Bassett Avocado Heights Advanced Energy Community (BAAEC)

Replication Toolkit

BASSETT AVOCADO HEIGHTS
advanced energy
community

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About This Toolkit

This toolkit is based on lessons learned by The Energy Coalition (TEC) through five years of implementing the Bassett Avocado Heights Advanced Energy Community (BAAEC) project. The toolkit is designed to help project teams build on our work and accelerate the implementation of similar strategies that support the clean energy transition in underserved communities.

Each section of the toolkit corresponds to an element of the BAAEC project and contains the most important experiences and challenges we encountered related to that work. In many cases, the BAAEC team was able to develop and implement solutions to the challenges encountered—we've shared those solutions here along with recommendations for how to incorporate what we learned in your own work. In other cases, the challenges arose from regulations or policies beyond our control and we had no choice but to work with those constraints. In such cases, we do not have a ready "solution" to share, but our recommendations identify regulatory or policy changes that need to occur to eliminate these barriers.

If you have any questions about the replication toolkit or the BAAEC project, please contact Genaro Bugarin at gbugarin@energycoalition.org.

Outreach and Engagement

Building Trust

The project team assumed that free home upgrades would drive enrollment, but the community was generally distrustful of energy program offerings, unclear about where the funding was coming from, and skeptical about how home upgrades would benefit them.

BAAEC Experience: The project team learned that enrollment requires trust building and community empowerment. The process was slow and required more resources and time than anticipated. The team legitimized the project by partnering with trusted messengers: the local school district and the County.

Solution: BAAEC created a visible community presence by establishing a community advisory committee (CAC) and iterated on outreach strategies with Day One and ActiveSGV, the project's community-based organization (CBO) partners. BAAEC also established a wraparound, concierge-like process as an enhanced customer service strategy throughout the grant term. This level of effort is needed to provide services in an inclusive and equitable manner.

Recommendation for Scalability: Leverage established CBOs to promote program services and consider co-branding with trusted organizations such as local governments and school districts to

establish legitimacy. Use a mix of outreach methods (in-person visits, phone calls, emails, etc.) to humanize the experience for the homeowner. Ensure that staff can explain why a program exists, how it's funded, and very clearly describe to participants what it means to enroll and participate. When this is done effectively, it can address the community's distrust. Build program flexibility that allows for people-first strategies, rather than rigid policy program drivers. Focus on educational outreach and the human connection, keeping in mind both the expected benefit for participants and what is being asked of them. Foster cross-sector collaboration for wraparound support, and acknowledge concerns even when a solution is not available.

Personal Connection

A large catalog of services and unfamiliar technologies represents a challenge in connecting with the community.

BAAEC Experience: It was difficult to grab residents' attention because the project had so many offerings. During the initial launch, the messaging was overwhelming for community members because it was complicated and new. It created hesitation that translated to a lack of participation.

Solution: The project team split the outreach scope between Day One and ActiveSGV, allowing each partner to concentrate on specific elements. The team delayed the introduction of project features to simplify messaging and developed new and improved marketing materials that focused on direct benefits. The team secured new funding to offer induction stoves, a tangible in-home fuel-substitution offering that participants engaged with more personally.

Recommendation for Scalability: Start with a simple approach to avoid overwhelming potential participants with all program services. Highlight top priority offerings, then once interest is expressed, introduce additional services.

Family-Based Engagement

Recognizing the best way to reach decision makers in intergenerational households.

BAAEC Experience: Community events, which the project team initially relied on for outreach, were primarily attended by a younger generation: parents with young children. While parents paid the utility bills, the homes were often owned by grandparents, who were the decision-makers for the types of major renovations offered by the project.

Solution: The project team pivoted to using mailers that reached older homeowners who had the legal agency to take action for home upgrades. The team also established a clear single point of contact for each participating home to streamline communication and avoid confusion.

Recommendation for Scalability: Understand the demographics of the target community, and

who would most likely be eligible/benefit most from program services, to tailor outreach efforts. Then use that information to integrate multi-stakeholder engagement strategies to reach leads that have the authority to enroll. The goal is for engaged leads to provide program referrals via word of mouth.

Communicating Sufficient Information for CBO Partners' Outreach Efforts, While Being Transparent About Program Design

BAAEC Experience: The project timeline required that outreach to prospective participants begin while the technical specialists on the project team were still working through some program details. Challenges with finding partners, stacking incentives, and establishing rebate bridge financing delayed program finalization. Residents had detailed questions that could not yet be answered, which put CBO staff members in an awkward position, potentially undermining their credibility.

Solution: In addition to sequencing the program offerings, to allow more time for details to be worked through, the project team developed and provided technical fluency training to better enable CBOs to talk about the technologies, how they were being funded, and what the benefits would be, even before all program details were worked out.

Recommendation for Scalability: Equitable decarbonization requires institutional capacity building and not just program deployment. A technology knowledge base/101 training for outreach staff is a best practice at the beginning of any new program so they are able to clearly and accurately communicate benefits and technical aspects of program services. Furthermore, project circumstances may require additional guidance or technical knowledge-sharing to ensure that CBOs can connect with potential participants without risking their credibility. Program implementers must be sensitive to the potential impact of the project on community members' perceptions of organizations on the front lines of outreach.

Community Characteristics

Unincorporated Los Angeles County community lacked resources and representation from local government to aid with outreach.

BAAEC Experience: Because the project was focused in an unincorporated area of Los Angeles County, there was no central civic hub, limited local government-led communications, and fewer organic gathering spaces. Local government services are less accessible in the area; community members typically travel outside the area for community events.

Solution: The BAAEC team needed to invest further in field outreach and community engagement to overcome this challenge. We formed a strong partnership with the County Supervisor's office and with the local school district. BAAEC's CAC, made up of recognized local community representatives, was key to understanding community dynamics. Eventually, we expanded the project area to include the adjacent cities.

Recommendation for Scalability: Plan for additional outreach effort when working in unincorporated areas, and invite County Supervisors as project partners. School districts can be reliable partners to anchor in-place outreach and as a trusted channel for communication. Whether formal or informal, as volunteers or as compensated community champions, invest in community organizing (e.g. CACs etc.) as a path to understand community dynamics and deliver effective outreach via existing, personal channels in place of city-led programming.

Competing Priorities

Energy is usually not an urgent concern for people and will compete for attention among other more urgent matters (health, job security, housing).

BAAEC Experience: The team recognized that outreach and enrollment will take time and that changes in approach were needed to connect with people through simple, familiar "asks" with a low level of commitment.

Solution: Building trust with residents was a critical first step to generating buy-in and enrollment. For example, the team introduced people to home electrification through the water heater assessment and tune-up services, which was a popular offering. Once an initial service was provided, homeowners felt more empowered and comfortable to pursue additional electrification measures.

