

A) New Agreement # EPC-21-013 (to be completed by CGL office)

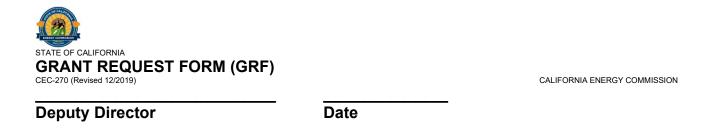
C) Recipient's Legal Name Yotta Energy, Inc. Di Title of Proiect Demonstrating Distributed Solar Plus Storage with Battery Backup Capability for Grid Resilience and Reliability E) Term and Amount Start Date End Date Amount Zir/2022 3/30/2026 \$1,229,174 F) Business Meeting Information ARFVTP agreements \$75K and under delegated to Executive Director Proposed Business Meeting Date 2/16/2022 Consent Discussion Business Meeting Presenter Michael Ferreira Time Needed: 5 minutes Please select one list serve. EPIC (Electric Program Investment Charge) Agenda Item Subject and Description: YOTTA ENERGY, INC. Proposed resolution approving agreement EPC-21-013 with Yotta Energy, Inc. for a \$1,229,174 grant to fund a grid-connected solar plus storage resiliency solut on an affordable housing rooftop in Santa Ana, California, and adopting staff's determination the this action is exempt from CEQA. The recipient's Solart_eaf technology consists of batteries, inverters, and other technology that fits under conventional solar panels. The funds will be use for applied research, design, testing, pilot demonstration, measurement, and verification to validate performance, safety, and economic feasibility for residences in disadvantaged communities. (EPIC funding) Contact: Michael Ferreira. G) California Environmental Quality Act (CEQA) Compliance 1. Is Agreement considered a "Project" under CEQA? Yes (skip to question 2) No (complete the following (PRC 21065 and 14 CCR 15378)): Explain why Agreement is not considered a "Project" under CEQA: a) Agreement is considered a "Project" under CEQA: Categorical Exemption. List CCR section number: Statutory Exemption. List CCR section number:	A) New Agreement # EPC-21-013 (to be completed by CGL office)					
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Yotta Energy, Inc. B2-0939225					51	916-776-0769
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Explain reason why Agreement is exempt under the above section: Cal. Code Regs., title 14, Section 15301 provides that projects which consist of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public and private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of use beyond that existing at the time of the lead agency's determination, are categorically exempt from the provisions of the California Environmental Quality Act. The physical aspects of this work will involve the procurement, testing, installation, and operation of photovoltaic solar panels, solar-power inverters, batteries, and related equipment at an existing multi-story residential apartment building in Santa Ana, California, primarily on the roof. No physical expansion of the residential building will take place. In addition, equipment will first be further developed and tested at existing laboratory facilities and/or offices in Austin, Texas; Aurora, Colorado; and possibly, Palo Alto, California. For these reasons, the proposed work will not have any significant effect on the environment and is exempt under Cal. Code Regs., tit 14, Section 15301.

exempt under Cal. Code Regs., tit 14, Se	
b) Agreement IS NOT exempt. (consult wit steps)	h the legal office to determine next
Check all that apply	
☐ Initial Study	
☐ Negative Declaration	
☐ Mitigated Negative Declaration	
☐ Environmental Impact Report	
Statement of Overriding Consideration	ns
s necessary) Legal Company Name:	Budget
Electric Power Research Institute, Inc.	\$ 400,000
Promise Energy Inc.	\$ 379,946
	\$
	\$
	\$
	\$
	\$
	\$
	\$ \$
	Ψ
List all key partners: (attach additional sheets as ned	cessary)
Legal Company Name:	

