STATE OF CALIFORNIA
GRANT REQUEST FORM (GRF)
CEC-270 (Revised 10/2015) CALIFORNIA ENERGY COMMISSION

New Agreement EPC-17-039 (To be completed by CGL Office)

ERDD	Ostap Loredo-Contreras	43	916-327-1552

Electric Power Research Institute, Inc.	23-7175375

Validated, Transparent, and Accessible Microgrid Valuation and Optimization Tool

	5/11/2018	3/31/2023	$ 2,000,000

☐ ARFVTP agreements under $75K delegated to Executive Director.			
Proposed Business Meeting Date	4/11/2018	☐ Consent	☒ Discussion
Business Meeting Presenter	Jamie Patterson	Time Needed:	5 minutes
Please select one list serve. EPIC (Electric Program Investment Charge)			
Agenda Item Subject and Description			
ELECTRIC POWER RESEARCH INSTITUTE, INC. Proposed resolution approving agreement EPC-17-039 with Electric Power Research Institute, Inc. for a $2,000,000.00 grant to develop a publicly-available, open-source, microgrid valuation and optimization software tool to aide in the design of microgrid and distributed energy resource deployments.			

1. Is Agreement considered a “Project” under CEQA?
   ☒ Yes (skip to question 2) ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):
   Explain why Agreement is not considered a “Project”:
   Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because

2. If Agreement is considered a “Project” under CEQA:
   ☒ a) Agreement **IS** exempt. (Attach draft NOE)
   - ☐ Statutory Exemption. List PRC and/or CCR section number:
   - ☒ Categorical Exemption. List CCR section number: 14 CCR § 15301
   - ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

   Explain reason why Agreement is exempt under the above section:
   Existing Facilities 14 CCR § 15301
   Section 15301 Existing Facilities provides an exemption for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing structures, facilities, mechanical equipment or topographical features involving negligible or no expansion of use beyond that existing. This project will involve software development and testing at an existing office building and will constitute the operation of an existing office building. The project will involve negligible or no expansion of use beyond that currently existing.

   ☐ b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)
   Check all that apply
   - ☐ Initial Study
   - ☐ Negative Declaration
   - ☐ Mitigated Negative Declaration
   - ☐ Environmental Impact Report
   - ☐ Statement of Overriding Considerations

List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)	
Legal Company Name:	Budget
XENDEE	$ 734,687
Lumina Decision Systems, Inc.	$ 99,901
DOE- Lawrence Livermore National Laboratory	$ 90,000
Helman Analytics	$ 90,000
	$
	$
	$
	$
	$

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

Budget Information

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	17-18	301.001E	$2,000,000
			$
			$
			$
			$
			$
R&D Program Area:	ESRO: ETSI	TOTAL:	$2,000,000
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer		Recipient's Project Manager	
Name:	David Morrison	Name:	Giovanni Damato
Address:	942 Corridor Park Blvd	Address:	3420 Hillview Ave
City, State, Zip:	Knoxville, TN 37932-3723	City, State, Zip:	Palo Alto, CA 94304-1355
Phone:	865-218-8104 / Fax: - -	Phone:	/ 650-855-2358 Fax: - -
E-Mail:	dmorriso@epri.com	E-Mail:	gdamato@epri.com

Selection Process Used

☒ Competitive Solicitation — Solicitation #: GFO-17-305
☐ First Come First Served Solicitation

The following items should be attached to this GRF

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

Agreement Manager	Date	Office Manager	Date	Deputy Director	Date

Exhibit A
Scope of Work

I. TASK ACRONYM/TERM LIST

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Product Specification and Architecture
3		Tool Development
4	x	Software Review Through Case Studies
5		Tool Completion, Documentation, and Delivery
6		Evaluation of Project Benefits
7		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
DER	Distributed Energy Resource(s)
DER-VET	Distributed Energy Resource Value Estimation Tool
MVP	Minimum Viable Product
QA/QC	Quality Assurance/Quality Control
TAC	Technical Advisory Committee
GUI or UI	(Graphical) User Interface
UX	User Experience

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

A. Purpose of Agreement

The purpose of this Agreement is to develop a microgrid valuation and optimization modeling tool called the Distributed Energy Resource Value Estimation Tool (DER-VET™) that is publicly-available, open-source, transparent, validated and accessible. DER-VET will combine robust technical analysis with economic optimization to aid in the design of microgrid and distributed energy resource (DER) deployments with maximum benefit to customers and society. This software will be shaped, reviewed, and continuously enhanced by a community of technical users and stakeholders.

