



# Prioritizing California's Affordable Housing in the Transition Towards Equitable Building Decarbonization



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The State created the California Housing Partnership (the Partnership) in 1988 as a private nonprofit organization with a public mission: to help preserve and expand California's supply of affordable homes and to provide leadership on affordable housing policy and resource issues. The California Housing Partnership is unique in combining on-the-ground technical assistance with applied research and policy leadership at the state and national level to increase the supply of affordable homes. Since 1988, the Partnership has helped more than a hundred California nonprofit and government housing agencies leverage more than \$20 billion in public and private financing, resulting in the creation or preservation of more than 75,000 homes affordable to low-income Californians.

The Partnership's Sustainable Housing team works directly with nonprofit affordable housing providers and public housing authorities to help them evaluate and finance clean energy and water improvements. This involves educating owners about the programs and opportunities for incentives available to them, as well as developing innovative demonstration projects to explore new technologies, financing tools, and business models for affordable rental homes. The Partnership's Sustainable Housing team is leading efforts to ensure that nonprofit affordable housing providers and residents are able to participate in California's path towards equitable decarbonization.

## Contributors

### **Author**

*Srinidhi Sampath Kumar, Sustainable Housing Policy and Program Manager*

### **Editors**

*Blanca de la Cruz, Sustainable Housing Program Director*

*Matt Schwartz, President and CEO*

### **Design**

*Christina Gotuaco, Director of Communications*

### **Special Thanks**

*Amélie Besson, MidPen Housing Corporation*

*Caitlin Rood, Mercy Housing*

*Carmelita Miller, The Greenlining institute*

*David Brenner, Fresno Housing Authority*

*Merrian Borgeson, Natural Resources Defense Fund*

*Rebecca Schaff, Stewards of Affordable Housing for the Future*

*Ruchi Shah, Tenderloin Neighborhood Development Corporation*

*Tom White, Eden Housing*

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*The Greenlining Institute*

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### **Facilitation**

*Michelle Vigen Ralston, CommonSpark Consulting*

*Cover Photos: Edwina Benner Plaza, MidPen Housing Corporation; National Night Out, Eden Housing.*

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# EXECUTIVE SUMMARY

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To achieve the aggressive greenhouse gas emissions reductions mandates set by the state, cities across California are considering and passing all-electric or near-all-electric building construction reach codes to curb building-level emissions and decarbonize new building stock. For these policies to be equitable, local governments and the state must recognize and address their impact on affordable multifamily rental housing providers and tenants. This report examines what should be done to ensure greater equity in decarbonization policies as they affect the provision and operation of rent-restricted low-income rental properties and the people who reside in them.

As the state grapples with a severe shortage of homes for low-income Californians, managing cost and speeding up production are dual priorities for affordable housing providers. Even before the COVID 19 pandemic-induced eviction crisis, the state faced a shortage of 1.2 million affordable rental homes. With the rates of evictions, displacement, and rental nonpayment at their highest since the 2008 financial crisis, there is not only an urgent need to preserve and create new affordable homes but also to avoid exacerbating the cost of producing and operating them.

As research by the California Housing Partnership has demonstrated, the impacts of the pandemic on top of the underlying housing crisis has disproportionately impacted Black and Brown commu-

nities, many of whom are at the brink of eviction and displacement. The energy burden and utility shut-offs faced by these communities have also skyrocketed as stay-at-home orders have led to increases in residential energy use and costs on top of losses of jobs and income. In addition to the financial impacts, communities of color have also faced higher death rates, and recent studies have indicated that long-term exposure to air pollution worsens the effects of COVID-19 among these communities.

Each natural disaster makes more evident the need and urgency for an equitable building decarbonization framework that centers and aligns with affordable housing policies. Local and state building electrification policies must be grounded in the realities of existing housing and energy burdens and address the affordable housing community's challenges.

In this context, the California Housing Partnership (the Partnership), with support from the Greenlining Institute, hosted a five-part Affordable Housing Decarbonization Summit (Summit) in October and November of 2020. The Summit's goal was to understand the barriers and solutions for affordable rental housing providers to transition from natural gas to all-electric infrastructures in an equitable manner. More than a hundred nonprofit affordable housing professionals participated, representing about forty nonprofit housing providers.





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## Key Findings and Challenges



Participants in the Summit identified the following five challenges as the primary barriers to equitably decarbonizing new and existing affordable rental housing.

1. **Increased Complexity and Cost of Technologies:** Providers pointed to the increased costs and design challenges of installing electrification technologies, including central domestic hot water heating (DHWH) systems, electric vehicle (EV) charging infrastructure, and battery storage.
2. **Limited Workforce Capacity and Availability:** Providers pointed out the difficulty of finding external contractors and internal staff knowledgeable and experienced with the procurement, installation, and maintenance of these new technologies.
3. **Cost Impacts and Financial Feasibility Implications:** Providers agreed that for new construction, initial equipment and installation costs are now comparable to gas infrastructure in the majority of situations (excluding the installation of EV charging infrastructure and upgrading or adding transformers). For existing buildings, however, they are concerned about high procurement and installation costs for new electric equipment and higher operating costs because of added electrical loads. Higher operating costs could lead to reduced net operating income and therefore less leveraged debt, thus reducing competitiveness for tax-exempt bond finance and Low-Income Housing Tax Credits (LIHTC/“Housing Credits”). Time Of Use rates and more expensive electric rates also add uncertainty about long-term operating costs in new construction and resident utility bills and operating costs in existing buildings.
4. **Exacerbated Split Incentives:** Providers noted the financial difficulties posed by paying for all-electric upgrades to existing buildings while being unable to recuperate costs through adjusted rents. Uncertainty around the future of electricity rates, solar tariffs, utility allowances, and program restrictions exacerbate this issue in existing buildings.
5. **Misaligned Energy and Housing Programs:** Providers noted a need for more energy-specific financial incentives to electrify new and existing buildings that align with existing affordable housing programs for simpler and streamlined participation. Arduous application processes and barriers to leveraging funds from multiple electrification programs are also barriers to comprehensively electrifying the building stock. Some new and existing electrification incentive programs fail to align their rules with the timelines and structures of the LIHTC program.

## KEY RECOMMENDATIONS

The Partnership developed the following policy recommendations based on the input of Summit participants:

### Fund Technical Assistance (TA)

State agencies and cities with local reach codes should coordinate with local Community Choice Aggregators (CCAs) and investor-owned utilities (IOUs) to provide funding for comprehensive TA to help nonprofit controlled affordable rental housing providers navigate the challenges of converting existing buildings to become all-electric, as they are more challenging to decarbonize. The TA should be flexible and tailored to meet the sector's specific needs, including navigating Title 24 (T24) challenges, assessing and adjusting Utility Allowances (UA), and building design concerns.

### Build Staff Capacity through Training

Policymakers overlook asset and property management staff as a critical workforce in making the transition to a decarbonized economy. These staff need help learning about newer technologies to enable informed decision-making and must be trained to monitor, maintain and fix any issues. This targeted curriculum should be part of the state and cities' decarbonization initiatives in coordination with the utilities and community college system, tailored specifically to meet the nonprofit affordable housing sector's needs.

### Create Flexibility through Interim Exemptions

If the California Energy Commission (CEC) is going to pass an all-electric T24 for 2022 and cities with all-electric reach codes, it must provide rent-restricted affordable housing providers with exemption flexibility through 2025 to avoid making affordable housing properties financially infeasible or forcing a reduction in the number of affordable homes they can build.

### Offset Higher Costs within State Housing Programs

If the state is serious about its decarbonization goals, it must work with the Treasurer's office to make sure the Tax Credit Allocation Committee (TCAC) and the California Debt Limit Allocation Committee (CDLAC) better account for the carbon reduction, improved resident health, and better indoor air quality in their competitive processes and push to contain costs. To make electrification a more feasible goal for projects funded by these agencies, TCAC should award a threshold basis boost to all-electric construction developments. CDLAC must modify its tiebreaker to give adequate weight to "public benefit efficiency," which includes fuel-switching measures for existing buildings and all-electric new construction. Alternatively, these agencies could recognize electrification benefits within their program rules while excluding clean energy costs and program incentives from development budgets and cost containment measures.

### Increase Electrification Incentive Payments

The state should explicitly allocate more funding to incentivize decarbonize in both new and existing affordable housing. It should also ensure these programs can be co-leveraged and flexible and aligned with each other and with state housing finance agency competitive requirements and timelines. Utility programs should combine TA and incentives so providers do not pay more upfront or in year one of operating costs through incentives and rate design.

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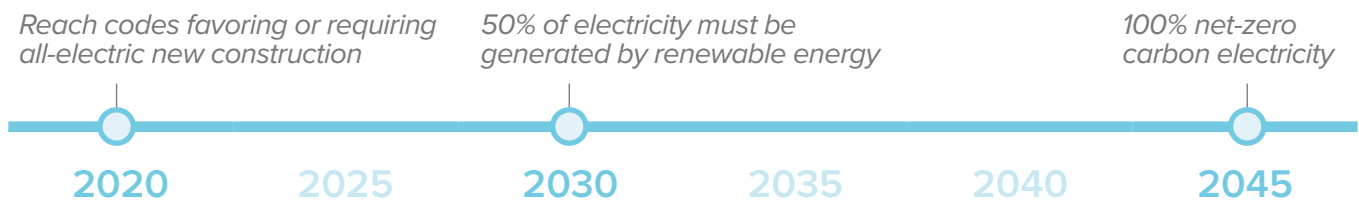
Beyond identifying these key challenges and recommendations, the report also provides comprehensive insights into these and related challenges, makes additional recommendations, and suggests areas for further research that the Partnership and its key partners will pursue under each of the topic areas.

The 2020 Summit revealed overwhelming support among nonprofit housing providers for electrifying new construction and progressing towards decarbonizing existing buildings but only if it can be done in a manner that does not effectively reduce

the number of affordable homes that providers can build and operate. For existing buildings, property budgets are already curtailed, and providers may prioritize more immediate building improvements unless the state and utilities provide adequate incentives and technical assistance. Hence, existing building decarbonization may take longer to achieve and require an increased financial and technical support. In sum, state leaders must tailor policies to meet the nonprofit affordable housing sector's needs to ensure there are no unintended consequences for lower-income households during the transition away from a reliance on fossil fuels.



# INTRODUCTION



Over the past year, 42 cities and jurisdictions have passed local building energy codes, or “reach” codes<sup>1</sup> that require new construction to be all or near electric.<sup>2</sup> While the reach codes vary in their mandates, the goal is to decarbonize or remove fossil fuels from buildings and electrify end uses which currently account for approximately 25 percent of greenhouse gas (GHG) emissions in California.<sup>3</sup> Electrifying buildings is crucial to achieving some of California’s more stringent climate goals, including returning to 1990 levels by 2020, reaching 40 percent below 1990 levels by 2030, and reaching full carbon neutrality by 2045.<sup>4</sup> Further, an increasing number of studies point to the negative impacts of gas appliances, specifically gas stoves on household health and overall air quality.<sup>5</sup> As the grid favors more electric loads, gas infrastructure elements are poised to become stranded assets, increasing gas rates for the few left behind in the transition.<sup>6</sup> As highlighted in the California Energy Commission’s (CEC) Low Income Barriers Study<sup>7</sup> and Greenlining Institute’s Equitable Electrification Framework,<sup>8</sup> clean energy policies in California have been unevenly distributed, leaving low-income Californians behind, even as they face the highest energy and housing rent burdens.

