

2011

# Electric Vehicles

## Who's Left Stranded?



C.C. SONG Green Assets Fellow | The Greenlining Institute

AUGUST 2011

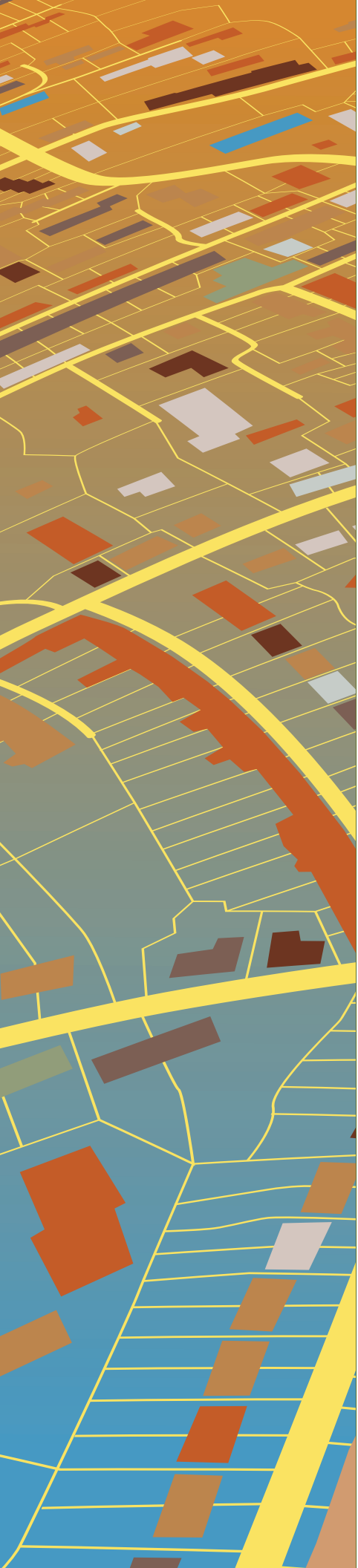


# Electric Vehicles: Who's Left Stranded?

C.C. SONG, Green Assets Fellow | The Greenlining Institute



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## About the Greenlining Institute

The Greenlining Institute is a national policy, organizing, and leadership institute working for racial and economic justice. We ensure that grassroots leaders are participating in major policy debates by building diverse coalitions of grassroots leaders that work together to advance solutions to our nation's most pressing problems.

Our Leadership Academy has become the farm system for tomorrow's social justice leaders, training the best and brightest from our communities. Our policy experts conduct research and coordinate multi pronged strategies on major policy issues, including but not limited to the environment, wealth creation (asset building), philanthropy, health, energy, communications, and higher education. Central to all of Greenlining's work is the "big picture" recognition of the interrelatedness of issues facing low income and minority communities.

## About Greenlining's Green Asset Program

Greenlining's Green Asset Program works to ensure that communities of color are at the forefront of the green economy as active stakeholders in our nation's efforts to "go green." With the advent of green technology and green business opportunities, Greenlining seeks to ensure that low-income and minority communities benefit from philanthropy, jobs, business contracts, and other green opportunities that are created in our efforts to fight global warming. Greenlining will be a strong advocate for "green solutions" to reduce our dependence on oil and other unsustainable energy practices that disproportionately impact low-income communities.

## Acknowledgements:

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## The Greenlining Institute

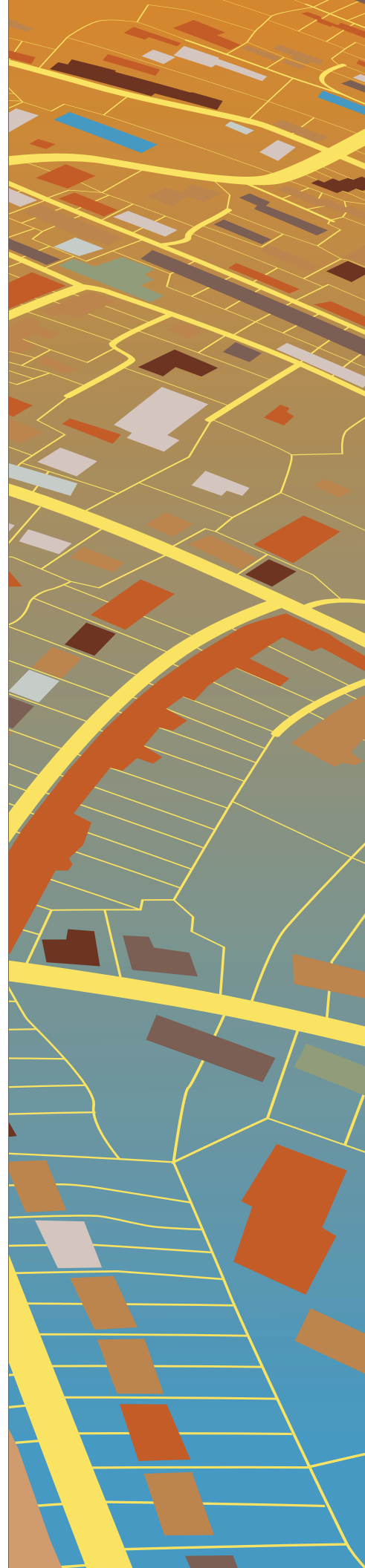
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## Executive Summary

- Electric vehicles are widely touted as a solution to a variety of problems, including air pollution, climate change and high gasoline prices. New investments in charging infrastructure may help spur consumer demand for EVs, which is already growing.
- Unfortunately, there are reasons for concern that many California communities – particularly communities of color, which now make up nearly 60% of California’s population – may get relatively little benefit from EVs, which are often seen as expensive and unattainable.
- EVs’ impact on air quality and public health will depend on how many get on the road, and where. Reductions in smog are likely to be minimal in the short and medium term, due to the relatively small number of EVs expected to be sold, and the fact that most will likely be purchased by affluent buyers who are already driving relatively clean vehicles. Statewide sales are projected to be in the 200,000-300,000 range by 2015 – compared with 7 million cars and trucks now registered in Los Angeles County alone.
- Sales of hybrid vehicles have been used as an indicator of EV market penetration, and hybrid buyers differ sharply from the state’s demographics. Although white Californians make up just over 40% of the state’s population, 70% of hybrid owners are white. Latino, Asian and African American Californians are all markedly less likely to own hybrids than are whites. If EV sales are similarly concentrated in white and relatively affluent areas, communities most in need of the environmental benefits from these vehicles won’t get them.
- Polls have shown Californians of color to be more concerned about air pollution than whites, making them a natural – and thus far, largely untapped – market for EVs and other low or zero-emissions vehicles.
- State and federal tax credits and rebates will do much to make EVs affordable as long as they last, but it is unclear whether these programs have had adequate publicity in all communities. California’s Clean Vehicle Rebate Project, for instance, is anticipated to run out of 2011 fiscal year funding by the end of July. While the popularity of rebates should encourage optimism, the effectiveness of the program in reaching out to those who need rebates should be evaluated.
- The overall impact of EVs on the electric grid and on pollution caused by electricity generation will be small if owners charge during off-peak hours. Widespread introduction of smart meters and the smart grid will help EV owners save money by encouraging this, but extensive outreach and education, in multiple languages, will be needed to make this happen and to calm concerns about smart meters. On the other hand, widespread charging during high-use periods could put a strain on the grid, which in turn could add to pollution problems if too much of this electricity comes from nonrenewable sources.
- EV manufacturing will likely be a fairly small job generator in California, but establishment of EV infrastructure such as charging stations will create employment opportunities. The clean tech industry should partner with community colleges to prepare diverse communities for the variety of job opportunities that will emerge.

