Complete Energy Solutions: Breaking Barriers to Electrification for Hard-to-Reach Small to Medium Businesses in Sacramento

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ABSTRACT

The Complete Energy Solutions program (CES) is a Sacramento Municipal Utility District (SMUD) initiative that incentivizes and educates small to medium businesses (SMBs) adopting electrification and energy efficiency measures. CES provides one-on-one support to replace fossil fuel equipment with heat pumps (HPs) and all-electric alternatives. Services include energy assessment, infrastructure evaluation, contractor selection, and permitting assistance.

Since TRC assumed SMUD's CES implementation in 2020, the program has evolved from a traditional energy efficiency offering into a comprehensive electrification program. Beginning in 2024, CES partnered with local chambers and property-based improvement districts (PBIDs) to engage SMB customers in electrification awareness and education. In 2025, SMUD launched a special funding initiative, Business District Electrification (BDE), that covered up to 100% of the remaining project costs for CES participants in under-resourced commercial corridors. Through this CES and BDE layering, 81 SMBs installed 149 HVAC heat pumps, 26 Heat pump water heaters (HPWHs), and additional energy efficiency measures, including kitchen electrification, lighting, and refrigeration upgrades in 2025. Beyond BDE, CES supported the installation of 336 HVAC heat pumps and 28 HPWHs across 131 businesses in 2025, exceeding annual program targets by more than 200%. This paper examines the challenges of electrifying the SMB market and the strategies CES used to overcome them. It highlights the role of incentives, education, and contractor training, program partnerships, and layered funding in creating an electrification model while strengthening engagement between SMUD and local businesses.

Introduction

Since passing the Warren-Alquist Act (California 1974), California has been at the forefront of energy efficiency in buildings and forty years later (CEC 2025), California continues to lead on building electrification (BDC 2023). Since California's pivot towards electrification in 2018 driven by Governor Brown's executive orders (Brown 2018), much progress has been made to electrify California buildings, with much of the focus centered on residential electrification. With programs like PG&E's statewide Energy Smart Homes, the California Energy Commission's (CEC) Building Initiative for Low-Emissions Development (BUILD), Technology Energy Clean Home Initiative (TECH), California Electric Homes Program and Sacramento Municipal Utility District's (SMUD) Smart Home programs electrifying thousands of existing and new construction homes since 2018, the electrification of the residential sector in California has matured.

This progress in the residential sector is evident with the adoption of 2025's Title-24 energy standards. Starting January 1, 2026, all-electric became the prescriptive pathway for residential new construction in the state (CEC 2024). With the residential electrification market maturing, utilities and regulators are shifting focus to commercial electrification.

In 2021, the SMUD Board of Directors approved a landmark Zero Carbon Plan that committed SMUD to removing carbon emissions from its power supply by 2030. It was the most ambitious clean-energy plan of any large electric utility in the United States, reflecting a flexible road map to reach an aggressive goal (SMUD 2021). Executing this plan while maintaining affordable rates and reliable electricity are SMUD's top priorities (SMUD 2021). Building electrification is a central element of SMUD's Zero Carbon Plan. While the residential sector saw early success, adoption in the commercial sector took longer to gain momentum. CES was in prime position to specifically address the SMB segment.

This paper shares the approaches that drove CES's transition from an energy efficiency program into a successful electrification program, and how layering equity funding for projects in under-resourced commercial corridors expanded participation in a market segment often left behind by traditional approaches.

Background

According to the International Panel on Climate Change, "there is a rapidly narrowing window of opportunity to enable climate resilient development," (IPCC 2022) and in recent years California has acted legislatively to not only allow, but to promote building electrification. In September 2018, three major pieces of legislation and an executive order served to further transform California's energy landscape, moving the focus towards deeper decarbonization through building electrification.

- **The 100 Percent Clean Energy Act of 2018 (SB-100):** Requires that renewable energy and zero-carbon resources supply 100% of electric retail sales to end-use customers by 2045 (Ca. SB-100).
- **Zero-Emissions Buildings and Sources of Heat Energy (AB-3232):** Requires the California Public Utilities Commission (CPUC) to assess the potential for the state to reduce the emissions of greenhouse gases in the state's residential and commercial building stock by at least 40% below 1990 levels by 2030 (Ca. AB-3232).
- **Low-Emissions Buildings and Sources of Heat Energy (SB-1477):** Requires the CEC to develop and supervise the administration of two new programs aimed at advancing the state's market for low-emission space and water heating equipment (Ca. SB-1477).
- **Executive Order 8-55-18 To Achieve Carbon Neutrality:** Establishes a statewide goal of achieving carbon neutrality as soon as possible, and no later than 2045, and maintaining net negative emissions thereafter (Brown 2018).

