

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION

New Agreement ARV-17-038 (To be completed by CGL Office)

600 Fuels and Transportation Division	Jennifer Allen	6	916-653-0291
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Tierra Resource Consultants, LLC	46-4686228
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EV Ready Community Low-Income MultiFamily Blueprint

06 / 30 / 2018	09 / 30 / 2019	\$ 199,811
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☐ ARFVTP agreements \$75K and under delegated to Executive Director.

Proposed Business Meeting Date	05 / 09 / 2018	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Discussion
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Business Meeting Presenter	Sharon Purewal	Time Needed:	5 minutes
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Please select one list serve. Transportation (General Trans / Petroleum Issues)

Agenda Item Subject and Description

TIERRA RESOURCE CONSULTANTS, LLC. Proposed resolution approving Agreement ARV-17-038 with Tierra Resource Consultants, LLC, for a \$199,811 grant to develop a blueprint report and forecasting model that provides the Fresno community with a comprehensive and strategic approach to identifying electrified transportation options, actions and milestones required to become an EV-ready community.(ARFVTP funding) Staff Contact: Jennifer Allen

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

☒ Yes (skip to question 2)☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

Explain why Agreement is not considered a "Project":

Agreement will not cause direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because .

2. If Agreement is considered a "Project" under CEQA:

☒ a) Agreement **IS** exempt. (Attach draft NOE)
☒ Statutory Exemption. List PRC and/or CCR 14 CCR §15262
 section number:

☒ Categorical Exemption. List CCR 14 CCR §15306
 section number:
☒ Common Sense Exemption. 14 CCR 15061 (b) (3)

Explain reason why Agreement is exempt under the above section:

This project will create a plan to help communities advance the installation of electric vehicle infrastructure; however, it will not include approval of construction of such infrastructure. The project includes information gathering and analysis, public outreach, and preparing documents. It involves no physical construction. This project is at most a planning study for possible future actions that no agency, board, or commission has yet approved, adopted, or funded. Under California Code of Regulations, title 14, section 15262, no EIR or negative declaration is required under these circumstances. This project is therefore exempt under 14 CCR 15262 as a feasibility or planning study, exempt under 14 CCR 15306 as a basic data collection activity, and exempt under 14 CCR 15061(b)(3) as a common sense exemption and will have no significant effect on the environment.

☐ b) Agreement **IS NOT** exempt. (Consult with the legal office to determine next steps.)

Check all that apply

☐ Initial Study☐ Environmental Impact Report☐ Negative Declaration☐ Statement of Overriding Considerations☐ Mitigated Negative Declaration

Legal Company Name:	Budget
Fresno Metro Ministry	\$ 45,000
Lumidyne	\$ 30,500
	\$ 0

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Legal Company Name:

Funding Source	Funding Year of Appropriation	Budget List No.	Amount
ARFVTP	FY 16/17	601.118I	\$199,811
Funding Source			\$
Funding Source			\$
Funding Source			\$
Funding Source			\$
R&D Program Area:	Select Program Area		\$199,811
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Name:	Marshall Keneipp	Name:	Floyd Keneipp
Address:	1501 North Broadway, Suite 300	Address:	1501 North Broadway, Suite 300
City, State, Zip:	Walnut Creek, CA 94596	City, State, Zip:	Walnut Creek, CA 94596
Phone:	303-913-8113	Fax:	831-600-7496
E-Mail:	Marshall.Keneipp@tierrarc.com	E-Mail:	Floyd.Keneipp@tierrarc.com

<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: GFO-17-604
<input type="checkbox"/> First Come First Served Solicitation	

1. Exhibit A, Scope of Work	<input checked="" type="checkbox"/> Attached
2. Exhibit B, Budget Detail	<input checked="" type="checkbox"/> Attached
3. CEC 105, Questionnaire for Identifying Conflicts	<input checked="" type="checkbox"/> Attached
4. Recipient Resolution	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Attached
5. CEQA Documentation	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Attached

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

Exhibit A SCOPE OF WORK

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		Administration
2	X	Develop Electric Vehicle Ready Communities Blueprint
3		Develop Quantitative Goals and Timeline Model

