



**California Energy Commission  
June 22, 2026 Business Meeting  
Backup Materials for Verdant Associates, LLC**

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

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

**CALIFORNIA ENERGY COMMISSION**

**PROPOSED RESOLUTION: Verdant Associates, LLC**

**RESOLUTION NO: 26-0622-XX**

**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 800-25-007 with Verdant Associates, LLC for a \$399,971 contract to provide technical support for improvements to the Distributed Generation Market Demand (dGen) Model. The model forecasts behind-the-meter solar photovoltaic (PV) and paired storage as a critical component to broader long-term energy demand forecasting in California; and

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

**APPROVED AND ADOPTED this 22 day of June 2026, by the following vote:**

AYE:

NAY:

ABSENT:

ABSTAIN:

**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 approved and adopted by affirmative vote of the CEC at a meeting held on June 22, 2026.

Kim Todd  
Secretariat



## CONTRACT REQUEST FORM (CRF)

### A. New Agreement Number

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

New Agreement Number: 800-25-007

### B. Division Information

1. Division Name: Energy Assessments Division
2. Agreement Manager: Mark Palmere
3. MS-Not Applicable
4. Phone Number: 916-776-3892

### C. Contractor's Information

1. Contractor's Legal Name: Verdant Associates LLC

### D. Title of Project

Title of project: Enhancing Behind-the-Meter PV and Storage Adoption Modeling in California

### E. Term and Amount

1. Start Date: June 22, 2026
2. End Date: June 30, 2028
3. Amount: \$399,971.00

### F. Business Meeting Information

1. Operational agreement to be approved by Executive Director? No
2. Are the ARFVTP agreements \$75K and under delegated to Executive Director? No
3. The Proposed Business Meeting Date: 06-22-2026
4. Consent or Discussion? Consent
5. Business Meeting Presenter Name: Mark Palmere, 916-776-3892,  
[mark.palmere@energy.ca.gov](mailto:mark.palmere@energy.ca.gov)
6. Time Needed for Business Meeting: N/A
7. The email subscription topic is: Energy Assessments, Renewable Energy

#### Project Description:

Verdant Associates LLC. Proposed resolution approving Agreement 800-25-007 with Verdant Associates LLC for a \$399,971.00 contract to provide technical support for improvements to the Distributed Generation Market Demand Model (dGen), which forecasts behind-the-meter solar photovoltaic and paired storage adoption as a critical component to broader long-term energy demand forecasting in California. Contact: Mark Palmere

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

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

No

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: Work under contract is to

provide technical support to CEC staff with forecasting and modeling of behind-the-meter distributed generation adoption.

**2. If Agreement is considered a “Project” under CEQA answer the following questions.**

a) Agreement **IS** exempt?

N/A

Statutory Exemption?

N/A

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: PRC section number 1, PRC section number 2. Or, "None"

CCR section number: CCR section number 1, CCR section number 2. Or, "None"

Categorical Exemption?

N/A

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 number: CCR section number 1, CCR section number 2. Or, "None"

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

N/A

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

Enter "Not applicable" or reason why Agreement is exempt under the above section

b) Agreement **IS NOT** exempt.

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

Enter Yes or No

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

<b>Additional Documents</b>	<b>Applies</b>
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). 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.

<b>Subcontractor Legal Company Name</b>	<b>Budget</b>
Jai J. Mitchell Analytics	\$ 28,179
Dr. Varun Rai	\$ 49,500

**J. 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.

<b>Key Partner Legal Company Name</b>
No Key Partner Legal Company to Report

**K. 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.

<b>Funding Source</b>	<b>Funding Year of Appropriation</b>	<b>Budget List Number</b>	<b>Amount</b>
General	2025-26	800.100	\$399,971.00

**TOTAL Amount:** \$399,971.00

R&D Program Area: Enter R&D Program Area. Example: EDMFO: EDMF

Explanation for "Other" selection Enter explanation for "Other"