California legislative efforts. These efforts were followed by additional legislative actions, including Assembly Bill 1279 in 2022, Senate Bill 1221 in 2024, and Assembly Bill 39 in 2025,

further solidifying California's leadership in building electrification. AB 1279 amended the California Health and Safety Code to codify the state's goal of achieving a carbon-neutral economy by 2045. SB 1221 amended the Public Utilities Code to require the identification of priority neighborhood decarbonization zones where aging natural gas infrastructure can be retired and not replaced. AB 39, the Local Electrification Planning Act, requiring cities and counties to develop comprehensive electrification plans to support the transition away from fossil fuels.

In addition to California's legislation, SMUD has its own ambitious electrification goals. SMUD's Zero Carbon Plan roadmap is centered on four focus areas: natural gas generation repurposing, proven clean technologies, new technologies and business models, and financial impact and options (SMUD 2021). SMUD expects to achieve a reduction in carbon emissions by 90% without compromising reliability or its low rates (SMUD 2021). Eliminating the last 10% is more challenging, requiring the research and development department to find new technologies and potential program implementations. In addition, SMUD's existing customer programs, such as Advanced Home Solutions and CES, are tasked with helping customers decarbonize their homes and businesses by optimizing and managing their electricity usage and converting from gas to efficient electric equipment, like Heat Pumps.

CES Program History

SMUD started CES in 2013, with a mission to serve SMUD's approximately 30,000 SMB customers, defined as commercial customers with peak demand below 299 kW and annual utility bills under $100,000, with energy efficiency rebates which focused mostly on lighting measures. In 2020 TRC took over full implementation of the program providing program outreach and marketing, energy advisory services, project management and tracking, contractor recruitment and management, incentive verification and processing, and all program administration and reporting.

When TRC took over implementation of CES in 2020, the program began requiring energy assessments at all participating sites to ensure business owners were informed of all opportunities. TRC formalized and expanded an approved contractor network for the program allowing for more structured training, customer referrals to contractors, and contractor communication channels. With most of the initial contractor interest coming from lighting contractors, TRC focused efforts on enrolling qualified HVAC contractors into the CES contractor network.

From 2020 to 2022, CES operated as a traditional small commercial energy efficiency program with most energy savings originating from lighting projects and to a less extent, refrigeration projects. As SMUD moved forward with adoption of the Zero Carbon Plan, that focus expanded to electrification measures in 2023. As part of that expansion, CES restructured to increase electrification incentives and provide expanded contractor education and support for electrification measures.

Incentive updates in 2023. Incentives for electrification measures were updated in 2023 from an incentive based on calculated savings to a per-unit incentive for HPWHs and a per-ton installed incentive for HP HVACs. This update made the electrification component of the program easier

and more transparent for contractors to understand and sell electrification projects. The straight-forward structure lets contractors include estimated incentives in bids without verifying values.

Recognizing the challenges of encouraging contractors and business owners to adopt unfamiliar technologies, the program established a per-unit and per-ton incentive, along with permit and electrical infrastructure stipends that would bring HP installations into cost parity with a like-for-like replacement. While these increased incentive levels may not be sustainable indefinitely, they have driven the necessary initial inertia in the market to ensure that contractors are familiar with HPs and local distributors are stocking them.

Focus on contractor training. Contractor training and support focused on assuring that the contractors were comfortable with all aspects of HP installations. While most contractors were familiar with the technical installation of HPs, few installed them regularly. As a result, there was a contractor learning curve involving permitting support, equipment specification, and navigating electrical capacity constraints such as panel and transformer upgrades, that needed to be overcome.

Small to Medium Businesses

According to the US Small Business Administration (SBA) office of Advocacy, a small business is generally defined as an independent business with fewer than 500 employees, although official SBA size standards vary by industry and may also be based on annual revenue thresholds. Under the SBA's definition there are 36.2 million SMBs in the U.S., accounting for 99.9% of all U.S. businesses (SBA 2026) and employing 61.6 million people, nearly half of the U.S. workforce (Forbes 2024). The 1.3 million new small businesses opening between March 2023 and March 2024, with a simultaneous 1.1 million closing (SBA 2026), shows the volatility in the market and how many business owners' main concern is keeping the doors open. It is no surprise that a 2026 NFIB survey of 775 small business owners across the U.S. reported that 80% of business owners believe that energy costs significantly impact their business, and 80% also report that energy costs have significantly increased over the past three years. That same survey also found that 36% of business owners believe that heating and cooling are the source of their primary energy costs (NFIB 2026).

Small to medium businesses present a ripe programmatic opportunity. Small commercial buildings (<50,000 square feet) make up 95% of all commercial buildings and account for 45% of all commercial energy use, yet a *2022 ACEEE Building Electrification: Programs and Best Practices* report found that out of 42 identified utility electrification programs in the U.S., only 11 served commercial buildings, with only two programs focusing specifically on commercial buildings (Cohn and Esram 2022). Contrast this with 40 of the 42 electrification programs serving residential customers with 31 of those programs focusing solely on residential projects. This gap in electrification programs for commercial buildings coupled with the potential to reduce commercial building energy use by about 37% and greenhouse gas emissions by about 44% makes commercial electrification a ripe opportunity for utilities (Nadel and Perry 2020).

Couple this focus on residential electrification with the fact that SMB customers have traditionally been a hard-to-reach segment due "the sector's fragmentation and complexity… create many barriers that inhibit the widespread adoption of energy efficiency solutions", (NREL

2013) and it is easy to see why SMB customers present a large opportunity for electrification adoption.

Small to medium businesses need financial support. As a community-owned, not-for-profit utility, SMUD has historically partnered with its SMB customers in a variety of ways, such as promoting economic development and education. SMUD has created small business opportunities like the Supplier Education and Economic Development (SEED) vendor incentive program to help small businesses gain visibility to larger contractors as sub-contractors, which gives their bids or proposals a competitive edge. Hosting business workshops on the SMUD campus to help the local contractor base and other stakeholders with the need to learn about SMB-related topics has provided value to the business community. SMUD's focus on small business as a cornerstone of the community remains a high priority, but businesses in under-resourced commercial corridors may not be able to take advantage of SMUD's typical SMB offerings, including customer programs.

In 2018, The Brookings Institution performed a study on the economic prosperity of the Sacramento region in which they found that 32% of the region's neighborhoods had more than 20% of households living below the poverty line (Parilla, Liu, and Gootman 2018). The study notes that while the region is maintaining, it is not progressing, in part due to "racial and ethnic disparities in education and skills, employment, and community-level opportunity" (Parilla, Liu, and Gootman 2018). According to the U.S. Small Business Administration (SBA), small businesses are responsible for 61% of net new job creation since 1995 (SBA 2026). SMBs are part of the community they serve, providing jobs, healthcare, resources, and services to their fellow community members. In a study done on the impacts of small businesses on development, Blanchard, Tolbert, and Mencken (2012) noted, "Because they are investing in the local community, the local entrepreneur classes are seeking significant returns on their investments. It is in their financial interest to use their resources to maximize the efficacy of the community" (Blanchard, Tolbert, and Mencken 2012). It is imperative that these SMBs do not get left behind in the Zero Carbon Plan, not only for their own survival, but for the vast impact they will have on the neighborhoods they serve. SMUD's CES was specifically designed to serve the SMB segment, but these customers may not be able to take advantage of the electrification program offerings due to these realities.

The City of Sacramento is strongly encouraging new and retrofit builders to move to all-electric (City of Sacramento May 2024). Jurisdictional requirements can turn a costly project into an impossible project for some business owners. These under-resourced business corridors are often in older areas where the electrical infrastructure and grid are at capacity. SMUD, through CES, is working together on projects with these businesses to help the most vulnerable under-resourced neighborhoods upgrade to cleaner and more reliable technologies, with the goal of increasing inclusion and closing the disparity gap in the Sacramento region.

SMUD's Zero Carbon Plan – Leave No Community Behind

As a community-owned not-for-profit electric utility, SMUD recognizes the importance of ensuring all communities they serve can participate in a clean energy future. SMUD's Community Impact Plan formalizes the community engagement and investment strategy identified in SMUD's 2030 Zero Carbon Plan. Business District Electrification (BDE) is an

initiative of the Community Impact Plan that leverages CES to perform electrification and energy efficiency work in under-resourced commercial corridors.

Engaging and empowering SMB customers. During planning of BDE, SMUD's initial business district outreach uncovered commercial customers who lacked financial means to prioritize and participate in electrification programs. Providing CES incentives, layered with BDE funding that cover up to 100% of the cost of electrification projects, allows these customers to access electrification programs and ensure the benefits of zero carbon are distributed across all customers.

Identifying under-resourced communities. BDE utilizes SMUD's Sustainable Communities Resource Priorities Map (SMUD 2026) to identify under-resourced commercial corridors for SMUD to outreach to and deploy the CES team to conduct assessments. SMUD's mapping tool brings together a variety of data inputs that identify areas that lack access to education, healthcare, and or employment opportunities and are disproportionately burdened by negative environmental factors (SMUD 2026).[1] SMUD leverages the mapping tool to improve decision making and to guide investment to their high-need communities.

SMUD's BDE initiative focuses on under-resourced business corridors designated as high sensitivity in the Resource Priorities Map. As part of this initiative, BDE utilizes the CES program to conduct energy assessments at pre-approved sites and provide business owners with proposals for electrification and energy efficiency projects. Once approved for BDE funding, CES layers it with CES incentives to cover 100% of project costs. Focusing on individual corridors allows for coordinated and concentrated SMUD outreach efforts and efficiency gains from grouping projects that are proximate and similar. For example, replacing all rooftop HVAC units in a single strip mall rather than doing one or two units and then returning to other businesses later. BDE provides a list of pre-screened businesses within the corridor to CES, allowing the program to assign energy advisors and contractors to multiple suites in the same building or parcel creating project efficiencies at all levels to help with project cost-effectiveness.

Education and outreach efforts. SMUD partners with local Chambers of Commerce and Property-Based Improvement Districts (PBIDs), to increase education and awareness of electrification benefits for small- and medium-size customers located in under-resourced commercial corridors. Activities such as question-and-answer sessions, Meet SMUD events and SMUD-led business walks help local businesses get to know SMUD, learn about the benefits of electrification and understand the process for partnering with SMUD on an electrification project.

During the education and outreach period, SMUD and CES staff help business owners understand the participation process and general time commitment for participating in the program. This has the potential to negatively impact a business and may be a factor in deciding to pursue electrification upgrades. Providing businesses with an accurate estimate of project

[1] Data underlying SMUD's Resource Priorities Map include but are not limited to: California Opportunity Zones, Sacramento Promise Zones, SB 535 Disadvantaged Communities, American Community Survey (Sacramento Poverty), Medically Underserved Areas, Be Healthy Sacramento (Health Equity Index), Social Vulnerability Index, CalEnviroScreen 4.0, EV charging locations, tree canopy/tree equity, transportation, food access, and digital access.

timelines informs the business owner's decision of whether to undertake an electrification project.

In corridors with high proportions of non-native English speakers, itis important to offer in-language education and outreach opportunities, both in the initial SMUD outreach and during the CES energy assessment. This includes holistic translation of marketing materials and forms as well as providing native speakers to facilitate conversation between SMUD, CES or contractor representatives and business owners/workers. While translation applications can help, these translations and native speakers are key to identifying words, phrases, and messaging that will resonate with different cultural groups. Often a word-for-word translation misses the intended message and can negatively impact business electrification adoption rates.

Identifying equitable electrification opportunities. For business owners interested in installing one or more electrification measures during SMUD outreach events, their first step to participation is submitting a BDE interest form to SMUD. These forms are available in English and Spanish and guidance for business and/or building owners is available from SMUD staff (e.g., Economic Development representatives, Strategic Account Advisors or CES staff).

These interest forms serve as the entry point for these businesses into the CES program process, beginning with an energy assessment of the business. During the assessment, a CES Energy Advisor visits the business and identifies all opportunities to install electrification and or energy efficiency measures. They may also note any infrastructure needs and or safety issues that need to be addressed.

Project selection. The outcome of each CES assessment is a proposal listing all possible measures. The proposal is reviewed by SMUD (CES Program Manager and SMUD leadership) for savings, cost-effectiveness and, for situations where outside grant funding is applied, any additional grant requirements such as economic impact on the business or other non-energy benefits. Once the project is approved by both SMUD and the business owner, an agreement is created and signed by both parties. The agreement outlines customer acceptance of the layered CES and BDE incentives. At this stage, before work orders are issued to contractors, it is important for SMUD and CES to provide in-language support for business owners to make sure they understand the scope of the agreement and are responsible for understanding their possible tax liability for the project.

For business owners that do not own their own building, they must receive permission from the building owner before moving forward with the proposal. When building owner permission is not granted, SMUD will not move forward with the project or will have CES work within the boundaries of the allowable tenant improvements.

Project implementation. Once the agreement is signed, a contractor or multiple contractors, depending on project scope, are issued work order assignments by CES. While the customer signs a contract directly with the contractor for the work, the contractor receives BDE funding

for the customer's portion of the work. Once the project is completed, a post-inspection is conducted by CES to verify installation.

Findings

These findings cover the program's shift to electrification and how layering BDE and CES incentives advanced both equity and electrification.

Small and Medium Enterprise Climate Hub's (SME) 2023 international Small Business Climate Action Survey found that the top three reasons preventing SMBs from taking climate action are a lack of skills and knowledge, lack of funds, and lack of time (SME 2023). CES has successfully addressed all three of these issues to deliver a SMB electrification program that completed well over 200% of the program's 2025 electrification goals.

2025 Program Metrics

As a result of this program design, CES accomplished 126,479 avoided therms of natural gas consumption through fuel switching, of which 90% were from electrification heat pump HVAC systems (113,926 therms avoided). The program also delivered approximately 5.9 GWh of electric efficiency savings, including 1.3 GWh of cooling savings from electrification HP HVAC installations. Savings constitute the electrification installation of 336 HP HVAC units (1,758 cooling tons) and 28 HPWHs.

This disproportionate contribution to program savings from HP installations demonstrates successful market penetration in a traditionally hard to reach segment and suggests measurable program influence in shifting both customer and contactor adoption of electrification measures in lieu of like-for-like replacements.

Although SMBs are hard to reach, CES achieved 48% of its total avoided therm savings from fuel switching electrification projects among businesses with peak demand of less than 20kW. Note this business population represents only 24% of the total SMUD customer energy consumption (kWh) across all commercial rate classes (2018 savings data SMUD).

Customer Satisfaction Surveys

Customer satisfaction surveys from 2024 and 2025, during CES' shift to electrification, show how SMB participants experience the program. While most reported positive outcomes from energy savings and equipment upgrades, Table 1 suggest perception is strongly influenced by several factors, including contractor communication and the level of technical guidance provided during project development.

Table 1. Primary Themes in 2024–2025 CES Customer Satisfaction Surveys

Areas for Improvement	**Mentions***
Contractor communication	3
Documentation clarity	2
Electrification operating cost concerns	1
* Counts are approximate; many comments referenced multiple themes.	

Communication Between Contractors and SMBs

Contractor to SMB customer communication emerged as an important driver of customer satisfaction in CES participant surveys. Several participants reported challenges related to contractor responsiveness during project implementation, after installation and delays in resolving issues. When communication gaps occur, proactive engagement and technical support from program staff can help bridge the gap by clarifying expectations for customers and assuring that they feel supported throughout the project process. Program support extends beyond administrative assistance to technical guidance as SMB customers navigate unfamiliar upgrade projects.

Technical Guidance to SMBs in Electrification Projects

These survey results also indicated that SMB customers expect the program to provide technical guidance through the project process, particularly for electrification projects as customers evaluate new technologies instead of like-for-like replacements. This feedback suggests that many SMB customers are unfamiliar with HP systems and may be hesitant to accept a project without trusted third party support to evaluate project suitability. By offering technical assistance, which helps customers understand technology options, contractor coordination, infrastructure upgrade evaluations and assistance navigating permitting and utility requirements, the CES program builds customer confidence in electrification projects while reducing friction associated with adopting new technologies.

The Transition to Electrification

Since updating CES' approach and incentive structure in 2023 to focus all efforts on electrification measures, the CES measure mix has shifted dramatically. Lighting once accounted for most installed measures, but by the end of 2025 HVAC electrification dominated the program. From 2023 to 2025, the program increased HP HVAC installations by 91%, while at the same time decreasing lighting installations by 55%.

Figure 1 shows project types (Lighting and HVAC Electrification) by year, with a recognizable inflection point for HVAC electrification in 2023 coinciding with these program updates, and a steep decrease in lighting projects coinciding with the sunsetting of most (still available for BDE projects) lighting measures in 2024.

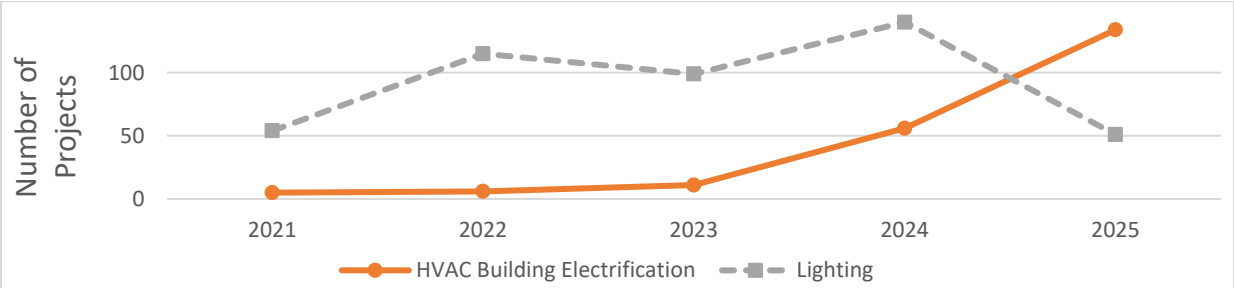

Figure 1. Number of CES Lighting and HVAC Building Electrification projects 2021-2025

BDE impacts – Performance. In 2025 CES served 81 SMBs also participating in the BDE initiative, installing 149 HPs (44% of the program volume) amounting to 601 tons of HPs installed, along with 26 HPWHs, as well as kitchen measures replacing natural gas units. These projects resulted in 48 thousand avoided therms (38% of the program's total) and paid over $1.07M in program incentives and $3.07M in BDE incentive funding to electrify businesses along under-resourced commercial corridors. These projects employed 26 different participating contractors (44% of 2025 active contractors) with 23 contractors working on multiple BDE projects.

Community impacts – Connecting with customers to bring into CES. BDE outreach starts long before the CES team enters the property. SMUD utilizes business walks, organized outreach events in which utility staff, community partners, and volunteers conduct door-to-door engagement with businesses in targeted commercial corridors. Trust can be difficult to build in these initial outreach efforts as customers view participants as solicitors or may even be concerned that they are being visited by a government official. The relationship between the customers and the Chambers of Commerce or the PBIDs can influence if a customer signs a BDE interest form. The presence of chambers and PBIDs can also aid in addressing any cultural or language barriers that may be prevalent in the community. Including translated program flyers and BDE interest forms allowed SMUD to reach every single business in a business corridor that was primarily Spanish-speaking, increasing outreach and participation in the BDE and CES programs.

Bringing awareness of potential pitfalls early in conversations with customers is important. These pitfalls may include informing customers of the potential for tax liability when receiving CES and BDE incentive funding is necessary so they can make an informed decision when signing a BDE interest form or a BDE agreement. In addition, commercial electrification projects often require coordination among tenants, property managers, and building owners, creating complexity in decision making.

Successful stories of customer impacts. Individual projects show the partnership's impact best. One example is Lil Joe's, a Sacramento restaurant that has served the community for more than seventy years. SMUD outreach and a CES assessment identified opportunities for electrification and energy efficiency measures. After previously completing lighting upgrades through CES, the business owner pursued further improvements by replacing two 5-ton gas HVAC systems and a gas water heater both with electric HP systems and smart thermostats. The HPWH was the first one installed in a kitchen facility in the Sacramento area and required the CES team to successfully navigate stringent city and county requirements. SMUD provided over $25,000 in combined CES and BDE incentives to offset project cost. Today, the business owner is a vocal supporter of the decarbonization work SMUD is doing and encourages fellow community members to engage with SMUD and CES to take action to decarbonize their businesses.

Community-serving nonprofit organizations also benefited from participation. Boys and Girl Club has supported the community in Sacramento, offering programs for children and teens to support their academic, physical, and emotional development. The property's aging infrastructure, including two gas water heaters, nine gas HVAC units, fluorescent lighting, metal halide lighting, refrigeration equipment, gas cooktops and a gas oven generated high energy costs. Their SMUD Strategic Account Advisor recommended a comprehensive energy

assessment from CES. Through a combination of CES incentives and additional BDE incentives totaling over $375,000, The Boys and Girls Club facility made all the recommended property upgrades. They installed LED lighting throughout the property, replaced two gas water heaters with HPWHs, and replaced nine gas HVAC units with energy-efficient HP systems. They completed refrigeration retrofits and converted gas cooking equipment to induction and electric replacements. The customer opted to also install three Level 2 electric vehicle chargers using their own funding. At project completion, the entire building was fully electrified.

These cases demonstrate how targeted outreach, strong contractor partnerships, and program support can translate into significant electrification success stories for customers.

BDE projects provide needed hands-on electrification training for contractors. Results from a contractor survey to the program's trade ally network in 2024 indicated more familiarity and interest in HP technologies (68% HPWH, 58% Air Source HP HVAC), but lower familiarity with grid impacts (42%) and overcoming grid capacity constraints (39%) due to installing electrification technologies. BDE projects provided participating contractors with practical exposure to projects that could potentially increase load and force them to navigate meter and service utility upgrade procedures, ensuring compliance with utility policies and processes. These fully incentivized projects function as a learn-by-doing workforce development tool, accelerating contractor competence and reducing risk aversion to HP technologies.

BDE projects drive multi-measure installations. Fully funded BDE projects have also served to increase the number of projects installing multiple measures through the program by serving as learning experience for both the contractors and the CES team. From decisions around permitting multi-measure projects, to the interactive effects of multiple measures for capacity evaluations, to roles and responsibilities for projects with multiple contractors, working on these projects has served to streamline and drive multiple measure projects into the CES program's standard projects (non-BDE).

As was expected, BDE projects have been more open to additional measures leading to a higher rate of multi-measure projects (projects installing more than one measure type) across the entire program. In 2024, when BDE was first introduced to the program, these projects averaged 1.6 measures per project and 2.3 measures per project in 2025. Leading up to the introduction of BDE, participating projects averaged only 1.2 measures per project in both 2023 and 2024 but in 2025 following the introduction of BDE the non-BDE project average increased to 1.5 measures per project. That is over 60 additional measure installations at non-BDE projects, 20% of all non-BDE measures installed in 2025. Not only are multi-measure type projects increasing but the number of contractors installing multiple measure types annually has increased from three to eleven since 2022.

Figure 2 shows secondary measures (non-lighting or HVAC electrification) project types per year. All project types increased in 2024 and then again more dramatically in 2025 except for energy efficiency (like-for-like) HVAC replacements, which was to be expected with the focus shifting to electrification. These increases in secondary measures have been driven by BDE, the program's equity component.

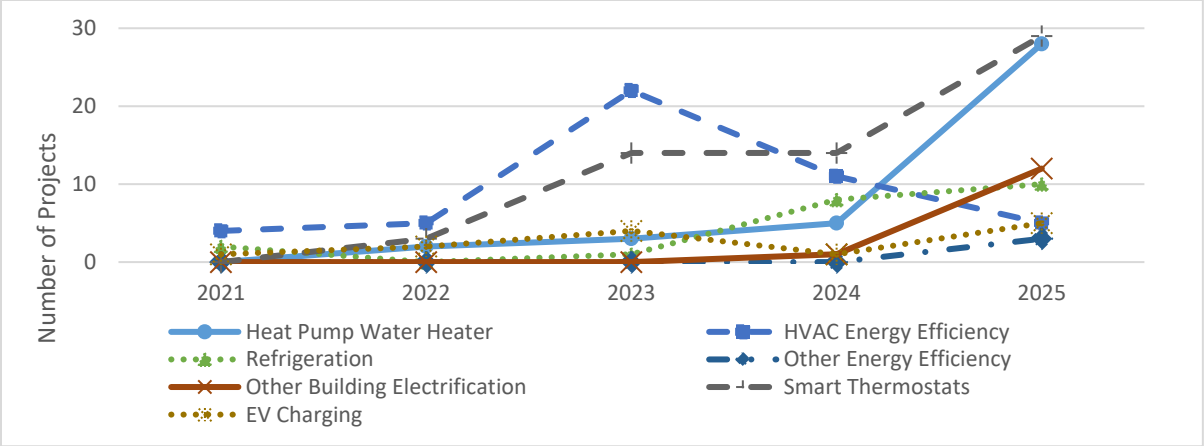

Figure 2. Number of CES projects by secondary measure type 2021-2025

Contractor education and support allow for the addition of a contractor-driven pathway. With many contractors now familiar with HP installation and the program process, the program now allows for the use of an expedited participation pathway where contractors will be able to bypass the previous required program site assessment and submit the project for incentives on their own without program staff support. This also allows the program staff to focus effort on recruiting, training and supporting new contractors, as opposed to spending time on contractors who no longer need that additional support.

The only reason the program can make this transition in approach is because of the focus over the past two years on developing a trained and educated contractor network. The program will continue to provide site assessments and full-service support for customers requesting the services and for new contractors completing their first projects as part of the program.

Recommendations

Although CES is only in its third year of electrification focus and integration of the BDE initiative, much remains to be learned, and many more buildings have yet to be electrified. Nevertheless, CES has successfully navigated this rapid transition through both the program approach and the support provided by BDE.

Program Approach Recommendations

These recommendations relate to the effective launch of, or transition to, an electrification program in the SMB space.

Recommendation 1: Increase incentive amounts. Increase incentives to provide the initial inertia needed in the market to ensure that HPs are in cost parity with like-for-like replacements. Trying to convince a contractor to install not only new technology, but new technology that is

more expensive is challenging. Achieving cost parity for HPs removes a key barrier and makes contractors more willing to install the technology.

