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Load Management Standards 2024 Compliance Plan

Valley Clean Energy Alliance

APPROVED 5.9.24

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1. Introduction

This plan is intended to address the requirements of the California Energy Commission's (CEC) Load Management Standard (LMS) by evaluating the cost effectiveness, equity, technological feasibility, benefits to the grid, and benefits to customers of marginal cost-based rates for Valley Clean Energy Alliance's (VCE) residential, commercial, and agricultural customer classes.[1] VCE will review this plan every three years after its adoption and submit a plan update to the Board if there is a material change to its evaluation of the factors noted above pursuant to 20 CCR § 1623.1(a)(1)(C).

Based on the evaluation of the factors discussed in the sections below, VCE has determined that it does not have sufficient information at this time to conclude that proposing and implementing marginal rates following the adopted LMS amendments' schedule would be cost effective or provide incremental benefits to VCE customers or the grid. Though results for VCE's AgFIT dynamic rates pilot have been encouraging, as noted in its July 2022 comments to the CEC during its consideration of the LMS, significant uncertainties exist related to a gap in dynamic rate pilot evaluation results and data in VCE's and Pacific Gas & Electric's (PG&E) service area, the level of incremental load shift potential, customer response to market price risks, and customer acceptance of a complex new rate design.

1.1 About VCE

VCE was formed as a Joint Powers Authority (JPA) of the City of Davis and County of Yolo in 2016. The City of Woodland joined the JPA in June 2017, and the City of Winters joined in 2021. The members formed VCE for the purpose of implementing a community choice aggregation (CCA) program to allow VCE to provide electric generation service within their respective jurisdictions. VCE initiated customer service on June 1, 2018. VCE currently serves nearly 61,000 customers or about 90% of the customers within its territory. VCE provided just under 700,000 MWh of power to its customers in 2023. VCE promotes long-term electric rate stability and energy security while reducing reliance on fossil fuels and stimulating our local economies.

VCE is a public agency that sources competitively priced electricity from clean and renewable energy resources. Through its dedicated Board and staff, VCE is steadfast in reducing greenhouse gas emissions by accelerating the transition to 100% renewable energy, while maintaining competitive rates. Committed to addressing the effects of climate change, VCE is investing in the development of a renewable and reliable grid that supports the electrification of sectors such as transportation, agriculture, and buildings, as well as incentivizing change through innovative customer benefiting programs.

1.2 VCE's Board of Directors

VCE's Board of Directors is comprised of eight seats, two each from its four member agencies across Yolo County. The Board directs the strategic vision, budget, rates, power procurement and major non-power-procurement capital expenses, as well as oversees contracts and policies to ensure effective administration.

[1] California Code of Regulations, Title 20, § 1623.1(a)(1)(A).

In fulfilling the state's climate policies, the Board has directed VCE to pursue the following:

1. **Procurement Strategy:** Commitment to serving 100% of retail sales with renewable energy by 2030.[2]
2. **Resource Adequacy Hedging**: Support for a structured approach ensuring system reliability through various measures, including investment in energy storage, baseload renewable energy technologies, and demand response.
3. **Ratemaking Discretion:** Aligning competitive and stable generation rates with state climate policies.

2. Load Management Standards

The Warren-Alquist Act of 1974 established the CEC and granted it with specific authority, including the ability to review and approve the siting of power plants, set efficiency standards for buildings and appliances, and establish load management standards.

In October 2022, the CEC adopted amendments to its LMS (California Code of Regulations, Title 20, §§ 1621-1625), effective April 1, 2023.[3] The amendments are designed to help integrate renewables on the grid by aligning electricity use with generation and capacity using energy storage, with the goals of improving air quality, helping to mitigate future climate change, and creating downward pressure on electric rates. LMS strives to achieve these goals by encouraging the use of energy at off-peak hours, encouraging the control of daily and seasonal peak loads to improve electricity system efficiency and reliability, reducing or delaying the need for new electrical capacity, and reducing fossil fuel consumption and greenhouse gas emissions.[4]

LMS does not set rates, but instead require that load-serving entities subject to 20 CCR § 1623.1 offer rates or programs structured according to the LMS requirements. The standards apply to major entities such as large investor-owned utilities (IOUs), large publicly owned utilities (POUs), and large CCAs, who provide over 700 GWh of electricity annually. To meet the LMS, CCAs are allowed to either create their own rates or programs or participate in already existing IOU programs and rate offerings.

The CEC's primary objectives of the LMS encompass:

1. Ensuring the accuracy of existing and future time-varying rates in the Market Informed Demand Automation Server (MIDAS) rate database, which is publicly accessible and machine-readable.
2. Developing a standard rate information access tool to support third-party demand response and load management services.

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[2] Valley Clean Energy 2021-2025 Strategic Plan at 3 (September 14, 2023). Available at: https://valleycleanenergy.org/wp-content/uploads/2021-2025-Strategic-Plan-Minor-Update-9-14-2023.pdf.
[3] California Energy Commission (CEC) Resolution No. 22-1012-2, October 12, 2022. Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=246501&DocumentContentId=80688. See also, October 12, 2022 CEC Meeting Transcript at 65-66. Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=247487&DocumentContentId=81884.
[4] California Code of Regulations, Title 20, § 1623.1(a)(1).

3. Creating and submitting location marginal price-based rates that change at least hourly to reflect marginal wholesale costs.
4. Integrating information about new time-varying rates and automation technologies into existing customer education and outreach programs.[5]

Objective 3 is an important feature in the CEC's LMS. To support demand flexibility, the LMS directs load-serving entities to adopt marginal-cost based rates, if such rates are determined to be cost-effective, equitable, technologically feasible, and beneficial to the grid and customers. Marginal-cost based rates, commonly linked to the wholesale price of electricity, are determined by factors like fuel costs, weather, renewable generation output, and the total demand for electricity at a specific time. These rates fluctuate during the day, reflecting real-time grid conditions.

Table 1: LMS Standards and Associated Deadlines

Due Date	Regulatory Requirement	LMS Reference
April 1, 2023	LMS Effective Date	
July 1, 2023 (Completed)	Within 3 months of the effective date, upload existing time-dependent rates to the MIDAS database.	§ 1623.1(c)
April 1, 2024 (Completed)	Within 1 year of the effective date, develop and submit to the Board a plan addressing how VCE will meet the requirements of the LMS, including an evaluation of marginal cost-based rates and programs. The Board must consider adoption of the plan within 60 days of submittal.	§ 1623.1(a)(1)
30 days after Board adoption (In Progress)	Submit approved plan to Executive Director of the CEC and respond to requests for additional information and/or recommendations within 90 days of receipt.	§ 1623.1(a)(3)(A)
April 1, 2024	Within 1 year of the effective date, provide customers with access to their Rate Identification Number (RIN) on billing statements and online accounts using both text and QR code.	§ 1623.1(c)(4)
October 1, 2024	Within 18 months of the effective date, develop and submit to the CEC, in conjunction with other obligated utilities, a single statewide standard tool for authorized rate data access by third-party providers, and the terms and conditions for using the tool. Upon CEC approval, maintain and implement the tool.	§ 1623.1(c)(2)
October 1, 2024	Within 18 months of the effective date, submit a list of load flexibility programs deemed cost effective by VCE to the Executive Director of the CEC. The program portfolio	§ 1623.1(b)(3)

[5] California Energy Commission. "Load Management Standards." Accessed February 2024. https://www.energy.ca.gov/programs-and-topics/topics/load-flexibility/load-management-standards

	must provide at least one option to automate response to MIDAS signals for each customer class where VCE's Board has determined such a program would materially reduce peak demand.	
April 1, 2025 and annually thereafter	Submit annual reports to the Executive Director of the CEC demonstrating implementation of VCE's plan, as approved by the Board.	§ 1623.1(a)(3)(C)
July 1, 2025	Within 27 months of the effective date, submit at least one marginal cost-based rate to VCE's Board for any customer class(es) where such rate will materially reduce peak load.	§ 1623.1(b)(2)
July 1, 2027	Within 51 months of the effective date, offer customers voluntary participation in either a marginal cost-based rate, if approved by VCE's Board, or a cost-effective load flexibility program.	§ 1623.1(b)(4)
Ongoing	Conduct a public information program to inform and educate affected customers on why marginal cost-based rates or load flexibility programs and automation are needed, how they will be used, and how these rates and programs can save customers money.	§ 1623.1(b)(5)
Triennially	Review the plan at least once every 3 years after the date of adoption and submit a plan update to the Board if there are any material changes.	§ 1623.1(a)(1)(C)

2.1 VCE's Compliance Plan Administration

Section 1623.1(a) requires each Large CCA to submit to its rate-approving body a compliance plan that is consistent with the applicable requirements of the LMS regulation. The plan must be submitted within one year of the regulation effective date, which is April 1, 2024, and must be considered for adoption by the rate-approving body in a duly noticed public meeting within 60 days of submission.

This Plan meets the requirements of the CEC regulation, Section 1623.1(a). The description of how VCE complies with each of the elements is provided in the subsequent sections. The draft Plan was submitted to the Board on April 1, 20244, and will be presented to the VCE Board for consideration at duly noticed meeting on May 9, 2024.

2.2 CEC Review Process

Section 1623.1(3)(A) specifies that, upon adoption by the CCA rate approving-body, the plan must be submitted to the CEC Executive Director within 30 days for review. Note that the VCE Board is the sole authority to approve rates; the CEC's role is limited to determining whether the plan that the VCE Board has adopted complies with the regulation. Following the Plan presentation and adoption by the VCE's Board on May 9, 2024, the Plan will be submitted to the CEC by June 9, 2024, for review. Any requests for additional information or recommended changes will be addressed and a written response submitted to the CEC within 90 days as required in the regulation.

2.3 Triennial Plan Review

Section 1623.1(a)(1)(C) requires each Large CCA to review its compliance plan at least once every three years. Where there is a material change to the factors considered in evaluating marginal cost-based rates and programs, the Large CCA must submit a plan update to its rate-approving body. Material revisions to the plan shall follow the same process as the initial plan approval.

This Plan will be reviewed every three years following the date of adoption and material Plan updates will be submitted to the VCE Board for consideration. This Plan and any approved material updates will be duly submitted to the CEC.

2.4 Annual Reporting

Section 1623.1(a)(3)(C) requires each Large CCA to submit annual reports to the CEC Executive Director demonstrating implementation of its Load Management Standards compliance plan. Each CCA must submit the initial report one year after adoption of the plan by the CCA's rate-approving body, and annually thereafter. Annual reports will be submitted to the CEC Executive Director describing the implementation of this Plan.

3. Rate Design & Deployment

CCA governing boards have jurisdictional control over rate-setting on behalf of their customers. Public Utilities Code Section 366.2(c)(3) provides that CCAs retain jurisdiction for setting rates for the electricity they purchase on behalf of their communities. This local control empowers CCAs to tailor energy programs, determine pricing structures, and prioritize renewable energy sources according to the preferences and goals of the communities they serve. VCE strives to stay competitive with Pacific Gas and Electric's (PG&E) rates. To this end, in January 2024 the VCE Board approved a 1% rate reduction on generation rates, in comparison to PG&E's generation rates, for all customers. VCE's most vulnerable community members which include customers enrolled in California Alternate Rates for Energy (CARE), Family Electric Rate Assistance (FERA), and Medical Baseline currently see an even greater generation rate reduction of 3.5%.

In consideration of any rate modifications or additions, VCE will work to ensure that charges to the customer stay competitive with PG&E's generation rates.

3.1 Marginal Rate Requirements

Section 1623.1(b)(2) of the LMS directs each Large CCA, by July 1, 2025, to seek approval from its Board for at least one marginal cost-based rate or cost-effective program for which its rate-approving body determines will materially reduce peak load. The rate(s) proposed for approval, if desired, can mirror the marginal cost-based rate(s) offered by the IOU in whose service area the Large CCA exists. Rates and/or programs approved by the CCA's board must be offered on a voluntary basis to the CCA's customers by July 1, 2027, in accordance with section 1623.1(b)(4).

Section 1623.1(a)(1) of the LMS requires each Large CCA to evaluate the cost effectiveness, equity, technological feasibility, and benefits to the grid and customers, of marginal cost-based rates for each customer class in its compliance plan. After evaluating each of these components, the Large CCA may

instead propose programs to enable automated response to marginal cost signals for each customer class and evaluate the programs and/or delay or modify compliance with the LMS requirements.[6]

VCE's customers are currently split into four customer classes, residential, commercial/industrial, agriculture, and state government. In this plan, VCE includes state government customers in its commercial/industrial customer class. Consistent with the adopted LMS amendments, the following section of the Plan evaluates the cost effectiveness, equity, technological feasibility, and benefits of dynamic rates to customers and the grid for each customer class.