- Creative efforts will be needed to increase EV market penetration in communities of color, but for these communities, as well as all low-income communities, a wide variety of strategies will be needed to reduce vehicle emissions. These can include car-sharing programs featuring EVs and other low-emissions vehicles as well as efficient, accessible and clean public transit.
- Historically, environmental initiatives have paid too little attention to low-income communities. That pattern must not be repeated if we are to solve America's oil addiction.

## Introduction:

### Electric Vehicles' Comeback

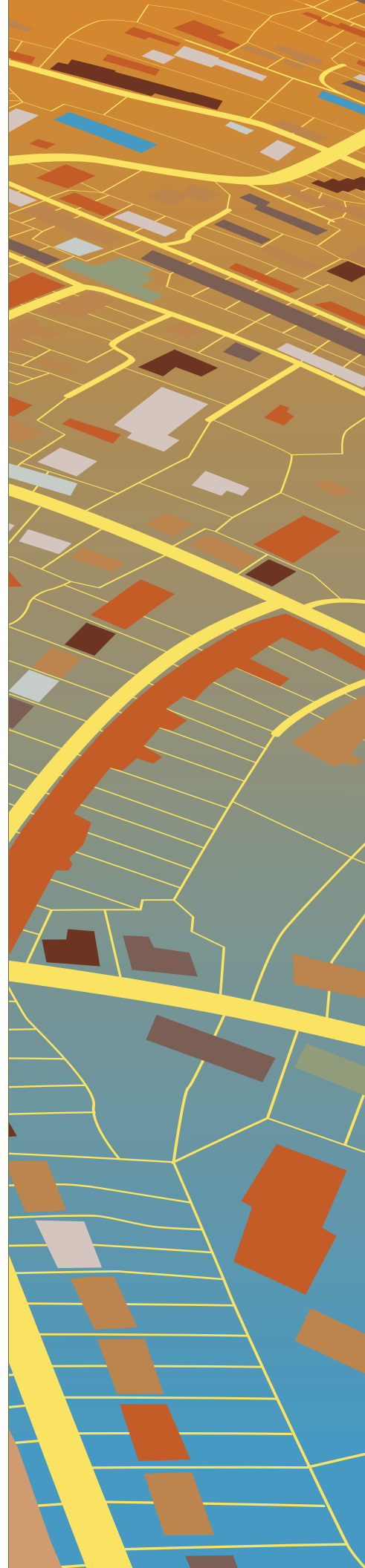
Less than 10 years after all of General Motors' EV1s were recalled and destroyed, electric vehicles are back, and being looked to as a major part of the solution to climate change, air pollution, and America's dependence on oil. But serious questions remain about how large an impact electric vehicles will have, and whether those benefits will reach all communities.

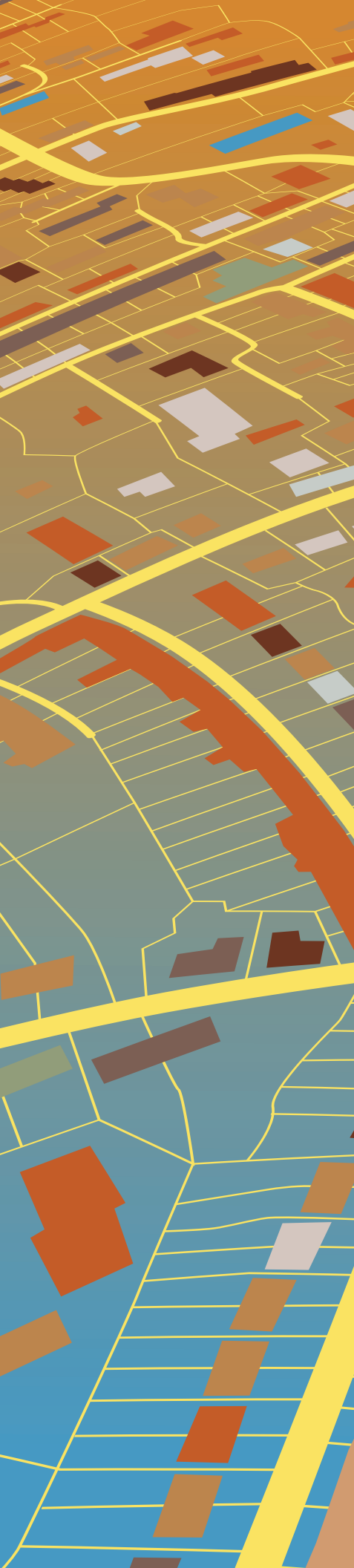
As oil becomes scarce, interest in electric vehicles has soared. In his State of the Union speech, President Obama called for putting one million electric cars on the road by 2015, a goal that has been applauded by some advocates, but called impossible by others.

In California, electric vehicles are touted as the solution to two problems plaguing the state: climate change and volatile, ever-rising gasoline prices. Currently, passenger vehicles emit 29% of the state's total greenhouse gas emissions.<sup>1</sup> As climate change becomes an immediate threat to our environment, community health, and economy, electric vehicles will be crucial in reducing emissions in the transportation sector. At the same time, the average retail regular gasoline price per gallon had been on a steady increase for 16 weeks as of May 2, 2011.<sup>2</sup> While the prices have gone down a bit recently, drivers remain worried that gasoline prices may approach \$5 per gallon in the near future. And as gasoline prices continue to be unpredictable and volatile, electric vehicles will be important in helping Californians cure our oil addiction and survive tough economic times.

Prominent legislators, regulators, and renewable energy advocates have joined together to form the California Plug-In Electric Vehicle Collaborative to establish California's leadership in the electric vehicle market place. The Department of Energy, California Energy Commission, and various Air Quality Management Districts all have plans to invest in electric vehicle charging infrastructure. In February, the Bay Area Air Quality Management District announced a \$3.9 million award to four companies to build electric vehicle charging infrastructure; this investment will add more public charging stations and provide incentives for homeowners to upgrade their home-charging capability.<sup>3</sup> Such policies will hopefully spur consumer demand for electric cars.

But for communities that make up California's new majority, electric vehicles currently remain a questionable solution to our gasoline and oil-related problems. In communities of color and low-income neighborhoods, electric vehicles are seen largely as expensive



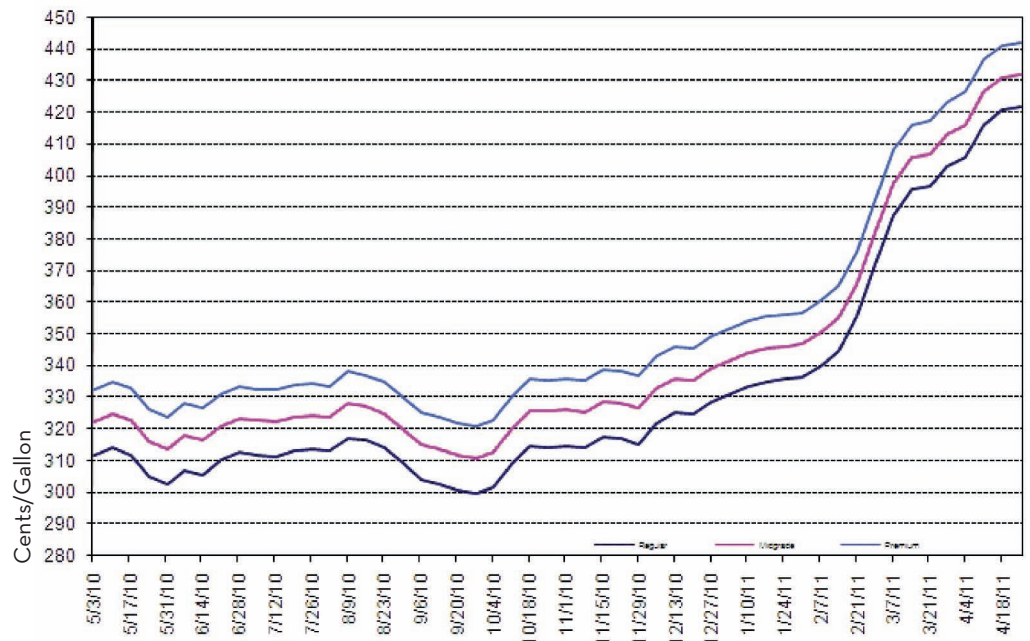


and unattainable—even with rebates and tax incentives. While emission and smog reductions are real, these vehicles aren't expected to be seen in the most polluted and poorest neighborhoods in meaningful numbers any time soon. It will be some years before California sees massive sales of electric vehicles, but today low-income families can't afford to put gasoline in their cars, and have to turn to the increasingly underfunded public transit system to get to work and school.

