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# An Action Plan for Greater Climate Equity for Disadvantaged Communities in Fresno

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# **An Action Plan for Greater Climate Equity for Disadvantaged Communities in Fresno**

Lawrence Berkeley National Lab, Every Neighborhood Partnership, Rising Sun Center for Opportunity, City of Fresno

## **Key Action Plan Takeaways**

### **Policy Gaps**

1. Gaps in extreme heat resilience are that (a) there are no requirements for maximum temperatures indoors or minimal cooling requirements in building codes and standards; and (b) we estimate about 15% of homes lack air conditioning, which can lead to dangerous indoor conditions during extreme heat waves which are growing in severity, duration, and frequency.
2. A disconnect among policies focusing on different aspects of buildings (energy, decarbonization, resilience, health, safety) and from different agencies.
3. Addressing deferred maintenance upgrades in DAC homes (e.g. roof repairs, electric panel upgrades, and kitchen and bathroom ventilation fans) is an equity priority for resident health and safety, independent of decarbonization and electrification policy goals. For example, about half of single-family homes are not “solar PV-ready” and there is no program to address this (repairing dilapidated roofs and upgrading old electric panels).
4. There is a lack of adequate financing programs for upgrading homes in DAC areas to meet decarbonization, equity, and climate resilience goals.
5. We find a substantial fraction of residents are renters in single family homes, and many clean energy programs are open only to homeowners. This is a major gap in equitable financing programs. For example, a large fraction of homes in South Fresno (70%) are single family homes and about 2/3 of those are rentals. These renters are not able to install and benefit from rooftop solar PV since renters are not eligible for solar PV rebates.

### **Recommendations**

1. The state should enact design standards for maximum allowed temperatures in all buildings, and all residents of Fresno should have access to an air conditioner at home. Mechanisms would be needed to ensure that resident utility bills are not increased with more electricity consumption.
2. There is the need for more integrated pilots and demonstration projects in DACs to “learn-by-doing” and develop best practices. More demonstration and pilot projects in the residential sector combining energy efficiency, electrification of heating, EVs, and solar PV, are needed to determine what works best for residents and to develop best practices for inspection, implementation, and monitoring. Such pilots would provide essential data collection and fill data gaps in installation costs and highlight the interactions between measures for improving cost-benefit analysis. Rather than having several serial interventions,

integrated programs can help develop pathways to scale up DAC decarbonization, equity, and resilience efforts. There are elements that include some of the above (e.g., EV and charging programs) but no integrated program for DAC areas.

- a. Upgrading DAC homes to rooftop solar PV and to cleaner end-uses (such as electric heat pumps for HVAC and water heating and used electric vehicles) is an opportunity to meet multiple policy objectives such as decarbonization, equity, resilience, and improved public health.
3. Existing programs for weatherization and energy efficiency are natural starting points to build greater capacity and implement broader home upgrades to better enable scaling up of decarbonization, equity, and resilience efforts in DAC homes.
  - a. Current weatherization programs do “like-for-like” upgrades (e.g. old gas water heater upgrade to new gas water heater or old evaporative cooler upgrade to new evaporative cooler) and should be broadened to include electrification upgrades to heat-pump based space and water heating and upgrades from evaporative coolers to air conditioners.
  - b. Expansion of energy efficiency audits to include other assessments such as building electrification readiness and extreme weather resilience audits/assessments, rooftop PV readiness, and EV readiness could improve overall efficacy of achieving policy goals, improve equity, and increase the speed of deployment. Current home audits, recommended measures for installation, and estimated benefits in energy efficiency programs could be broadened to become “comprehensive climate audits” including electrification and resilience assessments, recommended measures, and estimated energy and non-energy benefits of recommended measures.
  - c. Investment is needed in expanding the capacity and requirements for this broadening of energy efficiency programs such as training, handling legal issues such as data protocols and privacy, program organization, cost-benefit quantification of resilience measures, and decision support tools.
4. Innovative finance and incentive programs
  - a. Single family renters are not eligible for rooftop solar PV incentives and would benefit from more attractive community solar; or if solar PV is installed on rental homes with PV incentives for property owners, there would need to be property owner agreements or covenants to constrain any future rent increases.
  - b. More work is needed on developing financing options and pathways for DAC residential upgrades particularly to meet the high up-front costs of building and passenger vehicle electrification and related home infrastructure upgrades (electric panels and electric circuit upgrades).
  - c. Rooftop solar PV and battery storage with Self-Generation Incentive Program (SGIP) incentives for storage are an attractive opportunity with favorable economics for Fresno cooling centers to be upgraded to more

all-around “resilience hubs” for emergency event support, assuming that the City is eligible for SGIP Equity incentives for storage.

5. Promote low-cost yet effective interventions
  - a. Low cost Do-it-yourself (DIY) fans with MERV13 air filters can improve indoor air quality especially during wildfire events with smoky air and are an opportunity for program and outreach expansion.
  - b. Used EVs can be an attractive option for many residents, and residents would benefit from more programs, higher incentives, and greater community outreach.
6. More consolidated implementation programs are needed to reduced transaction cost barriers and improve equity among residents.
  - a. Program consolidation would minimize the transaction costs to residents and provide greater access to existing programs, rebates, and incentives and in principle could reduce transaction costs for program administrators as well. For example, program consolidation would require residents to be aware of a single clean energy program rather than the current patchwork of programs across energy efficiency, EVs, solar PV, air quality, healthy homes, etc.
  - b. Program consolidation would also maximize benefits to residents and provide more opportunities reduce their energy bills. For example, combining measures such as solar PV and heat pump electrification can bring resilience benefits and stabilize utility bills; and combining used EVs and heat pump electrification can better reduce overall energy bills from the operating cost savings of EVs versus older gasoline-based vehicles.
7. More outreach is needed to improve resident awareness of existing programs. We generally find a lack of awareness among residents for existing programs in community solar, rooftop PV, and clean cars. As highlighted above, more “one-stop shop” models for incentive and deployment programs would help to address issues in awareness/education and transactional costs.

### **Summary of key community outreach findings**

- Most residents are not comfortable in their homes in hot (70%) or cold weather (60%) at least once a week. This is an area to improve equity – to provide better indoor comfort during the summer and winter without increasing energy bills.
- About 45% of the participants reported having household member(s) with asthma and allergies. Although residents did not report excessive concern with indoor air quality, the prevalence of indoor air filters seems very low and residents seem quite open to adopting low cost Do-It-Yourself air filters. More education on HVAC furnace/AC filter cleaning or replacement is another opportunity.
- Common concerns for energy related services include high utility bills, poor outdoor air quality, and transportation fuel costs and access

- Awareness of existing rooftop solar PV and clean vehicle rebate programs appears low (80% or more unaware of these programs) and is an opportunity for greater outreach and/or more program consolidation to avoid missing residents who may inquire about a specific energy efficiency/PV or EV program.
- There is a general lack of interest in e-scooters sharing, and bike sharing due to long travel distances with more interest in carpooling.
- For personal transportation, we estimate that 60% or more of residents drive less than 35 miles per day and thus electric vehicles (EV) with Level 1 charging is an option instead of a gasoline vehicle. The dominant fraction of people was willing to adopt an electric vehicle if it was affordable.

## INTRODUCTION

### **Background on Climate Equity**

California is a leading state for progressive climate policies internationally and, in the last decade, has identified climate equity as one of its pillars for climate policy. Disadvantaged communities bear a disproportionate pollution burden, have worse social and health outcomes than non-DAC areas such as high unemployment and low incomes, have fewer economic opportunities, and have been historically underserved in terms of public and private investment. In the past, many of these areas have also been targets for racial discrimination with “redlining” housing policies and subsequent inequities in neighborhood capital, healthcare access, and education.<sup>1</sup>

The state has aggressive climate targets for energy efficiency and the electricity grid (e.g., SB 350, SB 100) with the goal to achieve carbon neutrality by 2045 and climate resilience is a key emerging issue, with Fresno expected to have almost six times more extreme heat days by 2040 than historically (4 days per year increasing to 22).

Thus, there is a need to simultaneously address several key issues in disadvantaged communities: climate equity, decarbonization, and climate resilience. Where ever possible, effort should be made to align policies, programs, and implementation plans to meet these multiple policy objectives.

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<sup>1</sup> <https://www.publichealth.columbia.edu/research/niehs-center-environmental-health-northern-manhattan/historical-redlining-and-birth-outcomes-california>, accessed 2 November 2021.

Underlying these issues is the state's high degree of income inequality that has grown over the past 20 years. Since 1998 the top quintile of earners in the state has grown by 21% but the bottom 2 quintiles have dropped by 8% while the ratio of income for the top quintile to the bottom quintile has increased from 28 to 33 (Figure 1 below).

This action plan has various audiences – local, regional, and state—and is meant to provide guidance on policy gaps, opportunities, and the need for greater funding and resources to provide greater equity. In many cases, while the issues and needs highlighted here are based on Fresno, the actions to address them may be most effectively directed at state entities such as the legislature, CEC, and Office of Planning and Research in the Governor's Office (OPR), and local actions are definitely limited by resourcing such as staffing, funding, and technical expertise. Thus, while there may be some items that are specific to Fresno, many recommendations can apply to other jurisdictions such as those that apply to clean vehicles, air quality, and program consolidation.



Figure 1. (a) Incomes across the state have grown much more slowly for the lowest two income quintiles and (b) income inequality in California has increased since 1998. (Income here refers to Adjusted Gross Income) Source: CA Franchise Tax Board

## Fresno Background

Numerous areas in the Central Valley are classified as disadvantaged communities in CalEnviroScreen<sup>2</sup> with high pollution burdens, high unemployment, and poor health and social

<sup>2</sup> <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40>

outcomes. Residents also lack broad and high-quality economic opportunities. Multiple sources of pollution from trucking, cars, road dust, agricultural dust/equipment, oil and gas extraction, other heavy industry, power plants, and dairies and a closed air basin both contribute to some of the worst air quality in the country.<sup>3</sup>

Fresno is the largest city in the Central Valley and has many disadvantaged communities in central and south Fresno in particular. Residents suffer from among the worst air quality in the state<sup>4</sup>, have the highest utility bills in the state, and have low ownership of clean technologies such as EV/PEVs and rooftop solar PV. Fresno residents will experience more extreme heat days in the next twenty years, from a historical level of 4 days per year to 22 days by 2040.<sup>5</sup> Note that the definition of extreme heat is location specific and is defined in California as those days above the 98<sup>th</sup> percentile of maximum temperatures, based on 1961-1990 data for a given location's warmest months and that threshold is 106.1°F in Fresno. In terms of very hot days, in 2021, Fresno broke the record for the number of days above 100°F, with 69 days.<sup>6</sup>

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<sup>3</sup> <https://abc30.com/state-of-the-air-report-american-lung-association-central-ca-pollution-quality/10534815/>

<sup>4</sup> <https://abc30.com/state-of-the-air-report-american-lung-association-central-ca-pollution-quality/10534815/>  
Accessed 30 October 2021.

<sup>5</sup> Data from <https://cal-adapt.org/tools/extreme-heat/>, accessed 1 August 2021.

<sup>6</sup> <https://www.fresnobee.com/article254041618>, accessed 3 November 2021



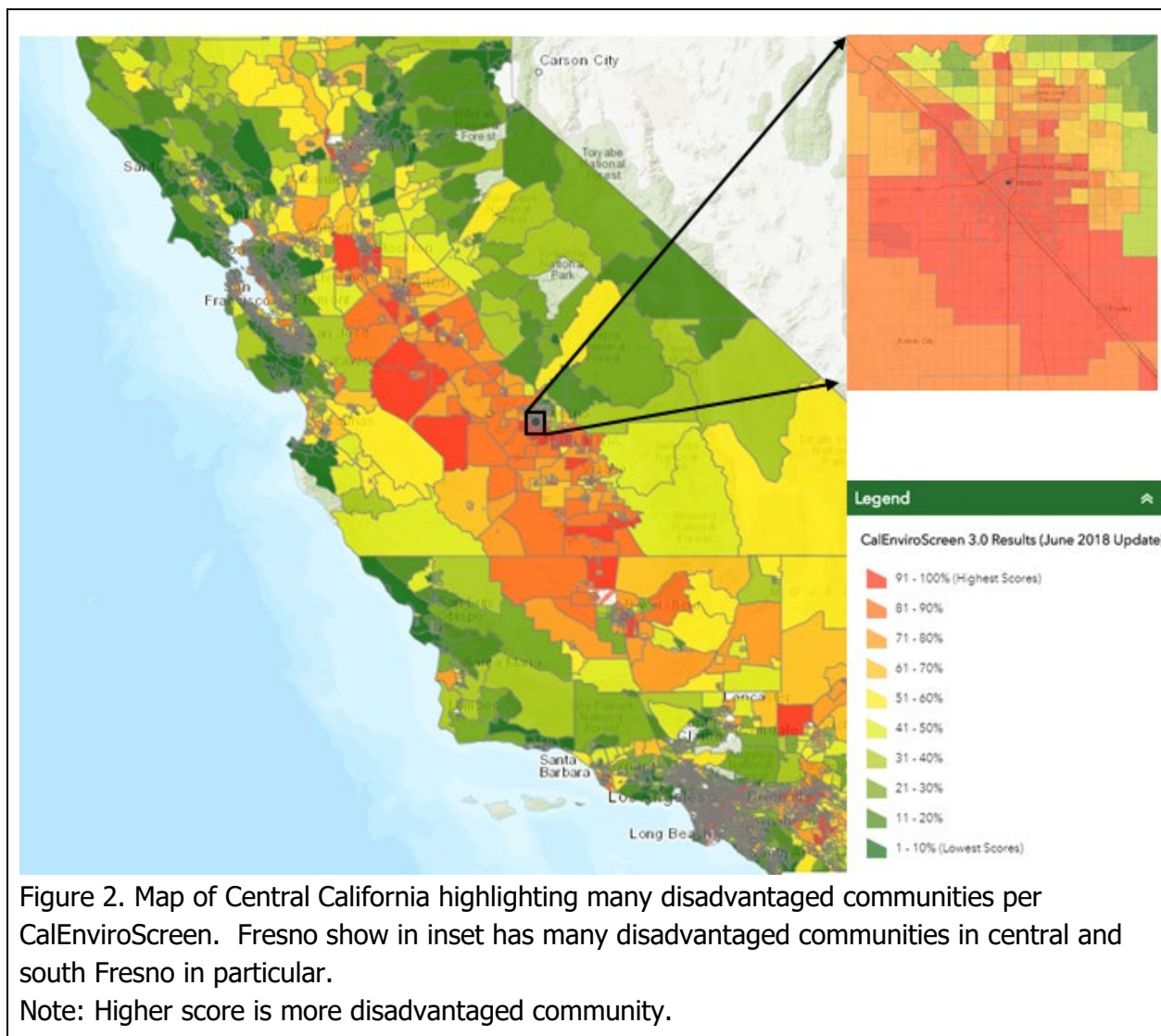


Figure 3 shows residential sector GHGs for the city of Fresno. Passenger vehicles over half of GHGs, natural gas about 20%, and high GWP refrigerants and solid waste: 11%. We address passenger vehicles, residential gas, and residential electricity and in this plan but not high GWP and solid waste. More details on City of Fresno GHGs can be found in Appendix A.

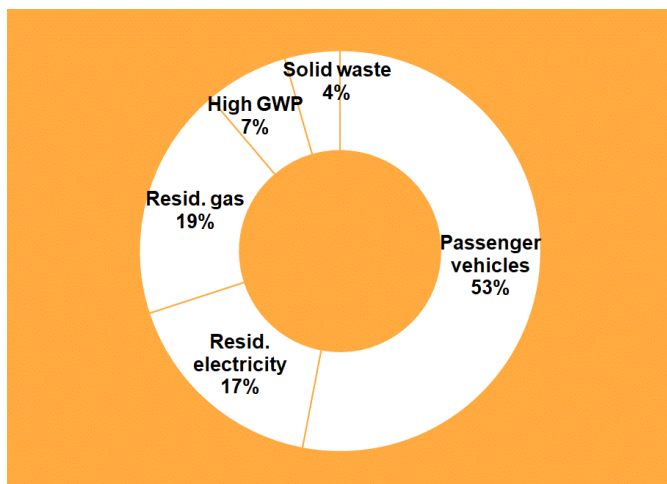


Figure 1 Residential sector GHGs for the city of Fresno (2020)

## Project Overview / Methodology

The project combines three key elements to develop an action plan for residential sector climate equity in disadvantaged communities (DACs) in Fresno: 1) community outreach/feedback, 2) policy analysis, and 3) technology assessment and modeling activities. We focused on two neighborhoods in south Fresno (Columbia and Winchell) that are disadvantaged, historically underserved, and targeted by the city for neighborhood revitalization. These are representative DACs with high unemployment, low average incomes, high pollution burdens, and poor social and health conditions. Many homes are single family with a high fraction of renters so there is greater focus on this demographic. Note that funding for new affordable multifamily housing is a focus for programs such as the Affordable Housing and Sustainable Communities program, but that Gov. Newsome’s 2022-23 budget has increased funding for existing older buildings and those housing California’s most vulnerable residents. The three key elements are described below,

**Community outreach/feedback.** This element was a key pillar of the project and included several outreach avenues: community meetings, community stakeholder interviews, and several rounds of phone interviews. Feedback from the community helped shape our selection of technology options, key priorities and barriers for community residents, as well as community awareness of existing programs.

**Policy analysis.** Relevant policies were compiled and summarized with a focus on existing and potential policies for low-income and DAC areas. The team queried the community about their awareness of existing incentives and rebates. From the overall analysis of policy gaps and opportunities, the team developed policy-related recommendations

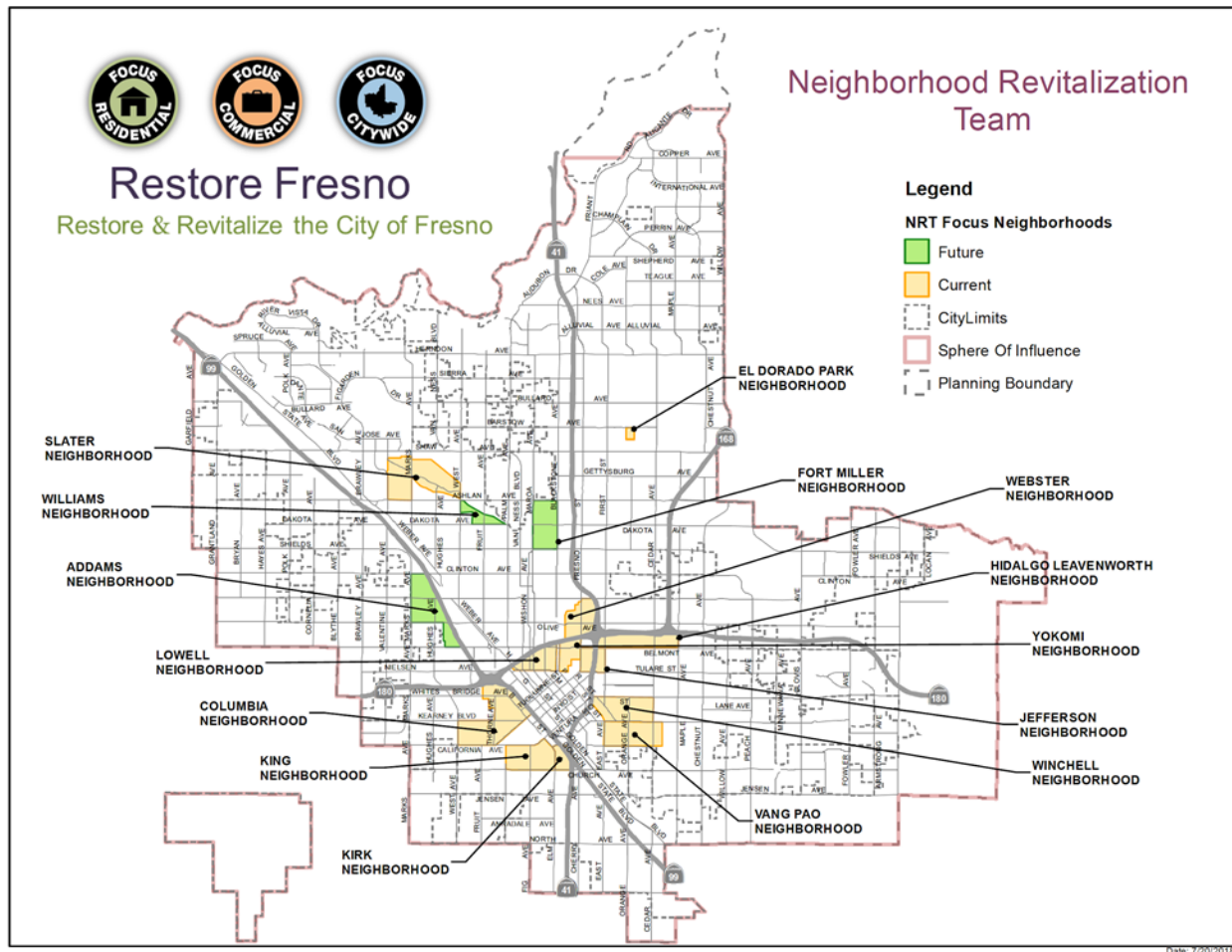


Figure 4. South Fresno was the area of focus for this work. Building modeling and outreach centered on the Columbia and Winchell neighborhoods.

