VALLEY CLEAN ENERGY ALLIANCE
COMMUNITY ADVISORY COMMITTEE

Staff Report – Item 8

TO: Community Advisory Committee

FROM: Gordon Samuel, Assistant General Manager & Director of Power Services

SUBJECT: Preliminary results of the VCE zero-carbon portfolio study

DATE: December 16, 2021

Overview

The purpose of this report is to transmit the preliminary results of the VCE zero-carbon portfolio study and initiate discussion by the full CAC. Staff is seeking feedback from the CAC as the final study/report is being prepared for presentation to the Board at their January meeting.

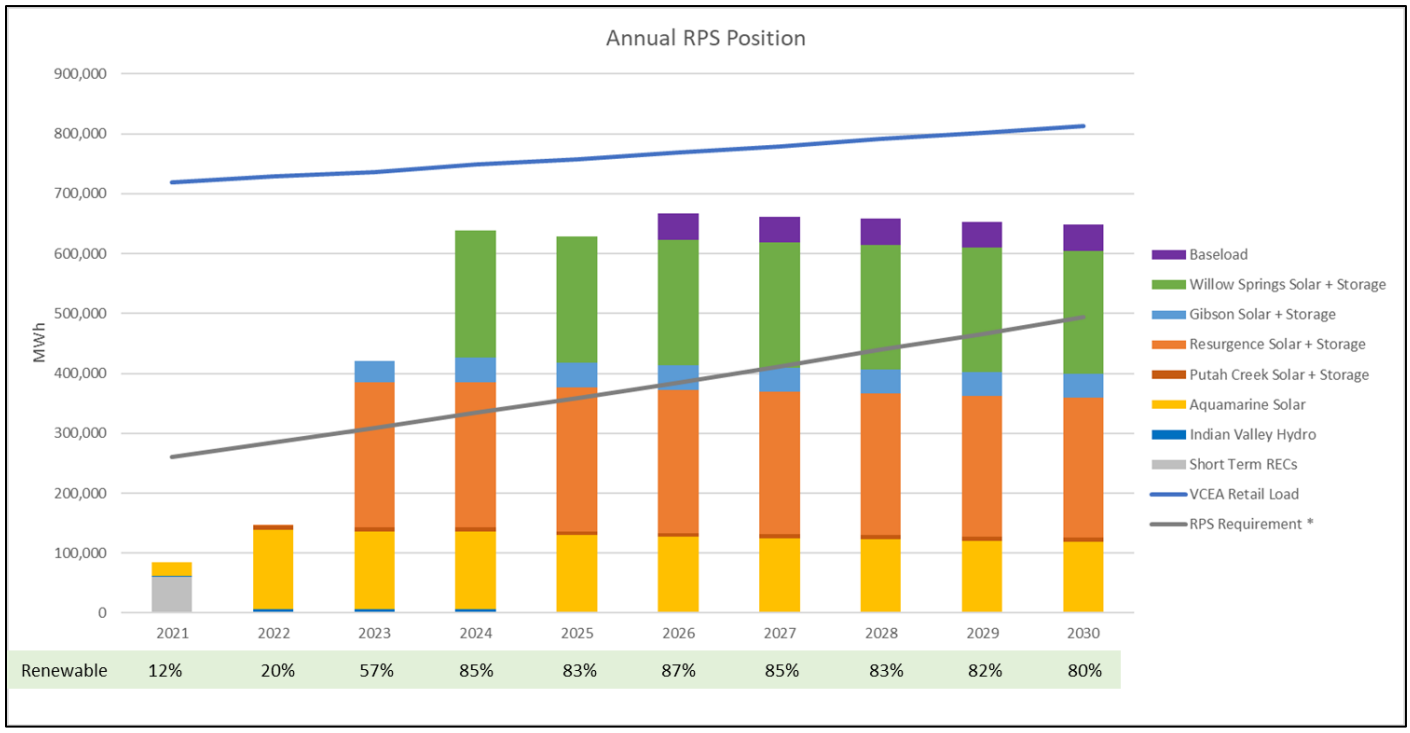
Background

In October 2020, the Board approved VCE's 2021-2023 Strategic Plan which contains goals related to VCE's power resource portfolio as well as decarbonization. The Community Advisory Committee (CAC) formed task groups at the January 2021 meeting and approved the task group "charge" at the February meeting. The initial task group – carbon neutral and decarbonization task group – has been meeting bi-weekly since March. It became apparent very early in the meetings that addressing the carbon neutral topic (specifically Goal 2, Objective 2.5) was going to be more than enough to focus on for 2021 and decided to postpone the decarbonization work (Goal 4) until 2022. The "charge" stated that the task group assist staff and consultants in evaluating feasibility and creating a road map for both carbon-neutral and carbon-free-hour-by-hour power by 2030. In order to complete this work an outside consultant was selected from an April 30, 2021 request for proposals (RFP) seeking qualified consultants to explore the feasibility, cost and benefit of pursuing a 100% carbon free portfolio. The consultant, Energeia, was selected to perform the study. The contract with the consultant was approved by the Board on July 8, 2021. Interim updates were provided to the CAC (late August 2021) and to the Board (September 2021).

VCE Current Renewable Portfolio Trajectory

For reference, staff is including VCE's current renewable portfolio and trajectory out to 2030.

Figure 1 - VCE Current Renewable Portfolio Trajectory

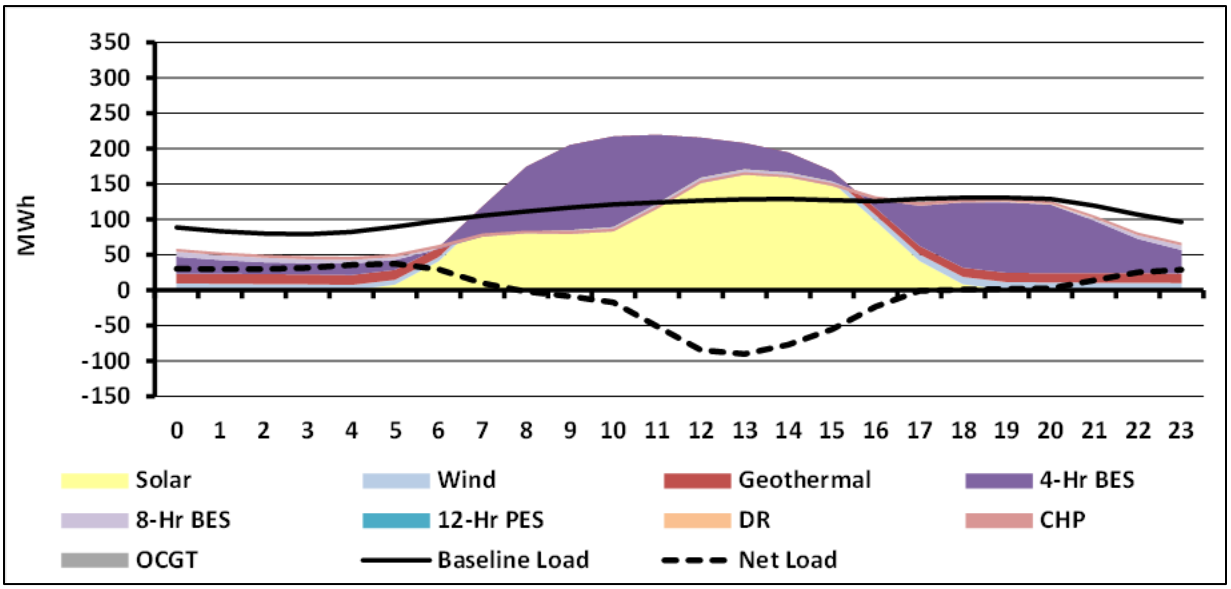


Analysis

The purpose of this effort is to understand what the future resource portfolio would consist of in order to be 100% carbon neutral as well as the be 100% renewable 24x7 (that is, every hour of every day meet VCE's demand with renewable resources). The figures below provide a potential outcome from the draft study to achieve either of these goals.

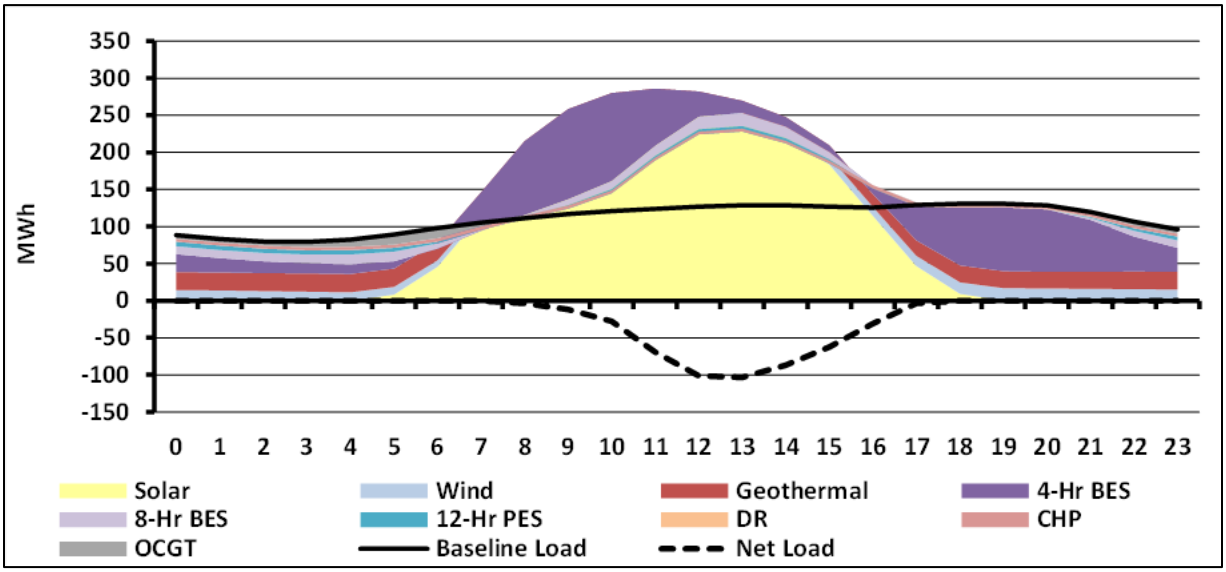
The below graphic is a 100% carbon neutral portfolio meeting VCE's annual demand. That is, over the course of a year the resources generate at least an annual amount that meets or exceeds VCE's annual demand. In this scenario the timing of the resource's generation does not have to match the load.

Figure 2 – 100% Carbon Neutral Portfolio



The below graphic is an hour by hour 100% renewable portfolio for VCE. This portfolio meets or exceeds VCE's load every hour of the year. At a minimum the resource's generation needs to match or exceed the load.

Figure 3 – Hour by Hour 100% Renewable Portfolio



VCE has a stated goal of being 80% renewable by 2030. Either of the portfolios studied goes beyond VCE's current commitment. Resources exist that can satisfy either situation, but there is a significant cost difference between the portfolios. The below table outlines the incremental resources needed – resources above what VCE has contracted for or will be contracting for in the near future to satisfy regulatory mandates (R.20-05-003). The carbon neutral portfolio is approximately 1/3rd the cost of the

hour-by-hour portfolio ($17M/yr vs $47m/yr). This would be in addition to the approximate $50-$60M/yr VCE spends on the current power portfolio.

Table 1 – MW Needed for Hour-by-Hour and Carbon Neutral Portfolios

Scenarios	Solar	Wind	Geothermal	Small Hydro	Large Hydro	4-Hour BES	8-Hour BES	12-Hour PES	OCGT
HBH	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.7	112.3
CN	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0

Above table represents the incremental MWs needed to satisfy the hour by hour (HBH) or the carbon neutral (CN) portfolios.

Next Steps

Energeia will complete the sensitivity analysis (such as drought impacts, electric vehicle penetration, building electrification, etc) as well as a final report. The complete results will be presented to the Board at the January meeting.

Discussion

At this time, staff is not recommending any policy adjustments. This information, combined with the final report, will act as a foundation that will be used for future discussions with the CAC to formulate a new policy that can be presented to the Board in the first half of 2022.

Attachment

1. Carbon Free Portfolio RFP

Valley Clean Energy Alliance
604 2nd Street, Davis, California 95616
Phone: (530) 446-2750

REQUEST FOR PROPOSALS
FOR
100% CARBON FREE PORTFOLIO STUDY

PROPOSALS ARE DUE:
Friday, May 21, 2021 BY 4:00 P.M. (Pacific Daylight Time)
Proposals must be e-mailed in PDF form to Gordon.Samuel@ValleyCleanEnergy.org

Valley Clean Energy Alliance is a Joint Powers Authority
consisting of the Cities of Davis, Woodland, and Winters and the County of Yolo.

Scope of Services

100% CARBON FREE PORTFOLIO STUDY

I. INTRODUCTION

Valley Clean Energy is seeking a qualified consultant (Contractor) to explore the feasibility, cost and benefit of pursuing a 100% carbon free portfolio. This 100% carbon free portfolio will be developed as an option to be considered as part of VCE's Strategic Plan and in VCE's upcoming Integrated Resource Plan (IRP). It is intended that all elements of the generation portfolio will be renewable and/or carbon free as defined below.

II. BACKGROUND

2.1 Valley Clean Energy Alliance or Valley Clean Energy (VCE), is a joint powers authority providing a state-authorized Community Choice Energy (CCE) program. Participating VCE governments include the City of Davis, the City of Woodland, the City of Winters and the unincorporated areas of Yolo County. PG&E continues to deliver the electricity procured by VCE and to perform billing, metering, and other electric distribution utility functions and services. Customers within the participating jurisdictions have the choice not to participate in the VCE program.

2.2 Since VCE started serving load in June 2018, VCE has added resources under long term contracts and is gradually building up a portfolio of short and long term assets in line with its vision and the demand of its customers. To date, VCE has relied mainly on market purchases of energy, Resource Adequacy (RA), and Renewable Energy Credits (RECs) in order to serve its electric demand and meet regulatory requirements with respect to resource adequacy and renewable energy. Starting in 2021 VCE will increasingly meet electric demand with resources under long term contracts. VCE has contracted for 50 MW of new solar resource (PV – photovoltaic) located in Kings County, CA and a 3 MW PV + 3 MW storage (BESS – battery energy storage system) project in Yolo County, CA to come online before the end of 2021. In 2022, two additional solar + storage power purchase agreements (PPAs) have been executed (90 MW PV + 75 MW BESS in San Bernardino County, CA and 20 MW PV + 6.5 MW BESS in Yolo County, CA). Finally, two other long-term RA capacity contracts have been executed - 7 MW of demand response beginning in the Summer 2021 and another 2.5 MW of stand-alone battery storage by Summer 2022.

III. DETAILED SCOPE OF WORK

The scope of work for this project includes the following:

- Develop a 100% renewable portfolio study report
  - Net zero and 24x7 by 2030
- Develop a 100% carbon free portfolio study report
  - Net zero and 24x7 by 2030
- Use production cost model to simulate generation of existing and future resources

- Develop lowest cost resource mix at different renewable/carbon free penetrations levels
- Perform risk analysis of the scenarios/contingencies
  - Contractor invited to present scenarios/contingencies to consider
- Provide industry trends for renewable resources, large hydro, storage, etc.

3.1 Renewable Electricity – includes "biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current", [(Public Resources Code § 25741), Renewables Portfolio Standard (RPS). (Public Utilities Code § 399.11 et seq.)] Renewable electricity is assumed to be free of GHG emissions.

3.2 Carbon Free Electricity – Any electricity that meets the definition of renewable electricity above plus other sources considered zero emission. These zero emission sources now in California include existing large hydro (greater than 30 MW) and existing nuclear. New technologies not now included in the zero-emission category can be added in the future. Carbon Free power uses no fossil fuel generation. See https://focus.senate.ca.gov/sb100/faqs for FAQs on existing large hydro and existing nuclear and their inclusion in SB 100. The percent of the power that must meet RPS is governed by SB 100 (De Leon, 2018) and shall be equal to or greater than 60% for 2030 and beyond. By 2045 all electricity in California is to be Carbon Free.

3.3 Hour by Hour // 24/7 – The Carbon Content of the Electricity provided is analyzed on an hour by hour basis. And for our purposes is either Renewable or Carbon Free Electricity each and every hour of the day.

3.4 Carbon Neutrality – The net carbon content of the electricity is analyzed over a period of time (usually a year) and the net carbon content is zero. During this period both sources that emit carbon and those that do not can be used, but the net carbon emissions are zero. Net zero can be achieved if zero carbon electricity is overproduced at certain times and that excess zero carbon electricity is demonstrated through available data to displace carbon emitting electricity on the grid at that time. If enough zero carbon electricity is overproduced, the net carbon emissions can be zero.

- This area purposely left blank -

POWER SOURCE	HOUR BY HOUR	CARBON NEUTRAL
RENEWABLE	R/HBH	R/CN
CARBON-FREE	CF HBH	CF/CN

ANAYLYSIS TIME FRAME

"R/HBH/CF/CN": Renewable /Hour by hour/Carbon free/Carbon neutral

IV. PROFESSIONAL SERVICES

The following tasks and are incorporated into the Scope of Work.

4.1 Project Tasks

Contractor shall prepare and provide the following:

4.2 Portfolio Study Reports

The Portfolio Study Report (Report) shall describe at a high level the method used to perform the work. The fundamental algorithmic assumptions and approach must however be logical, consistent and explained in narrative form. The inputs used by the Contractor should align with the inputs provided by VCE. Reports and supporting documents shall be provided in .pdf, WORD, Excel or other commonly used formats.

Potential resources that could be included in the portfolios

- Solar (Front of meter, FOM/Behind the meter, BTM)
- Wind
- Hydro
- Pump Storage

- Geothermal
- Biomass
- Battery Storage (FOM/BTM)
- Nuclear
- Energy Efficiency
- Demand Response
- Demand Management

4.3 Scenario Scope

The Contractor must use a production cost model to simulate the generation of existing and future resources. The results for each scenario must be summarized in the Report to at least include the following: costs, generation of each resource (GWh), market purchases (GWh), demand response deployment, behind the meter deployments, nameplate capacity of new resources, battery configurations (capacity and duration), imports, amount of local generation and CO2 equivalent tons.

The Contractor shall propose and discuss with VCE any viable scenarios based on Contractor's experience and expertise. These proposed scenario submittals will be reviewed by VCE. Each scenario shall include all costs on an annual basis for PPA energy costs, transmission or other delivery costs, fuel costs and any fixed and variable O&M. Contractor shall complete a quantitative evaluation for each scenario. Each scenario, unless otherwise noted, shall be modeled on an hourly basis. The Loss of Load Expectation (LOLE) for each scenario should not exceed one (1) day in ten (10) years.

4.4 Model VCE reference case. Align with the assumptions made for the reference case and identify any differences.

Contractor will solve for the mix of renewable or carbon free resources that results in the lowest cost plan. All loads will be served by assets procured by VCE. VCE will not rely on spot energy purchased from outside resources.

4.5 Risk Analysis

Attempting to achieve a 100% carbon free portfolio entails risks and unknowns, some of which VCE is able to anticipate, and others that may not be obvious. This section lists some of the potential risks that VCE has so far identified. The Contractor shall explain the risk and mitigation for each concern listed below.

It is also anticipated that the list below is likely incomplete, and for that reason the Contractor is expected to address and explain in the Report any additional risks and mitigations that it may be aware of or discover during the course of the study.

4.5.1 Particular attention shall be paid to the capacity and duration of output of any energy storage facilities proposed. There is some concern for instance, that solar

sources of supply may not be available or adequate for extended times, during some winter peak conditions. The storage must be capable of covering the deficit.

4.5.2 If large amounts of storage are necessary through the variability of renewable sources, how will it be ensured that storage can be kept sufficiently charged using only the renewables? Would access to a greater amount of renewables, either from the grid or locally connected, be required to charge the storage and maintain a 100% renewable posture? What would be the estimated cost?

For instance, if renewable resources are installed or purchased only in quantities sufficient to serve VCE's peak load, when and how often would it be assumed those resources could be successfully diverted to keep the storage charged to acceptable levels? Would it be necessary to purchase more renewables strictly to serve storage?

4.5.3 There could be a risk in purchasing access to renewables or carbon free in quantities sufficient to ensure the ability to reliably serve load for the full 8760 hours of the year. The risk is having significant excess energy at certain times of the year or day. What would be the best strategy for dealing with this issue? Exporting to the grid? Curtailing the renewable/carbon free energy?

The Contractor shall identify in each scenario evaluated the magnitude in MWs and the risk in annual hours of having significant excess energy.

4.5.4 How will demand response programs be deployed? What is the magnitude, duration (per day/per year), and time of day that these programs are expected to be implemented?

4.6 Discussion of possible future industry trends in renewable resources, carbon free resources and storage

Contractor shall also gather input on trends and emerging technologies that could reach maturity by 2030, and which could help in achieving the 100% renewable or carbon free goal.

The Contractor shall provide in the Report a separate discussion of what is considered to be emerging and future trends in renewable energy, carbon free energy, storage and other potential technologies that could aid in achieving a goal of 100% carbon free portfolio. The discussion should include future factors such as, but not limited to, pricing, capacity factor, efficiency, new inverter technology, operating capabilities, and whatever else the Contractor may consider to be relevant.

The Contractor shall provide in support of this discussion of future trends a survey or summary of pertinent industry sources, referenced as appropriate.

V. PROPOSER MINIMUM QUALIFICATIONS

The proposals submitted in response to this Request for Proposals shall be evaluated for award based on the following criteria and weighting.

Item	Criteria Description	Weighting
	Experience and Qualifications 1. Experience of firm 2. Resumes of staff designated to support this scope 3. CCA/Public Power/Energy experience	**45%**
	Compliance with VCE Sample Contract	**10%**
	Price	**45%**
	Total	**100%**

5.1 Proposal Submittal Requirements

1. Ten pages maximum submitted electronically. Executive Summary with brief description of company including Firm or individual name and contact information, including e-mail and website addresses, year organized, principals with the firm, types of work performed, number of employees.
2. Resumes of key staff that would work on VCE projects.
3. Information on any previous experience or services provided, including CCA experience.
4. Other factors or special considerations you feel would influence the selection of your proposal.
5. List of references and contact information.

5.2 Miscellaneous

1. Additional Information

Scope of Services may be revised upon mutual agreement between the Contractor and VCE.

2. Ownership of Work Products

All notes, documents, and final products in all native formats (e.g., Word, Excel, PowerPoint, databases, handwritten notes) produced in the performance of this agreement shall be the property of VCE and shall not be shared with other entities without permission from VCE staff.

3. Request for Proposal Schedule

VCE anticipates that the process for selection of Carbon Free Portfolio Study and awarding the contract will be according to the following tentative schedule.

5.3 Schedule

Milestone Description	Date
Issue RFP	4/30/2021
Return NDA	5/12/2021
Responses due	5/21/2021
Consultant selection	6/17/2021
Study work	Q3 2021
Final report complete	Q4 2021

5.4 Instructions to Proposers

1. Time and Manner of Submission

The Proposal shall be submitted electronically to and received by VCE's office no later than 4:00 p.m. (PDT) on Friday, May 21, 2021.

Submit to:

Gordon Samuel, Assistant General Manager
Email: gordon.samuel@ValleyCleanEnergy.org

- Each proposal shall include the full business legal name, DBA, and address and shall be signed by an authorized official of the company. The name of each person signing the proposal shall be typed or printed below the signature.
- All proposals submitted become the property of VCE.

2. Explanations to Proposers

All requests, questions or other communications regarding this RFP shall be made in writing to VCE via email. **Address all communications to Gordon Samuel (gordon.samuel@valleycleanenergy.org)**. To ensure that written requests are received and answered in a timely manner, email correspondence is required.

VCE will not be bound by any oral interpretation of the Request for Proposal, which may be made by any of its representatives or employees, unless such interpretations are subsequently issued in the form of an addendum to this Request for Proposal.

3. Withdrawal or Modification of Proposals

Proposals may be modified or withdrawn only by an electronic request received by VCE prior to the Request for Proposal due date.

4. **Revisions and Supplements**
   Addenda: If it becomes necessary to revise or supplement any part of this Request for Proposal an addendum will be provided.

5. **Proposal Evaluation and Selection Process**
   The proposals submitted shall be evaluated for award based on the criteria described in the "Proposal Evaluation Criteria" section of this Request for Proposal.

   VCE may request additional information from any or all Proposers after the initial evaluation of the proposals to clarify terms and conditions.

   Based on VCE's review of the proposals received, a "short listed" group of Proposers may be selected. The "short listed' firms may be required to make verbal presentations of their qualification to VCE. If a presentation is determined to be required, the presentation will be considered in the overall technical rating.

   The contract will be awarded to the best-qualified Proposer, after price and other factors have been considered, provided that the proposal is reasonable and is in the best interests of VCE to accept it.

   The right is reserved, as the interest of VCE may require, to reject any or all proposals and to waive any irregularity in the proposals received.

   Within fourteen (14) calendar days after notice of award, the successful Proposer shall deliver to VCE the required insurance certificates as per section 3.10 of the sample contract and the signed copies of the contract. The contract forms will be forwarded to the Proposer with the award notification.

6. **Duration of Contract**
   This contract shall be for one year, subject to approval by VCE's Board of Directors of the corresponding annual budget, unless otherwise mutually agreed upon in writing.

   The Budget is subject to the approval of VCE's Board of Directors.

7. **Qualifications of Proposers**
   VCE expressly reserves the right to reject any proposal if it determines that the business and technical organization, financial and other resources, or experience of the Proposer, compared to the work proposed justifies such rejection.

8. **Proposal Preparation Costs**
   The costs of developing proposals are entirely the responsibility of the Proposer and shall not be charged in any manner to VCE.

9. Conflicts

If conflicts exist between the contract and the other elements of this Request for Proposal, the contract prevails. If conflict exists within the contract itself, the Terms and Conditions govern, followed by Scope of Services. If conflict exists between the contract and applicable Federal or State law, rule, regulation, order, or code; the law, rule, regulation, order, or code shall control. Varying levels of control between the Terms and Conditions, drawings and documents, laws, rules, regulations, orders, or codes are not deemed conflicts, and the most stringent requirement(s) shall control.

10. Manner and Time of Payment

At completion of the scope, Contractor shall submit an invoice for the lump sum of the work performed.

11. Subcontractors

The Proposers must describe in their proposals the areas that they anticipate subcontracting to specialty firms. Identify the firms and describe how Proposer will manage these subcontracts.

Contractor will pay subcontractors in a timely manner.

Nothing contained in the Contract shall create any contractual relation between any subcontractor and VCE.

12. Notice Related to Proprietary/Confidential Data

Proposers are advised that the California Public Records Act (the “Act”, Government Code §§ 6250 et seq.) provides that any person may inspect or be provided a copy of any identifiable public record or document that is not exempted from disclosure by the express provisions of the Act. Each Proposer shall clearly identify any information within its submission that it intends to ask VCE to withhold as exempt under the Act. Any information contained in a Proposer’s submission which the Proposer believes qualifies for exemption from public disclosure as "proprietary” or “confidential” must be identified as such at the time of first submission of the Proposer’s response to this RFP. A failure to identify information contained in a Proposer’s submission to this RFP as "proprietary” or “confidential” shall constitute a waiver of Proposer’s right to object to the release of such information upon request under the Act. VCE favors full and open disclosure of all such records. VCE will not expend public funds defending claims for access to, inspection of, or to be provided copies of any such records.

13. Contract

VCE’s standard contract is included as Attachment A - *Sample* Contract of this Request for Proposal. VCE may reject proposals that contain exceptions to the Terms and Conditions included in the sample contract.

5.5 Performance Requirements

Performance Requirements/Acceptance Criteria

a. All Milestones shall be completed in accordance with approved schedule.

b. Deliverable items must be complete, legible, comprehensible, and satisfy all requirements set forth in the scope of work.

5.6 Reference Documents

VCE will provide reference documents to aid in the preparation of RFP responses after execution of the non-disclosure agreement (NDA) – a sample NDA is attached as Attachment B.

5.7 Resource and Submittal Requirements

Contractor shall provide all resources required to complete the work described herein, including but not limited to skills, services, supervision, tools, documents, information, labor, materials, equipment, computing capability, transportation, and any other necessary item or expense to fulfill the work requirements.

5.8 Project Cost

Contractor shall provide a not to exceed lump sum price. If VCE modifies the scope and additional study work needs to be performed, Contractor shall provide a change order price before initiating the work.