The sections that follow seek to put electric vehicles' environmental and health impact, costs, savings, and job creation potential in perspective from the viewpoints of communities of color and low-income communities. Our goals are to encourage policy discussions around electric vehicles' impacts and deployment plans in these communities, to raise the urgency and timeliness of these discussions, and to create policy solutions that address the concerns of these communities. If electric vehicles are going to lead California through the oil crisis and help us attain a clean energy economy, they will have to be affordable for communities of color, who make up nearly 60% of California's population.

### California Statewide Average Retail gasoline Prices (as of 4.25.11)

Gasoline prices in California saw a sharp increase between February and April. Will this be an opportunity to end our oil addiction? Source: Energy Information Administration.







## Electric Vehicles' Impact on Environment and Public Health

**Q: Will electric vehicles improve public health by reducing smog in disadvantaged communities?**

**A: Electric vehicles can reduce smog when policies set strong mid-term and long-term air quality goals, and when large-scale deployment happens.** Policy advocates are well aware of the importance of establishing strong zero-emission vehicle (ZEV) standards both federally and in California. An ambitious plan focusing on developing pure ZEVs and transitional ZEVs available in large, commercial quantities can ensure the emergence of a technologically diverse market, diverse consumer marketing strategies, and tangible public health benefits in the most polluted communities. Such a plan should include setting high fuel efficiency standards and strong tailpipe emission regulations to encourage clean vehicle production.

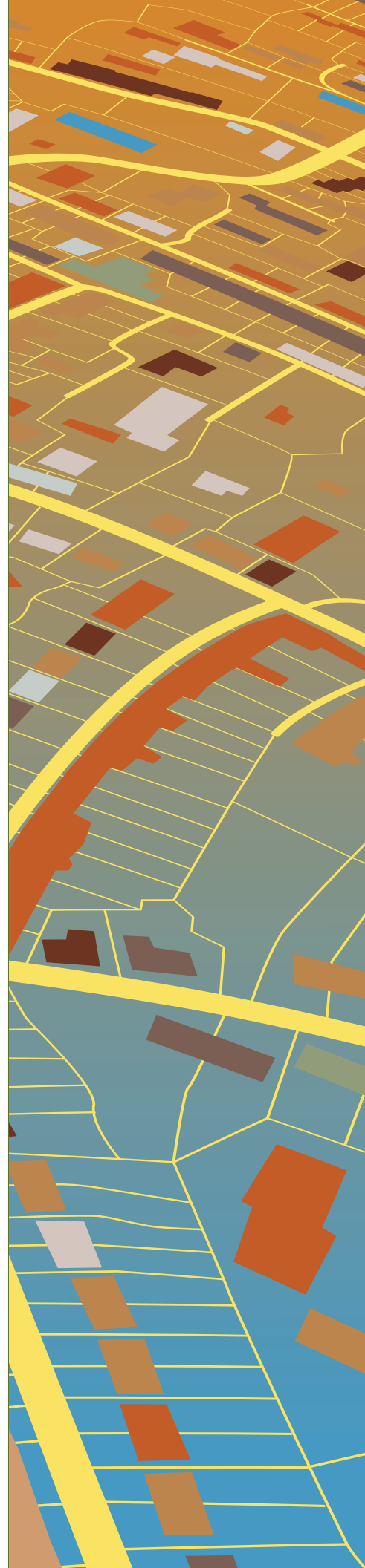
It's important to put the number of electric vehicles expected to be on the road in perspective to evaluate how significant the smog reduction will be. Out of the 1 million electric vehicles projected to be sold and bought by 2015, about 200,000 to 300,000 will likely come to California,<sup>4</sup> compared to 7 million cars and trucks now registered in Los Angeles County alone.<sup>5</sup> Last year (a relatively weak year for vehicle sales), 11.6 million cars and trucks were sold nationwide, and only 2.4% of them were hybrid electric vehicles.<sup>6</sup> While having roughly 300,000 zero-emission electric vehicles on the road is a good start, achieving significant smog reduction will require policies and education that create broader, systemic reductions.

The bottom line is simple: Electric vehicles' impact on health and air will depend on how many get on the road, and where.

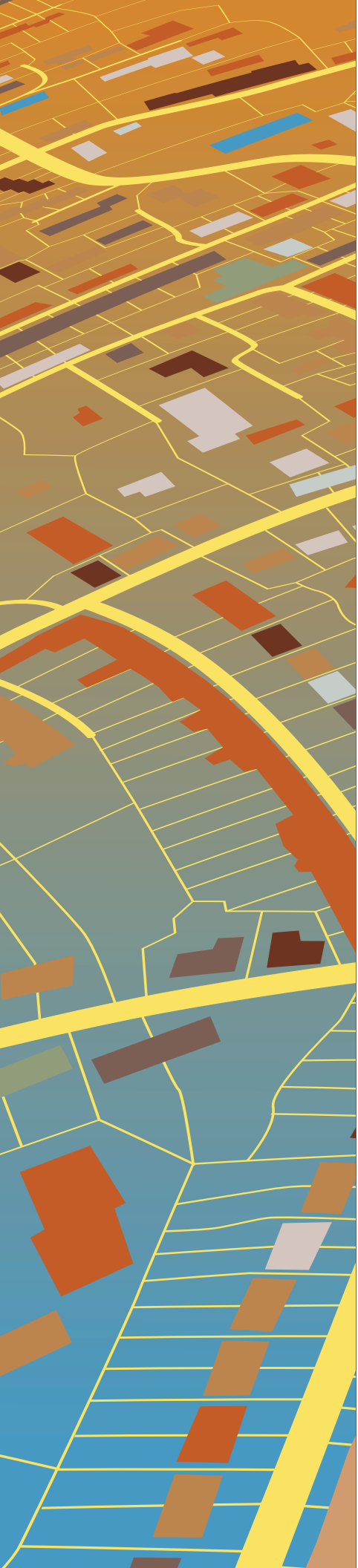
Experts have suggested recently that while the current electric vehicle deployment rate may reduce greenhouse gases, it may not reduce smog. In order to reduce smog, a significant number of people who drive old, smog-producing cars must retire their cars and start driving these clean electric vehicles. According to a recent article in the *San Jose Mercury News*, people who have purchased electric vehicles come from more affluent households, and were likely driving newer, less smog-belching cars already.<sup>7</sup>

Many have projected electric vehicle deployment using gasoline hybrid vehicle market penetration as a model. In California, most hybrid vehicle owners are white, while hybrid penetration is fairly insignificant amongst blacks, Asians, and Latinos, according to the 2009 National Household Travel Survey data.

Over 70% of hybrid vehicles in California are owned by whites, around 20% are owned by Latinos, and much smaller proportions of hybrids are owned by blacks and Asians—astonishingly low numbers for a state whose population is nearly 60% non-white. This presents immense market opportunities, but also raises concerns.



