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Expanding access to electric vehicles in California's low-income communities

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Executive Summary

In September 2020, California Governor Gavin Newsom announced an ambitious [executive order](#) requiring all new passenger vehicles sold in the state to be zero-emission by 2035. While unprecedented, this action recognizes the growing threats of climate change and local air pollution that necessitate a rapid transition away from traditional internal combustion engine vehicles. In California, the barriers to EV adoption, including financing and charging, are even higher among [disadvantaged populations](#). As the state works towards its climate goals, it must ensure that progress does not deprive certain communities of access to the benefits of clean energy. To facilitate a more just transition and widespread use of EVs, California should consider updating its building codes for multi-unit dwellings, expanding curbside charging infrastructure, instituting statewide EV charger rebate programs, and expanding EV sharing incentives.

I. California's EV Goals

California is a global leader in clean technology and progressive climate policy. However, recent [reports](#) indicate that greenhouse gas emissions from transportation are approaching record highs, accounting for 41.1 percent of the state's total emissions in 2017. Similarly, vehicle ownership and total miles driven by Californians reached all-time highs that year. Passenger vehicles are responsible for nearly a third of California's emissions, more than all the electric plants, livestock, and oil refineries in the state combined.

Even before Governor Newsom's recent announcement, California had already set an ambitious goal of [5 million zero-emission vehicles \(ZEVs\)](#) on the roads by 2030, including pure battery plug-in electric vehicles (EVs), plug-in hybrid EVs, and hydrogen fuel cell EVs. Other reports have called for that target to be raised to [7.5 million](#) to meet the state's climate goals. In 2020, the California Air Resources Board passed the [Advanced Clean Truck Regulation](#), requiring more than half of all trucks sold in the state to be zero-emissions by 2035.

These goals are necessary not only to mitigate the effects of climate change, but also to lessen local vehicle-related air pollution and improve the health of California residents. Vehicle air pollution disproportionately affects [communities of color](#). Therefore, efforts towards vehicle electrification, which can significantly reduce emissions, should be concentrated in communities with higher exposure to gasoline and diesel emissions.

Many zero-emission vehicles are now commercially available, but they still make up only a small fraction of all vehicles on the road (less than [10%](#) in California). Across the country, the slow

adoption is driven in part by a [shortage of charging infrastructure](#); consumers frequently cite a [low availability of charging stations](#) as a barrier to buying an electric vehicle (EV).

II. The Challenges of Deploying EVs

To meet the [expected electricity demand](#) that will accompany a drastic increase in EVs, California must also develop the electric charging infrastructure to power its new electric fleet. While the state set a target of [250,000](#) EV charging stations by 2025, it is unclear if it will be able to meet that goal. A [2017 study](#) of charge points across ten cities (five in California) with major EV markets shows significant expected charging gaps in 2025. The gaps are especially important given that these cities already had above average levels of EV infrastructure compared to other cities in the U.S. in 2017. Upon closer examination, existing EV infrastructure is even less accessible for disadvantaged populations, particularly low-income communities.

One reason for these disparities is that low-income drivers [tend to live](#) in multi-unit dwellings, where outdated building codes prevent the adoption of EV charging spaces. Because of this, these disadvantaged populations are often unable to take advantage of federal tax credits that incentivize EV adoption. Furthermore, these populations are excluded from the economic benefits of EV adoption, which include [savings over the vehicle lifetime](#) (10 years, 120,000 miles) due to reduced fuel and maintenance costs. While access to efficient transportation is the most effective predictor of escaping poverty, a growing population of younger drivers who live in cities do not own a car. Further, one survey found that [70%](#) of American drivers believed a car sharing service would be more economical than owning a vehicle. Therefore, any policies to facilitate a transition to EVs should also include car sharing options.

In California, EV infrastructure development has been largely driven by legislative mandates, regulated by the California Public Utilities Commission (CPUC) and primarily carried out by investor owned utilities. Three of California's largest utilities – Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E) – have installed over 2,500 charging stations as of November 2018, with approximately 12,000 more planned. These stations are focused on multifamily, workplace, and public markets; at least [10%](#) are to be located in disadvantaged communities. However, given the financial challenges that these utilities currently face as a result of COVID-19 and California's recent wildfires, the long-term stability of these programs is uncertain. By allowing investor owned utilities to solely drive the growth of EV infrastructure in California, the state places a larger burden on these public utilities that will likely lead to slower and unequal development of EV infrastructure across the state.

California's transportation sector has historically been intertwined with the marginalization of poor and minority communities in the state. In 1944, when the Federal-Aid Highway Act allocated funds to build 1,938 miles of freeways, planners [rerouted designs](#) to destroy thousands of homes in racially diverse Los Angeles communities. Policies like this mean that African Americans are about [three times](#) more likely to live in a high-traffic area and breathe harmful vehicle-related air pollution white residents.

The ramifications of these racist policies persist today as the state works towards a clean energy future. While 25% of the proceeds generated by California's cap-and-trade auctions are designated for projects benefiting disadvantaged communities, researchers have shown that these policies [aren't doing enough](#) to encourage uptake of solar panels and clean cars. Instead, these programs disproportionately benefit wealthier homes, creating gaps in energy expenditures across [race](#) and [income](#). Bridging the wealth gap for EV adoption will require a [holistic approach](#) that intentionally targets the longstanding marginalization and barriers to cleantech adoption that these low-income communities have faced in California.

III. Policy Recommendations

I recommend several measures that can be led by California lawmakers and state agencies to address the challenges above and expand EV charging infrastructure to low-income communities across the state.

First, state agencies must update California's building codes to increase standards for charging stations in multi-unit dwellings. Studies have shown that multi-unit dwellings will house 120,000 plug-in electric vehicles (PEVs) by 2025, with a projected gap of 66,000-79,500 charging stations to meet this need. Currently, California requires all new buildings with more than 17 units to implement EV charging for 3% of parking spaces. To fill the gap by 2025, all new multi-unit buildings, regardless of size, must install EV charging in [10% of parking spaces](#).

Second, lawmakers must work with local municipalities and utilities to expand curbside EV charging stations. There is a unique opportunity to use the [existing electrical infrastructure](#) provided by streetlights and power poles to power curbside charging stations, a technique that has already been piloted in cities such as [London](#) and [Los Angeles](#). Traditional streetlights use high-pressure sodium vapor, which is a highly inefficient lighting source. Switching to LED lighting not only improves lighting and public safety, but also has been shown in San Francisco to save about [300 kWh](#) per light per year. With the proper infrastructure, these energy savings could then be repurposed for EV charging. Because street lighting is typically owned and operated by public utilities, it can be difficult for local municipalities to easily implement changes. Switching to LED lighting and installing EV chargers would likely require partnerships from local government, public utilities, and governing bodies such as the CPUC. Despite challenges, including increased installation costs, the [overall savings](#) from energy efficiency and a secondary energy market based on EV charging should make this plan economically appealing.

Third, California must institute a statewide EV charger rebate program for residential and commercial customers to supplement or replace the patchwork of rebates currently available across the state. Like the [Clean Vehicle Rebate Program](#) (CVRP) that provides rebates for purchase or lease of eligible ZEVs, this program could be administered by the California Air Resources Board (CARB) or similar state agency. This program would provide financial incentives for not only homeowners, but also for businesses and owners of MUDs to install charging stations, making EV charging more broadly accessible to low-income communities. Importantly, this program should be funded upfront by the state, with funds disbursed over

time to allow for point-of-sale rebates, an important consideration for middle- or lower-income customers.

Finally, California lawmakers should provide funding and direct CARB to expand EV sharing [programs](#). To better accommodate the diverse needs of California residents, planning around EVs and charging infrastructure must reflect the rise of vehicle sharing and automated vehicles as car ownership [peaks](#). [Regional hybrid and electric car sharing projects](#), supported by CARB, already exist in Sacramento, Los Angeles, Santa Cruz, and the San Joaquin Valley. This distributed model allows for communities to tailor their car sharing services based on local needs; for example, Sacramento and Los Angeles use more traditional electric cars whereas programs in Santa Cruz and the San Joaquin Valley have opted for shuttles and passenger vans. Increased funding at the state level will allow local municipalities to implement and expand similar programs in their communities, ensuring that EVs are accessible to residents across the entire state.

IV. EVs of the Future

To ensure a just transition towards an EV future for California's low-income communities, I recommend that California work to update its building codes for multi-unit dwellings, expand curbside charging infrastructure, institute statewide EV charger rebate programs, and expand EV sharing incentives. To develop a robust EV charging network will be challenging and require sustained commitment and cooperation amongst the California state legislature, governing bodies such as the CPUC, CARB, and California Energy Commission. However, these changes have potential spillover benefits for other state climate goals. For example, large-scale deployment of electric vehicles could provide substantial electricity storage as back-up power systems. If all of the state's proposed 5 million ZEVs by 2030 were EVs, this would represent approximately [250 million kWh](#) of energy storage, enough to provide back-up power to all of San Francisco for about two weeks. As the state continues to deal with the effects of climate change, including threats to our electricity grid from wildfires, advances in vehicle-to-grid services will make this electricity reserve invaluable.

Whatever actions that policymakers decide to take, EV deployment and infrastructure programs should be designed closely with public utilities responsible for service and local community stakeholders to ensure feasible outcomes that are rooted in environmental justice in California.