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Floyd Keneipp - Tierra		
2	Floyd Keneipp – Tierra Keith Bergthold - Fresno Metro Ministry Joseph Oldham – CALSTART Preston Prince - Fresno Housing Authority	Fresno Metro Ministry	Fresno Housing Authority CALSTART
3	Floyd Keneipp – Tierra Cory Welch - Lumidyne	Lumidyne	

GLOSSARY

Specific terms and acronyms used throughout this scope of work are defined as follows:

Term/ Acronym	Definition
ARFVTP	Alternative and Renewable Fuel and Vehicle Technology Program
BBDC	Better Blackstone Design Challenge
CAM	Commission Agreement Manager
CPR	Critical Project Review
DER	Distributed Energy Resource
EV	Electric Vehicle
FHA	Fresno Housing Authority
FTD	Fuels and Transportation Division
IEPR	Integrated Energy Policy Report
IO	Individual Ownership
LIMF	Low Income Multi-Family

Term/ Acronym	Definition
LNBA	Location Net Benefits Analysis
PV RAM	Photovoltaic and Renewable Auction Mechanism
Recipient	Tierra Resource Consultants
TaaS	Transportation as a Service

BACKGROUND

Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP). The statute authorizes the California Energy Commission (Energy Commission) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. AB 8 (Perea, Chapter 401, Statutes of 2013) re-authorizes the ARFVTP through January 1, 2024, and specifies that the Energy Commission allocate up to \$20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The ARFVTP has an annual budget of approximately \$100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

On December 14, 2017, the California Energy Commission (Energy Commission) released a Grant Solicitation and Application Package entitled "Electric Vehicle (EV) Ready Communities Challenge Solicitation" under the ARFVTP. This competitive grant solicitation was for Phase I of an expected two phase effort for EV ready communities. Phase I planning blueprints will identify the actions and milestones needed to proceed towards implementation of an EV ready community. In response to GFO-17-604, the Recipient submitted application #12 which was proposed for funding in the Energy Commission's Notice of Proposed Awards on March 21, 2018. GFO-17-604 and Recipient's application are hereby incorporated by reference into this Agreement in their entirety.

In the event of any conflict or inconsistency between the terms of the Solicitation and the terms of the Recipient's Application, the Solicitation shall control. In the event of any conflict or inconsistency between the Recipient's Application and the terms of Commission's Award, the Commission's Award shall control. Similarly, in the event of any conflict or inconsistency between the terms of this Agreement and the Recipient's Application, the terms of this Agreement shall control.

Problem Statement:

Developing an effective EV ready community blueprint that has realistic goals and timelines is complex, requiring coordination and integration across multiple market and technical perspectives. This problem is especially true in the low income multifamily sector where EV market opportunities and stakeholder interests might not always align, resulting in various barriers.

- The markets and technologies related to EV's are evolving quickly.
 - Individual ownership of cars might be challenged in coming years by emerging business models that envision transportation as a service. At present there is no framework or blueprint around which evolving market dynamics can be explored or long-term goals and timelines accurately established. As a result, charger infrastructure investments might not recognize emerging business models or technology competition groups.
- The economics and policies around EV market transformation have broad implications which are not currently being viewed within a system context necessary for an accurate blueprint.
 - The risk of reduced taxes and fees associated with petroleum fuels might hamper local policies supporting aggressive EV adoption or impact electricity rates and cost-benefits for consumers.
 - In the low-income multifamily market, split incentives exist between owners and renters, and present barriers to aggressive deployment in subsidized housing developments.
 - While funding and financing can be leveraged and combined to support charger installation or address likely infrastructure upgrades needed to support increased electricity demand, the low-income multifamily market's hesitancy to utilize these existing funding and financing products is still not fully understood.
- Technology adoption has always been driven by familiarization through advertising and viral effects, and much of this occurs through community engagement.
 - This is especially true in low income communities, where aggressive community outreach, often at the neighborhood level, has been the focus of many different campaigns intended to drive change.
 - This will also be the case with EV adoption for low income multifamily residents. No model exists at present that has focused on how community engagement initiatives for low-income transportation options can drive adoption, and the related need for infrastructure.

Goals of the Agreement:

The specific goal of this Agreement is to produce an EV ready community blueprint that:

- Focuses on the low-income multifamily market.
- Includes realistic goals and timelines based on the dynamics between markets, technology, policy, economic, and community engagement perspectives.
- Develops a blueprint template that can be scaled across various markets.

Objectives of the Agreement:

The objectives of this Agreement are to:

- Produce a community blueprint that is based on four frameworks, including in-depth research on two low-income multifamily housing projects.
 - Market and Technology Framework
 - State and Local Policy Framework
 - Economic and Financial Framework
 - Community Engagement Framework
- Develop a forecast model that is informed by the community blueprint and implemented in a System Dynamics framework for forecasting localized adoption of EVs in the low-income multifamily market.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement. The Commission Agreement Manager (CAM) shall designate the date and location of this meeting and provide an agenda to the Recipient prior to the meeting.

The Recipient shall:

- Attend a “Kick-Off” meeting with the CAM, the Commission Agreement Officer (CAO), and a representative of the Energy Commission Accounting Office. The Recipient shall bring their Project Manager, Agreement Administrator, Accounting Officer, and any others determined necessary by the Recipient or specifically requested by the CAM to this meeting.
- Discuss the following administrative and technical aspects of this Agreement:
 - Agreement Terms and Conditions
 - Critical Project Review (Task 1.2)
 - Match fund documentation (Task 1.6) No reimbursable work may be done until this documentation is in place.
 - Permit documentation (Task 1.7)
 - Subcontracts needed to carry out project (Task 1.8)
 - The CAM's expectations for accomplishing tasks described in the Scope of Work
 - An updated Schedule of Products and Due Dates
 - Monthly Progress Reports (Task 1.4)

- Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)
- Final Report (Task 1.5)

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds
- Updated List of Permits

Commission Agreement Manager Product:

- Kick-Off Meeting Agenda

Task 1.2 Critical Project Review (CPR) Meetings

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

The CAM may schedule CPR meetings as necessary, and meeting costs will be borne by the Recipient.

Meeting participants include the CAM and the Recipient and may include the Commission Agreement Officer, the Fuels and Transportation Division (FTD) program lead, other Energy Commission staff and Management as well as other individuals selected by the CAM to provide support to the Energy Commission.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. Prepare a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (please see section 8 of the Terms and Conditions). If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Lead Commissioner for Transportation for his or her concurrence.
- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the CAM and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

CAM Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the Commission Agreement Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Agreement Manager.

The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement, and recommendations for improvements. The Commission Agreement Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Agreement Manager and the Grants Officer about the following Agreement closeout items:

- What to do with any equipment purchased with Energy Commission funds (Options)
- Energy Commission's request for specific "generated" data (not already provided in Agreement products)
- Need to document Recipient's disclosure of "subject inventions" developed under the Agreement

- “Surviving” Agreement provisions
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically 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 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, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Agreement Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Section 6 of the Terms and Conditions of this Agreement.
- In the first Monthly Progress Report and first invoice, document and verify match expenditures and provide a synopsis of project progress, if match funds have been expended or if work funded with match share has occurred after the notice of proposed award but before execution of the grant agreement. If no match funds have been expended or if no work funded with match share has occurred before execution, then state this in the report. All pre-execution match expenditures must conform to the requirements in the Terms and Conditions of this Agreement.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving the Agreement's goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements to the FTD project management processes.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following activities for both the public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report, if requested by the CAM.
- Prepare a Final Report following the latest version of the Final Report guidelines which will be provided by the CAM. The CAM shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed at least 60 days before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Outline of the Final Report, if requested
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of Energy Commission funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Agreement Manager at least 2 working days prior to the kick-off meeting. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state such in the letter. If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter a list of the match funds that identifies the:
 - Amount of each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.

- Amount of each in-kind contribution, a description, documented market or book value, and its 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 shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Agreement Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Agreement Manager within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR meeting.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task 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. Although the Energy Commission budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Agreement Manager at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit

- Name, address and telephone number of the permitting jurisdictions or lead agencies
 - The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement 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 the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Commission Agreement Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Agreement Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Agreement Manager within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- A copy of each approved permit (if applicable)
- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)
- A copy of each final approved permit (if applicable)

Task 1.8 Obtain and Execute Subcontracts

The goal of this task is to ensure quality products and to procure subcontractors required to carry out the tasks under this Agreement consistent with the Agreement Terms and Conditions and the Recipient's own procurement policies and procedures. It will also provide the Energy Commission an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement, and that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Manage and coordinate subcontractor activities.
- Submit a draft of each subcontract required to conduct the work under this Agreement to the Commission Agreement Manager for review.
- Submit a final copy of the executed subcontract.
- If Recipient decides to add new subcontractors, then the Recipient shall notify the CAM.

Products:

- Letter describing the subcontracts needed, or stating that no subcontracts are required
- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS**TASK 2 DEVELOP ELECTRIC VEHICLE READY MULTIFAMILY COMMUNITIES BLUEPRINT**

The goal of Task 2 is to develop an Electric Vehicle Ready Multifamily Communities Blueprint (the Blueprint) that will inform the critical success factors and benefits of an EV ready community that, once implemented, will accrue to the low income multi-family (LIMF) housing market within disadvantaged communities.

Four frameworks will be developed.

- Market and Technology
- Policy
- Economic and Financial
- Community Engagement

Each framework will produce a chapter that will be combined to define the full Blueprint report. Each framework produces a set of inputs and outputs used to develop the quantitative goals and timelines to be modelled in Task 3.

Subtask 2a Develop Market and Technology Framework

The goal of subtask 2a is to identify the market and technology framework for the Blueprint. This subtask will focus on profiling the potential for EV adoption, and resulting charger needs in the low income multi-family market.

The Recipient shall:

- Produce a Market and Technology Framework Blueprint Chapter, which includes, but is not limited to, information derived from the following activities:
 - Conduct surveys/interviews with LIMF residents, facility and property portfolio managers to include, but not be limited to:
 - Housing and parking characteristics.
 - EV market characteristics.
 - Conduct surveys/interviews with EV vendors and emerging TaaS providers to include, but not be limited to:
 - EV market characteristics, including purchasing patterns and participation characteristics of low-income residents in the EV market.

Surveys/interviews will be conducted and will be included as part of the Blueprint. Stakeholder input will inform topics to be covered and will include, but not are limited to:

- Familiarity and awareness of EV ownership risks and benefits.
 - Car ownership characteristics and stock turnover metrics.
 - Driving patterns and likely charging needs.
 - Transportation as a percentage of annual income.
 - Awareness of EV locational or portfolio policies on EV charging.
 - Purchase / lease characteristics of low income constituents and awareness of supporting financing and funding products.
 - Characteristics of housing and parking relevant to EV usage and charging infrastructure efficacy.
- Develop a Compendium of Market and Technology Framework Forecast Model Parameters. This component of task 2a will define the metrics necessary to model diffusion based adoption as discussed in Task 3, including but not limited to:
 - Fraction of low income multifamily residents and building operators familiar and unfamiliar with EVs as an individual ownership (IO) option, including knowledge of EV benefits, risks, and charging requirements.
 - Fraction of low income multifamily residents familiar and unfamiliar with EV IO competition groups, such as TaaS.
 - Metrics on EV and non-EV existing stock and stock turnover metrics, including changes in availability of EV purchase/lease options over time.
 - Metrics defining impacts of advertising and viral effects for the target population, including vendor perspectives.

Subtask 2a Products:

- Draft Market and Technology Framework Blueprint Chapter
- Final Market and Technology Framework Blueprint Chapter
- Compendium of Market and Technology Framework Forecast Model Parameters

Subtask 2b Develop Policy Framework

The goal of subtask 2b, the Policy Framework, is to identify policies will influence the IO and TaaS markets and related charging infrastructure needs. Our emphasis in this subtask will be on identifying and assessing policies that impact the low-income multifamily market, and include three areas of focus.

- Integrated Energy Policy Report (IEPR)
- State Policies and Plans
- Local and Regional Policies and Plans

The Recipient shall:

- Produce a Policy Framework Blueprint Chapter which includes, but is not limited to, the following components.