GRANT REQUEST FORM (GF CEC-270 (Revised 12/2019)	RF)		CALIFORNIA ENERGY COMMISSION		
) Budget Information					
Funding Source	Funding Year of Appropriation	Budget List Number	Amount		
EPIC	20-21	301.001H	\$1,229,174		
			\$ \$		
			\$		
			\$		
			\$		
R&D Program Area: EDMFO:		TOTAL	: \$ 1,229,174		
Explanation for "Other" selecti					
Reimbursement Contract #:	Federal Agreeme	nt #:			
K) Recipient's Contact Info1. Recipient's Admini		0 B	and Declaration		
Name: Jennifer Galle		-	ent's Project Manager		
Address: 2101 E Sai	•		Mario DiFranco		
150		Addres	SS.		
O:t. Otata 7: A	: TV 70744	City, S	tate, Zip: ,		
City, State, Zip: Aust 1171	In, IX /8/44-	Phone	Phone: +1.832.552.2738		
Phone: 210-884 - 65	E-Mail:	mario@yottaenergy.com			
E-Mail: jennifer@yot	taenergy.com				
L) Selection Process Used					
Competitive Solicitation	Solicitation #: GF	O-20-301			
First Come First Served S	Solicitation Solicitatio	n #:			
☐ Non-Competitive Bid Foll	ow-on Funding (SB 1	115)			
M) The following items sho	uld be attached to t	his GRF			
1. Exhibit A, Scope of	Work		☐ Attached		
2. Exhibit B, Budget D	•				
3. CEC 105, Question	3. CEC 105, Questionnaire for Identifying Conflicts				
4. Recipient Resolution	n 🗌	N/A	Attached		
5. CEQA Documentati	on \square	N/A	Attached		
Agreement Manager	 Date				
Office Manager	 Date				



I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Conduct Pilot Test Applied Research & Development
3		Applied Research & Development
4	Χ	Environmental Impact and Site Assessment
5	Х	Design, Install, and Deploy Solar Plus Storage Battery Backup Solution on
		Site
6	Χ	Deployment System Performance and Evaluation
7		Evaluation of Project Benefits
8		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
DER	Distributed Energy Resources
IOU	Investor Owned Utility
M&V	Measurement and Verification
PSPS	Public Safety Power Shutoffs
PV	Photovoltaics
R&D	Research and Development
SCE	Southern California Edison
TAC	Technical Advisory Committee

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

A. Purpose of Agreement

This proposal was submitted under solicitation GFO-20-301, proposal #3. The proposal was inadvertently submitted under the name Yotta Solar, Inc., which was the former name of Yotta Energy, Inc. The purpose of this Agreement is to fund a grid-connected solar plus storage battery backup solution on an affordable housing building rooftop in California. The project team plans to utilize the CEC funds for the applied research, design, testing, pilot demonstration, measurement, and verification of a solar plus storage battery backup solution to validate its performance, safety and economic feasibility for disadvantaged communities in California.

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

Grid resiliency and reliability has been problematic in California. Public Safety Power Shutoffs (PSPS) have also negatively impacted California ratepayers. Today, many residential and commercial customers are purchasing diesel-fueled generators to ensure PSPS or grid outages do not restrict their operations. Commercial and residential customers do not install energy storage systems tied to solar photovoltaics (PV) because they are bulky, complex, and expensive. Commercial systems also require their own building with heating, ventilation, and air conditioning systems, fire suppression systems, and other complex design elements. Additionally, many urban areas are at a standstill with respect to energy storage due to strict building and fire code regulations. Despite advancements in technology, installing energy storage is still cost prohibitive for most customers today due to the above reasons. Energy storage is a critical piece to solving climate change as it provides a way to store excess renewable energy and dispatch it at a time when it's needed most.

Solution

Yotta Energy, Inc. (Yotta) has developed the SolarLeaf, an energy storage solution that integrates directly behind standard PV panels by leveraging a phase change thermal management system. Integrating the system with PV racking avoids the need for concrete ballast which can reduce total installed system costs. The SolarLeaf's thermal management system avoids needing to be installed indoors by managing heat from ambient temperature, which further reduces totals costs. The overall cost of conventional solar plus storage is a pain point that's limits the deployment of solar plus storage. At scale, Yotta's solution has potential to brings down the total installed cost of energy storage, which can enable widespread adoption of solar plus storage installations.