[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.

B. Problem/ Solution Statement

Problem
Currently, there are several microgrid valuation tools that are intended to provide deployment decision-making support. While existing individual tools may be appropriate for addressing a particular set of objectives or use cases, there does not seem to be a comprehensive tool that can handle all possible use cases, geared for different user groups.

Solution
The Recipient will develop a powerful and user-friendly microgrid assessment tool, a comprehensive microgrid analysis framework, and a novel approach to microgrid location screening/selection to help streamline the deployment of microgrids across the state of California. When applied together, they can be used to maximize potential benefits to electricity end-customers (including disadvantaged communities), the electrical distribution grid, and the bulk system. At the same time, it will reduce soft-costs of microgrid project development and enhance engineering capabilities by simplifying the techno-economic analysis of prospective microgrid projects.

C. Goals and Objectives of the Agreement

Agreement Goals
The goals of this Agreement are to develop a tool to:

- Transparently and credibly model the technical attributes of DERs, including distribution-connected distributed generation resources, energy efficiency, electric vehicles, and demand response technologies.
- Model a range of services that DER may address to the electric grid and to end-customers.
- Calculate the cost and benefits delivered to different stakeholders from the deployment of DER and microgrids.
- Incorporate a consistent, transparent microgrid analysis framework to compare and contrast various technical and economic options, to inform customers, developers, utilities, and regulators.
- Incorporate these elements into open-source microgrid valuation software with impact from the user community.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety through improved insight into reliability needs and staked services to confidently deploy microgrids with appropriate DER sizing and dispatch strategies. Soft cost reductions are expected because the use of this proposed tool improves stakeholder communication and decision-making, resulting in optimal deployments of microgrids, which support higher penetration of DER, while also providing other grid and customer benefits. Increased safety is expected, because microgrids support grid resiliency, including in emergency outage situations.

[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).

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 though open-source microgrid valuation software integrated with complementary toolsets for California DER evaluation. The tool will establish reliability and resiliency-based metrics that can be used to drive microgrid system design combined with determinations of performance improvements and cost/benefit tradeoffs. The tool will also deploy a novel approach to microgrid screening and siting to maximize locational value based on feeder hosting capacity, local grid reliability, energy usage intensity, critical facility, high penetration renewables, and CalEnviroScreen for Disadvantaged Communities.[4]

Agreement Objectives

The objectives of this Agreement are to:

- Engage a diverse technical community for input and review: Evaluate the requirements for an open-source microgrid modeling tool that is both user-friendly and customizable.
- Support interoperability: Address the need for credible data sources and complementary tools to execute analyses by developing clear application program interfaces (APIs) and using widely used open-source software languages, such as Python.
- Address the need for a modeling tool that can be used as a supplement to existing utility distribution planning tools and to inform regulatory planning frameworks.
- Incorporate DER-VET into transparent, repeatable methodologies: Develop and review use cases and methods to perform consistent and credible analyses of technical and economic impacts of DER and microgrid deployment.
- Evaluate a streamlined approach for reliability and resiliency metrics that are potential drivers of microgrid system design such that determinations of performance improvements and cost/benefit tradeoffs can be made.
- Develop streamlined locational screening strategies: Develop streamlined methodologies to provide locational screening and microgrid system siting that avoid excessive computation.
- Optimal DER portfolio sizing: Develop algorithms and optimization strategies to optimally size a portfolio of DER considering both customer and utility objectives
- Support stacked services operation and optimization: Quantify the potential for microgrid systems to provide stacked benefits and use cases with shared utility and customer control
- Ongoing validation procedures: Develop procedures to validate DER-VET results with real-world projects