- Review of mandated state activities including assumptions underlying EV related IEPR forecasts and implications for the LIMF market. This includes planning and reporting requirements related to EV deployments (GHG, etc.) as related to the LIMF market.
 - Review state policies and plans (outside of IEPR) that will inform community outreach (see subtask 2d.).
 - Review of local and regional development activities as related to the LIMF market. This will include documenting actions or steps already adopted by the local jurisdiction and the impact of those actions or steps on the development of an EV ready community.
 - Policies that integrate distributed energy resources and emerging EV load characteristics and interrelationships within a ZNE context that include both building and transportation energy and demand requirements. This will include a review of regulatory decisions and rulings to assess alignment of integrated demand side policy with IO (and emerging TaaS initiative's) impacts, such as charging load shapes as related to building load shapes.
 - IEPR, state policies and plans, and local and regional development initiatives will be identified to serve as a model calibration resource, including LIMF market forecast calibration where appropriate.
- Develop a Compendium of Policy Framework Forecast Model Parameters. This component of task 2b will define the metrics necessary to model diffusion based adoption as discussed in Task 3 including, but not limited to:
 - Policy relation to EV market share and relationship to the low income multifamily market.
 - Estimates of installed base fraction and attribution of current policies in contributing the current installed base of IO chargers in the MF market.
 - Policies mandating or impacting changes to the installed base fraction, including impacts specific to the LIMF market.
 - Policies impacting innovation and familiarization with the EV market and estimates of resulting viral effects.

Subtask 2b Products:

- Draft Policy Framework Blueprint Chapter
- Final Policy Framework Blueprint Chapter
- Compendium of Policy Framework Forecast Model Parameters

Subtask 2c Develop Economic and Financial Framework

The goal of subtask 2c is to identify the financial framework that will influence the TaaS and IO markets, including the role of market ready funding and financing products.

The Recipient shall:

- Deliver an Economic and Financial Framework Blueprint Chapter which includes, but is not limited to, the following components.
 - Defined Charge Unit Installation Costs.
 - This research will focus on defining cost trends in IO chargers, including material and installation labor costs defined by manhours multiplied by local rates.
 - Defined Investment Models.

- This work will focus on the funding and financing sources available for IO installations in a commercial setting, including multifamily and MUSH markets. For this project, TaaS financing is considered to be capital financing internal to service providers and beyond the scope of this effort. This will include developing a capital stack model that identifies comprehensive financial and business models or collaborative strategies among developers, local governments, investor-owned utilities, etc. as well as showcasing innovative financing strategies that will accelerate the deployment of EV Ready Communities. The capital stack will include, but is not limited to, the following components.
 - A method to leverage funding and financing products (similar to the Energize Fresno project) to define all funding and financing options available for commercial DER deployments. This will include an assessment including, but not limited to, the following.
 - Grants
 - Finance
 - Rebates and technical assistance programs
 - Tax incentives
 - Fee waivers
 - Contract obligation such as leases or purchase agreements
 - An assessment of local financing institutions to be included in the implementation of the blueprint.
 - Developers and other stakeholders' views on potential incentives that increase the financial attractiveness of EV usage and charging infrastructure support.
- A high-level summary of possible impacts to local government revenue associated with taxes and fees on fuels as well as its potential impacts on local support for adoption of EV related initiatives or codes.
- Fuel Price Impacts. This research will review electricity and gasoline fuel price trends to inform adoption parameters to be included in the Task 3 forecast. A market average price will be defined based on PG&E records. (For example, see trends defined in Table 1.¹)

Table 1. PG&E Average Electricity Retail Cost Trends

Sector	2001	2017	CAGR
Residential Schedules	\$0.120	\$0.230	4.16%
Residential CARE Schedules	\$0.093	\$0.136	2.40%
Commercial Schedules	\$0.109	\$0.207	4.08%
Agricultural	\$0.144	\$0.249	3.50%
Industrial	\$0.068	\$0.146	4.87%
Average			4.15

- Adverse impacts of EV charging on utility rates will be used as a variable in the modeling work.

¹ Average rates based on estimated forecast. Average rates provided only for general reference, and individual customer's average rate will depend on its applicable kWh, and TOU data. At <https://www.pge.com/tariffs/electric.shtml>

- Develop a Compendium of Economic and Financial Framework Forecast Model Parameters. This component of task 2c will define the metrics necessary to model diffusion based adoption as discussed in Task 3, including but not limited to, the following.
 - Financing and funding products as related to the installed base fraction, to help define attribution of current funding and financing availability in contributing to the current installed base of IO chargers.
 - Financing and funding product impact on stock turnover decision for IO participants
 - Stakeholder views on familiarity with funding and financing products, including advertising and viral effects.
 - Coefficient of innovation estimates likely to be influenced by the extent to which market ready and emerging funding and financing can provide innovation to advance the EV adoption and charger installation.
 - Coefficient of imitation estimates as influenced by market demographics associated with current available funding and financing in the LIMF market.