The project team proposes to test, develop, and iterate on Yotta's existing technology to demonstrate the solar plus storage battery backup solution. While this has not been demonstrated before, the proposed solar plus storage solution would enable an affordable, modular, distributed, and scalable solar plus storage battery backup solution. Yotta plans to implement lessons learned on this project to develop a residential version to encourage homeowners to install energy storage with solar PV. This technology has potential to decarbonize existing technologies, provide a renewable-powered alternative to conventional natural gas and diesel generators, decrease the demand on the existing grid infrastructure, and increase at-home/at-business electric vehicle charging adoption rates.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Develop and deploy a grid-connected solar plus storage battery backup solution that can be deployed by Solar PV installers and, at scale, reduce total installed cost of energy storage.
- Validate the optimal battery backup configuration from a performance, safety, and code/standards perspective.
- Advance the battery backup solution to at least TRL 6 through testing, development, iteration, and demonstration.

- Validate the technology's ability to lower energy prices for customers in California through demand charge management and time-of-use shifting.
- Enhance grid reliability and resiliency functionality of the technology by integrating a solar plus storage battery backup solution.

Ratepayer Benefits: This Agreement could result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety by proving a distributed, modular, scalable, and cost effective solar plus storage battery backup solution. The proposed project could enable more distributed energy resources (DERs), which effectively smooths out the demand curve. The proposed project will also benefit the ratepayers by demonstrating a simplified and affordable energy storage solution that provides greater grid reliability and grid resiliency during power outages. Finally, the proposed solar plus storage battery backup solution will be designed for the commercial market with the intent of leveraging the technology's ability to mount with rooftop mounted PV to transition to the residential market using the lessons learned from this project.

<u>Technological Advancement and Breakthroughs</u>:³ This project is intended to lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by demonstrating a solar plus storage battery backup solution. The proposed project takes a systems approach by providing a plug-and-play solar plus storage battery backup solution that solar PV developers can install.

At scale, this can become a cost-effective solution that drives higher solar plus storage adoption rates. It also provides a pathway to an affordable, DER solution with resiliency to the residential market in California. Further, it decreases the existing grid fragility by offering alternative, local, and decarbonized power.

Agreement Objectives

The objectives of this Agreement are to:

- Test, develop, and iterate a solar plus storage battery backup solution that meets state of California and federal fire laws, ordinances, regulations, and standards.
- Demonstrate a roundtrip efficiency, solar PV to alternating current, of 90%.
- Confirm islanding transfer time of 4 milliseconds.
- Demonstrate a solar plus storage system reliability of 8,760 hours.
- validate greenhouse gas emissions reductions.
- Provide at least 2 hours of backup power to critical loads.
- Install a minimum solar plus storage battery backup system to support critical loads.

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).

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations. All technical tasks should include product(s). Products that require a draft version are indicated by marking "(draft and final)" after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, "days" means working days.

The Recipient shall:

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

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

For products that require a final version only

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

For all products

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

Instructions for Submitting Electronic Files and Developing Software:

Electronic File Format

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

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

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

Software Application Development

Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:

- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
- Visual Studio.NET (version 2008 and up). Recommend 2010.
- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

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

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

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

The <u>administrative portion</u> of the meeting will include discussion of the following:

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

The <u>technical portion</u> of the meeting will include discussion of the following:

- o The CAM's expectations for accomplishing tasks described in the Scope of Work;
- An updated Project Schedule;
- Technical products (subtask 1.1);
- Progress reports (subtask 1.5);
- Final Report (subtask 1.6);
- o Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
- Any other relevant topics.
- Provide Kick-off Meeting Presentation to include but not limited to:
 - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
 - Project schedule that identifies milestones
 - List of potential risk factors and hurdles, and mitigation strategy
- Provide an *Updated Project Schedule, Match Funds Status Letter*, and *Permit Status Letter*, as needed to reflect any changes in the documents.