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

[4] Disadvantaged Communities are communities defined as areas representing census tracts scoring in the top 25 % in *CalEnviroScreen 3.0*. (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30)

Exhibit A
Scope of Work

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

- 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.
- Submit the final product to the CAM once agreement has been reached on the draft. The CAM will provide written approval of the final product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- If the CAM determines that the final product does not sufficiently incorporate his/her comments, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

For products that require a final version only

- Submit the product to the CAM for approval.
- If the CAM determines that the product requires revision, submit the revised product to the CAM within 10 days of notice by the CAM, unless the CAM specifies a longer time period.

For all products

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

  - **Electronic File Format**

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

    The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

    - Data sets will be in MS Access or MS Excel file format

(version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Documents intended for public distribution will be in PDF file format. The Recipient must also provide the native Microsoft file format.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

- ***Software Application Development***
  Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
  - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
  - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
  - Visual Studio.NET (version 2008 and up). Recommend 2010.
  - C# Programming Language with Presentation (UI), Business Object and Data Layers.
  - SQL (Structured Query Language).
  - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
  - Microsoft SQL Reporting Services. Recommend 2008 R2.
  - XML (external interfaces).

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

MEETINGS

Subtask 1.2 Kick-off Meeting
The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

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

  The 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
- Technology/Knowledge Transfer Activities (Task 7)
- Any other relevant topics.

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

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

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

The CAM shall:

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

Recipient Products:

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

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

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

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

The Recipient shall:

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

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

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

CAM Products:

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

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

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

The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

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

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

Products:

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

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

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

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
    - Summarize all Agreement activities conducted by the Recipient for the preceding month, including 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.
    - Provide a synopsis of the project progress, including accomplishments, problems, milestones, products, schedule, fiscal status, and any evidence of progress such as photographs.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions. In addition, each invoice must document and verify:

- Energy Commission funds received by California-based entities;
- Energy Commission funds spent in California *(if applicable)*; and
- Match fund 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 and approve 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 a Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:
- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM.
- Submit a draft of the outline to the CAM for review and comment.
- Once agreement has been reached on the draft, submit the final outline to the CAM. The CAM will provide written approval of the final outline within 10 days of receipt.

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

CAM Product:
- Style Manual

Subtask 1.6.2 Final Report

The Recipient shall:
- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline and the Style Manual provided by the CAM.
- Submit a draft of the report to the CAM for review and comment. Once agreement on the draft report has been reached, the CAM will forward the electronic version for Energy Commission internal approval. Once the CAM receives approval, he/she will provide written approval to the Recipient.
- Submit one bound copy of the Final Report to the CAM.

Products:
- Final Report (draft and final)

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

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

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

The Recipient shall:

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

  If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:
  - A list of the match funds that identifies:
    - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
    - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
  - A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

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

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

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

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

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

Subtask 1.9 Subcontracts
The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

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

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

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

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)
The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:
- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

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

The Recipient shall:
- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, phone numbers summaries of relevant experience and descriptions of potential values added to project for each potential member. 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)
- 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 Product Specification and Architecture
The goal of this task is to compile the specifications, architecture, and development plan for the DER-VET tool.

The Recipient shall:
- Conduct industry outreach workshops and webinars and collect stakeholder feedback with respect to tool specifications
- Produce a *Minimum Viable Product Specification* (MVP) to be included as an appendix in the final report that documents the following elements:
  - Use cases and functional requirements, including the ability to identify and assess the greatest value for microgrids by geographic location and use case (critical facility, high penetration renewables, others) and be able to identify if these locations are within Disadvantaged Communities and whether the benefits would apply to the Disadvantaged Communities. The tool must also assess the optimal combination of DER for use within each microgrid.
  - Integrated analysis framework definition
  - Software platform features
  - Identification of external tools and their uses and interface requirements
  - Identification of other data integration and collection needs for the DER-VET tool
  - Model architecture and algorithm definitions for key modules of DER-VET tool
- Produce a *Software Development Plan* to be included as an appendix in the final report that includes the following elements:
  - Dataset requirements, data models and requirements, syntax, and format of the software
  - Test plan that (1) describes inputs, user actions, and expected outputs and (2) defines client-side and server side application framework
  - Multi-tool interface requirements for the DER-VET tool
  - Technical specification of the DER-VET tool to reflect identified software needs, requirements, and specifications in terms of software features, modules, and user interface elements
  - Implementation Plan for the DER-VET tool