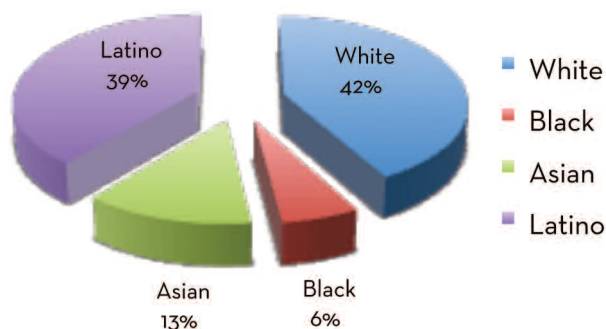




California's Latino and Asian populations are on the rise, and polling shows that Californians of color are more concerned about air pollution than their white counterparts. These communities constitute an untapped environmental base of potential electric vehicle buyers. But this also poses an important question for policy makers and industry: if we are serious about reducing greenhouse gases and improving public health, will the current market penetration and buyer demographics get us there?

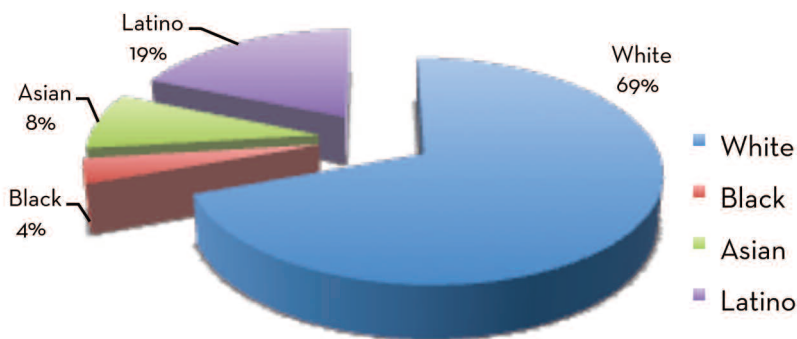
The American car market is pointing toward fuel-efficient and cleaner vehicles, as demonstrated by the steadily increasing sales of the Toyota Prius and other small, fuel-efficient cars, and the recent extinction of the gas-guzzling Hummer line.<sup>8</sup> As optimistic as we all want to be about electric vehicles, it would be tragic if these vehicles become just another marker of our society's growing racial wealth gap and the accompanying climate gap that sentences communities of color to the highest levels of pollution and effects from climate change.

### California Population 2010



Source: 2010 Census Data

### Hybrid or alternative fuel vehicle ownership by race in California



Source: 2009 National household Travel Survey, U.S. Department of Transportation

**Q: Will additional power plants be needed to meet the increased electricity demand from plug-in vehicles? And will the power plants emit more greenhouse gases and co-pollutants?**

**A: It depends on the number of vehicles purchased, when they are charged, and what types of power plants are built to meet peak or non-peak electricity demand.**

The actual electricity demand from electric vehicles, according to a study by University of California, Davis researchers Ryan McCarthy and Christopher Yang, will increase by 1% if only one million electric vehicles are charged during off-peak hours,<sup>9</sup> therefore there would be no need to build additional power plants. But if California and the rest of the nation are serious about mass electric vehicle deployment, more power plants will need to be built to increase capacity.

A few scenarios can happen, depending on when owners charge their cars. If vehicles are charged at night during off-peak hours, it is likely that the impact on the grid will be fairly minor. However, if owners charge their cars during the day, or in the early evening after work, grid capacity will need to be increased significantly to meet the demand. If high-polluting, non-renewable sources, such as coal, are used to meet heightened demand during peak hours, then the net greenhouse gas and co-pollutant emissions of powering electric vehicles might actually be higher than fueling hybrid vehicles.

Most of our electricity is currently generated by non-renewable sources, such as natural gas (56.7%), nuclear (15.3%), large hydro (12.2%), and coal (1.8%).<sup>10</sup> Concerns about additional emissions produced by new power plants will be addressed by the recently-signed renewable portfolio standard (RPS) law. The law requires that 33% of the state's electricity come from renewable sources by 2020, which would effectively reduce source greenhouse gas emissions. However, it is important to note that 39% of California's electricity will still come from natural gas plants, 6% from coal (generated in and out of state), and 12% from nuclear power plants. Many disadvantaged communities will remain in highly polluted "climate hot spots." To ensure that electric vehicles don't contribute to additional pollution and greenhouse gas emissions, car owners need to be made aware of the different environmental and economic impacts between charging during peak and off-peak hours, and California needs to diversify its peak and off-peak electricity generation profiles.

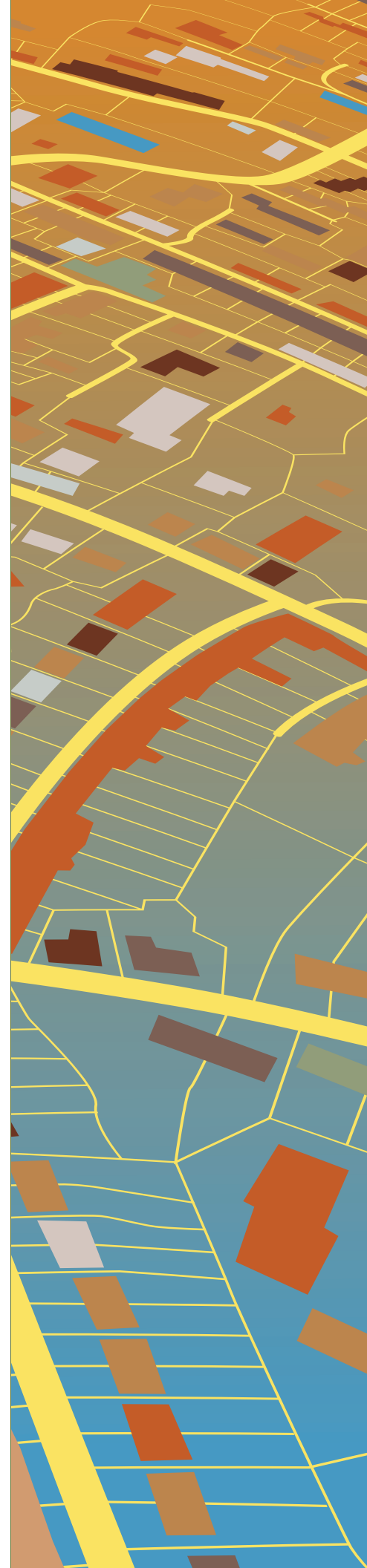
## Making Electric Vehicles Affordable

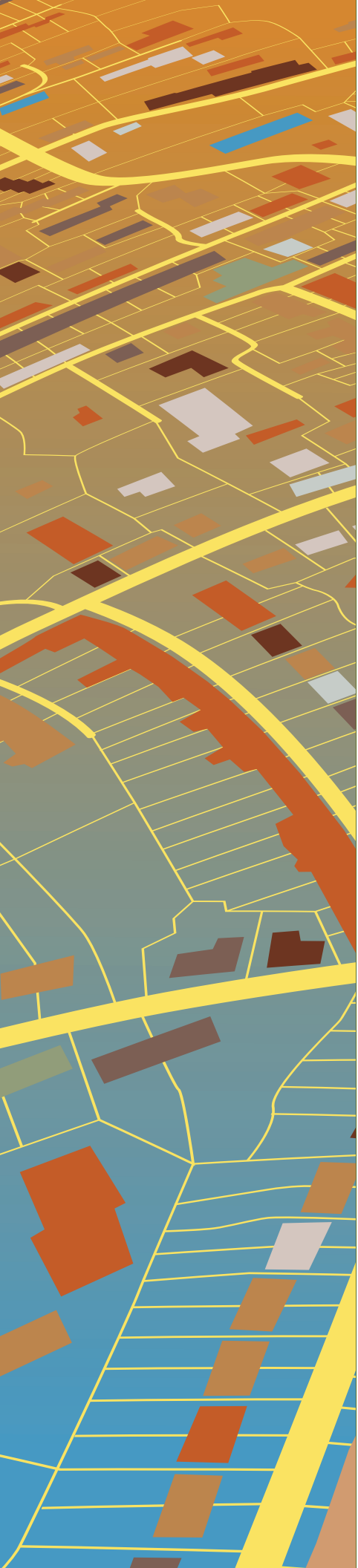
**Q: Aren't electric vehicles really expensive?**

**A: An electric vehicle may cost more than a gasoline-powered car upfront, but there are many different federal and state tax incentives available.** What is less clear, however, is whether information on these incentives is accessible and widely enough known, and whether adequate, long-term affordability strategies are in place. A standard Nissan LEAF costs around \$33,000 before taxes, which is comparable to some lower-end luxury cars.<sup>11</sup> But the federal government offers up to \$7,500 in tax credit, and California offers a whopping \$5,000 rebate while the funding lasts, reducing the car's final cost sharply.

Local utilities also offer discount rates for charging during off-peak hours, beginning at 7 p.m. In specific regions that are seriously promoting electric vehicles, incentive packages also include free metered parking, use of HOV lanes anytime, free electric vehicle supply equipment, and discount rates for home charging installation.

With all of these incentives, and with gasoline prices fluctuating, electric vehicles should be more attractive than ever to *everyone*, and especially for environmentally conscious



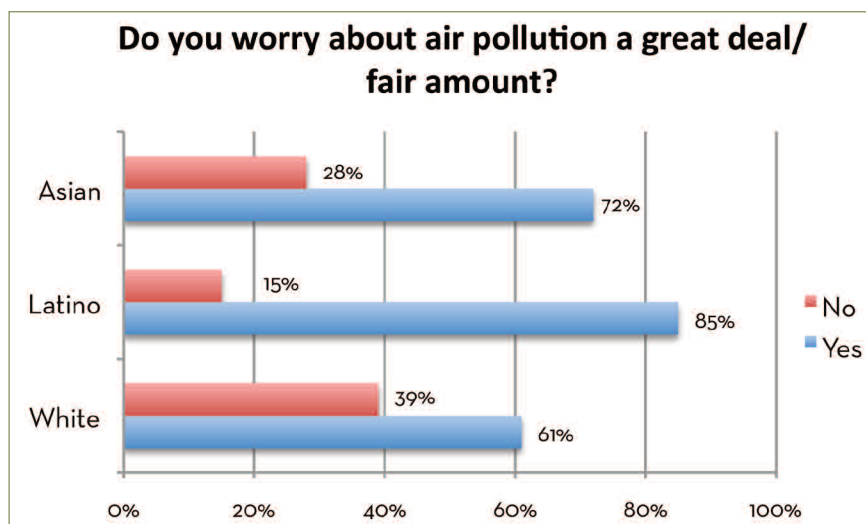


Latinos and Asians, according to a recent poll by the *Los Angeles Times* and the University of Southern California.<sup>12</sup> But for consumers to be willing to purchase electric vehicles, they need to know about the tax and other incentives, and have enough money to pay for the vehicles. Even with tax deductions and rebates, a LEAF is still about \$20,000, about the same price as a brand new 2012 Honda Civic.<sup>13</sup>

While California's Clean Vehicle Rebate Project, launched in March 2010, is supposed to run through 2015, funding for 2011 is anticipated to run out by July<sup>14</sup> – the Air Resources Board will consider expanding funding for the rebate program in its July board meeting,<sup>15</sup> but may also reduce the amount of the rebate. The federal tax credit is set to run out for each manufacturer when that manufacturer has sold 200,000 plug-in vehicles. It is unclear whether the rebates actually help bring electric vehicles to average American driveways, or have gone to more affluent motorists, to whom information about tax incentives and rebates is more accessible, but who may not be truly in need of help. As much as the popularity of the rebate program should encourage optimism around electric vehicles, effectiveness of the rebates in reaching average and low-income Americans should be evaluated.

This raises the question of whether electric vehicles should be advocated nationally as the primary solution to our oil crisis, and what solutions are available to disadvantaged communities that confront serious air pollution problems and high unemployment rates. While it is acknowledged that wealthier electric vehicle adopters will pay more to help front early adoption costs, which in turn should lower costs for others as demand increases, time is running out in disadvantaged communities. Increasing investment in clean, efficient public transit systems is crucial to improving air quality in polluted communities, while providing viable transportation to help community members get to work.

Unfortunately, public transit investment is not nearly as prioritized as highway and rail investments, which have historically displaced disadvantaged communities. The latest update on the Bay Area Regional Transportation Plan mirrors the usual plight of public transit: \$200 billion are distributed to highway and rail expansion, while, for example, the Alameda-Contra Costa Transit District's operating budget is experiencing an \$8 million deficit. The highway- and rail-oriented Transportation Plan may also increase greenhouse gas emissions, as the Bay Area is slated to house addition two million people.<sup>16</sup>

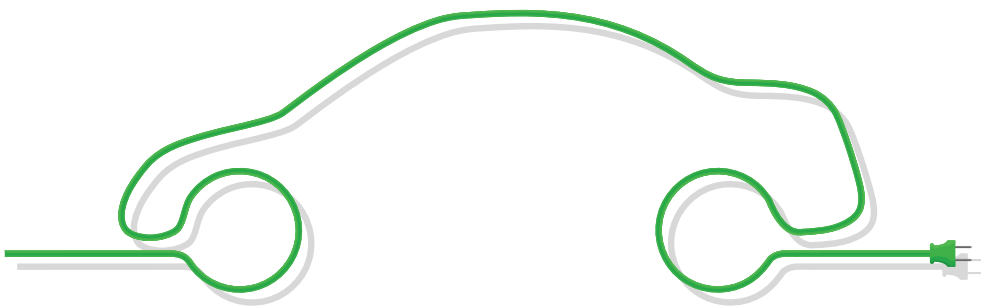


California's Latinos and Asians are more concerned about air pollution. The same poll also finds that while only 27% of whites worry a great deal about global warming, 50% of Latinos and 46% of Asians polled are concerned about global warming. Source: LA Times/University of Southern California poll, 2010.

**Q: Will smart meters and the smart grid help stabilize utility bills and electricity demand during peak hours?**

**A: Smart meters and the smart grid will only help save money and stabilize demand with adequate consumer outreach and effective education that changes consumers' charging habits.** Electric utility companies and entities are able to provide discount rates because smart meters differentiate peak hour and off-peak hour uses, and record electricity consumption by intervals and volumes to help companies determine rates. Consumers can also monitor their utility consumption online, and make smart decisions to do electricity-consuming tasks during off-peak hours.

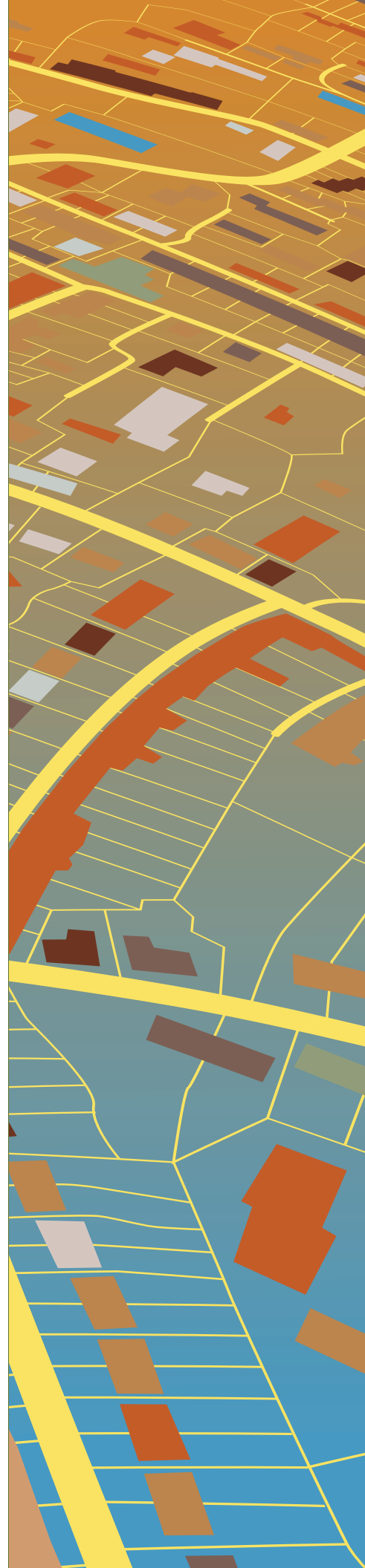
Smart meters and the smart grid have the potential to encourage conservation and reduce greenhouse gas emissions in California. However, inadequate outreach has led to outrage over billing, privacy, and health concerns in some areas, demonstrating the need for community education to be a key component of California's smart growth plan. For electric vehicle owners, smart meters and the smart grid can help save money, but only if they are conscious of their actions and know that their rates will only be cheaper if they begin charging after 7 p.m. Knowledge about energy usage will be crucial in energy conservation and bill management, especially for hard-to-reach communities that are isolated due to linguistic and economic barriers. To reach out to these communities effectively, utilities should partner with community-based organizations that have a track record in community outreach, cultural sensitivity, and language ability. Educational materials and billing should be available in a variety of languages to help non-English speakers learn about dynamic pricing. While electric vehicles won't immediately reach these hard-to-reach consumers, effective education on the smart grid can help reduce overall consumer anxiety.



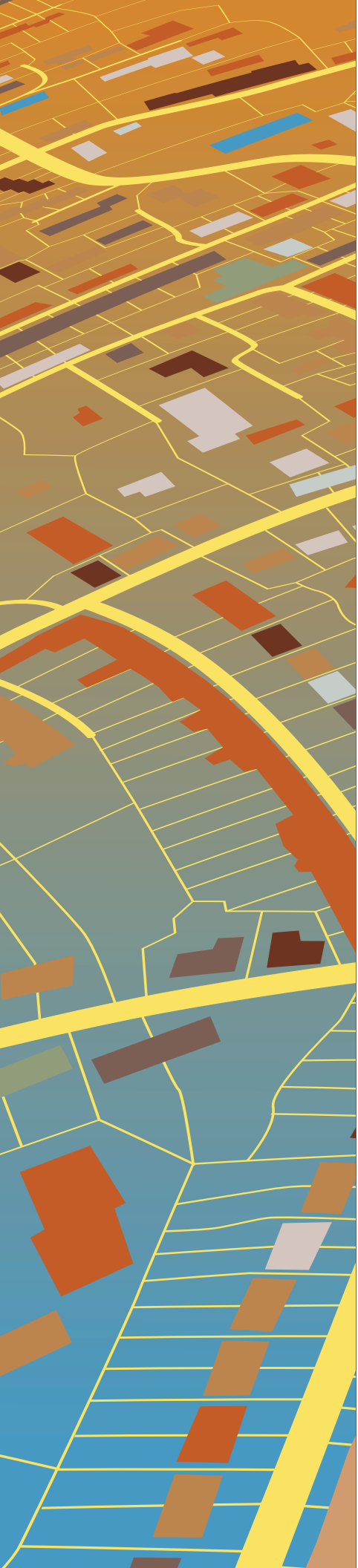
## Green Job Potential in Electric Vehicles

**Q: Will electric vehicle demand create more jobs?**

**A: More jobs will be created to develop charging infrastructure, provide repair and retail services, design clean and fuel efficient engine and car models, and upgrade the electricity grid.** There likely won't be large numbers of jobs in vehicle manufacturing, since California never been a center of car and truck production. Although auto manufacturing jobs may not be created in California on a large scale, a significant number of jobs will be needed to implement various smart, clean energy upgrades to help consumers make conservation decisions that save energy and money, and provide tangible clean air and public health benefits. It is also important to note that most of these jobs cannot be outsourced.







Jobs will be created in several clean energy initiatives that California is pursuing, such as feed-in tariff, energy efficiency, and renewable portfolio standards. A feed-in tariff is the mechanism by which homeowners who are renewable energy generators (e.g. with home solar systems) can sell energy back to the grid for profit. Along with RPS and other energy efficiency upgrades, California's electric grid should become cleaner, while meeting growing electricity demand. To ensure that communities of color and low-income communities benefit from the green economy, advocates need to look at equity opportunities from a systemic angle, not just at electric vehicles or other individual pieces interacting with the grid.

As more consumers adopt electric vehicles, there will be an increasing demand for mechanics trained to handle repair and maintenance. Since California is the hotbed for technological innovations, more software, mechanical, and other engineers will be in demand to create more diverse and efficient vehicles. These jobs should be sustainable, and have the potential to be long-term. To achieve sustainability, academic institutions in California must be able to provide vigorous opportunities that will lead to continuous research and product development and workforce training programs. Partnerships between the clean technology industry and California's racially, economically, and linguistically diverse community colleges are especially crucial in helping students from low-income and racially diverse backgrounds obtain jobs in the growing green economy.

**Q: I heard that building EV charging infrastructure will be highly profitable. Will it also create jobs?**

**A: These jobs will likely be created slowly.** Electric vehicle charging stations will spring up as the demand increases. Since experts are expecting slow market penetration,<sup>17</sup> these charging stations are likely to increase at a slow pace.

As slow as the job growth may be, there is still potential to lower unemployment rates in local communities by investing in worker training and placement programs. In the Bay Area, charging stations will be built in some highly concentrated areas, which can create local target hire opportunities in communities that suffer disproportionately from air pollution and under/unemployment. Of course, this will require collaboration between local academic institutions, private investors and entrepreneurs, community organizations, and regulators.