Subtask 2c Products:

- Draft Economic and Financial Framework Blueprint Chapter
- Final Economic and Financial Framework Blueprint Chapter
- Compendium of Economic and Financial Framework Forecast Model Parameters

Subtask 2d Develop Community Engagement Framework

The goal of subtask 2d is to define a community level development approach based on the Better Blackstone Design Challenge project.

The Recipient shall:

- Develop a Community Engagement Framework Blueprint chapter to accomplish the following;
 - Develop an outreach strategy for commercial and multifamily stakeholders in the BBDC planning area.
 - Stakeholders activities intended to maximize the value and minimize the risks and uncertainties surrounding the design of an EV ready community, including, but not limited to, the following;
 - Assess current plans and support further development of community workforce activities underway at Fresno Community College to develop, support, and maintain the EV ready community.
 - Engage with PG&E on grid delivery, reliability, and resiliency as related to interconnect and charger related load issues. This will include emphasis on
 - Profiling locational capacity requirements. This research effort will review available data to assess level 1, 2, and 3 impacts on various grid locations,
 - Profile charging load shapes. This work will document load shapes for both individual and fleet charging for light vehicles. For individual chargers, loads shapes will be defined for the residential and commercial markets for level 1, 2, and 3 chargers in a way that can be aggregated and forecast at the portfolio / market level.

- Convene meetings with workplaces, property and business owners related to the LIMF market to assess familiarity and educate on the benefits of EV transportation.
- Work with low income residents of multifamily locations to engage in the planning process and educate on the benefits of EV transportation, including views on how to maximize placement of chargers that could support their use of EVs.
- Develop EV ready templates based on site specific plans for two low income multifamily sites;
 - Vehicle usage and driving patterns are identified in order to maximize and optimize the type and placement of charging infrastructure to support the vehicles.
 - Vehicle usage and driving patterns are identified in order to maximize and optimize the type and placement of charging infrastructure to support the vehicles.
 - Define site DG capacity based on roof and ground mount capacity reflective of anticipated charging demand and load shapes.
 - Define site electricity storage capacity that complement site generation capacity and locational grid resiliency and reliability profile based on PVRAM, LBNA model or other method in discussion with PG&E.
 - For multifamily locations, define the needs of multi-unit residential units that have characteristics that make charging at home difficult, such as not having:
 - Garages
 - Dedicated parking areas for residents
 - Conveniently placed power supplies or electricity outlets placed beyond the reach of the vehicle's charging cord
 - Inadequate utility service
 - Define charging requirements for light-duty vehicles to be included in site specific plans and in the Blueprint.
 - Proposed charging infrastructure is identified for the two proposed research sites including accessibility to travel routes, and maps of proposed and existing sites are included in the Blueprint.
 - A summary of innovative charging options such as curbside, streetlamp, and intersection chargers, solar chargers, mobile chargers, and autonomous garages are addressed.
 - Identifying optimal locations for electric vehicle charging infrastructure deployment and the rationale for them being considered optimal.
- Develop a Compendium of Community Engagement Framework Forecast Model Parameters. This component of task 2d will define the metrics necessary to model diffusion based adoption as discussed in Task 3 including, but not limited to, the following.
 - Impact of community engagement on installed base fraction.
 - Community engagement impacts on coefficients of innovation, imitation, familiarity, and viral effects.
 - Anticipated impacts of community engagement on changes of the installed base fraction, including resulting charger needs.

Subtask 2d Products:

- Draft Community Engagement Framework Blueprint Chapter
- Final Community Engagement Framework Blueprint Chapter
- Compendium of Community Engagement Framework Forecast Model Inputs

- Draft EV Ready Multifamily Communities Blueprint Report
- Final EV Ready Multifamily Communities Blueprint Report
- Compendium of All Forecast Model Parameters

[A CPR meeting is tentatively scheduled to be held within this task as stated in Task 1.2]

The goal of this task is to use information developed in the Blueprint to construct a prototype forecast model that will demonstrate the viability of a Bass diffusion model implemented in a System Dynamics framework to forecast localized adoption of EVs. This modeling approach generates the classic adoption S-curve observed in the successful introduction of any new technology and will be based on a stock/flow approach as illustrated in Figure 1.