Products:
- Minimum Viable Product Specification (draft and final)
- Software Development Plan (draft and final)

TASK 3 Tool Development
The goal of this task is to develop the DER-VET tool based on the MVP specified in Task 2.

The Recipient shall:
- Implement the model architecture for the following DER-VET tool elements:
  - User experience (UX) mock ups and wire frames
  - Scenario manager

  - Application flow
  - Output and reporting
- Develop algorithms for key modules of the DER-VET tool for:
  - DER Sizing
  - Reliability
  - Optimization modules
  - Multi-perspective economic and financial valuation
- Code graphical user interface (GUI or UI) of the DER-VET tool including, but not limited to:
  - Developing graphical and application user interface design
  - Coding responsive application user interface
  - Coding client-side interface controls and layout
- Code key modules of the DER-VET tool
- Code database schema with tables, business logic, and rules
- Code external tool and database interfaces
- Conduct software platform testing, quality assurance (QA), and quality control (QC) with the following activities:
  - Draft an *Alpha Test Plan and Results* that includes test cases and user guide for Alpha software testing
  - Engage stakeholders through the TAC and other interested user groups for Alpha testing
  - Conduct QA/QC based on results of Alpha test period
  - Draft a *Beta Test Plan and Results* that includes test cases and user guide for Beta software testing
  - Engage stakeholders through the TAC and other interested user groups for Beta testing
  - Conduct QA/QC based on results of Beta test period

Products:
- Alpha Test Plan and Results
- Beta Test Plan and Results

TASK 4 Software Review Through Case Studies
The goal of this task is to review and validate the DER-VET tool through case studies using reference data sets and scenarios. For each of the case studies, reference datasets, scenarios, distribution feeder and customer loads, will be developed. The tool will be verified with these case studies. These case studies will show how core elements of the proposed tool enables integrated decision support and scenario analysis for optimal microgrid design, operational strategy, and location screening; multiple value stream including reliability and resiliency analysis based on different levels of data availability by the user; and microgrid valuation methodology that can address different stakeholder perspectives.

The Recipient shall:
- Conduct industry outreach workshops and webinars and collect stakeholder feedback with respect to reference data sets and scenarios to facilitate software review and validation
- Run case studies in DER-VET using reference data sets and scenarios
- Draft *Case Study Report* to be included as an appendix in the final report that contains the descriptions of the reference data sets and scenarios, software review and validation methodology, case study results, and findings
- Prepare a *CPR meeting Report* in accordance with subtask 1.3 (CPR Meetings)
- Participate in a CPR meeting

Products:
- Case Study Report (draft and final)
- CPR meeting Report

TASK 5 Tool Completion, Documentation, and Delivery
The goal of this task is to deliver the tool to the public with proper support, documentation, and training for interested stakeholders.

The Recipient shall:
- Develop, review, edit, and provide final *Software User Manual:*
    - Based on the software review
    - Documentation will provide user instructions to utilize the software in different circumstances and the technical documentation of model architecture and data sources
- Embed the contents of the *Software User Manual* into the software platform's UI to enhance the UX and alignment with software platform updates
- Respond to key issues identified in the software review related to functionality testing, usability testing, and stakeholder review and prioritize them for completion
- Perform final QA/QC review of software platform prior to public delivery
- Facilitate workshops, webinars, and training for end-users of the DER-VET tool
- Integrate workshop and training prioritized comments and suggestions into the final tool
- Post the tool's core modules to publically accessible website for open source software collaboration (www.github.com or equivalent)
- Setup server(s) for users to run DER-VET as a web-hosted tool
- Develop two-year support plan for the tool so that the tool is fully functional and supported for a period of at least two years from the end date of the Agreement.
- Draft a *Support and Maintenance Strategy Report* that outlines the support and maintenance plan for the tool through the required support and maintenance period