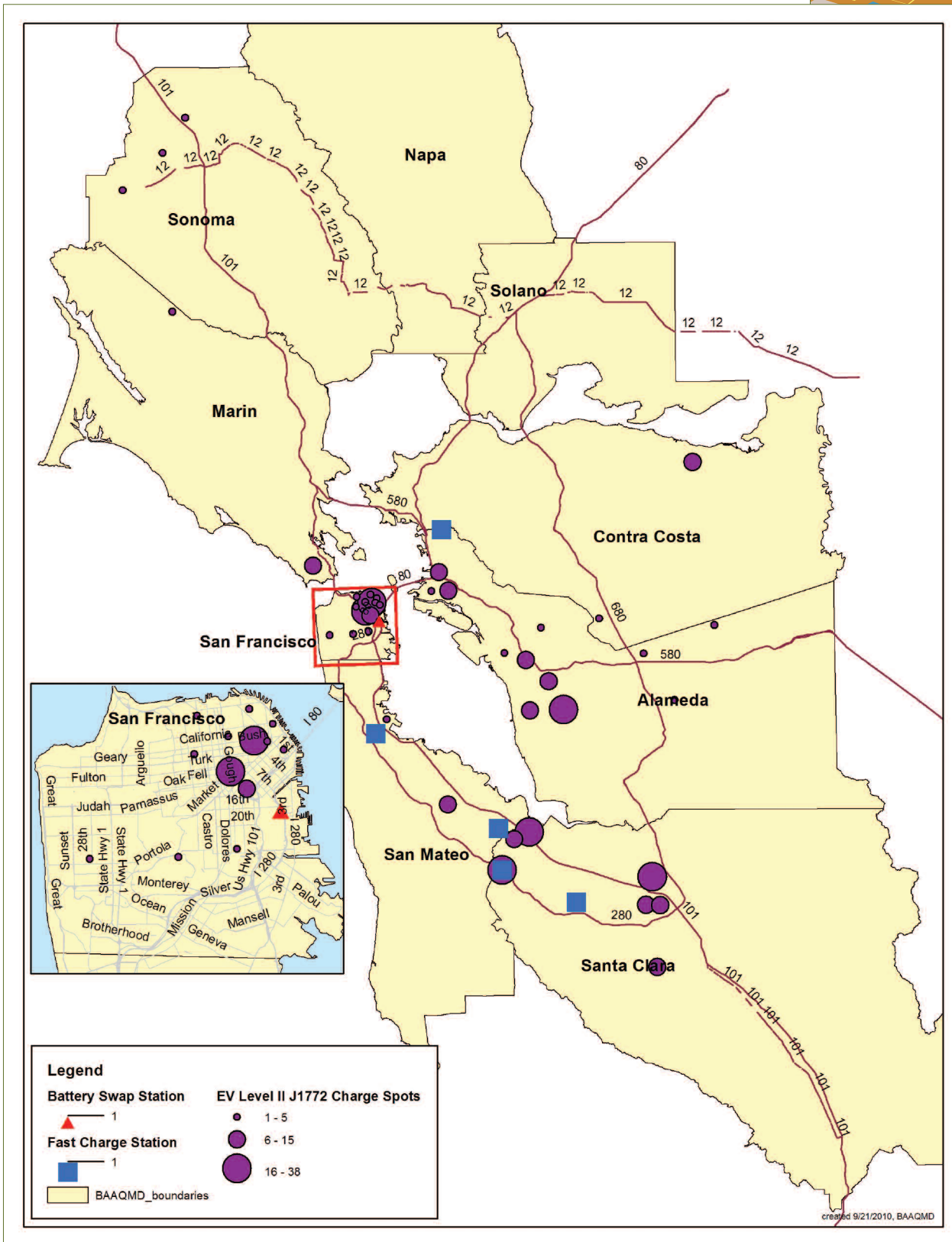
Local target hires will expose local communities to electric vehicles, and help reduce anxiety about finding charging stations, while helping consumers become informed about public charging and home-charging rates, and increasing awareness about costs and savings associated with electric vehicles. The Bay Area Air Quality Management District's proposed electric vehicle supply equipment map shows the potential for job creation in San Francisco, Oakland, and San Jose, all large metropolitan areas with large communities of color.

## Conclusion:

### Will Electric Vehicles Solve Our Transportation Crisis?

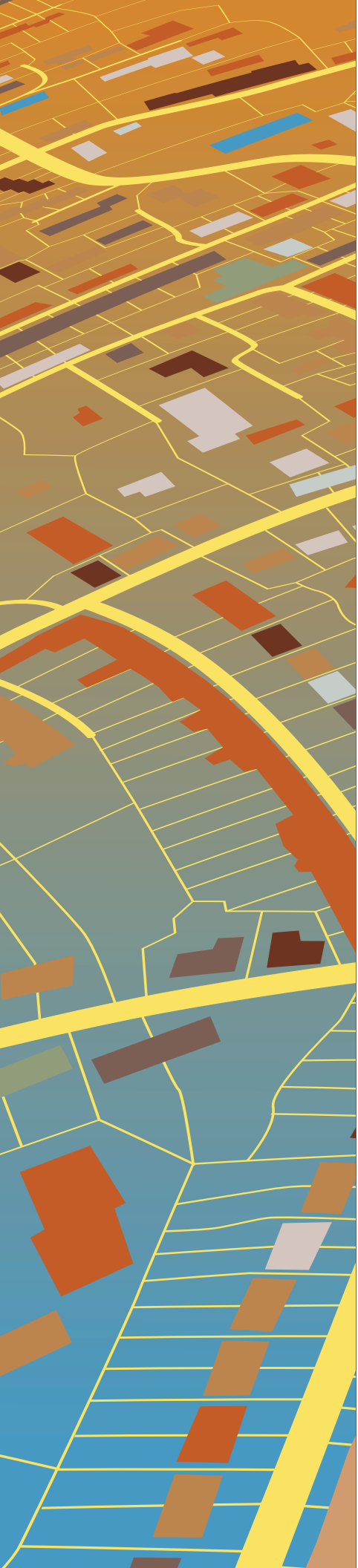
The growing interest in electric vehicles is certainly an encouraging sign. But for electric vehicles to reach the point of mass adoption, we need to research and develop diverse technologies and implement diverse marketing and education strategies. As experts predict, the earliest adopters are likely to be affluent motorists, who are already driving cleaner and more fuel-efficient cars. And for those who can afford electric vehicles but aren't making the purchase, their main concern is the lack of availability of recharging sites. As long as federal, state, and local governments continue to invest in infrastructure, worries about being stranded without a charging station nearby will eventually be debunked.

# Proposed Electric Vehicle Supply Equipment Map: BAAQMD



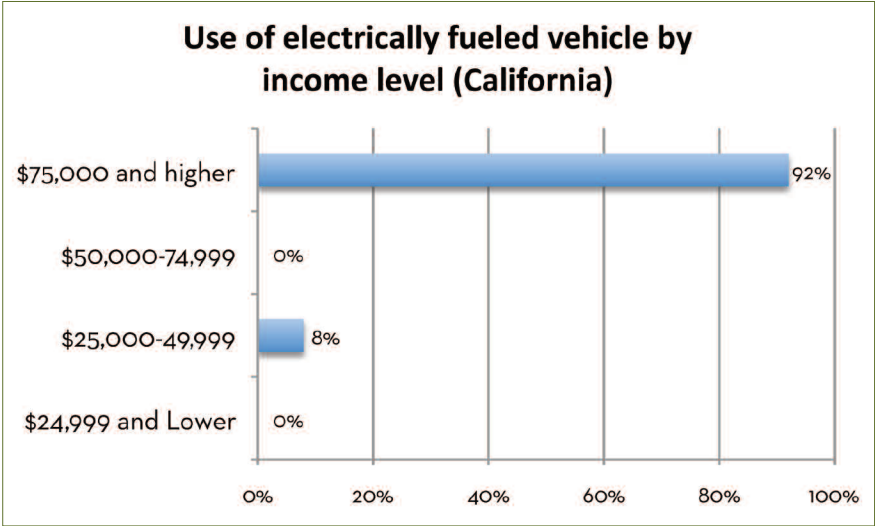
BAAQMD's Proposed EVSE map shows potential in local job creation, community education, and consumer anxiety reduction.



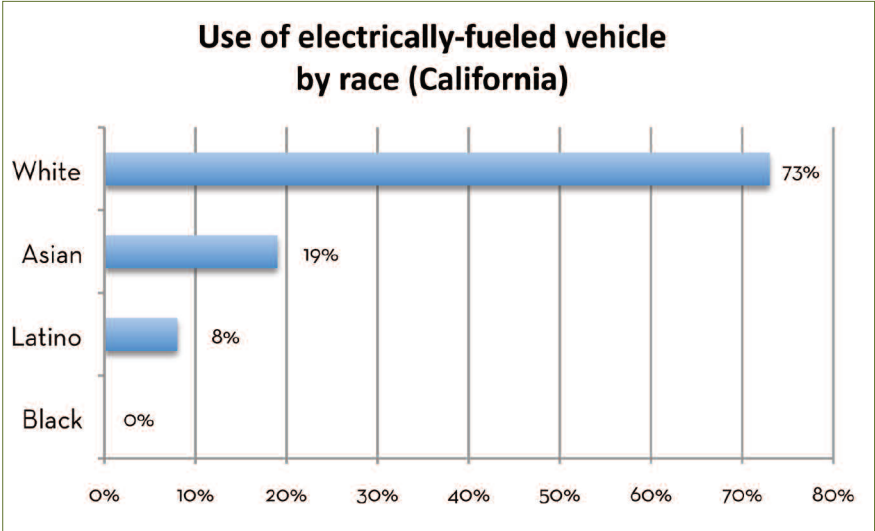


However, not everyone can afford electric vehicles and wean themselves off American society’s collective oil addiction right away. The worst case scenario would be that gas prices remain high, leaving low-income households unable to afford gasoline or purchase alternative fuel vehicles, and having to turn to California’s overburdened and underfunded public transportation system. Lacking a feasible plan to help all Californians end our addiction to oil will greatly lower California’s economic productivity. While many have been cheering soaring gas prices as an opportunity for our society to begin seeking alternative fuel options, for communities of color and low-income communities—the majority of Californians— soaring gas prices only mean tightening their belts and counting pennies to get by.