Recommendation for Scalability: Programs should look for equitable and inclusive participation from the community by providing entry-points that have lower levels of commitment. Whether these are services, education, or technical assistance, remove the big ask and allow for a process that is less transactional.

Wraparound, Concierge Support

Homeowners need hands-on relationships and one-on-one support.

BAAEC Experience: The team did not originally anticipate the magnitude of need for personalized, guided assistance. TEC staff had to expend significant time and resources to be a point of contact for participants.

Solution: The team developed collateral and talking points to explain the roles of each program partner, and centralized project scheduling and communication through a single point of contact for the homeowner, available via phone, email, and text messaging.

Recommendation for Scalability: Consider designating a physical site to offer "office hours" for interested residents to learn more about the program. Budget enough staff time to provide wraparound, concierge-level support for participants. Ensure that participants understand the role of other program partners, especially when having to interact with them directly. And, ensure that both the participant and program partners know who the main point of contact is. Provide clarity on program partner roles and responsibilities through program fact sheets, website, etc., including staff names and contact information, as appropriate. Expect and plan for the buy-in process to be iterative and not linear.

Creating Community Champions

The expectation that participants would help advance the project through referrals did not materialize.

BAAEC Experience: The project team had hoped that enrolled participants would provide references to neighbors and friends, in support of achieving enrollment goals. However, this did not occur. The customer journey was a long one, and it was not reasonable to expect them to be comfortable vouching for the program until after work was complete at their home and they had a chance to determine their level of satisfaction. Furthermore, the technologies were new and, in some cases, complex; participants would likely need support to feel confident explaining the project benefits to others.

Solution: Relied on alternative strategies for outreach and enrollment.

Recommendation for Scalability: Plan ahead for a strategy to develop and incentivize participants to become champions to advocate and promote the program to fellow community members. This may require a specific budget allocation to train participants in more depth, as well as to schedule early completion of work at the homes of project champions.

Technology Barriers

Limited digital fluency on the part of some participants.

BAAEC Experience: The process for participants to register interest, provide eligibility documentation, sign agreement forms, and get updates on next steps relied heavily on the use of email and other digital tools. A significant number of participants, however, did not use email and required an alternative method.

Solution: TEC staff visited participants' homes to review project requirements and sign required documentation.

Recommendation for Scalability: Account for staff time needed to visit participants homes to complete project milestones if email is unavailable. Consider having a physical site that participants can visit to ask questions about projects and sign documentation.

Advanced Homes

Despite Being Free, Participants Go Through a Time-Intensive Journey and Need Hands-On and Concierge-Like Support

BAAEC Experience: BAAEC layered various energy programs to create the Advanced Homes package, which needed the coordination of several different contractors. This tested the patience of many participants as their installations took longer than expected, with many more contractor touchpoints. The team did not originally anticipate that TEC staff would be strongly involved in personalized, guided assistance. TEC staff had to expend significant time and resources to be a point of contact for participants.

Solution: The team held weekly meetings with each installation partner to review installation status and support homeowner outreach. The outreach staff adjusted messaging to help manage participant expectations, developed collateral to explain the roles of each program partner, and centralized project scheduling and communication through a single point of contact for the homeowner, available via phone, email, and text messaging.

Recommendation for Scalability: Provide a clear roadmap ahead of enrollment to communicate steps and timeline, and be clear about the time investment that will be required. Stay in frequent communication, even when no specific milestone is achieved. Be very clear on what is under the program control, and what is not, especially when relying on other funding sources. Budget enough staff time to provide wraparound, concierge-level support for participants. Provide accessible and clear roles and responsibilities across implementation partners. Expect and plan for the buy-in process to be iterative and not one-time.

Need for Roof Replacements and Related Increases in Project Costs

BAAEC Experience: 26 participants required roof upgrades to accommodate solar. We had to identify funding to cover reroof costs and increase our investment of time to do roof replacements, which caused project delivery delays.

Solution: We used California Energy Commission grant funds to pay for roof upgrades so that they could be suitable for rooftop solar photovoltaic (PV). We did both full roof replacements and partial replacements, where only the solar impacted area received a new roof.

Recommendation for Scalability: Provide additional funding in equity programs to account for structural upgrades needed to install solar PV and battery storage. Look for partnerships with other health and safety programs, and with roofing industry trade associations, where work on sizing the opportunity for upgrades across communities can happen. Look for funding/financing partners that see an opportunity when it comes to deferred maintenance that can unlock some cashflow in the form of bill savings if addressed.

Need for Main Service Panel Upgrades and Related Increases in Project Costs

BAAEC Experience: 36 participants required main service panel upgrades to accommodate solar and/or battery, primarily due to concerns around panels by certain manufacturers that were deemed unsafe. Upgrading main service panels so they were compatible with advanced home technologies required an increased investment of time and resources, which caused project delivery delays.

Solution: We applied for and secured additional grant funding and stacked all available rebates and incentives to make the necessary service panel upgrades without creating financial barriers to project participation for homeowners.

Recommendation for Scalability: Provide additional funding in equity programs to account for structural upgrades needed to install solar PV and battery storage. Look for partnerships with other health and safety programs, and with roofing industry trade associations, where work on sizing the opportunity for upgrades across communities can happen. Look for funding/financing partners that see an opportunity when it comes to deferred maintenance that can unlock some cashflow in the form of bill savings if addressed.

Managing Funding and Incentive Stacking with Reimbursable Rebates

BAAEC Experience: Because the Self-Generation Incentive Program (SGIP) reimburses battery storage expenses only after installation and has a long (several months) and uncertain wait time, the project needed a way to cover the upfront costs. And, because each rebate and grant had its own timeline and requirements for contractors, the project faced added complexity and delays from working with extra partners.

Solution: TEC established a bridge financing program with private dollars borrowed against the anticipated SGIP funds and managed several sequences of work across home upgrades. Concierge-level customer support became a critical function. Contractors agreed to unusual implementation practices. For example, site photos and inspection reports from one contractor were used to design and permit another contractor's work.

Recommendation for Scalability: Incentive programs need to consider that homeowners, especially those that are low-income, cannot afford to bear the upfront cost of a rebate and cannot wait until reimbursement. These programs should consider partnering with bridge financing companies to alleviate this burden from homeowners, or develop other program approaches to remove this barrier. Similarly, small, local contractors with limited cash flows cannot be expected to cover the upfront cost and wait for the rebate reimbursement. When rebate programs are designed for implementers with more resources, it creates a competitive disadvantage for smaller, local contractors. Stacking rebates can be streamlined with transparent equipment performance specifications, contractor training, and by building performance-based contractor networks that emphasize standardization, upskilling, and peer-learning.