Reimbursement Contract #: Enter Reimbursement Contract Number

Federal Agreement #: Enter Federal Agreement Number

**L. Contractor's Contact Information**

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

Name: Stephan Barsun

Address: 1972 Los Angeles Ave

City, State, Zip: Berkeley, CA 94707

Phone: 916-801-2594

E-Mail: stephan@verdantassoc.com

**2. Contractor’s Project Manager**

Name: Kurt Scheuermann  
Address: 1972 Los Angeles Ave  
City, State, Zip: Berkeley, CA 94707  
Phone: 360-798-8261  
E-Mail: kurt@verdantassoc.com

**M. Selection Process Used**

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

Selection Process	Additional Information
Competitive Solicitation #	RFP-25-802, 3 bids
Non Competitive Bid ( <i>Attach DGS-GSPD-09-007</i> <a href="https://www.dgs.ca.gov/PD/Forms">https://www.dgs.ca.gov/PD/Forms</a> )	Not applicable
Exempt	Not applicable

**N. Contractor Entity Type**

Contractor Entity Type	Yes or No?
Private Company ( <i>including non-profits</i> )	Yes
CA State Agency ( <i>including UC and CSU</i> )	No
Government Entity ( <i>i.e. city, county, federal government, air/water/school district, joint power authorities, university from another state</i> )	No

**O. Is Contractor a certified Small Business (SB), Micro Business (MB) or Disabled Veterans Business Enterprise (DVBE)?**

The contractor is a certified: Micro Business (MB)

**P. Civil Service Considerations**

- a. Not Applicable (Agreement is with a CA State Entity or a membership/co-sponsorship)? No
- b. Public Resources Code 25620, et seq., authorizes the Commission to contract for the subject work. (PIER) Yes
- c. The Services Contracted: Yes.

If no, go to the next question. If yes, which of the following applies to the contract? More than one can apply, list each answer choice, and separate them with a comma:

- are not available within civil service

- cannot be performed satisfactorily by civil service employee
- are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system

The following applies to the contract: Are of such a highly specialized or technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.

- d. The Services are of such an urgent, temporary, or occasional nature that the delay to implement under civil service would frustrate their very purpose?

Occasional nature that the delay to implement under civil service would frustrate their very purpose.

**Justification:**

Work for this contract is highly specialized and technical nature that the expert knowledge, expertise, and ability are not available through the civil service system.

**Q. Payment Method**

1. Is the payment method Reimbursement, Advanced Payment, or Other?  
Reimbursement.

If Other, explain: Enter explanation for "Other" payment method.

2. If Reimbursement, is it in arrears based on Itemized Monthly, Itemized Quarterly, Flat Rate, or One-time?

Itemized Monthly.

**R. Retention**

Is Agreement subject to retention? Yes.

If Yes, Will retention be released prior to Agreement termination? Yes.

**S. Justification of Rates**

Based on expected hours by task and classifications required to perform the tasks.

**T. Disabled Veteran Business Enterprise Program (DVBE)**

Provide requested additional information.

1. Exempt (Interagency/Other Government Entity) No.
2. Meets DVBE Requirements DVBE Yes.  
Amount: \$ 28,179 DVBE %: 7
3. Is the Contractor Certified DVBE or Subcontracting with a DVBE? If subcontracting with a DVBE, provide the name of the DVBE company. If none applies, enter "Not Applicable".  
Jai J. Mitchell Analytics
4. Contractor selected through CMAS or MSA with no DVBE participation No.
5. Requesting DVBE Exemption (attach CEC 95) No.

**U. Miscellaneous Agreement Information**

- 1. Will there be Work Authorizations? No.
- 2. Is the contractor providing confidential information? No.
- 3. Is the contractor going to purchase equipment? No.
- 4. What is the check frequency of the progress reports? Monthly, Quarterly, or Other? If Other, please provide explanation.

Quarterly

- 5. Will a final report be required? Yes.
- 6. Is the Agreement, with amendments, longer than three years? If yes, why? No.

