

Plug-In Electric Vehicles for Low- and Moderate-Income Communities in the New York North Country: State of the Practice

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Plug-in Electric Vehicles for Low- and Moderate Income Communities in the New York North Country: State of the Practice

Final Report

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Abstract

Plug-In Electric Vehicles (PEVs) have seen strong initial adoption since becoming commercially available but are still low relative to overall registered vehicles. To help the PEV market become truly viable, the economics and impacts of PEV charging infrastructure must also improve – especially for people who are less able to afford the higher-upfront costs of buying a PEV. This paper examines current PEV policies in New York State and their effectiveness for people who have Low-to-Moderate Incomes (LMI). Finally, this paper provides recommendations as to how State policies could better serve LMI populations, with a focus on people living in the North Country of New York State.

Keywords

Plug-In Electric Vehicle (PEV), Charging, Low-to-Moderate Income (LMI), Incentives, Charging Station, Workplace, Residential, Finance

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Acronyms and Abbreviations

BEV	Battery electric vehicle
DCFC	Direct current fast charger
kW	kilowatts of power
kWh	kilowatt hours of energy
LMI	Low and moderate income, typically referring to households
MW	megawatts
NYS	New York State
NYSERDA	New York State Energy Research and Development Authority
PEV	Plug-in electric vehicle, including both battery electric and plug-in hybrids
PHEV	Plug-in hybrid electric vehicle
W	watts

Executive Summary

New York and other states have long supported energy efficiency and public assistance programs to improve comfort and safety for low- and moderate-income (LMI) households while reducing energy cost burdens for those who can least afford the expense. Approximately half of New York State households are classified as LMI, but few programs exist to support them with cleaner, lower cost, plug-in electric vehicle (PEV) transportation options.

This research paper reviews current State energy and climate change policies in the context of LMI PEV markets, with a particular focus on the North Country region of the State. The North Country covers a predominantly rural seven-county region in far northern NYS with one of the lowest levels of PEV ownership. The report includes detailed assessments of the following:

- Current PEV market conditions in New York State and North Country communities.
- PEV charging infrastructure needs and development activities.
- Potential economic benefits of PEVs for LMI households.
- Reviews of policies supporting LMI PEV market development in other states.
- Opportunities to advance PEV adoption in the NY North Country.

There are many strategies detailed in the following sections that would help spur higher adoption of PEVs in the North Country, most notably supporting LMI PEV purchasers with incentives that reduce up-front purchase costs of used PEVs (something NYS does not currently offer) and working with community partners already supporting LMI communities with financial assistance and independent living programs.

It is also important to recognize the PEV market may require additional time to develop before some North Country consumers will be ready to make the switch due to limited availability of used PEVs, few affordable models with all-wheel drive, PEV incentive structures that are not well designed for LMI PEV purchasers (particularly the federal PEV tax credit), current charging infrastructure limitations, and limited awareness of the benefits of PEV ownership.

Fortunately, research indicates many of these barriers can be addressed as the PEV market continues to develop. LMI PEV market transformation may take many years to achieve, but State leadership and investment will help shorten this timeframe and help reduce the transportation burden for households struggling with high cost, unreliable transportation options.

1 Project Overview

Plug-in electric vehicles (PEVs) offer many benefits to New Yorkers, including lower fuel and repair costs, significant reductions in toxic tailpipe and climate emissions, increased reliability, and much more efficient operation than gasoline powered vehicles. In the long term PEVs can also put downward pressure on electric rates when they are charged in off-peak times through smarter use of existing electric grid infrastructure.

As of March 2022, almost 54,000 New Yorkers have made the switch to a PEV, but many communities continue to face significant barriers to ownership, such as limited awareness and understanding of the technology, higher purchase prices for new PEVs, low availability of used EVs, limited charging infrastructure, decreased EV range in winter conditions and other factors. Data indicates the North Country region has lower adoption rates than other parts of the State, due in large part to these issues.

Three nonprofit organizations, Adirondack North Country Association (ANCA), Vermont Energy Investment Corporation (VEIC) and National Association of State Energy Officials (NASEO), have partnered to advance the PEV market in underserved communities in the North Country through stakeholder engagement and pilot demonstrations. This project has funding support from the New York State Energy Research and Development Authority (NYSERDA) and is engaging with key stakeholders to explore potential policies and programs to advance PEV adoption in low- and moderate-income households. This will inform the development of a pilot program to address barriers and support PEV adoption in underserved communities in the North Country. Our project includes the following activities:

1. **Identification of Underserved PEV Markets** through demographic and geographic analysis of PEV adoption.
2. **Stakeholder engagement** from a variety of community perspectives on PEV issues, including low income, community development, and environmental advocates; clean fuels experts; electric utilities; property owners; state government; and multifamily housing owners and property managers.
3. **Developing Policy Recommendations** for advancing PEVs in underserved communities, with a focus on bringing the benefits of EVs to low- to moderate-income households.
4. **Implementing Local Pilots** offering incentives, charging infrastructure, and/or financing programs to encourage PEV adoption and charging infrastructure development in low-income communities.

This research report summarizes findings from tasks 1 to 3 and provides a foundation for pilot program implementation in the next phase of work.

1.1 Transportation Electrification

The 2019 New York State Climate Leadership and Community Protection Act (CLCPA) requires greenhouse gas emission reductions of 100 percent over 1990 levels from all anthropogenic sources by the year 2050. The 2021 greenhouse gas inventory for New York State shows that transportation emissions currently comprise 20 percent of gross total emissions,¹ and while statewide emissions are lower today than in 1990, transportation emissions have risen 10 percent in the last 30 years. To meet the ambitious goals of the CLCPA, the State must reduce greenhouse gas (GHG) emissions in the transportation sector, and electrification will be the primary mechanism for achieving these reductions.

In recognition of the importance of transportation electrification, New York State has several goals and policies in place to support the adoption of PEVs. In 2021, Governor Hochul signed legislation (A.4302/S.2758) setting the goal that 100 percent of all light-duty vehicle sales be PEVs by 2035. This legislation builds on foundational policies the State adopted to advance light-duty PEVs, including California's Zero Emission Vehicle (ZEV) regulation and the ZEV Memorandum of Understanding (MOU) in which it agreed with seven other states to deploy 3.3 million PEVs by 2025. The NYS Department of Environmental Conservation estimates that as of October 2021, the ZEV regulation has helped deploy over 84,000 PEVs in the State.²

In 2015, the State Energy Plan initiated ChargeNY, which aims to deploy charging stations with strategies and programs to lower installation costs, engage the private market, expand access in major travel corridors, establish consistent building codes and standards, and integrate PEVs in the State fleet.³ ChargeNY further codified the goals of the ZEV MOU by establishing a statewide goal of deploying 850,000 zero emission vehicles by 2025.⁴ ChargeNY also set a goal of installing 10,000 EV charging stations by the end of 2021.

New York State has taken a similar approach in advancing electric medium- and heavy-duty (MHD) vehicles, which includes the three-quarter and one-ton truck found in some households. Assembly Bill 4302/S.2758 signed in 2021 set the goal of 100 percent medium- and heavy-duty (MHD) vehicle sales by 2045. In 2020, NYS signed on to an MOU with 14 states and Washington D.C. that sets the goal for 100 percent of all new MHD vehicle sales to be ZEV by 2050 with an interim target of 30 percent MHD ZEV sales by 2030. At the end of 2021, the State also adopted California's Advanced Clean Trucks rule,⁵ which requires MHD manufacturers to ramp up ZEV sales from 2024–2035.⁶

In addition to these policies, New York State is a member of the Transportation and Climate Initiative (TCI), a group of 14 Northeast and Mid-Atlantic jurisdictions that seeks to improve transportation while reducing greenhouse gas emissions. In 2020, TCI members, Massachusetts, Rhode Island, and Washington D.C. signed an MOU to implement the Transportation and Climate Initiative Program (TCI-P) to reduce GHG emissions from on-road motor vehicles and increase transportation investments.⁷ While the State did not sign the MOU to implement the program, it signed a statement agreeing to help develop the program.⁸ In December 2021 the governors of Massachusetts, Connecticut, and Rhode Island withdrew their support for the TCI market pricing program.⁹ States interested in advancing the equitable transportation cap and investing in programs continue to discuss additional options to advance programs in support of clean transportation investments in the future.

1.2 New York State Plug-In Electric Vehicle Programs

In support of the policies described above, NYSERDA offers many programs designed to advance PEVs and charging infrastructure in New York State. For vehicle purchases, NYSERDA offers the Drive Clean rebate, which is a point-of-sale incentive up to \$2,000 for new PEV purchases and leases.¹⁰ For PEV owners, there are also several on-road incentives available. The NYS Thruway Authority offers a 10 percent discount on tolls to vehicles achieving greater than 45 miles per gallon through its Green Pass Discount Plan.¹¹ Similarly, the New York Port Authority offers a toll discount during off-peak periods to PEVs.¹² PEVs are also able to participate in the Clean Pass program, which allows vehicles to drive in the high-occupancy vehicle (HOV) lanes on the Long Island Expressway, regardless of vehicle occupancy.¹³

Electric distribution utilities in the State also offer a range of programs to support PEV charging, including lower overnight rates for plugging in at home, incentives for public DC fast charger installations, and incentives for PEV owners to install smart chargers.¹⁴ Previously, NYSERDA's Charge Ready NY program included rebates of \$4,000 per charging port for Level 2 charging stations at public, workplace, and multi-unit dwelling parking lots, but the program has exhausted available funding.¹⁵

1.3 Project Focus

The focus of this project is low- and moderate- income (LMI) households in the North Country regional economic development council (REDC) region of New York State that are not well served by non-Single Occupant Vehicle (SOV) options. As shown in Figure 1 below, the North Country REDC covers seven counties, including Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, and St. Lawrence. These areas are highly dependent on personal vehicle travel due to limited public transportation services and more limited opportunities for walking and bicycling due to the rural character of these communities.

Figure 1. Northern New York State Regional Economic Development Council Regions with North Country Counties



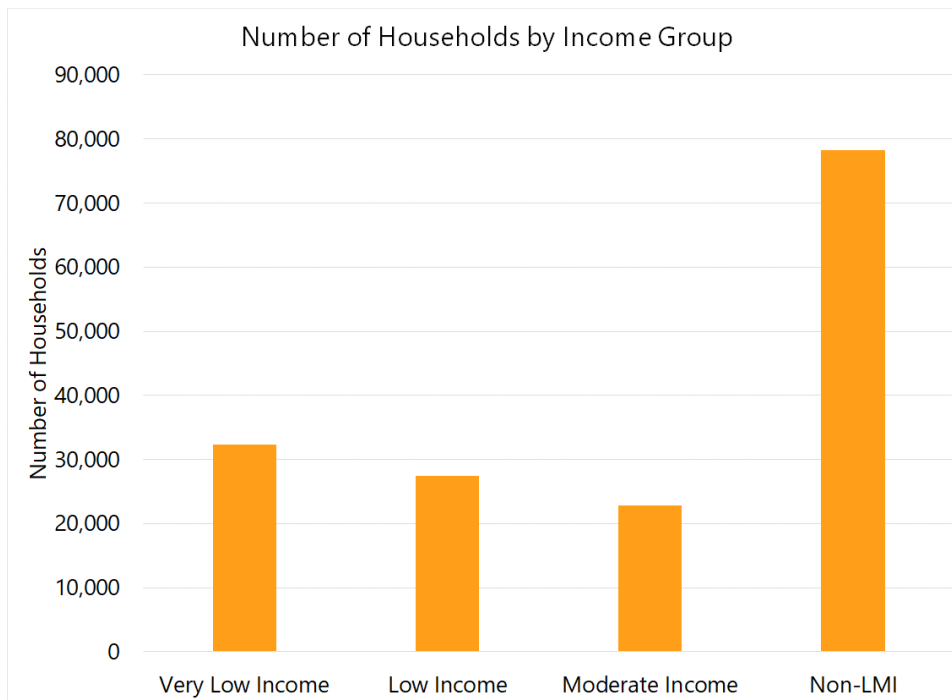
Table 1 below contains the three categories comprising NYSERDA’s defined LMI income classes along with approximate annual income bounds for each class derived from U.S. Department of Health and Human Services (HHS) statistics for federal fiscal year 2020.¹⁶

Table 1. NYSERDA Low- to Moderate-Income Classes

LMI Class	2020 Annual Income Upper Bound (4-person NY Household)	Description
Very Low Income	\$34,500	Household income at or below 130% of the HHS Poverty Guideline.
Low Income	\$57,600	Household income greater than 130% of the HHS Poverty Guideline but at or below 60% of the State Median Income.
Moderate Income	\$76,800	Household income greater than 60% of the State Median Income and at or below 80% of the State Median Income or Area Median Income.

