August 13, 2019

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Docket Number: 19-IEPR-05
Subject: 19-IEPR-05 Advancing Energy Equity Workshop Comments

Re: Comments of the California Energy Storage Alliance (CESA) on the July 30, 2019 Advancing Energy Equity Workshop

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CESA appreciates the opportunity to comment on the joint agency workshop on Advancing Energy Equity, held on July 30, 2019. CESA appreciated the opportunity to speak on the role and potential for energy storage and electric vehicle (EV) resources to provide benefits to low-income and disadvantaged community (DAC) customers, as well as on barriers and potential solutions to increase access of these resources. Energy equity is an important goal of the state to ensure affordable and clean resources and technologies provide benefits to all customers.

CESA is a 501(c)(6) organization representing over 80 member companies across the energy storage industry and is involved in a number of proceedings and initiatives that address the various strategies and barriers related to growing the energy storage and vehicle-grid integration market to support a more reliable, cleaner, and more efficient electric grid. With our background and expertise, CESA hopes to help inform staff and commissioners at the CEC and California Public Utilities Commission (CPUC) on potential considerations to develop policies and programs to support distributed energy resource (DER) access and benefits for low-income and DAC customers.

Introduction

California has made progress in energy equity issues by passing legislation and implementing programs to increase distributed energy resource (DER) access and to ensure DER and clean energy benefits accrue to low-income and DAC customers. In particular, CESA commends the CEC for developing energy equity indicators, which should serve as effective signs of progress toward energy equity and inform key policymaking proceedings at the CPUC and CEC.

Fortunately, across our work in the energy storage space, CESA has noticed increased areas of interest and focus on important equity matters, including but not limited to the following:

- **Assembly Bill (AB) 2868 Energy Storage Applications:** With a priority on low-income and public-sector customers, the investor-owned utilities (IOUs) were authorized to propose energy storage programs and investments. Though only a

behind-the-meter (BTM) thermal storage programs was approved in D.19-06-032, these applications represent a potential avenue for deploying energy storage resources for the underserved low-income and DAC customer segment.

- **Self-Generation Incentive Program (SGIP):** A 25% "Equity Budget" carve-out was established within SGIP to reserve incentive dollars to serve eligible low-income and DAC customers. Although the program has incented almost no BTM energy storage projects at this time, the Equity storage market is still in its early stages. Recently, the CPUC recently issued a Proposed Decision (PD) on August 9, 2019 that expanded the definition of eligible customers, increased the Equity incentive level to $0.65/Wh, established a $0.85/Wh Equity resiliency incentive, and proposed to synergize the program with counterpart solar programs will go a long way to improving energy storage access to equity customers.

- **Demand Response (DR) Pilot Programs:** In 2018, the CPUC authorized a three-year budget of $2.5 million across the three IOUs for DR pilot programs to target constrained local capacity areas and DACs[1] and test customer outreach techniques, bill credit levels, etc.

- **Clean Vehicle Rebate Program (CVRP):** This program provides an additional $2,000 in rebate incentives to applicants that are less than or equal to 300% of the Federal poverty level, in addition to the State and Federal incentives they would also qualify for.

Many of equity-focused programs and investments are still in the early stages and will take some time to understand the lessons learned to identify areas of improvement and potential for scaling. CESA believes it's important for regulators to utilize the key structural barriers limiting access to clean energy for low-income customers identified in SB 350 when developing policies for this population. These included low homeownership rates, complex ownership arrangements for low-income multifamily housing, insufficient access to capital, building age, and remoteness of serving the community.[2] As such, while increased incentives or improved marketing, education, and outreach (ME&O) will likely improve accessibility of DERs to equity customers, CESA also encourages the CPUC and CEC to explore pathways for DERs sited at customer sites to provide greater societal benefits by being used for broader grid services (*e.g.*, as a virtual power plant), which may produce additional benefits and value in, for example, offsetting nearby fossil-fueled generation facilities. In turn, this will produce some direct equity customer benefit as well as additional ratepayer benefit while advancing the state's decarbonization goals.

[1] D.17-12-003, OP 58.