Unpermitted Structures at Participants' Homes

BAAEC Experience: Unpermitted structures directly affected the feasibility of solar PV, battery storage, and electrification projects. Structures such as patios, home extensions or modifications that were completed without obtaining city permits made homes ineligible to participate in BAAEC. This program policy was put in place to avoid unintended consequences such as fines or forced changes to the home to meet building and safety code compliance.

Solution: The BAAEC team notified participants of the unpermitted structures on site and the need to resolve the issue before proceeding with solar PV/battery projects. BAAEC would also consult contractors to provide recommendations/next steps to participants for resolving issues with unpermitted structures.

Recommendation for Scalability: Revise protocols for inspections of solar, battery, and heat

pump installations to focus solely on the retrofit at hand, rather than looking for unpermitted structures, with the exception of imminent safety issues. Recognize that this is a major barrier to the clean energy transition in low-income households, and an equity issue.

Meeting Multiple Rebate and Grant Funding Requirements

BAAEC Experience: Because each rebate/grant had its own requirements for contractors, the project was required to work with multiple electricians, roofing contractors, a plumber, and financing partners to meet various rebate/grant requirements. This created added program complexity, delays, and use of resources.

Solution: We established detailed coordination processes and a case-management style approach to communicate across each implementing partner and service provider. For example, site photos and inspection reports from one contractor were used to design and permit another contractor's work. Shared tracking records created project progress transparency, which reduced transition times. And the concierge-level support with the homeowner allowed for changes in the sequence of upgrades, when appropriate.

Recommendation for Scalability: Create programs with transparent equipment performance specifications, and reference these specifications across programs. Provide consistent contractor training, and build performance-based contractor networks. The market for residential solar, battery, and electrification upgrades can benefit from standardization, upskilling, and peer-learning. State funded programs have the opportunity to lead, to streamline, and market customer benefits to support a clean energy transition for all.

Interconnection and Permit Approval Delays

BAAEC Experience: Approvals from the building department, County fire department, and utility (for interconnection) were slow, causing project delays.

Solution: BAAEC contractors shared nuances across cities or authorities having jurisdiction as a mitigating strategy for delays. Project workloads and upgrades to individual homes was proactively planned and sequenced around permitting, looking to minimize delays.

Recommendation for Scalability: Take lessons from Australia and consider a statewide standard, contractor certification, statistical inspections, etc. Coordinate early with permitting staff at the Cities where projects are located, to provide an opportunity for advanced planning. Research City-specific project requirements in advance.

Higher than Expected Heat Pump Water Heater (HPWH) Installation Costs

BAAEC Experience: Additional cost items, beyond just the HPWH unit and labor, significantly increased total project costs. Additional cost items were dependent on unique home characteristics and were not possible to predict until an assessment was completed. These items included water heater relocation, expansion tanks, and water heater enclosures.

Solution: We layered TECH Clean CA incentives, Quick Start Grant funds, and CEC grant funds to cover all project costs and ensure that participants paid no out of pocket costs.

Recommendation for Scalability: Incentive programs should factor in the need for costs beyond the basic HPWH unit to make heat pump adoption more accessible. Incentives should be calculated proportional to the total cost of all work required for HPWH installations instead of based on the unit cost.

Complicated Requirements to Obtain HPWH Incentives

BAAEC Experience: The project was delayed due to the complex set of documentation requirements for incentive programs. Some examples of required documentation include the last 12-month electricity and natural gas usage data, income documentation (tax forms, public benefits, etc.), and homeowner signatures for incentive and program approvals.

Solution: Not realizing the effort required to capture incentives, the HPWH installation contractor hired a third party to assist with submitting incentive claims, increasing coordination with homeowners. Since this was a new stakeholder, introduced later in the process, the communication with the customer had to be significantly supported by TEC.

Recommendation for Scalability: Incentive programs need appropriate training for participating contractors and, importantly, checks and balances to prevent contractors from initiating or completing work for which they can't recoup incentives. Incentive reservation processes need to require acknowledgments - at a minimum - of what is required to claim the incentive once the work is complete. All efforts and best practices across programs should be used to make incentive program processes clear and simple.

Induction Range Installation Contractor was a Licensed Electrician, Not a General Contractor

BAAEC Experience: The contractor responsible for installing induction ranges did not have a general license, which made them unable to work with tile, marble, or granite backsplashes to

hook up the new ranges. This prevented many interested homeowners from receiving these appliances.

Solution: The team did not find a solution, and was unable to install induction ranges at homes where additional work was needed.

Recommendation for Scalability: Consider a bench of contractors that can perform a variety of work, so that unforeseen issues can be addressed. If funding for this extra work is limited, ensure early screening of potential participants and develop appropriate talking points to explain the program limitations. Program flexibility is key for inclusive and equitable services to the community, so exploring additional funding partners may be the best option.

Insufficient Attic Space to Install Central Heat Pump HVAC

BAAEC Experience: Some homes were unable to receive a heat pump HVAC due to lack of attic space to fit the air handler unit (which may be larger than on the existing furnace).

Solution: The program offered heat pump mini-split units as an alternative to replacing existing central HVAC systems. The mini-splits could be used in combination with the existing central HVAC system to localize air conditioning instead of conditioning the entire home when not needed.

Recommendation for Scalability: Plan to offer a mix of central heat pump HVAC equipment that varies in size to accommodate homes with limited attic space. Include options for mini-splits as an alternative solution.

Prosumer Network Simulation

Specialized Installation and Commissioning Requirements for Emerging Smart Home Energy Monitoring Hardware and Software

BAAEC Experience: The installation of prosumer monitoring nodes (eGEO CT nodes) was delayed due to the limited availability of contractors familiar with current transformer placement in complex legacy residential panels. Node design and installation required electrical contractors who understood both distributed energy resource (DER) systems and data monitoring hardware—a combination that proved rare in the local contractor market.

Solution: To minimize installation and equipment failures, the program team conducted

pre-training, provided clear instructions, and sent program staff into the field for the first day of node installations. In subsequent installations, the program team diligently ensured the nodes were transmitting data, and when they did not, the team followed up with contractors to provide feedback on incorrect or incomplete installations.

Recommendation for Scalability: This broader market challenge requires both plug-and-play nodes and, more importantly, increased exposure of various contracting trades to the installation of smart home energy monitoring hardware and software. Node installation should be paired with DER installation scopes, leveraging contractors already on-site for solar, storage, or electrification work. Program designs should include explicit scope language for node installation, commissioning, and data validation, rather than treating it as an ancillary task.