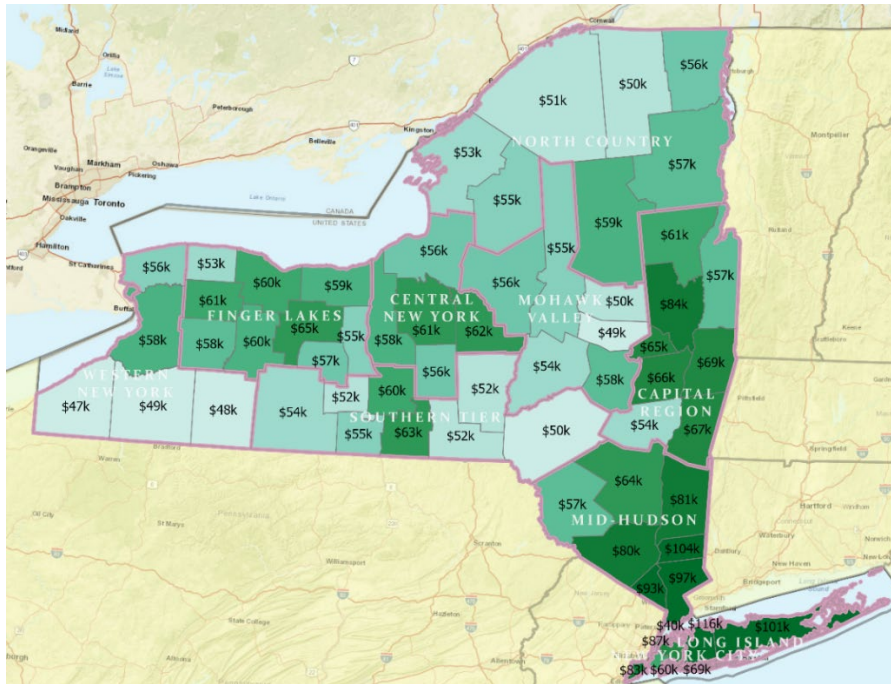
A NYSERDA-developed population analysis tool provided additional details on North Country-specific statistics based on 2013–2015 data when 51 percent of North Country households were considered LMI: 20 percent were considered very low income, 17 percent low income, and 14 percent moderate income. The total number of households in each income category are shown in Figure 2.¹⁷

Figure 2. Number of North Country Households by Income Group



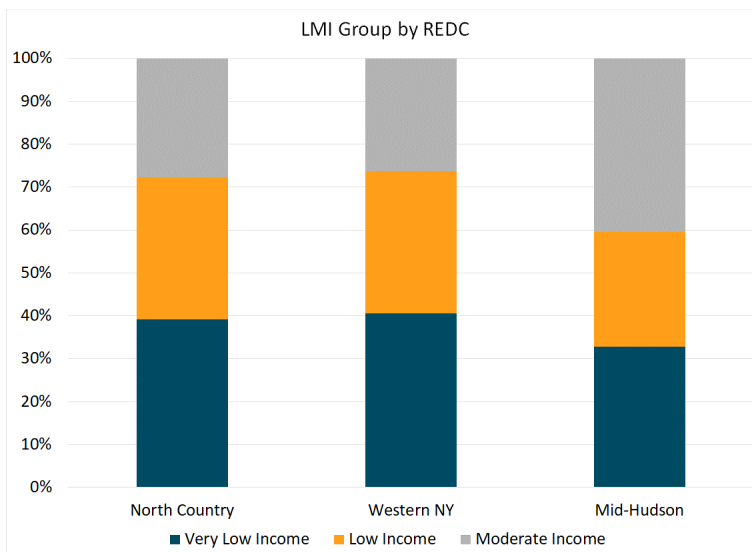
One way to compare the relative poverty or wealth between regions is to consider their area median income (AMI). Figure 3 below contains a map of AMI for all New York State counties based on 2019 U.S. Census data, with the lowest AMI counties in lighter shades of green.¹⁸ The map shows several of the lowest AMI counties in the State are concentrated in the North Country.

Figure 3. New York State County Median Household Income



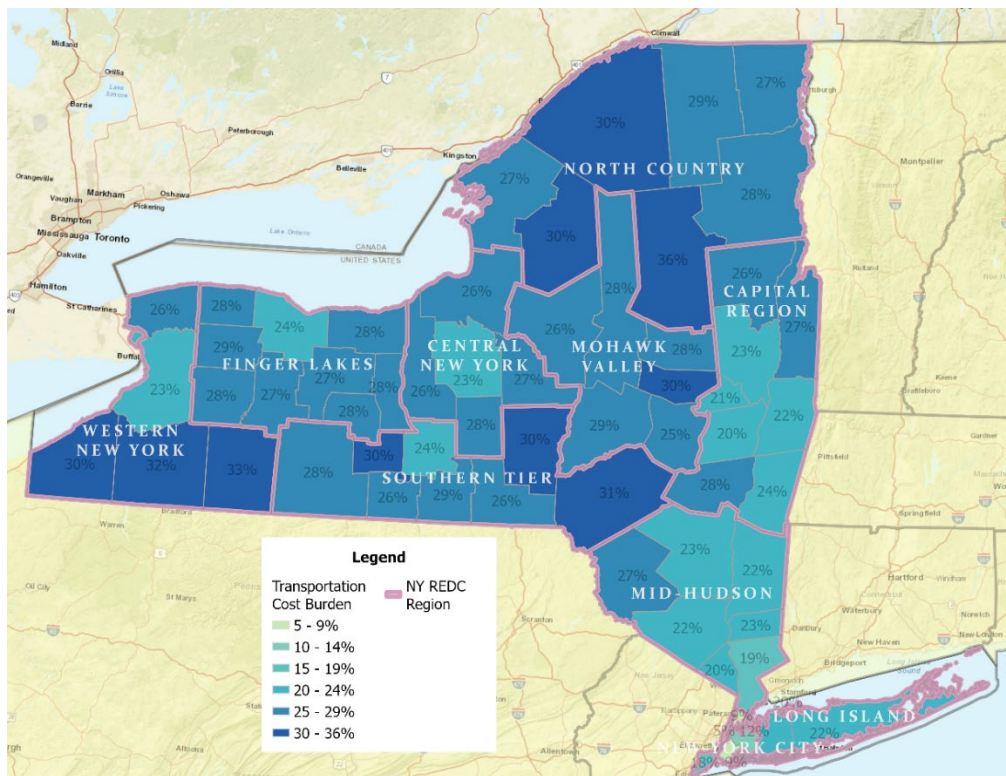
The distribution of households in the LMI categories in the North Country counties is similar compared to the Western New York REDC, where the counties have a similar range of AMI. Compared to the Mid-Hudson REDC, there is a much greater percentage of very low- and low-income households and fewer moderate-income households in the North Country. This data is shown in Figure 4.¹⁹

Figure 4. Low- to Moderate-Income Group Shares in Sample New York State Regional Economic Development Council Analysis



Transportation affordability is often looked at through the lens of cost burden, or the percentage of median income a household is estimated to spend on transportation needs. The Center for Neighborhood Technology (CNT) developed the Housing and Transportation (H+T) Affordability Index which reports county-level estimates of transportation cost burden as shown in Figure 5 below²⁰. North Country counties all had transportation cost burdens over 25 percent of median household income and three counties exceeded 30 percent, the only REDC region in NYS with this level of transportation burden. This is contrasted by downstate counties in the New York City, Long Island, and Mid-Hudson REDCs, which rarely exceeded transportation cost burdens of 25 percent.

Figure 5. Center for Neighborhood Technology Transportation Cost Burden by County (2017)



2 Low- and Moderate-Income Programs and State Policies

2.1 New York State Energy Legislation and State Energy Plan

New York State set an ambitious climate goal in the 2019 New York State CLCPA: to reduce greenhouse gas emissions from all anthropogenic sources 100 percent over 1990 levels by the year 2050. The target reflects the action needed to limit global warming to no more than 2 degrees Celsius and ideally 1.5 degrees Celsius determined by U.S. Global Change Research Program and the Intergovernmental Panel on Climate Change.²¹

CLCPA instructs State agencies to create additional programs to assist in the meeting of New York State’s ambitious goal. The bill assigns responsibility to jurisdictions to implement programs and policies that will reduce emissions and combat the effects of climate change: “The severity of current climate change and the threat of additional and more severe change will be affected by the actions undertaken by New York and other jurisdictions to reduce greenhouse gas emissions.”²²

Programs will need to be tailored to support and encourage participation from all communities. In the case of communities of people with low and moderate incomes, this would include addressing the financial burden that traditionally prevents participation. A disadvantaged community’s need is compounded by a greater climate change-related risk:

Climate change especially heightens the vulnerability of disadvantaged communities, which bear environmental and socioeconomic burdens as well as legacies of racial and ethnic discrimination. Actions undertaken by New York State to mitigate greenhouse gas emissions should prioritize the safety and health of disadvantaged communities, control potential regressive impacts of future climate change mitigation and adaptation policies on these communities and prioritize the allocation of public investments in these areas.²³

In order to create programs that meet the needs of these communities, CLCPA language goes on to describe that equity will be a priority of future programs implemented under CLCPA:

State agencies, authorities, and entities, in consultation with the environmental justice working group and the climate action council, shall, to the extent practicable, invest or direct available and relevant programmatic resources in a manner designed to achieve a goal for disadvantaged communities to receive forty percent of overall benefits of spending on clean energy and energy efficiency programs, projects or investments in the areas of housing,

workforce development, pollution reduction, low income energy assistance, energy, transportation and economic development, provided however, that disadvantaged communities shall receive no less than thirty-five percent of the overall benefits of spending on clean energy and energy efficiency programs, projects or investments and provided further that this section shall not alter funds already contracted or committed as of the effective date of this section.²⁴

The 2015 New York State Energy Plan expresses the importance of engaging with local communities directly to understand their priorities and needs. Initiatives identified in New York's State Energy Plan, are to be informed by the "Guiding Principles" outlined in the State Energy Plan. One such principle is community engagement. The State Energy Plan considers stakeholder engagement fundamental and says New York state will conduct engagement with local towns, villages, and cities; people with low and moderate incomes, Environmental Justice communities²⁵; academics, business, and industry to "enable them to develop and implement clean energy solutions that deliver the electricity, heating, water, communications, land-use, and transportation systems that each community values." The State Energy Plan also defines what meaningful engagement of environmental justice communities looks like: "people have the opportunity to participate in decisions about activities that may affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; their concerns will be considered in the decision-making process; and the decision makers seek out and facilitate the involvement of those potentially affected."

One of the initiatives in the State Energy Plan transportation section is specific to electric vehicles - ChargeNY. This work aims to deploy charging stations with strategies and programs to lower installation costs, engage the private market, expand access in major travel corridors, establish consistent building codes and standards, and integrate PEVs in the state fleet²⁶. Governor Cuomo's ChargeNY goals include installing 10,000 electric vehicle (EV) charging stations by the end of 2021 and deploying 850,000 zero emission vehicles by 2025.²⁷ The program includes rebates of \$4,000 per charging port for Level 2 charging stations at public, workplace, and multi-unit dwelling parking lots.²⁸

With such aggressive goals, every market segment target needs to be addressed and targeted for electric vehicle adoption.

2.2 Context for Low- and Moderate-Income Energy Issues

Americans spend 13 percent of household expenditures on transportation, but the portion spent on transportation changes with income, according to 2016 data. The lowest earning fifth of the U.S. population spent 29 percent of their income in 2016 on transportation; the next quintile spent 22 percent and the middle quintile spent 17 percent, while the highest earning quintile spent less than 10 percent on transportation.²⁹ Electric vehicles present an opportunity to relieve some energy burden as they cost 50 to 70 percent less to operate per mile.³⁰

Additionally, communities with higher shares of LMI households, including minorities, are often disproportionately affected by greenhouse gas emissions. They have higher rates of asthma, cancer, healthcare costs, and missed school and workdays compared to people with higher incomes as a result of exposure to emissions. For example, people with low incomes disproportionately live near busy roads that expose them to vehicle emissions.³¹ According to one study, “On average, communities of color in the Northeast and Mid-Atlantic breathe 66 percent more air pollution from vehicles than white residents.”³²

The cost savings and emissions reductions available from electric vehicles provide compelling evidence to create a program to increase the number of electric vehicles used by drivers in LMI households. Energy efficiency and renewable energy in LMI communities provide insights on best practices. The Solar for All and residential energy efficiency programs summarized below are examples of these types of programs.

New York State’s Solar for All program provides utility bill assistance and an opportunity for New Yorkers with low incomes to participate in community solar project benefits. The State invested in community solar projects and is providing a utility bill credit of \$5–\$15 per month to participants. As of September 2020, the income requirement is 60 percent of the State median income by household size. There are no other requirements or fees to participate.³³ The Inclusive Shared Solar Initiative at NASEO is an effort to deploy community solar throughout the country using resources and lessons learned from New York State. Despite the no-cost accessibility, program administrators have found that a simpler sign-up process would be useful. Some of the time and effort spent on marketing the program could be avoided if Solar for All were tied more closely to other income-eligible or energy programs that would allow an automated sign-up system for Solar for All.³⁴

New York State offers two residential energy efficiency improvement programs for people with low- and moderate-income levels. Assisted Home Performance with ENERGY STAR® provides a 50 percent discount on energy efficiency projects for a total up to \$4,000 for households with an income less than 80 percent of county median income. Approximately 3,000 households are served annually.³⁵ EmPower New York provides free weatherization services to households with an income below 60 percent of State median income to both renters and homeowners. As of May 2020, 165,000 households participated in the program.³⁶ Financing for making improvements is available regardless of household income. Contractors communicated to NYSERDA that interest rates below five percent are critical to engaging with customers and that they are interested in a financing product that is easy to communicate and offers better terms for people with low and moderate incomes. In order to support contractors after the COVID-19 New York on Pause Executive Order, NYSERDA offered zero percent interest loans for residential projects to all customers regardless of income. The program was suspended after two weeks after receiving more than 2,000 applications, exceeding the program cap of \$20 million. New York State gas and electric utilities also provide efficiency programs. Central Hudson, Con Edison, National Grid, NYSEG, Orange and Rockland Utilities, PSEG-LI, and RG&E are major utilities with efficiency programs.

Connecticut, Maryland, Nevada, New Jersey, and Washington State Energy Offices also run residential energy efficiency programs with considerations for people with low and moderate incomes. Connecticut, Nevada, and New Jersey offer weatherization installations for free. Connecticut's program, Home Energy Solutions–Income Eligible, provided upgrades for 28,848 households in 2019, savings those households \$250 per year on average. Nevada's program saved 7,454 kilowatt hours (kWh) and 279 therms on average and \$1,226 in utility bills on average. New Jersey's program has aided 114,000 since 2001. Another program in New Jersey provides people with moderate incomes an incentive for residential energy efficiency projects based on energy savings in addition to incentives and loan terms available to all participants. Maryland runs a grant program that funds energy audits and improvements, in addition to commercial projects and new construction that serve LMI households. Washington offers a loan program to homeowners of non-entitlement areas that earn 200 percent or less of the federal poverty level.

Administrators of residential energy efficiency programs for people with low incomes were interviewed for best practices that could apply to EV programs for people with low incomes. Representatives from both Nevada and Connecticut noted the importance of a program that does not have to turn people away. This does not necessarily mean that everyone in a state is eligible to participate. Instead, if one qualifies

for participation in a program based on income, age, or another metric, they won't be turned away if a barrier to participation emerges. One example is deferring participation in weatherization programs because of health and safety issues. In Nevada this practice includes flexible per project budgeting to allow for comprehensive home energy improvements. Connecticut is considering a "no wrong door" policy where home improvement programs coordinate between themselves to get participants access to as much support as possible. In order to ensure that programs reach their intended beneficiaries, Connecticut programs file an Equitable Distribution Report. The report tracks if there is program participation in low-income census tracts. Washington state's experience indicates the need to prioritize the needs of local implementation agencies. After feedback from community action agencies, the state worked closely with them to creatively meet funding needs for administrative costs and to develop resources on loan administration.

Determining what programs look like in practice can be aided by the community itself. Connecting with the intended users directly will ensure desired outcomes are achieved because the community itself can provide input and create a program that works for them.³⁷ A time of purchase incentive, for example, is a straightforward way to make electric vehicles more affordable; however, seeking input from the community will assist in creating a program that is utilized. These community conversations may include identifying total energy solutions and benefits across State, utility, and local programs for buildings/homes, clean energy generation, and clean transportation. Working in partnership with community-based organizations can help develop wrap around or "braided" services covering housing, transportation, energy efficiency, financial literacy, and/or other issues by combining program funding streams to offer LMI households individualized support based on their needs. The community can describe their lived experience and provide context for their lives outside of income barriers. For example, rural LMI communities may have different needs than urban, suburban, and exurban communities. Section 4 below provides additional detail on program design opportunities for LMI communities specific to PEVs, but states and local partners should consider the broader issues described above in developing LMI programs.

How community engagement is conducted is crucial to how communities perceive opportunities and intentions. The Spectrum of Community Engagement to Ownership is a measurement tool designed to help engage and empower community involvement and partners in local decision-making.³⁸ This tool describes an organization's stance toward its community on a scale from zero to five. Zero essentially represents organizations that "Ignore" or marginalize community members, while a five represents "defer to," where organizations have strong community ownership of programs. Between

these benchmarks (in ascending order) are “Inform,” “Consult,” “Involve,” and “Collaborate.” For each stance, the spectrum provides models of community engagement. Activities associated with the “Involve” stance, for example, include community organizing and advocacy, house meetings, interactive workshops, polling, and community forums.³⁹

Organizations involved in community engagement activities can evolve into trusted partners. Several PEV programs have found success collaborating with community-based organizations to enroll program participants. These groups have experience providing services to local citizens and can be an effective partner.⁴⁰ California’s success with this process is outlined in section 4 below. The Greenlining Institute and Forth Mobility provide guidance specific to transportation-related community engagement also described in this section.

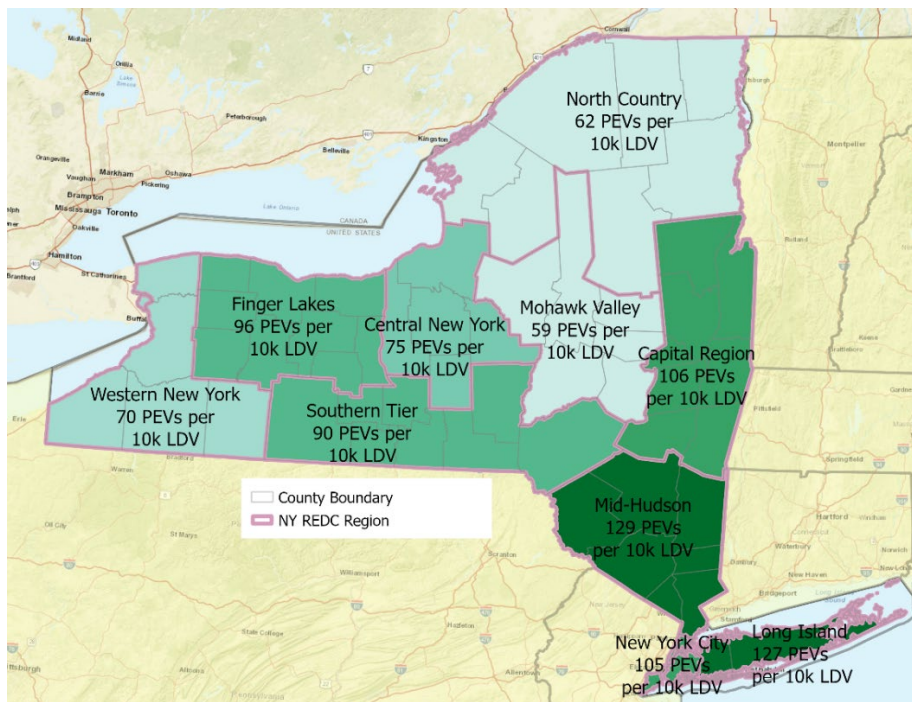
3 New York State Plug-In Electric Vehicle Market Conditions

3.1 Existing Plug-In Electric Vehicle Market Conditions

3.1.1 New Plug-In Electric Vehicle Market

VEIC used the Atlas EV Hub⁴¹ and NYSERDA vehicle registration data to better understand Plug-In Electric Vehicle (PEV) ownership trends in the State. The North Country Regional Economic Development Council (REDC) has a population of about 433,000—approximately 2 percent of the population of New York State. North Country light duty vehicle registrations total about 203,000 vehicles currently on the road. To compare PEV registrations in the North Country to other Regional Economic Development Council (REDC) regions with higher populations, Figure 6 shows PEV registrations as of March 2022 per 10,000 light duty vehicle (LDV) registrations for the REDC regions. The figure demonstrates PEV registration rates vary significantly across the State with one of the highest shares in the Long Island REDC at 127 PEVs per 10,000 LDV registrations (1.3 percent). The North Country REDC has the second lowest rate of PEVs in NYS with 62 PEVs per 10,000 LDV registrations (0.6 percent).

Figure 6. Plug-In Electric Vehicles Registered per 10,000 Light Duty Vehicles by New York State Regional Economic Development Council Region (March 2022)



To better distinguish market differences between the North Country REDC and the State as whole, Tables 2³⁹ and 3 below include current registration statistics for the top 10 PEVs registered in these areas. Statewide, Teslas comprise 34 percent of current registrations, but in the North Country only 15 percent. We also see greater prevalence of more affordable plug-in hybrid PEVs in the North Country.

Table 2. Top 10 Plug-In Electric Vehicles Registered in New York State (March 2022)

Automaker	Model	PEVs on the Road	% of Total PEV Registrations
Tesla	Model 3	16,332	17%
Tesla	Model Y	12,199	13%
Toyota	Prius Prime	11,684	12%
Tesla	Model S	4,908	5%
Toyota	RAV4 Prime	4,784	5%
Chevy	Volt	3,504	4%
Tesla	Model X	3,468	4%
Ford	Fusion Energi	3,325	4%
Chevy	Bolt EV	2,869	3%
Nissan	Leaf	2,256	2%
Total	All Models	94,020	

Table 3. North Country Regional Economic Development Council Top 10 Plug-In Electric Vehicles Registered (March 2022)

Automaker	Model	PEVs on the Road	% of Total PEV Registrations
Toyota	Prius Prime	290	23%
Toyota	RAV4 Prime	160	13%
Tesla	Model 3	102	8%
Ford	Fusion Energi	67	5%
Chevy	Volt	65	5%
Tesla	Model Y	63	5%
Chevy	Bolt EV	56	4%
Ford	Mustang Mach-E	40	3%
Nissan	LEAF	39	3%
Toyota	Prius Plug-in	33	3%
Total	All Models	1,252	

Stakeholder engagement identified several factors contributing to the lower incidence of PEV registrations in the North Country including:

- **Purchase price:** Residents of lower income regions of NYS may have higher barriers to purchasing PEVs due to more expensive purchase prices for new PEV models.

- **Rural character:** The North Country is largely rural with many residents driving longer distances, including in winter conditions. There are fewer PEV model options with all-wheel drive and battery range suitable for these regional travel patterns, particularly at more affordable purchase prices. Many rural residents also work in agriculture and other types of employment that rely on trucks, for which there are few PEV options.
- **Auto dealers:** North Country dealerships have less interest and/or funds available to support dealership infrastructure and training required to sell PEVs. Additional issues related to profitability of selling PEVs, availability of inventory and limited knowledge may also present challenges. Tesla’s direct sales model has supported significant adoption statewide, but their higher purchase prices and lack of showrooms or service facilities in the North Country equates to reduced market share in the region.

One approach to overcoming some of the dealership challenges is working with dealers on specific “midstream” incentives or “spiffs” to motivate higher sales. These have been offered in other states (e.g., Connecticut⁴²) and piloted by NYSEDA in the Saratoga and Kingston regions of NYS.⁴³

Despite challenges identified above, more dealerships are embracing PEV sales across New York State. Of the 1,089 new vehicle dealers registered with the NY DMV, 658 have signed up for the NY Drive Clean rebate program, or about 60 percent. In the North Country, 29 of the 64 new car dealerships have signed up for the rebate program, or about 45 percent. Further, about one third of the new car dealerships in the North Country are EV certified or have EVs listed in their inventory. Seventeen dealerships are identified as “EV Certified” or as offering sales and service for EV models by the automaker they represent—a distinction that Ford, Chevrolet, Nissan, and Mitsubishi offer to dealerships. Toyota, Honda, Hyundai, and Kia do not provide EV certification or information on their online dealership locators, but seven dealerships affiliated with these OEMs in the North Country have new EVs in their inventory.

3.1.2 Used Plug-in Electric Vehicle Market

The used Plug-in Electric Vehicle market is small but growing in New York State. Growing the secondary PEV market will be a critical ingredient to supporting LMI PEV adoption as their more affordable price points are often more appropriate for LMI purchasers (as is the case for the broader used vehicle market today). Research suggests used PEV availability will likely exceed sales of new PEVs sometime in the early 2040s.⁴⁴

Data on used PEV registrations in NYS over the past several years is limited but can be estimated by looking at original motor vehicle registrations of PEVs that are more than two years from their model year date. For example, a 2018 or older model year PEV with an original registration date in 2020 is most likely a used EV. Using this method of approximation, VEIC estimates used PEV registrations comprised about 6 percent of all original PEV registrations in NYS from 2011 through October 2021. North Country used PEV share was significantly higher—totaling approximately 12 percent of all original registrations over the same period of time (see Table 4).⁴⁵

Table 4. New York State Plug-in Electric Vehicle Original Registrations, 2011–2021

	Count	Percent
New York State		
Total New PEVs	114,684	94%
Total Used PEVs	7,876	6%
Total Original PEV Registrations	122,560	
North Country		
Total New PEVs	1,483	88%
Total Used PEVs	198	12%
Total Original PEV Registrations	1,681	

Used PEV registrations have grown in recent years, supported by increased new PEV sales and the resulting secondary market. Used PEV original registrations increased from 44 in 2013 to 1,318 in 2020, the last year with a full 12 months of data available. This represented an estimated 7 percent market share of total PEV sales in 2020. Looking at average monthly used PEV sales, Figure 7 shows a steady increase since 2018, up to about 170 used PEVs per month as of October 2021.