**V. The following items should be attached to this CRF (as applicable)**

List all items that should be attached to this CRF 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	DGS-GSPD-09-007, NCB Request	No
4	CEC 95, DVBE Exemption Request	No
5	Awardee CEQA Documentation	No
6	Resumes	Yes
7	CEC 105, Questionnaire for Identifying Conflicts	Yes

**Approved By**

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

**Agreement Manager:** Mark Palmere

**Approval Date:** 4/21/26 *Mark Palmere*

**Office Manager:** Heidi Javanbahkt

**Approval Date:** 21/04/26 *Heidi Javanbahkt*

**Deputy Director:** Aleecia Gutierrez

**Approval Date:** 21/04/26 *Aleecia Gutierrez*

# EXHIBIT A

## SCOPE OF WORK

### TASK LIST

Task #	Task Name
1	Agreement Management
2	dGen Agent Refinement
3	dGen Market Dynamics Assessment and Adjustment
4	Enable choice modeling for leased vs. customer-owned systems
5	Technology Cost Refinements
6	Predicting Storage Attachment Rates

### ACRONYMS/GLOSSARY

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

Acronym/Word	Definition
ACS	American Community Survey
BTM	Behind-the-Meter
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	State Energy Resources Conservation and Development Commission or as commonly called, the California Energy Commission
CED	California Energy Demand
CPUC	California Public Utilities Commission
DG	Distributed Generation
dGen	Distributed Generation Market Demand Model
DGStats	California Distributed Generation Statistics
DGS	Department of General Services
IEPR	Integrated Energy Policy Report
IOU	Investor-Owned Utility
ITC	Investment Tax Credit
KW	Kilowatt
MW	Megawatt
NBT	Net Billing Tariff
NEM	Net Energy Metering
NLR	National Laboratory of the Rockies
POU	Publicly Owned Utility
PV	Photovoltaics
State	State of California

## **BACKGROUND**

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial Integrated Energy Policy Report (IEPR). As required by Public Resources Code 25301(a), the report contains “assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand and prices.” The electricity demand forecast is used in electric grid system planning and electricity procurement, informing the CAISO Transmission Planning Process, CPUC Integrated Resource Planning, Distribution Planning Process, and Resource Adequacy work, along with other reliability studies such as the SB 100 Joint State Agency Report. The electricity demand forecast includes scenarios for BTM (PV) and energy storage adoption, as these technologies can reduce electricity demand from the electric grid. CEC seeks to improve methods for forecasting BTM PV and battery storage in the demand forecast.

CEC staff use a California-specific adaptation of the NLR’s dGen - a bottom-up market-penetration model - to forecast BTM PV and storage adoption for existing buildings across California. Developed collaboratively with NLR, the model considers the technical, economic, and market potential of these technologies to predict adoption. To efficiently assess potential across California’s diverse electricity customers, dGen represents them as agents. Each agent reflects distinct customer characteristics, capturing technical limitations based on geography and building types, as well as economic factors such as electricity rates, energy usage, and demographics. Clustering data across California with these considerations requires access to, and the capability to aggregate and map, complex data sets – including but not limited to: Interval Meter Data (IMD), and detailed demographic data from sources such as the American Community Survey (ACS). To our knowledge, a framework to distill and synthesize these data sources to build the most robust view of prospective BTM PV and storage adopters in California is not available.

## **GENERAL REQUIREMENTS OR GOALS AND OBJECTIVES**

### **TASK 1- AGREEMENT MANAGEMENT**

#### **TASK 1.1 Kick-off Meeting**

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

#### **The Contractor shall:**

- Attend a “kick-off” meeting with the CAM, the Commission Agreement Officer (CAO), and a representative of the Accounting Office. The meeting will be held via Zoom or teleconference. The Contractor shall include their Project Manager, Contracts Administrator, Accounting Officer, and others designated by the CAM in this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting.
- If necessary, prepare an updated Schedule of Deliverables based on the decisions made in the kick-off meeting.

**The CAM shall:**

- Arrange the meeting including scheduling the date and time.
- Provide an agenda to all potential meeting participants prior to the kick-off meeting.

**Deliverables:**

- Updated Schedule of Deliverables (if applicable)

**Task 1.2 Invoices**

The goal of this task is to itemize the expenses and services provided by the contractor for purposes of payment in line with contract details.

**The Contractor shall:**

- Prepare invoices for all reimbursable expenses incurred performing work under this Agreement in compliance with the Exhibit B2 of this Appendix A. Invoices shall be submitted with the same frequency as progress memos (task 1.4). Invoices must be submitted to the Energy Commission's Accounting Office.

**Deliverables:**

- Invoices

**Task 1.3 Manage Subcontractors**

The goal of this task is to ensure quality products, to enforce subcontractor Agreement provisions, and in the event of failure of the subcontractor to satisfactorily perform services, recommend a solution to resolve the problem.

**The Contractor shall:**

- Manage and coordinate subcontractor activities. The Contractor is responsible for the quality of all subcontractor work, and the Energy Commission will assign all work to the Contractor. If the Contractor decides to add new subcontractors, they shall 1) comply with the Terms and Conditions of the Agreement, and 2) notify the CAM who will follow the Energy Commission's process for adding or replacing subcontractors.

**Task 1.4 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.

**The Contractor shall:**

- Prepare progress reports which summarize all Agreement activities conducted by the Contractor 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 within 15 calendar days after the end of the reporting period. The CAM will provide the format for the progress reports.

**Deliverables:**

- Monthly Progress Reports

### **Task 1.5 Final Report**

The goal of this task is to prepare a comprehensive written Final Report that describes the original purpose, approach, results, and conclusions of the work completed under this Agreement. The Final Report will be written in plain language that is easily understood by the general public or individuals with limited technical knowledge and will be published by the CEC. Additionally, the contractor will present their work at two public meetings.

#### **The Contractor shall:**

- Create a final report which includes:
  - A timeline of tasks and when they were completed
  - Model performance metrics for each task and the updates associated with said task
  - All information sources and methodologies used in completing tasks and updating the model
  - The directional change in forecast results with the completion of each successive task
  - Recommendations for future model improvements
- Create a presentation showcasing the updates to the dGen model
  - Present at public meetings

#### **Deliverables:**

- Draft final report
- Final report
- Updated dGen source code with all updates from completed tasks
- Presentation slide decks

### **TASK 2 – dGEN AGENT REFINEMENT**

The objective of this task is to enhance the dGen model's representation of California electricity customers by creating new agent files—which distinguish the consumer population by characteristics such as energy usage, income, and rate schedule, and updating all associated reference data tables. These updates will integrate population, energy, and load profile data to more robustly reflect potential adopters of behind-the-meter (BTM) PV and storage.

#### **The Contractor Shall:**

- Develop new dGen agent files using:
  - Interval Meter Data (IMD) to characterize inputs, including but not limited to:
    - Customer populations
    - Rate schedules
    - Annual energy usage
    - Hourly load profiles
  - Interconnection data to:
    - Update observed deployment that is complimentary to agent file

- More accurately reflect installed PV and storage system sizes
  - Supplemental demographic data not available in IMD or interconnection data to incorporate:
    - Income level
    - Owner-occupancy status
- Devise a method to represent customers in utility service areas where CEC does not collect IMD. This method should approximate key customer characteristics required by the dGen agent file.
- Develop modular, well-documented code to automate the agent file update process. The code should include:
  - Queries and data processing routines for IMD, including quality control and cleaning of the data
  - Methods to represent customers in service areas lacking IMD
  - Strategic joining of datasets to ensure consistent alignment of data across sources
- Produce An Agent Assessment Memo. The memo shall include:
  - Analysis of results compared to the CEC's current agent file
  - Summarized metrics, including but not limited to:
    - PV and storage capacity added by year
    - Average and median PV and storage system sizes
    - Payback period
    - Net Present Value (NPV) grouped by key agent characteristics for each CEC planning area

**Deliverables:**

- Updated dGen agent files
- Agent file update code
- Agent Assessment Memo

**TASK 3 dGEN MARKET DYNAMICS ASSESSMENT AND ADJUSTMENT**

The goal of this task is to investigate the dGen adoption framework and potentially replace the current bass diffusion parameters and the maximum market share parameter. The assessment will require looking at market data, interconnection records, and census data to determine market penetration and adoption behavior for BTM solar and storage. Key outputs of the assessment will include either a) updated region-specific and sector-specific p and q parameters<sup>1</sup> and an updated maximum market share lookup table or b) updated source code with a new adoption framework.

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<sup>1</sup> dGen's bass diffusion model is governed by p and q parameters, the coefficient of innovation and the coefficient of imitation respectively, as well as time and max market share.