The CAM shall:

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

Recipient Products:

- Kick-off Meeting Presentation
- Updated Project Schedule (if applicable)
- Match Funds Status Letter (subtask 1.7) (if applicable)
- Permit Status Letter (subtask 1.8) (if applicable)

CAM Product:

Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

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

Recipient and may include the CAO and any other individuals selected by the CAM to provide support to the CEC.

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

The Recipient shall:

- Prepare and submit a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

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

Recipient Products:

CPR Report(s)

CAM Products:

- CPR Agenda
- Progress Determination

Subtask 1.4 Final Meeting

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

The Recipient shall:

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

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

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
 - Disposition of any procured equipment.
 - The CEC's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential products.
 - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a Schedule for Completing Agreement Closeout Activities.
- Provide copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:

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

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

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

The Recipient shall:

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

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

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

Subtask 1.6.1 Final Report Outline

The Recipient shall:

 Prepare a Final Report Outline in accordance with the Energy Commission Style Manual provided by the CAM.

Recipient Products:

• Final Report Outline (draft and final)

CAM Product:

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

Subtask 1.6.2 Final Report

- Prepare a Final Report for this Agreement in accordance with the approved Final Report
 Outline, Energy Commission Style Manual, and Final Report Template provided by the
 CAM with the following considerations:
 - o Ensure that the report includes the following items, in the following order:
 - Cover page (required)
 - Credits page on the reverse side of cover with legal disclaimer (required)
 - Acknowledgements page (optional)
 - Preface (required)
 - Abstract, keywords, and citation page (required)
 - Table of Contents (required, followed by List of Figures and List of Tables, if needed)
 - Executive summary (required)
 - Body of the report (required)
 - References (if applicable)
 - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
 - Bibliography (if applicable)
 - Appendices (if applicable) (Create a separate volume if very large.)
 - Attachments (if applicable)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
 - Comments the recipient proposes to incorporate.

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

Products:

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

CAM Product:

Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

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

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

The Recipient shall:

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

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

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

or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.

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

Products:

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

Subtask 1.8 Permits

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

The Recipient shall:

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

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

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

Products:

- Permit Status Letter
- Updated List of Permits (if applicable)
- Updated Schedule for Acquiring Permits (if applicable)
- Copy of Each Approved Permit (if applicable)

Subtask 1.9 Subcontracts

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

The Recipient shall:

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

Products:

• Subcontracts (draft if required by the CAM)

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

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

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

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

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

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

The Recipient shall:

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

Products:

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

Subtask 1.11 TAC Meetings

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

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a TAC Meeting Schedule that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a TAC Meeting Agenda and TAC Meeting Back-up Materials for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

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

Products:

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

Subtask 1.12 Project Performance Metrics

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

- Complete and submit the project performance metrics from the *Initial Project Benefits* Questionnaire, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.

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

Products:

- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2 APPLIED RESEARCH & DEVELOPMENT

Subtask 2.1 Pilot Test Solar Plus Storage Battery Backup Configuration

The goals of this task is to prepare a pilot test plan; and install and troubleshoot the pilot test system.

- Develop a 2-5 page Draft Pilot Test Plan for the team and CEC input. That includes but is not limited to:
 - High high-level summary of the location and activities that will be conducted for the initial solar plus storage battery backup configuration tests.
 - o A summary of key barriers and risks that may occur during the test.
 - A timeline of the key milestones for the tests.
 - A list of key performance metrics and characteristics being tracked for the test.
 - o A list of required metering points, data to be collected, and logging rate required.
 - A description of what a successful test would entail and mean for the rest of the project.
- Prepare pilot test installation layouts and single line diagrams to support the pilot test in Task 4.
- Procure equipment for the pilot test, initiate discussions with the pilot test facility, and coordinate delivery for installation at the pilot test facility.
- Troubleshoot any system integrations and correct prior to initiating the pilot test.
- Install and troubleshoot two solar plus storage battery backup configurations to verify integration with a multi-hybrid grid-forming inverter.
- Develop a 2-5 page Final Pilot Test Plan for the team and CEC input. That includes but is not limited to:
 - High high-level summary of the location and activities that will be conducted for the initial solar plus storage battery backup configuration tests.