Utility shut-offs have increased 50% between 2010 and 2017, and one in four California utility customers was energy insecure. Additionally, energy and pollution burdens disproportionately impact low-income Black and Latinx households.<sup>9</sup> The COVID-19 pandemic has meant an increase in utility burdens, including increased enrollment in bill payment assistance programs as stay at home orders have led to a surge in residential energy use.<sup>10</sup> Communities of color have also faced higher death rates due to COVID-19, and a recent study indicated that long-term exposure to air pollution worsened the effects of COVID-19 among these

communities.<sup>11</sup> Further, the pandemic has exacerbated the pre-existing housing crisis in California and has disproportionately impacted Black and Brown households, many already at the brink of eviction and displacement.

Even before the pandemic, the state needed 1.2 million affordable homes to house its homeless and low-income residents.<sup>12</sup> Many low-income Californians are unable to pay their rent and are facing evictions. The California Housing Partnership (the Partnership) recently analyzed data from the U.S. Census Bureau’s Household Pulse Survey. The most recent analysis from December 2020 found that 21% of California renters (1.9 million people) were behind on rent in December, the second highest point since the survey began in April.<sup>13</sup> Renters of color were more likely to experience disproportionate housing insecurity, struggle to afford rent, and fear eviction. To equitably decarbonize buildings, the state must grapple with these acute realities of housing and energy burdens. The state should simultaneously prioritize the construction and preservation of affordable housing, mitigate climate change impacts, and do this all through the lens of racial and socioeconomic justice.

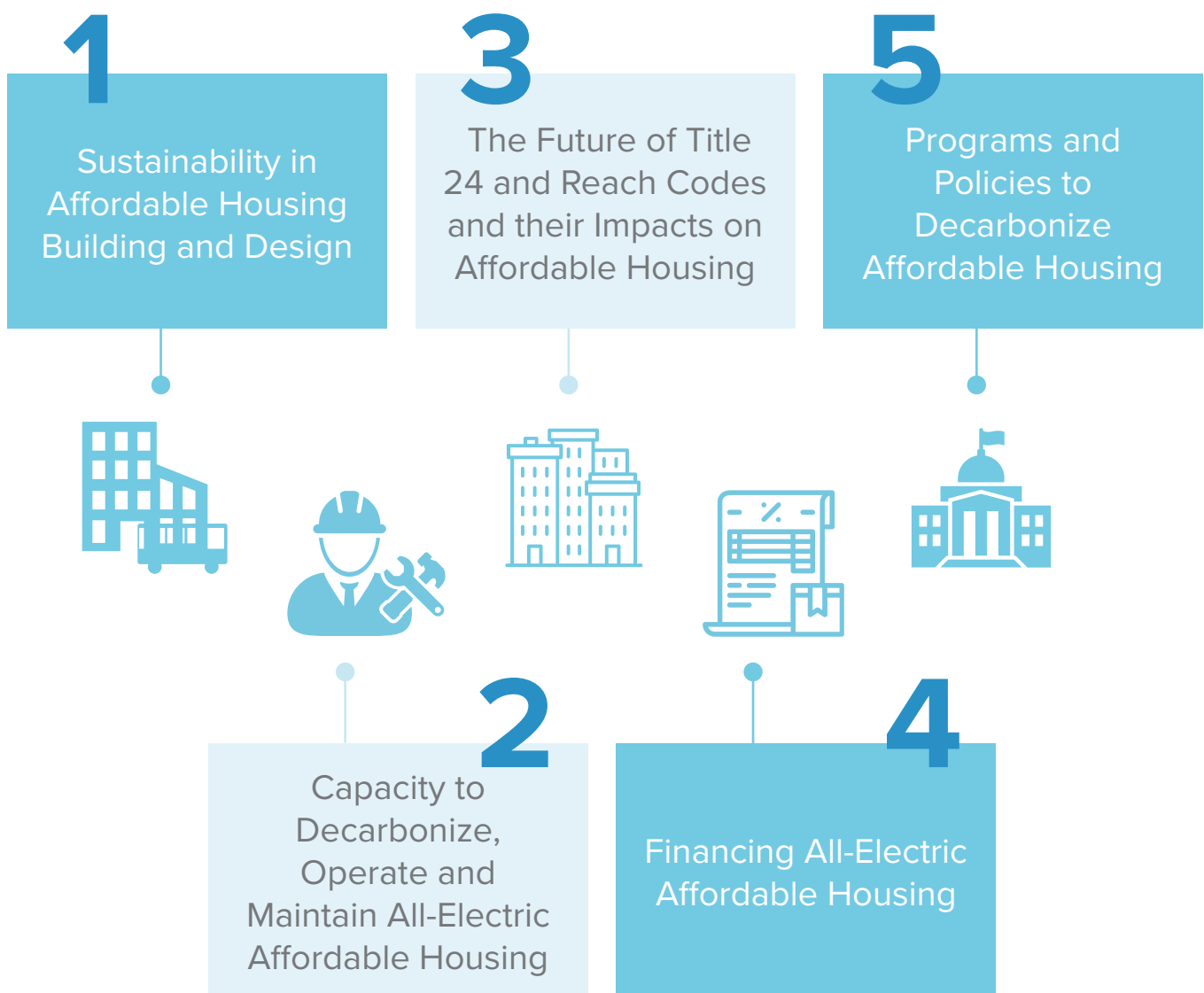
To understand the impacts of these climate-led goals on rent-restricted affordable housing<sup>14</sup> and how these policies could simultaneously address the affordability crisis, the Partnership, with support from the Greenlining Institute, hosted a five-part Affordable Housing Building Decarbonization Summit (Summit).<sup>15</sup> This report offers vital insights to inform the state’s building decarbonization policies related to deed-restricted affordable multifamily housing, which has rent restrictions. Further research is needed to understand the impacts of building decarbonization policies and programs on existing non-rent-restricted multifamily properties,



commonly referred to as naturally-occurring affordable housing (NOAHs). NOAHs serve a significant percentage of lower-income households in California.

Based on the Summit conversations, the Partnership finds that the views around building electrification differ widely among affordable housing providers.<sup>16</sup> Providers with in-house staff expertise on electrification strategies and technologies and extensive portfolios are more comfortable with all-electric mandates for new construction developments. This cohort of Providers is already developing and testing out electrification technologies in existing building rehabilitations. Overall, there was overwhelming support from the community for all-electric new construction. Providers deem it an important next step for several reasons, including improving resident health, comfort, and safety,

reducing GHG emissions, saving on long-term operating costs, protecting residents from increased future gas rates, and avoiding expensive future property rehabilitations in moving towards decarbonization too late. Providers noted the need for a more phased approach for existing buildings coupled with market and utility readiness and more financial incentives. However, providers point to several barriers that, if unaddressed, could pose a significant roadblock to equitably electrifying California's affordable rent-restricted multifamily housing. The Summit findings and recommendations that follow informs key state and local policymakers and advocates to take the necessary steps to proactively prevent inequitable outcomes and ensure that affordable housing providers can play the critical role they want to in the state's move towards a just transition away from fossil fuels.



# METHODOLOGY

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The California Housing Partnership (the Partnership), with support from the Greenlining Institute, organized the Affordable Housing Building Decarbonization Summit between October and November 2020. The Summit saw about 100 participants representing over 40 different nonprofit affordable housing organizations, including project managers, asset managers, and sustainability managers. The Summit spanned five different topics based on feedback from the Partnership's vast network of nonprofit affordable housing providers and sustainability experts.

The insights and findings from these convenings inform the entirety of this report. In addition to these conversations, the Partnership also reached out to several participants for one-on-one interviews. Despite the Partnership's outreach to create a geographically diverse set of participants for the convening, most providers were from Northern California, several were from Southern California and outlying regions, and the fewest were from the Central Valley. Some very significant issues, including labor and costs, vary significantly between regions. The topics included:

1. Sustainability in Affordable Housing Building and Design
2. Capacity to Decarbonize, Operate, and Maintain All-Electric Affordable Housing
3. The Future of Title 24 and Reach Codes and their Impacts on Affordable Housing
4. Financing All-Electric Affordable Housing
5. Programs and Policies to Decarbonize Affordable Housing

## **The goals of the Summit were to:**

- Inform and share perspectives on decarbonizing rent-restricted multi-family affordable housing in California
- Clarify and understand the nuances, challenges, and needs of this sector in the state's efforts to decarbonize
- Guide policymakers on what is needed to support the successful decarbonization of this sector

The Partnership reached out to several providers to gather cost data on new and existing buildings for all-electric versus dual-fuel buildings. Many providers whose portfolios span areas in which local reach codes require all-electric construction responded they have not been tracking those cost differences. It is harder to track and get uniform costs data in existing buildings, as it depends on each development's setup, making it harder to universalize or average costs. The Partnership also reached out to providers about prevailing wages and got more consistent data around a percent increase in development costs based on prevailing wage requirements. The Partnership has highlighted areas of further research that it plans to pursue in 2021-2022, including development costs and prevailing wage impacts. Appendix 1 maps out all of the recommendations from this report and the agencies and organizations that can execute those recommendations.

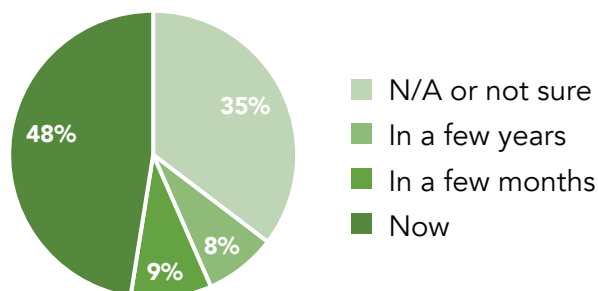
# 1. Sustainability in Affordable Housing Building and Design

During this Summit session, participants were provided a primer by the facilitator on building decarbonization. The objective was to understand what factors determine their organizations' sustainability goals and how those goals influence building design and operation, and the challenges with all-electric design.

Sustainability is a key focus for many affordable housing nonprofit developers in California due to their mission-driven work and other external factors. Among external factors are policies by housing finance agencies, state and local GHG emissions reduction goals, and building efficiency standards have effectively made sustainable new construction customary. For more than a decade, the California Tax Credit Allocation Committee (TCAC)<sup>17</sup> and California Debt Limit Allocation Committee (CDLAC) awarded points to developments using the Low-Income Housing Tax Credit (LIHTC) program for various sustainability measures, including exceeding Title 24 (T24).<sup>18</sup> Programs like the Affordable Housing and Sustainable Communities (AHSC) encourage affordable housing providers to co-locate their developments next to transit, reducing emissions through reductions in vehicle miles traveled.<sup>19</sup> Further, many

providers set organizational carbon reduction goals and other sustainability targets that can lead to overall carbon reduction across their portfolios. Given these priorities, it is not surprising that about 50% of participants noted that building decarbonization is an urgent topic for their organization, as shown in Figure 1.

**Figure 1. Participant Responses: Building decarbonization is an urgent topic for my organization.**



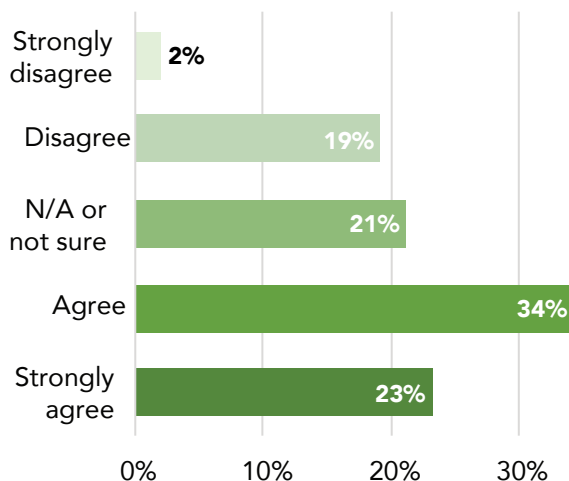
Given California's drive to decarbonize building end uses, the recent adoption of all-electric and near-electric local reach codes, and a general interest in cutting-edge design standards, most affordable housing providers have already started working on all-electric, new construction plans. However, some providers struggle to keep up with changing building standards and terms, and are still learning what building decarbonization entails.

As identified in the SB 350 barriers study, the knowledge discrepancy among organizations is directly linked to provider capacity and portfolio size.<sup>20</sup> Decarbonization policies that seek to address this sector's needs have to offer a range of tools that accommodate a spectrum of expertise and experience among providers and the diversity and size of their portfolios. Figure 2 shows that over 50% of participants' organizations had done work in building decarbonization. Over 20% of participants were unsure, and 19% of participants disagreed indicating their organization has not yet done building decarbonization work.

## Summit participants highlighted some of their organizations' priority goals:

- Reducing energy bills
- Building the greenest affordable buildings
- Promoting better indoor air quality and comfort for residents
- Boosting operational efficiency
- Integrating resiliency

**Figure 2. Participant Responses: The organization where I work has done work in building decarbonization.**



While the participants' knowledge and their organizations' experience working with building decarbonization strategies and technologies varied significantly, there was broad consensus on some of the community's critical challenges in navigating all-electric construction. Providers raised concerns about building design, resident and commercial tenant needs, utility costs, and supply chain preparedness.

Many providers noted that the space needed to install hot water heating systems with larger storage tanks was a concern. Heat pump water heaters using air sources need to be located closer to fresh air, which may not be available at larger, denser, or infill project sites due to space. Despite the ease of installing individual hot water heat pumps, many providers also noted that it does not make financial sense in the long run. They are more likely to increase the operations and maintenance (O&M) costs and the costs of replacement. Providers were also concerned about cold-water bypass issues as they relate to hot water systems. cold-water bypass issues are particularly challenging in existing buildings where gas systems are replaced with electric heat pumps without addressing existing cold-water bypass issues.<sup>21</sup> Accurately sizing systems, transformers, and switch gears to support some of these newer technologies are an ongoing challenge. In many instances<sup>22</sup> transformer sizing for all-electric resulted in project infeasibility. In existing buildings, the load capacity may not be sufficient to support replacing gas appliances. Providers

also noted a need for technologies to fit the space location and to replace like-for-like equipment. There is a need for readily available replacement parts in stock at local hardware stores.

In affordable housing, specifically LIHTC properties, gross rent equals net rent and Utility Allowance (UA).<sup>23</sup> UA schedules are meant to approximate the resident's utility consumption but their accuracy varies among the different types of UA models. For instance, the California Utility Allowance Calculator (CUAC) by TCAC uses property-specific modeled consumption. The standard UA (Standard UA) schedule issued by city and county Housing Authorities use different methodologies to calculate utility consumption averages based on their local building stock, not the property's actual or modeled utility consumption. Providers noted that they need more support to model and assess the best UA option for all-electric buildings, including support to choose between standard UA and CUAC.

Many housing authorities' Standard UA does not model for high efficiency heat pump water or space heaters and induction stoves. Often, the Standard UA assumes any electric heating to be electric resistance heating which results in higher utility allowances, not reflecting the actual energy costs for units with heat pumps. Overall, Standard UA schedules account for higher utility allowances for electric appliances than that for gas.<sup>24,25</sup> This disincentivizes providers to invest in higher efficiency electric appliances as they result in decreased rents leading to reduced operating expense and thereby lesser ability to leverage debt. While work arounds exist, they are complex and providers need technical input. Providers are unclear about the impacts of each type of UA model on the property's operating income and the resident's out-of-pocket costs. Additionally, gas rates are extremely low, and electric rates are currently higher than gas rates. Providers noted that their lower-income residents may be unable to afford increased utility bills, and if electricity rates continue to be higher than gas rates, this may further their energy burden.

Further, in existing buildings, many residents have a preference for gas for cooking. Thus, enabling residents to have the right kind of cookware is key to aiding the switch to all-electric. Some providers noted offering electric-compatible cookware as part of their new occupant "welcome package."



Low-income electrification programs – especially those targeting existing buildings – could offer this as part of their program offering. Similarly, commercial tenants of mixed-use affordable housing properties, particularly restaurants, have shown a gas preference. In new construction, providers may find it challenging to attract retail tenants in the short-run (in earlier years of transition). In existing buildings that already have long-term leases with commercial tenants, this problem can be more pronounced.

*“The goal is to stop using fossil fuels without impacting rates [electricity bills] and rents.”*

Throughout the Summit participants raised the importance of battery storage. Given the increase in extreme weather events and subsequent Public Safety Power Shut-offs (PSPS), providers pointed to the need for resiliency infrastructure to weather extreme weather-related events, as many residents are vulnerable and face health risks. Nearly all participants, including those aware of other electrification technologies, lacked knowledge in systems that can be used to power, at minimum, the common areas during emergencies and keep critical medical equipment running. Some providers lacked knowledge on existing options available to them, the technical assistance needed to navigate various options, and the funding required to support such technologies, which they perceive would be cost-prohibitive in new and existing buildings. Providers identified the lack of community solar options in California as a massive gap in achieving building decarbonization.

## Key Recommendation

### Fund Technical Assistance (TA)

State agencies and cities with local reach codes should coordinate with local Community Choice Aggregators (CCAs) and investor-owned utilities (IOUs) to provide funding for comprehensive TA to help nonprofit-controlled affordable rental housing providers navigate the challenges of converting

existing buildings to become all-electric, as they are more challenging to decarbonize. The TA should be flexible and tailored to meet the sector’s specific needs, including navigating Title 24 (T24) challenges, assessing and adjusting Utility Allowances, and addressing building design concerns.

## Other Recommendations

**1) Hire experienced consultants:** Housing providers should hire experienced key development team members:

- Consultants to model a guidance T24 and run a conceptual CUAC model to compare with the Standard UA during the design phase.
- MEP engineers with all-electric experience. If hiring an MEP with all-electric experience for the whole project is too expensive, hire one specifically to install the hot water systems.
- Architects and designers that are willing and able to offer assumptions on solar photovoltaic (PV) sizing.
- Energy analysts hired directly (vs. through the architect) to avoid an architect's design or aesthetic priorities misguiding an analyst's T24 results.
- A commissioning agent to ensure the centralized energy system is installed correctly, per design.

**2) Assemble the entire development team at the start:** It is to the providers’ advantage to assemble the entire team – from the architect and MEP/engineer to the installation contractors, energy analysts, and other experts – from the beginning, so they all understand the sustainability goals and approach for the development from the start.

## Further Research

Research EV and parking minimum requirements of affordable housing programs, state and local code requirements to help identify solutions and alternative models that connect with cleaner transportation choices for lower-income residents.

## 2. Capacity to Decarbonize, Operate and Maintain All-Electric Affordable Housing

The second session unpacked how the affordable housing sector recruits and retains the necessary workforce for its new construction, rehabilitation/ retrofit developments and the buildings' operations and maintenance (O&M). It covered how all-electric buildings may impact workforce needs, the current state of workforce availability, and what is needed to address gaps.

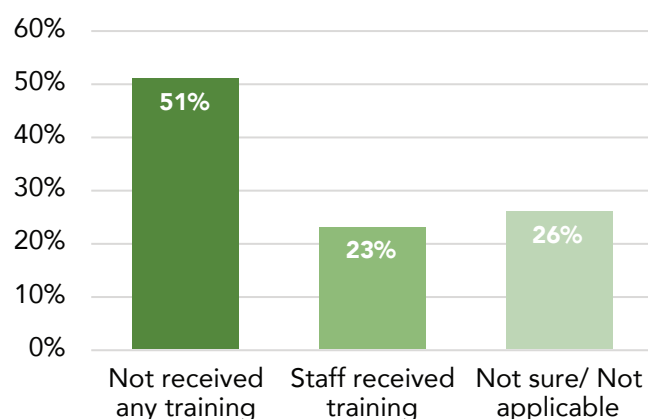
A trained workforce is crucial for the construction, management, and operations of a multifamily apartment building. The majority of affordable housing providers who participated in the Summit believe the overall workforce touching the affordable housing development is not fully ready for all-electric construction, O&M, and replacement. Project team members include the Mechanical, Electrical, Plumbing (MEP) engineers; property management staff; and other contractors. Several providers noted that they are currently in the design phase of their first potential all-electric new construction development and are unclear about both in-house staff or external consultants' readiness.

*“Be mindful of the long-term domino effect on costs: It’s one thing to build it, incorporate all these changes in the construction stage, but after a building is constructed, it must be maintained. There will be a premium for workers in higher tech building expertise areas.”*

Property management staff are needed to realize the development's decarbonization goals and ensure that the organization meets its goals in a financially feasible manner. Figure 3 high-

lights the participants' feedback regarding the training provided to building management staff for managing all-electric buildings. Over 50% of the participants noted that their property management staff had not received any training to make informed decisions around equipment choice, installation oversight, or long-term O&M. Many providers indicated that affordable housing for the O&M staff is a training ground. In-house staffing for property management is expensive and challenging to retain. Often, they are lower-paying positions, and once training is received and experience gathered, some staff leave for better-paying positions. With this higher turnover, providers lose expertise with each staff departure. Participants noted that third-party O&M and property management companies might experience less turnover, but had less clarity on the training and staff's readiness from these companies on more recent technologies. In either avenue, participants highlighted the need for internal staff to maintain, operate and fix minor issues.

**Figure 3. Participant Responses: Have you or your staff had received any training around how to operate and maintain all-electric buildings?**



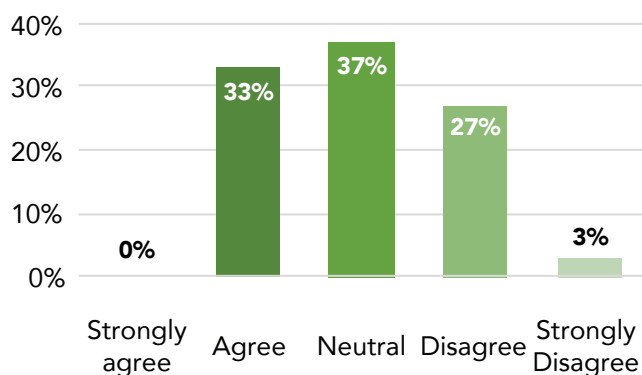
While internal O&M staff are crucial for the building's day-to-day operations, participants noted the difficulty of finding essential consultants and subcontractors to construct or rehabilitate the buildings. This development team includes architects, MEP engineers, and other subcontractors

who are familiar with and interested in working on all-electric installations. Those that are experienced with all-electric buildings charge a premium. One provider mentioned finding just two consultants to do an existing building rehabilitation project with deep decarbonization goals in San Francisco.

## “Most MEP engineers still live in the 1990s.”

Figure 4 shows the confidence of participants in the existing workforce for electrification. While no participant strongly agreed on external consultants' readiness for all-electric construction and rehabilitation, over 30% agreed that some external consultants were ready. Over 35% were neutral, and over 25% disagreed that external consultants were prepared. This is a more challenging issue for existing buildings than in new construction, where these systems are more complex to install. Many noted the importance of hiring an architect with all-electric experience and those with pre-established relationships with qualified MEP consultants. Architects must come with a set plan to contain costs and avoid costly, unanticipated change orders.

**Figure 4. Participant Responses: I am confident that the workforce is ready for all-electric buildings.**



### Note on Labor Requirements

In the conversation about the workforce, participants brought up issues they face while complying with specific labor requirements. Some providers in urban areas noted that local hiring requirements restrict consultants' pool in a market where knowledgeable consultants already seem limited. They also said that the bidding process required by

most affordable housing funding programs leads to more expensive contractors.

The impacts of prevailing wages also varied by geography. For example, several Bay Area providers noted that local housing financing requirements already mandate prevailing wages. Even on non-prevailing wage jobs, several subcontractors were demanding prevailing wages due to the general labor shortage. A provider with properties in San Francisco noted a 30-35% increase in labor costs associated with prevailing wage requirements. Providers from the Central Valley and more rural areas, meanwhile, felt “stuck” with it. Several noted that it could push up costs by 10-30%, and even more in some instances. Prevailing wage rates for rural areas' developments often default to what is set in the main metropolitan area without reflecting the median income in the area where the work is done. Prevailing wages in rural areas also discourage local hiring, due to triggering certified payroll and additional compliance mandates. This requires higher upfront costs that smaller, less established, local and minority-owned businesses find as huge deterrents. Rural developments also have trouble getting labor that will drive the distances needed.

All providers, irrespective of the geography, noted that skilled and trained labor clauses can make developments expensive or infeasible.

## Key Recommendation

### Build Staff Capacity through Training

Policymakers overlook asset and property management staff as a critical workforce in making the transition to a decarbonized economy. These staff need help learning about newer technologies to enable informed decision-making and must be trained to monitor, maintain and fix issues that arise. This targeted curriculum should be part of the state's and cities' decarbonization initiatives in coordination with the utilities and community college system, tailored specifically to meet gaps in existing knowledge, especially in the nonprofit affordable housing sector.

## Other Recommendations

### **1) Layer Expertise and Specialized Experience:**

When it is not possible to get all the expertise in one shop, providers should layer in additional expertise to advise less-experienced architects or review MEP work. Alternatively, if the MEP can cover most of the scope, providers could contract out for specialized experience for the remainder of the scope.

### **2) Hand off to Property Management Staff:**

Hand-offs between the installation and O&M staff are crucial and should be well-detailed and documented (including for PV systems). Providers could video record a walkthrough with the installer, commissioning agent, and O&M providers to capture and archive the complex details of proper setup and operation. Such recordings could be shared with property management staff and used to train newer staff.

**3) Fund External Monitoring:** Funding should be made available for external monitoring through a maintenance contract that can provide continuous feedback on the equipment's performance and track savings until the workforce is fully trained.

## Further Research

Research labor requirements already in place through various housing finance programs and the impacts of the application of prevailing wages among a few energy programs on overall project costs in California's different geographies.



### 3. The Future of Title 24 and Reach Codes and their Impacts on Affordable Housing

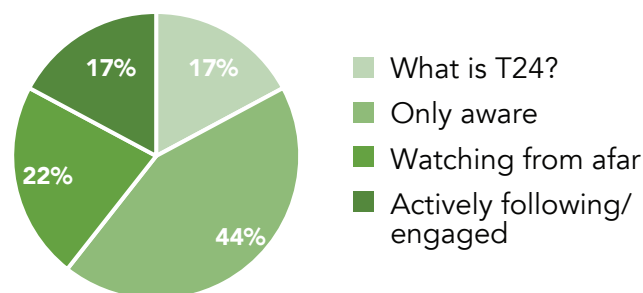
This topic covered the latest updates on Title 24 (T24) and local all-electric reach codes, what affordable housing providers need in anticipation of an all-electric T24 and local reach code, and the pros and cons of different solar options (rooftop vs. community solar vs. utility options).

Several providers with portfolios across multiple cities noted the difficulty navigating differing reach codes, sometimes even within the same county. A 2020 report published by the Turner Center for Housing and Innovation highlights that providers are concerned about local environmental standards that go beyond state standards as they increase development hard costs.<sup>26</sup> Nonprofit affordable housing providers are cash- and time-strapped, making navigating differing reach code requirements burdensome and costly. When cities pass all- or near-electric reach codes and an affordable housing development is at midstream in the design process, it exacerbates challenges for providers around development timelines, staffing needs, team capacity, project cost, and funding gaps.

In the case of the San Joaquin Valley, no jurisdiction has introduced all-electric reach codes. Providers from the San Joaquin Valley noted that the regional disparity in reach codes could lead to disparate and unintended impacts, including inequitable access to future program TA and incentives, uneven workforce experience building all-electric developments, and even exclusion of pollution-burdened communities from the benefits of building decarbonization. Providers flagged the lack of education and stakeholder outreach as part of local reach code development.<sup>27</sup>

Figure 5 shows the general awareness and engagement of the participants with the T24 process. 44% of the participants noted that they were only loosely aware of T24 and that, usually, they hired consultants to model and comply with T24 requirements. Many pointed out that the process is arduous and have found the modeling software a pain point, particularly for existing building electrification measures.

**Figure 5. Participant Responses: Familiarity with Title 24.**

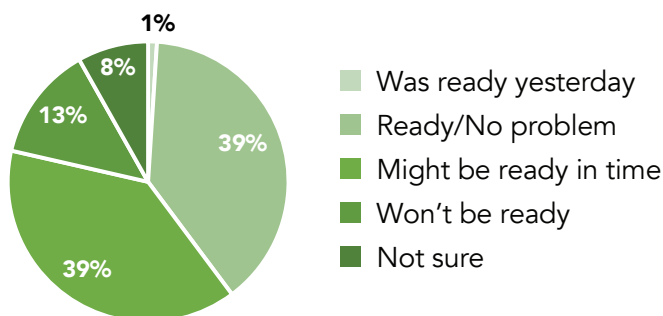


With an increased push from a wide range of advocates towards T24 requiring all-electric new construction, providers were asked about their readiness to meet such requirements. Figure 6 highlights the providers' readiness to comply with an all-electric new construction T24 for 2022. Most of the providers believe that they are either ready or might be ready in time for an all-electric T24. Providers indicated overwhelming support for a T24 requirement that required all-electric new buildings in 2022, provided that both TA and flexibility through exemptions are provided for affordable housing through 2025. Appendix 2 provides a roadmap for the timeline and affordable housing needs regarding T24 all-electric new construction mandates.

Providers expressed willingness to move towards all-electric code, but not at the expense of building fewer affordable homes. They also believe an all-electric T24 might address the issue of navigating several, disparate local reach codes. Given the 15-year rehabilitation cycle on affordable housing developments, providers are already avoiding gas infrastructure in new construction as adding gas could both complicate future rehabilitations and make them more costly.

***“We don’t have the luxury of saying it’s too difficult to decarbonize because there is a global mandate for it.”***

**Figure 6. Participant Responses: How ready are you for an all-electric new construction requirement by the end of 2022?**



*“We will not be building units based on the number of units we can build and will instead be forced to install units based on the capacity we can install.”*

Transformer sizing and electric vehicle (EV) requirements also pose a challenge for new and existing buildings. In some cases where an all-electric building required a second transformer or upsizing the existing transformer to accommodate an increased electric load, the development became financially infeasible. This is the main scenario in which the cost analysis does not favor building all-electric. Transformers are typically sized based on the building and California Green Building Standards Code (CalGreen) requirement.<sup>28</sup> However, providers encounter transformer sizing issues due to conflicting CALGreen EV requirements, affordable housing financing parking demands, and local reach codes rules. “2019 CALGreen requires that new construction and major alterations include adding ‘EV Capable’ parking spaces which have electrical panel capacity, a dedicated branch circuit and a raceway to the EV parking spot to support future installation of charging stations.”<sup>29</sup> This requirement results in expanding the transformer size appropriately “to simultaneously charge all EVs at all required EV spaces at the full rated amperage of the EV supply equipment.”<sup>30</sup> These requirements often do not support the capacity set by certain reach codes. For example, a provider of a devel-

opment in Belmont was planning an all-electric new construction. The provider learned that they would have to upsize the underground transformer if the development had to be all-electric and also comply with CALGreen EV requirements. The utility serving the site did not permit the development to underground the transformer as the site was located above an underground culvert. This site was located near a CalTrain station, making it ideal for a dense Transit Oriented Development (TOD) which reduces GHG emissions and offers other socio-economic benefits to its residents.<sup>31</sup>

The need for a new transformer or upsizing existing transformers also complicate infill developments where space is significantly constrained, and a transformer upgrade or new transformer and pre-wiring may risk reducing the number of total affordable homes able to be built within site. The same provider also cited another instance when all-electric construction became infeasible. The site for the development was in Menlo Park which was looking at raising its EV charging requirement to 100%. The added load due to the EV charging requirement would have required an upsized transformer. This had meant doubling the electrical room to handle the additional equipment which would have reduced the number of units by 40 and added costs, making the project infeasible. Menlo Park passed a resolution to exempt affordable housing communities from this requirement.



In cases where a new transformer is required, that usually means that the developer pays for a large infrastructure upgrade that serves additional buildings that may benefit from that electrical upgrade – but the cost falls only on the earliest mover. The concerns around EV requirements are due to many affordable housing developments being increasingly located close to transit and EVs are cost prohibitive for affordable housing residents. EV requirements in certain jurisdictions are a challenge and should be better tailored to meet the actual and market transformation needs of affordable housing.<sup>32</sup> These requirements do not fit tenant needs and jeopardize the number of affordable homes in new builds due to transformer size and cost. While lower income residents should participate in the clean transportation economy, alternative models, including EV car sharing – similar to a program successfully implemented by Mutual Housing – could help fill clean transportation gaps without rendering developments infeasible.<sup>33</sup> Similarly, funding programs like those offered by Sonoma Clean Power to purchase both new and second-hand EVs could also help residents afford an EV.<sup>34</sup>

Limited roof space and potential solar photovoltaic (PV) sizing limitations can also impact developments. There is a need for better ways to leverage renewable energy to stabilize energy costs and reduce California's carbon footprint. However, some providers in higher-density areas do not have the space for roofing and other central electric systems to support the all-electric needs of a building. Several providers noted the need for alternatives like community solar and local CCA renewable energy options as workarounds. Providers also noted that some local building codes and requirements stand in the way of making all-electric new construction feasible. For example, a provider who has a property in San Francisco noted that roof space for several of their sites is constricted as they are dense infill developments, and sizing and installing a right-sized PV system is often cost-prohibitive. All- or near-electric reach codes and other city-wide mandates should not be competing policies. Further, as noted in the Turner Center study, the costs and benefits of development should be assessed more broadly as the climate, and social benefits of locating a development close to transit could outweigh the GHG benefits of an all-electric building.

Providers found that many city inspectors had inconsistent knowledge, and this sometimes derailed development. This inconsistent knowledge is particularly evident while navigating T24 updates for development. City inspectors have needed additional time for approvals and review, which draws out the development timelines. With changes to T24, the state should ensure that building officials are aware and can still work with existing development timelines. Providers pointed out the need for timely responses on workarounds as any delays in the development could impact the TCAC timelines, potentially jeopardizing the whole project. Local jurisdictions need to adequately plan for permitting and planning processes to ensure their staff are up to speed on new requirements and do not cause delays for developments seeking review and approvals. Similarly, participants were concerned about utility readiness, noting that utilities need to be on-board, prepared, and supportive of a statewide all-electric mandate by anticipating what may be required.

## Key Recommendation

### Create Flexibility through Interim Exemptions

If the California Energy Commission (CEC) is going to pass an all-electric T24 for 2022 and cities with all-electric reach codes, it must provide rent-restricted affordable housing providers with exemption flexibility through 2025 to avoid making affordable housing properties financially infeasible or forcing a reduction in the number of affordable homes they can build.

### Other Recommendations

**1) Phase-in EV Requirements:** EV requirements should be phased-in statewide for affordable housing and as part of CALGreen, and not be a mandate until the market is ready to serve lower-income residents.

**2) Support Community Solar:** State policies and programs should support community solar infrastructure for high-rise infill developments

or in developments where rooftop solar is infeasible, rather than focusing only on rooftop solar mandates. Community solar can be a useful option for low-cost electricity even in properties where rooftop solar can cover some of the load.

**3) Allow for Trade-offs in Local Codes to Support Electrification:** If a local jurisdiction has an all-electric or near electric reach code, other mandates that impair going all-electric need to be made flexible. Local jurisdiction planning requirements could allow for trade-offs between building all-electric and other requirements, including setbacks, building heights, EV charging, and by-laws.

**4) Update T24 Modeling Software:** T24 modeling software needs to keep up with complex building design changes and housing industry needs around electrification technologies. The CEC could create a standardized way for approving new measures that can be adopted into the code modeling software.

### **5) Require Utilities to Pay for up to 3 Phase**

**Transformers:** Utilities should pay for up to 3 phase transformers and undergrounding of wires. There are additional panel and wiring considerations for existing buildings.

### **6) Simplify and Streamline the Utility and City**

**Inspection Processes:** Simplifying coordination and streamlining processes between utilities and local building code enforcement officials is essential for new and existing building decarbonization.

## **Further Research**

Research utility reform to ease new construction decarbonization, and provide guidance to address barriers to transformer upgrades or additional transformers and utility interconnection timelines.



## 4. Financing All-Electric Affordable Housing

This topic covered the financial and economic impacts of building new all-electric affordable housing. The goal was to understand how building all-electric may impact costs, tax credit opportunities, utility allowance calculations, and access to other programs and housing funds. It also covered tenant impacts and protection strategies. Further, it identified the effectiveness of additional private financing or potential tariffed on-bill programs.

*“Saying that all-electric new construction is at ‘no extra cost’ is a disservice to affordable housing developers. It costs more. There is a need to acknowledge that and still make it a priority because it is worth it.”*

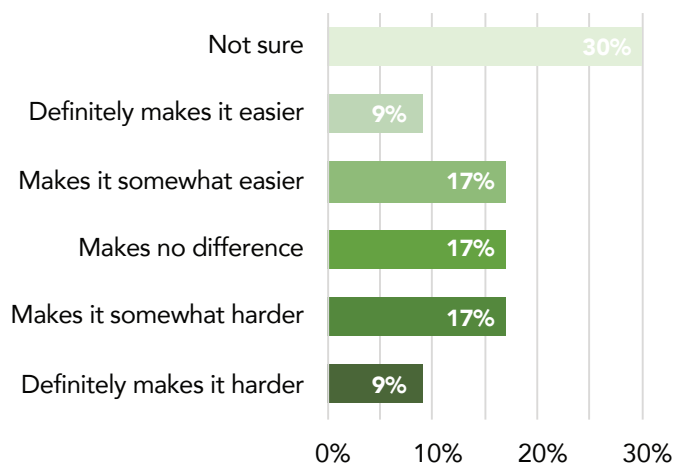
All affordable housing providers noted that their primary funding source is the Low-Income Housing Tax Credits (LIHTC) administered by TCAC. When asked if they thought building new all-electric will make it harder or easier to access these funds, participants’ responses varied. As shown in Figure 7, most participants were unsure of the impact all-electric construction would have on their TCAC application.

On whether building all-electric will make it easier or harder or make no difference, the response remained the same, with 17% voting for each of those options. Those who indicated that it would make it much harder emphasized that being an early adopter of newer technologies required higher initial upfront design and operating costs. This typically increased building costs and made the TCAC application less competitive.

To prioritize all-electric work, including for new construction developments, providers need the following market conditions:

- Neutral first costs and upfront capital costs
- Lower operating costs
- Data on lifecycle cost impacts, including replacement costs

**Figure 7. Participant Responses: Do you think building new all-electric will make it harder or easier to get a LIHTC allocation?**



Providers’ focus in developing and preserving affordable housing is always to stay within budget because it directly impacts their ability to secure funding. Many aspects of upfront and operating costs of all-electric buildings are still unknowns for many providers. For instance, the impacts of electric rate changes and time-of-use rates on building operations and residents’ bills are causing apprehension and confusion. Competitiveness for housing programs is based on cost per unit, making higher development costs more difficult to obtain a funding award. There was general group consensus that building all-electric new development pencils out in most cases. However, providers fear that any increase in the development upfront costs may negatively impact providers’ competitiveness when applying to the TCAC and California Debt Limit Allocation Committee (CDLAC)<sup>35</sup> and

create underwriting issues as well. Many of the all-electric reach codes are in cities where the costs of construction are already high, penalizing providers of affordable housing in those areas in the event of higher upfront costs. TCAC can accommodate higher costs as long as a development does not exceed its high cost test limit. Exceeding the higher cost test limit makes a project application less competitive for TCAC and significantly less competitive for CDLAC.

Nearly all providers shared concerns about adding a second transformer line or upsizing existing transformers, making all-electric construction less feasible in new construction. Some providers are often the first in the area to pay for the upgrade, which automatically enables others to more easily upgrade to all-electric. Summit participants noted the inequity of having a single provider having to bear such infrastructure costs. This means that affordable housing could end up shouldering the costs of market-rate properties electrifying.

In terms of new construction costs, Appendix 3 and 4 show a general approximation of cost differentials based on quotes received by two different providers for new construction developments in two different markets. Appendix 3 shows that the general cost to build an all-electric unit is lower than installing gas equipment. Appendix 4 shows an increase in costs for building all-electric developments. The provider who shared the contractor quotes in Appendix 4 mentioned an increase in costs of about \$13,000 per unit. However, the costs for transformer upgrades shown in Appendix 4 are not applicable to all properties. Anecdotally, participants cited a range of cost differences from an additional \$100/unit to build all-electric, all the way up to an additional \$3,000+/unit. This differential determines the feasibility of the development. As highlighted under Topic 3, San Jose has an exemption to its reach code when the cost adds more than \$400/unit.

*“Even though you can recoup your costs over time, we are in a highly competitive cost environment. Every dollar you are competing for counts.”*

There are also disadvantages for higher O&M costs that may be part of new technology because TCAC includes 15 years of O&M as part of its application.<sup>36</sup> Long-term operating costs and savings are unknown with electrification as the technologies are relatively new. To ensure that these systems are designed and installed correctly, most providers pay a premium for MEP engineers and additional commissioning and design fees. They expect these costs to go down when demand for all-electric construction increases. In addition, if the providers decide to use the California Utility Allowance Calculator (CUAC),<sup>37</sup> they need to include a CUAC consultant fee to O&M expenses.

For existing building electrification, providers need a considerable budget to update and insulate walls and windows and do energy efficiency upgrades first. Also, the budget and capital planning cycle largely determine the scope of work. Costs are an issue in existing buildings where there is a need to readjust the space to accommodate new electric systems.

Funding is key to alleviating some of these cost concerns in new and existing buildings. Many providers note the importance of more recent programs like Building Initiative for Low-Emissions Development (BUILD) that could bring down the costs for newer systems and the potentially expensive labor associated with technologies like the central heat pump hot water systems and back-up storage batteries. As long as providers include electrification work as part of a new construction or tax credit rehabilitation scope, the incentive funds would be included or accounted for in the project's total development costs. This is a much greater concern in the CDLAC bond application competition than in the TCAC 9% program. Appendix 5 provides a detailed note on how clean energy incentive funds work with TCAC and CDLAC applications.

Providers also noted the difficulty in navigating UA. The UA impacts of electrifying affordable homes are unclear. CUAC must be updated every few years, and it reduces some of the monetary value. Providers who have used or tried using CUAC noticed that it does not provide a lot of financial upside because some of the CUAC assumptions are conservative. Often, providers have to embark on a project without knowing whether CUAC is

the most appropriate model and if it will lower the UA, thereby making their upfront investment more financially feasible. Many providers look to hire a CUAC consultant who can run a conceptual CUAC. CUAC modeling as part of early-stage energy modeling is vital for providing accurate assumptions about the amount of PV to check if it is even a viable option. The consultant, once the providers solidify the design, must conduct a more detailed CUAC. These modeling and remodeling activities for CUAC cost more, pushing up development costs. The CUAC and Standard UAs set by housing authorities do not incentivize all-electric construction and are not compatible with future affordable building decarbonization efforts.

Several providers reiterated that TCAC policies should not run counter to other state programs. Overall, participants mentioned the need to address issues in criteria and competitiveness of all-electric affordable housing at TCAC and CDLAC and align TCAC and CDLAC goals with the state's sustainability goals. Providers need guarantees that costlier developments can remain competitive and affordable for TCAC applications and that there is support from utilities, program administrators, and state agencies to deal with any unanticipated impacts.

## Key Recommendation

### Offset Higher Costs within State Housing Programs

If the state is serious about its decarbonization goals, it must work with the Treasurer's office to make sure the Tax Credit Allocation Committee (TCAC) and the California Debt Limit Allocation Committee (CDLAC) better account for carbon reduction, improved resident health, and better indoor air quality in their competitive processes and push to contain costs. To make electrification a more feasible goal for projects funded by these agencies, TCAC should award a threshold basis boost to all-electric construction developments. CDLAC must modify its tiebreaker to give adequate weight to "public benefit efficiency," which includes fuel-switching measures for existing buildings and

all-electric new construction. Alternatively, these agencies could recognize electrification benefits within their program rules while excluding clean energy costs and program incentives from development budgets and cost containment measures.

## Other Recommendations

### 1) Pilot Affordable Building Decarbonization

**Efforts:** State agencies, especially the CEC, must pilot decarbonization efforts in different climate zones and track cost gaps to better inform policies for both new construction and existing buildings.

### 2) Coordinate with Local Housing Departments:

Cities with local reach codes should work closely with their housing departments early on to ensure that affordable housing priorities and needs are integrated into such reach codes.

### 3) Understand Cost-Impacts on Local Affordable Housing Stock:

Local and regional policy-makers need to perform independent cost analysis focused on affordable housing and consider the impacts of housing authorities' Standard UA schedules on furthering the split incentive to inform new electrification energy policies and programs.

## Further Research

Research and track costs in both new construction and existing buildings for gas versus electric appliances including labor costs associated. Further, research current use of CUAC and propose potential reforms.

## 5. Programs and Policies to Decarbonize Affordable Housing

This topic identified impacts of existing and proposed programs and policies intended to support electrification, energy efficiency and solar in affordable housing. It also covered best practices and cost gaps that could be addressed through newer electrification programs.

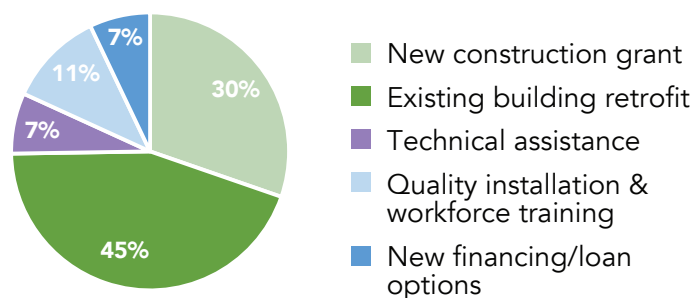
When participants were asked about the current energy efficiency and electrification programs and how helpful they were in supporting all-electric affordable housing, 63% of participants responded that they were unsure, while 37% responded that they were sort of helpful but that there were clear gaps that need to be addressed. Participants agreed that existing clean energy programs were insufficient to meet both current and future electrification needs. They concluded that climate goals function as an unfunded mandate, even as overall development and rehabilitation costs continue to go up alongside high labor and equipment costs.

*“The biggest issue is that it’s really hard to do this (electrification) without taking on debt; the rebates aren’t enough, there isn’t enough impact to make sure that it’s nearly free, if you can’t take on new debt. There needs to be larger grants, and a needs assessment associated with the overall project like roof, appliances, water heaters and so on.”*

More incentives are needed to fund building electrification technologies, especially space heating and cooling, hot water heating, solar PV and storage in both new and existing buildings. Figure

8 below shows that 45% of providers want newer electrification program funds to prioritize existing buildings. In existing buildings, it is important for providers to reduce consumption and energy through EE measures prior to pursuing electrification or solar PV. When asked about the priorities of programs to support all-electric affordable housing 30% of providers highlighted the need for program funds to reach new construction. 11% of providers noted the need for workforce training and some providers also wanted technical assistance and new financing options to be prioritized as part of newer affordable housing electrification programs. Providers shared they are least interested in financing programs especially financing programs that offer loans. Since all new financing needs to be approved by existing property lenders, it complicates loan financing making it infeasible. Providers also believe that models like Tariff On Bill Financing can still impact existing capital stack and have tax implications. The Low Income Weatherization Program (LIWP) was the most well-regarded energy efficiency and electrification program primarily because of its extensive TA offering. Many providers believe that the Self-Generation Incentive Program (SGIP) would be very useful. However, providers indicated that they do not know how to apply, and those who have applied noted that they had not received any response. SGIP funding is also limited and there is a fear that the program would not address reliability issues during PSPS events.

**Figure 8. Participant Responses: What should programs supporting all-electric affordable housing prioritize?**



Providers are aware of larger programs, but struggle to learn more about smaller and/or newer programs, especially those offered by CCAs. There is an additional interest in learning more about how electrification and other clean energy programs can actually work together. In counties and cities where CCAs are the primary energy provider, there is a desire to see more by way of free TA for electrification and programs that are administered by the CCAs. Appendix 6 provides an overview of the programs highlighted by participants and specific comments by the participants on those programs.

The split incentive issue is the most prevalent and impactful challenge to electrification programs. Providers mentioned that a lot of programs give money on the contingency of disallowing rent increases. Providers also recognized the undue burden even a marginal increase in utility costs may have on their residents and were concerned about the impacts of added loads due to electrification. They agreed that electrification programs must analyze the implications of different cost recovery options and provide guidance on how to share savings and costs. Provider's impression is that programs shifted all costs and no savings to property operations. Issues around using UA and CUAC adjustments further exacerbated the issue. Some providers noted that they master meter their properties for flexibility in managing building operations but this may not be a viable solution for all developments as it depends on the housing funding sources. Further, in master metered properties residents have no incentive to reduce usage, furthering the split incentive issue.

Other issues that came up were difficulty navigating multiple clean energy programs to comprehensively serve the property, arduous application processes for each clean energy program, program rules that do not allow for co-mingling of some of these program funds, lack of funding for service panel upgrades and misalignment with housing financing timelines owing to program rigidity.

Different program requirements are not compatible with each other and also with TCAC requirements. Participants called for a synergy between different clean energy programs by easing the application process and streamlining requirements across these programs. Participants also found that most clean energy program implementers have little to

no understanding of housing financing programs and the timelines and difficulty involved in navigating housing finance timelines. Construction timelines can be longer and can take years - a four-year clean energy program might not be long enough for some developments to participate. The length of time between the reservation letter and the incentive payment does not work well for providers. Providers also noted that with retrofits, there are increased costs associated with items like panel or roof upgrades. Most rebates are simply not sufficient for electrification as they do not cover significant allied expenses like panel and switch gear upgrades. Since they do not reduce GHG emissions, they fail to meet the cost-effectiveness test set by many programs.

*“There is also the complexity of program application for the amount of money. If they are too complicated for too little money, it makes it not worth it.”*

The group agreed that their desires for new programs and for fixing existing programs, included advocating for the following:

- Simple and clear incentive structure (similar to LIWP)
- Meaningful amount of funding to offset complicated application, reporting and other requirements, and staff time
- Alternate model that help avoid the need for new debt
- Comprehensive technical assistance (similar to LIWP)
- Alignment with housing finance timelines – so that funds are awarded and allocated along realistic timelines
- Explicit recognition and a solution to split incentive issues addressing impact on a project's bottom line and providers ability to apply for additional funding
- Flexibility to apply funding across a suite of varied retrofit costs – both soft and hard costs – for any individual project



## Key Recommendation

### Increase Electrification Incentive Payments

The state should explicitly allocate more funding to incentivize decarbonize in both new and existing affordable housing. It should also ensure these programs can be co-leveraged and flexible and aligned with each other and with state housing finance agency competitive requirements and timelines. Utility programs should combine TA and incentives so providers do not pay more upfront or in year one of operating costs through incentives and rate design.

### Other Recommendations

#### 1) Provide Higher Incentive for Existing Buildings:

Programs for existing buildings should provide higher incentive levels, with rate levels remaining the same for at least a three-year period. If electrification programs have restrictions around CUAC adjustments, those costs should be absorbed by providing higher incentives.

#### 2) Streamline Process between Electrification

**Programs:** A universal application and single point of contact that streamlines both the initial application process and coordination through the program stages could be helpful for providers that are interested in different clean energy and energy efficiency programs. This will ensure ease of participation and accessibility to these critical resources.

**3) Hire Experts for Targeted Program Marketing, Education and Outreach:** Programs that seek to support electrification of affordable housing should be designed by and marketed by organizations that have expertise in housing finance.

**4) Offer a Comprehensive Program Moving Away from Specific Measures:** Clean energy and energy efficiency programs that could be applied more generally and comprehensively to a development would be more helpful than programs that only cover a specific upgrade or piece of equipment.

#### 5) Account for Non-Energy Benefits in Program Evaluation and Metrics:

Agencies like the California Public Utilities Commission need to revamp their cost-effectiveness tests. Upgrades that are critical to electrification but expensive should still be funded using program dollars even though no direct savings are attributable to the infrastructure. Program metrics should account for the non-energy benefits of comprehensively serving a low-income unit.

#### 6) Provide Carve-Outs to Prioritize Affordable Housing:

All existing state energy efficiency and decarbonization funding programs, if not directly targeting lower income multifamily providers and residents, should have specific carve outs so providers are able to learn and apply for those programs. This is particularly true for programs that are for newer technologies like batteries and other forms of energy storage.

### Further Research

Research the impacts of current electric rates on residents and a cost-benefit share approach between providers and residents. There is a need for further inquiry and discussion around green leases or other agreements that might provide a more balanced structuring of costs and benefits when presented with incentive funds for energy upgrades.

# Note on COVID-19 Impacts

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After a year of sheltering in place due to the COVID-19 pandemic, there have been severe impacts on rent-restricted affordable housing and on-site upgrades. The pandemic is impacting all aspects of affordable housing and has pushed back some of the progress made by this sector towards all-electric construction and rehabilitation. COVID-19 has resulted in the following outcomes:

- **Impacted operations and maintenance (O&M) practices since work is limited to common areas only.** Entry into apartments is restricted except on an emergency basis. There are often work delays due to social distancing requirements, particularly if there has been a positive COVID-19 test experienced by someone in the building.
- **Delayed materials and equipment, including some appliances needed to comply with T24 and meet occupancy requirements that are in short supply.** There have also been delays for transformer upgrades needed for certain all-electric building demand.

- **Increased prices for concrete and supply chain issues that have led to difficulty in finding appliances, such as refrigerators.** There's concern that these supply chain issues will expand to impact other equipment types and may last, even after the economy generally improves.
- **Delayed timelines due to social distancing requirements.** In the event of positive tests, sites are required to shut down. There are extra costs associated with safety protocols. Most providers noted preference working with known vendors during this time.

While the intention of the Summit was to focus on existing challenges, it has been noted that providers believe that the impact of the COVID-19 pandemic on their operations could last for years unless federal and state resources are made available.

# Conclusion

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Given the implications of electrification on the overall environment; resident health, comfort and safety; and utility bills, the question no longer remains whether California should electrify its buildings. The state should focus on the how and – more importantly – on how to decarbonize equitably. An equitable building decarbonization framework that centers around the needs of the affordable housing community should include addressing the findings and the recommendations from the report. This report offers a starting point for program and policy advocacy that addresses the needs of electrification in affordable housing. The Partnership plans to pursue further research in areas that have been highlighted in the report.

Most affordable housing providers that joined the Summit are overwhelmingly supportive of electrification and understand the urgency and need to decarbonize the building stock. However, they experience several barriers to electrifying their new construction developments and significant barriers to electrifying existing buildings. Costs and implications of costs on housing financing emerged as key barriers to electrification. Electrification incentive programs that are meant to address these barriers often exacerbate the issue, either because these funding opportunities remain limited and sporadically available, or because they do not offer flexibility or alignment with housing financing programs. Lack of sufficient technical assistance to plan and design all-electric buildings and to choose the right electrification technologies are also barriers to electrification. The internal staff needed to ensure day-to-day operations and maintenance of equipment and the external staff that design and install these technologies are both limited in availability or costly.

State decarbonization policies and programs should specifically be designed to ensure that the challenges of the affordable housing community are addressed. There is a need for increased electrification incentives that comprehensively anticipate the actualized needs of affordable housing developments. Further, where possible, utilities must fund grid or service upgrades including transformer upgrades that impact new construction electrification feasibility. Electrification funding must be accompanied by comprehensive technical assistance on different aspects of planning and executing electrified new construction and on fuel-switching from gas to electric appliances in existing buildings. Training and education of affordable housing providers, their staff and residents on new technologies, their O&M, and proper use must be a key part of electrification programs. Housing finance agencies must also ensure their policies are aligned with broader state climate goals so providers who electrify their buildings can do so without being penalized or losing their competitiveness for funding allocations.

When conceived, designed and implemented thoughtfully, electrification policies can serve as a key strategy to bring down the costs of developing and preserving affordable housing. In order to do so, these policies must not be implemented in silos but with a recognition and understanding of the housing, health and energy burdens faced by lower income communities – disproportionately lower income Black and Brown households. Only then can these communities fully participate and realize the benefits of a clean energy economy.

# Endnotes

1. Reach codes are local building energy codes that go or reach beyond the state's building energy efficiency standards as defined in Title 24, Part 6 and 11, and designed by the CEC.
2. Gough, Matt. (2021). *California's Cities Lead the Way to a Gas-Free Future*. Retrieved from: <https://www.sierraclub.org/articles/2021/01/californias-cities-lead-way-gas-free-future>
3. Vukovich, J. & Delforge, P. (2018). *The Real Climate Impact of California's Buildings*. Retrieved from <https://www.nrdc.org/experts/joe-vukovich/real-climate-impact-californias-buildings>
4. State of California. (2018). *Executive Order B-55-18 To Achieve Carbon Neutrality*. Retrieved from: <https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf>
5. Seals, B. & Krasner, A. (2020). *Health Effects from Gas Stove Pollution*. Retrieved from <https://rmi.org/insight/gas-stoves-pollution-health>
6. Aas, Dan, Amber Mahone, Zack Subin, Michael Mac Kinnon, Blake Lane, and Snuller Price. 2020. *The Challenge of Retail Gas in California's Low-Carbon Future: Technology Options, Customer Costs and Public Health Benefits of Reducing Natural Gas Use*. California Energy Commission. Publication Number: CEC-500-2019-055-F.
7. California Energy Commission. (2016). *SB 350 Low-Income Barriers Study, Part A - Commission Final Report*.
8. Greenlining Institute. (2019). *Equitable Building Electrification: A Framework for Powering Resilient Communities*. Retrieved from [http://greenlining.org/wp-content/uploads/2019/10/Greenlining\\_EquitableElectrification\\_Report\\_2019\\_WEB.pdf](http://greenlining.org/wp-content/uploads/2019/10/Greenlining_EquitableElectrification_Report_2019_WEB.pdf)
9. Office of Environmental Health Hazard Assessment California Environmental Protection Agency. (2018). *Analysis of Race/Ethnicity, Age, and CalEnviroScreen 3.0 Scores*. Retrieved from <https://oehha.ca.gov/media/downloads/calenviroscreen/document-calenviroscreen/raceagece-s3analysis.pdf>
10. California Public Utilities Commission (CPUC). (2020). *CPUC Workshop on COVID Impacts on Customers in the Energy Sector*. Retrieved from <https://www.cpuc.ca.gov/covidworkshop/>
11. Harvard School of Public Health. *Coronavirus and Air Pollution*. Retrieved from <https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/>
12. California Housing Partnership. (2021). *California Affordable Housing Needs Report 2021*. Retrieved from <https://chpc.net/resources/california-affordable-housing-needs-report-2021/>
13. California Housing Partnership. (2021). *COVID-19 Housing Fragility Data Findings*. Retrieved from [https://1p08d91kd0c03rlxhmhtydp-wpengine.netdna-ssl.com/wp-content/uploads/2021/01/CV19HousingFragility-ByRace2021\\_01\\_07.pdf](https://1p08d91kd0c03rlxhmhtydp-wpengine.netdna-ssl.com/wp-content/uploads/2021/01/CV19HousingFragility-ByRace2021_01_07.pdf)
14. For the purpose of the Summit and this report, affordable housing is rent-restricted and regulated multifamily housing. It does not include the non-rent restricted homes where several lower income Californians live without housing security.
15. For the purpose of the Summit and this report, building decarbonization is limited to building electrification and does not delve into sustainable building materials.
16. For this report's purpose, providers are nonprofit affordable housing representatives, including project managers, sustainability managers, and asset managers.
17. TCAC facilitates the investment of private capital into the development of affordable rental housing. It allocates federal and state tax credits through the LIHTC program to affordable housing providers. LIHTC has 9% and 4% tax credit programs, and both applications are points-based. The 4% program is paired with tax-exempt bonds, while the 9% program is highly competitive. While the 4% tax credits are noncompetitive, recent changes to the way tax-exempt bonds are allocated have made the 4% program competitive. Development costs have a huge bearing on the overall score of an application.
18. TCAC updates its guidelines every year and, as part of its 2020 guidelines, it removed the Sustainable Building Methods (SBM), which awarded points for certain sustainability work. This generated intense discussion among providers about the impact and relevance of the sustainable building method points. Some participants voiced removing those points would make TCAC irrelevant for electrification purposes. However, others argued that the program would drive toward all-electric over time regardless as the only cost-effective option.
19. In the most recent AHSC guidelines, the AHSC program has proposed points for developments going all-electric and installing technologies like central domestic hot water heating systems.
20. *SB 350 Barriers study*.
21. The California Housing Partnership & Association of Energy Affordability (AEA). (2020) *California Crossover: Testing Solutions and Assessing Savings for Water and Energy in Low-Income Multifamily Affordable Housing*.

- Retrieved from <https://chpc.net/resources/crossover-testing-solutions-and-assessing-savings-for-water-and-energy-in-low-income-multifamily-affordable-housing/>
22. A few providers who have had experience doing all-electric new construction noted this to be an issue during the Summit. Data on what infrastructure the utilities could cover and when would help to understand the severity of the problem and explore policies that could mitigate this problem.
  23. The California Housing Partnership & National Housing Law Project (NHLP). (2016). An Affordable Housing Owner's Guide to Utility Allowances. Retrieved from: [https://chpc.net/wp-content/uploads/2016/04/UA-Guide\\_April-2016Web.pdf](https://chpc.net/wp-content/uploads/2016/04/UA-Guide_April-2016Web.pdf)
  24. Los Angeles County Development Authority. (2020). Los Angeles County Development Authority Utility Allowance Schedule. Retrieved from [https://wwwb.lacda.org/docs/default-source/default-document-library/ua-2020-schedule-ps.pdf?sfvrsn=2a9993bd\\_2](https://wwwb.lacda.org/docs/default-source/default-document-library/ua-2020-schedule-ps.pdf?sfvrsn=2a9993bd_2)
  25. City of Los Angeles. (2018). City of Los Angeles Utility Allowances Based on the Number of Bedrooms. Retrieved from <https://home.hacla.org/Portals/0/Attachments/S8/Util-12-1-18MFR.pdf?ver=2018-11-30-130348-827>
  26. Reid, Carolina. (2020). The Costs of Affordable Housing Production: Insights from California's 9% Low-Income Housing Tax Credit Program. Terner Center for Housing and Innovation. Retrieved from [https://ternercenter.berkeley.edu/wp-content/uploads/pdfs/LIHTC\\_Construction\\_Costs\\_March\\_2020.pdf](https://ternercenter.berkeley.edu/wp-content/uploads/pdfs/LIHTC_Construction_Costs_March_2020.pdf)
  27. The City of San Francisco's education and outreach process came up as a positive example of a local reach code.
  28. Part 11 of T24 (California Building Standards Code) is the CalGREEN requirement. It is California's mandatory green buildings code.
  29. City of Sacramento. (2019). EV Guide. Retrieved from [https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Electric-Vehicles/EV\\_Guide-Updated-April-2020.pdf?la=en#:~:text=The%202019%20California%20Green%20Building,to%20support%20future%20installation%20of](https://www.cityofsacramento.org/-/media/Corporate/Files/Public-Works/Electric-Vehicles/EV_Guide-Updated-April-2020.pdf?la=en#:~:text=The%202019%20California%20Green%20Building,to%20support%20future%20installation%20of)
  30. City of Santa Clarita Building & Safety Division. (2019). 2019 CALGreen Code Residential Mandatory Measures <https://www.santa-clarita.com/Home/ShowDocument?id=18081>
  31. TransForm and California Housing Partnership. (2014). Why Creating and Preserving Affordable Homes Near Transit is a Highly Effective Climate Protection Strategy. Retrieved from <https://www.transformca.org/sites/default/files/CHPC%20TF%20Affordable%20TOD%20Climate%20Strategy%20BOOKLET%20FORMAT.pdf>
  32. A provider voiced concern that a 40 amp per stall requirement is needed for fast charging but unnecessary for an overnight residential parking stall.
  33. Furillo, A. (2019). Free EV Program Takes Hold at Mutual Housing. Retrieved from <http://www.mutualhousing.com/free-ev-program-takes-hold-mutual-housing/#:~:text=The%20car%20share%20program%20is,program%20manager%20for%20Breathe%20California.>
  34. <https://sonomacleanpower.org/programs/drive-ev>
  35. CDLAC allocates tax exempt bonds for the 4% program and provides the guidelines for the 4% program.
  36. TCAC looks at a 15 year pro forma and requires that the development show a positive cash flow for the whole period. To the extent a development has higher operating costs, the sponsor usually addresses that by reducing their debt service (i.e., getting a small mortgage and therefore needing additional subsidy) to keep a positive cash flow. If the development will not have hard debt, it has to get an additional operating subsidy to offset the higher costs.
  37. CUAC is a method of calculating UA that is designed to ensure that it is more representative of resident utility consumption than other UA models. CUAC needs to be updated yearly to reflect changes to utility rates and advances in energy-efficiency technologies. CUAC can also be used only in limited scenarios. This includes new construction and existing LIHTC developments where solar PV is added through the Multifamily Affordable Solar Housing (MASH) program.



# APPENDICES

1. Matrix of Key Recommendations Per Agency
2. Roadmap to Electrifying Affordable Housing
3. Sample: Estimated Electrification Costs for Upcoming Developments in San José, California
4. Sample: New Construction Electrification Quote from a Bay Area General Contractor
5. CDLAC and TCAC Considerations
6. Clean Energy and Energy Efficiency Programs Highlighted by Summit Participants

## Matrix of Key Recommendations Per Agency

- **Provider** = Affordable Housing Providers (Property Owners and Operators)
- **TCAC** = California Tax Credit Allocation Committee
- **CDLAC** = California Debt Limit Allocation Committee
- **CPUC** = California Public Utilities Commission
- **CEC** = California Energy Commission
- **Utility/CCA** = Utility Companies/ Community Choice Aggregations
- **Local Govt** = Cities, Local Government Agencies and Officials
- **PA** = Program Administrators, Implementors and Regional Energy Networks

### Key Recommendations

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/ CCA	Local Govt	PA
Build staff capacity through training	●			●	●	●	●	●
Fund technical assistance (TA)				●	●	●	●	●
Increase electrification incentive payments				●	●	●	●	●
Offset higher costs within state housing programs		●	●					
Create more flexibility through interim exemptions					●		●	

## Recommendations: TOPIC 1

### Sustainability in Affordable Housing Building and Design

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/ CCA	Local Govt	PA
Hire experienced consultants	●							
Assemble the whole development team at the start	●							

## Recommendations: TOPIC 2

### Capacity to Decarbonize, Operate and Maintain All-Electric Affordable Housing

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/ CCA	Local Govt	PA
Fund external monitoring				●	●	●	●	●
Hand off to property management staff	●							
Layer expertise and specialized experience	●							

### Recommendations: TOPIC 3

#### The Future of Title 24 and Reach Codes and their Impact on Affordable Housing

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/ CCA	Local Govt	PA
Simplify and Streamline Utility and Inspection Process				●	●	●	●	
Support community solar				●	●	●	●	
Phase-in EV requirements					●		●	
Cover Cost Differentials when Passing Reach Code Midstream						●	●	
Require Utilities to Pay for up to 3 Phase Transformers				●		●		
Update T24 Modeling Software					●			
Allow for Trade-offs in Local Codes to Support Electrification							●	

## Recommendations: TOPIC 4

### Financing All-Electric Affordable Housing

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/CCA	Local Govt	PA
Understand Cost Impacts on Local Affordable Housing Stock				●	●	●	●	●
Pilot Affordable Building Decarbonization Efforts					●	●	●	●
Coordinate with Local Housing Departments					●	●	●	

## Recommendations: TOPIC 5

### Programs and Policies to Decarbonize Affordable Housing

RECOMMENDATION & IMPLEMENTOR(S)	Provider	TCAC	CDLAC	CPUC	CEC	Utility/CCA	Local Govt	PA
Streamline Process between Electrification Programs		●	●	●	●	●		●
Hire Experts for Targeted Program Marketing, Education and Outreach			●	●	●	●	●	●
Provide Higher Incentive with No Step-downs for Existing Buildings				●	●	●		●
Offer a Comprehensive Program Moving Away from Specific Measures				●	●	●		●
Account for Non-Energy Benefits in Program Evaluation and Metrics				●	●	●		●
Provide Carve-Outs to Prioritize Affordable Housing				●	●	●		●



## Road Map to Electrifying Affordable Housing: New Construction

	2021 – 2022	2022 – 2025	2025 – 2028
	<i>2019 T24 + All-Electric Reach Codes</i>	<i>If All-Electric (Alignment with Existing Reach Codes)</i>	<i>All-Electric T24</i>
POLICY	Provide flexibility and exemptions		
	Train architects, MEP engineers, contractors and property management staff		
	Align state housing and decarbonization policies and programs		
	Provide robust technical assistance		
FINANCE	Increase electrification and decarbonization incentives		
	Address split incentives		
	Decrease electric rates		

## Sample: Estimated Electrification Costs for Upcoming Developments in San José, California

The costs below are based on new construction developments that a provider in San Jose has in the pipeline.

Item	Gas/ Central	Electric/ Central	Gas/ Individual	Electric/ Individual	Comment
MEP			NA	NA	No impact on individual DHW. For central, somewhere between \$0 and \$150k. Depends on MEP experience with all-electric and willingness to learn/internalize training cost.
Architects					
Energy consultant					No difference, unless they oversee the MEP consultant on HPWH design.
Other labor cost					Reduced Joint Trench, and one less trade to coordinate during construction.
Hot water heater (DHW)	\$1,000	\$2,500-3,000	\$700	\$1,200	
Solar preheating	\$1,800-2,000	NA	\$2,400	NA	
PV to offset utility cost	NA	\$200-300	NA	\$600	
Space heating					Have not done gas space heating for about 10 years.
Induction vs gas					Have not done gas stoves for about 10 years, and do not do induction; instead do coil. Induction stoves are 5 times the price of a coil one.
Laundry					Leased machines for the laundry rooms. The cost is the same for electric or gas dryers. For in-unit machines, only install electric dryers.

