Thanks for checking out our poster! Please reach out to Beth Fitzjarrald with any questions.

Current EV efforts aren't reaching low-income customers

Utility EV programs

Program category	Number of programs
EVSE rebates	171
EV incentive	66
Rate incentives	65
Charging networks	48
Smart charging	6

Source: EV pilots and programs, Steven Day, E Source (2020)

Of the 363 pilots and programs we cataloged, only two provide rebates for used vehicles and only four offer increased incentives for low-income customers.

60%

Of all energy-efficiency, solar, and hybrid vehicle tax credits went to people earning $75,000 or more

Source: Energy Institute at Haas (The Distributional Effects of U.S. Clean Energy Tax Credits)

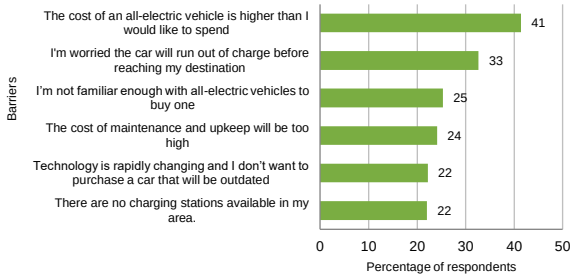
Incentives and benefits from utilities and governments mostly go to higher-income consumers. E Source reviewed over 360 EV-related pilots and programs in 2021 and found that almost half focus on charging equipment (EVSE) rebates. Another 18% of programs give direct incentives for EV purchases. Similarly, a 2016 study from researchers at the University of California, Berkeley, found that taxpayers with annual gross incomes of $75,000 or more received about 60% of all tax-credit dollars aimed at energy efficiency, residential solar, and hybrid vehicles. These higher-income taxpayers received about 90% of all credit dollars aimed at electric cars.

So, while there may be political or other rationales to prefer these utility and tax incentives, they clearly don't result in equitable outcomes on their own.

And likely won't for a while …

Cost is king

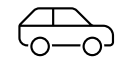
It's the top barrier to purchasing an EV among those who are considering an EV and make less than US$50,000 annually.



Base: US and Canada respondents with an annual household income less than US$50,000 and considering purchasing an EV (n = 1,565). **Question S2_4a:** What are the primary reasons preventing you from buying or leasing an all-electric vehicle? Select all that apply. **Note:** Only the top six answers are shown. © E Source

Source: 2020 Electric Vehicle Residential Customer Survey

Respondents with an annual household income of less than US$50,000 are more likely than higher income respondents to …



Purchase a traditional gas-powered vehicle next

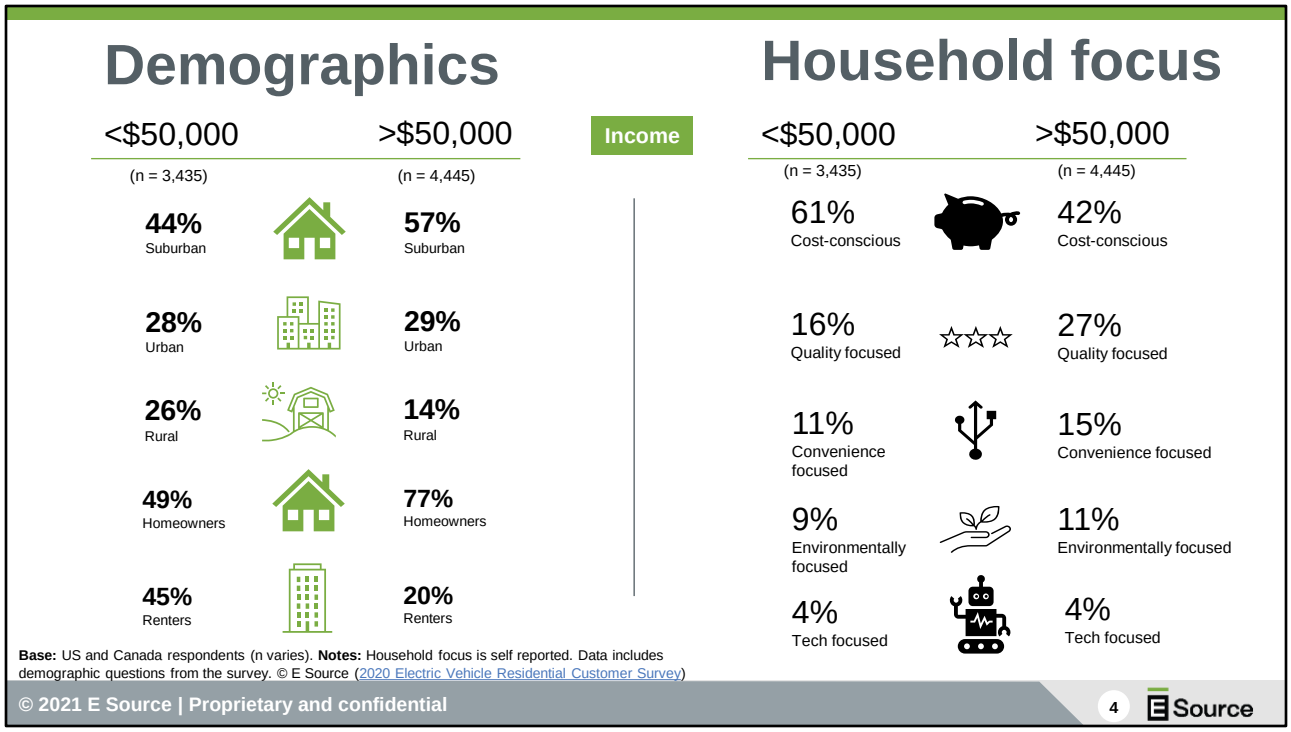
Have no plans to purchase or lease an all-electric vehicle

Base: US and Canada respondents with an annual household income less than US$50,000 and don't own an EV (n = 3,159). **Question S1_16:** Which statement best describes your stage in the purchase process of an all-electric vehicle? **Base:** US and Canada respondents with an annual household income less than US$50,000 (n = 3,435). **S2_1a:** What type of vehicle are you most likely to purchase or lease next? © E Source

E Source market research shows that low-income customers will be hard to reach through traditional EV programs. Cost is a major barrier, and purchasing EVs isn't part of lower-income customers' plans.

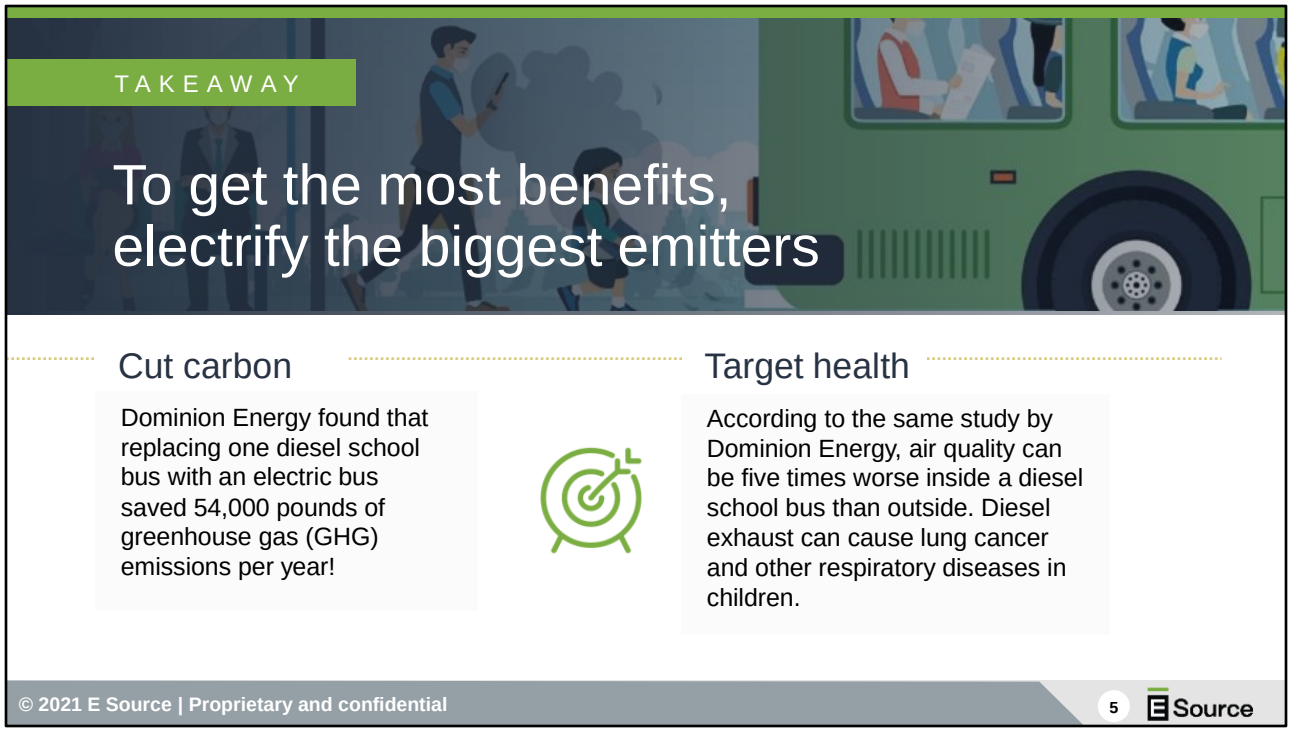
Respondents from the US and Canada with an annual household income of less than $50,000 are a difficult market to increase EV sales. Cost is the leading barrier to purchasing an EV among respondents earning less than US$50,000 and who don't have an EV. Almost half of these respondents in the E Source 2020 Electric Vehicle Residential Customer Survey are renters, and over half don't plan to purchase an EV. Most plan to purchase a traditional gas-powered vehicle instead.

Is there a better way?



Step 1 is to understand who we're talking about. What do we know about our customers?

Most respondents earning less than $50,000 consider themselves cost conscious, followed by focused on quality. So purchase price, cars running out of charge, and the cost of maintenance are the top barriers to purchasing an EV. However, respondents of all income levels find public charging stations, the ability to avoid gas stations, and convenient parking spaces to be reasons to purchase EVs. Utilities should consider how they can implement benefits in low- and moderate-income communities to spur adoption.

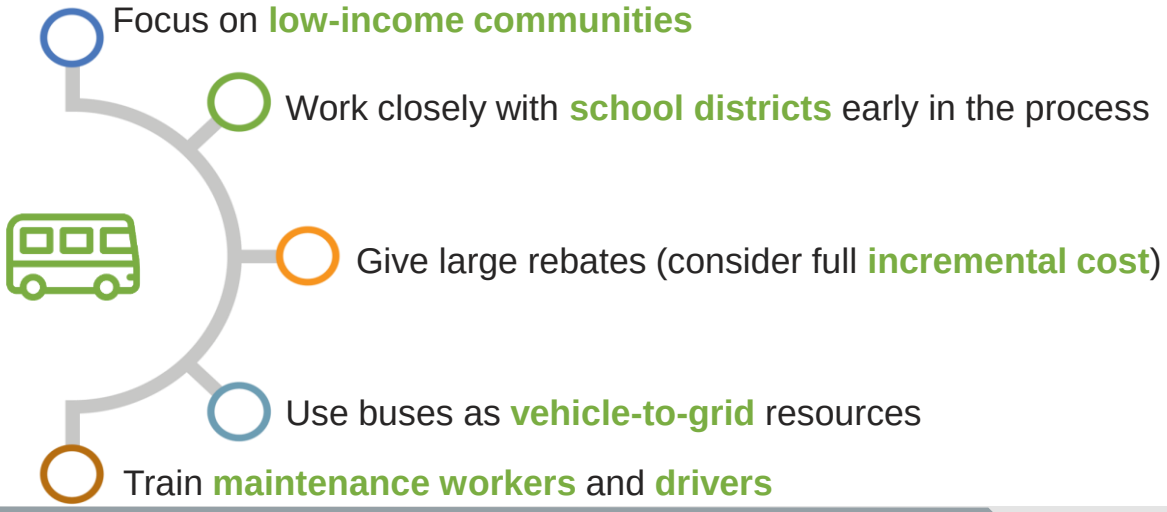


Why are we even pushing for EVs? EVs provide the same benefits no matter who drives them (providing cleaner local air, lower climate impacts, and noise and health benefits). And they don't have any added functional value because they move people to places in the same way internal combustion engine cars do. So utilities can promote the benefits of electric transportation to underserved communities by focusing on electrifying the worst emitters in those areas, which likely include transit and school buses and delivery-vehicle fleets.

We decided to focus on school buses. Electrifying US school buses would cut the transportation sector's GHG emissions by 5.3 million tons, which is the "equivalent to taking about a million cars off the road," according to the US PIRG Education Fund's report Paying for Electric Buses: Financing Tools for Cities and Agencies to Ditch Diesel. And electrifying buses would directly improve local air quality, noise pollution, and, perhaps most importantly for the community, children's health.

The California Air Resources Board's article Overview: Diesel Exhaust & Health notes that diesel exhaust can cause lung cancer and other health issues such as "asthma, increased respiratory symptoms, and decreased lung function in children."

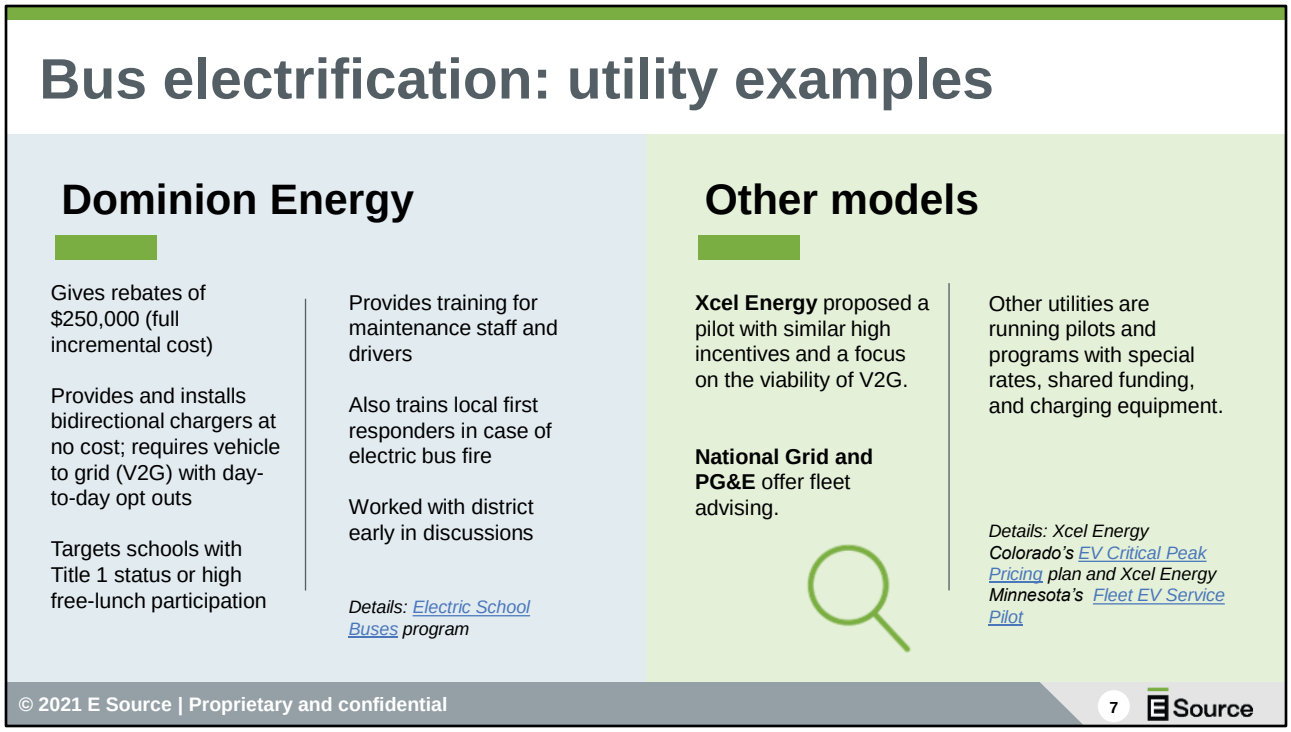
What do successful equity-focused bus electrification programs do?



We interviewed three program managers for school bus electrification programs. They agreed on these five themes as key to making a successful program for equity outcomes.

To identify which communities to target, we suggest looking at federal school-assistance programs or designations, such as Title 1 or free or reduced lunch programs. You can also focus on Environmental Justice Communities or areas you've targeted for other low-income assistance.

When referring to training maintenance workers and drivers, the program managers noted that electric-bus maintenance will be different than that for diesel buses: there are lots they don't need to do anymore and a couple new things. It's important to have these folks on board, advocating with you.



Dominion Energy's Electric School Buses program is the largest utility-led school electrification program in the US. The program helps 15 Virginia school districts transition from diesel to electric buses. The program currently supports more than 50 electric buses. The school districts and Dominion Energy share the up-front costs of the electric buses—Dominion Energy covers the incremental cost for an electric bus compared to diesel and provides all the charging infrastructure. Dominion Energy installs 60-kilowatt bidirectional chargers at no cost, and it requires buses to participate in V2G operations, though they can opt out day-by-day for events like field trips. Dominion Energy also pays a local bus dealer to train bus drivers and mechanics because, as a contact at the utility told us, "there's a lot of things they don't have to do [anymore] and there's a couple of small [new] things they do have to do." Dominion Energy talked with the school districts early on to be sure the program would provide the benefits the districts needed most. They also used that time to explain environmental, health, and financial benefits to the schools and provided bus demonstrations.

While the current funding for the program comes from base rates, Dominion Energy is trying to get legislation passed that would expand the program to an additional 1,000 buses. If the Virginia legislature expands the program, the utility will need to consider alternative funding mechanisms, such as increasing customer rates or using governmental grants, to support both the bus rebates and the infrastructure and charger installation.

Xcel Energy has a variety of fleet programs that can support school bus electrification. Some include Xcel Energy Colorado's EV Critical Peak Pricing plan, which is a special rate program for fleet EVs, and Xcel Energy Minnesota's Fleet EV Service Pilot, which supports make-ready

charging infrastructure and low charging rates. Most relevant for this conversation is Xcel Energy Minnesota's proposal before the Minnesota Public Utilities Commission to provide rebates that decrease over time for transit buses and school buses. Our contact told us that Xcel Energy hopes these rebates "cover most of the costs of the bus and potentially some infrastructure." The utility is already working closely with school districts and will allow for options with or without V2G, but it would like to use the program as a V2G test bed.

These programs have large rebates, but the school bus fleet manager at National Grid encouraged us to "think about the up-front cost from the perspective of a school board member who comes in once a quarter to approve a budget that's been the same for 20 years, and then all of a sudden the cost of a bus triples." This inevitably leads to long processes of follow-up. Incentivizing the whole incremental cost removes that timeliness barrier.

Getting regulatory approval

New equity-focused metrics and incorporating NEBs into cost-effectiveness testing can help

Questions that can help you find the right metrics

- How many households do we serve that qualify as energy burdened?
- How does program participation vary across our service territory?
- Do customers know about our DSM programs?

Hawaii Energy's equity evaluation metrics

- Kilowatt-hour savings and number of customers served in an economically disadvantaged direct-install program
- Spending equity across key islands, cities, and counties
- Number of workshops on energy literacy offered to hard-to-reach communities, and attendance statistics

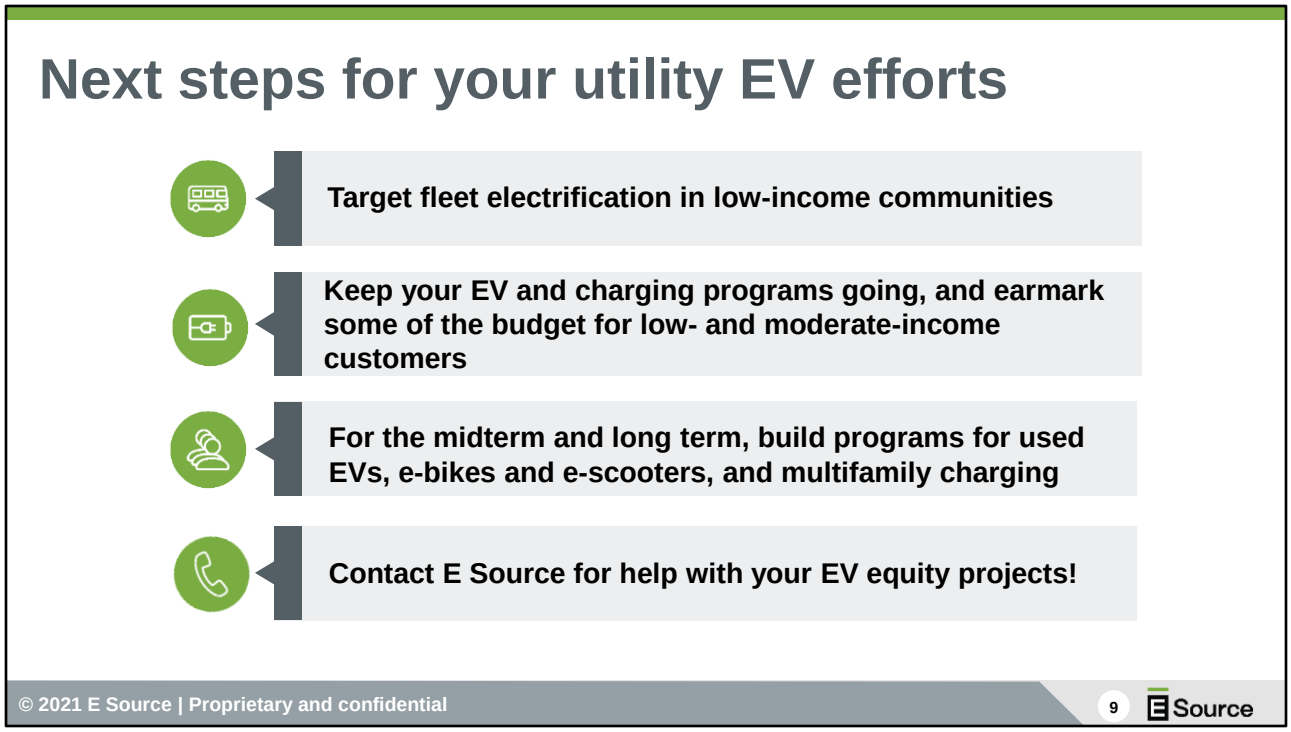
Source: Program Year 2018 Annual Report (PDF)

When you want to get moving on fleet electrification or other equity-focused programs, you'll need to work with your regulatory agency to come up with appropriate equity metrics. Some questions that can help you identify the right metrics include:

- *How many households do we serve qualify as energy burdened?* ACEEE's 2020 report "How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S." defines energy-burdened households as those spending 6% or more of their income on energy bills. Knowing how many customers are likely energy burdened can help you track whether your current residential services are producing equitable results.
- *How does program participation vary across our service territory?* Create an evaluation metric that determines whether program participation is distributed in limited areas or across different communities and areas.
- *Do customers know about our DSM programs?* Outreach establishes trust with communities and ensures more customers know about relevant utility programs. Create metrics around customer knowledge of DSM to be sure you're communicating effectively.

Hawaii Energy is a great example of a utility that has incorporated equity evaluation metrics; they're listed in its Program Year 2018 Annual Report (PDF)

Another example is Energy Trust of Oregon, which works with regulators on how to build in non-energy benefits (NEBs) to better capture equity-focused programs. Either capture measurable NEBs or have an exception framework for hard-to-quantify NEBs.



Electrifying school buses and other fleets (targeting low-income communities specifically) is a great way to jump-start equitable outcomes in your electrification programs.

We also recommend keeping EV and charger programs going to continue getting more EVs on the road to benefit everyone with air and climate benefits. Reserve a percentage of the budget for used vehicles or low-income consumers. Consumers with a household income of less than $50,000 are almost twice as likely as higher income earners to report that the next car they buy will be used: Almost 2 in 5 lower-income respondents stated so, compared to 1 in 5 higher-income respondents (Base: US and Canada respondents that plan to purchase a vehicle and make less than US$50,000 [n = 3,255] and those that make $50,000 or more (n = 4,361). Question S2_1b: Do you think the next vehicle you'll purchase or lease will be new or used?)

Looking further ahead, as you build new electric-mobility programs, consider other ways to meet low-income customer needs such as e-bikes and scooters, EV car-sharing programs, and programs to incentivize multifamily charging equipment.

Finally, we at E Source are happy to help with your EV equity projects through our research and consulting services!

Contact us!

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