Figure 7. Average Monthly Used PEV Registrations in New York State

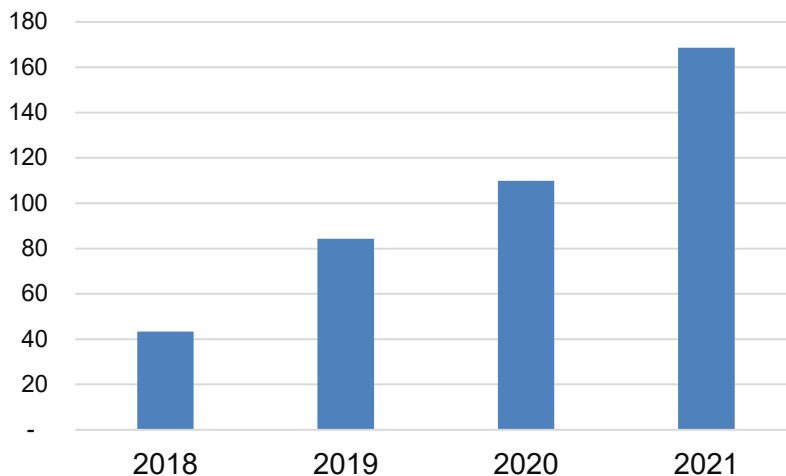


Table 5 below contains a listing of the most registered used PEVs in the State. These are generally models available for the longest period of time and with the greatest number of registrations over the past several years. Comparisons between these used PEV numbers with broader vehicle market characteristics demonstrates that a clear secondary PEV market is still in the very early stages.

Table 5. Top 10 Used PEV Models in New York State, 2011–2021

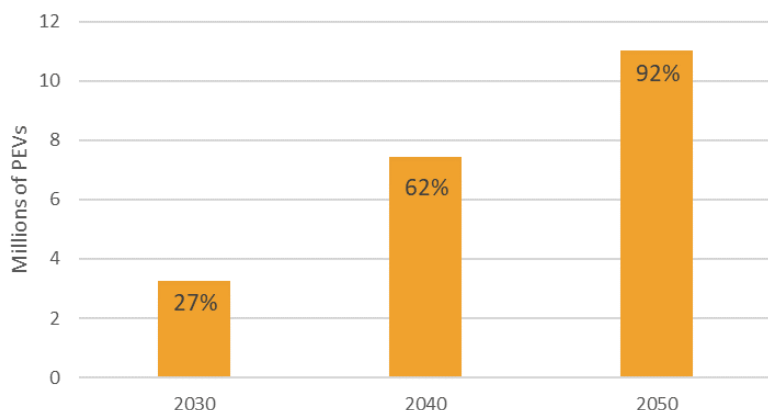
Make/Model	Used PEV Registration Count
Tesla Model S	926
Chevrolet Volt	856
Nissan Leaf	519
Ford C-Max Energi	328
Ford Fusion Energi	302
Tesla Model X	287
Toyota Prius Plug-in	284
BMW i3 REX	214
Smart forTwo EV	189
BMW i8	157

In addition to the 64 new car dealerships cited in the prior section, there are 350 used car dealers in the North Country. While it was not feasible to examine the inventory of every dealership in the region, information can be gathered using online car listing services such as cars.com, autotrader.com, and craigslist.org, as well as individual dealership websites. None of the online listing services showed any PEVs for sale from vehicle dealerships focused solely on the pre-owned market in a 2020 review. Only ten of the 64 North Country new car dealerships appeared to have any used EVs in inventory—nine listed PHEVs and only three listed BEVs.

3.2 Future Market Development Scenarios

New York State has committed to deploying 850,000 EVs by 2025 as part of the Multi-State Zero Emission Vehicle Memorandum of Understanding. As shown in Figure 8 below⁴⁶, New York Power Authority (NYPA) projected meeting CLCPA goals will require New Yorkers to deploy about 3 million EVs by 2030, or about 30 percent of the LDV fleet, ramping up quickly to over 7 million vehicles in 2040 and just over 11 million vehicles by 2050, or over 90 percent of registered vehicles. For North Country PEV adoption to reach 30 percent of LDVs by 2030 in line with State goals approximately 73,000 PEVs will need to be added within 10 years—an ambitious target given current North Country market share is reported at less than 1 percent of vehicle sales.

Figure 8. Projected New York State PEV Registrations Based on State Energy Goals



3.3 Charging Infrastructure Availability

PEV charging infrastructure is critical to support PEV adoption. Figure 9 below illustrates the three levels of electric vehicle supply equipment (EVSE), often referred to as charging infrastructure or charging equipment. Level 1 EVSE is provided with a PEV purchase and can be plugged into standard 120 volt (V) receptacles located within about 20 feet of where the PEV is parked. The roughly 5 miles of range added per hour of level 1 charging is slow relative to the higher-powered level 2 and DC fast charging options, but it can work fine for many PEV drivers, especially PHEVs that can usually charge overnight on level 1 due to their smaller battery sizes.

Figure 9. PEV Electric Vehicle Supply Equipment Levels

Level 1 Charging
120V
5 miles range / hr



Level 2 Charging
240V
10-20 miles / hr



DC Fast Charging
480V
Up to 1,000 miles / hr



Level 2 charging at home is often preferred by battery electric vehicle (BEV) owners and would likely be necessary for those traveling more than 50 miles per day. In addition, level 2 EVSE provides better PEV pre-heating in cold North Country winter conditions.

Direct Current Fast Charging (DCFC) is needed to support longer distance travel in a BEV but is generally not used for daily charging needs. In some cases, BEV owners may use DCFC to make up for limited home charging availability; for example, in areas without off-street parking available. It is important to note PHEVs generally are not able to use DCFC, as they rely on gasoline for longer distance trips.

To support NYS EV adoption goals, the State established a goal of installing at least 10,000 EV charging stations by the end of 2021. As of January 2022, the state had 2,776 locations with 6,812 ports offering public PEV charging as shown in Figure 10 below⁴⁷. Several NYS initiatives are underway to accelerate EVSE infrastructure development, including a PEV Make Ready Initiative that will support the installation of over 50,000 Level 2 plugs and 1,500 DCFC stations in the state by 2025.⁴⁸

Figure 10. Public Plug-in Electric Vehicle Charging Locations by New York State Regional Economic Development Council Region

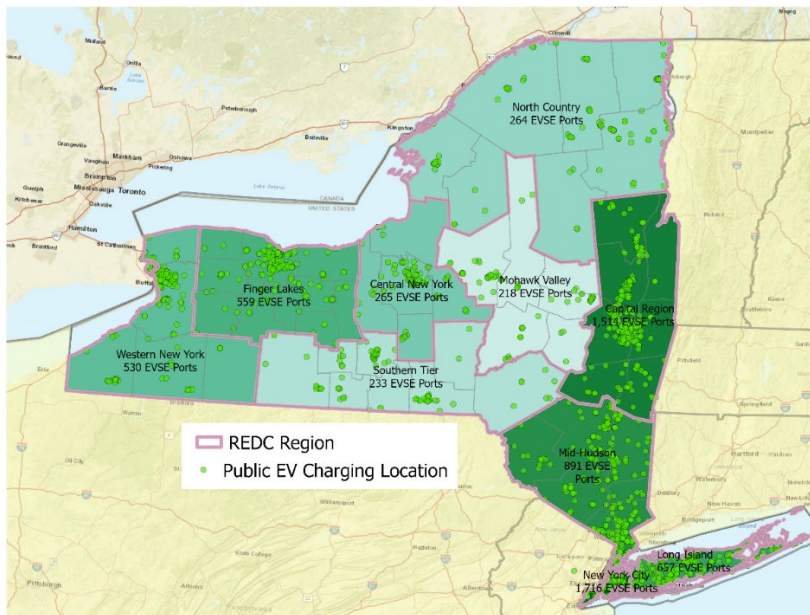
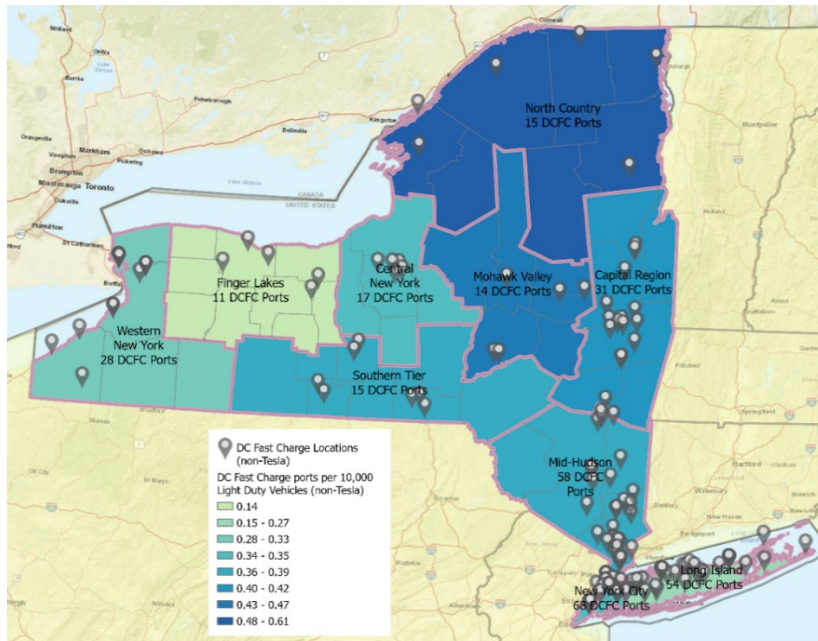


Figure 11⁴⁹ below examines a subset of EVSE showing DC fast charging locations for non-Tesla PEVs. Sixty Tesla Supercharger DCFC locations not shown are reserved exclusively for Tesla use. The map shows locations where DC fast charging is available and is shaded by REDC to indicate the availability of DC ports per 10,000 registered light duty vehicles. Overcoming consumer hesitancy of charging availability to support longer distance travel in a BEV will require significant additional charging infrastructure development. Recent investments through NYPA's EVolve NY program have supported several additional fast charging opportunities in the North Country with more coming soon.⁵⁰

Figure 11. DC Fast Charging Ports per 10,000 Vehicles by New York State Regional Economic Development Council Region (Non-Tesla)



3.4 Consumer Awareness

Consumer interest in purchasing EVs appears to be steady in the U.S.—an annual study by AAA has found that 15–20 percent of survey respondents were likely to buy an EV for their next vehicle since 2017.⁵¹ The most recent survey reported that this likelihood varies across age groups, with about 23 percent of millennials and 8 percent of baby boomers expressing an interest in purchasing an EV. Despite the low interest in EVs, consumer concerns over charging availability seems to be dropping. Respondents concerned about charger availability and running out of charge while driving were both down 11 percent since 2017.

A 2019 study from Consumer Reports and the Union of Concerned Scientists studied consumer intent for their next vehicle purchase.⁵² Five percent of respondents to the survey said they definitely plan to purchase a PEV for their next vehicle, 31 percent are considering a PEV for their next vehicle, 27 percent are interested in EVs but not for their next vehicle, and 37 percent have no interest in EVs for their next vehicle. The study also looked at the demographics of respondents and found that people of color are more likely to be considering a PEV for their next vehicle compared to all buyers combined at 42 percent compared to 36 percent. The same study also found that people of color are more interested in charging options outside the home compared to all buyers—59 percent felt that using a DCFC station for 10 minutes twice a week would be highly convenient compared to 50 percent of all car buyers.

4 Review of Existing Low- and Moderate-Income Plug-In Electric Vehicle Resources and Programs

4.1 PEV Opportunities for Low- and Moderate-Income Households

Plug-in electric vehicles offer a variety of environmental, economic, and health benefits to drivers. PEVs cost less than half as much to operate as gas-powered cars: the average cost to operate an EV is \$485 per year in the United States, while the average for a gasoline-powered vehicle is \$1,117.⁵³ These financial benefits are magnified in low-income communities, where a disproportionately high percentage of income is spent on transportation. According to a study from the Brookings Institute, in poor households with at least one car, transportation takes up approximately 23 percent of total expenditures—slightly more than higher income households.⁵⁴ Low-income communities and communities of color are often also located in areas that are exposed to significant amounts of air pollutants from transportation. In California, the lowest income households in the State live where particulate matter (PM2.5) pollution is 10 percent higher than the State average; the highest income households live where PM2.5 pollution is 13 percent below the State average; and African American Californians are exposed to PM2.5 that is 43 percent higher than that for white Californians.⁵⁵ PEVs are significantly cleaner to drive than combustion-engine vehicles and can help clean up local air quality and reduce greenhouse gas emissions: driving the average PEV produces global warming pollution equal to a gasoline vehicle that gets 88 miles per gallon fuel economy.⁵⁶

To capture these benefits, states, cities, and utilities have started to offer resources and programs to support PEV adoption in LMI communities. While the majority of these programs are in the form of supplemental PEV rebates for LMI drivers, some entities also offer low-interest financing options, targeted incentives for PEV charging station installation, ride-share programs, or access to enhanced mobility options.

4.2 Existing State Programs and Other Initiatives

States across the country have launched PEV and EVSE incentive programs to support PEV adoption broadly, including point-of-sale rebates, tax credits, grants and financing options to support charger installations, and other programs to raise awareness. However, only select states, cities, and utilities have policies or programs aimed at increasing PEV adoption among LMI communities. Table 6 below includes several examples of state and regional programs designed to support PEV adoption in LMI households. Further details on several of the programs included in the table are provided below.

Table 6. Sampling of PEV Incentive Programs for Low- and Moderate-Income Households

Program	Incentive Type	Incentive Details	Additional Criteria and Notes
California Clean Vehicle Rebate Project	Vehicle rebate	Up to \$7,000 for purchase or lease of new vehicle. All drivers eligible for \$4,500 for fuel cell vehicles; \$2,000 for BEVs; \$1,000 for PHEVs. Income-eligible applicants eligible for additional \$2,500.	High-income consumers are ineligible for rebate. State, federal, and local public entities that own and operate eligible vehicles in disadvantaged communities eligible.
California Clean Vehicle Assistance Program	Vehicle grants Affordable financing for vehicles Charging incentives	\$5,000 grant for purchase of new or used EV. \$2,500 grant for purchase of hybrid. Auto loan for income-qualified customers; 8% or lower interest rate loan. Vehicle incentive recipients eligible for L2 charging station installed in their home (up to \$2,000 value).	Limited to income-qualified drivers only Driver must receive approval packet prior to purchasing vehicle. Grant given to the dealer. May qualify for 8% loan from Beneficial State Bank, or 12% or less loan from another lender.
California Clean Cars 4 All	Scrap-and-replace	Up to \$9,500 toward the purchase of new or used BEV, PHEV, and FCEV. Up to \$7,500 in incentives to access shared mobility options.	Vehicle and income requirements apply. Limited to vehicle owners in participating districts
Oregon Clean Vehicle Rebate Program	Vehicle rebate	Up to \$2,500 for purchase or lease of PEV or PHEV. Additional \$2,500 “Charge Ahead Rebate” available to qualifying LMI drivers for purchase or lease of new or used PEV.	Must purchase from an authorized dealer. Must be registered in Oregon for at least two years. Must have base MSRP less than \$50,000.

Table 6 continued

Program	Incentive Type	Incentive Details	Additional Criteria and Notes
Connecticut Hydrogen and Electric Automobile Purchase Rebate	Vehicle rebate	<p>Up to \$9,500 for purchase or lease of BEV, PHEV, or FCEV.</p> <p>\$2,250 standard rebate for new BEVs; additional \$2,000 for income-qualified rebate for new BEVs</p> <p>\$7,500 standard rebate for new FCEV; additional \$2,000 for income-qualified rebate for new FCEV.</p> <p>\$3,000 for income-qualified rebate for used BEV</p> <p>\$7,500 for income-qualified rebate for used FCEV.</p>	<p>Pre-qualify applicants through income verification process.</p> <p>MSRP cap of \$42,000 for new PEVs; \$60,000 for FCEVs.</p>
Pennsylvania Alternative Fuel Vehicles Program	Vehicle rebate	<p>\$750 for purchase or lease of new or used EV.</p> <p>Additional \$1,000 for income-qualified driver.</p>	<p>Final purchase price of \$50,000 or less.</p> <p>Used vehicles are “one time pre-owned” with odometer readings of 75,000 miles or less.</p>
Maine Electric Vehicle Instant Rebates	Vehicle rebate	<p>Up to \$2,000 for all drivers.</p> <p>Up to \$5,000 for income-eligible drivers.</p>	
Washington Electrification of Transportation Systems Grant Program	Charging infrastructure grants	Various	<p>Stakeholder engagement during program design.</p> <p>Low match requirements for qualifying communities.</p> <p>Heavily weighted equity criteria in grant evaluation; equity narrative required by applicants.</p>

California is the notable example, where the state, regional air districts, and utilities all have made extensive investments in policies and programs to support EV uptake in LMI households. In 2014, the California Legislature passed Senate Bill 1275, the “Charge Ahead California Initiative,” which aims to put 1,000,000 zero-emission and near-zero emission vehicles on California’s roads by 2023, and to increase access to ZEVs for disadvantaged, low-income, and moderate-income communities and consumers. In particular, the bill calls for revisions to the California Vehicle Rebate Project and the establishment programs that further increase access to and direct benefits for disadvantaged and LMI communities.⁵⁷ Programs under Charge Ahead California are funded by proceeds from California’s cap-and-trade program, with specific amounts of funding dedicated to reducing greenhouse gas emissions in disadvantaged communities.

The California Clean Vehicle Rebate Project (CVRP) offers rebates of up to \$7,000 for the purchase or lease of a new zero-emission vehicle. \$4,500 is the rebate amount offered to hydrogen fuel-cell drivers; \$2,000 is offered to BEV drivers; and \$1,000 is offered to PHEV drivers. Income-eligible applicants are eligible for an additional \$2,500. CVRP imposes an “income cap,” and drivers making above this amount are not eligible for a rebate.⁵⁸ Conversely, the increased rebate amount of \$2,500 is available to consumers with household incomes less than or equal to 400 percent of the federal poverty level. As of September 2021, 34.1 percent of the CVRP funding had been used by “equity groups,” including disadvantaged and low-income communities. As of 2016, higher-income consumers became ineligible to participate in CVRP, and as of 2018, state, federal, and local public entities that own and operate eligible vehicles in one or more disadvantaged communities also became eligible for increased rebate amounts.

Defining Disadvantaged Communities

California legislation (SB 535 and AB 1550) directed that (1) at least 25 percent of the proceeds from California’s cap-and-trade program go to projects within and benefit disadvantaged communities and (2) at least an additional 10 percent of the funds go to projects that benefit LMI households within those communities.¹ The California Environmental Protection Agency and California Air Resources Board held community meetings in 2017 to discuss how to identify disadvantaged and LMI communities for the purpose of investing cap-and-trade proceeds. Following these meetings, and using input from CalEnviroScreen, a tool that assesses all census tracts in the State to identify areas disproportionately burdened by and vulnerable to multiple sources of air pollution, CalEPA released a list of disadvantaged communities. Disadvantaged communities are “identified by CalEPA as the top 25 percent most impacted census tracts in CalEnviroScreen 3.0,” and “low-income communities and households are defined as the census tracts and households, respectively, that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development’s 2016 State Income Limits.”² California’s EV programs that target disadvantaged and LMI communities use the list published by CalEPA when confirming program eligibility.

¹ California Environmental Protection Agency. *California Climate Investments to Benefit Disadvantaged Communities*. [https://calepa.ca.gov/envjustice/ghginvest/#:~:text=Assembly%20Bill%20\(AB\)%201550%20\(low%20income%20households%20or%20communities](https://calepa.ca.gov/envjustice/ghginvest/#:~:text=Assembly%20Bill%20(AB)%201550%20(low%20income%20households%20or%20communities).

² California Air Resources Board. *Priority Population Investments*. <https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/communityinvestment.htm>

Figure 12. California Clean Vehicle Rebate Project, Rebates by Equity Group

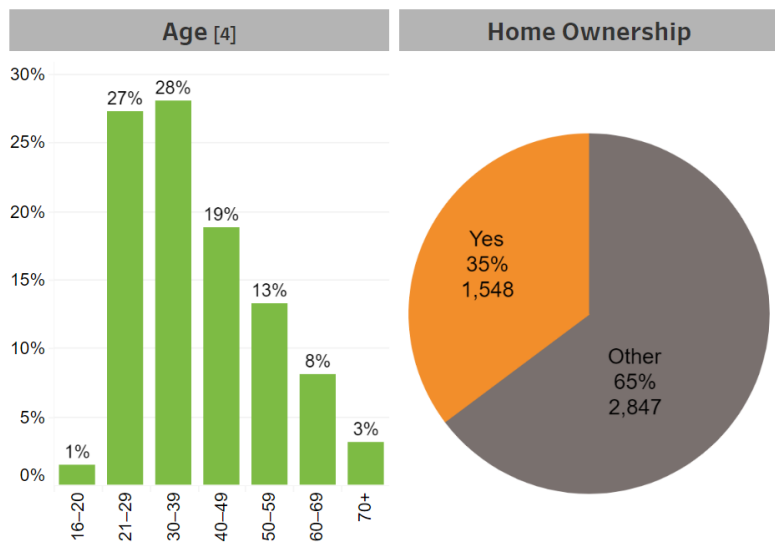
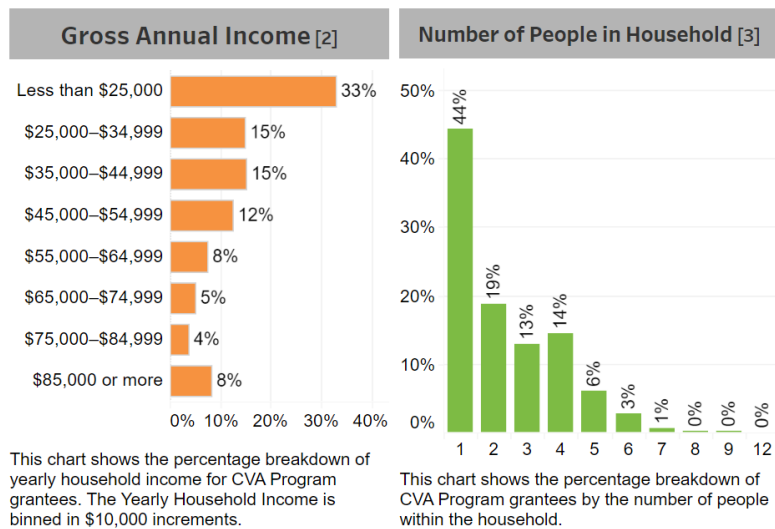
Image credit: Center for Sustainable Energy (2021). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last imported September 28, 2021. Retrieved November 4, 2021, from cleanvehiclerebate.org/rebate-statistics.

Rebates by Equity Group [2]				
Timeframe: [1] Current Income Criteria (11/1/2016 – Present)				
	Rebates	Funding	Percent of Funding	
All Equity Groups	72,297	\$200,542,248	34.1%	
Geography	Disadvantaged Communities	23,425	\$58,804,733	10.0%
	Low-Income Communities	51,996	\$127,748,901	21.7%
	<i>Disadvantaged Communities within Low-Income Communities</i>	<i>16,400</i>	<i>\$41,851,272</i>	<i>7.1%</i>
	<i>Low-Income Communities within 1/2 mile of a Disadvantaged Community [2]</i>	<i>10,404</i>	<i>\$25,705,877</i>	<i>4.4%</i>
Rebate Type	Increased Rebates for Low/Moderate-Income Consumers [1]	22,149	\$92,115,812	15.6%

This chart summarizes the number of rebates, amount of funding, and the percent of funding by all equity groups, by geography, and by rebate type. Geography is broken down into two main categories: Disadvantaged Communities (DACs) and Low-Income Communities (LIC). LICs are further split into two subcategories based on distance to DACs.

California’s Clean Vehicle Assistance Program is another offering that provides grants and affordable financing to income-qualified drivers for the purchase of new or used clean vehicles. Buyers are eligible for a \$5,000 grant toward the purchase of an EV, and a \$2,500 grant toward the purchase of a hybrid. To qualify, the driver must receive an approval packet prior to purchasing the vehicle and comply with all program requirements. If receiving a grant, the grant is given to the dealer to lower the overall cost of the vehicle. The Clean Vehicle Assistance Program also offers affordable financing options to income-qualified customers. The program has partnered with Beneficial State Bank to provide program participants with a special offering: an auto loan with an 8 percent or lower interest rate loan (available to some applicants with a low credit score as well). Importantly, drivers are only eligible for the Clean Vehicle Assistance Program grant if they qualify for (1) an 8 percent loan from Beneficial State Bank, (2) a 12 percent (or less) interest rate loan from another lender, or (3) purchase the vehicle outright.⁵⁹ As of June, 2021, 4,283 grants had been issued.⁶⁰ The Clean Vehicle Assistance Program grants can be stacked with CVRP; however, unlike the CVRP, the Clean Vehicle Assistance Program is limited to income-qualified drivers only and can be used for the purchase of a new or used vehicle.⁶¹

Figure 13. California Clean Vehicle Assistance Program, Incentive Statistics



The Clean Vehicle Assistance Program also provides charging incentives for applicants who receive a vehicle incentive⁶². Eligible applicants can have a Level 2 charging station installed in their home (up to \$2,000 value), can receive a \$1,000 prepaid charge card valid at public EVGO charging stations, as well as a lower-speed portable charger.⁶³ As of August 2021, 1,870 participants redeemed a charging grant.

