering requirements for generation facilities to be connected to a utility's distribution system (See CPUC <http://www.cpuc.ca.gov/Rule21/>).

³ 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).

⁴ 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.

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III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

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

The Recipient shall:

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

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

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

For all products

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

Instructions for Submitting Electronic Files and Developing Software:

o **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.

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- 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 administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

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- 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);
 - Technology/Knowledge Transfer (Task 8); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, as needed to reflect any changes in the documents.

The CAM shall:

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

Recipient Products:

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

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

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

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

The Recipient shall:

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

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- 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.

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- The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
- Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
- "Surviving" Agreement provisions such as repayment provisions and confidential products.
- Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:

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

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

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

The Recipient shall:

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

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

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

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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.

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- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

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

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

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

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

The Recipient shall:

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

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.

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

Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

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

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

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

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- Copy of Each Approved Permit (*if applicable*)

Subtask 1.9 Subcontracts

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

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

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

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

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

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

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

- Researchers knowledgeable about the project subject matter;

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- 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, phone numbers of potential members, a summary of relevant experience and potential value to the project. 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.

Products:

- TAC Meeting Schedule (draft and final)

EXHIBIT A Scope of Work

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

IV. 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.*

TASK 2: PERFORM SYSTEMS ENGINEERING TASKS

The goals of this task are to design the microgrids based on detailed configuration analysis and define technique approaches, use cases and test plans for future microgrids deployment and commission. In addition, a measurement and verification (M&V) plan will be developed to demonstrate the advanced capabilities of the proposed microgrids and provide a promising outlook for similar-typed projects.

The Recipient shall:

- Reach agreement with the manager(s) of the selected deployment sites regarding the project timeline, space reserved for the project, equipment installation, permit and insurance requirements, indemnity, and the Recipient’s use of any removal or support staff. The sites identified as of the commencement date of this grant are within DAC and the IOU service territories at no less than five locations. If Recipient cannot secure at least five locations, the Recipient must receive CAM written approval to reduce the number of locations below five.
- Prepare and provide *Site Readiness Verification Reports* for each site (e.g. copy of contract, City/County agreement, permits, and memorandum of understanding, as applicable).
- For any changes in site location, the Recipient shall consult with CAM to determine the procedure to approve site changes.
- Develop a detailed *Final System Engineering Report or PowerPoint Presentation* for each site to include but not be limited to:
 - Microgrid configurations for each of the host sites;
 - Grid integration strategy including interconnection with utilities’ distribution system feeders and distribution operations center;
 - Operating strategy of virtual microgrids including autonomous host-site microgrid;
 - A description of emergency response communications backbone; and
 - A description of cybersecurity strategy of each autonomous microgrid and combined virtual microgrid.
- Develop *M&V Test Plan*, including but not limited to:
 - A description of major equipment specifications which will be used at each site;
 - A description of operational use cases for performance and value-added grid services, including energy efficiency (EE) and demand response (DR) use cases as well as performance assessment metrics for other value-added use cases;
 - Energy Efficiency (EE) to measure before and after the modifications for the quantification of actual kW/kWh saved;
 - Demand Response (DR) including, but is not limited to:
 - kW/kWh provided when DR is used;

EXHIBIT A

Scope of Work

- Definition of how the DR is used; the services provided by the microgrid; and the proposed value provided for these microgrid load services;
- The values of integrated services and how the services can be verified, measured and valued;
- DR event performance information from the IOU or CA ISO for any DR services provided
 - A plan to verify microgrid performance and value; and
 - A business plan to ensure the success of the proposed microgrid and promote its commercialization.
- Prepare *CPR Report #1* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Site Readiness Verification Reports
- Final System Engineering Report or PowerPoint Presentation
- M&V Test Plan
- CPR Report #1

TASK 3: PROCURE AND DEPLOY MICROGRID AT EACH HOST SITE

The goal of this task is to procure and deploy major equipment including solar PV, storage, EV and vehicle to grid (V2G) systems in line with the engineering design process to fully implement the advanced microgrid infrastructure at the proposed sites.

The Recipient shall:

- Procure and deploy PV, energy storage, microgrid controller, EV and V2G infrastructure at each site, engaging the participating original equipment manufacturers.
- Develop and submit to CAM an *Equipment and Services Procurement Report*, describing the purchased equipment, services, and the associated quality assurance procedures.
- Prepare and submit to CAM *Site Completion Reports* for each site that includes signing off major equipment, a final walkthrough report to ensure the installation is in accordance with the licensed engineer's final design, and any documentation to ensure that the installed system meets all federal, state, local, and any applicable code requirements.

Products:

- Equipment and Services Procurement Report
- Site Completion Reports

TASK 4: INITIATE FIELD INTEGRATION AND TESTS TO VERIFY PERFORMANCE AND VALUE

The goal of this task is to integrate, test and evaluate the DER elements of the advanced microgrid, separately and together, to verify their performances and capabilities in various operating scenarios.

EXHIBIT A

Scope of Work

The Recipient shall:

- Integrate and operate DER elements at each host site to work in grid-tied mode with no interruption to ongoing site operations and verify performance of the integrated system.
- Integrate and operate DER elements at each host site to verify value-added grid services use cases, including EE, DR, PV, storage, EV and V2G.
- Integrate and operate virtual microgrid elements together to verify performance that delivers full power in grid-tied mode.
- Integrate and operate entire virtual microgrid system to verify value-added grid services
- Integrate and operate EV car sharing service integrated with virtual microgrid and charging infrastructure, assess customer preferences.
- Execute the M&V test plan and prepare and submit to CAM an *M&V Test Report or PowerPoint Presentation* to document initiated field integration and test results.
- Develop a *Data Collection Plan* for documentation of technical, environmental and economic data including, but not limited to:
 - Operational performance, including duration of islanding mode capability
 - Response to grid emergencies
 - Parameters that will measure and document successes, lessons learned, and best practices for the above.
- Prepare *CPR Report #2* in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- M&V Test Report or PowerPoint Presentation
- Data Collection Plan
- CPR Report #2

TASK 5: OPERATE MICROGRID FOR DATA COLLECTION AND PERFORMANCE ASSESSMENT

The goals of this task are to collect data, analyze the test results, and assess the performance of the advanced microgrid system. Essential testing data for all valuable scenarios will be collected, and an in-depth performance evaluation process will be performed to verify the projected benefits, including efficiency, GHG emission reduction and cost savings. Lessons learned will also be summarized in this task. This task will be executed for one year (12-months) after commissioning of microgrid at each site or other time period as approved in writing by the CAM and will then extend for the next three years at the host sites beyond the Agreement end date.

The Recipient shall:

- Develop *Site Data Collection Report* including, but not limited to:
 - Establish baseline performance prior to implementing the advanced microgrid.
 - Identify essential data for each microgrid test scenario, address factors for success, and provide metrics for reporting results.
 - Perform microgrid test in defined scenarios/use cases specific to each of the site location.
 - Analyze collected data and compare against the projected benefits.
 - Collect and organize data collection and analysis for the period of 12-months after commissioning microgrids at each site or other time period as approved in writing by the CAM.

EXHIBIT A

Scope of Work

- Plans for continuing collection and analysis of data for a period of three years after the Agreement end date.
- Document lessons learned, challenges encountered and overcome, and recommendations for future microgrid deployments.
- Develop *Operation and Maintenance Manuals* for each site containing relevant information for each microgrid component and the *Final As-Built Drawings*.
- Work with both the Energy Commission and the microgrid operator to negotiate the delivery of the following to the Energy Commission annually for three years beyond the term end date of this Agreement:
 - A confirmation that the microgrid system is operating.
 - Any available summary performance data, benefits, or other relevant summary data reports that can be easily provided based on the data collecting systems installed.

Products:

- Site Data Collection Report
- Operation and Maintenance Manuals
- Final As-Built Drawings

TASK 6: EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include, but are not limited to:
 - Reliability, resiliency and sustainability improvements as provided by the microgrid.
 - Net impacts on the larger grid's load and load shape as provided by the microgrid.
 - GHG reductions as provided by the microgrid, compared to using the utility grid for the electricity and also GHG reductions as provided by any new energy efficiency capabilities of the microgrid project.
 - The dollar value of energy savings as provided by the microgrid, each year.
 - The dollar value of any co-benefits that may accrue to the project, each year.
 - Cost savings or increments compared to business as usual, as provided by the microgrid, including but not limited to technology and installation costs, operations and maintenance, and energy use.
 - Benefit metrics for each of the different DER separated by the specific DER element (e.g., the value energy storage provides to the microgrid owner/operator, the value renewables provide to the microgrid owner/operator, the value demand response services provide to the microgrid owner/operator).
 - Benefit of services as provided by the microgrid to the utility grid.

EXHIBIT A

Scope of Work

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

- For Information/Tools and Other Research Studies:
 - 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.

EXHIBIT A

Scope of Work

- 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.

- Prepare a Business Case Report. As appropriate, the report will discuss the following:
 - How the microgrid system meets the critical needs of the intended end user/operator.
 - Define why the specific configuration has a high probability of being replicated in the future without EPIC funds.
 - Other areas as determined by the CAM.

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire
- Business Case Report (draft and final)

TASK 7: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

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

The Recipient shall:

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

EXHIBIT A

Scope of Work

sponsored conference/workshop on the results of the project. Presentation materials must be approved by the CAM in writing prior to the conference/workshop(s).

- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

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

TASK 8: PRODUCTION READINESS PLAN

The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project's results.

The Recipient shall:

- Prepare a *Production Readiness Plan*. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
 - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
 - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes."
 - The estimated cost of production.
 - The expected investment threshold needed to launch the commercial product.
 - An implementation plan to ramp up to full production.
 - The outcome of product development efforts, such as copyrights and license agreements.
 - Patent numbers and applications, along with dates and brief descriptions.
 - Other areas as determined by the CAM.

Products:

- Production Readiness Plan (draft and final)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: GRIDSCAPE SOLUTIONS, INC.

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 EPC-17-052 with Gridscape Solutions, Inc. for a \$4,995,498 grant to demonstrate a commercialization-capable, modular, and secure approach to accelerate adoption of microgrids in the state of California. The project will develop and deploy virtual wide-area microgrids within disadvantaged communities that span multiple investor owned utilities service territories and involve microgrids with different sizes for disaster-readiness, resiliency, and grid services; 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 May 9, 2018.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat