Decarbonizing Unsubsidized Affordable Housing: A Roadmap for Equity and Sustainability

Unlocking the Greenhouse Gas Reduction Fund's potential to preserve and transform homes in the San Francisco Bay Area

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HOUSING ACCELERATOR FUND

LISC BAY AREA

Acknowledgments

About This Report

The federal Greenhouse Gas Reduction Fund (GGRF) under the Inflation Reduction Act of 2022 offers transformative opportunities to address climate change. This report highlights the critical need to focus on existing multifamily affordable housing properties undergoing acquisition and rehabilitation to achieve significant greenhouse gas (GHG) reductions, prevent displacement in vulnerable communities, and address deferred maintenance on these properties.

The three organizations collaborating on the report – **Enterprise Community Partners** (Enterprise), **Housing Accelerator Fund** (HAF), and **Local Initiative Support Corporation - Bay Area** (LISC Bay Area) – bring vast experience in supporting developers in the acquisition and rehabilitation of existing multifamily properties to create healthy, green, and resilient affordable homes.

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About Enterprise Community Partners

Enterprise is a national nonprofit that exists to make a good home possible for the millions of families without one. We support community development organizations on the ground, aggregate and invest capital for impact, advance housing policy at every level of government, and build and manage communities ourselves. Since 1982, we have invested $72 billion and created 1 million homes across all 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands – all to make home and community places of pride, power and belonging.

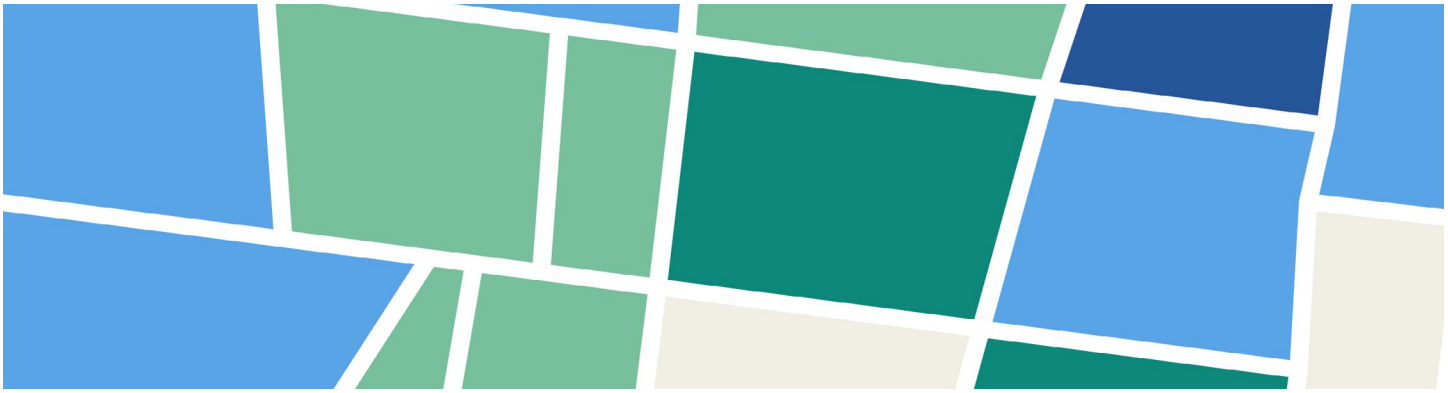
About Housing Accelerator Fund

The Housing Accelerator Fund (HAF) is dedicated to expanding the supply of quality affordable housing for economically disadvantaged individuals and families across the greater San Francisco Bay Area. By partnering with community-based organizations, local governments, and private and philanthropic institutions, HAF delivers powerful financing tools that accelerate housing solutions for the region's most vulnerable residents. HAF focuses on crafting and implementing innovative, scalable solutions that fill critical financing gaps to address the Bay Area's urgent housing needs, such as anti-displacement preservation lending programs in San Francisco and Oakland, the Bay Area Housing Innovation Fund, and the Industrialized Construction Catalyst Fund. Since 2017, HAF has invested over $600 million, creating more than 3,000 permanently affordable homes.

About LISC

Since 1981, LISC Bay Area has partnered with low-income communities of color to achieve their visions for healthy and sustainable neighborhoods of choice and opportunity. LISC Bay Area resources families, entrepreneurs, churches, organizations, and local leaders to generate wealth, build and own housing and businesses, and preserve their neighborhoods by serving as the connective tissue between communities and the capital, technical assistance, and partnerships communities need to build and keep the places they cherish.

Cover photo: Technicians install solar panels at Unity Gardens, an affordable housing property owned and operated by Northern California Land Trust in Berkeley, CA. Photo credit: RE-volv.



Executive Summary

The **Greenhouse Gas Reduction Fund** (GGRF), created by the federal Inflation Reduction Act of 2022, provides a first-of-its-kind opportunity to address the climate crisis with an unprecedented $27 billion in investments. GGRF funds will allow communities across the country to mobilize financing and private capital toward programs that reduce greenhouse gas (GHG) emissions. A significant share of GGRF funds will be invested in existing and new residential buildings, including affordable housing, to reduce emissions associated with domestic energy usage.

This report shares opportunities and challenges for financing and executing building decarbonization retrofits for unsubsidized multifamily housing in the Bay Area that either have been recently acquired and rehabilitated by nonprofit affordable housing developers,[1] or that could be acquired and rehabilitated in the near future.

Prioritize Acquisition-Rehabilitation Projects and their Vulnerable Residents

Eighty percent of the building stock projected to exist in 2050 already exists.[2] Even if all new buildings were to achieve net zero standards, total emissions as of 2050 would remain unchanged due to emissions from existing buildings. Rehabilitation of older multifamily affordable housing is therefore critical for GHG reduction. GGRF funding has a strong potential to catalyze decarbonization in this housing stock.

These properties serve some of the most vulnerable residents in our communities – and nonprofit acquisitions of these buildings can prevent displacement of long-standing community members and stabilize affordability for low-income households.

GGRF seeks to prioritize projects that would not be financed in the absence of this new federal program. However, new affordable housing in the Bay Area and California is already being built all-electric and to high energy efficiency standards to be competitive for scarce public funding and financing such as the Low-Income Housing Tax Credits. In California, GGRF will not tip the scales towards all-electric standards for newly constructed buildings, whereas the funding has much stronger potential to catalyze decarbonization in retrofits of existing multifamily affordable housing.

To support decarbonization retrofits in acquisition-rehabilitation projects that serve households at high risk of displacement and that otherwise meet GGRF standards for investment, Community Development Financial Institutions (CDFIs) administering GGRF funds may need to provide more favorable financing terms than what are needed for other affordable housing project types.

Increase Program Efficiency and Funding Accessibility

Various stakeholders will need to make changes to create an improved ecosystem for acquisition-rehabilitation decarbonization. Recommendations – for CDFIs administering GGRF funds, program administrators of rebate/incentive programs, affordable housing developers, jurisdictions with acquisition-rehabilitation funding programs, regional entities with decarbonization programs, utility providers, and philanthropic groups – can be found starting on **page 20**.

Analyze Data to Optimize Program Development and Implementation

The report highlights recent key findings from the Bay Area that will impact decarbonization work. For example, high electricity rates and common metering arrangements in multifamily properties can result in increases in operating expenses after decarbonization, which may impact the types of financing needed in our region. Case studies of acquisition-rehabilitation projects that have implemented decarbonization measures make apparent the gaps that need to be addressed so these projects are not left behind as more decarbonization resources become available and align with GGRF resources and existing local sources.

While these examples start to surface the challenges, more data is needed to estimate the typical ranges for actual costs of decarbonization for older multifamily affordable properties, the estimated GHG reductions achievable in these properties, and the gaps in incentive coverage. This new information can help create a strong foundation on which to build effective decarbonization programs for acquisition-rehabilitation projects.

Key Terms

Unsubsidized affordable housing: Rental homes that low-income households currently occupy and that offer relatively low rents without deed restrictions or subsidy due to building age, condition, and/or other factors (also known as naturally occurring affordable housing, or NOAH).

Multifamily housing: Residential buildings with two or more units.

Acquisition-Rehabilitation: An anti-displacement strategy used to allow low-income households to remain in their homes and communities, in which unsubsidized affordable housing is converted to deed restricted affordable housing with long-term affordability requirements. An affordable housing developer – typically a nonprofit – purchases the building and completes any necessary rehabilitation, often with subsidy.

Affordable housing preservation: Typically refers to strategies that preserve affordability of both previously unsubsidized affordable housing and of already subsidized affordable housing that is nearing the end of its affordability restrictions. For the purposes of this brief, preservation only refers to the former.

Decarbonization: Refers to measures that reduce building-related GHG emissions by transforming buildings to use less energy and different kinds of fuel sources that are less carbon-intensive, and/or generate renewable energy onsite. "Decarbonization" is often used interchangeably with the term "electrification," although electrification is just one of several decarbonization approaches.

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Technicians install solar panels at Unity Gardens, an affordable housing property owned and operated by Northern California Land Trust in Berkeley, CA. Photo credit: RE-volv.

The Need to Focus on Decarbonization in Existing Housing and Acquisition-Rehabilitation

Buildings are responsible for 39% of global GHGs annually, and in urban areas, buildings represent an even greater share of proportional emissions. In San Francisco, buildings account for 52% of GHG emissions.[3,4]

GGRF is intended to address the climate crisis and represents a concrete strategy for helping the U.S. reduce GHG emissions and achieve global climate targets. Meeting these targets requires decarbonizing the buildings sector by 2050.[5] Doing so requires addressing emissions generated by the construction of new buildings (11% of building stock-related emissions) as well as the operations of existing building stock (28% of building stock-related emissions).[6] In existing buildings, water heating and HVAC systems are typically the most energy-intensive appliances in a home, which have the greatest associated emissions depending on the fuel source (gas or electric) and the local utility provider's energy sources (fossil fuels or renewable).[7]

Two GGRF programs – the National Clean Investment Fund (NCIF)[8] and the Clean Communities Investment Accelerator (CCIA)[9,10] – will provide a total of $20 billion to be administered by CDFIs to support the decarbonization of our nation's building stock. From commercial spaces to single-family homes to multifamily residential,[11] GGRF will accelerate decarbonization projects that otherwise would not be viable in the absence of additional resources and/or more favorable financing terms.

As stated earlier, research shows that if every future building were to be built net zero,[12] the U.S. would still end up with the same aggregate building emissions as what it produces today.[13] Research also suggests that demolishing an existing building to rebuild a new one – even one with significantly lower GHG emissions – often results in a net increase in carbon emissions.[14]

It is therefore critical to focus on existing building stock to reduce the overall GHG footprint of the building sector. The process of decarbonizing existing homes can entail high upfront costs; therefore, funding like GGRF that prioritizes investments in affordable housing is essential because it ensures that the costs of decarbonization do not fall to – and potentially price out – existing low-income residents.

Rehabilitation of older multifamily affordable housing in the Bay Area often requires public support, especially if the rehabilitation scope encompasses decarbonization work.

To understand the existing landscape of housing stock in the Bay Area that GGRF funds can support, the following was examined:

- Impact of the local climate and existing building stock on decarbonization efforts
- Local developers engaged in acquisition-rehabilitation efforts and their capacity needs
- Existing decarbonization funding programs and how they might work in alignment with GGRF resources
- Regional and state policies driving decarbonization (or that will drive decarbonization)
- Impact of California's utility rates on decarbonization efforts

This report focuses on previously unsubsidized properties undergoing acquisition-rehabilitation because they tend to have greater challenges than already-subsidized properties when decarbonizing since, on average, they are older than most affordable stock in operation today. (Of the privately owned and maintained subsidized affordable housing stock, most was built after the Low-Income Housing Tax Credit program was established in the late 1980s.) Therefore, the previously unsubsidized stock may have more extensive rehabilitation needs and deferred maintenance.

Previously unsubsidized properties also may not yet have completed an income verification process with residents. Some households may be over income limits for certain decarbonization or electrification programs, or have no household income verification on record. These issues can pose short-term challenges for accessing rebates, incentives, and financing sources that have strict criteria for income eligibility until income verification is complete or until over-income households move out.

This type of affordable housing also merits specific attention because acquisition-rehabilitation is a key anti-displacement strategy. About 1.1 million people in California live in previously-unsubsidized affordable homes[15]– many of whom may be at risk of displacement if these properties were no longer available.

Unsubsidized housing predominantly occupied by low-income families and located in communities of color often costs the most to decarbonize, and the owners are least able to bear the upfront cost of decarbonization. As is discussed in greater detail later, this is largely due to enablement[16] work that must be completed prior to decarbonizing these properties as well as their low net operating income.

These properties are prime candidates for nonprofit acquisition-rehabilitation projects[17] that seek to prevent the displacement of residents, reduce the building's carbon impact, and make the building safer and healthier in the long-term. However, there are currently large gaps in the resources needed to fully decarbonize these properties, which GGRF can partially fulfill. To support the housing that is the most challenging to decarbonize, GGRF resources should be targeted toward acquisition-rehabilitation projects and, where possible, more favorable financing terms should be offered to projects that show strong potential for reducing displacement risk while reducing GHGs.

Bay Area Local Factors Impacting Decarbonization Capacity in Acquisition-Rehabilitation

While the GGRF funding is a national program, this report focuses specifically on the Bay Area since the implementation challenges are specific to the region's housing stock, the local climate and utilities context, development partners, local funding opportunities, and regional and state policies.

The Unsubsidized Affordable Housing Stock

The Bay Area's low-income households disproportionately live in multifamily properties built before 1970 because of their relative affordability.[18] This is significant because older properties can be more expensive to decarbonize if they have not had updates to the electric capacity since they were built,[19] if their electrical systems are not up to current codes, or if they have wall damage or areas of poor insulation that allows heat to escape through the building envelope.

California's first energy codes were not established until the 1970s, and buildings constructed before are likely to have significant upgrade needs. Additionally, because these buildings tend to provide unsubsidized affordable homes at lower rents, these properties may not generate sufficient income for owners to finance major upgrades to electrical systems, and/or owners may have deferred maintenance and habitability improvements.

For affordable housing developers that purchase properties that house low-income individuals, decarbonization efforts are likely to come with significant costs, especially relative to properties built in the 1980s or later.

Climate and Utilities Context

The Bay Area has advantages for low-cost electrification relative to other parts of the country, including regular sunshine during much of the year and a temperate climate. For example, only about 30% of low-to moderate-income households in San Francisco and the East Bay have air conditioning, making electricity consumption for cooling lower than other parts of the country.[20] The moderate climate along with the consistent sunshine makes many homes in the Bay Area good candidates for all-electric heat pumps and solar panels.[21]

But electricity rate increases and changes to utility provider net metering policies over the last few years have increased utility bill uncertainty for buildings that electrify - some may experience minor savings but others can experience short-term utility cost increases. This is especially true if the transition to electric appliances is not paired with other improvements such as building weatherization, energy efficiency upgrades, solar photovoltaics (PV), and battery storage for solar energy.[22]

Interviews revealed that electrifying buildings in the Bay Area, even with rebate programs, typically takes 10 to 15 years or longer to pay for itself based on operating expense savings. This delay is due to the current high electricity rates and the fact that any utility cost savings in individually metered properties primarily benefit tenants rather than property owners.[23,24] As a result, property owners may struggle to repay loans for decarbonization measures, leading to longer payback periods compared to other regions.[25]

Finally, decarbonizing in California can result in unpredictable charges from utility companies associated with adding an increased electrical load to the grid as more buildings transition their appliances from gas to electric. These can include charges for replacing a transformer and other infrastructure upgrades to facilitate the grid supporting a higher electrical load. These costs are typically unknown in advance to the affordable housing developer.

Local Acquisition-Rehabilitation Partners

A key feature of the acquisition-rehabilitation landscape in the Bay Area is that only a specific subset of affordable housing developers regularly engages in acquisition-rehabilitation, with the most active developers including Community Land Trusts (CLTs) and place-based Community Development Corporations (CDCs). These organizations tend to be less well-capitalized and have smaller staffs and therefore may face higher barriers in complying with various requirements associated with GGRF than larger regional or statewide affordable housing developers. Many would benefit from grants to hire contractors and consultants who can manage rebate paperwork and compliance requirements.

Because of their more limited staffing, these organizations will also benefit from having access to significant technical assistance (TA) support under GGRF, especially in light of the numerous requirements that these programs will impose on borrowers, such as Davis-Bacon prevailing wage requirements and Build America, Buy America.[26,27]

Technicians install solar panels at Unity Gardens, an affordable housing property owned and operated by Northern California Land Trust in Berkeley, CA. Photo credit: RE-volv.

Decarbonization Incentive and Technical Assistance Programs

The Bay Area is rich in well-established incentive programs for weatherization, electrification, and solar PV. These programs are generally available as rebates through regional and state government and local utility providers; some are accompanied by technical assistance. These programs can partially or fully cover the cost of electrification measures, such as the purchase of heat pumps or solar panels. However, some do not cover the full cost of purchasing and installing appliances.

If buildings require additional electrical capacity or need to be brought up to code to transition gas to electric appliances, affordable housing developers may be required to cover some of these costs through other funding sources. The inability to self-finance ineligible costs and/or identify working capital may preclude organizations from decarbonizing, even when the work could be partially or fully offset by rebates.

Table 1 below shows the various multifamily rebate programs that are available in the Bay Area and what building improvements related to decarbonization that they cover. For definitions of the various terms used in this table, see **Appendix: Definitions**.

Table 1: Bay Area and California Multifamily Incentive Programs for Decarbonization Retrofits[28]

Criteria	Battery Storage	Efficiency	Electrification	Enablement	Solar PV	Weatherization
Bay Area Multifamily Building Enhancements (Bay Area)		✓	✓	✓		✓
Energy Smart Homes (California)		✓	✓			
Equitable Building Decarb (California; forthcoming)		✓	✓	✓		✓
Low-Income Weatherization Program (California)		✓	✓	✓	✓	✓
Self Generation Incentive Program (California)	✓					
Solar on Multifamily Affordable Housing (California)				✓	✓	
TECH (California)			✓			

Source: Research team analysis and information from California Housing Partnership, September 2023, "Findings from the Los Angeles Affordable Housing Decarbonization Summit." https://chpc.net/wp-content/uploads/2023/09/CHP_SummitReport9.7.pdf

One major challenge affordable housing developers face in leveraging these rebate programs is the high degree of variability between different acquisition-rehabilitation projects, including the decarbonization measures they are best-suited for, the property's rebate eligibility, and the financial feasibility of the measures.

Factors that can influence total cost and decarbonization measure eligibility include:

- Building type (low-rise, mid-rise, or high-rise)
- Capacity of current electrical systems (highly related to building age)
- Feasibility of solar panels
- Sufficient space on the property for battery storage[29]

Without a site-level technical assessment, it is not possible to predict the per unit cost to decarbonize,[30] how much of this cost can be paid for by rebates, and whether operating expenses will decrease as a result.[31,32] In some cases, operating expenses may increase for both the property owner and for tenants after decarbonization measures are complete.[33] This may limit a property owner's ability to repay debt on a loan used to finance decarbonization, underscoring that GGRF programs should be rolled out with terms that can meet the needs of multiple types of projects and allow for the use of rebates as a partial takeout strategy.

As an example, Table 2 shows the total costs associated with electrification and efficiency measures used in a recent acquisition-rehabilitation project in Oakland, and the cost gaps that were not covered by local rebate programs.

Rebates for this project covered a significant portion of decarbonization costs – $18,000 per unit out of an estimated $44,700 per unit in total costs. The City of Oakland provided soft debt to this project via a local acquisition-rehabilitation funding program, which covered additional decarbonization costs not covered by the rebates, as well as other rehabilitation costs unrelated to decarbonization.

Technicians install solar panels at Unity Gardens, an affordable housing property owned and operated by Northern California Land Trust in Berkeley, CA. Photo credit: RE-volv.

Table 2: 2022 36th Avenue Case Study Property in Oakland
(17 Units, Unity Council, acquired in 2020)

Scope	Costs	Bay Area Multifamily Building Enhancements (BAMBE) Incentives	Low-Income Weatherization Program (LIWP) Incentives	TECH Incentives	Outstanding cost (-) or surplus (+) after rebates
Electrical Upgrades	-$200,000			$23,800	-$176,200
Heating/Cooling	-$202,800	$76,500	$47,011	$34,000	-$45,289
Hot Water	-$71,110	$45,750	$53,550	$20,400	$48,590
Thermal/ Insulation/ Sealants	-$8,000		$23,192		$15,192
Windows	-$106,558				-$106,558
Estimated Labor Costs (for all measures)	-$170,800				-$170,800
Totals	**-$759,268**	**$ 122,250**	**$123,753**	**$78,200**	**-$435,065**

Source: The Unity Council. Note that some costs represent estimates. In particular, labor costs are not reflected in each of the individual scopes. The estimated labor costs line item reflects rough estimates generated from the total labor across the entire rehabilitation scope. Rebate values that exceed the total cost of materials may, in some cases, be utilized to cover the cost of labor associated with installation.

CDFIs and public sector agencies supporting acquisition-rehabilitation projects should anticipate the wide potential range in total costs, eligibility for rebates, and payback periods across projects. High variability makes predicting financing needs challenging for affordable housing developers, and also makes it difficult for CDFIs to design loan products that fit heterogeneous projects.

Although the example project shown above was able to qualify for various rebate programs, other decarbonization programs designed with already subsidized affordable housing in mind may unintentionally exclude acquisition-rehabilitation buildings due to their income eligibility requirements. Previously unsubsidized affordable properties undergoing acquisition-rehabilitation may have more mixed-income households than typical subsidized affordable housing properties or may have households that have not completed income verification, but they still provide deep affordability to a range of households.

A final challenge affordable housing developers face is that rebate programs can be difficult to access or stack with one another, with deadlines that are sometimes misaligned across affordable housing funding and utility funding programs, and with burdensome paperwork that requires significant staff time. Centralized, one-stop shops for local and state electrification, weatherization, and efficiency programs should become the standard practice to reduce barriers for rebate utilization. These one-stop shops should also encompass representatives from local utility providers and affordable housing finance sources.

Technical Assistance Programs

Several of the state and local rebate programs described above have associated technical assistance offerings that can support affordable housing developers in assessing their property's energy needs, drafting a scope of work, and collecting bids. These technical assistance providers can also support affordable housing developers in determining how to stack measures (and associated state and regional rebate programs) together, estimate their cost savings over time, and estimate out-of-pocket costs.

Portions of GGRF awards will be used to provide technical assistance programming to affordable housing developers as they decarbonize their properties; however, it will be important to ensure that this future programming does not become redundant with the comprehensive technical assistance that is already offered in the Bay Area and California.

Locally available technical assistance largely does not include support with finance or with compliance with federal program requirements such as Davis-Bacon or Build America, Buy America. These topics will therefore be particularly important focus areas for GGRF technical assistance.

Acquisition-Rehabilitation Funding Programs

In the Bay Area, additional variability exists across municipalities. Some projects in San Francisco, Oakland, and a few other cities have access to public soft debt through housing preservation funding programs. This can help cover some construction costs not covered by rebates like in the 36th Avenue case study. However, projects outside these municipalities do not have the same resources. While beyond the scope of this brief, this underscores how additional public subsidy programs are needed to support acquisition-rehabilitation projects.

Local Decarbonization Mandates

Regional and state agencies have adopted[34] and/or are considering[35] policies that will preclude the sale of gas furnaces, water heaters, and stoves that emit NO_2, CO_2, and GHGs. By banning the future sale of new appliances, these policies will (or would) functionally require property owners, including nonprofit affordable housing developers, to electrify their buildings when these appliances need to be replaced.

Bay Area and California policymakers and climate program managers must quickly ensure that affordable housing developers have the tools to undertake building electrification without jeopardizing project sustainability. Affordable housing developers will need low-cost financing and/or grants to cover these costs, and this support should be convenient and straightforward to access. Because owners are strictly limited in the rent increases that they can impose on residents, they may be limited in their ability to support additional debt incurred in the course of decarbonizing their properties.

The Climate, Housing, and Equity Nexus

As a climate program with a primary goal to reduce GHGs, GGRF provides clear directives to CDFI awardees to provide the most favorable financing terms to projects that will have the deepest reductions in their GHG emissions. In the Bay Area, there are many acquisition-rehabilitation properties that would be excellent candidates for reducing GHG emissions and could leverage local incentive programs to improve the financial feasibility of decarbonization investments. Figures 1 and 2 in Appendix A: Case Studies are two such examples of real properties in San Francisco serving households at or below 50% of the Area Median Income (AMI) and that are respectively estimated to achieve about 310,000 and 350,000 pounds of CO_2 per year after various decarbonization measures are completed.

These types of properties are also a social equity priority for investment – as they are home to very low- and low-income households that will otherwise see increasing utility costs, rent, and face the possibility of displacement. Preventing displacement and maintaining affordable housing near transit and in urban areas also results in reduced transportation-related carbon emissions, as acknowledged by California's investments in programs like the Affordable Housing and Sustainable Communities program.

However, because many of these properties operate with very limited net operating income (NOI), they may not be able to take on additional hard debt and are therefore the least likely to be able to decarbonize without public assistance.

GGRF expects that financing building decarbonization will help affordable housing developers lower their utility bills by transitioning to all-electric buildings. This reduction in operating expenses is supposed to increase the NOI of these properties, enhancing their capacity to support low-interest loans. Unfortunately, not all projects in the Bay Area see costs savings after decarbonization. For example, both case studies in Appendix A are not projecting any cost savings on utility bills after the proposed scopes of work are completed.

Even in projects where decarbonization measures do yield cost savings, affordable housing developers of individually metered properties in the Bay Area sometimes face a reality where these measures result in reduced utility bills only for tenants. While this is a very positive outcome for cost-burdened low-income tenants, the developers' operating expenses sometimes remain unchanged or even increase in these scenarios, further reducing their NOI. The total cost savings in these scenarios (which are commonly referred to as "split incentive" scenarios) therefore fail to make the decarbonization measures more financially feasible.

While some of this challenge may be improved through policy changes that adjust utility allowances,[36] in the short-term, even loans that carry a low-interest rate may not be viable options for affordable properties with already low NOIs that remain unchanged or decrease further after decarbonization. Underscoring this point, Figure 2 in Appendix A is an example of a property that serves low-income seniors and which would have no additional cash flow to service additional debt. The project would be feasible only if a bridge loan with a 0% interest rate were available but would not be feasible if the interest rate offered were any higher.

The CDFI community should prioritize concessionary capital, such as soft debt or recoverable grants made available through GGRF awardees, for projects like these with significant social impact. In particular, the focus should be on acquisition-rehabilitation projects aimed at preventing displacement for very low-income households.

Furthermore, community-based affordable housing developers (especially small CDCs and CLTs) are great candidate organizations for embracing decarbonization efforts. In many cases, their strong relationships with their communities and tenants enable them to complete compliance measures for rebate programs, such as income verification. Many of these organizations are deeply interested in using GGRF and other green finance resources. However, these organizations may have limited or no working capital that they can utilize while they wait for rebates provided after project completion. CDFIs should offer favorable lending terms to organizations that are the least able to provide the upfront capital required to access local incentive programs. This could be done through, for example, zero interest or extremely low-interest bridge loans, or through recoverable grants.

Technicians install solar panels at Unity Gardens, an affordable housing property owned and operated by Northern California Land Trust in Berkeley, CA. Photo credit: RE-volv.

Illustrative Finance Case Studies[37]

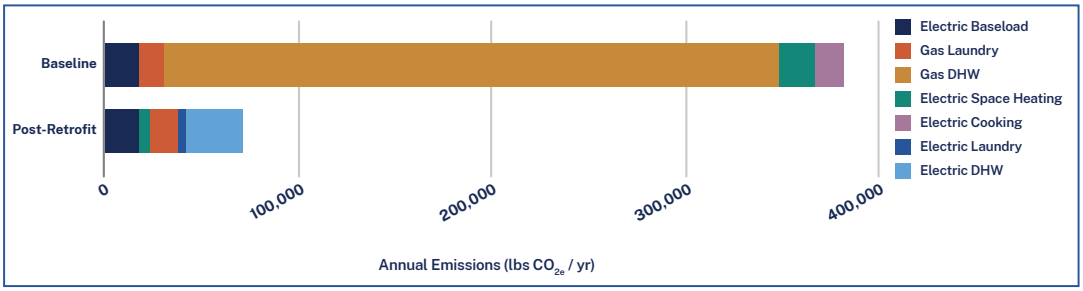
Illustrative Finance Case Study #1

PROPERTY INFORMATION	
# of Units	92
Type of Units	74 Studios, 18 One Bedrooms
Square Footage	66,825
Year Built	1969
Last Renovated	2018 - Including Seismic Retrofit
Housing Program	RAD
AMI	All units < 50% AMI
Meter Typology	Master Metered

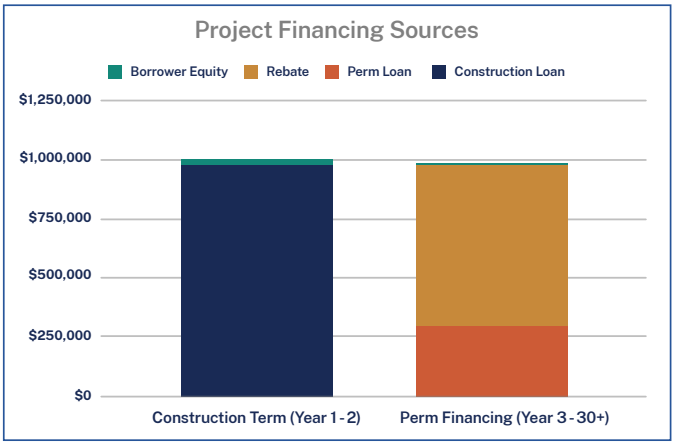
PROJECT INFORMATION	Cost (Labor + Materials)	Estimated Emissions Saving (lbs CO2/yr)
Install a Central Water Heat Pump Water Heater	$460,460	288,258
Install Attic Insulation	$65,780	3,765
Install Electric Dryer	$5,720	8,057
Install Through Wall HVAC Units in Unit	$469,219	12,549
Grand Total	**$1,001,179**	**312,629 lbs/yr**

~81%

Reduction in Annual CO_2 Emissions



Financing Approach



KEY INPUTS	
Rebate Eligibility	$7500 per unit
Monthly Cash Flow - After Debt Service	$1,500
Existing Debt	$9M @ 4.6% (First, 30 Yr)

SUB DEBT INTEREST RATE	FEASIBILITY
0%	✓
1%	✓
2%	✓
3%	✓

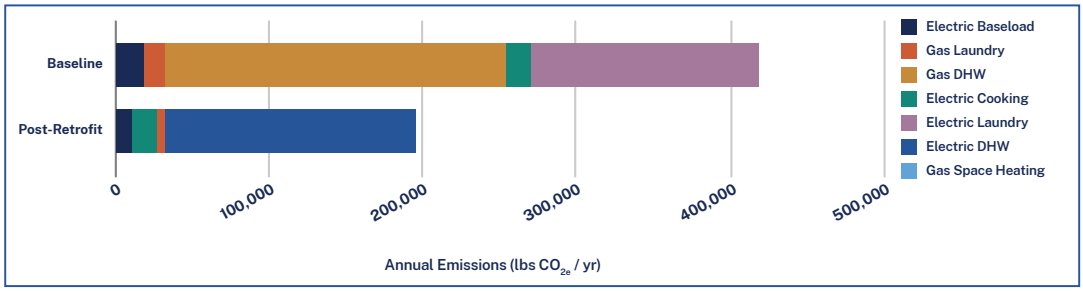
Illustrative Finance Case Study #2

PROPERTY INFORMATION	
# of Units	101
Type of Units	56 Studios, 45 One Bedrooms
Square Footage	54,500
Year Built	2005
Last Renovated	N/A
Housing Program	Seniors; Local Operating Subsidy Program
AMI	49.5% (Target Average)
Meter Typology	Master Metered

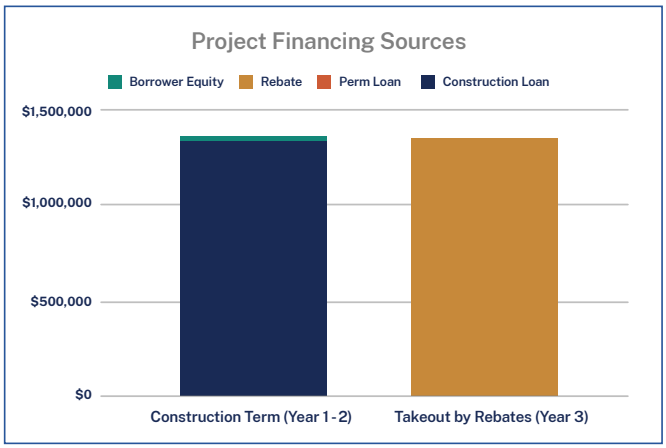
PROJECT INFORMATION		
	Cost (Labor + Materials)	Estimated Emissions Saving (lbs CO2/yr)
Install a Central Water Heat Pump Water Heater	$505,505	202,363
Install Electric Dryer	$11,440	8,758
Install a VRF System	$794,365	134,842
Install Apartment Lighting	$24,442	4,363
Upgrade Common Area Lighting	$19,553	2,909
Grand Total	**$1,355,305**	**353,135 lbs/yr**

~53%

Reduction in Annual CO_2 Emissions



Financing Approach



KEY INPUTS	
Rebate Eligibility	$13,400 per unit
Monthly Cash Flow – After Debt Service	None
Existing Debt	$2M @ 6.8% (First, 30 Yr)

SUB DEBT INTEREST RATE	FEASIBILITY
0%	✓
1%	✗
2%	✗
3%	✗

Case Study #1 - Key Takeaways

- **Proposed Decarbonization Financing:** Short-Term Construction Loan + Permanent Loan (Subordinate)
- **Summary:** Conservatively modeling rebates and cash flow, the project could support permanent debt up to 21 years (after a 2 year construction loan and rebates) sufficient to finance the full scope of proposed decarbonization measures.
- **Loan Serviceability:** Alongside the remaining 23 years of the first mortgage, the project could support **between $394,000 and $406,000** in subordinate debt. The range depends on interest rate (0% - 3%). This loan volume covers the projected funding gap after rebates **($290,000)**.
- **Loan Sizing Approach:** While this project was significantly renovated in 2018 with seismic and building envelope upgrades, a project without similar work might require a higher loan volume for additional "enabling" measures. The project could qualify for a permanent loan of up to $1.25 million (sized on CO_2 reduction-potential) or up to $5.5 million (sized by eligibility per unit given upgrades) based on illustrative terms from GGRF awardees. Additional cash flow, rebates or other sources would be required to service these higher potential permanent loan volumes that would be needed in a less renovated building to cover additional enablement work.
- **Cost Savings:** Given recent electricity rates trends, the models assumes no net cost savings from measures.
- **Rebates:** The model assumes utilization of BAMBE and Equitable Building Decarbonization Program.

Case Study #2 - Key Takeaways

- **Proposed decarbonization financing:** Short-term construction loan (bridges to rebates in year 2).
- **Summary:** Given the lack of project cash flow available to service additional debt, the project must utilize rebates for decarbonization to be feasible.
- **Need for Bridge Financing:** Rebates would fully subsidize the decarbonization measures but are insufficient without a bridge loan. This is because the the borrower cannot carry the upfront cost while waiting for the rebate payments.
- **Cost Savings:** Given recent electricity rates trends, the borrower models no net cost savings from the measures.
- **Rebates:** The model assumes utilization of BAMBE, Equitable Building Decarbonization Program, LIWP, and TECH.

Recommendations for GGRF Awardees, Local and State Program Administrators, Affordable Housing Developers, and Utility Providers

This section summarizes the challenges discussed in the previous sections for decarbonization finance; how these challenges can potentially be resolved or ameliorated; and which type of organizations must take action.

The overarching recommendations for CDFIs who are GGRF awardees and other stakeholders engaged in Bay Area decarbonization efforts are:

- Within the universe of properties with the greatest potential for GHG reductions, CDFIs should prioritize projects that will deliver the greatest social impact benefits, especially acquisition-rehabilitation projects that prevent residential displacement, through favorable financing terms or by establishing goals or set asides for this property type.
- Local agencies should simultaneously strive to increase the utilization, efficiency, and financial feasibility of local decarbonization programs, particularly for nonprofit and place-based building owners.

CHALLENGE

Buildings that house families with the highest socioeconomic needs also often have the highest physical rehabilitation needs and are more expensive to retrofit. In the Bay Area, many low-income residents live in older housing with significant deferred maintenance, making these properties a priority for affordable housing developers focused on acquisition-rehabilitation and decarbonization measures.

RECOMMENDATIONS

1. Additional subsidy or priority for favorable lending terms should be offered to enable decarbonization of housing for the Bay Area's most vulnerable residents. CDFIs can also consider offering construction-to-permanent loans for acquisition-rehabilitation projects to reduce transaction costs associated with taking out multiple kinds of loans.[38]
2. Decarbonization incentive programs should ensure that health, safety, and code compliance upgrades that are associated with/required for decarbonization measures are eligible for funding – most notably those related to the building envelope (roofing, siding, windows, and insulation).

IMPLEMENTERS

- CDFIs deploying GGRF funds, green banks, and other community lenders
- Program administrators of incentive/rebate programs

CHALLENGE

Several factors put acquisition-rehabilitation projects at a disadvantage relative to new construction and even to already-subsidized properties seeking retrofit resources. These include (1) that projects achieving a high social impact that house extremely low- and very low-income households may have low NOIs that preclude them from taking on significant debt, or any debt at all; (2) that acquisition-rehabilitation projects may be undertaken by organizations with smaller staffs; and (3) that scarce public subsidy resources are available for acquisition-rehabilitation projects as of early 2025.

RECOMMENDATIONS

1. Lower leverage requirements or provide concessionary capital for these types of projects. CDFIs can help identify private capital sources to meet these requirements, including philanthropic funds or pass-through grants.
2. CDFIs should earmark a subset of GGRF awards for acquisition-rehabilitation housing (versus new construction) and set a target number of these properties to finance through GGRF in the Bay Area and other regions with a significant number of affordable housing developers engaging in acquisition-rehabilitation.

IMPLEMENTER

- CDFIs deploying GGRF funds

CHALLENGE

Acquisitions which seek to prevent displacement must happen quickly. Affordable housing developers engaging in acquisition-rehabilitation may not yet have determined whether their properties can achieve significant GHG reductions and may not currently be well-positioned to take advantage of GGRF and other decarbonization resources.

RECOMMENDATION

1. Affordable housing developers, and especially community-based organizations serving high-need populations, should identify high priority properties for significant GHG reductions and good candidates for GGRF lending and other decarbonization sources. This may require predevelopment funding to support portfolio analysis.[39]

IMPLEMENTER

- Affordable housing developers

CHALLENGE

Some local and state rebate programs require income certification to ensure subsidies are targeting residents with highest need. However, the process of income certification for acquisition-rehabilitation can take time and hinder organizations' ability to reserve rebates quickly.

RECOMMENDATION

1. Programs should have reasonable income certification requirements, ranging from requiring income caps in regulatory/deed restrictions but not requiring income certification of individual tenants; or providing grace periods for income certification. Income certification standards should align with existing programs to maximize ability to stack rebates and financing; or utilize certifications from other programs in lieu of requesting documentation for each program to expedite approval.

IMPLEMENTER

- Program administrators for incentive/rebate programs

CHALLENGE

Managing layered and complicated financing and rebate programs takes significant, uncompensated staff time, creating a major barrier for already-stretched affordable housing developers with limited staff capacity to take on decarbonization measures.

RECOMMENDATION

1. Capacity building and TA funding should be directed to emerging organizations and those with small staffs. Long term, jurisdictions with their own preservation programs could establish a project-level developer fee add-on to compensate for additional decarbonization work.

IMPLEMENTERS

- CDFIs deploying GGRF funds with associated TA programs
- Program administrators for incentive/rebate programs
- Jurisdictions with acquisition-rehabilitation funding programs

CHALLENGE

While the presence of rebate and financing programs helps close the funding gap, cobbling together funding from various sources is onerous and puts further pressure on affordable housing developers.

RECOMMENDATION

1. Regional entities (for example, California's regional energy networks) should establish "Single Points of Contact," creating one-stop-shops for utility incentives, rebate programs, and decarbonization finance sources to reduce the burden of navigating various programs.

IMPLEMENTER

- Regional entities with decarbonization programs

CHALLENGE

Rebate programs typically provide funding after improvements are completed, requiring affordable housing developers to cover the upfront costs of decarbonization measures. This is prohibitive for organizations without sufficient working capital. CDFIs offer bridge loans, but these come with interest payments that the rebates will not cover.

RECOMMENDATIONS

1. Municipal utilities and Community Choice Aggregators[40] that offer decarbonization incentive programs should allow incentive programs to provide funding up-front, rather than requiring that the funding be delivered almost exclusively as rebates.
2. For affordable housing projects that qualify for rebates, philanthropic groups and organizations that deliver pass-through grants should consider offering recoverable grants to bridge to rebates.

IMPLEMENTERS

- Municipal utilities, Community Choice Aggregators, and other public agencies offering decarbonization incentive programs
- Philanthropic groups and organizations that deliver pass-through grants

CHALLENGE

Rebates do not cover the full costs associated with decarbonization, especially when properties encounter major enablement or habitability needs. This means that organizations cannot undertake some of the significant additional rehabilitation that may be required in order to decarbonize.

RECOMMENDATIONS

1. In cases where per unit or per project preservation funding caps limit decarbonization for high-priority projects, acquisition-rehabilitation program managers should consider increasing their per unit subsidy limits for projects that partially or fully decarbonize to ensure that this work is incentivized and properly funded.
2. In the longer-term, additional funds should be made available to these programs to ensure high-priority projects with planned decarbonization retrofits can be funded in full and at scale.

IMPLEMENTERS

- Program administrators for rebate programs
- Jurisdictions with acquisition/rehab funding programs

CHALLENGE

There is a lack of robust data on real costs to decarbonize older buildings, the typical share of costs that can be covered by rebates, and the projected utility expenses that affordable housing developers and tenants typically experience after decarbonization. As a result, it is difficult to predict the scale of resources needed from financial institutions to cover cost gaps for decarbonization in our area, the financing terms that will work for these properties, and the aggregate GHGs that can be reduced by financing decarbonization of various property types.

RECOMMENDATIONS

1. The types of studies that have been conducted in the Los Angeles[41] area on actual decarbonization costs, estimated utility costs under various scenarios for various building typologies, and estimates of the share of costs covered by rebates should be replicated in the Bay Area.
2. Utility providers should increase transparency regarding areas of the grid that are currently able or unable to handle an increased electrical load to improve cost predictability for affordable housing developers seeking to electrify buildings.

IMPLEMENTERS

- Jurisdictions enacting decarbonization mandates and/or research community
- Utility providers

Conclusion

Acquisition-rehabilitation projects represent a unique opportunity for achieving GHG reductions and enhancing community stability. By aligning financial products, policy, and technical support, GGRF and its stakeholders can catalyze meaningful change in the building decarbonization landscape.

One of the key eligibility criteria for projects to be funded through GGRF's NCIF and CCIA programs is to support projects that may not have otherwise been financed in the absence of these resources.[42] Although not every acquisition-rehabilitation project is an ideal candidate for GGRF funding, it is clear that there are strong candidate projects that will struggle to access decarbonization financing for the reasons discussed throughout this report. Acquisition-rehabilitation projects should therefore receive special attention due to the pivotal role that new GGRF resources could play in decarbonization that would otherwise not occur.

Although GGRF is among the largest climate investments made to date by the U.S. government, GGRF programs will ultimately not be able to serve all eligible projects due to finite funds. There are also many affordable housing properties that will not meet eligibility criteria for CCIA and NCIF financing. Still, GGRF presents a critical opportunity to decarbonize projects that have historically been harder to finance, especially acquisition-rehabilitation projects serving households who are at high risk of displacement. Financing some acquisition-rehabilitation projects now through GGRF can help surface new information and best practices for supporting decarbonization properties of this type at scale in the future. This early legwork is critical for ensuring that low-income communities, especially communities of color, who live in this housing stock can maintain their housing stability and benefit from healthier homes as decarbonization of existing buildings becomes increasingly widespread.

Appendix: Definitions

What are the specific measures associated with retrofitting buildings to decarbonize or improve efficiency?

- **Weatherization:** Modifications to a property to ensure energy efficiency and comfort, by sealing the building envelope against wind, sunlight and precipitation. Modifications include insulation (particularly near roofs, attics, and windows), patching holes in building envelopes, improving ventilation, and upgrading doors and windows, installing roofing, and sealing bypasses.
    - By making improvements to the building to better insulate heat, keep temperatures cool and manage moisture levels, residents can reduce their usage of air conditioning and space heaters. Weatherization overall reduces energy use and improves savings.
- **Electrification:** Replacing appliances that use fossil fuels - like stoves, space heaters, and water heaters - to appliances that run on electricity. Electrification is a term that's often used interchangeably with building decarbonization, although decarbonization can encompass efficiency (using less energy) and electrification (using energy that is less carbon intensive).
- **Efficiency:** Improvements in a building that lead to decreased consumption of energy in a home or building. In homes with already-electric appliances, this can include replacing appliances and heating and cooling systems with more efficient alternatives, such as installing heat pumps and heat pump water heaters. Efficiency measures also include weatherization measures, such as adding insulation or air sealing.
- **Residential renewable energy generation:** Methods of generating energy at the property level that produces close to or zero carbon dioxide emissions. Renewable energy sources at the household level are currently largely limited to solar PV and, more recently, geothermal.
    - Transitioning a building's energy source to on-site solar energy generation can result in significant and immediate reductions to GHG emissions if the local utility company utilizes fossil fuels to deliver electricity. In utility areas where the grid is already powered by renewable sources, transitioning to on-site solar or other renewable energy generation can reduce electricity costs because the property draws significantly less energy from the grid.
- **Enablement:** Providing the necessary changes to the building envelope or to electrical capacity to complete energy decarbonization improvements.
    - Due to the deterioration of buildings over time and outdated electrical systems, many older buildings do not have well-sealed building enclosures or adequate electrical capacity to support decarbonization measures such as switching to electric heating systems or installing rooftop solar. Enablement measures include roof and window replacements and electrical capacity upgrades that create the conditions for property owners to complete additional measures that reduce emissions and reduce energy costs.

Endnotes

1 This brief will refer to various types of organizations, including community land trusts (CLTs), community development corporations (CDCs), and nonprofit affordable housing developers, using the simplified term "affordable housing developers."

2 https://www.mckinsey.com/capabilities/operations/our-insights/accelerating-green-growth-in-the-built-environment&sa=D&source=docs&ust=1734562079759551&usg=AOvVaw1mmjYoOTTirmPjIZZsvdXm

3 https://worldgbc.org/advancing-net-zero/embodied-carbon/

4 https://uli.org/wp-content/uploads/ULI-Documents/SFenergybenchmarkingreport.pdf

5 https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_Chapter_2_LR.pdf

6 https://worldgbc.org/advancing-net-zero/embodied-carbon/

7 https://www.c2es.org/document/decarbonizing-u-s-buildings/

8 The NCIF program awarded three grant recipients including Power Forward Communities – a coalition joined by Enterprise and LISC – to partner with community organizations, developers, and private sector investors with a goal of nationally funding projects deploying clean technology. Projects eligible for NCIF must focus on reducing GHG emissions and other pollutants, delivering benefits to communities, financing projects that may not otherwise have been funded, mobilizing private capital, and supporting commercial technologies that reduce dependency on fossil fuels. The total amount of funding for Power Forward Communities is $14B over a 7-year performance period. While grant recipients have a minimum dedication of 40% capital to low-income and disadvantaged communities, Power Forward Communities has declared a commitment to allocating more than 40% of funding to low-income populations.

9 The CCIA program is a smaller, $6 billion initiative for five awardees – including the Opportunity Finance Network, a membership-based group in which the Housing Accelerator Fund and Enterprise participate. This program provides community lenders in historically divested communities with funding and technical assistance for projects. Under CCIA, projects must meet the same criteria as NCIF and fall under one of the priority areas – distributed energy generation and storage, net-zero emissions buildings, or zero-emissions transportation.

10 GGRF also established a third program, Solar for All, which will be administered via state and tribal governments and will support solar projects in low-income and disadvantaged communities. Because this brief is predominantly focused on the financing products that will be delivered through CDFIs, we are focusing on the CCIA and NCIF programs.

11 While many of the types of multifamily decarbonization projects that NCIF and CCIA will provide decarbonization financing for are the same, the NCIF program is intended to scale replicable models for adopting decarbonizing technologies, while the CCIA targets support for community partners with readiness and capacity building to better transition and utilize the models funneled through the NCIF program.

12 Net zero refers to "the balance between the amount of GHG that's produced and the amount that's removed from the atmosphere. It can be achieved through a combination of emission reduction and emission removal." See **https://www.nationalgrid.com/stories/energy-explained/what-is-net-zero**. However, the EPA definitions of net zero emissions buildings are aligned with the U.S. Department of Energy's national definitions for existing and new buildings. The definition for existing buildings incorporates specific Energy Star Portfolio Manager scores and certain Energy Use Intensity (EUI) standards.

13 In addition to the emissions that are generated on a property level (both from utilities consumption and new construction methods), it is important to consider the less direct and often overlooked consequences that a lack of housing affordability and displacement may have on our climate. Gentrification and displacement are not only racial and social justice issues, but climate issues as well. Given the rising costs of housing in the Bay Area, many residents have been forced to move away from urban centers with fewer options for public transit. This may result in an increased reliance on cars, leading to higher GHG emissions.

14 Source: "Retrofits more effective in cutting operational, embodied carbon emissions than new builds: study" **https://www.smartcitiesdive.com/news/retrofits-buildings-operational-embodied-carbon-emissions-new-construction/726719/**

15 Lesar Development Consultants, Housing Partnership Sustainability Solutions, and Housing Sustainability Advisors. "Funding Gap Analysis." From series, "Driving Energy Efficiency and Renewable Energy Funds into Low-to-Moderate Income (LMI) Communities in California"

16 This brief uses the term "enablement" to refer to all of the necessary changes that must occur to the building envelope or to electrical capacity to complete energy decarbonization improvements. This can refer to, for example, treating buildings for mold or asbestos which are necessary steps prior to installing insulation, or to replacing a roof prior to installing solar panels. It can also refer to making upgrades to a building's electrical systems that enable installing more electric appliances.

17 Although decarbonization programs have been proposed for privately-owned, multifamily properties that limit rent increases, enforcement of these restrictions is uncertain. Nonprofits are more reliable stewards of properties if a goal is long-term affordability of properties that are receiving public support for decarbonization, since nonprofits have affordability agreements with jurisdictions to keep rents low long-term and are mission-driven to limit rent increases.

18 According to a recent report, 55% of low-to-moderate income households live in multifamily properties in the Oakland-San Francisco MSA, and of those households, 49% live in properties built prior to 1970. These figures are 46% and 28%, respectively, for the San Jose-Santa Clara MSA. While data is not available for low-income households specifically, these figures would likely be higher if these data points excluded moderate income households. Source: CalNEXT 2023, "Low-Income Multifamily Housing Characteristics Study." **https://www.veic.org/Media/Default/Reports/CalNEXT%20-%20Low-Income%20Multifamily%20Housing%20Characteristics%20Study.pdf**

19 Stopwaste and AEA 2021, "Accelerating Electrification of California's Multifamily Buildings: Policy Considerations and Technical Guidelines." **https://www.stopwaste.org/sites/default/files/MF%20Electrification%20Readiness%20Report_FINAL.pdf**

20 This figure reflects households in the San Francisco-Oakland-Hayward MSA. Note that the share of households with air conditioning is significantly higher (73%) in the South Bay (San Jose-Sunnyvale-Santa Clara MSA). Source: **https://www.veic.org/Media/Default/Reports/CalNEXT%20-%20Low-Income%20Multifamily%20Housing%20Characteristics%20Study.pdf**

21 **https://techcleanca.com/**

22 Although affordable properties can also sell back their energy to the grid in the form of solar credits, the tariff rate at which they are generally able to sell the electricity back can be too low to compensate for the cost of installing solar. Changes that were rolled out earlier this year exacerbated this issue for properties except those that have access to the SOMAH (California rebate) program tariff. This has led to a reduced payback period for investments in solar PV and underscores how battery storage to reduce overall energy draw from the grid is important for lowering operating costs and therefore improving payback in solar investments. Source: California Housing Partnership staff.

23 Individually metered properties are those in which utility consumption is measured for each apartment unit and tenants are billed directly. These stand in contrast to master metered properties, where utility consumption is measured for the entire building and paid for by the property owner, who then bills tenants. Affordable housing providers are only permitted to bill tenants up to a certain amount according to utility allowances that are updated annually by a public agency, typically local public housing authorities.

24 If properties are able to pair electrification measures and solar PV with battery storage, the short-term financing picture may be different; however, as is true nationally, installing battery storage on-site is not possible for many properties due to space limitations.

25 While comprehensive cost-benefit analyses have not been completed for the Bay Area, estimates based on data from Los Angeles County indicate that it would take 29 to 40 years for an older multifamily property to see cumulative energy savings payback, and - even then - payback would cover only about 30% of the up-front investments needed to enable the installation of heat pumps and thermal resistance heating, respectively. (See Table 6 in ARUP 2022, "Zero Carbon Collaboration." **https://www.arup.com/globalassets/downloads/insights/zero-carbon-collaboration-the-case-for-collaboration.pdf**. See also ARUP 2021, "Los Angeles Affordable Housing Decarbonization Study Phase II." **https://www.nrdc.org/sites/default/files/la-affordable-housing-decarbonization-study-phase2-20211108.pdf**). While the Los Angeles data is not a perfect point of reference for the Bay Area, the general trend holds: electrification measures often do not cover upfront costs, even after long payback periods. In cases where there is partial (or full) payback of upfront costs, there's a separate question of who the payback accrues to: for instance, a landlord may bear the upfront cost of decarbonizing measure but - in an individually metered buildings - long-term savings may accrue to exclusively to tenants (this is further discussed in the 'Climate, Housing, and Equity Nexus section' of this report).

26 The Davis-Bacon Act prevailing wages are hourly wage rates that contractors and subcontractors of federally funded construction projects must pay their laborers. These rates, known as wage determinations, are established by the Department of Labor for different geographic areas and are typically higher than local minimum wages. Davis-Bacon also comes with various compliance requirements. For more information, see **https://www.dol.gov/agencies/whd/fact-sheets/66-dbra**

27 Build America, Buy America is a domestic procurement preference policy for for iron, steel, manufactured products, and construction materials used in infrastructure and covered construction projects that are funded by the federal government. For more information see **https://www.commerce.gov/oam/build-america-buy-america**

28 Other rebate programs may be available in specific subregions of the Bay Area. For example, the Silicon Valley Clean Energy's Multifamily Retrofit Program also provides up to $450,000 in gap funding for project costs that are not covered by other incentive programs for properties in specific jurisdictions within Santa Clara County.

29 These and other factors are discussed at length in this Stopwaste report: **https://www.stopwaste.org/sites/default/files/MF%20Electrification%20Readiness%20Report_FINAL.pdf**

30 At an aggregate level, one recent study estimated the total cost of decarbonization for a typical property built in the 1990s to be about $25,000 per unit (see Lesar Development Consultants, Housing Partnership Sustainability Solutions, and Housing Sustainability Advisors. "Funding Gap Analysis." From series, "Driving Energy Efficiency and Renewable Energy Funds into Low-to-Moderate Income (LMI) Communities in California"). However, other studies put this figure at a much higher dollar amount per unit; these higher estimates may be more appropriate for properties that were constructed prior to 1980.

31 Affordable housing developers can access technical assistance and scoping services that are offered after enrollment in various rebate and incentive programs; however, the technical assistance/assessments will only examine the part of the building that is associated with the specific decarbonization measure (unless the same technical assistance provider covers multiple decarbonization programs). This can lead to multiple site visits before an affordable housing developer can receive funding through different programs. Affordable housing developers can also gather this information through self-funded energy audits/benchmarking or physical needs assessments, although costs may be prohibitive.

32 Note that some investor-owned utilities such as PG&E have established "single points of contact" to assist multifamily property owners with energy benchmarking, some financing resources, and assistance identifying and enrolling in incentive programs for decarbonization.

33 Interviewees emphasized, for example, that properties that electrify but are unable to install solar panels and/or battery storage are likely to see their energy costs increase significantly. Projects that include solar PV as they transition from gas to electric appliances are still likely to see operating costs increase due to current electricity rates and solar credit rates that these operators receive in the Bay Area for selling excess electricity back to the grid.

34 By 2031, the Bay Area Air Quality Management District policy will ban the sale of commercial water heaters in the Bay Area that emit N0x as a byproduct. This policy will also apply to gas furnaces and will go into effect even earlier (2027) for single-family homes. Source: **https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-9-rule-4-nitrogen-oxides-from-fan-type-residential-central-furnaces/2021-amendments/documents/20230127_factsheet_rg09040906-pdf**.

35 For example, the California Air Resource Board has proposed regulations that would ban the sale of new space and water heaters that produce GHG emissions. The Board will vote on this proposal in 2025, meaning that a ban on gas furnaces may soon apply statewide, rather than be restricted to the nine-county Bay Area. Source: **https://ww2.arb.ca.gov/our-work/programs/building-decarbonization/zero-emission-space-and-water-heater-standards/faq#:~:text=If%20we%20dramatically%20reduce%20gas%20usage%20for%20water%20and%20space**

36 Utility allowances typically establish fixed values for both gas and electric that may be misaligned with the real utility costs after electrification. Affordable housing developers that anticipate a utility cost reduction after electrification and/or energy efficiency measures are completed may not see much, or any, of the financial benefit of this cost reduction if the utility allowance remains unchanged after electrification, reducing the financial incentives for affordable housing owners to decarbonize. Alternative utility allowance schedules have been created by the California Treasury, but these schedules are currently not available to affordable housing projects that are not utilizing affordable housing tax credits. While this issue affects affordable housing properties across the country, policy recommendations specific to the California context can be found here: **https://chpc.net/wp-content/uploads/2022/03/Decarbonization-by-Utility-Allowances-2022-Report.pdf**

37 Calculating emissions in terms of pounds (or tons) of carbon per year is the convention for GHG emissions. Using this standardized metrics make it possible to compare carbon footprints across different emissions-producing activities and understand the impact of activities that reduce carbon emissions.

38 Additional subsidy or prioritizing favorable lending terms should be offered to enable decarbonization of housing for the Bay Area's most vulnerable residents. CDFIs can also consider offering construction-to-permanent loans for acquisition-rehabilitation projects to reduce transaction costs associated with taking out multiple kinds of loans.

39 Master metered properties may be "low-hanging fruit" because they are most likely to see reductions in operating expenses delivered to the affordable housing developer, increasing their capacity to take on hard debt.

40 For more information about Community Choice Aggregators, see: **https://www.cpuc.ca.gov/consumer-support/consumer-programs-and-services/electrical-energy-and-energy-efficiency/community-choice-aggregation-and-direct-access-/consumer-information-on-ccas---frequently-asked-questions**

41 See Endnotes 25 and 30.

42 **https://www.epa.gov/greenhouse-gas-reduction-fund/frequent-questions-about-fund**

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