### **The Contractor Shall:**

- Working jointly with CEC staff, determine data requirements to complete an assessment of the bass diffusion and max market share parameters including market reports and interconnection data.
- Prepare part one of the Parameter Assessment and Adjustment Memo with a recommendation to update or not update the bass diffusion and max market share parameters. The memo should include:
  - Information on all data sources used
  - The methodology for completing the assessment
- Meet with CEC staff to discuss recommendations before moving forward
- Submit part two of the Parameter Assessment and Adjustment Memo with:
  - Analysis comparing the new adoption framework with the prior adoption framework. The analysis should be carried out with the new agent files and include:
    - Summarized dGen output, including, but not limited to:
      - Capacity added by year
      - Mean and median system size
      - Payback period
      - NPV grouped by key agent characteristics for each CEC planning area
    - dGen runtime statistics
  - All inputs, assumptions, and methodology used in developing the following:
    - If it's determined that the parameters need to be updated:
      - Updated p and q parameters
      - Updated max market shares
    - If it is recommended that an alternative method for simulating distributed generation adoption be implemented:
      - Assessment of alternative approaches to modeling distributed generation resources that do not rely on max market share and/or payback period, e.g. electric bill reduction, including explanation for ultimate method selection
      - dGen module(s) for the new adoption modeling framework

### **Deliverables:**

- Parameter Assessment and Adjustment Memo
- If it's determined that the parameters need to be updated:
  - Updated max market share and payback period data files
- If it is recommended that an alternative method for simulating distributed generation adoption be implemented
  - Updated dGen source code (see Task: Final Report)

## **TASK 4 ENABLE CHOICE MODELING FOR LEASED vs. CUSTOMER-OWNED SYSTEMS**

The goal of this task is to enable choice modeling in dGen to forecast adoption of third-party owned (TPO) solar and storage systems. The current dGen model does not consider TPO adoption, and only considers customer-owned systems. Key outputs are updated source code and a Choice Modeling Assessment Memo.

### **The Contractor Shall:**

- Develop a Python module with choice modeling to forecast TPO adoption.
- Prepare a Choice Modeling Memo. The memo should include:
  - An assessment of model performance highlighting historical and forecast adoption trends across ownership types. The memo should be based on the new agent file and updated adoption modeling framework and summarize dGen output by:
    - Capacity added by year
    - Mean and median system size
    - Payback period
    - NPV grouped by key agent characteristics for each CEC planning area
  - dGen runtime statistics

### **Deliverables:**

- Choice Modeling Memo
- Updated dGen source code (see Task: Final Report)

## **TASK 5 TECHNOLOGY COST REFINEMENTS**

The goal of this task is to evaluate the most applicable way to stratify cost inputs for the dGen model and make the inputs compatible with the model. Technology costs consist of the PV system with and without energy storage and are currently statewide.

### **The Contractor Shall:**

- Working jointly with CEC Staff, evaluate the most applicable way to stratify cost inputs for the dGen model
- Revise dGen modules for compatibility with new cost inputs
- Create an assessment memo of technology cost input revision(s)

### **Deliverables:**

- Revised dGen modules
- Updated technology costs
- Technology Costs Assessment Memo

## **TASK 6 PREDICTING STORAGE ATTACHMENT RATES**

The goal of this task is to improve the dGen model's ability to predict storage attachment rates (i.e. share of PV adopters that also install storage) based on observations from recent interconnection data. The model currently predicts attachment

rates based on cost-effectiveness but has been found to predict lower attachment rates when compared with real-world values.

**The Contractor Shall:**

- Meet with CEC staff to discuss a target range for storage attachment rates
- If necessary, adjust dGen model code to align predicted attachment rates with historical interconnection data
  - Prepare a Storage Attachment Memo. The memo should summarize dGen output, including, but not limited to:
    - Storage pairing rates by sector, utility planning area and income type
    - Capacity added by year
    - Mean and median size of stand-alone PV and PV paired with storage
    - Payback period by sector, planning area, and income type
    - NPV grouped by key agent characteristics for each CEC planning area
  - dGen runtime statistics

**Deliverables:**

- Updated Storage Attachment Code
- Storage Attachment Memo