Limited Access to Real-Time Utility Meter and Device-Level Telemetry Data

BAAEC Experience: Distinct data access constraints limited the team's ability to deliver on the original real-time simulation vision

- Device Application Programming Interface (API) Access: Obtaining over-the-air API connections to DERs was cost-prohibitive or unavailable from manufacturers. Rheem did not offer a project-level API for heat pump water heaters. Tesla required expensive commercial arrangements. Sunrun/Swell inverter telemetry failed to materialize as Swell entered bankruptcy and Sunrun ended its GRID Alternatives partnership. Without device-level telemetry, the team could not enable device-specific data collection or optimization strategies.
- Utility Data Instability: Utility data access via UtilityAPI was fragile due to multi-factor authentication interruptions and customer data-sharing concerns. Not all participants had online utility accounts, language barriers on utility websites created friction, and participants had general privacy concerns about sharing data. When customers began using their DERs they moved to a different tariff, triggering the need to reset UtilityAPI data authorization.
- Lack of Electrical Distribution Grid Data: Publicly available electrical distribution grid data was limited and further information was unobtainable from Southern California Edison (SCE). Volt-voltage and reactive power (volt-VAR) sensitivity data—which is needed to assess the locational value of DER siting and operations for grid services—is not included in SCE's Integration Capacity Analysis maps.

Solution: The team diversified our methods for collecting the necessary data across these challenges. When the main service panel could accommodate current transformers, the node

takes precedence for collecting whole building data. When the panel could not accommodate the current transformers, the team used UtilityAPI.

Recommendation for Scalability: Any new smart meter deployment must be regulated in ways to remove investor-owned utility exclusivity on building data ownership and access. Additionally, programs that value and utilize direct insights from appliance level data, which is customer-owned and not contested (currently) by investor-owned utilities, should be explored for program and dynamic pricing purposes. Device manufacturers should be required to provide project-level API access as a condition of eligible equipment listing for incentive programs. Distribution grid data (including volt-VAR sensitivities) must be made available through integration capacity analysis maps to enable DER siting that supports grid services.

Absence of a Local Energy Market and Unresolved Pricing and Settlement Structures for Transactive Energy

BAAEC Experience: No local energy market exists in California through which households can directly buy and sell electricity, requiring the team to conduct a simulation rather than a live market. This constraint surfaced several unresolved structural questions that would need to be addressed before a live prosumer market could operate:

- Energy procurement charges on bills only represent one-third of the total retail rate, with the remaining two-thirds consisting of transmission and distribution (T&D) charges including line losses, reliability reserves, and planning reserves. It remains unresolved how prosumer transactions settling at the meter in real time, producing power only using the distribution grid would interact with or avoid these cost recovery mechanisms.
- A fundamental pricing mismatch exists between how prosumers are compensated and how grid-scale energy is valued. Prosumers sell at the retail price while grid-scale energy settles at the Locational Marginal Price (LMP) or Load Aggregation Point (LAP) prices, with the only exception being Participating Load that can respond directly to a California Independent System Operator (CAISO) real-time dispatch.The price signals between retail, wholesale, and the avoided cost calculator are not aligned, nor do they reflect local grid conditions. However, these are the realistic prices that can be transacted today, without the creation of a new volumetric tariff at the Community Choice Aggregation (CCA) level.
- The avoided cost calculator (ACC) adder governing export compensation for low-income participants or residents of disadvantaged communities (known as the DAC adder) was found to always exceed the LMP at the nearest pricing node—the inverse of what one might expect. The DAC adder must also be calculated separately from the PRIME rate, adding administrative complexity for program administrators and participants.

Recommendation for Scalability: The California Public Utilities Commission (CPUC) and CEC should establish a regulatory pathway for community-scale, price-bounded local energy market pilots, including clear guidance on how transactive energy settlements interact with T&D cost recovery and investor-owned utility tariff structures. A CCA may be the most viable near-term vehicle for piloting tariff-based local energy market structures.

Lack of Established Ecosystem for Data Acquisition and Transactive Energy Analysis

BAAEC Experience: Finding subconsultants with the necessary skills and reliable product offerings for hardware and software related to transactive energy required a worldwide search. Most vendors engaged were startups, either in business development stages, or as secondary business ventures. As an example, the firms Splight and DEXCO performed the work in an exploratory capacity and were not financially compensated, having been secured as partners late in the project. Ultimately Splight became unresponsive when data access challenges surfaced, requiring the project team to find new partners such as DEXCO.

Solution: The team performed enhanced due diligence on the DEXCO platform, investigated and visited their pilot project site in the Netherlands, and determined the appropriate suitability for their role in the BAAEC Prosumer Network.

Recommendation for Scalability: In order for firms to enter this market, regulatory intervention is needed to create market demand and investment incentives for these specialized vendors in smart home energy management and transactive energy platforms. Future programs should build in scope, budget, and scheduling contingency in prosumer networks, and exercise thorough vetting processes to ensure California market readiness.

Consumer and Prosumer Engagement, Education, and Data Consent

BAAEC Experience: Participant engagement challenges increased over the course of the project. Participation fatigue led some customers to decline data-sharing authorization or allow access links to expire. Language barriers on utility websites and general privacy concerns around data sharing further limited data access. Customer education on the purpose and function of the prosumer monitoring equipment never launched to the degree anticipated, due to the simulation-only scope of the project.

Solution: A multi-pronged approach allowed the project team to maintain engagement over a long and complicated data access journey. One-on-one calls, house visits, and emails were

required to navigate the investor-owned utility green button / UtilityAPI process. When customers disengaged, gift cards for data access and re-engagement helped. Where applicable, the current transformers provided the real-time data needed.

Recommendation for Scalability: Future programs should include a dedicated consumer/prosumer education component, and clearly articulated benefits as part of the enrollment process. Programs should include information on benefits that describes both general monetary benefits alongside the purpose of monitoring equipment, how data is used, and how participants benefit. Clear, multilingual data consent flows should be developed in advance, and CBOs should be engaged to support ongoing trust-building with participants.

Prosumer Network Node Physical Configuration and DER Installations

BAAEC Experience: The on-site electrical infrastructure configuration of the main service panel, sub-panels, and the required solar and battery storage current transformers have affected the prosumer monitoring node installation strategy. Oftentimes, the circuit breakers for end-use appliances were not co-located in the same main service panel, due to the installation of battery gateways or load centers.

Solution: The nodes were shipped with a three-foot cable that connected the control box of the node and the current transformer (CT). Our team ordered extension cabling to allow for more flexibility in node placement. In some cases, we also ordered larger capacity CTs where needed. In cases where contractors for Disadvantaged Communities – Single-Family Solar Homes (DAC-SASH) and SGIP had installed their own CTs for program monitoring, our team leveraged their data for the solar, storage, and main service drop, and then collected the water heater, induction range, and ancillary loads to complete the prosumer telemetry data collection process.

Recommendation for Scalability: A prosumer network node that can monitor and also control key loads in the home is the goal. It can be equipped with a cellular signal as a redundant measure to the home's internet. Because of the space and logistical installation challenges experienced in the project area, the node should concentrate on battery, heading/cooling load, hot water, and electric vehicle (EV) charging as the main loads (absent unique features like pool pumps etc). The physical connection and software controls need further investigation, but the potential for firmer and more reliable dispatching and load management is essential to utility demand-side flexibility programs (e.g., virtual power plants).

Community Solar

Site Host Commitment: Change of Site Host for Community Solar

BAAEC Experience: Delays due to the need to search for a new site host.

Solution: We searched for a new site with the help of publicly available property information and the state-funded Community Solar Opportunities Map, created by University of California, Los Angeles. Ultimately, however, the new site was identified by the community solar project developer through their industry relationships with property owners.

Recommendation for Scalability: Expand existing efforts that create programs and update regulations to increase the value of distributed solar. State agencies should ensure that there's a strong market signal for more distributed solar. In addition to an enabling regulatory environment, state agencies can partner with solar industry associations to commission research and develop tools that help quantify the opportunity. In turn, industry can undertake public campaigns that target large property owners, through which education around the opportunity to leverage available roof space can be made. By taking these steps to build the market and engage stakeholders, site hosts will be approached with clear, credible, and certain offers that they can respond and commit to.

Interconnection: Delays with Utility Interconnection Approval

BAAEC Experience: Significant delays in obtaining confirmation of SCE's interconnection Fast Track eligibility forced BAAEC to participate in two competitive solicitations (requests for offers) from the Clean Power Alliance (CPA) over a two-year period.

Solution: We invested additional project resources in a second competitive solicitation from CPA. Using the same interconnection application a year later helped to overcome this barrier.

Recommendation for Scalability: Design a flexible, two-stage competitive power procurement process through which developers can reserve the opportunity for a formal bid once utility interconnection feasibility and eligibility are confirmed. Developers can better manage the pre-development expense to the probability of securing a project power offtaker with flexible and/or staged competitive procurement. Program funding and schedule milestones should similarly allow for any flexibility that encourages developer participation. Without these changes, interconnection delays will cause projects to be either unviable and not built, or to charge more for electricity to cover the additional costs.

CPUC Community Solar Program Requirements

BAAEC Experience: The Community Solar Green Tariff (CS-GT) requires local public agencies, as the community sponsor, to work with the community to identify project site preferences and to do outreach to generate community interest in community solar, but this work was not funded. Battery storage was not allowed, reducing the value of the installation for reliability, resilience, dispatchability, and resource adequacy (RA) benefit.

Solution: BAAEC enlisted the help of the school district to serve as the project's community sponsor and used grant resources for enrollment outreach.

Recommendation for Scalability: Revise CS-GT program requirements. Although the CPUC's 2024 changes to the Community Solar Program discontinued the CS-GT model, these two issues were partially resolved through revisions to the Disadvantaged Communities Green Tariff (DAC-GT) model, which now allow for automatic enrollments and permit battery storage. More generally, the CPUC should continue to invest in community solar programs using regulatory and program implementation best practices from other states, where the market for community solar has been successful. The CEC should evaluate a finer granularity in their land use screens for urbanized and the built environment in order to maximize community scale DERs into the resource planning process. Deploying community DERs avoids transmission losses and lowers the need for rate-based capital investments that would otherwise be needed to increase grid capacity, and can be deployed faster than long-lead time assets typically required in transmission and CPUC distribution planning.

Community Solar Rules Should Leverage Demonstrated Aggregation For CAISO Interconnection

BAAEC Experience: The Project was required to comply with CAISO new resource implementation (NRI) requirements. Substantial costs and delays resulted from the process of determining the terms of agreements, and roles and responsibilities across parties, because it was being defined for the first time. The project effort took four full years, from 2021 to 2025.

Recommendation for Scalability: The CAISO minimum size has been lowered to 100kW since the time that the BAAEC Project was undergoing interconnection. However, CPUC discontinued the CS-GT program (which had no minimum project size), and only the DAC-GT remains, which has a 500kW minimum size. That change limits the number of sites that can be used for community solar and renders the CAISO change irrelevant with respect to supporting community solar interconnection under the DAC-GT program. The CPUC should not set project size limits and instead, leverage the minimum size and aggregation requirements already in place by CAISO. In

other words, the CPUC funding should not create programs that are more restrictive than the CAISO. Instead, it should act as a catalyst and build a market that supports the aggregated DER participation model enabled by Federal Energy Regulatory Commission Order 2222.

Market Support: The Bankruptcy of Sunworks, Pivot Energy's Project Installation Contractor

BAAEC Experience: This unexpected bankruptcy caused delays in completing the project and made project close-out more complicated and expensive.

Solution: BAAEC supported Pivot Energy's transition to a new contractor, Endelos Energy. Once Sunworks' bankruptcy filing concluded, Endelos Energy completed the project installation.

Recommendation for Scalability: Concerns around affordability and meeting future electricity demand are helping develop the market for demand-side solutions. State agencies must collaborate to support a strong local, decentralized, clean energy industry. Regulatory, labor, compliance, and economic development issues can be proactively supported to foster a strong market and avoid policy or other changes that have a systemic impact, such as bankruptcies and other industry contractions that cause job losses and reduced economic activity.

Microgrid Resiliency Hub

Local Government's Undefined Role in Community Energy Resilience

BAAEC Experience: The County stakeholder buy-in and decision-making process was hindered by the lack of a specific mandate to plan for local energy and community resilience.

Recommendation for Scalability: Integrate local clean energy into local government planning. In addition to engaging with zoning, land use, public space, stormwater, housing, building codes, forestry, and economic development, local governments should specifically build local energy planning capacity and support carbon-free energy projects that enhance energy resilience and affordability. Local clean energy projects, such as community microgrids and community solar, can power neighborhood-scale critical services and generate community-wide savings on customer bills. Recommendations include:

- Fund and develop internal energy planning capacity.
- Develop partnerships with organizations advocating for local clean energy.

- Establish collaboration with internal department leads responsible for addressing local energy adjacent issues, such as zoning, building codes, etc.
- Collaborate with other local governments for knowledge sharing and best practices around local clean energy. For example:
    - Types and applications of local clean energy, including information on benefits, costs, and deployment challenges
    - Technical, Policy, and regulatory obstacles
    - Availability of resources such as technical assistance, funding, and best practices
- Work within applicable Regional Energy Networks and CCAs to leverage existing programs and efficiencies.

Procurement: Lengthy, Competitive Public Procurement Process

BAAEC Experience: The County required full designs before they would put the project up for board approval. The County's strict policies around sole-source projects also create project delays.

Recommendation for Scalability: Streamline lengthy approval processes in collaboration with other public agencies.

- Develop master power purchase agreement templates with generally applicable language that can streamline the approval process, with site and project specifics in a separate addendum that can be more easily reviewed.
- CCAs, as public agencies and direct beneficiaries of the demand flexibility offered by microgrids, should lead competitive procurement and financing solutions on behalf of local governments and non-profits with community-serving facilities.
- Local governments, CCAs, or program administrators (on behalf of, for example, non-profits with community-serving facilities) should create a preapproved contractor or vendor list, share knowledge on specific procurement options, develop related language and resources (e.g., legal opinion review letter) on needed procurement paths such as sole source justification, and develop templates for letters of support addressed to the jurisdiction overseeing the project site.
- Proactively identify and address long-lead time and product availability issues.

Uncertainty Around the Host's Ongoing Responsibilities and Associated Costs

BAAEC Experience: Prior to approaching Los Angeles County, the project team had been working with a local church and with the Bassett Unified School District (BUSD) as potential hosts for the resilience hub. Both organizations cited uncertainties about public access in their explanations for leaving the project, as their operational scope did not completely align with the project's. Neither site host found the financial benefits of solar plus battery storage a sufficient compensation for the risks and responsibilities they would have assumed as the host of the Resilience Center, resulting in cancellation of the project.

Recommendation for Scalability:

- Define public use and facility access requirements from the start.
- Provide details on the ongoing operation and maintenance of the resiliency hub. Project developers must provide details on plans for the resiliency hub's operations, maintenance, and hand-off during the site and site host vetting phase. Program administrators should add an operations & maintenance (O&M) hand-off plan requirement to grant-funding opportunities. The hand-off plan would outline details on the full transition of ownership and responsibility for continued operations after the grant term length has expired. The end result would be a self-sufficient resiliency hub with established standard operating procedures and staff prepared to deploy resiliency services to the community.
- For sites operated by non-profits in the community, grant funding opportunities must support both resilience hub community-building activities year-round and the services provided during grid outages and during emergency operations. For resilience sites at municipal facilities, local governments' community services and emergency response services should be explicitly budgeted to support community resilience.

Site Host Commitment: Changes in Site Host

BAAEC Experience: The project's original community resilience center site host declined participation. The team spent substantial time and resources searching for and evaluating new sites, resulting in significant project delays.

Solution: The team worked with existing partnerships at the local school district and County representatives to identify potential new sites. BAAEC's CAC was consulted, and the team used surveys to understand site preferences. Facility and site host due diligence was used to vet potential sites and to find a viable location.

Recommendation for Scalability: Improve the evaluation rubric for identifying a resiliency center project site and vetting host commitment. There needs to be a clear economic benefit for the site host, a way to mitigate construction impacts, and a clear understanding of any ongoing site activities or constraints on the use of the site going forward. Recommendations include:

- Develop requirements for minimum building, solar, and battery size to inform economic feasibility for all parties.
- Make explicit that project sites are required to be publicly accessible and provide guidelines on preferred building types that meet these criteria, i.e. community center, library, gym.
- Establish early meetings with jurisdictions overseeing the prospective sites and outline potential barriers and challenges as well as proposed solutions. This critical path process needs to be acknowledged early on in the vetting process.
- Address showstoppers or key barriers early. Program funding should include roof assessments to determine whether rooftop solar is feasible for a potential site. Analyzing the condition of the roof, and other site conditions like barriers to battery location, and main service panel condition, prior to proceeding with further project development would prevent unexpected costs associated with replacing deteriorating roofs and performing other remediation work later in the project development timeline. Program funders may also consider including financing to replace roofs if needed.

Aligning Subject Matter Experts and Decision-Making Stakeholders

BAAEC Experience: As potentially the first solar and storage project at a County facility, we required support and buy-in from multiple County departments. Coordinating across stakeholders created project delays, without clarity on who the decision maker was for various aspects of the project.

Solution: We invested the time that was needed to build buy-in and support project development. Ultimately, delays in getting buy-in and project benefits alignment created a cascading impact that resulted in project cancellation.

Recommendation for Scalability: ***Develop strategies to strengthen stakeholder commitment as part of a standardized development process.*** Develop a stakeholder map and identify their role as well as the critical decision points they must take through a standardized project development process. Details can include:

a. Adding incentives and/or penalties to improve timely communication and coordination. For

example, should a stakeholder choose to withdraw from their role in the project, they are required to return a certain percentage of funds used back into the project pool. Binding terms could also come in the form of incentivizing stakeholders to remain committed by locking in power purchase agreement rates early on in the project development process and honoring this rate for the duration of the project regardless of any legislative changes. Another option could be to develop a clause that provides assurance that a special tariff will be applied to the resiliency hub project, guaranteeing a positive or no worse than neutral economic impact for the parties involved.

b. Program administrators could develop a "resiliency hub 101" video or guidance document covering what a resiliency hub is, what services could be provided, who will have access to the hub and when, the roles of each party in development, potential challenges, case studies from previous successes, etc.

c. Require an initial kick-off and planned critical milestone meetings with all stakeholders, both technical and administrative, to review the resiliency hub 101 training to foster discussions surrounding the commitment needed to the project and ultimately to make clear what is expected of each party before full commitment is confirmed.

d. Identify and onboard additional expertise to weigh in on project elements.

    i. Project teams should explore adding structural or electrical licensed professional engineers to the project in addition to solar and battery storage developers to cultivate a stronger understanding of the resiliency system's impact on the proposed building.

    ii. The project team should have the potential site host's building operations staff present in ongoing discussions to support communicating technical details with decision-makers.

    iii. To ensure the persistence of the resiliency hub beyond the grant term length, program administrators should establish a partnership with resiliency organizations early on in the process to provide valuable insights throughout project development and to provide workforce training for site host staff during the operations and maintenance phase.

Electric Vehicle Charging Infrastructure

Challenging Economics for Electric Vehicle Charging Infrastructure (EVI)

BAAEC Experience: EVI installation requires significant upfront costs, including permitting, utility design, construction, and equipment. These costs cannot be recuperated until well after the planning and installation phase, when revenue can finally be realized from charging sessions and California's Low Carbon Fuel Standard credits. Due to these high upfront costs, many public agency or community site hosts cannot participate in the clean transportation transition, despite their interest, unless economic assistance is provided. For the BAAEC installation, the willing site host, BUSD, was not able to provide any funding toward the EVI installations – the BAAEC grant covered all out of pocket costs.

Solution: The project team spent upfront time and resources identifying additional funding opportunities beyond the BAAEC grant. Ultimately, the decision was made to use SCE's Charge Ready program to cover the infrastructure costs so that grant funds could be used for equipment and installation labor. Utilizing Charge Ready resulted in a no-cost installation of the infrastructure, although it did not cover charging equipment.

Recommendation for Scalability: Additional EVI funding must be made available to public agencies and disadvantaged communities (DAC) to participate in the clean transportation transformation. Bridge funding is required to cover the upfront cost and make EVI accessible in DACs. Funding should also support technical assistance for under-resourced site owners throughout the process. Without this comprehensive support, public charging infrastructure will continue to be limited in DACs, reducing uptake of electric vehicles.

Identifying a No-Cost, Turnkey Electric Vehicle Supply Equipment (EVSE) Provider

BAAEC Experience: With the goal of having a no-cost offer to the site host, the BAAEC project team needed to find an EVSE partner who had a compatible business model. This delayed project implementation as the team spent time working through two partners, Greenlots (Shell Recharge) and EV Connect, whose business models did not meet the needs of BUSD, before deciding on Green Commuter/EVCS.

Solution: The team found a third partner with the right business model. EVCS was able to provide the District with a turnkey third-party-owned model that does not require any upfront funds,

minimizes administrative burdens on district staff, covers O&M, and can wait to receive the utility rebate as a form of payment. BAAEC worked with EVCS to comply with SCE's Charge Ready requirements and streamline rebate processing.

Recommendation for Scalability: We recommend promoting and vetting more turnkey business models to support EV charging with hosts that do not have the means to pay out of pocket and would otherwise not serve as hosts for disadvantaged or priority communities. Investor-owned utilities should continue funding programs such as SCE's Charge Ready and Power Your Drive (San Diego Gas & Electric) to provide streamlined utility extension work for EV charging stations.

DSA Unclear Procedures and Long Permit Review Timelines

BAAEC Experience: Unique to working with a public school district, the authority having jurisdiction for these installations is the DSA. Throughout the project, there were unanticipated delays as DSA approval was needed at more steps than were planned in the original timeline. Beyond issuing permits, DSA approves pre-construction kickoff forms and does multiple inspections throughout the construction process.

Recommendation for Scalability: A clearly defined process overview for EVI installations by DSA would be a valuable tool, allowing for more accurate and efficient planning. In addition, we advocate for streamlined EVI permitting procedures, per California Assembly Bill 1236 (2015) and Assembly Bill 970 (2021) to expedite the planning stages of these installations.

Finding Site Hosts for Electric Vehicle (EV) Chargers

BAAEC Experience: Project kick-off was delayed by the search for a willing site host. The project team spent time assessing potential sites and meeting with owners to discuss the benefits of hosting EV charging stations. This was a time-consuming process during the early stages of the project.

Solution: After adapting the program to provide a no-cost, turnkey business model, the project team reached an agreement with BUSD, an eager site host.

Recommendation for Scalability: Future projects should prepare information ahead of time on the benefits of hosting EV charging stations for potential site owners to fast-track discussions. Benefits to the site host include:

1. The opportunity to obtain charging revenue through a revenue share with the charging vendor based on charging station usage. With ten Level 2 ports per site and an estimated four hours of charging time per port each day, a typical District site could see 91,100 kWh

used per year. EVCS' agreement for revenue share with the District of $0.05 per kWh means each site could bring in an additional $4,555 annually for the school district.

2. EV charging availability can be a valuable employee benefit as staff can charge vehicles while working, making EV ownership feasible even if they live in housing without reliable charging, such as multi-unit dwellings or as renters. Workplace chargers also allow vehicle charging to be done during the day when the grid is powered by renewables, thereby reducing grid stress and greenhouse gas emissions. For employers looking to attract new talent, the offering of on-site charging may be an attractive selling point to potential employees.
3. For future projects that are installed at or near businesses that thrive on foot traffic, site hosts gain an extra benefit: EV charging stations attract customers who are likely to spend money at the establishment while they wait for their vehicles to charge. For example, gas stations may be a good site for future installations – instead of losing the business when customers switch to EVs, those same drivers can charge at the station and still purchase from the on-site convenience store. These value propositions can be shared with potential site hosts when seeking them out.

Customizing Solutions and Managing Customer Expectations

BAAEC Experience: BUSD was initially interested in Direct Current Fast Charging (DCFC) equipment, but the project team found this was more expensive, needed more utility upgrades, and the use case was not appropriate for a workplace site. The project design was changed to use Level 2 equipment instead.

Solution: The project team managed expectations with the District and provided information showing why Level 2 infrastructure is appropriate for workplaces, where vehicles sit idle for long periods of time. This participant education on new technology was consistent throughout project features.

Recommendation for Scalability: Programs must build in flexibility and funding for outreach and customer support to provide adequate solutions for the community. It is essential to balance and optimize direct customer benefits with technology features, knowing when emerging technology has a place, and when vetted and more basic options can offer reliable service that build community trust. Whether it relates to a 220V vs. 120V heat pump water heater, or a DCFC vs. a Level 2 charger, there are always tradeoffs between cost and level of service that need to be clearly articulated.

Coordination Between Multiple Parties

BAAEC Experience: With numerous stakeholders involved in decision-making at every step, the coordination of communications, reviews, and signoff was a complex undertaking. Without a playbook to follow, there was confusion over who filled the role of decision maker, meter owner, signatory, and approved recipient of construction updates across the multiple stakeholders. For example, the Van Wig school site faced significant delays during the utility construction phase because SCE contracted with an architectural and engineering firm to complete paperwork requested by the Division of the State Architect (DSA), resulting in three separate parties working on the forms, none of whom were the site host.

Solution: The team provided key facilitation and project management, consistency in communication, and careful tracking of action items that helped manage the process and reduce delays.

Recommendation for Scalability: We recommend identifying all nuanced points of communication and agreements required; the currently available utility-provided process overview does not account for many of the necessary steps, which have resulted in unexpected returns to monthly Board meetings for additional approvals. These steps can include necessary Board approval for conveyance for utility providers, site host agreements, and equipment owner contracts, as well as the authority having jurisdiction (DSA for California public school districts) approval for each step of construction along the way. For future installations, we recommend hosting a meeting with the utility service provider early in the process to review all required steps and a realistic timeline for completion. This would also be a good time to discuss common pain points and delay triggers and incorporate these into project plans.

Board Approvals Required Throughout Project When Working with a School District

BAAEC Experience: Multiple decisions required approval by BUSD's Board, causing delays (sometimes weeks long between meetings), requiring additional contextual information be developed for decision makers, and creating uncertainty at each approval point.

Recommendation for Scalability: Get a clear understanding of all required decisions and signatures as early on in the project as possible. Build time in the project schedule for the buy-in process at critical milestones and decision points, including formal Board meetings.

Public Agency Requirement of Competitive Procurement

BAAEC Experience: The school district was required to justify to their Board the lack of a competitive procurement process, due to the unique EVSE no-cost agreement facilitated through the California Energy Commission grant. This required revising the EVCS Site Host Agreement, resulting in project delays.