[2] CEC Low-Income Barriers Study, Part A: Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers in DACs, at p. 2

Energy Storage Access

As CESA presented at the July 30, 2019 workshop, energy storage is unique in that it provides flexibility to users through various use case applications. However, as noted in the CEC's *Low-Income Barriers Study*, access to energy storage technologies can be limited due to some structural and policy barriers, such as:

- **Split Incentives/Low Ownership Rates:** Many low-income customers are renters who live in multi-family housing,[3] where there may be split incentives to invest in DERs, such as energy storage. The Solar on Multifamily Affordable Housing (SOMAH) addresses this barrier through a provision where 51% of the system's electric output must directly offset tenant load and be provided to tenants in the form of virtual net energy metering (VNEM) bill credits.[4] Similar approaches could be taken in SGIP, or alternatively, SGIP projects could leverage existing SOMAH program structures via adders funded by SGIP to encourage solar-plus-storage pairings and to deliver customer bill savings, as demonstrated the Clean Energy Group.[5]

- **Insufficient Access to Capital:** The current incentive structure in the SGIP is not sufficient to spur movement in the equity budget. CESA calculates that the average cost of electrochemical storage for equity customers is approximately $1.25/Wh, based on the SGIP Weekly Statewide Report as of July 29, 2019. However, prior to the issuance of the recent PD in R.12-11-005, the Equity incentive rate remained at $0.50/Wh, which makes it economically unviable given that low-income customers are on tiered and/or low-differential time-of-use (TOU) rates.

- **Lack of Economic Signals:** Many low-income customers are exempt from TOU rates or only take service on low-differential TOU rates, which limits the value proposition of energy storage cycling, leading to more of the costs and revenues to be collected upfront. Understandably, low-income customers have bill protection measures in place as well given their lack of flexibility to shift demand. However, by encouraging energy storage adoption via higher incentive rates, low-income customers may experience increased accessibility to energy storage, thereby allowing them to take service under more dynamic rates that provide grid benefit and reduce greenhouse gas (GHG) emissions.

[3] California Department of Housing and Community Development CA's Housing Future: Challenges and Opportunities at p.1 and 24

[4] Solar on Multifamily Affordable Housing (SOMAH) Handbook at p. 18

[5] *Closing the California Clean Energy Divide – Reducing Electric Bills in Affordable Multifamily Rental Housing with Solar+Storage*, Clean Energy Group https://www.cleanegroup.org/wp-content/uploads/Closing-the-California-Clean-Energy-Divide.pdf

- **Building Age:** Considering many low-income customers live in older homes, energy storage deployment to their homes and buildings will likely require electrical panel upgrades or other wall structure renovations, which can add $2,744 to the cost of a single-family home or $4,256 for low-rise multi-family dwellings, according to an E3 study of 200A panel upgrades.[6] Incentive rates for energy storage deployment will likely need to consider these additional costs in order to encourage access.

- **Remoteness of Certain Communities:** Extending transmission or distribution lines to remote locations may not be the most cost-effective pathway to provide clean energy benefits to low-income communities. In Australia, for example, the state of Western Australia (WA) has found that microgrids can supply electricity more cheaply, more safely, and more reliably than the traditional 'poles and wires' approach.[7] This approach may be especially beneficial to low-income populations located in unincorporated communities and tribal populations.

- **Marketing, Education, and Outreach (ME&O):** Low-income communities may require specialized, customized, and/or simplified ME&O efforts as well as a trusted mediator to encourage energy storage adoption, especially for certain developers who may not be proficient or equipped to sell to this customer segment. One-stop shops with multi-lingual resources on the benefits of energy storage (*e.g.*, Energy Upgrade California for energy efficiency) and mediators from other existing programs (*e.g.*, community energy navigators for the San Joaquin pilots) could be models that improve information flow and accessibility.

Ultimately, to get developers to focus on the equity market, CESA recommends that the CPUC and CEC explore higher incentive rates, streamline processes for customers and developers alike, and leverage best practices from existing low-income programs.

Energy Storage for Resiliency

Resiliency represents another potential energy storage use case for low-income households – a major topic that was discussed at the July 30, 2019 workshop. CESA believes that resiliency is a growing need for all customers given that more than 52% of PG&E's customers and more than 35% of SCE's customers live in fire-threat areas where proactive, planned power shutoffs may occur, according to their Wildfire Mitigation Plans.[8] While typical unplanned outages last between 0.5 to 4 hours, public safety power shut-off (PSPS) events could last between 24 to 48 hours, though the IOUs have notified customers to be prepared for 48+ hours of planned

[6] E3 Residential Building Electrification in California: Consumer Economics, greenhouse gases, and grid impacts at p. 26

[7] Clean Energy Council submission to the Economics and Industry Standing Committee inquiry into electricity microgrids in WA, at p. 2

[8] PG&E's 2019 Wildfire Safety Plan at p. 7 and SCE's 2019 Wildfire Mitigation Plan at p. 19.

outages. This represents a major concern for all customers, but it is particularly worrying for the close to 200,000 Californians on Medicare who are electrically dependent, out of 5 million in total.[9] Absent electricity for more than two hours, "critical care customers" who use medical equipment at home for life sustaining purposes are at risk.[10]

Energy storage for resiliency can assist this population segment from riding through both unplanned and planned outages. The three IOUs plan to provide temporary mobile generators in safe community gathering places, but this option presents health issues, risk of diesel supplies running out in sustained outage, and risk of not working if not properly maintained. CESA calculated that backup diesel generators can contribute approximately 20 pounds of CO2 per hour of usage per home and 6.6 times more of GHG than generated from grid. Energy storage and solar-plus-storage represent a cleaner and more reliable alternative, but a value for resiliency has not been adopted to inform DER programs, even as several studies have sought to quantify this value. One study found that valuing resiliency increased the net present value (NPV) of 20-year solar+storage system on a primary school in Anaheim, CA from $28,759 to $58,399 based on utility customer surveys, when modeling outages that lasted approximately two hours based on CAIDI values reported by utilities and with PV and storage sized accordingly.[11] Adders reflecting this value, such as those recently proposed in the SGIP PD, are needed to encourage this resiliency use case.

The energy storage duration needed to realize this resiliency benefit depends on the type of storage device (duration), whether storage is paired with onsite generation, and whether full or critical loads are wired to the storage device to provide resiliency. In particular, serving only critical loads requires re-wiring breaker panels and installation of specialized switchgear. The cost to make solar-plus-storage islandable can add incremental expenses ranging from 10% to 50%, but an NREL and Clean Energy Group study found that maximum cost to island should not exceed 3% to 21%, when factoring in added bill savings that exceed added islanding costs. If economically feasible to island, lithium-ion battery serving critical loads and paired with solar can ride-through multi-hour outage, or sometimes multi-day, depending on application and customer load. Some battery technologies or configurations, including flow or zinc-air solutions with four- to ten-hour energy durations can provide longer load shifting and resiliency capabilities. Actual performance can vary based on solar insolation and other factors, but CESA calculated that Powerwall paired with 7.6-kWh solar should be able to serve 75% of average residential load (18.56 kWh). Standalone storage or specialized long-durations storage technologies can be sufficient for shorter-duration needs.

[9] HHS emPOWER Map 3.0. https://empowermap.hhs.gov/
[10] Khoury (2019) at p. 68.
[11] "Valuing the Resilience Provided by Solar and Battery Energy Storage Systems," published in January 2018 by NREL and Clean Energy Group. https://www.nrel.gov/docs/fy18osti/70679.pdf

Energy Storage for Grid Services

Given that the direct economic value of energy storage deployment to low-income customers may be limited and less of a driver, CESA encourages the CPUC and CEC to explore how energy storage deployed in these communities can be leveraged for grid services, such as local capacity, that can provide broader benefits to low-income customers and DACs. By overlaying CalEnviroScreen 3.0 map[12] with a layer of operational power plants in California[13], there is a high geographic correlation between the physical location of natural gas power plants relative to where DACs reside. GRID Alternatives has installed a total of 12,184 solar systems, equating to approximately 53.5 MW, abatement of 947,919 tons of GHG emissions (based on their 25-year expected lifetime), and bill savings to low-income customers of $365 million over their lifetime. Similarly, Sunrun recently contracted with East Bay Community Energy (EBCE) to provide capacity services that not only delivered direct customer bill savings but also provided incremental value and revenue via a local capacity contract that likely offset the cycling and emissions of a local gas plant in the Oakland area.

Such 'goldilocks' projects are able to deliver increased value to all ratepayers and deliver larger scale benefits to the DAC in which the solar-plus-storage resources are sited. CESA plans to develop a deeper concept paper on how to scale this project model across all DACs and recommends that the CPUC and CEC think creatively about such impactful projects.

Electric Water Heaters

Smart electric water heaters (EWHs) are more broadly available and installed, so mobilizing them as storage assets may be another smart path give low-income customers access to a cleaner heating technology that also provides storage-like services. Especially given that EWHs can be lower cost and deliver outsized benefits, CESA believes that policies to encourage greater fuel switching to EWHs and to operationalize them for grid benefit represent effective means to improve DER access to low-income customers. For example, with $500 for a commercially available smart controller on 0.5-kW EWHs for 10-year life, CESA calculated that the state could mobilize 1 MW of smart storage-like assets from 2,000 participating DAC customers, with just $1 million in SGIP incentives.

Greater consideration of EWHs in the Building Decarbonization proceeding and other proceedings and initiatives therefore appears to be an effective pathway to mobilize smart DERs for grid services while increasing accessibility for low-income customers to clean alternative technologies. Energy storage is broader than battery storage.

[12] https://calepa.ca.gov/wp-content/uploads/sites/6/2017/04/SB-535-Maps-Final.pdf
[13] https://ww2.energy.ca.gov/maps/powerplants/Power_Plants_Statewide.pdf

Conclusion

CESA appreciates the opportunity to provide these comments and feedback following the discussions from the Advancing Energy Equity workshop. We look forward to collaborating with the CEC and other stakeholders in this proceeding.

Sincerely,

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