**Technology assessment and modeling activities.** The team considered a set of technology options for both energy supply and energy end use and utilized community outreach and feedback to down-select key technology options for the action plan. For example, based on community inputs, microgrids were not a priority for the community and among alternative transportation options, community members indicated more willingness to carpool than other options such as scooter or bike sharing. Modeling activities focused on residential building modeling of energy efficiency measures, electrification of water heating and space heating, coupled with rooftop solar PV and electric vehicles. Other modeling activities estimated the monetary health benefits from passenger vehicle electrification and “resilience hub” of a community cooling center.

This action plan focuses on residents’ access to clean technologies, or how to increase the adoption of clean technologies in disadvantaged communities with the least disruption to living patterns, or equivalently, technologies that minimize resident hardship. Inputs from the community are strongly considered. For example, active transportation options such as walking

or biking is certainly a cleaner option for transportation but entails behavior and lifestyle changes that might make life harder for residents especially those in DAC areas that may have greater incidence of underlying health conditions and lower incomes. Similarly, in the transportation sector, electric buses would be a great measure to reduce GHGs in transportation but are more of an indirect measure in terms of household adoption of a given end-use technology, and walking to a bus shelter and waiting for a bus outside in increasing frequent extreme heat did not seem to be most equitable measure for Fresno residents. Our intent is to highlight areas that are closer to drop-in substitutes of what people use today, for example a cleaner vehicle instead of an old and polluting gasoline-burning vehicle.

## **Community Development Priorities**

The priorities we identify below (and expand on later) are grounded in the community input we received. They are important for reaching the City's climate targets, fostering environmental justice, and ensuring local resiliency. And while they're not all easy to achieve, they highlight what the City and its residents can reasonably do – without dramatic changes to existing lifestyles and patterns of development.

### Clean Transportation

Transportation is the single-biggest source of Fresno's annual emissions (53% in 2020) which makes clean transportation the most important area for emissions reductions in Fresno. And yet it's particularly challenging for three reasons:

- *Urban Sprawl:* Cars, bicycles, their own two feet – most residents already possess their own modes of transit and are not currently utilizing public transit options
- *Diversity:* We all have our own needs and preferences. Some residents would prefer to drive, but can't afford to. Others would prefer to walk or bike, but don't due to the heat, a disability, or safety concerns. The best way to serve such a disparate set of needs is to consider options that address pre-existing equity and accessibility issues.
- *Inertia:* Vehicles and infrastructure are capital-intensive and behavior change takes time

All that said, we focus many of our recommendations and analysis in this area on transportation electrification. Partly because electric vehicles are the closest thing many people have to a drop-in substitute for their existing methods of transit. And partly because many of the state programs and incentives focus on transportation electrification.

### Clean Energy Supply

Clean energy, such as electricity from solar PV, does not contribute to the city's GHG emissions and displaces higher carbon sources of energy. Consequently, increasing the supply of clean energy in Fresno can reduce the city's contribution to climate change.

It can also reduce the other harms associated with burning fossil fuels – the environmental harm associated with mining, drilling, and spillage and public health harms associated with breathing polluted air. This has equity implications, because the people most often harmed are the vulnerable – children; ethnic minorities; those with low-to-moderate incomes. So regardless of where the city's clean energy supply comes from, it provides benefits to the vulnerable, to the planet, and to our collective future.

### Energy Efficiency & Electrification

The more efficiently we can use the energy we have, the more we can do with that energy, and the less it costs to do so. This has climate implications (via reduced emissions) and financial implications (which are particularly valuable for those with low incomes).

In contrast, electrification means using more of a particular form of energy – electricity. Electricity sourced from the grid isn't completely clean, but it is expected to grow cleaner over time, as existing fossil fuel plants are retired, and replaced with solar, wind, and other forms of clean electricity together with energy storage. But even today, electrification has immediate climate benefits, because it displaces forms of energy that are still more carbon-intensive (like gasoline or natural gas) and prioritizes utilizing more efficient appliances

### Air Quality

Fresno has some of the worst air quality in the country. This matters because polluted air is a threat to human health, killing thousands of Californians each year, sickening others, and even reducing educational achievement among students – all burdens which fall disproportionately on those who are already disadvantaged. So mitigating sources of local pollution (like automobile exhaust) doesn't just help the climate, it helps the people who breathe that air – local residents. But switching to electricity isn't the only solution. Indoor air filters also help enormously, and do so cost-effectively, which we explore further below.

### Global Priorities

In this final section, we explore global priorities challenges, opportunities, and benefits in order to highlight solutions that would alleviate concerns across the four community priorities. Global recommendations include:

- Community Engagement
- Financing & Funding
- Deferred Maintenance

- Local Pilot and Demonstration Programs

Accordingly, we've highlighted programs and recommendations throughout this Action Plan that have special significance for disadvantaged communities. In doing so, we've been guided by four primary objectives:

- **Improved access to, and understanding of, clean technologies:** Clean energy technologies, especially those that support electric vehicles and infrastructure, are already accessible to mainstream consumers but limited to those within DACs. Directly addressing these limitations will not only expand equitable clean energy access but also increase the level of community knowledge about the importance of the renewable energy transition. At the same time, in keeping with CPUC guidance, residents' energy bills should not increase.
- **Improved community awareness of rebates and incentive programs:** Although numerous rebate and incentive programs are already available to DACs, many residents are either not aware of the programs or do not realize they are eligible to apply. Knowledge-sharing, especially by direct and consolidated outreach (sharing about a variety of programs instead of just one program), is one way that residents can learn of these opportunities.
- **Improved local air quality:** Zero emission vehicles, including electric vehicles, do not emit pollution as they do not have a tail pipe and are powered by electricity rather than a fossil fuel-powered internal combustion engine. Consequently, they provide numerous environmental benefits to local communities, especially DACs, which tend to be hardest hit by air pollution.
- **Improved community health and resilience:** Reducing point source pollution from polluting vehicles and greenhouse gas emissions from burning fossil fuels will reduce health impacts such as asthma and heart disease, in turn saving money on health care costs for the community. Such actions also increase the resiliency of a local community further ensuring that it has the resources necessary to weather an increasingly unpredictable future. Providing community "resilience hubs" are another key opportunity to improve community resilience and prepare for future emergency events such as dangerously polluted air quality from wildfires or power outages from extreme heat waves across the West.

## ACCESSIBLE CLEAN TRANSPORTATION

### Overview & Benefits

California has a goal of 5 million ZEVs on the roads by 2030 and 250,000 electric vehicle charging stations by 2025. To meet these ambitious goals, state agencies, such as the Air Resources Board, have begun to administer funding and programs to help Californians adopt clean energy technologies. Some of these programs include additional funding and assistance for disadvantaged communities. Due to an emphasis on electrification and decarbonization, a majority of incentives focus on electric transportation projects; additional funding is provided for active transportation.

For the City of Fresno, motor vehicle emissions make up the largest share of city GHGs at 53% (or 1,170,329 MT CO<sub>2</sub>eq.) according to the 2020 Greenhouse Gas Inventory.<sup>7</sup> By targeting improvements in clean transportation, the City can greatly reduce their local emissions and achieve their 2030 climate goals. The City has the most control over its own municipal fleet and can reduce emissions and lead by example by converting the municipal fleet to clean vehicles. However, the biggest impact and most transportation emissions are from those who live and work and travel through the City.

Prioritizing clean transportation is a triple win for local communities:

- **Equity and Access to Clean Technologies:** Familiarity with, and access to, clean transportation options provides opportunities to engage further in other clean technologies, like solar and energy efficient appliances.
- **Improved Local Air quality:** Increasing the utilization of clean transportation options and, in turn, reducing the number of gasoline vehicles on the road, provides significant local air quality benefits and provides a myriad of associated health benefits due to the reduction in point-source pollution.
- **Lowered Operating and Maintenance Costs:** Provided that the incremental costs of obtaining an EV/PHEV is offset by a rebate, a lower operational cost improves equity by providing more personal transportation services to residents for the same transportation budget. This means that residents can use their car more for the same fuel and maintenance budget that would have been incurred for a gasoline vehicle.

### Key Modeling Findings

Our modeling of vehicle electrification in Fresno estimates a median value of \$44-59 million in health benefits in 2020 if all passenger vehicles in Fresno County were electrified using the closed form InMAP health impacts model (ref: <https://www.inmap.run/>). Similar magnitude of

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<sup>7</sup> [https://www.fresno.gov/darm/wp-content/uploads/sites/10/2020/03/Appendix\\_G-GHG\\_Reduction\\_Plan\\_Update.pdf](https://www.fresno.gov/darm/wp-content/uploads/sites/10/2020/03/Appendix_G-GHG_Reduction_Plan_Update.pdf)



health benefits is found from early work using the EASIUR health impacts model (Wei et al 2019 CEC study). Annual fuel savings from EV versus gasoline vehicles can be several hundred dollars per year depending on the fuel efficiency of the gasoline vehicle being replaced and annual mileage driven.

## Key Outreach Findings

Among alternative transportation options, community members indicated more willingness to carpool than other options such as scooter or bike sharing. As noted above, in 2021 Fresno had a record number of days above 100°F with 69 days.<sup>8</sup> Thus it does not seem reasonable or realistic to say that residents should take alternative transportation such as transit or car/bike/or scooter sharing if these are fully outdoor travel modes, if residents need to walk several blocks to access these modes, and/or if residents need to wait outside for a bus without any shelter or shade as is typically the case in Southwest Fresno. According to the statistical data of the U.S. Department of Transportation, the annual mileage per vehicle in the Fresno Columbia and Winchell districts is 9000 (U.S. Department of Transportation, 2021a). Most survey responses indicated that residents drove less than 30 miles per day and thus an electric vehicle with Level 1<sup>9</sup> overnight charging could work for many homes while others would need hybrid electric vehicles for longer daily driving distances.

Most of the residents surveyed (85%) have not heard about clean vehicle rebates, and the majority of them seem to be interested in electric cars if it is within their price range. However, the price budget for most residents is under \$3000, so EVs or PEVs would not be affordable unless they are used vehicles with large rebate incentive amounts.

## Current Programs

Current programs that support accessible clean transportation investments are detailed below. Programs are separated into two categories:

- **DAC-Priority:** Programs that prioritize, partially or fully, development in designated Disadvantaged Communities (DACs)
- **Non-DAC:** Programs that do not explicitly prioritize development in designated Disadvantaged Communities (DACs).

Please note that the information detailed below for each program is a summary. For more details, please see Appendix B.

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<sup>8</sup> <https://www.wrh.noaa.gov/hnx/fat/normals/fat100degreefacts.htm>, accessed Dec. 20, 2021.

<sup>9</sup> Level 1 charging refers to charging that is done with a standard electrical outlet (120V).



## DAC-Priority Accessible Clean Transportation Programs

### Clean Cars 4 All

*Clean Cars 4 All* (CC4A) is a statewide program, implemented via local air districts, to help low-income families exchange their old vehicle for a newer model. To qualify for the program, an individual's household income must be at or below 400% of the Federal Poverty Level (FPL).

### Clean Vehicle Assistance Program

The Clean Vehicle Assistance Program is a statewide program, also funded through California Climate Investments that provides grants, not rebates (i.e. financial support at the time of sale and not funding after purchase), and affordable financing to income-qualified California residents to support the purchase or lease of a new clean vehicle (EV or hybrid). The program also provides two options for EV charging credits:

- Option (1): EV Charger Installation
- Option (2): Public Charging Card for those who do not wish or cannot install a charger at their home

### Drive Clean in the San Joaquin

The San Joaquin Valley Air Pollution Control District's *Drive Clean in the San Joaquin program offers tiered services to improve transportation impacts on air quality in the San Joaquin Valley*.<sup>10</sup>

- The "Repair" service hosts regular free events where older cars that do not meet emissions standards are inspected to determine if they can be fixed.
- The next level program, "Replace" offers rebates to those who own older, higher emission cars to replace with a newer lower emission ICE, hybrid, or electric vehicle.
- The third level of service that Drive Clean in the San Joaquin offers is "Rebate" which offers rebates to Valley residents and businesses for the purchase or lease of new, clean-air vehicles.

### Clean Vehicle Rebate Project (CVRP)

The Clean Vehicle Rebate Project (CVRP) is administered by the Center of Sustainable Energy and offers rebates for zero-emission and plug-in hybrid vehicles<sup>11</sup> for public agencies. Funding is subject to availability and program renewal status.

<sup>10</sup> <http://ww2.arb.ca.gov/sites/default/files/movingca/vehiclescrap.html>, accessed 2 November 2021.

<sup>11</sup>

### California Electric Vehicle Infrastructure Project (CALeVIP)

CALeVIP is a rebate program designed to create a statewide infrastructure for electric vehicles by facilitating the purchase and installation of EV chargers. Due to the public access requirement, an applicant must be a business, non-profit organization, tribal government, or government entity; private single-family residences are not eligible for the program; multi-family properties are eligible but it is unclear how many, if any, have been installed at such properties. Along with chargers, eligible costs include energy storage equipment, transformers, extended warranties, and signage. Two programs are listed for Fresno:

#### Fresno County Incentive Project (FCIP)

The Fresno County Incentive Project offers rebates (\$4,000 for single port; \$7,000 for dual port) for the purchase and installation of Level 2 EV chargers for public and private organizations in Fresno.<sup>12</sup>

#### San Joaquin Valley Incentive Project (SJVIP)

The San Joaquin Valley Incentive Project provides funding for the installation of EV chargers in Fresno, Kern, and San Joaquin Counties and has committed about 25% of its \$15.3 million budget for projects in DACs.<sup>13</sup>

### Driving Clean Assistance Program

The Community Housing Development Corporation of several Northern California counties offers a Driving Clean Assistance Program that provides financial education and down-payment assistance for clean energy vehicles to low-income families/individuals. They offer applicants two options: a grant of up to \$5,000 (amount depends on income level and the vehicle type) or financing of up to \$20,000. Both new and used vehicles (less than 8 years old and less than 75,000 miles) are acceptable for either purchase or lease.

## Non-DAC Accessible Clean Transportation Programs

### California Clean Fuel Reward

<sup>12</sup> <https://calevip.org/incentive-project/fresno>

<sup>13</sup> <https://calevip.org/incentive-project/san-joaquin-valley>

The California Clean Fuel Reward is a time-of-sale reward that is applied during the purchase of a new Battery Electric Vehicle (BEV) or Plug-in Hybrid Electric Vehicle (PHEV). The instant reward is offered depending on the size of the battery and can be up to \$1,500.

#### Charge Up! Electric Vehicle Charger Incentive Program

The Charge Up! Program is managed by the San Joaquin Valley Air Pollution Control District and provides incentives for the purchase of Level 2 and Level 3 EV chargers.

Eligible organizations – public and private entities and owners of multi-unit dwellings – can receive up to \$50,000 in funding annually, but there is no prioritization of, or additional support for, disadvantaged communities.

## Key Challenges

As state and local agencies more strongly prioritize an equitable energy transition, widespread community adoption challenges persist. In many cases, individuals from DACs are not aware of pre-existing programs and, if they are, are not aware that they meet the eligibility criteria nor have the time and capacity to complete the application process. Additionally, many challenges that affect adoption rates across all demographics are particularly heightened in low-income communities, including cost, financing, market size, and other limiting factors to EV adoption. The challenges, along with others, are detailed below:

- **Awareness:** A significant challenge in electric vehicle adoption is general awareness about available vehicles and existing rebate programs. Many low-income residents consider electric vehicles to be outside of their price range because they are not aware of electric vehicles that exist at different price points. In Fresno, most survey participants (about 85%) were not aware of Clean Car rebates.
- **Cost:** The main barrier to wider EV adoption in the City of Fresno is cost as EVs are still more expensive than conventional vehicles. This was cited as the number one barrier for residents at the second community meeting on September 30, 2021. According to Kelley Blue Book, the estimated average price for a light-duty new vehicle in the United States was \$40,768 in April 2021; at the same time, new EVs averaged \$51,532.<sup>14</sup> The fraction of households with incomes less than \$35,000 per year in the Columbia and Winchell neighborhoods DACs of Fresno were 69% and 63% vs. the city average of 43% (Phil Skei, City of Fresno). On the other hand, used electric vehicles can be affordable with large rebate amounts. Used electric vehicles have a higher rate of

<sup>14</sup> <https://mediaroom.kbb.com/2021-05-18-Average-New-Vehicle-Prices-Continue-to-Climb,-up-2-2-Year-Over-Year-for-April-2021,-According-to-Kelley-Blue-Book>

depreciation compared to gasoline-fueled vehicles. Three-year old Nissan LEAFs for example and are below \$12,000 and with EV rebates for DAC residents, used EVs can be below \$4,000 for many residents or within their budget for many residents.

- Limited Market: The variety of EV makes and models is currently more limited than conventional vehicles. Consumers with different needs, such as those who use their vehicle for work to frequently haul or transport goods, for outdoor recreation, or for large families, may be concerned about finding a vehicle that fits their needs. After EV cost (76% thought EVs were too expensive), the next highest concern for residents at the second community meeting was vehicle range (56% mentioned this as a top concern) and charging availability (56% mentioned this as a top concern). However, this is changing over time as more models become available and battery range improves.
- Financing: Conventional financing methods for vehicles may be prohibitive to low-income communities (ARB 2018 Low income barriers study, Part B, p25,31). Financing programs such as grants and rebates can address these barriers but the design of some programs skew the benefits to middle- and high- income earners. Because many of the current EV incentives come in the form of income tax credits, consumers do not benefit from the savings until months after the time of sale. For low- and medium-income households that do not qualify for earlier rebates due to incomes above the FPL-based limits, they may not be able to wait that long to receive those savings. Additionally, anticipated savings can also be lower than expected as federal tax credits, for example, are only worth as much as the consumer owes in federal taxes. A 2016 study from University of California, Davis, found that 13 percent of electric vehicle owners overestimated how much money they would get back on their purchase.<sup>15</sup> In order to earn the full \$7,500 federal tax credit available, one must make more than \$66,000 a year.<sup>16</sup> In 2016, most of the tax credits (78%) were claimed by filers with adjusted gross incomes (AGI) of \$100,000 or more.<sup>17</sup> This means middle- and upper-class consumers benefit more from federal tax credits than their low-income counterparts.
- Range of EVs: According to the [2021 J.D. Power U.S. Electric Vehicle Experience \(EVX\) Ownership Study](#), EV buyers cite battery size and range most often as a factor in purchase decisions. More specifically, the variation between stated battery range and actual battery range experienced influences up to 20% of owners' overall satisfaction with their EV purchase. Despite improvements in the EV market, "range anxiety" continues to be a major barrier to EV perception and EV adoption and is, naturally,

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<sup>15</sup> <https://doi.org/10.3141/2572-11>

<sup>16</sup> <https://sgp.fas.org/crs/misc/IF11017.pdf>

<sup>17</sup> <https://sgp.fas.org/crs/misc/IF11017.pdf>

largely influenced by the availability of public EV charging infrastructure. Census vehicle travel data indicates an average daily VMT of less than 31 miles in the Columbia and Winchell neighborhoods. Phase 1 and 2 surveys were consistent with this or lower daily VMT indicating that overnight Level 1 charging is sufficient for most residents.