- A summary of key barriers and risks that may occur during the test.
- A timeline of the key milestones for the tests.
- A list of key performance metrics and characteristics being tracked for the test.
- A list of steps required for testing.
- A description of what a successful test would entail and mean for the rest of the project.
- Results and learning from the installation and troubleshooting of the system.
- Edits based off the CAM's feedback to the *Draft Pilot Test Plan*, or comments to why the edits were not included.

Products:

Pilot Test Plan (Draft and Final)

Subtask 2.2 Determine Quantitative Target Metrics for Performance, Safety, and Cost Savings.

The goals of this subtask are to establish technology requirements, measure results, and validate performance (e.g., efficiency, energy storage throughput), safety (e.g., required certifications, testing), and cost savings (e.g., installation, equipment, maintenance, utility bill). In this task the Recipient will develop quantitative measurements and analysis methods to evaluate the impacts, benefits, and challenges of the proposed battery backup solution to the utility and the grid for Task 4 and Task 5.

- Evaluate overall technology performance, as defined by key performance metrics in the test plan developed in Task 2.1.
- Prepare a 2-3 page Techno-Economic System Performance Assessment memo which will include:
 - o Measurement and validation methods and analysis,
 - o Quantitative evaluation on cost, benefit, and energy impacts, and
 - Observations regarding system safety, performance, reliability, building occupant perception, and quality-of-life.
- Evaluate utility and grid impacts of the technology.
- Prepare a 2-3 page Utility and Grid Impact Metrics and Assessment memo which will include but is not limited to:
 - An explanation of how and why energy storage and solar impacts the utility and grid.
 - A summary of quantitative measurements, analysis methods to evaluate project impacts to the utility and the grid, and significance of findings.
 - Procedures and best practices for proper capture and recording of these measurements and metrics.
- Evaluate cybersecurity requirements of the technology.
- Prepare a 2-3 page *Cybersecurity Requirements Assessment memo* which will include, but is not limited to, the following:
 - Capture and summarize high level cybersecurity challenges and best practices.
 - o Implementation strategies for ensuring proper enabling and use of secure communication modes and protocols.

Products:

- Utility and Grid Impact Metrics and Assessment
- Techno-Economic System Performance Assessment
- Cybersecurity Requirements Assessment

Subtask 2.3 Develop a Measurement and Verification (M&V) Plan

The goal of this subtask is to create a tailored Measurement and Verification (M&V) Plan for Tasks 4 and Task 5. The team is targeting a 12-month M&V Plan for the pilot test and 12-month M&V Plan for the deployment demonstration.

The Recipient shall:

- Develop a 3-5 page *Deployment Demonstration Test Plan (Draft and Final)* for the team and CEC input. That includes but is not limited to:
 - High high-level summary of the location and activities that will be conducted for the initial solar plus storage battery backup configuration tests in Task 4.
 - A summary of key barriers and risks that may occur during the test.
 - A timeline of the key milestones for the tests.
- Prepare a 4-7 page Measurement and Verification Plan for the pilot test and the deployment demonstration which will include but is not limited to:
 - o A high-level summary of the measurement and verification plan.
 - A description of the measurement devices and locations, data collection platform, and setup for the planned demonstration.
 - A timeline of the measurement and verification period.
 - A list of parameters that will be measured and metrics that will be used to validate cost effectiveness and performance.
 - A description of test procedures to properly quantify system performance and reliability.
 - o Definitions of analytical methods for processing data.
 - An overview of the expected results prior to measurement period.

Products:

- Deployment Demonstration Test Plan (Draft and Final)
- Measurement and Verification Plan (Pilot Test and Deployment Demonstration)

TASK 3 ENVIRONMENTAL IMPACT AND SITE ASSESSMENT

The goals of this task are to conduct projected results for the deployment demonstration in Task 5 including: greenhouse gas emissions reduction; solar PV enablement; quantitative metrics that will be tracked as part of the project performance. This task will also identify necessary design changes based on the projected impact evaluation.

- Quantify greenhouse gas emissions reduction
- Quantify solar PV enablement
- Assess quantitative metrics that will be tracked as part of the project performance
- Identify necessary design changes for general applications.
- Identify necessary design changes based on pilot test applied R&D, specific to Low-Income Site and Configuration.

- Prepare an Environmental Impact Metrics and Assessment which will include but is not limited to:
 - o An explanation of how energy storage and solar deployment impact the environment and local community.
 - A summary of completed assessment results:
 - Expected greenhouse gas emissions reduction
 - Expected solar PV enablement
 - Identified necessary design changes for general applications.
 - Identified necessary design changes based on pilot test applied R&D, specific to Low-Income Site and Configuration.
 - An evaluation of procedures and best practices for proper evaluation of these measurements and metrics.

Products:

Environmental Impact Metrics and Assessment

TASK 4 PILOT TEST TESTING AND EVALUATION

The goals of this task are to: 1) procure M&V equipment for the pilot test; 2) execute the pilot test M&V plan from Task 2.3; 3) conduct design, performance, and iterative testing; and 4) incorporate any necessary changes prior to the deployment demonstration installation.

The Recipient shall:

- Execute the pilot test M&V plan from Subtask 2.3.
- Prepare a 1-2 page Field Testing Site Overview which will include:
 - o A description and layout of site configuration and test setup.
 - o An overview of the equipment used on and connected to solution to be evaluated.
 - o High-quality photographs and diagram of site arrangement.
- Prepare a 2-5 page *Draft Pilot Testing and Evaluation Report*, which will include:
 - A summary of the evaluation and analysis of results from the completion of the M&V Plan.
 - A list of recommendations of future deployment strategies and approaches.
- Provide a 2-5 page *Final Pilot Testing and Evaluation Report* incorporating input from CEC and the project team.
- Conduct early technical readiness M&V design, performance, and iterative testing.
- Incorporate any necessary design changes based on pilot test M&V and prior to the demonstration installation.
- Procure M&V Equipment for the deployment demonstration project.
- Prepare a CPR Report #1 in accordance with subtask 1.3 (CPR Meetings).
- Participate in a CPR meeting.

Products:

- Field Testing Site Overview
- CPR Report #1
- Pilot Testing and Evaluation Report (Draft and Final)

TASK 5 DESIGN, INSTALL, AND DEPLOY SOLAR PLUS STORAGE BATTERY BACKUP SOLUTION ON SITE

The goals of this task are to: 1) complete the design and engineering of the solar plus storage battery backup system; 2) ensure a smooth interconnection review process with the utility; 3) secure permits with the City; 4) install the solar plus storage battery backup solution at the deployment demonstration site; 5) install the M&V equipment at the posy-demonstration site; and 6) demonstrate the solar plus storage battery backup solution.

The Recipient shall:

- Develop construction documents for the solar plus storage battery backup solution.
- Develop a 2-5 page *Draft System Installation and Commissioning Report* for review by the project team and CEC which will include but is not limited to:
 - o A description and layout of site configuration and demonstration setup.
 - An overview of the equipment proposed to be installed, the system components to be inspected, battery backup modes to be tested, and the proposed inspection test methods for the demonstration.
 - o High-quality photographs and diagram of site arrangement.
- Initiate interconnection discussion with the utility provider and conduct a gap study (e.g., perform analyses, additional work) as needed.
- Apply for and secure the required permits for installation.
- Prepare a 2-5 page *Final System Installation and Commissioning Report* incorporating input from the project team and CEC which will include:
 - A description and layout of site configuration and demonstration setup.
 - An overview of the equipment installed, the system components inspected, battery backup modes tested in operation, the proposed inspection test methods for the demonstration, and the outcome of final inspection and testing.
 - High-quality photographs and diagram of site arrangement.
- Procure equipment for the project demonstration.
- Install solar plus storage battery backup solution at demonstration site.
- Install M&V equipment at demonstration site for the proposed installation to begin deployment demonstration data collection.
- Commission solar plus storage battery backup system, pass inspection, and receive permission to operate.