Other Equipment Costs	Gas/ Central	Electric/ Central	Gas/ Individual	Electric/ Individual	Comment
Commissioning	NA	\$20-30k	NA	NA	Commissioning for the whole system; does not vary much.
Gas connection/ Transformer upsized	\$300-600	\$0-300	\$400	\$400	Transformer upsized: \$20k/200Amp – not always required. No data for additional transformer; has design impact, in addition to cost.
Gas piping/ additional electrical	\$100-200	\$100	\$1,300	\$300	
<b>TOTAL</b>	<b>\$3,200-3,800</b>	<b>\$2,800-\$3,700</b>	<b>\$4,800</b>	<b>\$2,500</b>	Does not include water piping, recirculation loop which are identical.

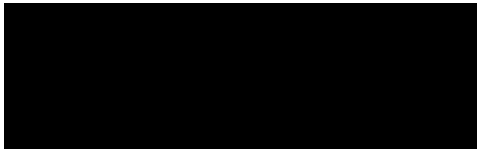
**Notes from the provider:**

- Solar preheating/ PV and gas piping are often forgotten in cost comparisons and have a large impact.
- The impact on architects and MEP engineers is very difficult to estimate. Each project is different, making it difficult to pinpoint what is due to the project itself and what is due to going all-electric. There is one less trade to coordinate, but more coordination because it is still new to most consultants. There is a need to have at least one team member who has done all-electric before, as they can help drive the team.
- All-electric is the way the industry is going. So, consultants and subcontractors should consider it an investment/learning opportunity and shoulder the additional cost as part of their continued training.
- [This provider has been pushing for all-electric in their upcoming developments.]

## Sample: New Construction Electrification Quote from a Bay Area General Contractor

The following costs are based on a new construction development quote that a statewide provider received from a Bay Area contractor.

January 5, 2021



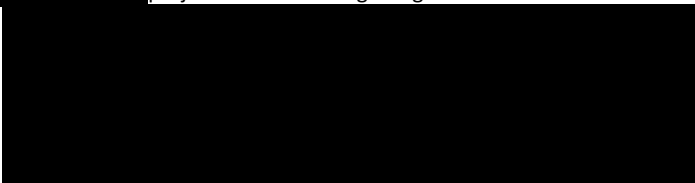
Re: **ALL ELECTRIC HOUSING CONSTRUCTION**




Here's a brief bullet point list of items to consider for all electric construction as it applies for multi-unit housing.

San Francisco Bay Area cities that now require all electric new construction buildings: San Francisco, Berkeley, San Jose, Richmond, Oakland.

[Redacted] projects that are being designed as All Electric:



[Redacted] projects that are All Electric:



Implications to consider:

1. Electric heat pump water heaters are more expensive, plus hot water storage tank sizes may change (generally larger or more of them than if gas).
2. Possible to do an all-electric solar hot water system per SL&P, but much more expensive.
3. Makes Solar PV more popular & pretty much required to help and/or exceed meet Title 24.
4. Makes solar hot water / thermal less popular.
5. Water heaters require heat pump water types w/ multiple ones.
6. Electric heat in general is less expensive than a hydronic heating system.
7. Mechanical rooms will need decent room size for water heaters or water heaters on roof. Some projects require more heaters than usually w/ gas.
8. No gas service so no gas meter room.
9. No gas so one less PG&E service to worry about & deal with.
10. All electric heat so more PTAC units showing up & more electric fan coil split systems. No more hydronic, wet HVAC systems.
11. Bigger electric loads so larger switchgear, transformers.



12. All electric buildings may require more battery backup system (that also takes up space).
13. Harder to reach TCAC requirements to be better than Title 24 by 7 or 12%. The current energy modeling software doesn't give much points for solar PV, not as much as for solar thermal and doesn't take into account electric has lower carbon footprint.
14. Will most likely increase the glazing requirements to meet and/or exceed Title 24.
15. Roof and exterior rigid insulation may need to get beefed up to account for TCAC req's.
16. Can PG&E deliver the additional power or need to upgrade their infrastructure?
17. Potential for more "PGE betterment infrastructure work" required to get us power to the building. Potential more joint trench work, more design coordination requiring longer lead times upfront.
18. Owners can expect a significant bill from PG&E related to the engineering and infrastructure necessary to deliver the amount of power needed.
19. No tax credits available for adding solar hot water / PV when you have an all electric building. The purpose of those are to offset gas to the building.
20. In San Francisco, the local plumbing union is upset w/ the city officials, takes away from their work & have even suggested for the city to expand the city's reclaimed water requirements.
21. Costs:
  - a. In general gas HW boilers less costly than electric water heaters. Savings <\$50k> to <\$100k>.
  - b. In general HW electric storage tanks cost more than gas ones. +\$10k to \$50k.
  - c. Going electric saves on gas trenching, PG&E gas fees, gas meter room, gas piping, gas venting, gas to the roof & laundry, street work associated w/ gas connections. Savings could range from <\$100k> to <\$300k>.
  - d. Electric may require battery backup. \$100k to \$200k.
  - e. Electric may increase costs for glazing. +\$50k to \$100k.
  - f. Electric may increase costs for roof insulation. +\$25k to \$100k.
  - g. Electric may increase costs for exterior wall insulation. +\$50k to \$200k.
  - h. Electric increases costs for larger loads, switchgear, transformer. +\$50k to \$200k.
  - i. Electric increases costs for a larger electrical room. +\$25k to \$75k.
  - j. Electric may increase site joint trench costs. +\$50k to \$250k.
  - k. Electric requires larger PV system but results in little or no solar thermal hot water system. +\$100k to +\$200k.
  - l. Electric requires results in little or no solar thermal hot water system. Savings <\$100k> to <\$200k>.
  - m. Electric heat system is generally less expensive than a hydronic heating system (hot water or steam, such as w/ radiators).



## CDLAC and TCAC Considerations

Provided that the work is done as part of new construction or a tax credit rehabilitation, any program incentives that could facilitate decarbonization would be included in a project's total development costs. This is a much greater concern in the CDLAC bond competition than in the TCAC 9% program.



The CDLAC tiebreaker for 2021 rewards the lowest bond request per unit and due to the 50% rule, the bond request is a direct function of total development costs. So, adding costs will hurt a bond application in 2021. For 2022, CDLAC is discussing a broader tiebreaker based on “public benefit efficiency” that will measure a range of public benefits (and could include sustainability measures) divided by the total amount of state resources in a project (including bonds, state tax credits, and soft funds – not currently including LIWP, BUILD, SOMAH and other clean energy programs). If sustainability benefits are included and LIWP/BUILD/SOMAH and other clean energy program funds are excluded, this would fully support the sustainability programs. If sustainability benefits are not included, the sustainability program funds would be excluded, but a project would still need more bonds due to the higher costs that would decrease its tiebreaker.



In the TCAC 9% program, the only issue is the high-cost test which disallows developments with a total basis in excess of 130% of the project's threshold basis limit. The sustainability costs add to basis, but most sustainability improvements trigger a threshold basis limit increase, so this would generally not be an issue. For a project close to the high-cost test, this is neither an incentive nor disincentive to participating in sustainability programs. For developments that are not near the high-cost test, the threshold basis limit increases will be an incentive and there is no disincentive.

## Clean Energy and Energy Efficiency Programs Highlighted by Summit Participants

### Low Income Weatherization Program (LIWP)

Funded by the California Department of Community Services and Development, LIWP supports owners and residents to lower utility costs, save energy and reduce greenhouse gas emissions in multifamily properties. LIWP has specific funding carve outs to support farmworker housing and permanent supportive housing that houses people experiencing homelessness. Due to program popularity and inconsistent funding, the program has a waitlist of over 18,000 households.

LIWP was consistently regarded as the top program given that its funding specifies greenhouse gas reductions, provides fuel switching measures, and involves a clear incentive structure. Participants also highlighted the valuable technical assistance provided as part of LIWP support. However, it was mentioned that the timeline of funding was a significant constraint for rehabilitation developments and that the total funding amount per project was far from enough to cover the full cost of equipment and upgrades.

### Community Choice Aggregator (CCA) Programs and Incentives

Multiple participants agreed on the value of programs being launched and managed by CCAs. One participant highlighted Central Coast Community Energy's electrification program, where electrification is incentivized on a per-unit basis up to \$2,500/unit. Another participant noted the Peninsula Clean Energy and Silicon Valley Clean Energy electrification TA program, offering in-depth TA for affordable housing electrification. The group agreed that understanding CCA programs, especially those that offer incentives and TA, was a priority area.

### BUILD and TECH Programs

The Building Initiative for Low Emissions Development (BUILD) Program will provide downstream incentives for the deployment of near-zero-emission building technologies in low-income residential buildings that reduce greenhouse gas (GHG) emissions significantly beyond what otherwise would be expected to result from the implementation of the prescriptive standards described in Part 6 of Title 24 of the California Code of Regulations (California Energy Code). The Partnership advocated that 100% of program incentives reach low-income communities, specifically multifamily affordable housing residents. The Technology and Equipment for Clean Heating (TECH) initiative, would build out the market for low-emission space and water heaters in new and existing residential buildings through upstream and midstream incentives.

Participants had little existing knowledge of Senate Bill 1477 which authorized the BUILD and TECH programs, except that BUILD had an explicit affordable housing carveout while TECH did not. There was agreement that this group would like to remain engaged and informed as the two programs launch in 2021.

## Self-Generation Incentive Program (SGIP)

The CPUC's Self-Generation Incentive Program (SGIP) provides incentives to support existing, new, and emerging distributed energy resources. SGIP provides rebates for qualifying distributed energy systems installed on the customer's side of the utility meter.

As some participants highlighted, SGIP provides some value in driving decarbonization by funding battery backup. This seemed like minimal value, though, given SGIP-supported storage tended to be low power and not sufficient to cover all loads. Participants noted that the application process was complex, and the program's outreach has not reached them. Many providers noted that the program funding level was not worthwhile to pursue.

## Solar on Multifamily Affordable Housing (SOMAH)

The Solar on Multifamily Affordable Housing (SOMAH) program provides financial incentives for installing photovoltaic (PV) energy systems on multifamily affordable housing in California.

The main value of SOMAH as highlighted by the participants was the support for PV, which is helpful in reducing overall operating costs. The group pointed to MASH and GoSolar SF as similar programs. However, participants agreed that the biggest drawback of the program was incompatibility with housing financing, which made it harder to use. Some providers were also not using the program because of being unable to adjust their utility allowances through a CUAC when participating in SOMAH.

## Energy Efficiency Rebates

Participants highlighted the need for energy efficiency (EE) as a priority issue. They find EE rebates insufficient and that EE rebates rarely support fuel-switching away from gas equipment. BayREN was mentioned as one rebate program that participants had used, as it covers fuel switching during rehabilitation. It was generally agreed that BayREN's funding level was not high and that providers needed to bear a significant portion of the costs. Providers noted that BayREN co-leveraged incentives, which helped with addressing some cost gaps.

## Financing (C-PACE, CAEFTA, TOB)

Finally, the group largely denounced financing programs like Commercial Property Assessed Clean Energy (C-PACE) or financing programs through the state Treasurer's Office California Alternative Energy and Advanced Transportation Financing Authority (CAEFTA), or Tariffed On-bill Programs (TOB) as a high priority area to drive new all-electric retrofits and construction. As was relayed multiple times, most developments cannot take on more debt. However, multiple groups mentioned a desire to learn more about leasing and Purchase Power Agreement (PPA) programs, such as with Everyday Energy or ReNew. A few participants also agreed on a desire to better engage the private sector through public/private partnerships (including foundations, Community Development Financial Institutions, banks), as well as other nonprofits and new housing finance authorities (including the Bay Area Housing Finance Authority).



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