Products:
- Software User Manual (draft and final)
- Support and Maintenance Strategy Report (draft and final)

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:

- 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 as 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.
    - A discussion of project product downloads from websites, and publications in technical journals.
    - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.

- Respond to CAM questions regarding responses to the questionnaires.

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

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

TASK 7 Technology/Knowledge Transfer Activities
The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

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

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

Notice of Exemption **Form D**

To: Office of Planning and Research
PO Box 3044
1400 Tenth Street, Room 113
Sacramento, CA 95812-3044

From: California Energy Commission
1516 Ninth Street, MS-48
Sacramento, CA 95814

Project Applicant: Electric Power Research Institute, Inc.

Project Title: DER-VET A Distributed Energy Resource Value Estimation Tool

Project Location – Specific: 3420 Hillview Ave

Project Location – City: Palo Alto 94304 **Project Location – County:** Santa Clara

Description of Nature, Purpose and Beneficiaries of Project:

The purpose of this project is to develop a Distributed Energy Resource Value Estimation Tool (DER-VET), a publicly-available, open-source, microgrid valuation and optimization software tool. DER-VET will combine robust technical analysis with economic optimization to aide in the design of microgrid and distributed energy resource (DER) deployments with maximum benefit to customers and society. This software will be shaped, reviewed, and continuously enhanced by a community of technical users and stakeholders.
DER-VET is intended to directly address technical gaps in the present suite of tools used by grid planners and technology developers to design and analyze DER in utility grids and microgrids.

Name of Public Agency Approving Project: California Energy Commission

Name of Person or Agency Carrying Out Project: Electric Power Research Institute, Inc.

Exempt Status: (*check one*)

- ☐ Ministerial Exemption (Pub. Resources Code § 21080(b)(1); Cal. Code Regs., tit 14, § 15268);
- ☐ Declared Emergency (Pub. Resources Code § 21080(b)(3); Cal. Code Regs., tit 14, § 15269(a));
- ☐ Emergency Project (Pub. Resources Code § 21080(b)(4); Cal. Code Regs., tit 14, § 15269(b)(c));
- ☒ Categorical Exemption. State type and section number
  Cal. Code Regs., tit 14, § 15301
- ☐ Statutory Exemptions. State code number.
- ☐ Common Sense Exemption. (Cal. Code Regs., tit 14, §15061(b)(3))

Reasons why project is exempt:

Existing Facilities 14 CCR § 15301

Section 15301 Existing Facilities provides an exemption for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing structures, facilities, mechanical equipment or topographical features involving negligible or no expansion of use beyond that existing. This project will involve software development and testing at an existing office building and will constitute the operation of an existing office building.

Authority cited: Sections 21083 and 21110, Public Resources Code. Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Lead Agency
Contact Person: **Ostap Loredo-Contreras** **Area code/Telephone/Ext:** 916-327-1552

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: ______________ **Date:** ______________ **Title:** ______________

☐ **Signed by Responsible Agency**

☒ **Signed by Lead Agency**

☐ **Signed by Applicant** **Date received for filing at OPR:** ______________

Authority cited: Sections 21083 and 21110, Public Resources Code. Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

RESOLUTION NO: 18-0411-13a

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: ELECTRIC POWER RESEARCH INSTITUTE

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-17-039 from GFO-17-305 with Electric Power Research Institute for $2,000,000, to develop a publicly-available, open-source, microgrid valuation and optimization software tool to aide in the design of microgrid and distributed energy resource deployments; 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 April 11, 2018.
AYE: [List of Commissioners]
NAY: [List of Commissioners]
ABSENT: [List of Commissioners]
ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat