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on RFI Clean Energy Resources for Reliability

Additional submitted attachment is included below.

Valley Clean Energy Comments/Proposal 21-ESR-01

These comments and preliminary proposal are intended to respond to the CEC's call to identify and collect information on clean energy resources and characterize their ability to support grid reliability.

Summary

Valley Clean Energy (VCE) proposes that State funding be allocated to enable dynamic pricing in the agricultural sector. Proposed funding would be used to implement irrigation pump automation, controllable irrigation systems (e.g. drip), and customer support so that farmers can automate irrigation systems to shift load out of peak hours and into non-peak hours.

According to a 2020 LBNL study[1] load shift potential in the agricultural sector is second only to office buildings but represents a much less diversified sector, speeding up and simplifying implementation. Enabling agricultural dynamic pricing will assist the agricultural sector, help the State better understand opportunities for load shifting/shaping, gain grid reliability in the near-term without building/extending fossil plants, and potentially achieve water savings through more efficient irrigation systems. In addition, GHG emission and air quality reductions associated with the load shift are measurable based on CAISO hourly power content factors.

VCE, a Community Choice Aggregation[2] program in Yolo County, is entering year two of its three-year CPUC-funded agricultural dynamic pricing pilot project, AgFIT (Flexible Irrigation Technology). As shown in the tables below, the pilot is showing strong results and, along with CEC and CPUC demand management studies and rule makings, forms the basis for the funding request.

VCE sees opportunity to address near and longer-term grid reliability in a cost-effective manner. Further, this approach provides important co-benefits that help address other critical issues facing the State (water conservation, drought hardening of the agricultural sector, GHG reductions), while building new alliances based on mutual benefit.

Overview

This is a funding allocation request for State investment in the agricultural sector to enable cost effective electricity load shift, with water conservation and groundwater aquifer sustainability included as potential co-benefits. Investment in mature agricultural irrigation control technology, deployment of dynamic pricing platforms, and customer support will allow farmers

[1] Lawrence Berkley National Laboratory, *The California Demand Response Potential Study, Phase 3: Final Report on the Shift Resource through 2030*, July 2020. Available at: https://emp.lbl.gov/publications/california-demand-response-potential .

[2] VCE member jurisdictions are the cities of Woodland, Winters and Davis and unincorporated Yolo County. www.ValleyCleanEnergy.org.

to gain greater control over their electricity expenditures and help “shave the peak and fill the valley” of the demand curve.

Reliability of the grid will be enhanced as farmers shift out of high-cost/high-demand hours in pursuit of lower-cost/lower-demand hours that meet their irrigation requirements. This use of market mechanisms appeals to the agricultural sector’s desire for greater control over their costs.

Results from the first phases under the Ag FIT pilot program (2022) vs. prior year (2021) (16 pumps measured in KWh), clearly show that with the proper incentives farmers are willing to adjust irrigation schedules based on pricing signals, as shown in Figures 1 and 2 (based on VCE’s pilot program). These results mirror EPIC-funded research conducted from 2017-2020.

Figure 1 - 2022

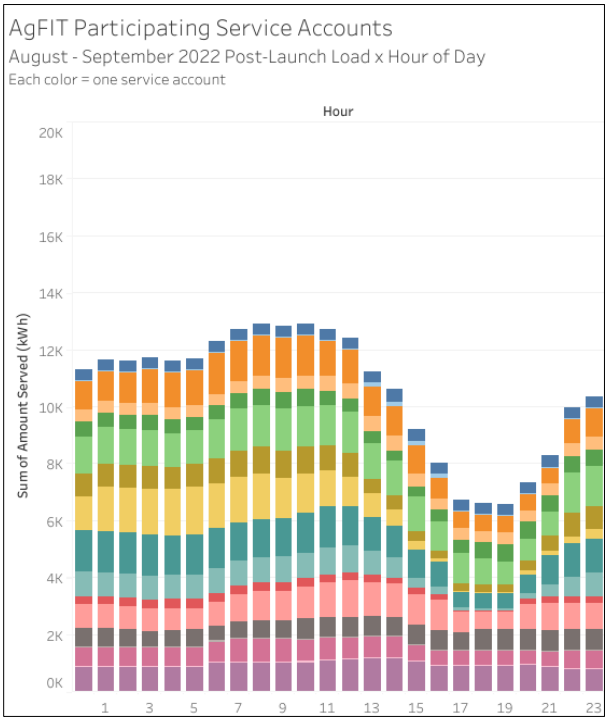
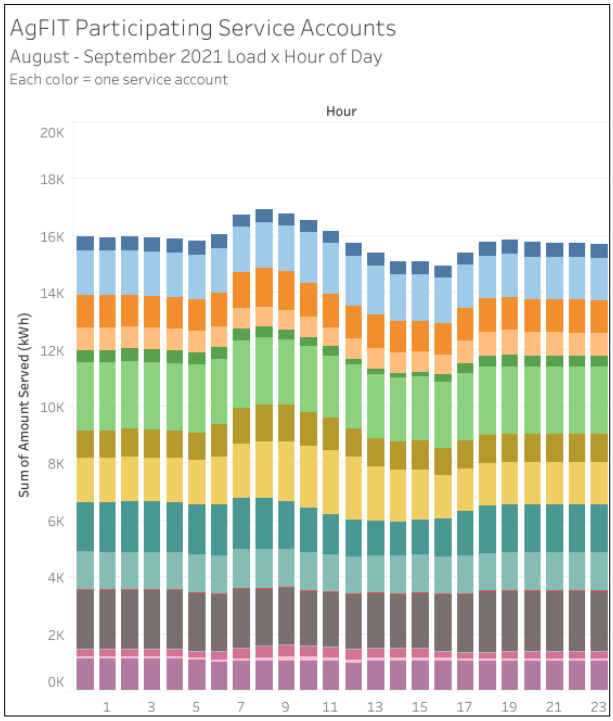


Figure 2 - 2021



According to a 2020 Lawrence Berkely National Laboratory (LBNL) study and shown in the figure below, agricultural pumping load has the 2nd highest load shift potential of any sector in the State (building load shift is 1st but much more difficult to activate). Greenhouse gas and air quality savings are achieved by avoiding the need for high emission peaker plants during periods of high demand. LBNL estimates that over 1000MW of ag irrigation load shift in California is possible (LBNL Demand Response Potential Study, 2020). This table also shows the relative potential within the three IOUs.

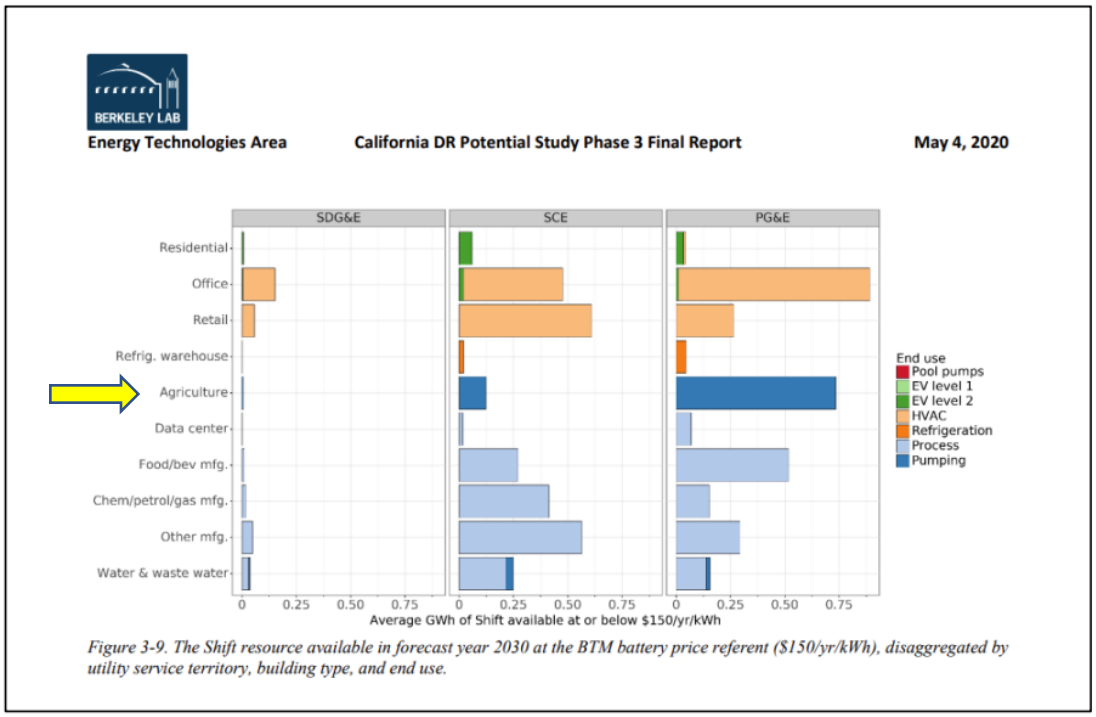


Figure 3-9. The Shift resource available in forecast year 2030 at the BTM battery price referent ($150/yr/kWh), disaggregated by utility service territory, building type, and end use.

California Demand Response Potential Study Phase 3 Final Report, Figure 3-9

The co-benefit of water conservation/aquifer sustainability is achieved by expanding use of water conserving irrigation equipment and controls.

Through this investment in long-lasting irrigation control and automation equipment, the State can activate new and existing coalitions with the agricultural, water, and energy sectors while further demonstrating that it is actively seeking pragmatic, cost-effective solutions to some of the California's most pressing issues. Note: VCE is also beginning to field interest in the approach from outside the State.

VCE's existing dynamic pricing pilot shows that this load shift potential is accessible if resources are invested in price signaling software, irrigation control technology, and customer support. By meeting agricultural customers "where they're at", the State can help provide immediate improvements in grid reliability while building common cause with the agricultural sector.

State investments in the software, irrigation control technology, and customer support that enables shifting of significant agricultural irrigation load from peak to non-peak hours differs from Time of Use rates in that it is taking a granular look at the close to real time demand on the grid and translating it into actionable pricing for agricultural customers. The focus is on the agricultural sector because it has a high level of relatively flexible irrigation demand that can be controlled at relatively few service points. Unlike cooling load, shifting pumping is not a "one trick pony" (from evening ramp to early afternoon) but can largely respond to price signals that

vary around the clock. This provides durability as California's grid evolves to, for example, consume offshore wind power generated at night.

What Is Dynamic Pricing? Dynamic pricing is a system designed to send actionable price signals to customers and their grid-enabled devices to achieve load shift. With a price signaling software platform, irrigation control technology, and customer support, dynamic pricing (such as AgFIT) enables growers to adjust their irrigation schedules to take advantage of week-ahead price signals based on CAISO prices, thus irrigating when prices are expected to be lower.

Funding Proposal

As noted, the LBNL study identified up to 1,000 MWs of potential load shift in the agricultural sector. Based on learnings from a prior CEC EPIC funded pilot and the current AgFIT pilot, VCE estimates that with adequate funding and support, between 400 MW and 500 MW of agricultural load shift is potentially accessible within the next 5 years. Extrapolating costs associated with the 5 MW AgFIT pilot, VCE estimates that an investment of $150M to $180M would enable between 400MW to 500 MW of agricultural irrigation load shift over the next five years.

For the purposes of this proposal, the following estimates are assumed:

- Total statewide estimated agricultural load shift potential: ~1,000MW (source LBNL Demand Response Potential Study, 2020). Between 400 MW and 500 MW of agricultural load shift is potentially accessible within the next 5 years.
- Annual Goal: up to 10% (80MW to 100MW/yr) for this proposal.
- Automation/Irrigation System Incentives: $200 to $300/kwh (estimate from AgFIT implementation)
- Dynamic Pricing System: ~10% of total program cost (Estimate from CPUC Summer Reliability proceeding).
- Program Operation/Admin: ~10% of total program cost (estimate from AgFIT pilot).
- Total Funding Allocation Request: $150M to $180M to achieve 400 MW to 500 MW load shift

The State investment improves grid reliability, reduces GHG/air pollution and has the co-benefits of helping drought harden a $51B/yr industry, conserving water resources, and protecting the State's aquifers.

The State allocation would be used to fund software costs for growers, automated irrigation technology, incentive funds for ag participants, as well as consultant and administration costs.

Role of CCAs. CCAs, with their rate making authority, close connections with their customers, and nimble decision-making capabilities, are positioned to move the State forward in the emerging area of dynamic rate design/implementation. Specifically, because of their local

relationships, CCAs are uniquely positioned to work with growers and encourage them to participate. CCAs also are trusted local representatives and can provide personalized assistance to participants, thus cutting through potential regulatory red-tape when needed.

Role of the Incumbent IOUs. The IOUs are already running or supporting dynamic rate pilots and PG&E has indicated their general support for agricultural dynamic rates in their recent CPUC filing on demand flexibility (R.22-07-005). The IOUs can also provide helpful information about available audit/rebate/loan opportunities they offer for agricultural pumps and motors.

Role of CAISO. CAISO staff have expressed interest in the AgFIT pilot and the early results. Continued dialog with CAISO and other State agencies (i.e. DWR, ARB, CPUC, Dept of Food and Agriculture, etc) offers opportunities to build support for this proposal.

Role of the CPUC. The CPUC has an existing proceeding underway regarding establishing dynamic pricing for all LSEs.

Why Funding is Needed Now. California continues to experience extreme heat, testing the resiliency of the electricity grid. The State is actively seeking solutions to reduce load at the peak. At the same time, California is once again experiencing a crippling multi-year drought that is straining agriculture water supplies and the state is pursuing an array of strategies to save water.

California currently has grant programs providing financial assistance for the implementation of existing irrigation control system technology (such as the State Water Efficiency & Enhancement Program (SWEEP)). Additional opportunities exist through dynamic pricing strategies to shift electricity use and reduce water use while saving growers money.