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- **Develop a Model Inputs and Outputs Specification.** A number of data items are needed to populate such an adoption model. Data from the CEC's latest Transportation Energy

Demand Forecast will be leveraged to the greatest extent practicable (in some cases scaled to the local region to be modeled, as with vehicle stock forecasts), with additional data obtained through supplemental research. As the modeling forecast is a demonstration, however, additional data (e.g., regarding consumer choice coefficients) would likely be needed for future research phases to provide a more robust forecast of EV adoption. Inputs will be developed through research completed in Task 2, Blueprint, and will be informed by the following.

- Market and Technology Framework
 - State and Local Policy Framework
 - Economic and Financial Framework
 - Community Engagement Framework
- Recipient will work with the CAM to define model outputs during the development of the Blueprint and related frameworks.
 - Identifying the benefits that would accrue to Disadvantaged Communities, including identifying potential reduction goals in GHGs, criteria air pollutants, and toxic air contaminants for the region, and the emitters at the local level that would need to be targeted.
 - Scenarios that analyze the combination of IO and TaaS applications comparing economic, environmental, and technical performance specific for the LIMF market.
 - Identifying analytical tools, software applications, and data needed to improve future planning activities and model application in subsequent funding opportunities.
 - Develop an Analytical Based Prototype Forecast model that performs two distinct calculations:
 - Calculates long-run market share of EVs as a function of both economic and non-economic attributes of EVs relative to their conventional counterparts. Comparative economic attributes of EVs are a function of many factors including EV prices, tax credits, rebates and incentives, electricity rates and structures, vehicle efficiency, and gasoline prices, among others. Non-economic attributes can include any other product feature such as the environmental benefits, charging station convenience, availability of transportation as a service (TaaS), and inherent customer preferences. Each of these economic and non-economic attributes feeds a logit market share calculation using random utility theory. Since each of the input attributes can change over time, so can the long-run market share.
 - Develop a dynamic approach to calculate the long-run market share. The dynamic approach to long-run market share is governed two key constructs, including the following.
 - Stock Turnover Dynamics: Vehicle stock turnover dynamics must be factored into any model simulating the adoption of EVs, as the rate of vehicle turnover impacts the rate at which the stock of non-electric vehicles can be replaced with electric vehicles.
 - Familiarity Dynamics: Further affecting the rate of approach to the long run market share is the “advertising strength” and “word of mouth strength” parameters shown in Figure 12 above (described as the “p” and “q” parameters in the classical Bass diffusion model). These parameters affect the rate of growth in product familiarity and therefore the speed of adoption and ultimate shape of the S-curve, independent of the long-run market share.
 - Model development will include the following activities
 - Complete Model Calibration. Nonlinear optimization techniques will be used to calibrate certain diffusion coefficients of the model, which ensures that the model can at least replicate past adoption. Forecasting future adoption is still uncertain, of course, but the calibration to historical adoption data helps to ground the forecasts in

reality. To ensure the parameters of the local model are reasonably consistent with those used by the CEC, the calibration process would further consider the forecasts from the CEC's Transportation Energy Demand Forecast which is being used in the current IEPR process.

- **Model Vetting and Stakeholder Review.** Throughout the project the team will engage with interested stakeholders for comment and input on components of the Bass diffusion model. Input may be from the following, for example:
 - Stakeholders engaged in all framework discussions
 - Recipients of competitive awards under GFO 17-604, including groups 1, 2 and 3
 - Other stakeholders at the request of the CAM

All model vetting activities completed outside of the project team engagements will be subject to approval of the Commission Agreement Manager (CAM). Stakeholder engagement will be structured and documented as part of the Task 3 reporting process.

Products:

- Draft Model Inputs and Outputs Specification
- Final Model Inputs and Outputs Specification
- Analytica Based Prototype Forecast Model

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: TIERRA RESOURCE CONSULTANTS, LLC

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

RESOLVED, that the Energy Commission approves Agreement ARV-17-038 with Tierra Resource Consultants, LLC, for a \$199,811 grant to develop a blueprint report and forecasting model that provides the Fresno community with a comprehensive and strategic approach to identifying electrified transportation options, actions and milestones required to become an EV-ready community.; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on May 9, 2018.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Cody Goldthrite,
Secretariat