California’s Clean Cars 4 All (CC4A) is a scrap-and-replace program that provides incentives to lower income California drivers to trade in older, high-polluting cars for zero- or near-zero emission vehicles or to replace their older vehicle with alternative mobility options, such as public transit passes. The program is limited to vehicle owners residing in participating air districts (South Coast Area, San Joaquin Valley, Bay Area, and Sacramento Metropolitan Area) and to those who meet vehicle and income requirements.

Participants may receive up to \$9,500 toward the purchase of a new or used BEV, PHEV, and FCEV, or choose up to \$7,500 in incentives to access public, private, and shared mobility options.⁶⁴ From 2015–2019, 6,868 vehicles were replaced across all participating air districts. The average age of the replaced vehicle was model year 1998 with 192,297 miles at retirement, with the average replacement vehicle having a model year 2015 with 77 miles per gallon (mpg) equivalent. The vast majority of program participants (6,167) were less than or equal to the lowest qualifying income threshold (225 percent of the Federal Poverty Level).⁶⁵

While California’s EV LMI program offerings are robust and growing, other states offer LMI incentives within existing, select EV programs.

Oregon’s Clean Vehicle Rebate Program provides rebates to Oregon residents that purchase certain types of ZEVs. The program was established in 2018, is administered by the Oregon Department of Environmental Quality (ODEQ) and is funded by a tax imposed on auto dealers in the state. The standard rebate for the purchase or lease of a new PEV or PHEV ranges from \$750 to \$2,500 and is available to any driver. An additional \$2,500 “Charge Ahead Rebate” is available to qualifying LMI drivers for the purchase or lease of a new or used PEV. This is one example of a “stacked” rebate—where LMI drivers may be eligible for both the standard rebate, as well as the additional “Charge Ahead Rebate,” for a total \$5,000 incentive.⁶⁶ To receive these rebates at the time of purchase, drivers must purchase from an Authorized Dealer. Vehicles must be registered in Oregon for at least two years to qualify for the program and must have a base manufacturer’s suggested retail price (MSRP) of less than \$50,000. The Oregon DEQ has been receiving this funding since 2018 and the program is authorized at \$12 million per year. Implementation of the program was delayed initially due to a lawsuit regarding the funding mechanism for the program. In 2018, the Oregon Supreme Court determined the “privilege tax” on auto dealers could be utilized for the program, and DEQ is now proceeding with implementation of the program.⁶⁷

The Connecticut Hydrogen and Electric Automobile Purchase Rebate (CHEAPR) offers incentives of up to \$9,500 for Connecticut residents who purchase or lease an eligible battery electric, plug-in hybrid electric or fuel cell electric vehicle. The program is funded through a fee on new motor vehicle sales and a fee on motor vehicle registration renewals. Prior to program launch, a CHEAPR pilot program was administered and was made possible through funding commitments by American Electric Power Service Corporation, Eversource Energy, and Avangrid. There are three types of rebates under the

CHEAPR program as shown in Table 7.⁶⁸ The CHEAPR Standard Rebate is offered for the purchase or lease of a new eligible vehicle. The Rebate+ New incentive is offered to individuals who participate in certain income qualified programs and can be stacked on top of the Standard Rebate. The Rebate+ Used incentive is offered to individuals who participate in certain income qualified programs and is for the purchase or lease of a used eligible vehicle. The Standard Rebate is automatically applied at the time of purchase, and after the Standard Rebate is redeemed by the dealer, the driver will receive an offer email with applicability information and instructions on how to apply for the Rebate+ New. Similarly, drivers who purchase a used vehicle must submit a Rebate+ Used application online after purchase if they qualify for the program. To qualify for the Rebate+ programs, applicants must submit documentation or a membership card that at a minimum provides applicant name, name of the qualifying program, the government entity or the managed care organization that issued the document, and an issue date within the last 12 months.⁶⁹

Table 7. CHEAPR Rebate Amounts as of June 2021

Vehicle Type	Incentive Type		
	CHEAPR Standard	Rebate+ New	Rebate+ Used
PHEV	\$750	\$1,500	\$1,125
BEV	\$2,250	\$2,000	\$3,000
FCEV	\$7,500	\$2,000	\$7,500

A number of other states are exploring options for establishing an LMI component within an existing rebate program or for launching a new EV rebate program with an LMI process. Pennsylvania’s Alternative Fuel Vehicles Program offers a \$750 rebate to assist residents with the incremental cost of purchasing or leasing new or used EVs, and an additional \$1,000 is available for LMI drivers.⁷⁰ Virginia recently passed legislation establishing an EV rebate program. Starting January 1, 2022, residents of Virginia who purchase a new or used EV from a participating dealer will be eligible for a rebate of \$2,500 and certain qualified (i.e., income-eligible) residents will be eligible for an additional \$2,000 enhance rebate.⁷¹ Efficiency Maine, a quasi-state agency, administers Electric Vehicle Instant Rebates. Rebates of up to \$2,000 are available to Maine residents, and qualified low-income Maine residents are eligible for up to \$5,500 for a BEV or PHEV.⁷² In a shift from other states’ strategies, the Washington State Department of Transportation is tasked with developing a pilot program to provide alternative fuel vehicle-use opportunities to underserved and LMI communities.⁷³

Washington is also one of the few states that have incorporated equity components into their EVSE incentive programs. In 2017, the Washington legislature appropriated money from Washington’s Clean Energy Fund 3 to support the Electrification of Transportation Systems (ETS) Grant Program. The ETS program provides grants to Washington local governments, federally recognized tribal governments, and retail electric utilities for EVSE and related development costs, with a specific focus on benefitting communities that have been disproportionately impacted by climate change. When developing the ETS program, the program administrator, Washington Department of Commerce reached out to local governments and stakeholders in the equity community to invite input on program design. Commerce received comments from a broad coalition and learned several key points: (1) the program should ensure that benefits will be felt by the communities that need them most, (2) the program’s original match requirements were prohibitively high for some communities, and (3) some local and tribal governments felt less equipped to complete an application due to staffing and technical constraints.

In response to these comments, the Washington Department of Commerce redesigned the program to lower the match requirements for qualifying communities. In addition, it included evaluation criteria in their ETS applications that directly addressed equity concerns. The highest-rated evaluation criterion was “highly impacted and vulnerable communities,” which includes “projects that benefit communities that have historically experienced and/or currently face social, economic, environmental, health, and other institutional or systemic discriminatory forces, particularly from sources of localized transportation emissions.”¹ Under this criterion, median household income, environmental health disparities, rural status, and transportation costs were taken into consideration. In addition, under this criterion applicants were required to submit an “equity narrative,” which must address the direct and indirect benefits to highly impacted and vulnerable communities, meaningful efforts to engage these communities, and reflection of the highly impacted and vulnerable community desire and need. The combination of lowered match requirements, heavily weighted equity criteria in the evaluation process, and the requirement of an equity narrative—all identified as helpful during the stakeholder engagement process—is a unique approach and led the Washington Department of Commerce to issue awards to a diverse set of EV charging projects from across the state.

While state initiatives are typically focused on financial incentives for EV or EVSE adoption among LMI communities, there are a number of cities and regions exploring other EV mobility solutions. The “Good2Go” electric car share pilot in Roxbury, Massachusetts was launched in June 2021, and is designed to enhance clean transportation access within disadvantaged communities. Users can sign-up for an account, book an available EV using their smartphone, use the EV carshare for trips, charge at

any ChargePoint station for free if needed, and return the EV to the station where they began their trip. Good2Go offers two membership types: the Standard Membership (\$10/hour) and the Reduced Membership (\$5/hour), which is available to income-qualifying individuals.⁷⁴ The Good2Go electric carshare pilot is a new initiative and data from the program will be available in 2022 and 2023.

Similarly, the Hacienda Community Development Corporation in Portland, Oregon partnered with Forth, an electric car advocacy group, to launch a Community Electric Vehicle Project. The project was launched after extensive conversations with community stakeholders and sought to enhance access and mobility in the low-income Cully neighborhood by offering EV car share. Despite significant community outreach, the project encountered multiple issues related to insurance, software, technology barriers, banking, driver’s licenses, organizational capacity, and outreach. Ultimately, a permanent car-share service was not adopted. Moving forward, it will be important for LMI EV mobility projects to build on lessons learned from the Hacienda Community Electric Vehicle Project and other initiatives to ensure that the proposed solution adequately addresses the needs of the community.

Utilities across the country are also removing barriers to EV charging in LMI communities and exploring options to enhance EV adoption among LMI drivers. Pacific Gas and Electric has launched the “Empower EV Program” and offers incentives of up to \$2,500 per income-eligible, single-family household to help cover the cost of purchasing and installing EV charging equipment.⁷⁵ NV Energy offers rebates to commercial customers for purchase and installation of a Level 2 or DCFC station, and LMI multi-unit dwellings are eligible for additional funding. The “Lower-Income Multifamily Charging Stations Incentives” program is funded jointly by NV Energy and the Nevada Governor’s Office of Energy (GOE), with NV Energy contributing 75 percent of the project cost, up to \$7,500 per port, and GOE contributing the remaining 25 percent of the total project cost, up to \$2,500 per port.⁷⁶ Tucson Electric Power offers rebates and technical support to commercial customers to install EV chargers, with higher rebates available to customers located in lower-income areas.⁷⁷

Table 8. Tucson Electric Power Smart EV Charging Program Incentives

EVSE Type	Location	Rebate	Low-Income Area Rebate
Level 2	Workplace	\$4,500 per port; up to 75% of project cost.	\$6,000 per port; up to 75% of project cost.
Level 2	Multifamily dwelling or nonprofit organization.	\$6,000 per port; up to 85% of project cost.	\$9,000 per port; up to 85% of project cost.
DC Fast Charger	All	\$24,000 per port; up to 75% of project cost.	\$40,000 per port; up to 75% of project cost.

4.3 Literature Review

While states, cities, and utilities are launching programs to incentivize EV adoption among LMI communities, most of these policies and programs are in the pilot phase and/or have limited data on program uptake. There are several analyses that examine the effectiveness of different types of EV incentive programs for LMI drivers and offer strategies for program success.

A notable study from the Luskin Center included a representative survey of 1,604 LMI drivers in California and offers insights on current mobility patterns and needs of LMI households.⁷⁸ The study showed that respondents own as many vehicles as higher-income households in the state and relied on them for travel, and respondents did not express a strong interest in transit or alternative travel modes. Unsurprisingly, rural and suburban households reported traveling more miles (about 25 percent) by vehicle than urban households. Survey respondents spent over 50 percent of their annual reported income on their last vehicle purchase, and over 10 percent on the annual operation of their main vehicle; moreover, the study showed that minorities pay substantially more for auto insurance than non-Hispanic whites.

The Luskin Center study also provides key insights on EV LMI program uptake. Survey respondents suggest that rebates would have a significantly higher impact on EV adoption, and favorable financing would do little to incentivize EV uptake. According to the study, “Offering rebates of \$2,500, \$5,000, or \$9,500 increased PHEV and BEV purchases incrementally by approximately 20, 40, and 60–80 percent, respectively. For the policy scenarios considered, rebates had a much larger impact than offering guaranteed financing alternatives—offering both together did not significantly increase purchase rebates beyond the increases associated with offering the rebate alone.”⁷⁹ The study also examines California’s existing scrap-and-replace programs and shows “uniformly high demand for vehicle retirement and replacement incentives.”⁸⁰ These findings suggest that LMI households rely on cars for their transportation needs and are more likely to take advantage of on-the-hood rebates, rather than favorable financing or deferred incentives (e.g., tax credits).

Other literature stresses the importance of community engagement and leadership before program design and during program implementation. The Greenlining Institute’s Mobility Equity Framework outlines three steps for meeting a community’s mobility needs: (1) undertaking a community needs assessment, (2) conducting a mobility equity analysis, and (3) emboldening community decision-making power. The community needs assessment (sometimes referred to as transportation needs assessment) is cited by other organizations as a necessary first step in building equitable EV policies in traditionally underserved

communities. According to a study by Forth, “the goal of a transportation needs assessment is to identify the existing gaps in mobility and services as well as guide cities to invest in clean transportation solutions that are informed.”⁸¹ In conducting the transportation needs assessment, Forth emphasizes several strategies to ensure community participation, including non-digital engagement, and the importance of hosting a meeting in a neutral, accessible space, and compensating stakeholders for their time. Forth also stresses the need to work with trusted, established community-based organizations. As noted in the report, “Due to historical events and intergenerational trauma that comes from government projects such as gentrification and redlining, the most effective work comes from a partnership with a community organization that has a rapport with the people being served.”⁸²

The importance of engaging community-based organizations before and during EV program design, and during program implementation cannot be overstated. In a series of interviews conducted with key EV policy and energy equity nonprofit organizations, including the Center for Sustainable Energy, Greenlining Institute, Forth, Green for All, and EVNoire, the common message from all organizations was that EV policies and programs should be designed to meet the mobility needs of specific communities, and that the only way to identify those needs and develop responsive programs is to work directly with a community to design a program from the ground-up.