Products:

System Installation and Commissioning Report (Draft and Final)

TASK 6 DEPLOYMENT SYSTEM PERFORMANCE AND EVALUATION

The goals of this task are to: 1) ensure M&V data collection is proceeding as planned; 2) evaluate M&V data; and 2) prepare an evaluation report describing the project performance with respect to pilot testing and deployment demonstration conditions.

- Conduct necessary field visits to support M&V at the pilot test and deployment demonstration site.
- Take high-quality photographs and prepare a diagram of site arrangement.
- Execute necessary tests and procedures to quantify and validate system performance.
- Analyze the M&V results for pilot testing and deployment demonstration.

- Prepare a Draft Evaluation Report of Findings from M&V results for pilot testing and deployment demonstration for CEC review and input that will include but is not limited to:
 - o A summary of the deployment and testing of the system.
 - A summary of the key findings from the deployment and testing.
 - An overview of lessons learned from deployment and testing.
 - High-quality photographs
- Provide a *Final Evaluation Report* of findings from M&V results for pilot testing and deployment demonstration incorporating CEC input.

Products:

Evaluation Report (Draft and Final)

TASK 7 EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete the Initial Project Benefits Questionnaire. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* each year as of January 31st. The Annual Survey includes but is not limited to the following information:
 - Technology commercialization progress
 - New media and publications
 - Company growth
 - o Follow-on funding and awards received
- Complete the Final Project Benefits Questionnaire. The Final Project Benefits
 Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant
 data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile at least once a year at a minimum by January 31st every year on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of* Project Profile on EnergizeInnovation.fund, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the
 organizational profile on the CEC's public online project and recipient directory on the
 Energize Innovation website (www.energizeinnovation.fund), and provide
 Documentation of Organization Profile on EnergizeInnovation.fund, including the profile
 link.

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)
- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

TASK 8 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

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

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

- Develop and submit a Technology Transfer Plan (Draft/Final) that identifies the
 proposed activities the recipient will conduct to accelerate the successful commercial
 adoption of the technology.
- Present the Draft Technology Transfer Plan to the TAC for feedback and comments.
 - The Draft Technology Transfer Plan (CEC CAM, Technical Advisory Committee and CA IOU (SCE focus) will include stakeholder webcasts to present technical and procedural findings to elevate to CPUC.
- Develop and submit a Summary of TAC Comments that summarizes comments received from the TAC members on the Draft Technology Transfer Plan. This document will identify:
 - o TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.
 - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the Final Technology Transfer Plan to the CAM for approval.
- Implement activities identified in Final Technology Transfer Plan.
- Develop and submit a Technology Transfer Summary Report (Draft/Final) that
 includes high level summaries of the activities, results, and lessons learned of tasks
 performed relating to implementing the Final Technology Transfer Plan. This report
 should not include any proprietary information.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six High Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) of pilot testing and deployment demonstration technology installation at the project sites or related project photographs.

Products:

- Technology Transfer Plan (Draft/Final)
- Summary of TAC Comments
- Technology Transfer Summary Report (Draft/Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 22-0216-8a

STATE OF CALIFORNIA

STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION: YOTTA ENERGY, INC.

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

RESOLVED, that the CEC Agreement EPC-21-013 with Yotta Energy, Inc. for a \$1,229,174 grant to fund a grid-connected solar plus storage resiliency solution on an affordable housing rooftop in Santa Ana, California. The recipient's SolarLeaf technology consists of batteries, inverters, and other technology that fits under conventional solar panels. The funds will be used for applied research, design, testing, pilot demonstration, measurement, and verification to validate performance, safety, and economic feasibility for residences in disadvantaged communities; and

FURTHER BE IT RESOLVED, that the Executive Director or their designee shall execute the same on behalf of the CEC.

<u>CERTIFICATION</u>

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the CEC held on February 16, 2022.

AYE: NAY: ABSENT: ABSTAIN:	
	Liza Lopez Secretariat