Recommendation for Scalability: Build competitive procurement, or documentation of rationale for lack of competitive procurement, into early Board proposals and overall steps/timeline. Local governments, CCAs, or program administrators (on behalf of, for example, non-profits with community-serving facilities) should create a preapproved contractor or vendor list, do knowledge sharing on specific procurement options, develop related language and resources (e.g., legal opinion review letters) on needed procurement paths such as sole source justification, and develop templates for letters of support addressed to the jurisdiction overseeing the project site.

Air Quality Monitoring

Local Air Quality Monitoring Requires More Resources Than Were Available to Produce Results Meaningful for Residents

BAAEC Experience: Due to differences in methodologies and length of monitoring period, neither the street-level nor the tailpipe measurements were able to be compared directly to regulatory standards set by California Air Resource Board (CARB) or South Coast Air Quality Management District for purposes of assessing regulatory compliance. Nor were we able to determine the value of local monitoring, compared to existing regional data sets, for purposes of providing residents with improved information about air quality conditions in the community. Both ambient and tailpipe monitoring companies struggled to translate their monitoring results in a way that was meaningful for the public.

Recommendation for Scalability: All aspects of any air quality monitoring effort should be planned in collaboration with air quality professionals and public health agencies. Study design should ensure that results can be compared to established public health standards, other baseline values that have relevance to human health and safety, or provide other actionable information to community members. An emphasis should be placed on translating findings into actionable data for community members. Funding and expertise for developing community-specific mitigation plans/strategies, with community feedback, that include paths for mitigation strategy implementation, must always be part of air quality monitoring.

Shared Mobility

Identifying the Community's Needs for the CarShare Program

BAAEC Experience: Despite receiving a large amount of interest from people, the program's early designs struggled to enroll participants.

Solution: The team made modifications to the initial program eligibility requirements and program design. This included reducing the EV rental fee, expanding the eligible service area, removing the requirement to install an EV charger, and no longer requiring participants who installed the EV charger to share it publicly.

Recommendation for Scalability: CarShare and other forms of zero-emissions shared mobility services are relatively new. Stakeholders interested in launching any model of smart shared mobility should evaluate existing CarShare models (for example, those tested under the Clean Mobility Options program by CARB) to understand why each model has worked and what the limitations are. Ideally, a transportation needs assessment should be conducted first, and the available program designs should be compared against community needs. Prior to finalizing a program design, a survey should be conducted in the community to get feedback on the specific elements proposed.

Home Level 2 EV Chargers Trigger Service Panel Upgrades

BAAEC Experience: There were three residents that were interested in participating in the CarShare program and installing a Level 2 EV charger at their home, but were unable to unless their main service panel was upgraded. This was either due to the panel already being at capacity, or having a panel that was unsafe to work on (e.g., Stab-lok). One of the homes was able to have their panel upgraded through the Advanced Homes program and was able to have the EV charger installed, while the other two were unable to upgrade their panels to participate.

Solution: The team upgraded one of the panels by a combination of CEC and SCE funding (through the SCE Building Electrification pilot). Once the panel upgrade was completed, the team was able to install the EV charger at the home. The other two were referred to the SCE Charge Ready Home program to leverage its funding for panel upgrades.

Recommendation for Scalability: Account for funding needed to upgrade panels before EV charger installation. Transportation electrification and building electrification programs should both support consumer education and funding for panel upgrades, when needed. Explore best practices for the use of smart load management alternatives. When the existing panel is to code and otherwise safe to remain in place, these smart 'load sharing' technologies coordinate when

and how appliances in the home draw power and can avoid a panel upgrade. If physical panel capacity for breakers is a constraint, subpanels might be an option.

Lack of Community Interest in Vanpooling

BAAEC Experience: We initially pursued EV vanpooling as a shared mobility strategy, but the community felt that the EV van (medium-duty) was difficult to drive and park. It was also difficult to find people in the community with common work destinations for the vanpool.

Solution: We modified the scope and moved away from a vanpool program, focusing on microtransit instead.

Recommendation for Scalability: Gather extensive community input before designing program models to ensure services are aligned with community needs. Develop interest and potentially pre-signups before programs are designed, seeking feedback from relevant stakeholders early and through the program design phase. New vanpools will likely be more successful when started from a common destination (e.g. a large employer's office or school campus) rather than starting from a community, for multiple reasons including having access (with permission) to employee addresses, as well as having control over a dedicated parking space and charging infrastructure.

Limited Public EV Charging Infrastructure

BAAEC Experience: Very few public chargers were available throughout the BAAEC territory, which had a direct impact on initial CarShare program designs.

Solution: We provided CarShare participants with Level 2 chargers for their homes and designed the car share program for long durations, to provide the ease of charging at home.

Recommendation for Scalability: Increase funding and technical assistance support for public EV charging infrastructure, and provide funding for electrical panel upgrades or smart load sharing technologies to allow for home charging.

Hesitation by Participants Around Sharing their Electric Vehicle (EV) charger with the General Public

BAAEC Experience: Residents liked the program offering but were unwilling to make their home EV charger accessible to the public. Likely reasons include security concerns about strangers coming to the participants' driveways and potential for vandalism to the charger or property. Potential participants were likely unfamiliar with the service value to neighbors or the potential revenue to be gained.

Solution: The team decided to remove the requirement of making home EV chargers accessible to the public, while continuing to provide the software and licensing for people to offer this option at a later time, if they choose to.

Recommendation for Scalability: The goal for the Shared Mobility program was to enroll participants in the CarShare program, not to create a pool of participants that offered their home chargers to the public. Given the lack of participants sharing their charger with the public, we may conclude that this program element was not a driver for enrollment. More work is needed to understand the customer profile that would be interested in the revenue potential from offering their home EV charger to the public.

Acronym Glossary

API - application programming interface
BAAEC - Bassett-Avocado Advanced Energy Community
BUSD - Bassett Unified School District
CAC - community advisory committee
CAISO - California Independent System Operator
CARB - California Air Resource Board
CBO - community-based organization
CCA - Community Choice Aggregation, Community Choice Aggregator
CEC - California Energy Commission
CPA - Clean Power Alliance
CPUC - California Public Utilities Commission
CS-GT - Community Solar Green Tariff
CT - current transformer
DAC - disadvantaged community
DAC-GT - Disadvantaged Communities Green Tariff
DAC-SASH - Disadvantaged Communities – Single-family Solar Homes
DCFC - Direct Current Fast Charging
DER - distributed energy resource
DSA - Division of the State Architect
EV - electric vehicle
EVI - electric vehicle infrastructure
EVSE - electric vehicle supply equipment
HPWH - heat pump water heater
LAP - Load Aggregation Point
LMP - Locational Marginal Price
O&M - operations & maintenance
PV - photovoltaic
SCE - Southern California Edison
SGIP - Self-Generation Incentive Program
volt-VAR - volt-voltage and reactive power
T&D - transmission and distribution