5 Accelerating Low- to Moderate-Income PEV Adoption

Research of PEV market adoption trends indicates it is rarely a single program or factor that contributes to accelerating broad PEV uptake in communities. For example, the International Council on Clean Transportation (ICCT) has studied PEV market growth in metropolitan areas across the U.S. and found the greatest advancements occurred in regions with over 30 unique policies or actions supporting PEVs.⁸³

The following sections detail four areas where market interventions may be most effective in advancing LMI PEV adoption in the North Country, including reducing upfront PEV purchase costs, increasing PEV charging infrastructure availability, increasing the supply of new and used PEVs available for purchase, as well as outreach strategies needed to spur consumer interest.

Should this research effort proceed to Phase II it will be important to monitor current market conditions and evolving best practices as new State and federal policies are implemented to support ZEV transitions.

5.1 Reducing Upfront PEV Costs

5.1.1 Incentives

As described throughout section 4, incentives are one of the most used tools to advance PEV markets across the country. Reducing the upfront cost of a PEV purchase can help open the door for LMI drivers to enjoy the long-term cost of ownership benefits of spending less on fuel and maintenance. For the New York North Country region, PEV purchasers can currently take advantage of two incentive programs for new PEV purchases:

1. **Federal tax credit:** this offers up to \$7,500 for a new PEV purchase. This incentive is not available for more affordable used vehicle purchases often more suitable for the LMI market. Post purchase tax credits are also not as accessible for LMI new PEV buyers since lower incomes generally indicate less tax liability to be offset by a credit. There are discussions underway in Congress that could address both deficiencies, although prospects of passage are uncertain. If a LMI buyer has good credit then leasing may be an attractive alternative to purchasing since the tax credit is assigned to the leasing entity (lessor), who will usually pass through all or a portion of the credit to the lessee and monthly costs of leases are typically lower as the lessee is not building equity in the vehicle.

2. **New York Drive Clean Rebate:** Managed by NYSERDA, this incentive offers up to \$2,000 off a new PEV purchase through auto dealers at the point of sale. The amount is determined by the electric range of the vehicle, with BEVs offering a range greater than 200 miles qualifying for highest \$2,000 incentive. NYS does not currently offer higher incentives for income-qualified buyers or used PEV incentives. The incentive is limited to \$500 for PEVs with a MSRP over \$42,000. Limiting incentive amounts based on MSRP helps direct spending away from the wealthiest market segments who often prefer more expensive vehicles without the additional administrative burden of income qualifications. Providing incentives at the point of sale as this program does is a best practice to support LMI buyers. “Cash on the hood” incentives reduce financing requirements which may improve access and lower costs for LMI buyers.

NYS does not currently offer larger incentives for LMI qualified buyers or used PEV incentives as several other states have done (see section 4.2). If this project moves to Phase II for a pilot program, the project team will work with North Country community partners to develop LMI-focused incentives as this work proceeds.

According to the U.S. Department of Energy, NYS electric distribution utilities are not currently providing consumer incentives for PEV purchases, although many do offer off-peak EV charging programs.⁸⁴ Some distribution utilities in other states are providing income-sensitive incentives for PEV purchases as well as support for home EVSE equipment and installations which may be worth exploring in future utility EV program plans.

The vehicle scrap and replace program is another tool supporting LMI EV adoption in other states; for example, the California Clean Cars 4 All programs offers up to \$9,500 in additional incentives to LMI program participants who turn in an older, higher polluting vehicle to purchase a new or used PEV or a voucher for other clean mobility options like public transportation (see section 4.2 for additional details). Demand for these programs has exceeded available funding in some regions—an indication of the success of these equity-centered investments, making them a potential model to consider in NYS.

5.1.2 Financing Support

In many of the stakeholder interviews, the project team heard LMI populations in the North Country were not able to access vehicle financing due to two factors: lack of financial capacity and poor credit. A few interviewees also identified a negative feedback cycle for transportation costs with LMI individuals or

households, where they purchase an inexpensive used vehicle that is often in disrepair, pay high maintenance costs to keep that vehicle operating, and then when the vehicle is beyond repair they purchase another similar vehicle and start the cycle again. In this loop, the individual or household is never able to get ahead of their transportation expenses.

In terms of financial capacity, one metric for transportation affordability suggests transportation expenses should be 10 percent of household income or less, and combined transportation and housing expenses should be no more than 45 percent of income.⁸⁵ The Center for Neighborhood Technology's Housing and Transportation (H+T[®]) Affordability Index indicates North Country residents pay between 27–36 percent of their income toward transportation expenses (on average), and LMI populations would experience higher burdens.⁸⁶ While struggling with disproportionate transportation burdens and caught in the negative feedback cycle of vehicle repair, financing a PEV (or any vehicle) is often not feasible for LMI populations.

However, financing support for a reliable PEV with lower operating and maintenance costs could help break the negative feedback cycle and reduce transportation cost burdens, which would help LMI drivers avoid high-interest rates associated with lower credit scores or other predatory lending practices they may encounter when shopping for a vehicle. Coupled with incentives to lower upfront purchase costs, low interest rate financing at a reasonable interest rate could potentially lower transportation expenses to 10–15 percent of household income due to savings on fuel and maintenance costs for many North Country LMI households currently experiencing high transportation cost burdens. The literature review detailed in section 4.3 found financing options may not support greater LMI PEV interest, but this may be worth further exploration in future work, particularly if financing can be supported through trusted institutions already working to support anti-poverty initiatives.

Several North Country organizations interviewed for this project noted local credit unions have supported financing of energy efficiency upgrades for LMI households. United Way-Adirondack is developing a microloan program for LMI households to improve access to reliable transportation. As noted above, energy efficiency programs have demonstrated that financing rates less than 5 percent are critical to improving access to LMI populations. To the extent local credit unions or United Way-Adirondack can offer rates less than 5 percent, they could be valuable partners

for a potential pilot. Importantly, financing will not be a viable option for all LMI households. Even with reduced operation and maintenance costs, financing a PEV is likely too great of a financial burden for very low-income households. A program that provides free or deeply reduced costs for PEVs is likely the best option to help these households reduce transportation expenses and emissions through electric vehicle ownership.

Table 9 illustrates how several assumptions regarding financing capacity for LMI drivers could affect PEV purchasing. The monthly income in the first column is based on the upper bound of annual income for the LMI income classes, as defined in section 1.3. The monthly affordable transportation limit is based on 10 percent of monthly income—a reasonable cost burden for most households. The gasoline vehicle borrowing capacity is the principal amount available to a potential borrower for a five-year loan at 5 percent interest, after deducting \$130/month for gasoline expenses (based on 1,000 miles/month in a 25 MPG vehicle with gas at \$3.19/gallon) and another \$92 for basic insurance and registration fees in NYS. This assumes only one vehicle per household and does not factor in maintenance or other vehicle ownership costs. The PEV borrowing capacity adds \$65/month in potential transportation energy cost savings with home charging and as shown could allow a LMI vehicle purchaser to access a more expensive PEV that could offer long-term operating cost savings without exceeding the affordability limit. It is also important to note the estimate of borrowing capacity does not account for PEV purchase incentives that could further support an affordable PEV purchase.

Table 9. Vehicle Financing Capacity by LMI Class

Income Class	Monthly Income (4 Person Family)	Monthly Affordable Transportation Limit	Gasoline Vehicle Borrowing Capacity	PEV Borrowing Capacity
Moderate Income	\$6,400	\$640	\$22,200	\$25,600
Low Income	\$4,800	\$480	\$13,700	\$17,100
Very Low Income	\$2,875	\$288	\$3,500	\$6,900

5.2 PEV Charging Infrastructure

There is limited public EVSE availability in the North Country, but as the NYS infrastructure programs described in section 3.3 are implemented and additional charging investments supported by the recent passage of the federal Infrastructure Investment and Jobs Act (IIJA) are advanced it will be important to ensure rural areas of NYS receive EVSE support.

The expense of installing EVSE and limited returns on capital investments with current low PEV adoption rates make it challenging to build out this important infrastructure with private funding. Table 10 has approximate cost ranges for the different EVSE types. Installation costs are highly site specific—the available electric capacity and distance from existing service panels to the location of the charging equipment are often the critical determinants of installation costs. Single-family home installations are typically toward the lower end of these cost ranges, and in at least one case an automaker is providing a free EVSE installation with a PEV purchase.⁸⁷

Table 10. Typical EVSE Equipment and Installation Costs

Cost Component	Level 1	Level 2	DC Fast Charging
Equipment Price	\$30–900	\$600–9,000	\$15,000–100,000+
Installation	\$200–450+	\$400–12,000+	\$10,000–100,000+
<i>Total Cost</i>	<i>\$230-1,350+</i>	<i>\$1,000–21,000+</i>	<i>\$25,000–200,000+</i>

The following sections provide additional information and recommendations for advancing LMI PEV charging infrastructure availability to support North Country clean transportation efforts.

5.2.3 Home Charging

The vast majority of PEV drivers do most of their charging at home during the overnight hours. This is generally the most convenient option, and it is usually the lowest cost option as public charging often charges additional fees to cover electricity use and costs to cover credit card fees, peak electric demand charges, and more expensive EVSE equipment intended for public use. In addition, the current lack of public and workplace charging availability in the North Country reinforces the need for PEV drivers to have charging options available at their residence.

Figure 14⁸⁸ provides information on the share of households in single-family homes versus multifamily and mobile homes in New York State and the seven North Country counties. As expected in a more rural area like the North Country, there is a significantly lower share of multifamily structures, especially larger properties with more than 10 units. The prevalence of single-family homes in the North Country may be beneficial for PEV adoption as it is generally simpler and lower cost to install charging in single-family homes.

Figure 14. Share of Housing Types in New York State and the North Country

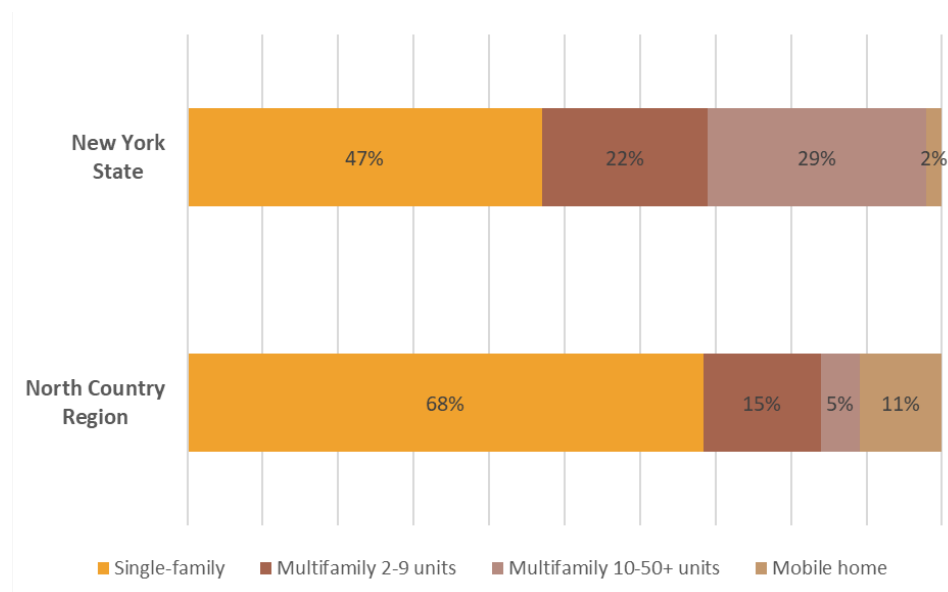
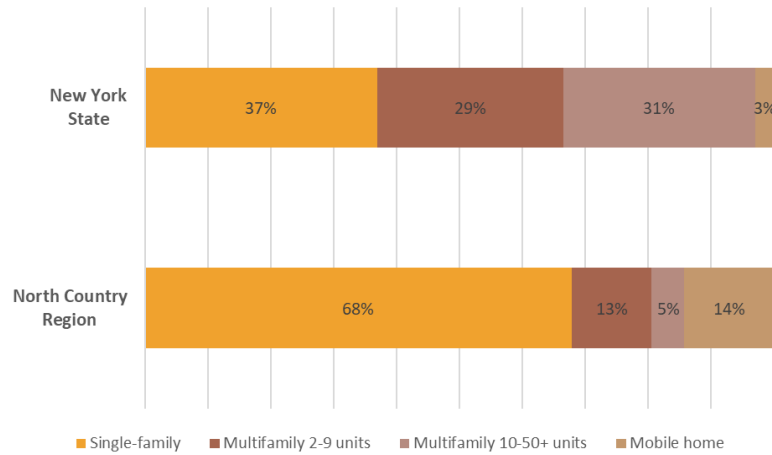


Figure 15⁸⁹ presents similar Census data on shares of housing types but is limited to households at or below 299 percent of the federal poverty level, which approximately corresponds to the NYSERDA LMI definitions from section 1.3 above. Statewide, LMI residents are less likely to live in a single-family home compared to the population as a whole. However, in the North Country there is no difference between LMI and the general population as single-family homes represent about 68 percent of total North Country housing stock, and 68 percent of households under 300 percent of the federal poverty level are in single-family homes. One distinction for the North Country is the higher share of households living in mobile homes, which are 11 percent of total housing in the region, but have 14 percent of the LMI households.