4. Evaluation of Marginal Rates

The LMS regulation identifies dynamic hourly or marginal rates as a central tool for achieving the goals of encouraging off-peak energy usage, encouraging control of daily and seasonal peak loads, reducing, or delaying the need for new electrical capacity, and reducing fossil fuel consumption and associated GHGs. VCE has demonstrated support for this approach through implementation of its innovative Agricultural Flexible Irrigation Technology (AgFIT) dynamic pricing pilot.

In explaining marginal rate design, the LMS states that the "total marginal cost shall be calculated as the sum of the marginal energy cost, the marginal capacity cost (generation, transmission, and distribution), and any other appropriate time- and location-dependent marginal costs, including the locational marginal cost of associated greenhouse gas emissions, on a time interval of no more than one hour. Energy cost computations shall reflect locational marginal cost pricing as determined by the associated balancing authority."[7]

Being a CCA, VCE is authorized and responsible for setting and recovering only the generation cost components for each applicable electric rate, including marginal rates and programs. PG&E is responsible for setting distribution, transmission, and any other non-generation cost components for each rate.

4.1 Cost Effectiveness of Marginal Rates

LMS section 1623.1(a)(1)(A) specifies cost effectiveness as the first evaluation factor. VCE aims to estimate the costs and benefits associated with new dynamic rates for each rate class. This approach is necessary because, as of the time of the preparation of this Plan, VCE does not have sufficient data to support a full quantitative analysis.

4.1.1 Estimated Costs

To assess cost effectiveness, it is necessary to consider the costs associated with designing, implementing, and maintaining new rates for each customer class, as well as the ongoing benefits associated with that implementation. To demonstrate cost effectiveness, the expected benefits for each rate must exceed the costs of implementation.

As a best practice for assessing the cost effectiveness of a new rate, VCE would need to conduct a comprehensive pilot study to test and gather data on different rate options, which would likely require several years and a multi-million-dollar investment with a third-party contractor specializing in rate

[6] Id., § 1623.1(a)(1).
[7] California Code of Regulations, Title 20, § 1623.1(b)(1).

design and pilot program evaluation. Beginning customer service in mid-2018, VCE is a relatively young organization and has been limited in terms of developing rate options, in order to prioritize building a strong, cost effective RPS-compliant portfolio backed by energy storage. VCE is engaged in an active dynamic rate pilot (AgFIT); however, this pilot is focused solely on agricultural customers with irrigation equipment, and it is inferred that customers would respond differently given differences in rate class, electricity usage, weather conditions, and other factors.

VCE has initial results published in the AgFIT Pilot's midterm evaluation report on which to draw limited conclusions on cost effectiveness, but the data is based only on a subset of agricultural customers, and VCE is hesitant to apply those initial results to other rate classes or pilots. As a result, VCE's evaluation of cost effectiveness is based on this limited assessment. VCE anticipates being able to refine estimates to inform future updates of our Plan as more results become available in pilots being conducted around the state of California by other load-serving entities (LSEs).

Implementing pilot rates for all customer classes, particularly rates that are far more complex than other currently available rates would require significant investment in planning, outreach, education, marketing, and technology development. VCE has identified several cost categories associated with implementing dynamic pilot rates, including but not limited to:

- Pilot rate design costs include market research, testing rate options, and analyzing the results of those pilots to refine the final design. In the event of a new rate recommendation, a rate action would be needed for it to be approved, adding to the costs.
- Setup costs including one-time costs like Information Technology (IT) system updates to enable data integration, and developing new or updating existing customer tools.
- Recruitment and retention costs include marketing, outreach, and enrollment costs. For example, with VCE's AgFIT pilot, staff drew upon existing relationships in the agricultural community with which to keep recruiting costs down, but there were still costs associated with the staff time necessary to recruit and retain customers. Additionally, because dynamic rates are new and novel, educating the customer on how to interact with the pilot rate and customer-facing scheduling application took significant staff investment.

To minimize cost to the LSE, the AgFIT pilot rate design was calibrated to recover annual LSE generation costs. However, the pilot included customer incentives for automation as well as incentives based on the difference between the pilot tariff and the customers' otherwise applicable tariff, with the goal of incentivizing the customer to shift peak load. While the pilot has seen initial success in customer response, it is unknown to what extent customers would respond to price signals without both sets of incentives, if it were not economically feasible to offer the same or similar incentives.

4.1.2 Estimated Cost Benefits

This section of the Plan describes the potential cost benefits associated with implementing new dynamic rates and the estimated realization of incremental benefits based on design effectiveness, customer adoption levels, and available load shift capacity.

VCE has identified the primary avoided cost benefits of new dynamic rates as the following:

- Avoided capacity costs resulting from a reduction for new capacity additions or resource adequacy procurement.

- Avoided energy costs resulting from shifting demand from higher-cost periods to lower-cost periods.

Secondary benefits could also flow from the realization of avoided capacity and energy procurement needs. For example, to the extent that load shifting could potentially reduce the need for new capacity and wholesale energy purchases during peak periods, reductions could also contribute to the following:

- Avoided GHG compliance costs associated with a reduction in generating or purchasing energy from fossil-fueled resources that may otherwise be needed to serve load during peak periods.
- Improved air quality, public health, and environmental outcomes associated with a reduction in operations of fossil-fueled resources. While these benefits do not accrue directly to VCE, they provide value to the communities that we serve.

As a retail electric service provider and a CCA, VCE anticipates that the greatest potential direct benefits would be derived from avoided capacity and energy procurement costs. However, the realization of any of the above-identified benefits from new dynamic rates is highly dependent on the following factors:

- Effectiveness of the rate design in shifting customer usage patterns.
- Operational value of the load shift.
- Adoption levels of the new rates.
- The customer experience on the new rate.

In addition, with respect to avoided GHG compliance costs and improved air quality, public health, and environmental outcomes, the realization of benefits also depends on the relative utilization of fossil-fueled resources to serve peak load.

4.1.3 Estimated Design Effectiveness Factors

Effective rate design is necessary to achieve predictable load shift during the most valuable peak hours. The risk of not having sufficient generation, which results in the need for new capacity additions or resource adequacy procurement, is typically concentrated in a small number of peak hours each year when serving that load is most challenging. Accordingly, to realize any avoided capacity benefits, it is important that a new rate design can achieve consistent and meaningful load reductions during peak hours. Reducing capacity and energy procurement during peak periods relies on consistent shift in demand.

Time to develop and test the effectiveness of rate design options will be especially important when proposing a complex new rate structure. If customers do not adequately understand price signals, their response may be unpredictable, leading to reduced load shift and potentially adverse bill impacts. VCE's ideal rate development process would include market research, testing the effectiveness of different rate options through pilots, analyzing the results, and considering and implementing refinements. This will help to ensure that the rate sends the right signals and takes into consideration customers' willingness and ability to respond directly or via automated technologies/devices while fully recognizing that the process can take significant time and resources.

The LMS requirements direct Large CCAs to propose new dynamic rates for every customer class to their Boards of Directors by July 1, 2025. That timeline does not provide sufficient time for VCE to design a pilot (outside of the limited scope of the AgFIT Pilot), test responses to different rate options, and

analyze the results for even one rate class. In addition, PG&E's dynamic rate pilots have been delayed and results of those studies may not be available before July 1, 2025. Without the results from pilots, it is unclear that a complex new dynamic rate design would result in any incremental, dependable load shift, or ensure a positive customer experience for our customers.

The estimated adoption level of new hourly dynamic rates directly impacts the value of load shift benefits. Based on available information, VCE anticipates that dynamic rates rolled out to non-agricultural customers by July 1, 2027, may have low adoption and retention levels. VCE's assumption is based on several key factors, including the uncertainty in bill impacts from complex new rate structures, the time needed to educate customers to promote a positive experience, and the cost and limited accessibility of enabling behind-the-meter automation technology.

4.2 Equity of Marginal Rates

The second criterion by which to evaluate dynamic rates is equity. Since VCE does not currently have pilot study data to support quantifying load shift and bill impacts for different customer groups, VCE qualitatively evaluated the equity impacts of these rates by considering customers' ability to benefit directly and indirectly from the rates.

A key requirement of successful implementation of a dynamic or marginal cost-based rate is the ability of a customer to respond to the price signal of the rate. Customers, including residential, non-residential, and agricultural customers, that are capable of responding to a dynamic rate by shifting load are more likely to realize bill savings and provide benefits to the grid. Customers that lack an understanding of dynamic pricing, or the technology that easily enables load shifting (e.g. battery storage, smart appliances), are at a disadvantage to those with such resources when taking service under a dynamic pricing scheme. The inherent inequity of marginal rates providing savings benefits to affluent or tech-savvy businesses and residential customers that have the time and capability to closely manage their devices or energy usage has the potential to leave small business, low-income, and hard-to-reach communities behind. Without specific pricing or rate design information available, VCE is unable to determine the potential equity impact of any particular rate design option and would likely require a bill impact study before implementing a new rate.

The ability to directly benefit from a dynamic rate depends on several factors, such as access to enabling technology, the ability to shift load away from high-cost periods, and the ability to benefit from the rate and absorb potential bill shocks:

- Technology access: the ability to participate in a dynamic rate depends on customers' access to technology with characteristics that enable response to hourly or sub-hourly price signals. Currently, the high up-front cost of this technology may pose a limitation, particularly for lower-income customers. Customers that rent or lease their home or business may face additional constraints with respect to securing permission for technology installations.
- Flexible load shift ability: the ability to quickly shift load away from high price periods will affect whether participating customers can directly benefit from a dynamic rate. As market signals would be dynamic with potentially large changes in prices between hours, customers that cannot or do not adopt and/or utilize enabling technology could see large bill impacts.
- Ability to absorb potential bill shocks: participating customers on a dynamic rate run the risk of bill shocks if they are unable to shift load away from high price hours. VCE anticipates that lower-income customers and small businesses that face greater barriers in implementing

enabling technology would be least able to absorb potential bill shocks. By contrast, VCE's Time-of-Use rates provide customers the opportunity to save money without requiring specific technology or exposure to market risks and bill shocks if load is not sufficiently flexible.

Based on the information currently available, VCE cannot conclude that implementing dynamic rates would result in substantial equity benefits. At this time, the availability of such rates is likely to disproportionately benefit higher-income customers, early adopters of technology and businesses that own their property, have up-front capital to purchase enabling technology, and can absorb the risk of bill shocks. In addition, while VCE's entire customer base could potentially benefit from the incremental avoided system costs and improved air quality, public health, and environmental outcomes, the magnitude and uncertainty of these benefits are uncertain. VCE would not anticipate a high level of adoption of dynamic, hourly, or sub-hourly rates from low-income customers.

4.3 Technological Feasibility of Marginal Rates

The third evaluation factor for dynamic rates is technological feasibility. VCE's evaluation assesses the technological feasibility of implementing dynamic rates for all customers on the schedule specified in the LMS regulations. VCE's evaluation considers the feasibility of both the internal technology systems needed to support implementation of dynamic rates and the external customer technology that is needed to enable response to hourly or sub-hourly signals.

4.3.1 VCE's Billing System

As part of PG&E's 2020 General Rate Case (GRC), the IOU planned on implementing a Day-Ahead Hourly Real Time Price (DAHRTP) rate that would launch in the first quarter of 2024. DAHRTP would have required PG&E to make enhancements to its billing system, allowing for PG&E and CCAs to bill customers on dynamic rates. Since PG&E's submittal of their Load Management Compliance Plan in October 2023, DAHRTP has been postponed till 2025 and changes to the billing system have been halted.

The postponement of DAHRTP followed the California Public Utilities' approval of the Demand Flexibility Pilot Expansion in Decision 21-12-015. The expansion addressed PG&E's concerns over billing system upgrades and the cost associated by adopting the Joint DR parties' proposal of "shadow" billing. The programs under the expansion require no changes to the IOU or CCA billing systems. Program participants will instead receive an additional monthly bill that details their performance in the dynamic rate pilot.

The implementation of a "shadow" bill, while effective for the pilot programs under the expansion, does continue to postpone the billing enhancements needed for widespread adoption dynamic rates. VCE does not have adequate information on the cost, timing, and scope of the changes needed to bill on hourly dynamic prices. VCE is exploring this subject with our billing agent, the Sacramento Municipal Utility District (SMUD), and will consider any findings derived from the investigation in future rate option decisions.

4.3.2 VCE's Price Generation

PG&E was developing a pricing methodology as part of its DAHRTP rate implementation that was to be implemented in quarter one of 2024. Following the postponement of DAHRTP, PG&E is now developing a pricing methodology as part of the Demand Flexibility Pilot Expansion to be launched in June 2024. With the enrollment of customers in the expansion, CCAs will be able to utilize PG&E's pricing methodology. Working within the parameters of the methodology's formula, CCAs can modify or adjust the real time prices by changing the coefficients. The capacity to modify the coefficients provides the necessary tools to VCE to remain cost competitive with PG&E. The advantages and cost of VCE developing its own pricing methodology is under evaluation. The option of partnering with another CCA(s) is an avenue that will be considered.

4.3.3 Customer Technology

Smart devices or load automation technology make it easier for customers to respond to price signals and have been shown to drive performance on dynamic rates. This is consistent with VCE's observations related to its AgFIT pilot. Following is a list of common load flexibility technologies in VCE's service area, along with their capabilities and constraints. VCE anticipates these same technologies will be necessary to respond to new dynamic rates.

- **Smart thermostats:** Wi-fi enabled smart thermostats are currently by far the most widely adopted load flexibility technology. These devices can receive and respond to dispatch signals within 15-30 minutes; however, doing so could end up sacrificing customer comfort, as market price signals may not allow time for the home to pre-cool.
- **Battery energy storage systems:** Battery energy storage systems are being adopted with increasing frequency by both residential and non-residential customers, particularly as an add-on to solar PV installations. However, the current adoption rates are relatively low, and it will likely be years before storage is affordable for a majority of VCE's customers.
- **Electric Vehicles (EVs):** EVs are an emerging source of load flexibility across VCE's service territory, and the rate of customer adoption appears to be increasing. There is significant potential for further growth given statewide goals for zero-emissions vehicles by 2030.
- **Electric Tractors:** The adoption of bi-directional and unidirectional charging equipment and electric tractors are likely to be supported throughout VCE's territory in the near term. VCE may be exploring the shift and shape potential of electric tractors in its Rural Electrification and Charging Technology (REACT) Pilot Program.

4.4 Benefits of Marginal Rates

The final two criteria for evaluating dynamic rates are benefits to the grid and benefits to customers. VCE is evaluating these factors together because many grid benefits also have pass-through benefits to customers.

Following is a summary of anticipated grid and customer benefits associated with implementation of new dynamic rates on the timeframe specified in the LMS regulation. VCE's evaluation of the benefits considers the expected effectiveness of the rate design, the expected adoption rate, and the incremental benefits relative to VCE's existing time-dependent rates and load flexibility programs. The realization of each benefit depends on whether dynamic rates would result in material load shift relative

to VCE's existing time-dependent rates and programs.

- Avoided capacity needs: realizing the incremental benefits of avoided capacity costs in the form of reduced need to contract for new generation capacity or procure resource adequacy (RA), depends significantly on an effective rate design that delivers meaningful, dependable load shift in response to hourly or sub-hourly price signals. Shifting demand away from peak periods also has the potential to relieve grid strain and contribute to reliability.
- Avoided energy purchase costs: realizing the incremental benefits of avoided energy costs relies on a rate design that effectively encourages customers to shift from high-cost (high GHG) periods to lower cost (low GHG) periods. This allows for more efficient use of cheaper solar energy when it is generated and reduces the higher costs of energy associated with serving peak load.
- Improved air quality, public health, and environmental outcomes: the potential air quality, public health, and environmental benefits associated with dynamic rates depends on such rates reducing the capacity needs or energy purchases during time periods when the grid has a higher carbon intensity.
- Customer bill impacts: with dynamic rates, customers have the potential to save money by shifting their usage out of the most expensive hours. However, there are risks to customers in adopting dynamic rates, even if customers can largely rely on device automation to manage their demand. Depending on the rate design, customers could potentially take on the risk of market price fluctuations, which could have a negative impact on customer bills, especially during times of extreme market volatility.
- Customer experience: while dynamic rates would reflect the cost of energy at the time it is used, they could potentially be very complex and difficult for customers to understand. This could adversely impact adoption and benefits of the rate, as well as potentially hindering future load shift efforts.

Based on the information currently available, VCE's evaluation is unable to conclude that implementing dynamic rates on the timeframe specified in the LMS would yield material incremental benefits to the grid or to VCE's customers. Currently, VCE's load flexibility pilot programs are designed to capture peak load shift benefits. Any incremental benefits associated with dynamic rates being applied to all customer classes that enable response on hourly or sub-hourly signals are uncertain.

4.5 Marginal Rates Proposal

VCE requires additional information with respect to the cost, equity, technical feasibility, and benefits of marginal cost-based rates, including how these factors can be measured and evaluated. At this time, VCE lacks the internal resources necessary to develop this information and would require the use of external experts, likely at significant cost, to present a robust evaluation of dynamic pricing for its customer classes. As described in the sections below, VCE currently offers limited dynamic rate load flexibility programs, as well as time of use-differentiated rates that are intended to achieve the goals of the LMS without having to expend significant financial and staff resources.

VCE plans to defer the proposal and adoption of new marginal rates at this time. VCE will re-evaluate marginal rates with the benefit of additional information from dynamic rate pilots in our own territory, as well as PG&E's service area and other service areas in the next update of this Plan.

The following sections describe VCE's efforts in the development and implementation of dynamic rate programs that will assist in meeting the LMS requirements.

5. AgFIT and Expansion Pilot 1

A marginal signal program that could help VCE meet the LMS requirements is VCE's Agricultural Flexible Irrigation Technology (AgFIT) Pilot Program and its recent expansion, referred to as the AgFIT Expansion or Expansion Pilot 1. AgFIT was originally designed to target the shift potential of agricultural irrigation but was recently expanded to include all agricultural end uses. The sections below describe VCE's dynamic rates pilot program.

5.1 The Agriculture Sector

With the proposal in our Opening Testimony in California Public Utilities Commission docket R.20-11-003,VCE explained that more than 85% of our service territory is designated for agricultural use, and that the agricultural sector represents approximately 18% of VCE's total annual load and 16% of our peak demand.[8] The annual load can be seen to increases significantly during drought years (2020-2022), which is directly related to agricultural pumping in VCE's service territory.