- Infrastructure Access and Availability: Lower-income communities, especially those with a higher percentage of renters and/or residents in multi-family housing, rely more on public infrastructure for charging due to the inability to install charging infrastructure directly at home. This presents two potential issues for lower income residents that may be interested in purchasing an EV: (1) access issue of not having a nearby charging port to utilize; and (2) availability of chargers, especially at multi-family properties as there may not be sufficient chargers for the number of electric vehicles within the property.
- Infrastructure Reliability: As noted above, lower income households are more likely to rely on public charging sites than their higher income counterparts, but in addition to access issues, the reliability of many public chargers is not consistent. This could be due to numerous operational challenges upstream (network provider) or downstream (station operator) delays.<sup>18</sup> This phenomenon of station unavailability occurs enough to have its own name: *downtime*.<sup>19</sup> Higher levels of downtime can lead to range anxiety as consumers grow less and less confident that the charging infrastructure will work when they need it to.
- Technological Requirements for Charging: Locating nearby public EV charging points can be challenging for low-income residents because available charging stations are often found through cell phone applications, requiring a cell phone with both consistent data and service. This is an additional barrier for certain populations who are less likely to own cell phones or those who lack a cell phone data plan or familiarity with charging apps.
- Charger Incompatibility and Rate of Charge: Not all chargers are compatible with all EV types and individuals may not have access to the necessary adaptor to utilize a public charging station. Tesla, for example, has proprietary charging which means only Tesla vehicles can use Tesla charging stations (although this might change if Tesla decides to open its Supercharger network up to all EVs). The rate of charge – dependent on the charging type – can also be prohibitively slow, leading to even greater range anxiety for EV owners. Level 1 (120 V) charging, for example, can take up to 10 hours to get 20-50 miles of range; Level 2 (240 V) charging can achieve almost the same added range in 1 to 2 hours.<sup>20</sup>

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<sup>18</sup> <https://www.utilitydive.com/spons/the-best-remedy-for-charger-anxiety-a-focus-on-reliability/589699/>

<sup>19</sup> <https://www.utilitydive.com/spons/from-range-anxiety-to-charger-anxiety-evolving-challenges-for-ev-adoption/588063/>

<sup>20</sup> <https://www.jdpower.com/cars/shopping-guides/how-long-does-it-take-to-charge-an-electric-car>

- **Battery Lifetime:** The working life of electric car batteries and the cost for a replacement battery remains a concern for would-be EV owners. A manufacturer's battery warranty typically covers 8 years/100,000 miles. Under normal operating conditions, an EV's battery lifetime is 10–12 years<sup>21</sup>. The energy capacity of an electric battery or equivalently, the vehicle range, can also fade with calendar life and charging cycles<sup>22</sup>.

## Recommendations

### LOCAL

#### **Recommendation #1:** Upgrade Municipal Fleet (City of Fresno)

The City of Fresno should participate in the [Clean Vehicle Rebate Project \(CVRP\) II](#) to secure grant funds to purchase clean vehicles for the city fleet. The city should develop a training program for city staff and fleet analysts on EV use, increase charging infrastructure at city sites, prepare key performance indicators (KPIs) to track usage and savings from an electrified fleet, and benchmark progress to compare against peers.

The City of Fresno could participate more widely in the [Clean Vehicle Rebate Project \(CVRP\) II](#) to secure grant funds to purchase clean vehicles for the city fleet. To support this vehicle electrification, the city could develop a training program for city staff and fleet analysts on EV use, increase charging infrastructure at city sites, prepare key performance indicators (KPIs) to track usage and savings from an electrified fleet, and benchmark progress to compare against peers.

#### **Recommendation #2:** Expand Partnerships and Program Participation (City of Fresno and Community-Based Organizations (CBOs))

The City of Fresno and local CBOs should work with the San Joaquin Valley Air Pollution Control District to increase community awareness and participation in available EV rebate and grant programs. This can be done through a variety of methods such as city-approved joint mailers to eligible households, community workshops focused on EVs and EV infrastructure, and public EV charging demonstrations.

<sup>21</sup> [https://afdc.energy.gov/files/u/publication/electric-drive\\_vehicles.pdf](https://afdc.energy.gov/files/u/publication/electric-drive_vehicles.pdf)

<sup>22</sup> <https://www.nature.com/articles/s41467-018-04826-0.pdf?origin=ppub>

**Recommendation #3:** Work with Community to Prioritize Solutions (City of Fresno)

One potentially effective approach to increasing clean transportation adoption in a community is to work with and listen to the community to identify what transportation or PEV/EV solutions they think will work best in their neighborhood. The city facilitator should be able to relate to the community and know what it's like to live there in order to build an effective relationship to share options for EV adoption. For example, alternative solutions could include car-sharing programs or more carpooling programs potentially featuring fleets of EVs. Other alternatives, such as scooter sharing and bike sharing, are not very favorable given that Fresno just experienced 69 days above 100 °F in 2021. The project team received more positive responses for carpooling with friends, family, or coworkers over more active transportation options.

## REGIONAL

**Recommendation #4:** Alternative Financing Options (Community Housing Development Corporation)

Applicants who are interested in installing an EV charger may not have sufficient capital for the upfront costs of both purchasing and installing the equipment. Providing alternative options such as zero-money down financing or grants may help reduce this barrier. For example, the Driving Clean Assistant Program would increase access to used clean vehicles and financing options for EVs. Having the ability to lease EVs also opens up the opportunity for Federal Tax Credits, which get applied at the time of purchase.

**Recommendation #5:** Public Agency Participation in CALeVIP (County of Fresno)

City and public agencies within Fresno County can apply for funding from the [California Electric Vehicle Infrastructure Project \(CALeVIP\)](#) in order to increase EV charging capacity at public buildings and other city- and county-owned properties. For example, the Fresno Housing Authority is eligible for these funds and could install EV chargers at their sites in priority, low-income neighborhoods. Increasing EV infrastructure is consistent with the City of Fresno's General Plan Policy RC-8-j Alternative Fuel Network: "Support the development of a

network of integrated charging and alternate fuel stations for both public and private vehicles, and if feasible, open up municipal stations to the public as part of network development.”

## STATE

**Recommendation #6:** Increase Eligible Age of Cars in Trade-in Programs (Drive Clean in the San Joaquin)

Increasing the model year range of an eligible car to cars purchased after the current limit of 1999 (or within a larger time window) can provide opportunities for more residents to participate in the program, resulting in a potential increase of DAC participation.

**Recommendation #7:** EV/PHEV Focus (Drive Clean in the San Joaquin)

Fuel efficient combustion vehicles are eligible as a replacement vehicle for the Drive Clean in San Joaquin program; the program may be more effective at reducing localized air pollution if EV and PHEVs were the only replacement option.

**Recommendation #8:** Scale-up or Increase Funding for Used ZEV Programs (Statewide Clean Vehicle Assistance Program)

The Statewide Clean Vehicle Assistance Program is one of the few grant programs that includes used vehicles in its eligibility. The 2021 Program Funding began wait-listing interested applicants, on April 14, 2021. Due to the popularity of this program, the funding for this program from the California Climate Investments program should be renewed and expanded in subsequent years to avoid a waitlist forming so early in the year. Expanding eligibility to used EVs can decrease consumer costs, increase program participation, and increase accessibility for low-income residents.

**Recommendation #9:** Develop Feebate Model to Incentivize Lower-Emission Vehicle Adoption



Programs that establish a sliding scale of fees or rebates for vehicle purchases based on GHG emissions have proven to successfully influence consumer behavior; France's "bonus-malus system", for example, provides rebates for consumers with the lowest GHG-emitting vehicles and enacts a fee on those higher emissions; average fleet emissions have fallen accordingly.<sup>23</sup> This approach aligns incentives with GHG gas objectives and increases the funding available for zero emission vehicles.

**Recommendation #9:** Scale-up or Increase Funding for Used ZEV Programs (Statewide Clean Vehicle Assistance Program)

The Statewide Clean Vehicle Assistance Program is one of the few grant programs that includes used vehicles in its eligibility. The 2021 Program Funding began wait-listing interested applicants, on April 14, 2021. Due to the popularity of this program, the funding for this program from the California Climate Investments program should be renewed and expanded in subsequent years to avoid a waitlist forming so early in the year. Expanding eligibility to used EVs can decrease consumer costs, increase program participation, and increase accessibility for low-income residents.

**Recommendation #10:** Expand partnerships to Increase Research & Development (R&D) in Lower Cost "Economy" EVs

A significant challenge to universal EV adoption continues to be cost paired with a limited market. Although EVs are becoming relatively cheaper (at least when compared to their earlier counterparts), additional support is needed to develop a more economical EV for the general public. China, for example, has recently released a compact EV that costs only \$4500<sup>24</sup> and, with the right partnerships for expanded R&D, the state of California could potentially replicate this effort.

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<sup>24</sup> <https://www.bbc.com/news/business-56178802>

## CLEAN ENERGY SUPPLY

### Overview & Benefits

Improvements to the accessibility and affordability of clean energy supply – whether achieved through Residential Energy (via rooftop solar PV installation) or Community Energy (via community solar)- would provide numerous benefits to residents and businesses of Fresno alike. Community solar, in particular, provides an access point for renters who are otherwise unable to install rooftop solar, and prioritizing access to these technologies for those residing in DACs would align well with statewide goals of energy equity and access. Even though California leads nationally in renewable energy production, the rate of community solar adoption is much lower than other states such as New York or Maryland.<sup>25</sup> Within the state there are little more than 100 MW of mostly one-off community solar projects built as of March 2019.<sup>26</sup> Additionally, research has shown that access to distributed energy resources (DERs), like residential and community solar, reflect pre-existing racial and financial divides.<sup>27</sup> Proponents of community solar argue that California should do more to increase the affordability and accessibility of community solar as it has great potential to address environmental justice concerns.<sup>28</sup>

Local energy provides an additional three key benefits:

- **Energy Resilience:** Floods, fires, high winds and other hazards – all more common in a warming world – can disrupt the transmission of electricity. Local production reduces this hazard because less transmission is needed and communities are less dependent on the state or national grid. In the future, homes with solar and storage will be more resilient to power outages.
- **Employment and Workforce Development:** Local energy projects bring new employment and workforce development opportunities to disadvantaged communities. Training and information-sharing, especially as it applies to new technologies, also ensures that communities are better prepared for the impending energy transition.
- **Public Health:** Transitioning from polluting sources of fuel, like oil and gas, to cleaner sources of energy, like Solar PV, can provide public health benefits to low-income communities through the direct reduction of point-source pollution.

Additionally, some of the methods of local electricity production may offer further value. Community Choice Aggregation (CCA) – also known as Community Choice Energy – can increase consumer choice and local influence over rate-setting. Community solar can allow

<sup>25</sup> <https://www.greenbiz.com/article/whats-new-community-solar>

<sup>26</sup> <https://www.greentechmedia.com/articles/read/inside-californias-community-solar-experiment#gs.6w9h3t>

<sup>27</sup> [https://s3.documentcloud.org/documents/21061599/uc-berkeley-study.pdf?utm\\_id=41257&sfmc\\_id=4499202](https://s3.documentcloud.org/documents/21061599/uc-berkeley-study.pdf?utm_id=41257&sfmc_id=4499202)

<sup>28</sup> <https://calmatters.org/commentary/2021/11/community-solar-can-expand-access-to-renewables-for-all-californians/>

renters to invest in solar – and enjoy its lower cost – even when it is not located on their own roof.

### Key Modeling Findings

- Under current NEM rules, most homes would see a solar PV payback of less than 12 years without any other upgrades.
- With an electrification package including mini-split heat pump, electric heat pump water heater, used EV, and rooftop solar PV, there would be net operating energy cost savings and global payback time within 20 years for most homes in the two modelled neighborhoods.

### Key Outreach Findings

- About 4% of residents reported having solar PV for their home.
- About half of single family homes are not roof-ready for solar PV, meaning roof repair is needed and/or an electric panel upgrade is required
- Most residents (80%) were not aware of solar PV incentive programs such as those offered by the Fresno Transformative Climate Communities and a slightly smaller fraction were not aware of community solar programs (69%)

### Current Programs

Current programs that promote clean energy investments are detailed below. Programs are separated into two categories:

- **DAC-Priority:** Programs that prioritize, partially or fully, development in designated Disadvantaged Communities (DACs)
- **Non-DAC:** Programs that do not explicitly prioritize development in Disadvantaged Communities (DACs).

Please note that the information detailed below for each program is a summary. For more details, please see Appendix C.

#### DAC-Priority Clean Energy Programs

##### Solar in Disadvantaged Communities (AB 327)

AB-327<sup>29</sup>, also known by some as the “rate reform bill”, was signed also into law in 2013 and directed the California Public Utilities Commission (the CPUC) to “develop specific alternatives designed to increase adoption of renewable generation in disadvantaged communities (DACs)”<sup>30</sup>. The CPUC created three programs in June 2018 to assist with this effort:

[Disadvantaged Communities-Single-Family Affordable Solar Homes \(DAC-SASH\)](#)

<sup>29</sup> [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB327](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327)

<sup>30</sup> <https://www.cpuc.ca.gov/SolarInDACs/>

Modeled after the Single-family Affordable Solar Housing (SASH) program, DAC-SASH provides incentives for qualified homeowners to receive a PV solar system in addition workforce training and consumer education on energy efficiency.

#### Disadvantaged Communities – Green-Tariff (DAC-GT)

The Disadvantaged Communities – Green-Tariff (PG&E’s “Green Saver”) program provides 100% renewable energy and a 20% bill discount to income-qualified residents in DACs or eligible San Joaquin pilot communities<sup>31</sup> who are not able to install their own solar.<sup>32</sup>

#### Community Solar Green Tariff (CSGT)

The Community Solar Green Tariff (CSGT) is designed to increase access to solar energy for low-income households. Implemented by PG&E, pilot projects will consist of community solar arrays installed near to DACs or the San Joaquin Valley (SJV); along with local power generation, eligible customers will receive a 20% discount on their electricity bill.

#### Solar on Multifamily Affordable Housing (SOMAH)

The Solar on Multifamily Affordable Housing (SOMAH) program provides installation incentives for solar PV systems to property owners of low-income residential housing and technical assistance throughout the length of the project.<sup>33</sup> Once installed, residents receive energy credits on their bill through virtual net energy metering and have the option of enrolling in a free Energy Savings Assistance Program.<sup>34</sup>

### Non-DAC Clean Energy Programs

#### Green Tariff Shared Renewables (GTSR)

SB-43, which was signed into law on September 28, 2013 by Governor Jerry Brown, enacted the Green Tariff Shared Renewables (GTSR) program, a 600-megawatt program that provides options for customers — including local governments, businesses, schools, homeowners,

<sup>31</sup> Includes: Allensworth, Alpaugh, Cantua Creek, Fairmead, Lanare, Le Grand, Seville, and La Vina

<sup>32</sup> [https://www.pge.com/en\\_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/disadvantaged-communities.page](https://www.pge.com/en_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/disadvantaged-communities.page)

<sup>33</sup> <https://calsomah.org/property-owners>

<sup>34</sup> <https://calsomah.org/tenants>

municipal customers and renters—to utilize renewable energy to meet up to 100 percent of their energy needs.<sup>35</sup> PG&E offers two options under the GTSR program:

#### Solar Choice

Solar Choice is a purchasing option for customers that works like a subscription where customers can choose to purchase enough solar energy from PG&E's power mix to meet between 50% to 100% of their bill.

#### Regional Renewable Choice

Regional Renewable Choice is a program that enables customers to purchase renewable energy through a local renewable energy developer within PG&E's territory.

## Key Challenges

Despite the numerous clean energy programs available, mainstream adoption can be challenging for communities throughout the state, particularly those with a higher percentage of low-income residents. This is because low-income homeowners, more so than their middle- or high-income counterparts, often face challenges meeting the prerequisites of the solar programs, even programs specifically tailored for their demographic. Roof readiness, residency, and housing stock are among a few of the challenges encountered. These challenges, and others, are detailed below:

- **Roof Readiness:** An estimated 50% of single-family homes are not "roof-ready" for solar installation (Grid Alternatives Jesse Arreguin, 8/27/19). "Roof-readiness" refers to a series of criteria necessary for solar installation, including, but not inclusive of, roof pitch or incline, static load (the weight of the solar panels), and wind load (the additional impact from wind due to the location of the panels)<sup>36</sup> and roof age. So even if the resident owns their home, if their roof is not "roof-ready", they are not able to install solar until they make the necessary changes (which requires additional up-front capital).
- **Owner/ Renter Issue:** Renters in single family homes are not eligible for rooftop solar PV programs and may lack the incentive to ask their landlord to apply on their behalf as they won't see the full benefits of the program in the short-term.
- **Older housing stock:** A significant fraction of homes in the Fresno area were built prior to 1978 (i.e. before Title 24 Building Codes) and thus may have old electrical panels and

<sup>35</sup>[https://www.pge.com/en\\_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/regional-solar-choice-program.page](https://www.pge.com/en_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/regional-solar-choice-program.page)

<sup>36</sup><https://www.energymatters.com.au/renewable-energy-systems-faqs/solar-ready-roof/>

wiring and lack insulation. These features may affect the “roof-readiness” of the property (as defined above). This may require costly upgrades.

- **Old Electrical Infrastructure:** A limited sample from Community Survey #3 indicated that about up to a third of Fresno homes have older looking circuit panels which in some cases may have a higher risk of sparking, catching fire and/or blowing a fuse. Upgrades to these systems can be costly and prohibitive for low-income households.

## Recommendations

### LOCAL

**Recommendation #1:** Reduce or Waive Building Permit Fees (City of Fresno’s Building Department)

Fresno’s Building Department could reduce or waive building permit fees explicitly for grid-connected solar installations completed through the DAC-SASH program or community solar installations completed through the CSGT program.

**Recommendation #2:** Expedite Approval of Building Permits for DACs (City of Fresno’s Building Department)

If reducing permit costs is not a viable option, a policy can be put in place to expedite the approval process of said permits. Expediting permits has the potential to both reduce project costs and save time for homeowners.

**Recommendation #3:** Develop a Marketing Campaign that Provides Information about DAC-Priority Programs (City of Fresno)

DAC-SASH, DAC-GT), and CSGT have been in place since 2018 but are under-utilized by residents because many residents are unaware that they exist. The City of Fresno could remedy this by launching a marketing campaign (Public Service Announcements [PSA], infographics, webinars) that features these programs and provides a one-stop-shop for DAC homeowners. This would also provide an opportunity to leverage pre-existing partnerships with local CBOs that service these neighborhoods.

## REGIONAL

**Recommendation #4:** Expanding Partnerships (San Joaquin Valley Air Pollution Control District)

GRID Central Valley (GRID CV) and the San Joaquin Valley Air Pollution Control District can provide information on their complementary services to their respective audiences. For example, GRID CV can refer their qualified homeowners to apply to the Drive Clean in San Joaquin program. Homeowners with newly installed PV solar systems may have more incentive to apply to the program and elect a plug-in hybrid or all electric vehicle as their trade-in option.

**Recommendation #5:** Subsidized Roof Repair Program (Fresno County Community Development Division)

Roof-readiness is a significant limiting factor for residents qualifying for solar PV incentive programs as necessary repairs can be prohibitively costly. A subsidized roof repair program, similar to LA Department of Water and Power's [cool roof rebate program](#), would help residents overcome this particular barrier. Fresno County's Community Development Division already runs a series of affordable housing programs and would be a good candidate to house such a program.

**Recommendation #6:** Subsidized Electrical Panel Upgrade Program (Fresno County Community Development Division)

As noted above, low income households in Fresno often have old electrical panels and faulty wiring which prohibits them from qualifying for clean energy programs. To address this, the County's Community Development Division could provide a free or heavily subsidized electrical panel upgrade program for DACs as an incentive to pursue additional clean energy upgrades. An example of service panel rebates is from Central Coast Community Energy CCA which provides a maximum of \$10,000 incentive for electrical work and Level 2 chargers for income qualified and public agency incentives. (Brett Bishop, Franklin Energy, Aug. 12, 2021 s "The Cost of Cooling" presentation).

**Recommendation #6:** Address Transactional Barriers with Community Solar Programs (PG&E)

As detailed above, many of the community or residential solar programs offered by PG&E require significant administrative investment by homeowners to determine program eligibility and benefits. This could be addressed by providing administrative or technical support for homeowners and prioritizing, or restricting to, homeowners or residents from DACs.

STATE

**Recommendation #7:** Redirect More Subsidies to Community Solar

If more renters can benefit from community solar than single family residents, then an argument could be made to subsidize community solar more strongly than single family. This would improve the equity aspects of current rooftop solar incentive that are not available to many single-family home renters in Fresno.

**Recommendation #8:** Provide greater bill offset for LI/DAC (much greater than 20%)

Customers enrolled in a pilot project through the Community Solar Green Tariff (CSGT) currently receive a 20% discount on their utility bill, but this discount may not be enough to incentivize residents to enroll in the program. Raising the discount (to 40 or 50%, for example) would both increase enrollment while also reducing electricity costs for low-income residents.



## ENERGY EFFICIENCY & ELECTRIFICATION

### Overview & Benefits

In alignment with its Climate Action Plan, the City of Fresno has made commitments to address energy usage through building infrastructure and, more broadly, promote energy efficiency measures for its residents. Electrifying residential homes, in particular, has been shown to be a key pathway for reducing greenhouse gas (GHG) emissions, improving energy efficiency, and improving indoor air quality as well as for reducing energy costs in some cases. Benefits result from reduced indirect (i.e., leakage) and direct (i.e., consumption) use of natural gas and the anticipated drop in capital costs of all-electric appliances as both demand and supply for electrified heating increases.

Beyond direct emissions reductions, electrification and energy efficiency provides an additional two key benefits:

- **Financial:** Electrification can provide significant financial benefits to homeowners as the capital cost of certain electric appliances, such as heat pumps, is \$1,500-\$3,000 less than the natural gas counterpart, and the direct energy savings (due to the 40-70% efficiency gains from these technologies) provide even greater value.<sup>37</sup>
- **Public Health:** Electrification improves public health and supports social equity and environmental justice objectives. According to a recent UCLA study, just one hour of natural gas stove or oven usage leads to levels of nitrogen dioxide in the home in excess of national ambient air quality standards.<sup>38</sup> Similarly, a Rocky Mountain Institute study revealed that homes with gas stoves have nitrogen dioxide concentrations 50-400% higher than homes with electric stoves.<sup>39</sup> Full electrification effectively eliminates air pollutants emitted by natural gas usage in the home, improving indoor air quality and overall public health.

### Key Modeling Findings

- We identify a combination of energy efficiency packages that are less than \$1000 with up to 10% annual energy savings (adding portable fans, improving water tank insulation, and adding air sealing to seal leaks), and up to 22% annual energy savings

<sup>37</sup> Energy and Environmental Economics. 2019. Residential Building Electrification in California: Consumer economics, greenhouse gases and grid impacts. [https://www.ethree.com/wp-content/uploads/2019/04/E3\\_Residential\\_Building\\_Electrification\\_in\\_California\\_April\\_2019.pdf](https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf)

<sup>38</sup> Zhu, Y., Connolly R., Lin, Y., Mathews, T., Wang, Z. 2020. *Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California*. <https://coeh.ph.ucla.edu/effects-of-residential-gas-appliances-on-indoor-and-outdoor-air-quality-and-public-health-in-california/>

<sup>39</sup> Seals, B. Krasner, A. 2020. *Gas Stoves: Health and Air Quality Impacts and Solutions*. <https://rmi.org/insight/gas-stoves-pollution-health>

by upgrading to an efficiency package with LED upgrade, portable fans, improving water tank insulation, and higher efficiency gas furnace.

- Single measures such as mini-split HP HVAC units can have payback times less than 10 years for some cases (e.g., replacing a window AC and gas wall heater). Due to their higher efficiency, mini-splits were found to be more cost effective than air-source heat pumps in replacing old air conditioning and furnaces.
- Integrated modeling of rooftop PV, electrification of space and water heating, and used EV give lower overall energy costs than baseline values but have high initial costs.

#### Key Outreach Findings

- Among residents that were surveyed, we found a mix of air conditioning types and space heating equipment in residents' homes. A large fraction of older homes (pre-1978) only have swamp coolers (25-33%) and most older homes have gas-based wall heaters.
- Most newer homes (post 1980) have central heating and cooling with a large number of packaged rooftop units especially from 1980-2000. Relatively fewer units were built post 1980 in southwest Fresno however.
- Many homes have rooftop units (either swamp coolers or packaged cooling and [natural gas] heating units)
- Most homes have gas water heating with storage tanks.
- A majority of residents (71%) are willing to transition to all-electric heating if there is no equipment cost to them
- We did not do extensive outreach on electric panel age or condition, but limited data indicate about one-third or more of homes appear to have old panels needing replacement.

#### Current Programs

Current programs that promote energy efficiency and electrification investments are detailed below. Programs are separated into two categories:

- **DAC-Priority:** Programs that prioritize, partially or fully, development in designated Disadvantaged Communities (DACs)
- **Non-DAC:** Programs that do not explicitly prioritize development in Disadvantaged Communities (DACs).

Please note that the information detailed below for each program is a summary. For more details, please see Appendix D.

#### DAC-Priority Energy Efficiency & Electrification Programs

### Building Initiatives for Low Emissions Development (BUILD)

The Building Initiatives for Low Emissions Development (BUILD) program's aim is to incentivize the deployment of carbon neutral building technologies in new residential buildings, specifically those designed to be all-electric. Funding will be allocated to the building of low-income residential housing and contractors providing technical assistance; the program pilots reserve \$80 million for projects located in DAC's.<sup>40</sup>

### Low-Income Home Energy Assistance Program (LIHEAP)

The Low-Income Home Energy Assistance Program (LIHEAP) is managed by the California Department of Community Services & Development and provides support to low-income families with their heating and/or cooling needs.<sup>41</sup> Funding is provided through the Coronavirus Aid, Relief, and Economic Security (CARES) Act.

### Energy Savings Assistance: Common Area Measures (ESA CAM)

The Energy Assistance: Common Area Measures (ESA CAM) is funded through the California Public Utilities Commission, managed by PG&E, and covers the cost of energy upgrades in low-income multifamily residential units.<sup>42</sup> Under this program, landlords receive financing for 100% of the costs associated with upgrading the building envelope, water heating, heating & cooling, lighting, and appliances and loads infrastructure of their buildings.<sup>43</sup>

### California Low Income Weatherization Program (LIWP)

The California Low Income Weatherization Program (LIWP) can cover costs associated with energy efficiency, solar PV, and solar thermal upgrades in DAC multi-family properties<sup>44</sup> as long as proposed improvements "create at least 15% savings above existing conditions"

### GoGreen Financing

<sup>40</sup> <https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program>

<sup>41</sup> <https://www.csd.ca.gov/Pages/LIHEAPProgram.aspx>

<sup>42</sup> <https://esacommonarea.com/>

<sup>43</sup> [https://esacommonarea.com/wp-content/uploads/2021/03/ESACAM\\_Factsheet\\_v2021-06.pdf](https://esacommonarea.com/wp-content/uploads/2021/03/ESACAM_Factsheet_v2021-06.pdf)

<sup>44</sup> [https://camultifamilyenergyefficiencydotorg.files.wordpress.com/2020/02/liwpflyer\\_v2\\_2020.pdf](https://camultifamilyenergyefficiencydotorg.files.wordpress.com/2020/02/liwpflyer_v2_2020.pdf)

GoGreen Financing is focused on reducing energy costs for three key stakeholders: homeowners, renters (especially those in low income multifamily buildings) and businesses.<sup>45</sup> GoGreen Financing provides two programs relevant for the City of Fresno DAC communities:

#### [GoGreen Home](#)

GoGreen Home provides financing to renters and homeowners for the purchase of energy efficiency products including: appliances, cool roofs, heating & cooling infrastructure, insulating, lighting, pool products, water heating, and windows.

#### [GoGreen Multifamily](#)

GoGreen Multifamily provides up to \$10 million in financing for energy-saving improvements to low income multifamily units throughout California.<sup>46</sup> An extensive list of improvements are eligible for financing in addition to remodeling and solar equipment and storage (at the discretion of the financing company).<sup>47</sup>

## Non-DAC Energy Efficiency & Electrification Programs

### [Tariffed On-Bill Financing \(Tariffed OBF\)](#)

Tariffed on-bill financing allows for utilities to invest in cost-effective energy efficiency upgrades for residential customers like the installation of an energy efficient heating and cooling unit. State examples of tariffed on-bill financing include:

#### [Windsor Energy PAYS® Program](#)

The Town of Windsor's Windsor Energy PAYS® program allows residents and businesses to finance water and energy saving upgrades with no up-front cost and immediate savings on utility bills.

#### [Green Hayward PAYS® Program](#)

The City of Hayward's Green Hayward PAYS® program allows multifamily property owners to get immediate savings on their water and energy utility bills by installing efficiency improvements with no up-front cost.

## Key Challenges

<sup>45</sup> <https://gogreenfinancing.com/>

<sup>46</sup> <https://gogreenfinancing.com/multifamily>

<sup>47</sup> <https://www.treasurer.ca.gov/caeatfa/cheef/multifamily/resources/esmlist.pdf>

Energy efficiency and electrification programs can provide significant benefits to low-income communities (as detailed above). But program implementation can still be challenging in low-income communities for a variety of reasons. These reasons are detailed below and reflect similar challenges to those detailed for other community priorities above.

- Hidden Cost: Because electrification technologies and appliances are relatively new to the market, individuals are often not fully aware of the full cost for their purchase and maintenance. Although they have been shown to be cost effective (compared to natural gas appliances), consumers may not be aware of the additional costs that they will be expected to take on. For example, induction stovetops often require consumers to upgrade their cookware.<sup>48</sup>
- Awareness: Electrification efforts have been increasing over the last few years, but many individuals are still unaware of the expansive benefits this would provide to indoor air quality. This is largely due to a considerable focus on outdoor air quality and minimal action on setting indoor air quality standards.<sup>49</sup>
- Familiarity and Cultural Considerations: As with any new technology, individuals are resistant to change and are very comfortable and familiar with utilizing natural gas appliances in their home. Natural gas stovetops, in particular, are also culturally relevant; Chinese restaurant owners, for example, have often opposed natural gas bans due to their cultural cooking practices.<sup>50</sup>
- Political/Industry Opposition: The American Gas Association is vehemently opposed to electrification efforts and is a big proponent of natural gas.<sup>51</sup> They market natural gas as a sustainable, clean, reliable and affordable fuel for homes and families.<sup>52</sup>
- Challenges for Retrofitting Pre-Existing Homes: Many programs offered by investor-owned utilities geared towards supporting electrification are focused on new buildings and not pre-existing properties. Retrofitting these homes can pose new and more difficult challenges for program administrators and homeowners, leading to longer wait times for support and less success with completing the program.

## Recommendations

### LOCAL

<sup>48</sup> <https://www.nytimes.com/wirecutter/blog/why-dont-people-use-induction-cooktops/>

<sup>49</sup> <https://rmi.org/insight/gas-stoves-pollution-health>

<sup>50</sup> <https://www.marketplace.org/2019/10/24/chinese-restaurant-owners-in-california-fight-for-gas-stoves/>

<sup>51</sup> <https://www.vox.com/energy-and-environment/2020/5/7/21247602/gas-stove-cooking-indoor-air-pollution-health-risks>

<sup>52</sup> <https://www.apga.org/programs/genius>

**Recommendation #1:** City Pilot Program for Tariffed On-Bill Financing (City of Fresno)

The City of Fresno can apply to [where for] grant funding to launch a municipal led Tariffed OBF pilot program similar to the [Windsor Energy PAYS® program](#) and [Green Hayward PAYS® program](#). If a pilot program were to occur, prioritizing households already qualified for Low-to-Moderate Income (LMI) programs would ensure accessibility. The potential tariff could be applied to both income-qualified single family and multi-family residences and support energy efficiency purchases.

**Recommendation #2:** CCA Services (City of Fresno)

The City should consider participation in a CCA agency to provide more choice for community residents and to provide more local control for electricity sector generation and investment. For example, the City of Stockton has done a technical study on joining a CCA organized under a Joint Powers Authority and this is something the city should consider. While there is no “Central Valley CCA” for Fresno County CCA” as such, there is interest in smaller Central Valley cities and there is a role and there is as an opportunity for a CCA in the Central Valley supporting the community more directly with local projects, training, and investment. Benefits of a CCA could provide residents with lower rates, more local generation, project revenue in future, and more community-tailored programs e.g., support for dilapidated rooftops to facilitate more rooftop solar PV.

If the City of Fresno moves forward with joining a Community Choice Aggregate (CCA)—either by forming its own, or more likely joining the San Joaquin Valley CCA – providing Tariffed OBF as a service can help ensure accessibility to energy efficiency services.

**Recommendation #3:** Develop and Launch a PSA Campaign that Highlights the Benefits of Electrification and Natural Gas Hazards

As noted above, many homeowners are unaware of the hazards of natural gas and some are inadvertently exposed to unhealthy levels of pollutants when cooking over a natural gas flame. This is most hazardous to low income households because they tend to have smaller kitchens and less space to ventilate the fumes. A multilingual campaign by the City of Fresno focusing on these hazards would be a great first step towards improving public health and beginning initial conversations about the benefits of electrification.

## REGIONAL

**Recommendation #4:** Regional Pilot Program (San Joaquin Valley Clean Energy Organization)

A regional agency such as San Joaquin Valley Clean Energy Organization could apply to larger sources of funding such as that which is available by the Federal Department of Energy to offer pilot funding for Tariffed OBF programs in their territory. This is similar to the service that the [Sonoma County Regional Climate Protection Authority](#) provides to its jurisdictions.

## STATE

**Recommendation #5:** Subsidized Upgrades for Energy Efficiency Appliances (e.g. administered through the Fresno County Community Development Division)

Energy efficient appliances, such as heat pumps for HVAC and electric heat pump water heaters, can save homeowners money and address indoor air quality concerns but require initial upfront investment and maintenance. To address this barrier, the state should consider a subsidized upgrade program for energy efficient appliances including energy efficient heat pumps specifically tailored to DACs and low-income communities.

**Recommendation #8:** PSA/ market transformation campaign to support greater adoption of standard voltage (120V) heat pump HVAC units and when commercially available heat pump water heaters.

Market transformation programs including PSA, rebates/incentives, cost/benefit tools and pilot programs should be implemented to support greater adoption of “plug-in ready” heat pumps. Tools could be tools to help consumers decide if these units can meet their cooling and heating and water heating needs for example.

See also **Recommendation #5** in **Global Priorities** below: Integrated Pilot/Demonstration Project in Fresno and other DACs for building decarbonization, climate equity, and greater resilience.

## IMPROVED AIR QUALITY AND HEAT RESILIENCE

### Overview & Benefits

#### Air Quality

Numerous areas in the Central Valley including Fresno are classified as disadvantaged communities in CalEnviroScreen<sup>53</sup> with high pollution burdens, high unemployment, and poor health and social outcomes. Residents also have lack of broad and high-quality economic opportunities. Multiple sources of pollution from trucking, cars, road dust, agricultural dust/equipment, oil and gas extraction, other heavy industry, power plants, and dairies and a closed air basin both contribute to some of the worst air quality in the country.<sup>54</sup>

Small particles (PM<sub>2.5</sub>) from dust and smoke are carcinogenic and most harmful to human health. Low-cost air filters can reduce these small particles in your home. Do-it-yourself (DIY) air filters attached to indoor portable fans are low cost and easy to install. DIY air filter using MERV13 filters are nearly as effective as HEPA filters which can be much more expensive.<sup>55</sup> Benefits for residents include improved indoor air quality and improved health from better air quality.

Figure 5a below shows the benefits of the DIY air filter during a worst-case situation with wildfire smoke. Smoke can enter home especially if the home is not well-sealed. An indoor fan with a MERV 13 filter can then filter harmful PM<sub>2.5</sub> particles to a low level inside the home. Figure 5b-5d shows the box fan, MERV filter and simple construction of the unit. Higher rated air filters can increase the filtration rate but on the other hand, decrease ventilation/air flow due to increased pressure drop across the finer filter.

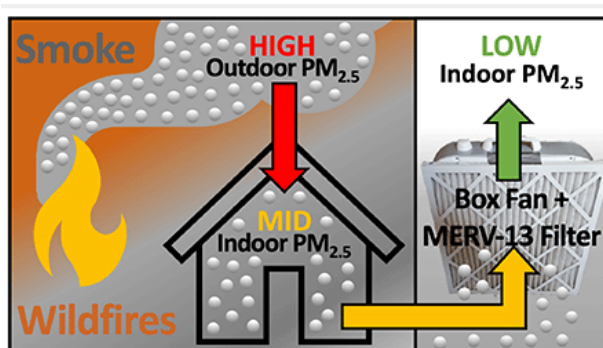
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<sup>53</sup> <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40>

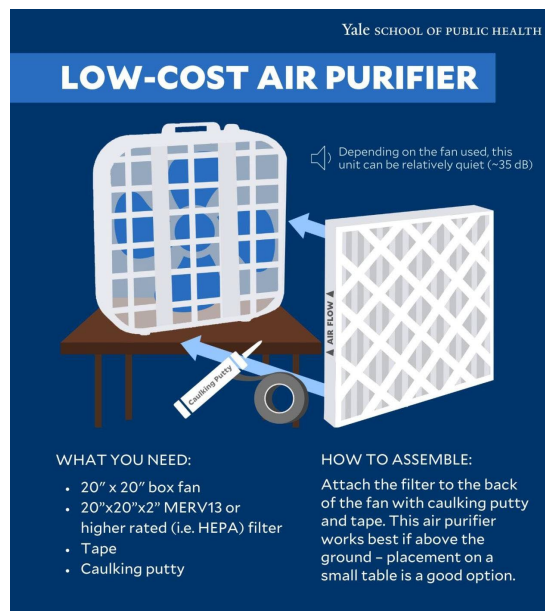
<sup>54</sup> <https://abc30.com/state-of-the-air-report-american-lung-association-central-ca-pollution-quality/10534815/>

<sup>55</sup> <https://www.wgbh.org/news/local-news/2021/08/17/diy-air-filters-for-classrooms-experts-are-enthusiastic-and-a-citizen-scientist-makes-it-easy>, accessed January 15, 2022.





(a)



(b)

**Tools:***20" Box Fan**MERV13 filter: available at home improvement stores**Duct tape**Scissors*

(c)



(d)

Figure 5. Do-it-yourself air filters with box fans and MERV13 filters. (a) Usage during a wildfire event with poor air quality; (b) assembly instructions; (c) components and tools; (d) resulting air filter;

**Extreme heat resilience<sup>56</sup>**

Increasingly frequent extreme heat presents urgent health and equity issues for low income and disadvantaged communities. Extreme heat is the leading cause of weather-

<sup>56</sup> The discussion and recommendations for heat resilience are drawn from a parallel study in Fresno for the California Strategic Growth Council, Cal-THRIVES (A California Toolkit for Heat Resiliency in Underserved Environments). We present them here to provide a consolidated summary with the results from this project in the context of improving equitable outcomes in south Fresno.

related deaths in the US and is projected to be the costliest climate change impact in California by 2050 (Bedsworth et al. 2018). Residents in disadvantaged communities (DACs) face more frequent discomfort in the summer because they tend to live in older buildings that are leaky, lack sufficient insulation, and generally have older and poorly-maintained cooling equipment. The public health threat of extreme temperatures in such homes will grow more severe as California warms, raising both the number of hours each year in which buildings need cooling and the number of extreme heat days each year in which lack of adequate cooling threatens occupant health.

A variety of passive and active cooling measures can improve extreme heat resilience in homes (e.g., attic insulation, cool surfaces, solar control window films, portable and ceiling fans), but for worst case heat waves (several consecutive days of extreme heat), air conditioning units are needed to ensure safe indoor temperatures.

## **Goals**

### **Air quality**

- Improve awareness of the health impacts of poor indoor air quality and the potential of low-cost DIY air filters
- Make low cost DIY air filters available to DAC residents and those areas at high fire risk
- Make Fact Sheet available to regional NGOs and CBOs to help residents understand operation. For example, windows and doors should be shut when running the fan and filter and with time of use electricity rates, it is more economic to run fan during times when rates are low. It's best to place the fan in the center of the room (my assumption).

### **Extreme heat Resilience**

- Ensure that indoor temperatures are maintained at safe levels during extreme heat conditions.

## **Outreach Data**

### **Air quality**

Our outreach data suggests both a demand and need for this type of measure. From Community meeting #2, "Better air quality in my home" was among the top three choices among seven choices for 66% of meeting participants. We found that about 25% of residents have a box-shaped portable fan and only 3% reported seeing any programs or rebates for this type of low-cost air filter. We also found that 89% of residents were willing to pay up to \$20 for an air filter.

### **Extreme heat resilience**

Most residents (60-70%) are not comfortable in their homes in hot or cold weather at least once a week. This is an area to improve equity and provide better indoor comfort during the summer and winter without increasing energy bills. From stakeholder interviews and community surveys, we estimate that 15% of homes lack air conditioning units (i.e. these homes may only have evaporative coolers or only fans). The lack of an air conditioning unit can lead to dangerously hot indoor temperatures during extreme heat waves.

## **Current Programs**

### **Air Quality**

The Central California Asthma Collaborative is planning to deploy several hundred DIY air filters in the Fresno area (Kevin Hamilton, 9/27/21 email). Beyond this, the research team is not aware of any programs. Considering there are hundreds of thousands of residents in disadvantaged communities in Fresno and the Central Valley, this type of program should be scaled up to reach the majority of residents in DAC areas of the Central Valley.

Total retail costs (fan + filter) ranges from \$30-40 per unit for a 20" box fan (about \$20) and a MERV13 20"x20" air filter at about \$10-20 per filter. A MERV13 filter is recommended to change every 3 months, so this would be about a \$20-40 cost annually for filters assuming 6 months of annual operation, or \$40-80 for 12-month operation. Volume discounts from bulk purchases by the city or regional air quality districts could help to lower these costs.

### **Heat Resilience**

Current energy efficiency programs and weatherization programs offer like-for-like equipment replacement, or replacing old equipment with new equipment of the same type, e.g. replacing an old evaporative cooler with a new evaporative cooler. Like-for-like replacement would not replace an evaporative cooler with a new air conditioning unit.

## **Key Challenges**

### **Air quality**

- Awareness appears to be low for this DIY option
- People may need to be reminded to replace their filters on a regular basis
- A starting cost of \$30-40 may still pose a barrier for LI residents. Those with larger families may lack a square fan and may need several fans to cover residents in several rooms.

### **Heat Resilience**

- There are no requirements for maximum indoor temperature or minimal cooling requirements in Fresno or the state. Updating building codes to include these requirements would address new construction, but this would not ensure safe indoor environments for the many Fresno residents living in existing homes.

## Recommendations

### LOCAL

**Recommended #1:** We recommend that city increase outreach for DIY air filters as a low-cost measure that can improve indoor air quality.

**Recommended #2:** We recommend that city and community-based organizations improve outreach for extreme heat resilience for example through of the Cal-THRIVES heat resilience toolkit (Cal-THRIVES.LBL.gov). For example, by using portable or ceiling fans, residents can increase the setpoint cooling temperature of their air conditioning unit and save substantially on their summer electricity bill.

### REGIONAL

**Recommended # 3:** We recommend the state more widely publicize the DIY air filter, partnering with regional AQ districts.

### STATE

**Recommended #4:**

- We recommend the state more widely publicize the DIY air filter, partnering with AQ districts as above.
- The state should offer rebates and discounts for box fans and MERV13 filters; or distribute this equipment and supplies such as duct tape free to DAC residents with highest priority in poor air quality regions such as Fresno and the Central Valley and also in regions with high wildfire risk.
- The state should also fund local DIY workshops where equipment is distributed for free and/flyers to distribute in fire prone areas.
- We recommend that ARB/state government sponsor more programs to distribute these filters

**Recommended #5:** All homes should have a minimum cooling standard or equivalently a maximum indoor temperature allowed.

- Minimum cooling comfort requirements are needed in both new construction and in existing residential buildings. Minimum cooling standards would avoid dangerous situations and prevent worst case heat exposure to residents.
- Policy options for this recommendation depend on the type of building. Some examples are described below:
  - New homes: include in Title 24 building code
  - Existing rentals: address in state habitability requirements
  - Existing owner-occupied: require inspection at point of sale, or require inspection during other permitting work, and implement climate resilience audit above
  - Specific requirements should be set by a consensus process similar to that used for Title 24.

**Recommendation #6:** All homes without an air conditioner in Fresno and other hot climates should get at least one air conditioning or heat pump unit<sup>57</sup> to safely withstand extreme heat waves

- Many homes in Fresno do not have air conditioner and only have evaporative (“swamp”) coolers, which are inadequate for extreme heat. Homes without air conditioning in Fresno and other hot climates should be prioritized for upgrades to receive an air conditioner or heat pump.
- The type of air conditioner or heat pump to be installed depends on many factors such as home configuration (e.g., availability of HVAC ducts), existing cooling and heating equipment, climate zone, and available incentives. Increased use of cooling will raise electricity consumption and additional financial assistance may be help residents address higher utility costs.

## GLOBAL PRIORITIES

### Overview & Benefits

Clean transportation, clean energy supply, energy efficiency & electrification, and air quality initiatives throughout the State each provide their own diverse opportunities and challenges but there are cross-cutting solutions that could improve the effectiveness and efficiencies of these

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<sup>57</sup> “Heat pump” here refers to a unit that provides both cooling in the summer and heating in the winter; an air conditioning unit that only provides cooling is also technically speaking a heat pump also.

initiatives as a whole, including Community Engagement, Funding/Financing, Deferred Maintenance, and more Local Pilot Projects.

### Community Engagement

Effective community Engagement, whether adopted as a regional outreach program, online marketing program, or tailored technical assistance, could alleviate numerous challenges associated with these efforts. If undertaken, this could not only increase local adoption of clean energy technologies but also align with environmental justice commitments undertaken by the State and the City of Fresno. Benefits of a larger, more comprehensive community engagement strategy are detailed below:

- **Local Awareness & Accessibility:** Improved outreach to DACs about related clean energy, air quality, and heat resilience will expand knowledge and understanding of the importance of these issues and highlight opportunities for community members to participate in these programs. In some cases, residents were less familiar with the technologies, such as electric heat pump-based heating and cooling and water heating. This points to the need for greater education and the need for data-based pilot programs for these technologies.
- **Program Efficiencies:** Integrating and consolidating clean energy and air quality programs will improve the efficiency of multiple programs and drastically reduce duplicative efforts in communities of concern. There are benefits from one-stop shop for the administrators as well at least in principle from having less forms and less touches and less in-home visits.
- **Reduced Transaction Costs & Barriers:** Approaching engagement as a one-stop-shop reduces the time communities must spend in exploring and applying for applicable programs and expands the likelihood that they will complete a program and share their success with others.

The considerations here for consolidation of programs and community outreach are similar to those in AB 1232 and its recent action plan<sup>58</sup>. AB1232 “charges CA Department of Community Services and Development (CSD), the California Energy Commission (CEC) and the California Department of Public Health’s (CDPH’s) Office of Health Equity with collaborating to identify best practices from model programs and funding mechanisms and to provide a recommended action plan to deliver comprehensive energy and healthy home improvements to multi-family housing (among other requirements).” The AB1232 action plan highlights that for more integrated programs between energy efficiency and public health, more substantial funding and program expansion enhancements are needed beyond tweaking existing programs which may be more stove-piped:

- The need for cross-training programs

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<sup>58</sup> California Department of Community Services & Development, “Assembly Bill 1232 Report & Action Plan”, Jan. 2021.

- A robust database tracking system would need to be developed to follow clients through the entire process, need special protections must be put in place to protect client health information.
- Clear roles for health and energy service providers

These considerations mirror those expansions of training, capacity, coordination, and tracking that is needed to move to a one-stop service model for DAC resident in Fresno and across the state.

### Funding/Financing

As has been detailed previously, financing and funding opportunities are often limited for clean energy technologies and remain one of the largest barriers for communities of concern in transitioning their vehicles, HVAC systems, energy sources, and other related appliances. Single-family renters for example are not eligible for rooftop PV incentives or PACE financing. Expanding both financing and funding options for communities of concern could provide the following benefits:

- Opportunities to improve health and safety in the community through decarbonization and resilience investments
- Opportunities for greater local economic development training and investments
- Consolidation of programs would improve access to residents and improve climate equity

### Deferred Maintenance

An important issue that cuts across climate equity for clean energy supply and demand is that of deferred maintenance. These might include non-solar ready roofs due to age or condition of roof; old electric panels that need replacing due to age and safety issues; and other basic health and safety items such as making sure kitchen fans work for harmful emission reduction and that bathroom ventilation fans work so that excess humidity does not lead to mold and mildew.

Old electric infrastructure can be a safety and equity issue independent of decarbonization and electrification initiatives from the greater risk of sparking and fire in the worst case, and greater incidence of blowing fuses/ tripping electrical circuit breakers leading to power unavailability due to overloaded circuits during peak demand times.

Two important points here are that first, these upgrades should be prioritized in DAC areas for health, safety, and basic equity reasons, independent of building decarbonization objectives; and second, that upgrading these items are an excellent opportunity to concurrently achieve greater building decarbonization, climate resilience, and both non-energy equity and climate & energy equity.

### Local Pilot Projects

As mentioned above in the Energy Efficiency and Electrification section above, more demonstration and pilot projects<sup>59</sup> in the building sector are needed to determine what works best for residents and to develop best practices for inspection, implementation, and monitoring in terms of building electrification.

More generally, integrated pilot and demonstration project to increase access to clean energy, and electrified end-use options across buildings and transportation in Fresno would help meet building decarbonization and climate equity commitments, and increase overall resilience in disadvantaged communities. Additional benefits could also accrue as follows:

- **Provide vital information and data** on the costs of electrification and transportation electrification, optimal installation practices and packages, and invaluable insight on residents' responses to new technologies. Integrating measures across energy efficiency, electrified heating, EV, and solar PV would also provide valuable data on the interactions between measures.
- **Reduce program cost & inefficiencies:** The demonstration could target the most cost-effective improvements identified in our action plan thus saving residents money. These improvements could also be implemented in tandem, thus reducing program inefficiencies.
- **Workforce development:** If effectively paired with training programs for contractor training on heat pump installation and related technologies, this project would provide both workforce development and economic benefits to the local community.
- **Replicable solutions:** A considerable benefit of any pilot project is the ability to test out new developments in a smaller subset of the population in order to determine the most effective way to implement these changes at a larger scale. It would also allow for initiatives to be more tailored to locals. For example, homes with lower heating demands from smaller household sizes or fewer residents could be targeted for plug-in ready heat pumps for HVAC and water heating to avoid electric panel upgrades. Other homes could test smart panels or smart switches to control electricity consumption and reduce the need for costly panel upgrades.
- **Reduce transaction costs:** An integrated program providing one-stop assistance and upgrades to residents would reduce transaction costs to residents. Currently there are separate programs for energy efficiency, EV, and solar PV for example.

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<sup>59</sup> The distinction between a pilot and demonstration project does not have a universal definition. Here we view the scale of the project to be one differentiator: a pilot project could for example combine HVAC and water heating electrification across a relatively large population of homes, whereas a demonstration could combine a greater number of measures, such as HVAC/water heating electrification, electrical upgrades, used EVs, and solar PV in a smaller number of homes.



## Current Programs

Current clean energy, transportation, energy efficiency, and air quality programs that focus on, and prioritize community engagement, and funding/financing are detailed below. Please note that this is a simplified list as descriptions of each program have already been provided.

COMMUNITY ENGAGEMENT
<p><b>Clean Transportation</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Drive Clean in the San Joaquin</a></li> </ul>
<p><b>Clean Energy Supply</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Disadvantaged Communities-Single-Family Affordable Solar Homes (DAC-SASH)</a></li> <li>• <a href="#">Solar on Multifamily Affordable Housing (SOMAH)</a></li> </ul>
<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Asthma Impact Model (Central California Asthma Collaborative)</a></li> </ul>

FUNDING/FINANCING
<p><b>Clean Transportation</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Clean Cars 4 All</a></li> <li>• <a href="#">Clean Vehicle Assistance Program</a></li> <li>• <a href="#">Drive Clean in the San Joaquin</a></li> <li>• <a href="#">Clean Vehicle Rebate Project (CVRP)</a></li> <li>• <a href="#">California Electric Vehicle Infrastructure Project (CALeVIP)</a></li> <li>• <a href="#">California Clean Fuel Reward</a></li> <li>• <a href="#">Charge Up! Electric Vehicle Charger Incentive Program</a></li> </ul>
<p><b>Clean Energy Supply</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Disadvantaged Communities-Single-Family Affordable Solar Homes (DAC-SASH)</a></li> <li>• <a href="#">Disadvantaged Communities – Green-Tariff (DAC-GT)</a></li> <li>• <a href="#">Solar on Multifamily Affordable Housing (SOMAH)</a></li> </ul>
<p><b>Energy Efficiency &amp; Electrification</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Low-Income Home Energy Assistance Program (LIHEAP)</a></li> <li>• <a href="#">GoGreen Financing</a> <ul style="list-style-type: none"> <li>○ <a href="#">GoGreen Home</a></li> <li>○ <a href="#">GoGreen Multifamily</a></li> </ul> </li> <li>• <a href="#">Tariffed On-Bill Financing (Tariffed OBF)</a></li> </ul>
<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Asthma Impact Model (Central California Asthma Collaborative)</a></li> </ul>

Programs that support deferred maintenance or a potential pilot project are very limited, if at all available, currently.

## Universal Challenges

Regardless of community priority, it should be noted that challenges exist universally for clean energy and transportation initiatives. These challenges are detailed below and may reflect topic-specific challenges noted previously.

- Transaction Costs & Hurdles: The sheer number of available sustainability programs is daunting. In addition to solar PV incentive programs, there are also programs to support weatherization, electric vehicles, residential electrification, and more. Thus, residents have to navigate through multiple websites, organizations, application forms, and eligibility requirements to locate the clean technology program that works best for them. Additionally, adoption can be piecemeal and fragmented as organizations working on similar programs may not collaborate on these issues; this can lead to significant inefficiencies and an unnecessary time burden and transaction costs on residents.
- Inefficient Services: Because programs do not intersect effectively with one another, they result in significant inefficiencies for residents. For example, a resident installing solar in their home also provides an opportunity to upgrade appliances and potentially add-in a charging outlet for an EV. Without taking advantage of these efficiencies, homeowners must spend more of their time coordinating with the respective installers and, potentially, need to identify more funding for the installation.
- Fluid Residency: There are a substantial number of “kinship networks” (Mazur-Stommen 2020)– households that rent from a relative or live in a property that is owned by a relative – in south/southwest Fresno. As a result, the number of residents in a home is fluid. This could also be because grandkids stay with grandparents during the summer but not during the school year. Thus, applications with the assumption of fixed family sizes or structures can be a barrier for some residents.
- Misinformation: It is common for consumers to come across misinformation about the residential solar industry, clean transportation options, and/or the effectiveness of energy efficient products. Eligible homeowners may be hesitant to apply due to past negative experiences with such companies. For example, it has become common practice for some solar contractors to enter into agreements with homeowners without the homeowners’ full understanding of contractual terms. Residents who have experienced such behaviors may, as a result, mistrust organizations supporting the larger clean energy and clean transportation industry.

- **Costs Associated with Upgrades:** In order to implement many of the clean energy, clean transportation or energy efficiency and electrification programs detailed above, homeowners must make initial upgrades to their homes. Upgrades for electric panels and/or electric circuits to support a higher voltage for electric appliances (e.g. heat pumps at 220V/230V), for example, are a major cost challenge. Median incomes are very low in Fresno's DACs so most residents are not able to afford the initial costs of new equipment necessary for these changes.

## Recommendations

### LOCAL

#### **Recommendation #1:** Partnership-Building (City of Fresno)

The City of Fresno can work with GRID CV, and other related organizations, to send a joint mailer to eligible households and organize educational workshops. This strategy is often used by regional GRID offices to reach a broader audience in DACs. The City can also partner with CBOs to identify funding to help cover the cost of upgrades that prevent a household from receiving a PV solar system.

The Strategic Growth Council's Regional Climate Collaboratives (RCC) Program is another opportunity of note that can provide support to engage Fresno stakeholders for relationship building and partnership development and develop greater capacity to acquire more local funding for climate and resilience funding from the state.

#### **Recommendation #2:** Community Information-Sharing (City of Fresno)

As detailed above, a considerable barrier to wide scale adoption of clean technologies in low-income neighborhoods is a lack of awareness about such initiatives and the support they provide for such a demographic. To alleviate this, the City of Fresno could host an informational page about programs (in addition to highlighting eligibility criteria and funding amounts) and develop fact sheets to distribute to residents at community events.

## STATE

### **Recommendation #4:** Prioritize the Backlog of Deferred Maintenance

Clearing the backlog of deferred maintenance, or overdue home repairs, should be prioritized especially when there is a safety or health hazard. For example, old electric infrastructure can be a safety and equity issue independent of climate equity.

Outreach data indicate that about one-third of homes have older looking circuit panels.<sup>60</sup> Thus, from a pure equity standpoint, DAC residents should get greater access to low or free deferred maintenance upgrades with safety-related measures like electric panels.

### **Recommendation #5:** Integrated Pilot/Demonstration Project in Fresno and other DACs for building decarbonization, climate equity, and greater resilience.

Pilot projects can be used as a method to educate community members on the local impacts of renewable energy and energy efficiency. It can also be used to showcase other programs in which residents are eligible for such as DAC-SASH and Clean Cars 4 All.

More residential electrification pilots would provide vital information and data for the costs of electrification, optimal installation practices and packages, and provide data on the benefits and resident responses to electrified heating for space heating and water heating.

- The demonstration could target the most cost-effective retrofits identified in our companion report for example (homes with window AC and gas wall heaters) and pilot a range of electrification options from mini-splits to air-source heat pumps and used electric vehicles.
- Those homes with lower heating demand from smaller household sizes or fewer residents could be targeted for plug-in ready heat pumps for HVAC and water heating to avoid electric panel upgrades. Other homes could test smart panels or smart switches to control electricity consumption and reduce the need for costly panel upgrades.
- A subset of homes e.g. those with roof ready homes could also install rooftop PV to reduce utility bills. Pilot programs could also be combined with training programs for contractor training on heat pump installation.
- A focus area could be on upgrading rooftop packaged HVAC units to heat pump units since rooftop units are very common in Fresno in both old and new housing and single and multi-family housing.

<sup>60</sup> [https://inspectapedia.com/electric/Zinsco\\_Electrical\\_Panels.php](https://inspectapedia.com/electric/Zinsco_Electrical_Panels.php)

- Data collection could include total costs of retrofits, pre- and post- utility bills, pre- and post-air indoor air quality readings, pre- and post-survey of resident experiences with the new equipment and their indoor comfort level.
- These “learn-by-doing” pilots would help determine the best way to install and deploy heat pump equipment, figure out what residents like and dislike, and identify where the technology is lacking or has opportunity for improvement.

Gov. Newsome’s proposed 2022 budget from January 2022 has almost \$1 billion allocation for equitable building decarbonization with focus on the state’s most vulnerable residents and this could be one possible funding source for this type of pilot program.

## Appendix A: City of Fresno's Greenhouse Gas Reduction Plan Update Climate Action Strategies

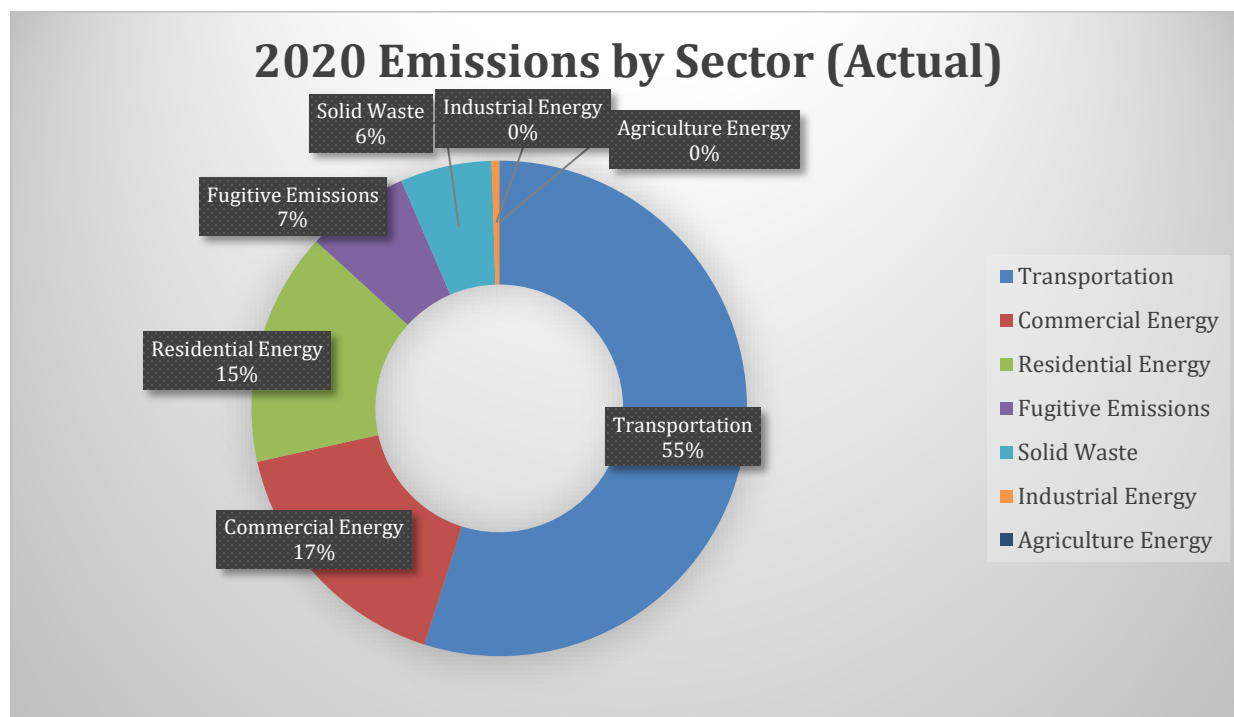
The City of Fresno's [Greenhouse Gas Reduction Plan Update](#) was completed in 2020 and outlines a series of emission goals and strategies to help the City of Fresno reach their climate commitments. The update incorporates new data acquired since the creation of the first plan in 2014 and aligns with the targets established by the adoption of SB 32 in 2016 which established a statewide goal of reducing emissions to 40% below 1990 levels by 2030.

Emission goals, as noted in the Update, are presented in *Figure 1*.

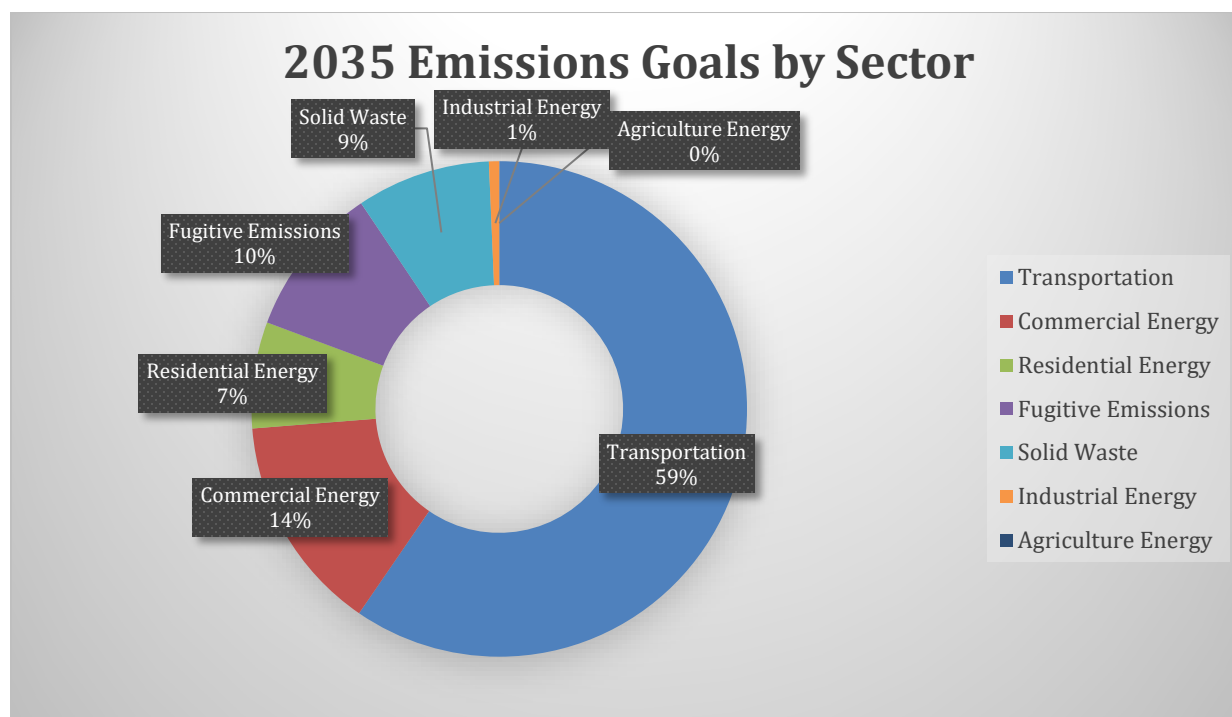
	2020	2030	2035
State-Aligned Emissions Goal (MT CO <sub>2</sub> e)	3,183,348	1,910,009	1,591,674
Reduction from 1990 Levels	0%	40%	50%
Reduction from 2010 Levels	15%	49%	58%

*Figure 1: City of Fresno GHG Emission Goals/ Projections*

Broken down by sector, emissions by sector in 2020 are detailed in *Figure 2* and 2035 emission goals are shown in *Figure 3*.



*Figure 2: City of Fresno 2020 GHG Emissions by Sector*




*Figure 3: City of Fresno 2035 GHG Emissions goal by Sector*

Transportation is currently the largest single source of emissions for the City of Fresno (Fig below), and is projected to remain so. However, it also represents a large target for emissions-reduction strategies. Fresno’s Climate Action Plan calls for changes to the design (e.g. traffic calming); rules (like property development standards); and services (like sidewalks, public transit, and EV charging) of transportation in order to can to mitigate emissions. The purpose of these suggestions is to encourage walking, bicycling, and other forms of less-polluting transit (including via electric vehicles).

A few highlights of the Reduction Plan are noted below:

1. **Transportation.** Land use isn’t the only mechanism by which Fresno can reduce emissions from transportation. Design (e.g. traffic calming); rules (like property development standards); and services (like sidewalks, public transit, and EV charging) can also be used to mitigate emissions from the transportation sector. Again, the Update makes a number of specific suggestions – and again, the purpose of these suggestions is to encourage walking, bicycling, and other forms of less-polluting transit (including via electric vehicles).

2. Resources. The bulk of the Update’s recommendations focus on reducing resource use – primarily water and energy. It suggests using a number of policy tools: analysis (e.g. models and inventories to measure progress); rules (e.g. green building requirements that incentivize energy efficiency and water conservation); public education (e.g. energy use disclosure); financing (e.g. a revolving energy fund to invest in efficiency improvements); incentives (e.g. for meeting ENERGY STAR performance guidelines); and upgrades to city-owned buildings and equipment. However, some recommendations also focus on resource creation (e.g. faster solar permitting) and waste management (e.g. diverting organic matter from landfills).
  
3. Land Use. This is a key area of local government authority and influence, via zoning, infrastructure provision, permitting, and other mechanisms. The Update suggests that Fresno uses these mechanisms to push for patterns of development that are denser, mixed-use, and more easily accessible via public and active transit (e.g. walking and bicycling). The central idea here is that these patterns of development will require less automotive travel, thereby reducing emissions – and less travel overall, reducing emissions even more.

Urban Form Element	
Policy UF-1-c	<b>Identifiable City Structure.</b> Focus integrated and ongoing planning efforts to achieve an identifiable city structure, comprised of a concentration of buildings, people, and pedestrian-oriented activity in Downtown; along a small number of transit-oriented, mixed-use corridors and strategically located Activity Centers; and in existing and new neighborhoods augmented with parks and connected by multi-purpose trails and tree lined bike lanes and streets.
Objective UF-12	Locate roughly one-half of future residential development in infill areas — defined as being within the City on December 31, 2012—including the Downtown core area and surrounding neighborhoods, mixed-use centers and transit-oriented development along major BRT corridors, and other non-corridor infill areas, and vacant land.
Policy UF-12-a	<b>BRT Corridors.</b> Design land uses and integrate development site plans along BRT corridors, with transit-oriented development that supports transit ridership and convenient pedestrian access to bus stops and BRT station stops.
	
Policy UF-12-b	<b>Activity Centers.</b> Mixed-use designated areas along BRT and/or transit corridors are appropriate for more intensive concentrations of urban uses. Typical uses could include commercial areas; employment centers; schools; compact



	residential development; religious institutions; parks; and other gathering points where residents may interact, work, and obtain goods and services in the same place.
Policy UF-12-d	<b>Appropriate Mixed-Use.</b> Facilitate the development of vertical and horizontal mixed-uses to blend residential, commercial, and public land uses on one or adjacent sites. Ensure land use compatibility between mixed-use districts in Activity Centers and the surrounding residential neighborhoods.
Policy UF-12-e	<b>Access to Activity Centers.</b> Promote adoption and implementation of standards supporting pedestrian activities and bicycle linkages from surrounding land uses and neighborhoods into Activity Centers and to transit stops. Provide for priority transit routes and facilities to serve the Activity Centers.
Policy UF-12-f	<b>Mixed-Use in Activity Centers.</b> Adopt a new Development Code which includes use regulations and standards to allow for mixed uses and shared parking facilities.
Objective UF-14	Create an urban form to facilitate multi-modal connectivity.
Policy UF-14-a	<b>Design Guidelines for Walkability.</b> Develop and use design guidelines and standards for a walkable and pedestrian-scaled environment with a network of streets and connections for pedestrians and bicyclists, as well as transit and autos.
Policy UF-14-b	<b>Local Street Connectivity.</b> Design local roadways to connect throughout neighborhoods and large private developments with adjacent major roadways and pathways of existing adjacent development. Create access for pedestrians and bicycles where a local street must dead end or be designed as a cul-de-sac to adjoining uses that provide services, shopping, and connecting pathways for access to the greater community area.
Policy UF-14-c	<b>Block Length.</b> Create development standards that provide desired and maximum block lengths in residential, retail, and mixed-use districts in order to enhance walkability.
<b>Land Use Element</b>	
Objective LU-2	Plan for infill development that includes a range of housing types, building forms, and land uses to meet the needs of both current and future residents.
Policy LU-2-a	<b>Infill Development and Redevelopment.</b> Promote development of vacant, underdeveloped, and redevelopable land within the City Limits where urban services are available by considering the establishment and implementation of supportive regulations and programs.
Policy LU-2-b	<b>Infill Development for Affordable Housing.</b> Establish a priority infill incentive program for residential infill development of existing vacant lots and underutilized sites within the City as a strategy to help to meet the affordable housing needs of the community.
Policy LU-3-b	<b>Mixed-Use Urban Corridors that Connect the Downtown Planning Area.</b> Support the development of mixed-use urban corridors that connect the Downtown Planning Area with the greater Fresno-Clovis Metropolitan Area with functional, enduring, and desirable urban qualities along the Blackstone Avenue, Shaw Avenue, California Avenue, and Ventura Avenue/Kings Canyon corridors, as shown on Figure LU-1: General Plan Land Use Diagram.
Policy LU-3-c	<b>Zoning for High Density on Major BRT Corridors.</b> Encourage adoption of supportive zoning regulations for compact development along BRT corridors leading to the Downtown Core that will not diminish long-term growth and development potential for Downtown.
Policy LU-5-f	<b>High Density Residential Uses.</b> Promote high-density residential uses to support Activity Centers and BRT corridors, and walkable access to transit stops.
<b>Design Element</b>	
Policy D-3-c	<b>Local Streets as Urban Parkways.</b> Develop local streets as "urban parkways", where appropriate, with landscaping and pedestrian spaces.
Policy D-4-b	<b>Incentives for Pedestrian-Oriented Anchor Retail.</b> Consider adopting and implementing incentives for new pedestrian-friendly anchor retail at intersections within Activity Centers and along corridors to attract retail clientele and maximize foot traffic.
<b>Transportation Element</b>	
Policy MT-1-h	<b>Update Standards for Complete Streets.</b> Update the City's Engineering and Street Design Standards to ensure that roadway and streetscape design specifications reflect the Complete Streets concept, while also addressing the needs of through traffic, <b>transit stops, bus turnouts, passenger loading needs, bike lanes, pedestrian accommodation, and short- and long-term parking.</b>
Policy MT-1-i	<b>Local Street Standards.</b> Establish and implement local roadway standards addressing characteristics such as alignment, width, continuity and traffic calming, to provide efficient neighborhood circulation; to allow convenient

	access by residents, visitors, and public service and safety providers; and to promote neighborhood integrity and desired quality of life by limiting intrusive pass-through traffic.
Policy MT-1-j	<p>Transportation Improvements Consistent with Community Character. Prioritize transportation improvements that are consistent with the character of surrounding neighborhoods and supportive of safe, functional and Complete Neighborhoods; minimize negative impacts upon sensitive land uses such as residences, hospitals, schools, natural habitats, open space areas, and historic and cultural resources.</p> <p>In implementing this policy, the City will design improvements to:</p> <ul style="list-style-type: none"> <li>● Facilitate provision of multi-modal transportation opportunities;</li> <li>● Provide added safety, including appropriate traffic calming measures;</li> <li>● <b>Promote achievement of air quality standards;</b></li> <li>● Provide capacity in a cost effective manner; and</li> <li>● Create improved and equitable access with increased efficiency and connectivity.</li> </ul>
Objective MT-4	Establish and maintain a continuous, safe, and easily accessible bikeways system throughout the metropolitan area to reduce vehicle use, improve air quality and the quality of life, and provide public health benefits.
Policy MT-4-a	<b>Active Transportation Plan.</b> To the extent consistent with this General Plan, continue to implement and periodically update the Active Transportation Plan to meet State standards and requirements for recommended improvements and funding proposals as determined appropriate and feasible
Policy MT-4-b	<b>Bikeway Improvements.</b> Establish and implement property development standards to assure that projects adjacent to designated bikeways provide adequate right-of-way and that necessary improvements are constructed to implement the planned bikeway system shown on Figure MT-2 to provide for bikeways, to the extent feasible, when existing roadways are reconstructed; and alternative bikeway alignments or routes where inadequate right-of-way is available
Policy MT-4-c	<b>Bikeway Linkages.</b> Provide linkages between bikeways, trails and paths, and other regional networks such as the San Joaquin River Trail and adjacent jurisdiction bicycle systems wherever possible.
Objective MT-5	Establish a well-integrated network of pedestrian facilities to accommodate safe, convenient, practical, and inviting travel by walking, including for those with physical mobility and vision impairments.
Policy MT-5-a	<b>Sidewalk Development.</b> Pursue funding and implement standards for development of sidewalks on public streets, with priority given to meeting the needs of persons with physical and vision limitations; providing safe routes to school; completing pedestrian improvements in established neighborhoods with lower vehicle ownership rates; or providing pedestrian access to public transportation routes.
Policy MT-5-e	<b>Traffic Management in Established Neighborhoods.</b> Establish acceptable design and improvement standards and provide traffic planning assistance to established neighborhoods to identify practical traffic management and calming methods to enhance the pedestrian environment with costs equitably assigned to properties receiving the benefits or generating excessive vehicle traffic.
Objective MT-6	Establish a network of multi-purpose pedestrian and bicycle paths, as well as limited access trails, to link residential areas to local and regional open spaces and recreational areas and urban Activity Centers in order to enhance Fresno's recreational amenities and alternative transportation options.
Policy MT-6-a	<b>Link Residences to Destinations.</b> Design a pedestrian and bicycle path network that links residential areas with Activity Centers, such as parks and recreational facilities, educational institutions, employment centers, cultural sites, and other focal points of the city environment.
Policy MT-6-g	<b>Path and Trail Development.</b> Require all projects to incorporate planned multi-purpose path and trail development standards and corridor linkages consistent with the General Plan, applicable law and case-by-case determinations as a condition of project approval.
Objective MT-8	Provide public transit options that serve existing and future concentrations of residences, employment, recreation and civic uses and are feasible, efficient, safe, and minimize environmental impacts.
Policy MT-8-a	<b>Street Design Coordinated with Transit.</b> Coordinate the planning, design, and construction of the major roadway network with transit operators to facilitate efficient direct transit routing throughout the Planning Area.
Policy MT-8-b	<b>Transit Serving Residential and Employment Nodes.</b> Identify the location of current and future residential and employment concentrations and Activity Centers throughout the transit service area in order to facilitate planning and implementation of optimal transit service area in order to facilitate planning and implementation of optimal transit services for these uses. Work with California State University, Fresno to determine locations within the campus core for bus stops.
Policy MT-8-g	<b>High Speed Train.</b> If the State moves forward with HST, ensure it is constructed through Fresno in a manner that minimizes impacts to surrounding property owners and creates the most opportunity for redevelopment around the HST station.

Objective MT-9	Provide public transit opportunities to the maximum number and diversity of people practicable in balance with providing service that is high in quality, convenient, frequent, reliable, cost-effective and financially feasible.
Policy MT-10-a	<b>Updating Parking Standards.</b> Update off-street parking standards to reflect the context and location within activity areas of multiple uses and reductions appropriate for mixed residential and non-residential uses and proximity to existing or planned transit service.
Policy MT-10-b	<b>Shared Parking.</b> Establish a strategy to promote the sharing of excess parking between uses within Activity Centers and BRT corridors, including specific provisions for this in the Development Code.
Policy MT-10-c	<b>Transportation Demand Management Guidelines.</b> Establish transportation demand management guidelines to allow for reduced off-street parking requirements.
Policy MT-10-d	<b>Parking Maximums.</b> Explore maximum off-street parking limits within Activity Centers proximate to BRT corridors, if such an Activity Center is determined compatible with promotion of a healthy and vigorous business environment.
Policy MT-10-f	<b>Parking Benefit Districts.</b> Establish parking benefit districts to fund consolidated public parking where supported by local businesses.
<b>Park and Open Space</b>	
Policy POSS-1-g	<b>Regional Urban Forest.</b> Maintain and implement incrementally, through new development projects, additions to Fresno's regional urban forest to delineate corridors and the boundaries of urban areas, and to provide tree canopy for bike lanes, sidewalks, parking lots, and trails.
Policy POSS-7-h	<b>Interlink City and San Joaquin River Parkway Trail Networks.</b> Strive to connect the parkway trail network to other trails in the vicinity, in order to create a community and regional trail system that offers a variety of different route combinations and enhances public access to the parkway.
<b>Public Utilities</b>	
Objective PU-7	Promote reduction in wastewater flows and develop facilities for beneficial reuse of reclaimed water and biosolids for management and distribution of treated wastewater.
Policy PU-7-a	<b>Reduce Wastewater.</b> Identify and consider implementing water conservation standards and other programs and policies, as determined and appropriate, to reduce wastewater flows.
Policy PU-7-d	<b>Wastewater Recycling.</b> Pursue the development of a recycled water system and the expansion of beneficial wastewater recycling opportunities, including a timely technical, practicable, and institutional evaluation of treatment, facility siting, and water exchange elements.
Policy PU-9-a	<b>New Techniques.</b> Continue to collaborate affected stakeholders and partners to identify and support programs and new techniques of solid waste disposal, such as recycling, composting, waste to energy technology, and waste separation, to reduce the volume and toxicity of solid wastes that must be sent to landfill facilities.
Policy PU-9-b	<b>Compliance with State Law.</b> Continue to pursue programs to maintain conformance with the Solid Waste Management Act of 1989 or as otherwise required by law and mandated diversion goals.
<b>Resource Conservation and Resilience</b>	
Objective RC-2	Promote land uses that conserve resources
Policy RC-2-a	<b>Link Land Use to Transportation.</b> Promote mixed-use, higher density infill development in multi-modal corridors. Support land use patterns that make more efficient use of the transportation system and plan future transportation investments in areas of higher-intensity development. Discourage investment in infrastructure that would not meet these criteria.
Policy RC-2-b	<b>Provide Infrastructure for Mixed-Use and Infill.</b> Promote investment in the public infrastructure needed to allow mixed-use and denser infill development to occur in targeted locations, such as expanded water and wastewater conveyance systems, complete streetscapes, parks and open space amenities, and trails. Discourage investment in infrastructure that would not meet these criteria.
Policy RC-4-i	<b>Methane Capture.</b> Continue to pursue opportunities to reduce air pollution by using methane gas from the old City landfill and the City's wastewater treatment process.
Objective RC-5	In cooperation with other jurisdictions and agencies in the San Joaquin Valley Air Basin, take timely, necessary, and the most cost-effective actions to achieve and maintain reductions in greenhouse gas emissions and all strategies that reduce the causes of climate change in order to limit and prevent the related potential detrimental effects upon public health and welfare of present and future residents of the Fresno community.
Policy RC-5-a	<b>Support State Goal to Reduce Statewide GHG Emissions.</b> As is consistent with State law, strive to meet AB 32 goal to reduce greenhouse gas emissions to 1990 levels by 2020 and strive to meet a reduction of 80 percent below 1990 levels by 2050 as stated in Executive Order S-03-05. As new statewide GHG reduction targets and dates are set

	by the State update the City's Greenhouse Gas Reduction Plan to include a comprehensive strategy to achieve consistency with those targets by the dates established.
Policy RC-5-b	<p><b>Greenhouse Gas Reduction Plan.</b> As is consistent with State law, prepare and adopt a Greenhouse Gas Reduction Plan as part of the Master Environmental Impact Report to be concurrently approved with the Fresno General Plan in order to achieve compliance with State mandates, assist development by streamlining the approval process, and focus on feasible actions the City can take to minimize the adverse impacts of growth and development on global climate change. The Greenhouse Gas Reduction Plan shall include, but not be limited to:</p> <ul style="list-style-type: none"> <li>● A baseline inventory of all known or reasonably discoverable sources of GHGs that currently exist in the city and sources that existed in 1990.</li> <li>● A projected inventory of the GHGs that can reasonably be expected to be emitted from those sources in the year 2035 with implementation of this General Plan and foreseeable communitywide and municipal operations.</li> <li>● A target for the reduction of emissions from those identified sources.</li> <li>● A list of feasible GHG reduction measures to meet the reduction target, including energy conservation and "green building" requirements in municipal buildings and private development.</li> <li>● Periodically update municipal and community-wide GHG emissions inventories to determine the efficacy of adopted measures and to guide future policy formulation needed to achieve and maintain GHG emissions reduction targets.</li> </ul>
Policy RC-5-c	<p><b>GHG Reduction through Design and Operations.</b> Increase efforts to incorporate requirements for GHG emission reductions in land use entitlement decisions, facility design, and operational measures subject to City regulation through the following measures and strategies:</p> <ul style="list-style-type: none"> <li>● Promote the expansion of incentive-based programs that involve certification of projects for energy and water efficiency and resiliency. These certification programs and scoring systems may include public agency "Green" and conservation criteria, Energy Star™ certification, CALGreen Tier 1 or Tier 2, Leadership in Energy Efficient Design (LEED™) certification, etc.</li> <li>● Promote appropriate energy and water conservation standards and facilitate <b>mixed-use projects</b>, new incentives for infill development, and the incorporation of mass transit, bicycle and pedestrian amenities into public and private projects.</li> <li>● Require energy and water audits and upgrades for water conservation, energy efficiency, and mass transit, pedestrian, and bicycle amenities at the time of renovation, change in use, change in occupancy, and change in ownership for major projects meeting review thresholds specified in an implementing ordinance.</li> <li>● Incorporate the City's "Guidelines for Ponding Basin/Pond Construction and Management to Control Mosquito Breeding" as conditions of approval for any project using an on-site stormwater basin to prevent possible increases in vector-borne illnesses associated with global climate change.</li> <li>● Periodically evaluate the <b>City's facility maintenance</b> practices to determine whether there are additional opportunities to reduce GHGs through facility cleaning and painting, parks maintenance, road maintenance, and utility system maintenance.</li> <li>● Periodically evaluate standards and mitigation strategies for highly vehicle-dependent land uses and facilities, such as drive-through facilities and auto-oriented development.</li> </ul>
Policy RC-5-d	<b>SCS and CAP Conformity Analysis.</b> Ensure that the City includes analysis of a project's conformity to an adopted regional Sustainable Community Strategy or Alternative Planning Strategy (APS), an adopted Climate Action Plan (CAP), and any other applicable City and regional greenhouse gas reduction strategies in effect at the time of project review.
Policy RC-5-e	<b>Ensure Compliance.</b> Ensure ongoing compliance with GHG emissions reduction plans and programs by requiring that air quality measures are incorporated into projects' design, conditions of approval, and mitigation measures.
Policy RC-5-f	<b>Toolkit.</b> Provide residents and project applicants with a "toolkit" of generally feasible measures that can be used to reduce GHG emissions, including educational materials on energy-efficient and "climate-friendly" products.
Policy RC-5-g	<b>Evaluate Impacts with Models.</b> Continue to use computer models such as those used by SJVAPCD to evaluate greenhouse gas impacts of plans and projects that require such review.
Policy RC-6-d	<b>Recycled Water.</b> Prepare, adopt, and implement a City of Fresno Recycled Water Master Plan.
Objective RC-7	Promote water conservation through standards, incentives and capital investments.
Policy RC-7-a	<p><b>Water Conservation Program Target.</b> Maintain a comprehensive conservation program that reduces per capita water usage in the city's water service area to 243 gallons per capita per day (gpcd) by 2020 and 190 gpcd by 2035, by adopting conservation standards and implementing a program of incentives, design and operation standards, and user fees.</p> <ul style="list-style-type: none"> <li>● Support programs that result in decreased water demand, such as landscaping standards that require drought-tolerant plants, rebates for water conserving devices and systems, turf replacement, xeriscape landscape for new homes, irrigation controllers, commercial/industrial/institutional water conserving</li> </ul>

	<p>programs, prioritized leak detection program, complete water system audit, landscape water audit and budget program, and retrofit upon resale ordinance.</p> <ul style="list-style-type: none"> <li>● Implement the U.S. Bureau of Reclamation Best Management Practices for water conservation as necessary to maintain the City's surface water entitlements.</li> <li>● Adopt and implement policies in the event an artificial lake is proposed for development.</li> <li>● Work cooperatively toward effective uniform water conservation measures that would apply throughout the Planning Area.</li> <li>● Expand efforts to educate the public about water supply issues and water conservation techniques.</li> </ul>
Policy RC-7-c	<b>Best Practices for Conservation.</b> Require all City facilities and all new private development to follow U.S. Bureau of Reclamation Best Management Practices for water conservation, as warranted and appropriate
Policy RC-7-d	<b>Update Standards for New Development.</b> Continue to refine water saving and conservation standards for new development
Policy RC-7-e	<b>Retrofit City Facilities, and Consider Incentives Programs to Encourage Retrofitting of Other Existing Public and Private Residential and Non-Residential Facilities and Sites.</b> Reduce water use in municipal buildings and City operations by developing a schedule and budget for the retrofit of existing municipal buildings with water conservation features, such as auto shut-off faucets and water saving irrigation systems. Prepare a comprehensive incentive program for other existing public and private residential and non-residential buildings and irrigation systems.
Policy RC-7-f	<b>Implement and Update Conservation Program.</b> Continue to implement the City of Fresno Water Conservation Program, as may be updated, and periodically update restrictions on water uses, such as lawn and landscape watering and the filling of fountains and swimming pools, and penalties for violations. Evaluate the feasibility of a 2035 conservation target of 190 gpcd in the next comprehensive update of the City of Fresno Water Conservation Program.
Policy RC-7-g	<b>Educate on State Requirements.</b> Educate the residents and businesses of Fresno on the requirements of the California Water Conservation Act of 2009.
Policy RC-7-h	<b>Landscape Water Conservation Standards.</b> Refine landscape water conservation standards that will apply to new development installed landscapes, building on the State Model Water Efficient Landscape Ordinance and other State regulations. <ul style="list-style-type: none"> <li>● Evaluate and apply, as appropriate, augmented xeriscape, "water-wise," and "green gardening" practices to be implemented in public and private landscaping design and maintenance.</li> <li>● Facilitate implementation of the State's Water Efficient Landscape Ordinance by developing alternative compliance measures that are easy to understand and observe.</li> </ul>
Policy RC-7-i	<b>PACE Financing.</b> Develop a residential Property Assessed Clean Energy (PACE) program, if it is determined to be a feasible option, to help finance water efficiency and energy efficiency upgrades for property owners.
Objective RC-8	Reduce the consumption of non-renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources.
Policy RC-8-a	<b>Existing Standards and Programs.</b> Continue existing beneficial energy conservation programs, including adhering to the California Energy Code in new construction and major renovations.
Policy RC-8-b	<b>Energy Reduction Targets.</b> Strive to reduce per capita residential electricity use to 1,800 kWh per year and nonresidential electricity use to 2,700 kWh per year per capita by developing and implementing incentives, design and operation standards, promoting alternative energy sources, and cost-effective savings.
Policy RC-8-c	<b>Energy Conservation in New Development.</b> Consider providing an incentive program for new buildings that exceed California Energy Code requirements by fifteen percent.
Policy RC-8-d	<b>Incentives.</b> Establish an incentive program for residential developers who commit to building all of their homes to ENERGY STAR performance guidelines.
Policy RC-8-e	<b>Energy Use Disclosure.</b> Promote compliance with State law mandating disclosure of a building's energy data and rating of the previous year to prospective buyers and lessees of the entire building or lenders financing the entire building.
Policy RC-8-f	<b>City Heating and Cooling.</b> Reduce energy use at City facilities by updating heating and cooling equipment and installing "smart lighting" where feasible and economically viable.
Policy RC-8-g	<b>Revolving Energy Fund.</b> Create a City Energy Fund which uses first year savings and rebates from completed City-owned energy efficiency projects to provide resources for additional energy projects. Dedicate this revolving fund to the sole use of energy efficiency projects that will pay back into the fund.
Policy RC-8-h	<b>Solar Assistance.</b> Identify and publicize information about financial mechanisms for private solar installations and provide over-the-counter permitting for solar installations meeting specified standards, which may include maximum size (in kW kW?) of units that can be so approved.

Policy RC-8-j	<b>Alternative Fuel Network.</b> Support the development of a network of integrated charging and alternate fuel stations for both public and private vehicles, and if feasible, open up municipal stations to the public as part of network development.
Policy RC-8-k	<b>Energy Efficiency Education.</b> Provide long-term and ongoing education of homeowners and businesses as to the value of energy efficiency and the need to upgrade existing structures on a regular basis as technology improves and structures age.
Policy RC-11-a	<p><b>Waste Reduction Strategies.</b> Maintain current targets for recycling and re-use of all types of waste material in the city and enhance waste and wastewater management practices to reduce natural resource consumption, including the following measures:</p> <ul style="list-style-type: none"> <li>● Continue to require recyclable material collection and storage areas in all residential development.</li> <li>● Establish recycling collection and storage area standards for commercial and industrial facilities to size the recycling areas according to the anticipated types and amounts of recyclable material generated.</li> <li>● Provide educational materials to residents on how and what to recycle and how to dispose of hazardous waste.</li> <li>● Provide recycling canisters and collection in public areas where trash cans are also provided.</li> <li>● Institute a program to evaluate major waste generators and identify recycling opportunities for their facilities and operations.</li> <li>● Continue to partner with the California Integrated Waste Management Board on waste diversion and recycling programs and the CalMax (California Materials Exchange) program.</li> <li>● Evaluate the feasibility of a residential, restaurant and institutional food waste segregation and recycling program, to reduce the amount of organic material sent to landfill and minimize the emissions generated by decomposing organic material.</li> <li>● Evaluate the feasibility of “carbon footprinting” for the City’s wastewater treatment facilities, biomass and composting operations, solid waste collection and recycling programs.</li> <li>● Expand yard waste collection to divert compostable waste from landfills.</li> <li>● Study the feasibility and cost-benefit analysis of a municipal composting program to collect and compost food and yard waste, including institutional food and yard waste, using the resulting compost matter for City park and median maintenance.</li> </ul>
Policy RC-11-b	<b>Zero Waste Strategy.</b> Create a strategic and operations plan for fulfilling the City Council resolution committing the City to a Zero Waste goal.

## Appendix B: Clean Transportation Programs

DAC-Priority Accessible Clean Transportation Programs
<p><b>Clean Cars 4 All</b></p> <p>Clean Cars 4 All (CC4A) is a statewide program to help low-income families exchange their old vehicle for a newer model. It is implemented via local air districts throughout the state. The San Joaquin Valley Air Pollution Control District (SJVAPCD) is the local implementer for Fresno and markets their CC4A program as part of their Drive Clean in the San Joaquin program (see below). Qualified residents can receive a larger grant if they purchase an Electric Vehicle (EV). For this program, hybrids, plug-in hybrids (PHEV), and zero emission vehicles (ZEV) are considered to be Evs. To qualify for the program, an individual's household income must be at or below 400% of the Federal Poverty Level (FPL).</p>
<p><b>Clean Vehicle Assistance Program</b></p> <p>The Clean Vehicle Assistance Program is a statewide program, also funded through California Climate Investments that provides grants, not rebates (i.e. financial support at the time of sale and not funding after purchase), and affordable financing to income-qualified California residents to support the purchase or lease of a new clean vehicle (EV or hybrid). Customers apply before they purchase the vehicle; when approved, the grant is applied directly at the dealership. The program also provides two options for EV charging credits:</p> <ul style="list-style-type: none"> <li>▪ Option (1): EV Charger Installation</li> <li>▪ Option (2): Public Charging Card for those who do not wish or cannot install a charger at their home</li> </ul> <p>Four types of vehicles available are eligible through the program: Battery Electric Vehicle (BEV), Fuel Cell Electric Vehicle (FCEV), Plug-In Hybrid (PHEV), and Hybrid Electric Vehicle (HEV). The vehicle must be a 2014 or newer model. Due to the popularity of the program, and a lack of funding, it was closed to new applicants in April 2021 and will likely not re-open until new funds are allocated next year (2022).</p>
<p><b>Drive Clean in the San Joaquin</b></p> <p>The San Joaquin Valley Air Pollution Control District uses funding through California Climate Investments (Cap and Trade proceeds) to offer Drive Clean in the San</p>

Joaquin.<sup>61</sup> This program offers tiered services to improve transportation impacts on air quality in the San Joaquin Valley. The “Repair” service hosts regular free events where older cars that do not meet emissions standards are inspected to determine if they can be fixed. Repairable vehicles receive a voucher for free repairs at a STAR Test and Repair station. This enables residents to meet smog check requirements for example. The next level program, “Replace” offers rebates to those who own older, higher emission cars to replace with a newer lower emission ICE, hybrid, or electric vehicle. Eligible vehicles must be older than 1999 and unable to pass a smog test; the applicant’s household income must also be at or below 400 percent of the federal poverty level (FPL). There are increased funding amounts for applicants who live in a disadvantaged community and choose a hybrid, plug-in, or electric vehicle. The rebate amount can be up to \$9,500 for a new or used PHEV/EV (plug-in hybrid electric vehicles/ electric vehicles). See the charts below for the full funding breakdown for the “Replace” program.

Funding Levels in Disadvantaged Communities					Funding Levels in All Other Communities				
	FPL:	225%	300%	400%		FPL:	225%	300%	400%
Conventional		\$4,000			Conventional		\$4,000		
Hybrid 20+		\$6,500			Hybrid 20+		\$4,000		
Hybrid 35+		\$7,000	\$5,000		Hybrid 35+		\$4,500	\$3,500	
PHEV / EV		\$9,500	\$7,500	\$5,500	PHEV / EV		\$4,500	\$3,500	\$2,500

Figure 3: Drive Clean in the San Joaquin Funding Levels

The third level of service that Drive Clean in the San Joaquin offers is “Rebate” which offers rebates to Valley residents and businesses for the purchase or lease of new, clean-air vehicles. Rebates are dependent on the type of vehicle and can range in value from \$1000 (for zero-emission motorcycles) to \$3,000 (for battery-electric vehicles and hydrogen fuel cell vehicles).

<sup>61</sup> <http://ww2.arb.ca.gov/sites/default/files/movingca/vehiclescrap.html>, accessed 2 November 2021.



Funding acquired through the “Replacement” option cannot be combined with the “Rebate” option, but eligible individuals may also be eligible for additional funding through the Clean Vehicle Rebate Project (CVRP) detailed below.<sup>62</sup>

#### Clean Vehicle Rebate Project (CVRP)

The Clean Vehicle Rebate Project (CVRP) is administered by the Center of Sustainable Energy and offers rebates for zero-emission and plug-in hybrid vehicles for public agencies.<sup>63</sup> Funding is subject to availability and program renewal status. CVRP offers three different funding options for the purchase or lease of new EVs or plug-in hybrids:<sup>64</sup>

- Public Fleets: Up to \$7,000 for purchase or lease; up to 30 rebates a year
- Car Sharing and Rental Fleets: Up to \$4,500 for purchase or lease; up to 20 vehicles a year
- Business, Nonprofit, Tribal Communities and Federal Entities: Up to \$4,500 for purchase or lease; one vehicle per lifetime

In order to receive a rebate, qualified organizations must purchase or lease an eligible vehicle – fuel cell electric, battery electric, plug-in hybrid or zero-emission vehicle. CVRP provides additional rebates for DACs (as determined by EnviroScreen).

#### California Electric Vehicle Infrastructure Project (CALeVIP)

CALeVIP is a rebate program designed to create a statewide infrastructure for electric vehicles by facilitating the purchase and installation of EV chargers. Due to the public access requirement, an applicant must be a business, non-profit organization, tribal government, or government entity; private single-family residences are not eligible for the program. Eligible locations are also determined on the type of EV charger to be installed- a Level 2 Charger or DC Fast Charger. Under the CALeVIP program, DC Fast Chargers can be installed for residential multi-family properties, but it is not clear how many, if any, have been installed at these sites as opposed to more public sites like grocery stores and government buildings. Along with chargers, eligible costs include energy storage equipment, transformers, extended warranties, and signage. As the administrator of CALeVIP, the Center for Sustainable Energy (CSE) subcontracts with Central California Asthma Coalition (CCAC) to facilitate local program implementation. Two programs are listed for Fresno:

Fresno County Incentive Project (FCIP)

<sup>62</sup> <https://www.valleyair.org/drivecleaninthesanjoaquin/replace/>

<sup>63</sup> <https://cleanvehiclerebate.org/eng/fleet>

<sup>64</sup> <https://cleanvehiclerebate.org/eng/fleet-resources#public-fleets>

The Fresno County Incentive Project offers rebates (\$4,000 for single port; \$7,000 for dual port) for the purchase and installation of Level 2 EV chargers for public and private organizations in Fresno.<sup>65</sup> As of October 2021, the project had received rebate requests totally over \$2.5 million and is no longer accepting applications. Interested organizations are, instead, encouraged to apply for funding through the San Joaquin Valley Incentive Project and are eligible to do so on December 11, 2021.

#### San Joaquin Valley Incentive Project (SJVIP)

The San Joaquin Valley Incentive Project provides funding for the installation of EV chargers in Fresno, Kern, and San Joaquin Counties and has committed about 25% of its \$15.3 million budget for projects in DACs.<sup>66</sup> Through the project, businesses, nonprofits, California Native American tribes listed with the Native American Heritage Commission, and public and government entities are eligible to apply for support. SJVIP provides funding for the following two types of chargers in DACs:

- DC Fast Chargers: Up to \$80,000 per DC fast charger or 80% of total project cost, whichever is less.
- Level 2 Chargers: Up to \$4,000 per connector and an additional \$1,000 for multi-unit dwellings.

For this project, Fresno County was allocated \$2.7 million in program support but rebate requests far exceeded this amount; the project received \$308,560 in excess applications for Level 2 chargers and \$23,739,204 in excess applications for DC chargers. As a result, there is no additional funding at present (October 2021) available for Fresno County through SJVIP.

#### Driving Clean Assistance Program

The Community Housing Development Corporation of several Northern California counties offers a Driving Clean Assistance Program that provides financial education and down-payment assistance for clean energy vehicles to low-income families/individuals. They offer applicants two options: a grant of up to \$5,000 (amount depends on income level and the vehicle type) or financing of up to \$20,000. Both new and used vehicles (less than 8 years old and less than 75,000 miles) are acceptable for either purchase or lease.

<sup>65</sup> <https://calevip.org/incentive-project/fresno>

<sup>66</sup> <https://calevip.org/incentive-project/san-joaquin-valley>

## Appendix C: Clean Energy Programs

### DAC-Priority Clean Energy Programs

#### Solar in Disadvantaged Communities (AB 327)

AB-327<sup>67</sup>, also known by some as the “rate reform bill”, was signed also into law in 2013 and directed the California Public Utilities Commission (the CPUC) to “develop specific alternatives designed to increase adoption of renewable generation in disadvantaged communities (DACs)”<sup>68</sup>. The CPUC created three programs in June 2018 to assist with this effort: Disadvantaged Single-Family Solar Homes (DAC-SASH); Disadvantaged Communities – Green-Tariff (DAC-GT); and Community Solar Green Tariff (CSGT), each described below.

#### Disadvantaged Communities-Single-Family Affordable Solar Homes (DAC-SASH)

Modeled after the Single-family Affordable Solar Housing (SASH) program, DAC-SASH provides incentives for qualified homeowners to receive a PV solar system. It also provides workforce training and consumer education on energy efficiency. To qualify for DAC-SASH, applicants must meet the following requirements:

- Live in the top 25% of disadvantaged communities based on CalEnviroScreen.
- Receive electrical service from Pacific Gas & Electric (PG&E), Southern California Edison (SCE), or San Diego Gas & Electric (SDG&E).
- Reside in a single-family home in which they own.
- Have their annual household income meet the California Alternate Rates for Energy (CARE) or Family Electric Rate Assistance (FERA) guidelines.

Eligible households cannot receive a solar PV system if their home requires structural upgrades. Common upgrades needed can include a main service panel or roof replacement, both of which are costly. It is common for eligible families to drop out of the program due to their inability to afford these structural upgrades.

#### Disadvantaged Communities – Green-Tariff (DAC-GT)

<sup>67</sup> [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB327](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327)

<sup>68</sup> <https://www.cpuc.ca.gov/SolarInDACs/>

The Disadvantaged Communities – Green-Tariff (PG&E’s “Green Saver”) program provides 100% renewable energy and a 20% bill discount to income-qualified residents in DACs or eligible San Joaquin pilot communities<sup>69</sup> who are not able to install their own solar.<sup>70</sup> Residents must meet California Alternate Rates for Energy (CARE) or Family Electric Rate Assistance (FERA) income requirements. Projects can be between 500kW and 20 MW and workforce development provisions are not nor sponsorship (support from a local government or non-profit on behalf of the community) is required.

#### Community Solar Green Tariff (CSGT)

The Community Solar Green Tariff (CSGT) is designed to increase access to solar energy for low-income households. Implemented by PG&E, pilot projects will consist of community solar arrays installed near to DACs or the San Joaquin Valley (SJV). Along with local power generation, eligible customers will receive a 20% discount on their electricity bill. For a pilot project to be eligible, it must meet the following requirements:

- Sponsored by a local community organization (ex. non-profit or government agency).
- Support local workforce development by hiring residents to participate in project installation.
- Located within 5 miles of the top 25% of DACs or within 40 miles of SJV pilot community (defined above).
- Array size not to exceed 4.26 MW.
- A minimum of 50% enrolled customers meet the CARE/FERA income restrictions.

#### Solar on Multifamily Affordable Housing (SOMAH)

The Solar on Multifamily Affordable Housing (SOMAH) program is overseen by the California Public Utilities Commission and is managed by the Center for Sustainable Energy with support from Grid Alternatives. SOMAH has an annual budget of \$100 million to provide renewable energy to residents of multi-family affordable housing

<sup>69</sup> Includes: Allensworth, Alpaugh, Cantua Creek, Fairmead, Lanare, Le Grand, Seville, and La Vina

<sup>70</sup> [https://www.pge.com/en\\_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/disadvantaged-communities.page](https://www.pge.com/en_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/disadvantaged-communities.page)

with a goal of installing 300 MW by 2030.<sup>71</sup> The program provides installation incentives for solar PV systems to property owners of low-income residential housing and technical assistance throughout the length of the project.<sup>72</sup> Once installed, residents receive energy credits on their bill through virtual net energy metering and have the option of enrolling in a free Energy Savings Assistance Program.<sup>73</sup>

### Non-DAC Clean Energy Programs

#### Green Tariff Shared Renewables (GTSR)

SB-43, which was signed into law on September 28, 2013 by Governor Jerry Brown, enacted the Green Tariff Shared Renewables (GTSR) program, a 600-megawatt program that provides options for customers — including local governments, businesses, schools, homeowners, municipal customers and renters—to utilize renewable energy to meet up to 100 percent of their energy needs.<sup>74</sup> PG&E offers two options under the GTSR program: Solar Choice and Regional Renewable Choice. Both are currently available for residential customers and businesses and range from 0.5 kW to 20MW.

#### Solar Choice

Solar Choice is a purchasing option for customers that works like a subscription. The customers can choose to purchase enough solar energy from PG&E's power mix to meet between 50% to 100% of their bill. There is an extra charge for this program that appears on the customer's regular utility bill from PG&E.<sup>75</sup> This program is similar to joining a Community Choice Aggregator (CCA).

#### Regional Renewable Choice

Regional Renewable Choice is a program that enables customers to purchase renewable energy through a local renewable energy developer within PG&E's

<sup>71</sup> <https://calsomah.org/about>

<sup>72</sup> <https://calsomah.org/property-owners>

<sup>73</sup> <https://calsomah.org/tenants>

<sup>74</sup> [https://www.pge.com/en\\_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/regional-solar-choice-program.page](https://www.pge.com/en_US/for-our-business-partners/energy-supply/electric-rfo/wholesale-electric-power-procurement/regional-solar-choice-program.page)

<sup>75</sup> [https://www.pge.com/en\\_US/residential/solar-and-vehicles/options/solar/solar-choice/which-program-is-best-for-you.page](https://www.pge.com/en_US/residential/solar-and-vehicles/options/solar/solar-choice/which-program-is-best-for-you.page)

territory. In order to subscribe, residents must locate their own project, contact the developer, and determine the percentage of renewable energy they would like to receive.<sup>76</sup> Once enrolled, residents receive an invoice from the developer for the renewable energy utilized and then a credit on their PG&E bill equal to that amount. PG&E provides a list of eligible projects on their website.<sup>77</sup> Although prior Fresno projects have been included, at present (October 2021), no projects (statewide) are currently listed.<sup>78</sup>

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<sup>76</sup> [https://www.pge.com/en\\_US/residential/solar-and-vehicles/options/solar/solar-choice/regional-renewable-choice.page](https://www.pge.com/en_US/residential/solar-and-vehicles/options/solar/solar-choice/regional-renewable-choice.page)

<sup>77</sup> [https://www.pge.com/en\\_US/residential/solar-and-vehicles/options/solar/solar-choice/develop.page](https://www.pge.com/en_US/residential/solar-and-vehicles/options/solar/solar-choice/develop.page)

<sup>78</sup> [https://www.pge.com/en\\_US/residential/solar-and-vehicles/options/solar/solar-choice/develop.page](https://www.pge.com/en_US/residential/solar-and-vehicles/options/solar/solar-choice/develop.page)

## Appendix D: Energy Efficiency & Electrification Programs

### DAC-Priority Energy Efficiency & Electrification Programs

#### Building Initiatives for Low Emissions Development (BUILD)

The Building Initiatives for Low Emissions Development (BUILD) program was authorized in September 2018 with the passing of SB 1477.<sup>79</sup> BUILD's aim is to incentivize the deployment of carbon neutral building technologies in new residential buildings, specifically those designed to be all-electric. Funding will be allocated to the building of low-income residential housing and contractors providing technical assistance; the program pilots reserve \$80 million for projects located in DAC's.<sup>80</sup> To ensure equitable access to the program, projects not located in the top 25% of DAC's are only eligible for BUILD if residences are classified as affordable housing. The BUILD Implementation Plan was adopted in April 2021 and a preliminary program design was released in September 2021. At present (October 2021), the program is under development by the CEC and not accepting applications.

#### Low-Income Home Energy Assistance Program (LIHEAP)

The Low-Income Home Energy Assistance Program (LIHEAP) is managed by the California Department of Community Services & Development and provides support to low-income families with their heating and/or cooling needs.<sup>81</sup> Funding is provided through the Coronavirus Aid, Relief, and Economic Security (CARES) Act and eligibility is based on the income restrictions below:

<sup>79</sup> [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180SB1477](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1477)

<sup>80</sup> <https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program>

<sup>81</sup> <https://www.csd.ca.gov/Pages/LIHEAPProgram.aspx>

Persons In Household	Monthly Income
1	\$2,431.09
2	\$3,179.11
3	\$3,927.14
4	\$4,675.17
5	\$5,423.19
6	\$6,171.22
7	\$6,311.48
8	\$6,451.73
9	\$6,591.99
10	\$6,732.24

#### Energy Savings Assistance: Common Area Measures (ESA CAM)

The Energy Assistance: Common Area Measures (ESA CAM) is funded through the California Public Utilities Commission, managed by PG&E, and covers the cost of energy upgrades in low-income multifamily residential units.<sup>82</sup> Under this program, landlords receive financing for 100% of the costs associated with upgrading the building envelope, water heating, heating & cooling, lighting, and appliances and loads infrastructure of their buildings.<sup>83</sup> In order to qualify, the building must be deed restricted, have at least 5 units, and 2/3 of residents must live at 200% or below the Federal Poverty level.<sup>84</sup> In May 2021, ESA CAM met its capacity limits and is not able to take on additional requests until additional funding is allocated.<sup>85</sup>

#### California Low Income Weatherization Program (LIWP)

The California Low Income Weatherization Program (LIWP) managed by the California Department of Community Services and Development and funded through the California Climate Investments program.<sup>86</sup> Eligible properties must be located in a disadvantaged community (DAC), contain at least 5 units, and meet affordability

<sup>82</sup> <https://esacommonarea.com/>

<sup>83</sup> [https://esacommonarea.com/wp-content/uploads/2021/03/ESACAM\\_Factsheet\\_v2021-06.pdf](https://esacommonarea.com/wp-content/uploads/2021/03/ESACAM_Factsheet_v2021-06.pdf)

<sup>84</sup> <https://esacommonarea.com/how-to-participate/>

<sup>85</sup> <https://esacommonarea.com/how-to-participate/> IBID

<sup>86</sup> <https://camultifamilyenergyefficiency.org/>



requirements (i.e. at least 66% of households are at or below 80% of local median income).<sup>87</sup> Additionally, proposed improvements must “create at least 15% savings above existing conditions”. If eligible, LIWP can cover costs associated with energy efficiency, solar PV, and solar thermal upgrades.<sup>88</sup>

### GoGreen Financing

GoGreen Financing (previously named Residential Energy Efficiency Loan, REEL) is the “public-facing platform” of the California Hub for Energy Efficiency Financing (CHEEF) and is focused on reducing energy for three key stakeholders: homeowners, renters (especially those in low income multifamily buildings) and businesses.<sup>89</sup> CHEEF is a program authorized by the California Public Utilities Commission and was developed in partnership with California’s investor-owned utilities. GoGreen Financing provides two programs relevant for the City of Fresno DAC communities:

#### GoGreen Home

GoGreen Home provides financing to renters and homeowners for the purchase of energy efficiency products. Applicants must receive electric or gas service from one of the four investor-owned utilities in California in order to qualify for support.<sup>90</sup> Eligible improvement projects include: appliances, cool roofs, heating & cooling infrastructure, insulating, lighting, pool products, water heating, and windows. At present, the program only provides financing options for energy efficiency improvements and not solar or battery storage.<sup>91</sup> Additionally, renters must receive permission from the property owner before applying to the program.

#### GoGreen Multifamily

GoGreen Multifamily provides up to \$10 million in financing for energy-saving improvements to low income multifamily units throughout California.<sup>92</sup> In order to be eligible, properties must have “5 or more units where at least 50% of the

<sup>87</sup> <https://camultifamilyenergyefficiency.org/about/propertyowners/>

<sup>88</sup> [https://camultifamilyenergyefficiencydotorg.files.wordpress.com/2020/02/liwpflyer\\_v2\\_2020.pdf](https://camultifamilyenergyefficiencydotorg.files.wordpress.com/2020/02/liwpflyer_v2_2020.pdf)

<sup>89</sup> <https://gogreenfinancing.com/>

<sup>90</sup> <https://gogreenfinancing.com/residential#tab-18>

<sup>91</sup> Ibid

<sup>92</sup> <https://gogreenfinancing.com/multifamily>

units are income-restricted”; units must also receive electric or gas service from a California-based investor-owned utility.<sup>93</sup> An extensive list of improvements are eligible for financing in addition to remodeling and solar equipment and storage (at the discretion of the financing company).<sup>94</sup> GoGreen Multifamily is also structured to work with other energy efficiency programs like LIWP (described below) and other solar initiatives like SOMAH (described previously).

### Non-DAC Energy Efficiency & Electrification Programs

#### Tariffed On-Bill Financing (Tariffed OBF)

Tariffed on-bill financing allows for utilities to invest in cost-effective energy efficiency upgrades for residential customers. An example of an eligible upgrade is the installation of an energy efficient heating and cooling unit. Investment costs are recovered through a dedicated charge on a customer’s utility bill. The charge is designed to be less than the estimated savings of the energy efficiency improvements to preserve customer affordability. Tariffed OBF is associated with the utility meter of a residential property, therefore the tariff will remain in place until the cost of the investment is fully recouped, regardless of residential occupants. This model is more accessible than conventional On-Bill Financing because it does not require consumer loans, credit checks, nor proof of homeownership. As a result, it is a viable option for financing energy efficiency upgrades for low-income households and rental properties.

Tariffed OBF programs have been successfully implemented in eight states by 18 utilities, including investor owned, cooperative, and municipal utilities. More than \$30 million has been invested in energy efficiency and renewable upgrades at 5,000 locations. State examples include the Town of Windsor and the City of Hayward described below.

#### Windsor Energy PAYS® Program

<sup>93</sup> <https://gogreenfinancing.com/multifamily>

<sup>94</sup> <https://www.treasurer.ca.gov/caeatfa/cheef/multifamily/resources/esmlist.pdf>

The Town of Windsor's Windsor Energy PAYS® program allows residents and businesses to finance water and energy saving upgrades with no up-front cost and immediate savings on utility bills. Customers save an average of \$30 per utility bill and reduce their energy use by 10% reduction in energy use and their indoor water use by 20%. <sup>95</sup> This program was funded by a \$665,000 grant from the U.S. Department of Energy Better Buildings Neighborhood Program given to the Sonoma County Regional Climate Protection Authority (RCPA) for an on-water-bill financing pilot. <sup>96</sup>

#### Green Hayward PAYS® Program

The City of Hayward's Green Hayward PAYS® program allows multifamily property owners to get immediate savings on their water and energy utility bills by installing efficiency improvements with no up-front cost.

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<sup>95</sup> [https://rcpa.ca.gov/projects/pay-as-you-save-pays/#:~:text=The%20RCPA%20is%20leading%20the,You%20Save%20\(PAYS%C2%AE\).&text=The%20Windsor%20Efficiency%20PAYS%20program,of%20Energy's%20Better%20Buildings%20Program.](https://rcpa.ca.gov/projects/pay-as-you-save-pays/#:~:text=The%20RCPA%20is%20leading%20the,You%20Save%20(PAYS%C2%AE).&text=The%20Windsor%20Efficiency%20PAYS%20program,of%20Energy's%20Better%20Buildings%20Program.)

<sup>96</sup> [http://www.calmac.org/publications/Existing\\_Programs\\_Review\\_FINAL.pdf](http://www.calmac.org/publications/Existing_Programs_Review_FINAL.pdf)