Multifamily housing is less common in the North Country, but still represents 20 percent of total housing stock and 18 percent of the LMI households as shown in Figure 15. EVSE installation costs are generally higher at multifamily properties and residents in rental apartment buildings may be challenged to convince property owners/managers of the need to make investments. Building code requirements for EVSE readiness have been used in other states to help address this issue for new housing developments, but challenges would remain for existing housing stock. Electric distribution utilities have provided financial and technical support for multifamily EVSE in some states. Public investments may also be needed, especially in areas with higher concentrations of LMI multifamily housing. Use of Level 1 EVSE could reduce costs and still provide adequate PEV charging capabilities, especially for PHEV owners as described in section 3.3.

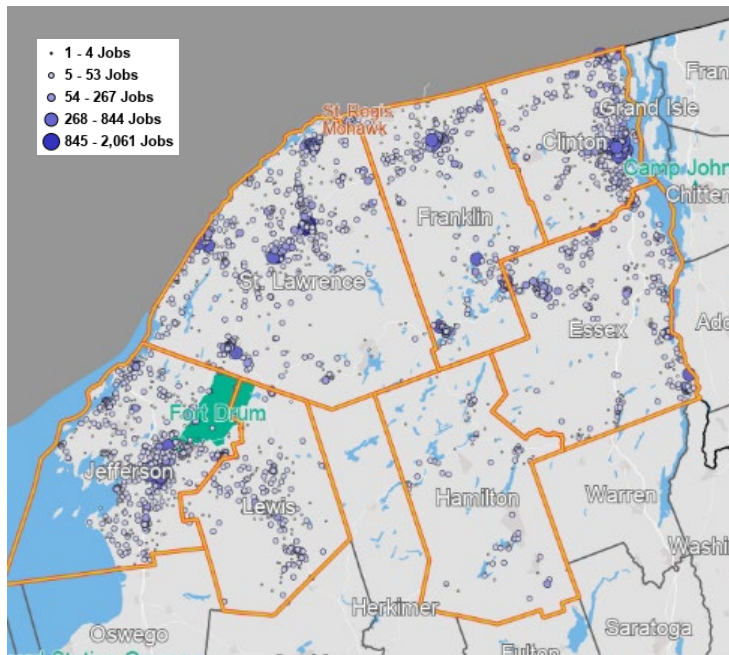
Figure 15. Share of Housing Types for Households at or below 299 Percent of Federal Poverty Level



5.2.4 Workplace Charging

Home charging options are preferred for the reasons stated above, but EVSE availability at workplaces can help promote PEV ownership and provide lower cost charging options to LMI drivers who do not have ready access to home charging. Figure 16⁹⁰ below shows the locations of over 93,000 jobs in the North Country region, each of which is a potential opportunity to support PEV owners and in some cases business PEV fleets as well.

Figure 16. North Country Job Locations



Electric distribution utilities in NYS are supporting workplace charging investments and the project team for this work engaged with National Grid on potential opportunities to support LMI PEV ownership. Through targeting workplace charging investments at employers with significant numbers of LMI employees—such as the manufacturing employment hub located in the former Plattsburgh Air Base, which includes Bombardier and Nova Bus—two companies developing cleaner transportation rolling stock may be especially suitable workplace charging hosts.

5.2.5 Public Charging

The present level of charging infrastructure availability in the North Country is not adequate to meet the needs of most PEV drivers without access to home charging. As additional public charging investments are made in disadvantaged areas this may change in the future, especially as longer range and more cold resistant battery technologies are commercialized. NYS is already taking several steps to increase public charging infrastructure, but it will be important to monitor and evaluate whether the level of planned investment will be adequate to provide a robust safety net of charging availability to ensure BEV drivers are not stranded and charging is available in areas with higher densities of multifamily and mobile home properties where on-site charging has additional barriers to implementation.

As public charging availability grows, it will be important to ensure PEV drivers understand any applicable fee structures. For EVSE receiving public support there may be a role for State oversight to ensure pricing practices are not predatory as part of funding agreements to ensure any LMI drivers who are forced to rely on public charging are able to access similar operating cost savings as a driver with home charging. Convenient payment mechanisms including credit and debit cards are also needed, although these options alone may not be adequate to serve the entire LMI community—research from the NY Federal Reserve Bank indicates only about 50 percent of low-income adults have a credit card available.⁹¹ This would suggest providing options for cash payments could be helpful, which could be done in some instances by integrating EVSE payment with retail point-of-sale systems when located at fueling stations or potentially by providing preloaded vouchers for charging use that could be used at public charging locations.

5.3 PEV Purchase Availability

As discussed in section 3.1, new and used auto dealerships have a critical role in advancing PEV ownership. The vast majority of LMI auto sales occur through dealerships and until the supply of used PEVs reaches much higher levels new dealers will continue to be important partners in building the PEV marketplace. This may also extend to Tesla and other direct-to-consumer automakers who do not have traditional franchise relationships with local dealerships.

Dealers in rural areas like the North Country may have additional challenges to stocking and servicing PEVs, as they may need to invest tens of thousands of dollars in charging infrastructure, service equipment, and trainings to sell and service PEVs—funds which are difficult to recoup in lower sales environments typically found in rural areas. Providing funding and training opportunities to dealerships to support these investments and increase PEV knowledge could increase PEV purchase availability in the North Country and other rural areas.

According to the National Auto Dealers Association (NADA), about 30 percent of dealership net profits flow from service and parts revenues.⁹² Greater PEV adoption may impact these revenues as PEVs have proven to have lower maintenance costs than comparable conventional vehicles, although there are still service needs for PEVs. Providing additional dealership sales incentives could help reduce the impact of reduced PEV servicing revenues.

New York State's ZEV participation should help increase PEV availability at dealerships, especially as the program requirements grow with each new model year of vehicles. Planned updates to the program proposed in CARB's Advanced Clean Cars II (ACC II) regulations would require automakers to reach 100 percent ZEV sales for new light duty vehicles by 2035.⁹³ If NYS continues to participate in this program, it will spur automakers to offer additional PEV models at various price points with the types of capabilities desired by customers in the northeast, including all-wheel drive and higher ground clearance vehicles.

The ACC II regulations also propose a new requirement for automakers to include a consumer-friendly interface to understand the current battery health of a PEV. For example, a dashboard readout that will indicate how much of the original battery capacity remains on a scale from 1–100%. Most PEVs currently available for sale do not provide this sort of battery health reporting in a way that is transparent to a consumer, so this will be very helpful to ensure a LMI driver does not unknowingly purchase a used PEV with battery issues that could require expensive repair or replacement servicing.

As new and used vehicle prices reach historic highs due to a variety of supply chain and inflationary pressures, it may grow increasingly challenging for LMI drivers to afford a vehicle purchase, including PEV options.⁹⁴ It will likely take many years to reach widespread availability of PEVs in the used market, so market interventions may be needed to spur used PEV availability in rural areas. This may include working with new car dealers to provide incentives that will result in them retaining more off-lease and trade-in PEVs to sell locally rather than allowing them to be sent to regional auto auctions. In some cases, it may be necessary for rural EV purchasers to work around local used PEV supply constraints by accessing national outlets like Carvana, Vroom, and others offering a greater variety of used PEVs for sale with national delivery options. Supplying PEV purchase incentive options—that can support LMI consumers in making a purchase through one direct-to-consumer channels—should be considered if it results in a wider range of choices for LMI PEV purchasers.

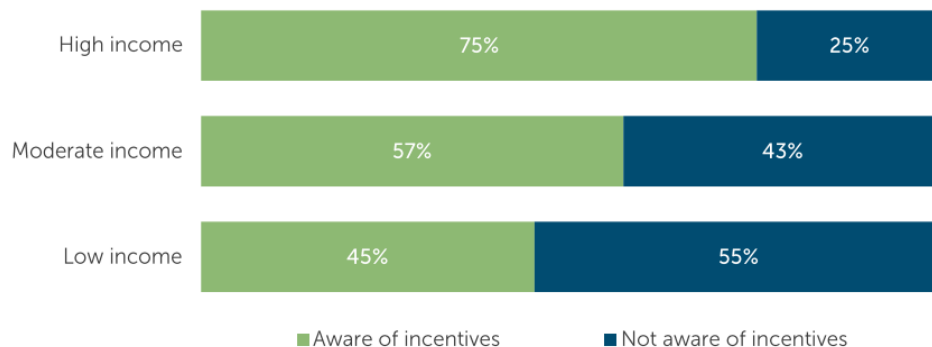
5.4 PEV Outreach and Engagement Strategies

In developing this whitepaper, the project team conducted twelve interviews with organizations providing services to LMI communities in the North Country, as well as other stakeholders including utilities and a car dealership. These interviews provided valuable information and perspective on the needs of the North Country population that should inform the design of a pilot program. A separate report is available detailing stakeholder engagement activities completed for this project. A larger scale LMI PEV program would ideally build on connections formed in this work along with initial experience gathered from the pilot implementation planned for Phase I of our project and then engage more deeply with LMI community members and other statewide and regional service providers to guide long-term programs. As noted above, meaningful community engagement and capacity for self-determination within program development are critical elements to a successful LMI PEV program.

Through the interviews, the project team learned low-income households were not generally shopping at dealerships and that most of their vehicles were purchased through family members or other private sales. This indicates traditional vehicle dealership advertisements may not reach low-income populations. Many of the service organizations interviewed, as well as project partner ANCA, are trusted community organizations in the North Country and would likely be the best messengers for sharing information about a pilot program. ANCA and several of the community service organizations interviewed have offered to share pilot program information with their constituents should this project advance to Phase II.

Messaging for LMI drivers could include detailing the available incentives and potential PEV cost savings. Many consumers are not aware of the range of PEV models and incentive offerings. Figure 17 below⁹⁵ is from a recent Vermont survey of PEV consumer attitudes and indicates incentive awareness is significantly lower among LMI populations. Outreach resources for community partners to engage with their constituents on these issues would be a valuable channel to reaching this market segment.

Figure 17. PEV Incentive Awareness by Income (Efficiency Vermont)



Another engagement opportunity that emerged from the interviews is to partner with the manufacturing hub businesses in the North Country. Since transportation challenges are one of the barriers to workforce development in the region, partnering with one of the larger businesses in the area to promote PEVs could help accelerate adoption. For example, if one of the businesses installed workplace charging through existing State or utility programs as described above, they could help promote a PEV pilot in tandem to help attract and retain workers.

An important point that emerged from the interviews is that most LMI households are not focused on their GHG emissions when selecting a vehicle, and that cost is the primary motivator of vehicle purchase decisions. Any engagement materials for a PEV pilot should accordingly focus on cost to best resonate with the target audience.

5.5 Conclusion

New York State’s Climate Leadership and Community Protection Act (CLCPA) enacted ambitious goals to reduce greenhouse gas emissions, including an emphasis on equity-based approaches to emission reductions that will benefit disadvantaged communities across the State.

Accelerating PEV use is an essential strategy to meeting the CLCPA goals. Significant barriers to PEV uptake were reviewed in section 3 and throughout this document. Many of these impediments are particularly challenging for lower income New Yorkers to overcome.

Growing LMI PEV adoption will require action on multiple fronts, including addressing higher PEV purchase costs, increasing new and used PEV availability, charging infrastructure development, boosting consumer awareness and more.

Research suggests a combination of the PEV market development activities covered in section 5 above will accelerate LMI PEV adoption. These concepts will be further refined through pilot program implementation in the North Country should NYSERDA elect to proceed with Phase II of this research project.

Continuing this work and additional efforts will be critical to supporting LMI households in the clean transportation revolution underway. Waiting for the market to address LMI needs without intervening will delay PEV adoption in this community, likely for many years until affordable used PEVs are available in much greater supply. This delay will result in further harm to LMI communities most burdened by fuel costs and impacted by transportation emissions but least able to afford participation in the PEV marketplace as it currently exists.

Endnotes

- 1 New York State 2021 Statewide Greenhouse Gas Emissions Report, https://www.dec.ny.gov/docs/administration_pdf/ghgsumrpt21.pdf
- 2 New York State Department of Environmental Conservation 2020 Zero Emission Vehicle Credits, https://www.dec.ny.gov/docs/air_pdf/zev2020credit.pdf
- 3 New York State Energy Plan
- 4 New York State. Governor Cuomo announces nation leading initiatives to expand electric vehicle use and combat climate change. <https://www.governor.ny.gov/news/governor-cuomo-announces-nation-leading-initiatives-expand-electric-vehicle-use-combat-climate>
- 5 Governor Hochul Announces Adoption of Regulation to Transition to Zero-Emission Trucks, <https://www.governor.ny.gov/news/governor-hochul-announces-adoption-regulation-transition-zero-emission-trucks>
- 6 California Air Resources Board Advanced Clean Trucks Fact Sheet, <https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-fact-sheet>
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