Table 2: Annual Retail and Wholesale Load

Year	Retail Load, MWh	Wholesale Load, MWh
2019	642,656	684,191
2020	706,393	752,764
2021	755,901	806,377
2022	739,932	789,142
2023	654,637	697,056
Average	699,904	745,906

In Polaris's Opening Phase 2 Prepared Testimony in R.20-11-003, it states that "agricultural pumping has more shed and shift potential that can be built more quickly at lower costs than other sectors, especially residential space cooling and electric vehicle (EV) … Agricultural pumping has proven highly reliable in demand response events and is beneficial because of its mostly binary operating profile (pumps are either on or off), large loads controlled by a relatively small number of decision makers and lower weather sensitivity compared to cooling loads."[9]

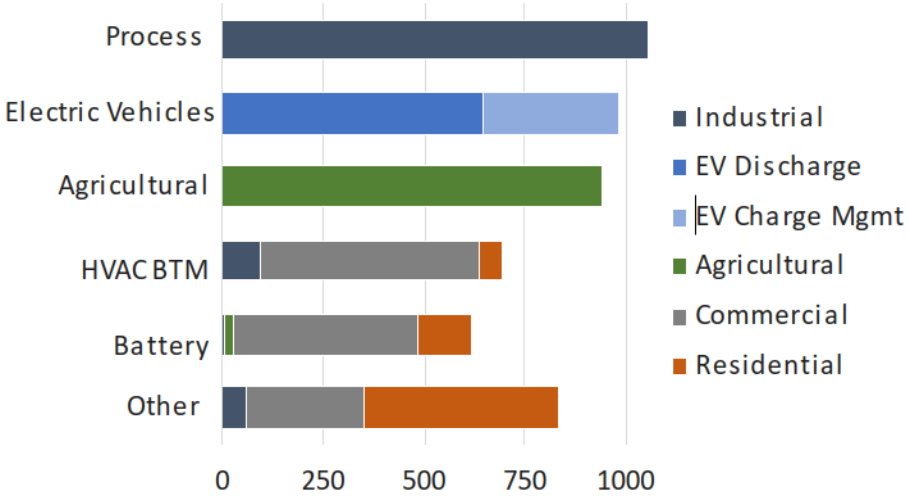
The figure below is from the CEC's Senate Bill 846 Load-Shift Goal Report, depicting the load flexibility potential by end use and sector. Collectively, industrial processes, EV-related interventions (vehicle-to-grid, vehicle-to-building, and managed charging), and agricultural load flexibility (not including batteries) make up 58% of the state's estimated potential. Including process facilities and bi-directional EVs, VCE

[8] Docket No. R.20-11-003, *Opening Prepared Testimony of Gordon Samuel on behalf of Valley Clean Energy* at 1-2 (September 1, 2021). Accessible at: https://eqresearch.sharefile.com/public/share/web-s1c978db45ba94c71bc70d622bf070246.

[9] [9] Docket No. R.20-11-003, *Opening Phase 2 Prepared Testimony of Polaris Energy Services* at 3. Accessible at: https://docs.cpuc.ca.gov/PublishedDocs/SupDoc/R2011003/4050/404292630.pdf.

believes that agriculture is most likely the sector with the greatest load flexibility potential in Yolo County.

Figure 1: Load Flexibility Potential by End Use and Sector



Source: CEC staff

Figure 2 (below) is from Phase 3 of The California Demand Response Potential Study by Lawrence Berkeley National Laboratory published July 2020. The figure shows the disaggregation of the Shift supply in 2030, at the behind-the-meter (BTM) battery price threshold of $150/yr/kWh, broken out by utility service territory. Key conclusions from this figure are that the pumping resource is primarily to be found at agricultural sites and primarily in PG&E's service territory.

Figure 2: Average GWh of Shift Resources

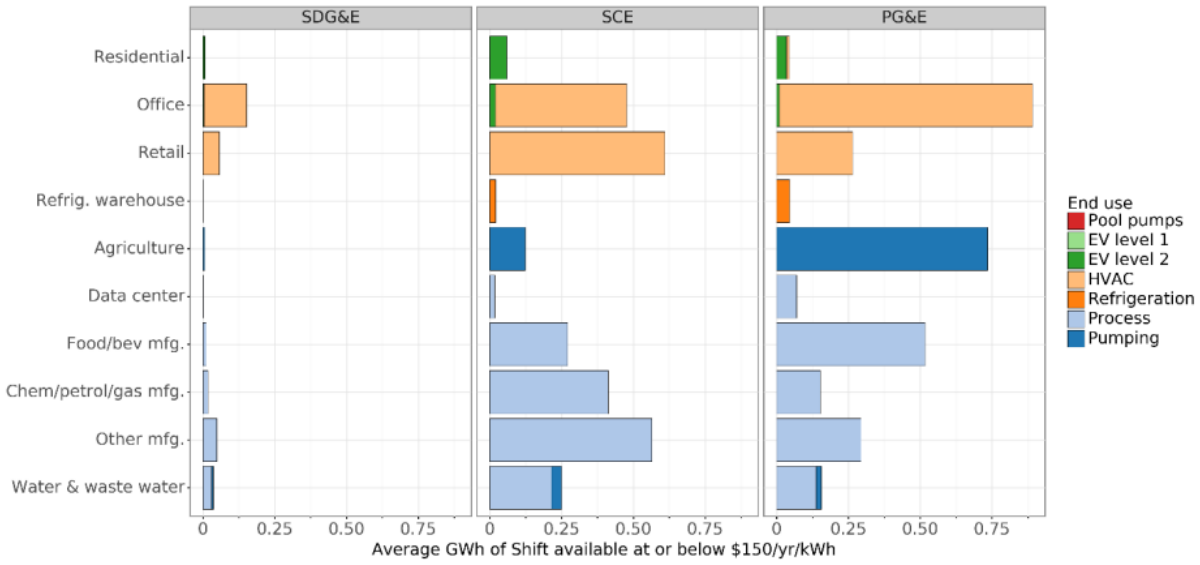


Figure 3-9. The Shift resource available in forecast year 2030 at the BTM battery price referent ($150/yr/kWh), disaggregated by utility service territory, building type, and end use.

5.2 Agricultural Automation

When VCE was evaluating the effectiveness of enrolling agriculture customers in dynamic rates, the cost of installing and operating sector-specific automation technology was a consideration. Figure 3 (below) from Lawrence Berkeley National Laboratory's (LBNL) California Demand Response Potential Study Phase 3 illustrates the impact of equipment cost on the overall cost-competitiveness of enabling load shift at different sites. Figure 3 shows the annualized costs per unit of shiftable energy ($/yr/kWh, circa 2015) to install and operate shift-enabling technology, for each shiftable end use, at a typical site in each one of the customer clusters modeled in LBNL's DR-Path. The variation in cost can be large from site to site for a given end use because each site has a different amount of shiftable load that is available to be captured. The minimum BTM battery cost is shown as a vertical dashed line. Any point in the figure that sits at a higher cost will not be cost-competitive with a battery. The conclusion from figure 3 is that the cost of automating pumping load is cheaper than installing a BTM battery.

Figure 3: Annualized Resource Procurement Cost ($/yr/kWh)

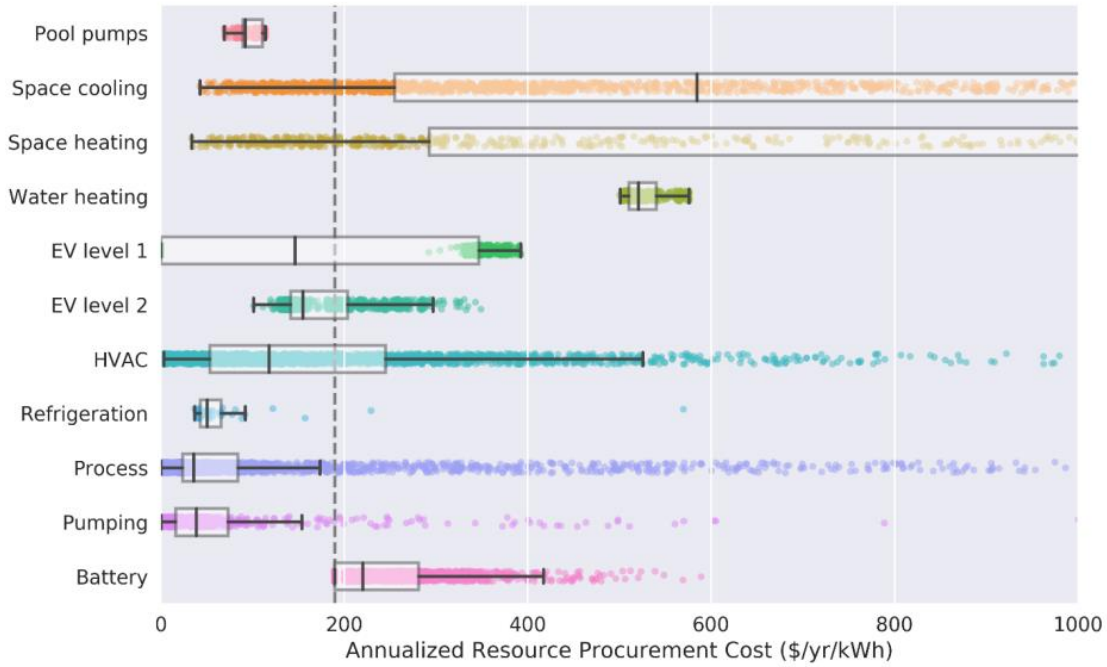


Figure 3-17. Installed costs, circa 2015, for Shift-enabling technologies, by end use, for a typical site in each customer cluster modeled in DR-Path. The minimum battery cost is shown as a vertical dashed line for reference. Box plots show the interquartile range (IQR, middle 50 percent of cluster costs), and whiskers show points beyond the IQR that are within 1.5 times the magnitude of the IQR.

5.3 Program Overview

The original Agricultural Flexible Irrigation Technology (AgFIT) Pilot Program was approved by the California Public Utilities Commission in D.21-12-015 on December 2,2021, as a near-term solution for summer reliability issues. The proposal was for a limited program focused on the agricultural sector and its flexibility in pumping water. The pilot was designed to unlock up to 5 MW of demand shift in the near term, with a simple, low-cost program design with benefits matched to meet customer needs.

The original pilot is expected to provide valuable data about the potential of dynamic rates for load shift. The results, which will be published Q3 of 2025, are expected to be used to help inform further load flexibility pilots and scale dynamic rates to other customers.

Due to the midterm results presented in AgFIT's initial evaluation, the extension and expansion of VCE's AgFIT pilot was instituted in Rulemaking 22-07-005 on August 15, 2023. The expansion of AgFIT, called Pilot 1, was formally approved in D.24-01-032. The expansion allowed for the inclusion of other agriculture sector end uses outside of irrigation, permitted the enrollment of customers throughout PG&E's service territory, as well as the extended the operation of the program until 2027.

5.3.1 Pricing Methodology

As stated in D. 21-12-015, AgFIT is a dynamic hourly tariff, with week-ahead projections that are integrated with pump automation controllers. Non-generation and non-delivery costs are recovered through existing rate structures, but all other costs are collected using a marginal rate design.

The generation prices are calibrated to fully recover VCE's costs. The generation price formula uses Locational Marginal Prices (LMP) provided by the California Independent System Operator (CAISO) and a marginal energy capacity cost from PG&E's latest General Rate Case (GRC).

6. PG&E Administered Programs

VCE is considering participating in PG&E administered marginal rate programs that would employ a diversity of enabling technologies and provide different tiers of engagement. The potential program portfolio includes dynamic rate offerings for both residential and commercial/industrial customer classes.

The following is a list of prospective programs that will be monitored and evaluated for reliability, load reduction and customer adoption. Participation by VCE in the programs below is dependent upon board approval.

6.1 Expansion Pilot 2

Using the same pricing design and program structure as the AgFIT program, D.24-01-032 directed PG&E to offer a secondary pilot that enrolls both residential and commercial/industrial customers. Eligible rate schedules include B-6, B-10, B-19, B-20, E-ELEC, and EV2-A.

Pilot 2 intends to target residential and non-residential customers who already have automation technology in place. Example use cases include smart EV charging, industrial processes, behind the meter batteries, and box stores. PG&E aims to enroll 50 MW of controlled load into the program.

VCE plans to take this program to the board for consideration in quarter 2 of 2024.

6.2 Vehicle-Grid Integration

PG&E's Vehicle-to-Grid Integration (VGI) Program will utilize the same pricing and billing methodology as AgFIT and Expansion Pilot 1. Only bi-directional electric vehicles will be eligible to participate in the program. Definitive details on VGI are pending final resolution from the California Public Utilities Commission.

6.3 Day-Ahead Hourly Real Time Pricing

PG&E's Day-Ahead Hourly Real Time Pricing (DAHRTP) Program was approved in D.21-11-017 on November 18, 2021. Due to the overlap in eligible rate schedules with Pilot 2, DAHRTP was paused after R.22-07-005 instituted the expansion of AgFIT. The program plans to utilize the pricing methodology approved in D.21-11-016 to derive a marginal generation rate, while all other rate components will be billed using existing rate structures.

Table 3: In Progress and Potential Programs

Program Name	Start Date	End Date	Status	Marginal Signal (Y/N)
AgFIT	Mar-22	Dec-24	In Progress	Y
Expansion Pilot 1	May-24	Dec-27	CPUC Approved	Y
Expansion Pilot 2	Jun-24	Dec-27	CPUC Approved	Y

VGI	Sep-24	Sep-25	Pending Final Resolution	Y
DAHRTP	Unknown	Unknown	Paused till Mar-25	Y

7. Education and Outreach

Section 1623.1(b)(5) of the LMS asks the Large CCAs to conduct a public information program to inform and educate affected customers why marginal cost-based rates or load flexibility programs and automation are needed, how they will be used, and how these rates and programs can save customers money.

VCE has a successful history of educating its customers on various energy-related initiatives. These experiences include marketing Time-of-Use rates, highlighting customer programs like CARE, FERA, AMP, CAPP and PIPP, and promoting our portfolio of energy programs and initiatives. VCE also maintains consistent communication across Yolo County through monthly newsletters and social media posts.

To reduce costs and boost enrollment, a Public Information Program would be run in conjunction with the launch of a Board-approved load flexibility program to eligible customer classes. VCE would design a campaign that may include direct mail, website, social media, newsletter articles, monthly content shares, and public presentations. VCE would also consider working with community partners to enhance customer outreach. VCE would examine the expansion of existing contracts with vendors to conduct graphic design, media buying, and video production.

8. Time-Dependent Rate Submission to MIDAS

The CEC developed the Market Informed Demand Automation Server (MIDAS), as part of the LMS revisions, so customers and automation service providers can connect flexible loads to a machine-readable database of rates to automate demand flexibility, section 1623.1(c). The LMS amendments require the utilities and Large CCAs to populate utility rate information into MIDAS and to facilitate access to MIDAS signals for customers and their authorized third parties. Each uploaded rate must be assigned a Rate Identification Number (RIN), which is used to uniquely identify each rate. Large CCAs are also required to upload any new time-dependent rates or changes to existing rates prior to the effective date of that rate. All uploaded time-dependent rates must include all applicable time-dependent cost components. This section of the Plan details VCE's actions to meet this requirement.

On August 1, 2023 VCE successfully uploaded all generation rates and associated RINs to the CEC's MIDAS, including base rates and rates with price adders. VCE will continue to upload and update the generation rate components with each rate change.

9. Billing System Updates

Section 1623(c)(4) of the LMS requests that by March 31, 2024, RINs be incorporated into customer billing statements and online accounts using both text and quick response (QR) codes or similar machine-readable digital code. Given that the IOUs act as billing agents, the design, placement, and input for RINs on the bill by Large CCAs are restricted. Nevertheless, VCE has collaborated with PG&E to furnish RINs, facilitating their inclusion in the billing statement. VCE plans to make the RINs available in

text and QR formats on billing statements on or before April 1, 2024. This will allow customers to access their RIN on the billing statement received by mail or accessed online.

VCE customers will see two RINs, one for the CCA-associated component(s) of their bill pertinent to their generation rates and another for the PG&E-associated component(s) of their bill related to transmission and distribution rates.

Lastly, VCE is working with PG&E to have consistent and clear language regarding the RINs for customer understanding. VCE will likely augment the information provided by PG&E with content on our own webpages.

10. Single Statewide RIN Access Tool

Section 1623(c) requires the Large IOUs, Large POUs, and Large CCAs to develop a single statewide standard tool for authorized rate data access by third parties, along with a single set of terms and conditions for third parties using the tool, for submission to the CEC by October 1, 2024, for approval.

The tool must:

- Provide the RIN(s) for the rate(s) applicable to a customer's premises.
- Provide any RIN(s) for the rate(s) to which the customer is eligible to be switched.
- Provide estimated average or annual bill amounts based on the customer's current rate and any other rate(s) for which the customer is eligible to be switched if such calculation tools already exist.
- Enable authorized third parties, upon direction and consent of the customer, to modify the customer's applicable rate, to be reflected in the next billing cycle.

The tool must also incorporate reasonable and applicable cybersecurity measures, minimize enrollment barriers, and be accessible in a digital, machine-readable format according to best practices and standards.

VCE has provided stakeholder input and participated in CEC workshops on the RIN Access Tool's development held on March 21, 2024. If the need for an extension is determined by stakeholders, the CEC Executive Director will be notified in accordance with section 1623(c)(2)(B) of the CEC's LMS.

11. Recommendation

VCE has distributed this working draft plan to its Board, which will be considering its adoption within the 60-day timeframe allotted by the CEC. The draft plan underscores VCE's dedication to supporting the provision of affordable, clean, and reliable electricity to its customers through innovative rate design and customer-focused programs. It is important to note that new information on marginal programs and rates, as well as evolving customer needs, may influence VCE's approach on these issues.

VCE's evaluation of the cost effectiveness, equity, technological feasibility, and benefits to the grid and customers, of marginal cost-based rates indicates that there is currently insufficient data available to recommend the development and implementation of one or more marginal cost-based rates to the Board. Therefore, VCE staff plans to recommend the deferral of new marginal rates until a more robust study and pilot process can be completed. Without a comprehensive cost-of-service rate design study,

which would require the use of a third-party consultant at significant cost, VCE is limited to a qualitative evaluation of the criteria set forth in the LMS. The qualitative evaluation provided in this report is intended to serve as an initial step in complying with the CEC's LMS requirements and will be revisited over time as new data and information become available.

VCE remains committed to the overall goals of the LMS, including aligning electricity use with generation and capacity using energy storage, improving air quality, helping to mitigate future climate change, and creating downward pressure on electric rates. This commitment is demonstrated through the participation in and offering of load flexibility programs including the AgFIT pilot program and expansions, as well as PG&E-administered programs.

Looking ahead, this plan remains flexible and open to adjustments as new information and opportunities emerge. VCE will assess opportunities to uphold reliability and align with the State's goals in a manner that is consistent with VCE’s goal to best support our customers.