Recommendation 2: Focus on increasing installers' understanding. Focus on installers/contractors to make them comfortable with the HP technologies and program process. Contractors that are comfortable recommending HP technologies create a pipeline of contractor driven projects that otherwise would have installed like-for-like replacements. CES accomplished this by providing education and training not only on HPs but on electrification and program participation in general. Training and education were accompanied by direct project support where energy advisors worked directly with contractors to navigate program participation, project permitting, and SMUD's capacity evaluation process. Educated, informed, and experienced contractors are now enabling CES to open a pathway for contractor-driven projects that require less program support and increase cost-effectiveness.

Recommendation 3: Simplify programs. Establish a simple straight-forward program design with clearly defined eligibility requirements based on pre-defined savings and per-unit incentives to eliminate the need for time-consuming and burdensome savings and incentive calculations. This enables contractors to more readily suggest HP measures as it allows them to present pricing including incentive impacts. Being able to easily include incentives has made contractors more likely to suggest HPs since it makes these projects more attractive to customers.

Equity Approach Recommendations

These three recommendations relate to the inclusion of an equity aspect into SMB programs.

Recommendation 1: Build relationships and trust. Leverage established community resources such as Chambers of Commerce and PBIDs, to lend credence and viability to a program coming into under-resourced business corridors. Strengthening partnerships with community resources promotes repeatability, fosters word-of-mouth referrals, and builds support for the work being done in the community. Community resources can be as valuable as an organization's own employee base. Employees living in these communities can act as ambassadors and change champions for electrification work. Develop pathways for business owners and community leaders to publicly share the benefits they experience from participation, positioning them as program supporters and advocates for electrification and a clean energy future.

Recommendation 2: Create a holistic program design strategy to meet under-resourced community needs. Develop a method to identify under-resourced business corridors, such as a resource priority map, to focus efforts and ensure efficiency by addressing multiple businesses in a dedicated outreach effort. Diversify program offerings to pair with electrification work, which can help address a business' needs holistically, such as pairing electrification with energy efficiency or electrical infrastructure work. Find ways to address non-energy benefits with electrification work, such as replacing a security light that has been out for months or a reach-in

refrigerator that dies frequently leading to stock spoilage, harming the business. Addressing real business concerns creates trust and buy-in from the business owner.

Ensure that program offers are culturally relevant. Translate marketing and program documentation appropriately and ensure that community engagement and education are relevant for the community being served. Maintain awareness of the current political landscape and how that impacts the community. Performing outreach and program assessments in a community during times of current or recent unrest can create challenges for trust building. Understand how current events impact a community and use a sensitive strategy for outreach efforts.

Develop pathways for economic development to lift SMBs up, such as business education offerings or creating networks of vendors that help SMBs gain visibility, creating opportunities for programs to come in later as the businesses are more prepared to handle the change. Building capacity for community leaders, like nonprofits, similarly will have a trickle-down effect as they serve the same communities the programs want to serve.

Recommendation 3: Understand complexities of construction. Understand the electrical infrastructure (substations and/or transformers serving) needs of the business corridor and the expected timeline to upgrade the infrastructure if needed. Having this data up front can lead to better planning of outreach efforts and good communication with potential participants. Once a project is underway, small or large, the construction will have an impact on business operations, especially if there are multiple measures. Be mindful and acknowledge this upfront with business owners during outreach, and coordinate with them and contractors to lessen that impact, which contributes to the customer's overall ability to participate, and their potential willingness to share their positive story with their community.

Conclusion

The SMB segment has historically been difficult to engage in both energy efficiency and electrification efforts, despite its important role in local economies and communities. The CES program demonstrates that utilities can transition existing programs to support a transition from energy efficiency to an electrification focused offering while continuing to deliver efficiency savings.

The CES program's findings suggest that successful SMB electrification requires more than increasing incentive levels. The program's impact came from reducing structural barriers to adoption. Contractor education, simplified incentive structures, streamlined program processes and hands on project support increased contractor and customer confidence in electrification technologies. In addition, the partnership between SMUD's CES and Business District Electrification initiatives depends on trusted community partnerships, culturally tailored outreach, and direct technical assistance alongside financial incentives. Combined, these approaches increase participation and drive adoption in underserved commercial corridors.

The work needed to ensure that no community is left behind in electrification efforts is multidimensional and requires support from all levels of the organization to be accomplished. As utilities pursue decarbonization goals, CES provides an example framework for SMB electrification that combines workforce development, simplified program delivery, community engagement, and layered incentives to accelerate market adoption. The recommendations

presented in this paper help administrators and industry stakeholders with strategies for evolving traditional energy efficiency programs to incorporate and prioritize electrification with a more integrated program design.

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