If this is not addressed, a large number of Californians will lose mobility. Alternative and feasible options need to be made available to those who can’t afford buying electric vehicles, and these options—including better public transit programs or car sharing programs—require more investment and more diverse community outreach.

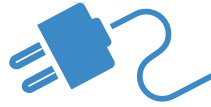


In 2009, the majority of people who used electricity to power their cars were from affluent households. Source: NHTS 2009, Department of Transportation.



Among Californians who are using electricity to fuel their vehicles, the majority were white. Source: NHTS 2009, Department of Transportation.

## Next Steps: Getting Plugged In



An important lesson California learned from Proposition 23—a November 2010 ballot initiative to effectively repeal California’s Global Warming Solutions Act—is that an environmental policy can win over voters if the campaign’s central messages focus on improving public health and boosting economic activity. Not only that, these messages must come from the right messengers—people trusted by California’s diverse communities. Policy conversations around fuel efficiency are no exception to this rule. Not only will framing fuel efficiency around public health and the economy help reach a broader audience, it will also build a broader coalition that can collaborate on diverse strategies to move our state and country away from “drill, baby, drill” slogans.

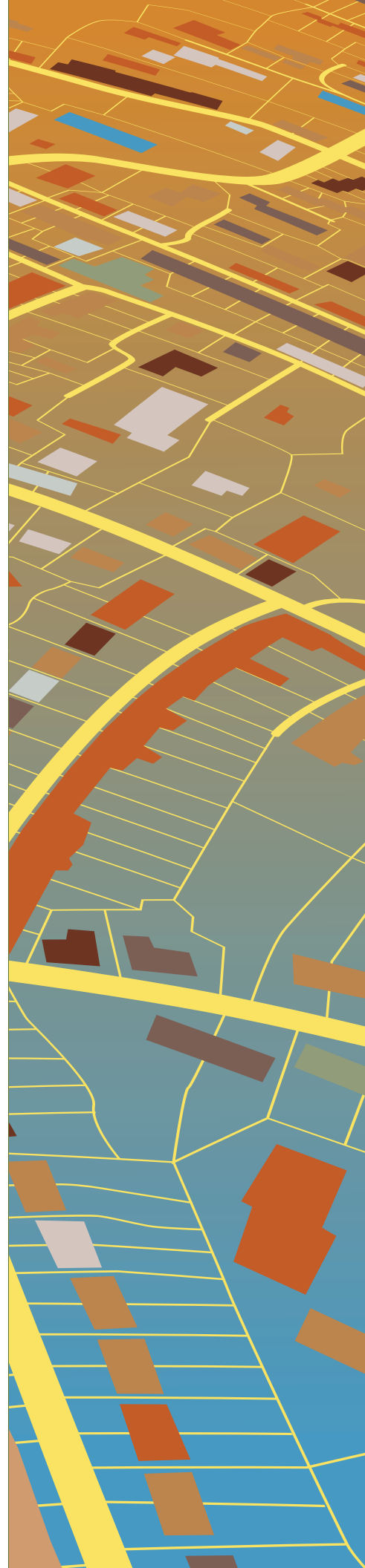
A serious conversation about fuel efficiency and alternative fuels needs to happen between advocates and community leaders to address concerns around transit investment, environment and health benefits, cost and savings, and job creation. Suggestions are made below to provide a basic conversation framework around electric vehicles and other fuel efficiency topics:

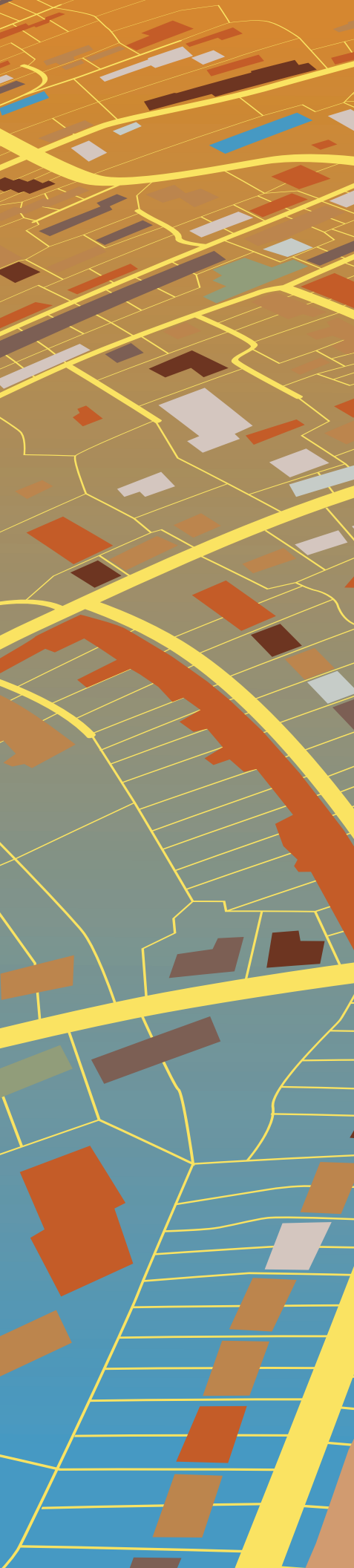
**Environment, environmental justice, and public health.** Advocates and policymakers need research evaluating increased electricity demand’s impact on communities living near power plants in order to understand how different types of fuel production affect local community health. Electric vehicles’ ability to reduce air pollution must also be discussed and evaluated. Since drastic smog reduction will only happen when electric vehicles can penetrate beyond affluent neighborhoods, this conversation should also include creative strategies to help disadvantaged communities gain access to electric vehicles.

**Economic justice and consumer education.** There is still a lot to be explored in market deployment strategies, and secondary market potential analysis for electric and hybrid vehicles. Also, consumers need better access to information about tax incentives, electricity rate discounts, and the smart grid. While comparing savings gained from purchasing an electric vehicle against volatile oil and gas prices may be a good idea, the message that will resonate with the untapped environmental base is how rising gas prices will leave communities stranded and impede economic mobility.

**Sustainable public transit development and other car sharing incentives.** Unless electric cars become affordable for low-income households overnight, serious discussions about making public transit and other car sharing options viable are crucial. In addition, the quality of vehicles used in these programs cannot be overlooked—clean buses and clean cars will provide cleaner air for all. Plans to develop sustainable transit corridors have already been taking place, and investment in clean and accessible public transit must be a central part of these plans.

Americans, and especially Californians, love our cars, but today our health and the health of our economy is deeply intertwined with how we power those cars. To steer away from the old fossil fuel economy, our nation will have to be open-minded about newer and cleaner fuel options, and policy discussions will also need to target untapped markets. Historically, environmental initiatives have paid little attention to communities of color and low-income communities. Solving our oil addiction requires listening to and working with these communities. Otherwise, we risk jeopardizing our necessary transition to renewable and clean fuels.





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