



**CALIFORNIA  
ENERGY COMMISSION**



**California Energy Commission  
September 11, 2024 Business Meeting  
Backup Materials for NeWorld Energy**

The following backup materials for the above-referenced agenda item are available in this PDF packet as listed below:

1. Proposed Resolution
2. Grant Request Form
3. Scope of Work

**[PROPOSED]**

**RESOLUTION NO: 24-0911-12a**

**STATE OF CALIFORNIA**

**STATE ENERGY RESOURCES  
CONSERVATION AND DEVELOPMENT COMMISSION**

**RESOLUTION: NeWoIrd Energy**

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

**RESOLVED**, that the CEC approves agreement EPC-24-016 with NeWorld Energy for a \$2,000,000 grant. This agreement will fund the development, certification, deployment, demonstration, and data analysis of the Energy Quarterback (EQB) system which enables scaled deployment of low-cost zero emissions backup power systems and streamlined grid interconnection. The technology will be deployed at two MFH locations in Tuolumne County and ten single-family homes in San Diego County. Both sites are in Disadvantaged Communities and the Tuolumne County site is within a High Fire Threat District; and

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

**CERTIFICATION**

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the CEC held on September 11, 2024.

AYE:

NAY:

ABSENT:

ABSTAIN:

Dated:

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Kristine Banaag  
Secretariat



## GRANT REQUEST FORM (GRF)

### A. New Agreement Number

**IMPORTANT:** New Agreement # to be completed by Contracts, Grants, and Loans Office.

**New Agreement Number:** EPC-24-016

### B. Division Information

1. Division Name: ERDD
2. Agreement Manager: Liet Le
3. MS-:None
4. Phone Number: 916-776-0785

### C. Recipient's Information

1. Recipient's Legal Name: NEWORLD.ENERGY LLC
2. Federal ID Number: 84-2082139

### D. Title of Project

Title of project: Energy Quarterback Development and Demonstration Project

### E. Term and Amount

1. Start Date: 10/14/2024
2. End Date: 3/31/2027
3. Amount: \$2,000,000.00

### F. Business Meeting Information

1. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
2. The Proposed Business Meeting Date: 9/11/2024.
3. Consent or Discussion? Discussion
4. Business Meeting Presenter Name: Tanner Kural
5. Time Needed for Business Meeting: 5 minutes.
6. The email subscription topic is: EPIC (Electric Program Investment Charge).

#### **Agenda Item Subject and Description:**

NEWORLD.ENERGY LLC

NEWORLD.ENERGY LLC. Proposed resolution approving agreement EPC-24-016 with NEWORLD.ENERGY LLC for a \$2,000,000 grant and adopting staff's recommendation that this action is exempt from CEQA. This project will fund the development, certification, deployment, demonstration, and data analysis of the Energy Quarterback (EQB) system which enables scaled deployment of low-cost zero emissions backup power systems and streamlined grid interconnection. The EQB is plug-and-play and plugs directly to the utility meter socket with no re-wiring required (EPIC funding). Contact: Liet Le.

### G. California Environmental Quality Act (CEQA) Compliance

#### **1. Is Agreement considered a "Project" under CEQA?**

Yes.

If yes, skip to question 2.



If no, complete the following (PRC 21065 and 14 CCR 15378) and 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 answer the following questions.**

a) Agreement **IS** exempt?

Yes or No

Statutory Exemption?

No

If yes, list PRC and/or CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

PRC section number: None

CCR section number: None

Categorical Exemption?

Yes

If yes, list CCR section number(s) and separate each with a comma. If no, enter "None" and go to the next question.

CCR section numbers: Cal. Code Regs., tit. 14, §§ 15301, 15303, 15306

California Code of Regulations, title 14, section 15301 provides that projects which consist of the operation, repair, maintenance, permitting, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, and which involve negligible or no expansion of existing or former use, are categorically exempt from the provisions of the California Environmental Quality Act (CEQA). This project involves the development and demonstration installation of an electric utility metering and panel expander device for existing facilities. The device is plug and play and connects directly to existing residential building utility meters. No re-wiring is required, and no new construction will take place. Therefore, the project is exempt from CEQA under section 15301.

California Code of Regulations, title 14, section 15303 provides that projects which consist of installation of small new equipment and facilities in small structures are categorically exempt from the provisions of CEQA. This project involves the development and demonstration installation of an electric utility metering and panel expander device for existing facilities. The device is plug and play and connects directly to existing residential building utility meters. No re-wiring is required, and no new construction will take place. Therefore, the project is exempt from CEQA under section 15303.

California Code of Regulations, title 14, section 15306 provides that projects which consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource are categorically exempt from the provisions of CEQA. This project involves the development and demonstration installation of an electric utility metering and panel expander device for existing facilities. The device is plug and



play and connects directly to existing residential building utility meters. No re-wiring is required, and no new construction will take place. This project will involve basic data collection, research, experimental management, and resource evaluation activities to achieve seamless and rapid integration of the utility metering and panel expander device with existing residential buildings and utility equipment. This work will not result in a serious or major disturbance to an environmental resource. Therefore, the project is exempt from CEQA under Section 15306.

This project does not involve impacts on any particularly sensitive environment; does not involve any cumulative impacts of successive projects of the same type in the same place that might be considered significant; does not involve unusual circumstances that might have a significant effect on the environment; will not result in damage to scenic resources within a highway officially designated as a state scenic highway; the project site is not included on any list compiled pursuant to Government Code section 65962.5; and the project will not cause a substantial adverse change in the significance of a historical resource. Therefore, none of the exceptions to categorical exemptions listed in CEQA Guidelines section 15300.2.

Common Sense Exemption? 14 CCR 15061 (b) (3)

No

If yes, explain reason why Agreement is exempt under the above section. If no, enter "Not applicable" and go to the next section.

Not applicable

b) Agreement **IS NOT** exempt.

**IMPORTANT:** consult with the legal office to determine next steps.

Not applicable

If yes, answer yes or no to all that applies. If no, list all as "no" and "None" as "yes".

| Additional Documents                   | Applies |
|----------------------------------------|---------|
| Initial Study                          | No      |
| Negative Declaration                   | No      |
| Mitigated Negative Declaration         | No      |
| Environmental Impact Report            | No      |
| Statement of Overriding Considerations | No      |
| None                                   | Yes     |

**H. Is this project considered "Infrastructure"?**

No

**I. Subcontractors**

List all Subcontractors listed in the Budget (s) (major and minor). Insert additional rows if needed. If no subcontractors to report, enter "No subcontractors to report" and "0" to funds. **Delete** any unused rows from the table.



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CALIFORNIA ENERGY COMMISSION

Grant Request Form  
CEC-270 (Revised 01/2024)

| Subcontractor Legal Company Name | CEC Funds  | Match Funds |
|----------------------------------|------------|-------------|
| Powertree Services Inc.          | \$ 254,170 | \$35,000    |
| Tierra Resource Consultants, LLC | \$ 150,015 | \$0         |
| Zero Net Energy Alliance, Inc.   | \$ 381,210 | \$0         |
| Tolteca Corp                     | \$ 40,000  | \$0         |
| Serious Controls LLC             | \$ 30,000  | \$0         |

**J. Vendors and Sellers for Equipment and Materials/Miscellaneous**

List all Vendors and Sellers listed in Budget(s) for Equipment and Materials/Miscellaneous. Insert additional rows if needed. If no vendors or sellers to report, enter "No vendors or sellers to report" and "0" to funds. **Delete** any unused rows from the table.

| Vendor/Seller Legal Company Name              | CEC Funds | Match Funds |
|-----------------------------------------------|-----------|-------------|
| NB Baker Electric, Inc. dba Baker Home Energy | \$75,000  | \$0         |
| UL LLC                                        | \$0       | \$100,000   |
| TBD - Testing and Certification               | \$0       | \$50,000    |
| TBD - Battery Energy Storage                  | \$180,000 | \$0         |
| NEWORLD.ENERGY LLC                            | \$75,110  | \$100       |

**K. Key Partners**

List all key partner(s). Insert additional rows if needed. If no key partners to report, enter "No key partners to report." **Delete** any unused rows from the table.

| Key Partner Legal Company Name |
|--------------------------------|
| No key partners to report      |

**L. Budget Information**

Include all budget information. Insert additional rows if needed. If no budget information to report, enter "N/A" for "Not Applicable" and "0" to Amount. **Delete** any unused rows from the table.

| Funding Source | Funding Year of Appropriation | Budget List Number | Amount       |
|----------------|-------------------------------|--------------------|--------------|
| EPIC           | 23-24                         | 301.001K           | \$ 2,000,000 |

**TOTAL Amount: \$ 2,000,000**

R&D Program Area: ESB: Renewables

Explanation for "Other" selection Not applicable



Reimbursement Contract #: Not applicable

Federal Agreement #: 101

**M. Recipient's Contact Information**

**1. Recipient's Administrator/Officer**

Name: Gary Robbins

Address: 729 Santana Drive

City, State, Zip: Corona Del Mar, CA 92625

Phone: 775-560-6153

E-Mail: gary@eqbmim200.com

**3. Recipient's Project Manager**

Name: Paul Donahue

Address: 729 Santana Drive

City, State, Zip: Corona Del Mar, CA 92625

Phone: 949-400-6393

E-Mail: paul@eqbmim200.com

**N. Selection Process Used**

There are three types of selection process. List the one used for this GRF.

| Selection Process                      | Additional Information |
|----------------------------------------|------------------------|
| Competitive Solicitation #             | GFO-23-302             |
| First Come First Served Solicitation # | Not applicable         |
| Other                                  | Not applicable         |

**O. Attached Items**

1. List all items that should be attached to this GRF by entering "Yes" or "No".

| Item Number | Item Name                                        | Attached |
|-------------|--------------------------------------------------|----------|
| 1           | Exhibit A, Scope of Work/Schedule                | Yes      |
| 2           | Exhibit B, Budget Detail                         | Yes      |
| 3           | CEC 105, Questionnaire for Identifying Conflicts | Yes      |
| 4           | Recipient Resolution                             | No       |
| 5           | Awardee CEQA Documentation                       | No       |

**Approved By**



STATE OF CALIFORNIA  
CALIFORNIA ENERGY COMMISSION

Grant Request Form  
CEC-270 (Revised 01/2024)

Individuals who approve this form must enter their full name and approval date in the MS Word version.

**Agreement Manager:** Sean Dory for Liet Le

**Approval Date:** 7/26/2024

**Branch Manager:** Kevin Uy

**Approval Date:** 7/30/2024

**Director:** Kevin Uy for Jonah Steinbuck

**Approval Date:** 7/30/2024

**EXHIBIT A**  
**Scope of Work**  
**NEWORLD.ENERGY LLC**

**I. TASK ACRONYM/TERM LISTS**

**A. Task List**

| <b>Task #</b> | <b>CPR<sup>1</sup></b> | <b>Task Name</b>                                                                                           |
|---------------|------------------------|------------------------------------------------------------------------------------------------------------|
| 1             |                        | General Project Tasks                                                                                      |
| 2             |                        | Development and Safety Certification of Energy Quarterback                                                 |
| 3             | X                      | Deployment & Interconnection of EQB-Linked Batteries and DERs                                              |
| 4             |                        | Training for EQB and Backup Battery Installation                                                           |
| 5             | X                      | Integration of EQB Into Advanced Energy Communities                                                        |
| 6             |                        | Integration of EQB with Software Tools that Optimize DER Configuration, Deployment, and Incentive Claiming |
| 7             |                        | Financing Scaled Deployment of EQB-Enabled Distributed Energy Resources                                    |
| 8             |                        | Evaluation of Project Benefits                                                                             |
| 9             |                        | Technology/Knowledge Transfer Activities                                                                   |

**B. Acronym/Term List**

| <b>Acronym/Term</b> | <b>Meaning</b>                                                                    |
|---------------------|-----------------------------------------------------------------------------------|
| AEC                 | Advanced Energy Community                                                         |
| BESS                | Battery Energy Storage System                                                     |
| CAM                 | Commission Agreement Manager                                                      |
| CAISO               | California Independent System Operator                                            |
| CAO                 | Commission Agreement Officer                                                      |
| CEC                 | California Energy Commission                                                      |
| CPR                 | Critical Project Review                                                           |
| DER                 | Distributed Energy Resource                                                       |
| DERMS               | Distributed Energy Resource Management System                                     |
| EV                  | Electric Vehicle                                                                  |
| EQB                 | Energy Quarterback                                                                |
| EQB U-DERIVE        | Energy Quarterback Universal DER Integration and Vehicle Electrification Platform |
| IOU                 | Investor-Owned Utility                                                            |
| MUD                 | Multi-Unit Development                                                            |
| PV                  | Photovoltaic                                                                      |
| TAC                 | Technical Advisory Committee                                                      |
| UL                  | Underwriters Laboratory                                                           |
| V2G                 | Vehicle-to-Grid                                                                   |
| V2H                 | Vehicle-to-Home                                                                   |
| VGI                 | Vehicle-Grid-Integration                                                          |
| VPP                 | Virtual Power Plant                                                               |

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

**EXHIBIT A**  
**Scope of Work**  
**NEWORLD.ENERGY LLC**

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

**A. Purpose of Agreement**

The purpose of this Agreement is to fund the development and certification of the second generation of the Recipient's Energy Quarterback "EQB" Microgrid-in-a-Meter and Panel Expander to enable scaled deployment of low-cost zero emissions backup power systems and streamlined grid interconnection; to demonstrate EQB deployment in single and multi-family residential markets; and to integrate the EQB with Virtual Power Plants, Distributed Energy Resource Management Systems, Battery Energy Storage, Settlement-Quality Meter Data systems, and Electric Vehicle (EV) Charging Stations, including bi-directional (Vehicle-to-Grid) chargers.

**B. Problem/ Solution Statement**

**Problem**

The Recipient's Quarterback Demonstration and Deployment Project will address four key challenges to accelerated distributed energy resource (DER) deployment, resilient backup, and grid balancing in California:

- **The lack of low-cost, UL approved grid isolation devices meeting investor-owned utility (IOU) standards.** Lower-cost grid isolation devices are urgently needed to increase the ability of California households to self-consume solar energy in a grid outage and to reduce the "all-in" cost of battery power backup. This problem is due to the failure of other DER OEMs to meet stringent Underwriters Laboratory (UL) safety specifications (UL 414-SB) for grid isolation devices. The EQB is urgently needed to supply low-cost resilience solutions to all ratepayers, including low-income households, DACs, and apartment residents, especially in high fire threat areas.
- **Long battery interconnection delays and high costs.** Battery installation costs have been too high -- with too much "hassle-factor" -- due in part to interconnection queues that last many months and pose serious financial costs and risks. The Recipient has addressed this challenge by developing a streamlined battery interconnection portal with California IOUs that will enable batteries pre-approved and pre-integrated with the EQB to be interconnected within two weeks. This agreement is urgently needed now, is unique to the Recipient, and is unlikely to be met by other DER OEMs in the near future due to UL approval challenges and EQB patent protections.
- **Limited access to battery backup and EV charging for multi-family residents.** Nearly 50% of Californians are apartment residents and currently have limited access to EV charging and backup power, leading to lower uptake of EVs in this key market segment, and higher exposure to grid outages. Reasons for this include the high cost of upgrading electrical panels and service to accommodate EV charging in older homes and apartments. The EQB addresses this problem by integrating a plug-and-play modular Panel Expander into the EQB, which provides 100 amps of additional panel capacity -- installable in under one hour -- for thousands of dollars less than the cost of existing sub-panel solutions. The Recipient will also develop an EQB solution for multi-family residents integrated with behind-the-meter solar, storage, and EV charging provided by Powertree Services. This solution will

## EXHIBIT A Scope of Work NEWORLD.ENERGY LLC

provide charging and backup power at zero upfront cost to multi-family property owners and residents, providing solar, backup, power and EV charging at a significant discount to current IOU rates and industry solutions.

- **High cost and slow pace of building electrification and DER-grid integration.** Building electrification measures – especially heat pump HVAC and electric water heater solutions – as well as batteries and EVSE – are being deployed at a slower pace and higher cost than needed to meet state policy goals. The cost of expanded panel capacity – ranging from \$4,000 to \$10,000+ per home – is a key factor. In addition, it has been complex and costly to link these key DERs to Distributed Resource Management Systems (DERMS) and Virtual Power Plants (VPPs) that are essential to optimally manage new loads and resources to meet grid balancing requirements and lower rates for all. The EQB addresses this challenge by providing built-in utility grade metering, energy management systems, and Open ADR 2.0b connectivity to easily link solar, storage, EVSE, and smart appliances to utility DERMS and VPPs. This capability will be demonstrated by pre-integration of the EQB with the Serious Controls DERMS, the only open architecture VPP solution currently licensed for low-cost deployment by all CCAs in California.

### **Solution**

The Recipient's EQB Project will address the four key challenges to accelerated DER deployment, resilient backup, and grid balancing indicated above -- and overcome key barriers to the achievement of the State of California's statutory energy goals -- by means of the following technological advancements and deployment strategies.

- Development and deployment of low-cost, UL approved Energy Quarterback "Microgrid in a Meter" grid isolation device and modular Panel Expander: NeWorld Energy will develop, demonstrate, and deploy its second generation Energy Quarterback in high-fire threat and low-income communities, including both single-family and multi-family homes. The EQB v2 consists of two components – the Microgrid in a Meter (MIM), and Panel Expander -- which are typically configured as an integrated unit -- but can also be individually deployed to meet specific market and customer needs.
  - The Microgrid-in-a-Meter (MiM) provides a patented, UL-414 SB approved grid isolation switch enabling safe islanding of a home, apartment, or small business to enable solar or battery self-consumption and enhanced Demand Response program participation.
  - The Panel Expander provides 100 amps of additional pre-wired panel capability that plugs in directly to the utility meter. No re-wiring or direct connection to the existing panel is required, enabling installation in well under one hour. The EQB software enables energization of selected circuits in grid isolation mode through a built-in Energy Management System (EMS).
- **Demonstration and Scale-up of Low-Cost Installation and High-Speed Battery Interconnection Process.** The Recipient's project team will demonstrate a streamlined battery interconnection portal with California IOUs that will enable battery systems that are pre-integrated with the EQB to be interconnected within two weeks. In addition, the Project will demonstrate that IOU field sign-off for EQB installation oversight will be completed in an average of one hour or less.
- **Expanding access to battery backup and EV charging for multi-family residents.** The Project will develop and deploy a special Multi-Family (MF) model of the Energy Quarterback (EQB-MF) with hardware and software modifications to enable the product to

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### Scope of Work

#### NEWORLD.ENERGY LLC

integrate with existing meters and electrical panels located in crowded utility closets. The multi-family version of the EQB will be developed in partnership with Powertree Services, and integrate directly with their behind-the-meter solar, storage, and EV charging solutions, as well as other multi-family configurations. The combined Recipient and Subrecipient multi-family solution will provide charging and backup power at zero upfront cost to multi-family property owners and residents, and provide ongoing solar, backup power and EV charging services at a significant discount to current IOU rates and industry solutions.

- **Enhanced DER and EV Grid Integration and Load Management.** The Project will accelerate the deployment of backup batteries and enable streamlined integration of batteries, solar, EV chargers, and smart appliances with Virtual Power Plants (VPP) and Distributed Energy Resource Management Systems (DERMS). This will be achieved by: 1) Reducing panel upgrade costs and associated DER installation costs through the EQB's modular Panel Expander; and 2) Developing an integrated Energy Management System (EMS), Settlement-Quality Meter Data system (SQMD), and wireless communications hub to enable real-time utility and customer visibility into the operational status and capabilities of all EQB-integrated DERs, including EV chargers. These capabilities will be demonstrated by integrating the Automated Demand Response (ADR) 2.0b compliant EQB with the Serious Controls DER Management System (DERMS), which is the only open architecture VPP solution currently licensed for low-cost deployment by all CCAs in California.

#### ***C. Goals and Objectives of the Agreement***

##### **Agreement Goals**

The goals of this Agreement are:

- Develop and certify (in compliance with UL 414-SB) the second generation *Energy Quarterback Universal DER Integration and Vehicle Electrification Platform* (EQB U-DERIVE).
- Develop and UL certify the *Multi-Family Energy Quarterback* (MF-EQB).
- Develop & UL certify the *Vehicle-to-Grid EQB* and integrate with bi-directional EV chargers.
- Demonstrate and deploy the EQB in single-family and multi-family configurations in High-Threat Fire Districts and low-income communities.
- Develop and demonstrate accelerated installation and grid interconnection approaches for the EQB with leading battery backup systems in IOU territories.
- Integrate the EQB with an Advanced Energy Community (AEC) initiative that enables streamlined customer engagement and scaled and integrated EQB, battery, and DER finance and deployment.
- Define a process for financing scaled deployment of the EQB-enabled distributed energy resources.

## EXHIBIT A

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#### NEWORLD.ENERGY LLC

Ratepayer Benefits:<sup>2</sup> This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety by implementing these strategies:

- **Greater reliability and resilience:** The EQB will increase grid reliability and resilience by:
  - Reducing the cost and time for installation and interconnection of backup battery and other flex load assets – and thereby enabling expanded participation in DR programs such as the Emergency Load Reduction Program (ELRP).
  - Increasing the ease, size, and speed of load shift through the EQB's built-in Energy Management Systems (which can control all DER asset types).
  - Enabling low-cost and comprehensive DER aggregation and control via ADR 2.0b connectivity to leading DER management platforms and VPPs.
  - Enabling solar self-consumption.
- **Lower costs:** The EQB will lower costs for installing backup power by:
  - providing the combination of grid isolation and electrical panel expansion at a substantial (50+) discount to existing products in the marketplace,
  - accelerating a typical installation to under one hour; and
  - enabling streamlined interconnection approvals in under two weeks for EQB-integrated battery systems via online interconnect portals established by the three major Investor Owned Utilities (IOUs) in collaboration with NeWorld Energy.
- **Increased Safety:** The EQB will enhance safety by:
  - Providing a low-cost grid isolation switch that has been UL certified to reduce operating temperatures in EQB-equipped meters.
  - Ensuring worker and customer safety through automatic backfeed prevention when the system is operating in islanded mode.
  - Enabling a much larger number of customers to “ride through” PSPS and grid outage events with reliable backup power to meet essential health and safety requirements.

Technological Advancement and Breakthroughs: This Agreement will lead to technological advancement and breakthroughs to overcome barriers to California's statutory energy goals. The Energy Quarterback will provide a Universal DER Integration and Vehicle Electrification platform that consists of 48kW 200Amp plug-in grid isolation device with a 24kW 100Amp plug-in panel expander that features numerous innovations to enable installation in under twenty minutes, provision of automated grid islanding capability, solar and battery energy self-consumption, VPP/DERMS and EMS integration, revenue grade metering and telemetry, bi-directional EV charging integration capability, as well as 100 amps of supplemental electrical capacity for all forms of beneficial electrification. Technical innovations include:

- An innovative low-cost smart meter adapter and grid isolation switch.

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<sup>2</sup> 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](http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF)).

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- Advanced thermal management.
- Innovative modular panel expansion with digital control and flexible mounting to serve both single and multi-family buildings.
- Built-in Energy Management System (EMS) and smart thermostat functions.
- Optional bi-directional EV charging integration.
- Open ADR 2.0b and EMS features to enable universal integration with any Smart Inverter and DER type, and any VPP / DERMS platform.
- Settlement Quality Meter Data (SQMD) tracking and telemetry (using a Rogowski coil).

Key innovations are further described below.

- Meter integration: EQB MIM is the only UL 414 SB tested, and listed 200Amp (48kw) Meter Collar device that is approved by UL to work with any Smart Meter and any meter socket. It is compatible with all utility analog and smart meters through its UL 414 SB listing that encompasses compliance with UL 2735, UL 744, and ANSI C-12.1.
- Grid isolation switch: The EQB isolation switch enables solar self-consumption in alignment with California's SB 1339 statute, and the CPUC Rulemaking proceeding R.19.09.009 for Microgrids and Resilience, whereby the CPUC ALJ mandated IOUs to find a pathway to approve Meter Adapter Microgrid Isolation technology in "D". 21-01-018, which specifically cited the NeWorld demonstrations to CEC in February 2020 and filings in CPUC R.19.09.009.
- Advanced thermal management and safety: To pass the new June 2024 required UL 414 SB for all meter collar adapters, NeWorld patented and implemented passive heat reduction techniques that enabled its UL 414 SB Listing at 200Amps with a separate 100Amp (24kW) DER connection. The EQB passive cooling works so well that it cools the meter and meter socket by 16 degrees F. at its rated 200Amp capacity. This also mitigates heat rise of south-facing meters and panels. To date, EQB is the only Meter adapter to have passed UL 414 SB.
- Plug-in panel expansion with digital control for single-family and multi-family buildings. The EQB plug-in approach enables low-cost installation and the addition of multiple DERs for backup power, electrification, E-mobility, and decarbonization. The new EQB model for multi-family buildings will enable installations even in limited physical spaces and provide an additional 100 amps (24kW) of panel capacity revenue grade metering at 30 samples per second to add and manage the loads of additional batteries, PV, EV chargers, and other DERs. We have a TRL-8 version of the EQB that is ideally suited to serve the multifamily apartment needs and will dramatically reduce the time and cost of installation in multifamily facilities.
- Open ADR integration will enable utilities to respond in under 0.5 seconds to meet grid balancing needs involving EQB-linked batteries and other DERs, bi-directional chargers, and Demand Response programs; and to enable effective integration with VPPs and DERMS.
- Revenue grade metering and telemetry will enable real-time load management and reduced utility power procurement costs. The EQB contains fixed wide-bandwidth Rogowski coils with reliable 0.1% accuracy for Settlement Quality Meter Data (SQMD) provided at 30 times per second to drive DSM and UL 1741 Smart Inverter Certified Power Controls (CRD PCS) to ensure safe operation within Ampacity constraints of existing facility wiring and secondary feeder lines. Telemetry is delivered via RS485 Modbus plus IP protocol cellular and WIFI

# EXHIBIT A

## Scope of Work

### NEWORLD.ENERGY LLC

systems to Aggregators, Utilities, and CAISO. This provides the real-time visibility into DER assets that most LSEs (especially CCAs) do not currently have, but which they urgently need to optimize DER integration into the CAISO wholesale system and to meet Resource Adequacy requirements efficiently.

### 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:

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- **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, and other CEC staff relevant to the Agreement. The Recipient's Project Manager and any other individuals deemed necessary by the CAM or the Project Manager shall participate in 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

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agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., Teams, Zoom), with approval of the CAM.

The Kick-off meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Travel;
  - Equipment purchases;
  - Administrative and Technical products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Monthly Calls (subtask 1.5);
  - Quarterly Progress reports (subtask 1.6);
  - Final Report (subtask 1.7);
  - Match funds (subtask 1.8);
  - Permit documentation (subtask 1.9);
  - Subawards(subtask 1.10);
  - Technical Advisory Committee meetings (subtasks 1.11 and 1.12);
  - Agreement changes;
  - Performance Evaluations; 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*

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**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 may 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 may 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. A determination of unsatisfactory progress This may result in project delays, including a potential Stop Work Order, while the CEC determines whether the project should continue.
- 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(s)
- Progress Determination

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#### **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 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* organized by the tasks in the Agreement.

##### **Products:**

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

#### **MONTHLY CALLS, REPORTS, AND INVOICES**

#### **SUBTASK 1.5 MONTHLY CALLS**

The goal of this task is to have calls at least monthly between the CAM and Recipient to verify that satisfactory and continued progress is made towards achieving the objectives of this Agreement on time and within budget.

The objectives of this task are to verbally summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, to verify match funds are being proportionally spent concurrently or in advance of CEC funds or are being spent in accordance with an approved Match Funding Spending Plan, to form the basis for determining whether invoices are consistent with work performed, and to answer any other questions from the CAM. Monthly

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calls might not be held on those months when a quarterly progress report is submitted or the CAM determines that a monthly call is unnecessary.

The CAM shall:

- Schedule monthly calls.
- Provide questions to the Recipient prior to the monthly call.
- Provide call summary notes to Recipient of items discussed during call.

**The Recipient shall:**

- Review the questions provided by CAM prior to the monthly call.
- Provide verbal answers to the CAM during the call.

Product:

- Email to CAM concurring with call summary notes.

**SUBTASK 1.6 QUARTERLY 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 *Quarterly 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 reporting period, 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. Progress reports are due to the CAM the 10th day of each January, April, July, and October. The Quarterly Progress Report template can be found on the ECAMS Resources webpage available at: <https://www.energy.ca.gov/media/4691>
- Submit a monthly or quarterly *Invoice* on the invoice template(s) provided by the CAM.

Recipient Products:

- Quarterly Progress Reports
- Invoices

CAM Product:

- Invoice template

**SUBTASK 1.7 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 1.7.1 Final Report Outline**

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#### 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 Products:

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

### Subtask 1.7.2 Final Report

#### The Recipient shall:

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

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- 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 on Draft Final Report
- Draft Final Report
- Written Responses to Comments (*if applicable*)
- Final Report

CAM Product:

- Written Comments on the Draft Final Report

**MATCH FUNDS, PERMITS, AND SUBAWARDS**

**SUBTASK 1.8 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. 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 application 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 application 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.

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- 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 1.9 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*)

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**SUBTASK 1.10 SUBAWARDS**

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

**The Recipient shall:**

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

**Products:**

- Subawards ( if requested by the CAM)

**TECHNICAL ADVISORY COMMITTEE**

**Subtask 1.11 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.

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- 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 1.12.
- 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 1.12 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.

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- 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 1.13 Project Performance Metrics**

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

**The Recipient shall:**

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

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- 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

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**IV. TECHNICAL TASKS**

**TASK 2: DEVELOPMENT AND SAFETY CERTIFICATION OF ENERGY QUARTERBACK (EQB)**

The goal of this task is to complete design, engineering, and testing of a TRL-9 version of the EQB Universal DER Integration and Vehicle Electrification Platform (EQB U-DERIVE). The TRL 9 version of the EQB will enable deployment across single and multi-family residential marketplaces, integration with DERMS and VPP platforms, accelerated interconnection of back-up batteries, and integration of bi-directional EV chargers, Energy Management Systems, and revenue-grading metering, in compliance with UL 414-SB and all relevant utility safety standards.

**Subtask 2.1. Engineering Design of the Energy Quarterback v2**

The goal of this Subtask is to complete engineering design of the Energy Quarterback version 2, meeting the requirements for both single and multi-family residential marketplaces, integration with Open ADR 2.0b, DERMS, and PowerTree, and VPP platforms, accelerated interconnection of back-up batteries, and integration of bi-directional EV chargers, Energy Management Systems, and revenue-grade metering, in compliance with UL 414-SB and all relevant utility safety standards.

**The Recipient shall:**

- Complete *Engineering Design of EQB v2 Report* (TRL-9) to enable seamless grid integration and VPP/DERMS control of batteries, solar, bidirectional EV charging, Energy Management Systems, and revenue grade metering, with 100 amps of plug-in panel expansion capability.
- Develop a new integration that will seamlessly connect the EQB power monitoring system to the Open ADR 2.0b, PowerTree, and Serious Controls DERMS platforms. This integration will encompass a hardware and software interface designed to interface with the EQB's MODBUS RS485 Revenue Grade Interval Meter data communication protocol. It will capture accurate interval meter data and transmit it to the Open ADR 2.0b or DERMS platform utilizing both wired RS 485 and wireless Wi-Fi or LTE networks. The transmitted interval data is crucial as it will be employed for the verification of distributed energy resource (DER) operations at residential locations, measurement and verification (M&V) purposes, and to facilitate real-time adjustments by the DERMS and PowerTree multi family Apartment Allocator device in response to grid events and TOU energy costs. This integration will enhance the reliability and efficiency of power management at the consumer level.
- Integrate to the DERMS for managed charging to ensure this critical component enables the project's success in electrifying low-income homes for consumer transformation. The managed charging involves strategically controlling the charging and discharging of bi-direction EVs and BESS to optimize energy consumption, reduce peak demand, and enhance grid stability. By integrating managed charging capabilities into the EQB through the DERMS signals, we can effectively coordinate and prioritize EV charging based on grid conditions, energy prices, and renewable energy availability.
- Evaluate the DERMS revenue quality meter data (RQMD) to optimize the performance and coordination DERs within the grid. By integrating real-time meter data, the DERMS can monitor energy consumption patterns, identify peak demand periods, and forecast energy needs accurately. This data-driven approach enables the DERMS to orchestrate the operation of DER assets, such as solar PV systems, battery energy storage, and electric

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vehicle chargers, in a way that maximizes grid stability and efficiency. The version 2 EQB will deliver the DERMS RQMD which it will use in real-time grid decisions, plus turn into SQMD for participation in the CAISO market.

#### **Products:**

- Engineering Design of EQB v2 Report

### **TASK 3: DEPLOYMENT & INTERCONNECTION OF EQB-LINKED BATTERIES AND DERS**

The purpose of this Task is to develop and demonstrate accelerated integration and grid interconnection of leading battery backup systems with the Energy Quarterback.

#### **Subtask 3.1. Integration of Battery Back-up Systems with the Energy Quarterback**

The purpose of this Subtask is to integrate at least three leading battery energy storage systems with the EQB.

#### **The Recipient shall:**

- Complete *Engineering Design of Battery Linked System Report* for integration of battery backup systems and the EQB.
- Complete battery-specific *Testing and Verification Plan for Battery Linked Systems Report* for EQB v2 with relevant battery suppliers, including procedures for:
  - Demonstrating safe grid-tied and grid-isolated operation of batteries.
  - Testings for 7 Interconnection preapproval tests conducted by CA IOUs and NeWorld Energy with solar and battery inverters.
  - Validating critical metrics for the non-backfeeding of backup battery power onto a de-energized grid or during self-consumption of the backup battery or solar power.
  - Identifying measurement tools for verification including portable voltmeters such as FLUKE model 377 at the output of the battery or solar inverter and also at the Interconnection point with the home or apartment and the Grid.
- Prepare a *Verification Report for Battery Linked Systems*. The report shall include a high-level executive summary that contains the following:
  - Process and results of the final EQB – battery integration demonstration.
  - Testing of EQB-MIM for Grid Isolation at each installed location.
  - Identification of any installation or technical issues lessons learned from this element of the design and testing phase of the project.
- Prepare a *CPR Report #1* in accordance with subtask 1.3.
- Participate in a CPR Meeting.

#### **Products:**

- Engineering Design of Battery Linked Systems Report
- Testing and Verification Plan for Battery Linked Systems Report
- Verification Report for Battery Linked Systems (draft and final)
- CPR Report #1

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**Subtask 3.2. Demonstration of Accelerated Interconnection of Battery Back-up Systems Linked to the Energy Quarterback**

The purpose of this Subtask is to demonstrate rapid grid interconnection of leading battery backup systems with the Energy Quarterback in at least three investor-owned utility territories.

**The Recipient shall:**

- Develop and execute the *Online Interconnection Memorandum of Agreement* with PG&E, SDG&E, and SCE that enable accelerated grid interconnection of battery back-up systems linked to the Energy Quarterback.
- Demonstrate accelerated interconnection of EQB linked batteries via the online interconnect portals of PG&E, SDG&E, and SCE that meet performance goals defined in the MOU.
- Develop an *Interconnection Verification Report* that summarizes Utility on-line portal performance vs the current time-consuming method of the IOU evaluating each individual home or apartment battery Interconnection design individually.

**Products:**

- Online Interconnection Memorandum of Agreement
- Interconnection Verification Report

**TASK 4: TRAINING FOR EQB AND BACKUP BATTERY INSTALLATION**

The purpose of this Task is to develop and deliver an installer training program that enables installers to deploy the EQB with target install times of under one hour for the EQB itself, and under four hours for the EQB and integrated battery backup systems.

**Subtask 4.1. Develop, Deliver, and Assess Installer Training Program**

The purpose of this Subtask is to develop the EQB + Battery backup installer training program.

**The Recipient shall:**

- Develop and execute *EQB Installer Training Program Memoranda of Agreement* with at least 5 partners -- including PG&E, SDG&E, CED Greentech Renewables, Baker Electric, and Powertree Services -- to develop and deliver an installer training program that instructs qualified electricians and contractors in the safe, rapid, and effective installation of the Energy Quarterback and EQB-linked battery backup systems
- Develop the *EQB Installer Training Program Design and Curriculum*, including training program goals, activities, materials, and Training Program Assessment
- Deliver the *EQB Installer Training Program Design and Curriculum* to qualified electricians and contractors in collaboration with PG&E, SDG&E, CED Greentech Renewables, and Powertree Services
- Conduct *EQB Installer Training Program Assessment* measuring the competence of installers to safely install the EQB with integrated battery systems
- Develop *EQB Installer Training Program Results Report* summarizing results of the Training Program Assessment

**Products:**

- EQB Installer Training Program Memorandum of Agreement
- EQB Installer Training Program Design and Curriculum

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- EQB Installer Training Program Assessment
- EQB Installer Training Program Results Report

**TASK 5: INTEGRATION OF EQB INTO ADVANCED ENERGY COMMUNITIES**

The goal of this Task is to integrate the EQB into Advanced Energy Communities, defined as DER aggregations within utility territories that consist of combinations of energy storage, flexible loads, and an effective form of Distributed Energy Resource management and control, whether on the customer or utility side of the meter, or both.

**Subtask 5.1. Develop a Community Engagement, Deployment, and Assessment Plan for Integration of EQB into Advanced Energy Communities**

The purpose of this Subtask is to develop a comprehensive Community Engagement, Deployment, and Assessment Plan for integration of the EQB in both single-family and multi-family residential market segments within targeted communities

**The Recipient shall:**

- Develop an *EQB Advanced Energy Community Engagement, Deployment, and Assessment Plan* for integration of EQB in targeted communities, to include:
  - A community engagement process responsive to the needs of residents in both single-family and multi-family homes and apartments in targeted neighborhoods
  - A process for assessing the costs and benefits of integrating relevant DERs with the EQB – such as solar, storage, EVSE, and flex-load devices such as smart electric water heaters
  - Financing options and strategies for both the EQB and any associated DERs
- Complete the participation agreements and develop *EQB Deployment Memoranda of Understanding (MOUs) Report* between the customer, NeWorld, Powertree, DER vendors, relevant Load Serving Entities, and relevant DER aggregators and VPP operators

**Products:**

- EQB Advanced Energy Community Engagement, Deployment and Assessment Plan (draft and final)
- EQB Deployment Memoranda of Understanding (MOUs) Report

**Subtask 5.2. Deploy and Demonstrate the EQB in Advanced Energy Communities**

The purpose of this Subtask is to deploy and demonstrate operation of the EQB in Advanced Energy Communities in both single-family and multi-family residential market segments.

**The Recipient shall:**

- Develop an *EQB Deployment Assessment Plan*, to include:
  - Informational materials for customers and other deployment partners
  - Strategies to identify and engage targeted single-family and multi-family residential customers to educate them about EQB-enabled solutions (including the Powertree system for multi-family property owners and tenants)
  - The complete scope of technology to be deployed in both single-family and multi-family sites

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- The complete DR program and DERMS/VPP integration requirements as relevant to single-family and multi-family program contexts
- Prepare and complete *EQB Deployment Customer and Site Host Agreements (for single-family and multi-family site hosts)* and EQB+Powertree installation and operation
- Develop an *EQB Demonstration Report*, to include:
  - Installation diagrams of EQB and associated DERs, such as batteries, in at least 10 single-family homes
  - Installation diagrams of EQB and associated DERs, including batteries and EVSE, in at least 40 apartment units
  - Establishing Commission equipment and integration requirements with load management systems, DERMS, and/or Open ADR programs as relevant
  - Operational requirements of EQB and associated DER in alignment with Demonstration Plan and M&V requirements
- Prepare a *CPR Report #2* in accordance with subtask 1.3.
- Participate in a CPR Meeting.

**Products:**

- EQB Deployment Assessment Plan (draft and final)
- EQB Deployment Customer and Site Host Agreements (for single-family and multi-family customers and multi-family site hosts)
- EQB Demonstration Report (draft and final)
- CPR Report #2

**TASK 6: INTEGRATION OF EQB WITH SOFTWARE TOOLS THAT OPTIMIZE DER CONFIGURATION, DEPLOYMENT, AND INCENTIVE CLAIMING**

The goal of this Task is to integrate the EQB with one or more software tools that optimize DER configuration, deployment, and incentive claiming.

**Subtask 6.1. Demonstrate Integration of EQB with Software Tools that Optimize DER Configuration, Deployment, and Incentive Claiming**

The purpose of this Subtask is to demonstrate the integration of the EQB with one or more software tools that optimize DER configuration, deployment, and incentive claiming.

**The Recipient shall:**

- Develop a *Software Integration Strategic Plan*, to include:
  - Definition and explanation of the universe of software tools that optimize DER configuration, deployment, and incentive claiming in single-family and multi-family residential environments
  - Identification of priority integration targets
  - Definition and explanation of integration requirements for targeted tools
- Integrate EQB performance parameters into targeted tools to enable software tool users such as contractors and project developers to deploy the EQB effectively and at scale
- Develop a *Software Integration Strategic Report* to document findings and summarize all results.

**Products:**

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- Software Integration Strategic Plan
- Software Integration Report (draft and final)

#### **TASK 7: FINANCING SCALED DEPLOYMENT OF EQB-ENABLED DISTRIBUTED ENERGY RESOURCES**

The goal of this Task is to develop and implement a financing strategy for scaled statewide deployment of DERs linked to the Energy Quarterback to provide resilient clean energy backup and flexible load management.

##### **Subtask 7.1. Develop and Implement Financing and Deployment Plan for Scaled Statewide Deployment of EQB-Enabled Distributed Energy Resources**

The goal of this Subtask is to develop and implement a Financing and Deployment Plan for scaled-up statewide deployment of DERs linked to the Energy Quarterback, with a focus on battery backup systems.

##### **The Recipient shall:**

- Develop an *EQB - DER Financing and Deployment Assessment Plan* that defines the funding sources and strategies most applicable to scaling the EQB and associated DER technologies. The financing plan to include the following sections:
  - Financing product characterization. This section will build a catalog funding and financing products offered by a comprehensive list of market participants. The intent of this section will be to define in detail all available funding and financing products, where they're available, and how they can best match customer needs in different scenarios, such as panel upgrades related to electrification. The catalog will include specific guidance on the use case for each project, from small individual DER projects (i.e. EQB enabled service expansion), or how they may be combined to define an optimal capital stack for large multifamily projects.
  - Facility market characterization. This section will focus on characterizing the markets where EQB-Enabled DERs will scale, including single family and market rate and subsidized multifamily dwellings. The section will define, for example, consideration for specific geography areas or economic zones, market needs related to the grid reliability needs of various resource balancing areas, or the roll of EQB in zonal applications such as decommissioning natural gas distribution lines.
  - Market development pathways. This section will combine financing and market characterization to identify specific market channels that can be developed and leveraged to scale the EQB and related DER technologies, including upstream, mid, and downstream channels. Examples of prospective channels include utilities, DER solution providers, equipment distributors, developers, contractors, institutional building investors and private owners.
- Implement the EQB - DER Financing and Deployment Assessment Plan in partnership with program administrator staff at various agencies and at least two major utility territories. The implementation will include the following steps:
  - Define our market partners. This process will define the agencies and utilities and other local market participants to receive technical and finance training that will allow EQB to be deployed at scale. This will be heavily focused on local markets with support from our project partners, Tolteca Corp.

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- Develop customized marketing, education and outreach material for each market channel and customers in at least two major utility territories. This material will be developed in parallel with other grant tasks, such as the Installer Training Program and will define how EQB benefits are presented, focusing on:
  - Addressing long battery interconnection delays and high costs.
  - Addressing limited access to battery backup and EV charging for multi-family residents.
  - Offering a path to accelerated building electrification and DER-grid integration.
  - Delivering enhanced DER and EV Grid Integration and Load Management.
- Implement the deployment plan in partnership with our partner agencies and utilities. This will be primarily accomplished through direct outreach to mid-market channels including DER solution providers, distributors, and contractors. Multifamily outreach will include a focus on large private development and management companies. The deployment plan will include specific installation goals and key performance indicators to track market performance and where corrective action, or process redesign is needed.
- Develop *EQB – DER Finance and Deployment Report* summarizing results of the EQB – DER Finance Deployment Assessment Plan

**Products:**

- EQB – DER Finance and Deployment Assessment Plan
- EQB – DER Finance and Deployment Report (draft and final)

**TASK 8: MEASUREMENT & VERIFICATION (M&V)**

The goal of this task is to analyze the data collected to calculate performance and effectiveness of the demonstrated system against established performance metrics.

**The Recipient shall:**

- Develop a *Measurement and Verification Plan for EQB v2* to identify metrics, methods, and measurement tools that will assess:
  - Safe grid-tied and grid-isolated operation
  - Effective battery and DER integration
  - Integration and operation of all capabilities of the EQB platform in both single-family homes and multi-family apartment buildings
  - Low rate initial EQB production
  - Product quality
  - Compliance with UL 414-SB certification parameters
  - Compliance with IOU safety standards
- Prepare a *Measurement and Verification Report for EQB v2* which includes but is not limited to a high-level executive summary reviewing:
  - Process and results of the final EQB demonstration
  - Testing results of EQB
  - Technical issues
  - Lessons learned from the design and testing phase of the project

**Products:**

- Measurement and Verification Plan for EQB v2

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- Measurement and Verification Report for EQB v2 (draft and final)

**TASK 9: EVALUATION OF PROJECT BENEFITS (MANDATORY TASK)**

The goal of this task is to report the benefits resulting from this project, which will include but are not limited to:

- Reduced operational steps for customers to shift into island mode.
- Reduced interconnection time.
- Reduced cost of resiliency-enabling power electronics equipment
- Reduced cost of backup power when connected to the Energy Quarterback. When compared to existing systems.
- Loads (kW) that can be served via accelerated deployment of EQB-linked batteries.
- Duration of serving critical loads during a grid outage.

**The Recipient shall:**

- Complete the *Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by January 31st of each year. The Annual Survey includes but is not limited to the following information:
  - Technology commercialization progress
  - New media and publications
  - Company growth
  - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the [Energize Innovation website \(www.energizeinnovation.fund\)](http://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 \(www.energizeinnovation.fund\)](http://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 10: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES (MANDATORY TASK)**

NOTE from the Recipient: Tasks below include ALL items related to *Technology Development* and non-redundant items related to *Technology Demonstration and Deployment*.

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The goal of this task is to conduct activities that will accelerate the commercial adoption of the Energy Quarterback.

**The Recipient Shall:**

- Develop and submit a *Project Case Study Plan* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The Project Case Study Plan should include:
  - An outline of the objectives, goals, and activities of the case study.
  - The organization that will be conducting the case study and the plan for conducting it.
  - A list of professions and practitioners involved in the technology's deployment.
  - Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
  - Presentations/webinars/training events to disseminate the results of the case study.
- Present the draft *Project Case Study Plan* to the TAC for review and comment.
- Develop and submit a *Technology Transfer Plan* that identifies the proposed activities the recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the draft *Technology Transfer Plan* to the TAC for feedback and comments.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the draft *Project Case Study Plan* and draft *Technology Transfer Plan*. This document will identify:
  - TAC comments the Recipient proposes to incorporate into the final *Project Case Study Plan*.
  - 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 *Project Case Study Plan* to the CAM for approval.
- Execute the final Project Case Study Plan and develop and submit a Project Case Study.
- 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* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the Final Technology Transfer Plan. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

**Products:**

- Project Case Study Plan (draft and final)
- Project Case Study (draft and final)
- Technology Transfer Plan (draft and final)
- Summary of TAC Comments
- Technology Transfer Summary Report (draft and final)

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- High Quality Digital Photographs

**V. Project schedule**

Please see the attached Excel spreadsheet.