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EXPANDING ZERO-EMISSION MOBILITY EQUITY AND ACCESS

WORKSHOP REPORT



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This workshop report summarizes the knowledge gathered from a series of listening sessions on expanding access to zero-emission vehicles commissioned and convened by the International Zero-Emission Vehicle Alliance. This work is conducted for the International Zero-Emission Vehicle Alliance and is supported by its members (Baden-Württemberg, British Columbia, California, Canada, Connecticut, Germany, Maryland, Massachusetts, the Netherlands, New Jersey, New York, Norway, Oregon, Québec, Rhode Island, the United Kingdom, Vermont, and Washington). Dale Hall and Amy Smorodin provided critical reviews and key input. Members of the International Zero-Emission Vehicle Alliance and the listening series participants reviewed an earlier version of the report. Their review does not imply an endorsement, and any errors are the authors' own.

INTRODUCTION

The global electric vehicle market continues to grow, with cumulative light-duty electric vehicle sales surpassing 5 million in 2018. Figure 1 shows the total global electric vehicle sales from 2010 through 2018. As shown, annual global electric vehicle sales surpassed 2 million units in 2018, an increase of over 60% from 2017. Electric vehicle sales tend to be concentrated in the major markets of China, Europe, and the United States, where there are numerous policy measures in place to overcome adoption barriers including model availability, higher upfront cost, infrastructure, and consumer awareness.

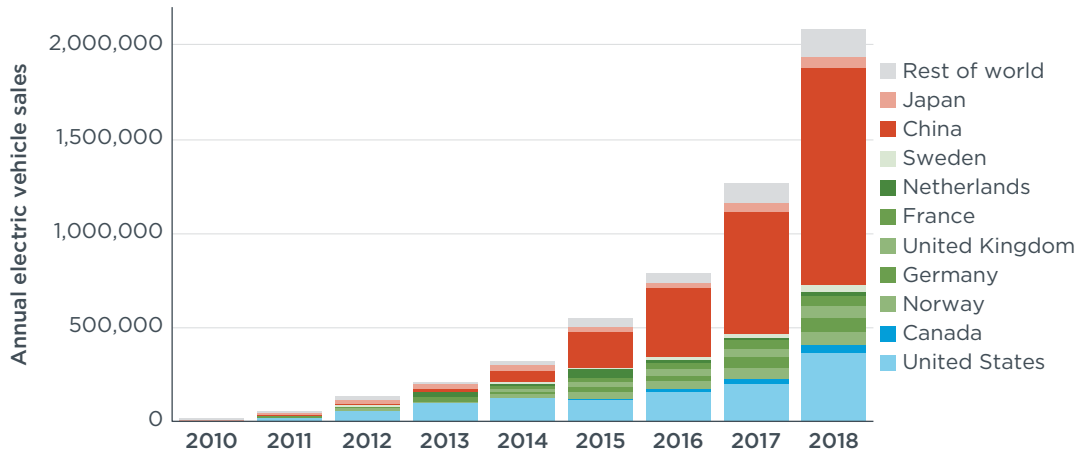


Figure 1. Global electric vehicle sales 2010 through 2018. Vehicle sales data from EV-Volumes (EV Data Center, 2019), <http://www.ev-volumes.com/datacenter/>

Despite early success and rapid zero-emission vehicle (ZEV) market development across the major markets, more work is needed to increase and broaden access to zero-emission mobility beyond early adopters. Numerous governments are committed to transitioning entirely to ZEVs within the next three decades. At the same time, many of these same governments are committed to providing equitable zero-emission mobility options in their jurisdictions.

For a complete and equitable ZEV transition, ZEVs will need to see deployment beyond early adopters to all demographics, including low-income communities, residents in multi-unit dwellings, and rural populations. Governments and nonprofit groups are exploring a variety of options to overcome barriers in low-income and underserved communities and increase access to affordable and practical ZEV solutions.

This workshop report summarizes the learnings from a listening series of five webinars on expanding ZEV access, commissioned and convened by the International Zero-Emission Vehicle Alliance (IZEVA) in August and September, 2019. Table 1 summarizes the five topics covered and lists the participants who represented non-profit and community organizations; city, regional, state, and provincial governments; utilities; and other thought leaders across North America and Europe. The listening series fostered discussions on how the leading groups, projects, and policies are working to expand access to zero-emission mobility and push for broader and more equitable inclusion of more communities in the transition.

Table 1. Summary of expanding access listening series

Topic	Participants
Framing: importance of expanding access and what it means to provide equitable zero-emission mobility options	Jeff Allen, <i>Forth</i> ; Terea Macomber, <i>GRID Alternatives</i> ; Joel Espino, <i>The Greenlining Institute</i> ; Eleanor Fort, <i>Green for All</i> ; Terry Travis, <i>EVHybridNoire</i>
Making ZEVs affordable: improving incentives to ensure equitable access	Rachel Sakata, <i>Oregon Department of Environmental Quality</i> ; Terea Macomber, <i>GRID Alternatives</i> ; Simon-Pierre Rioux, <i>Québec Electric Vehicle Association</i> ; Brett Williams, <i>Center for Sustainable Energy</i> ; Carl-Friedrich Elmer, <i>Agora Verkehrswende</i> ; Petter Haugneland, <i>Norwegian EV Association</i>
Making ZEVs convenient: ensuring charging options for all	Andrea Pratt, <i>City of Seattle</i> ; Bob Van Meter, <i>Community development leader</i> ; Karl Popham, <i>Austin Energy</i> ; Zach Franklin, <i>GRID Alternatives</i> ; Aaron Milano, <i>Portland General Electric</i> ; Mark Tang, <i>Bay Area Air Quality Management District</i> ; Kathleen Yip, <i>TransForm</i> ; Nicole Scott Harris, <i>New Jersey Environmental Justice Alliance</i>
Ensuring the economic ZEV benefits are widely experienced	Ingrid Fish, <i>City of Portland</i> ; Zainab Badi, <i>GRID Alternatives</i> ; Jon Stenning, <i>Cambridge Econometrics</i> ; Tegan Molloy, <i>Forth</i> ; Nick Clark, <i>British Columbia Ministry of Energy and Mines</i> ; Joy Massey, <i>TransForm</i> , Petter Haugneland, <i>Norwegian EV Association</i>
Diversifying the ZEV market	Ingrid Fish, <i>City of Portland</i> ; Isabelle Joncas, <i>Equiterre</i> ; Chelsea Sexton, <i>EV advocate and advisor</i> ; Jen Grebeldinger, <i>Community Energy Association</i> ; Eva DeCesaro, <i>Pacific Power</i> ; Dave Roberts, <i>Vermont Energy Investment Corporation</i>

The key insights from each webinar are summarized in the sections below. In them, we largely use the voices and perspectives of the expert speakers and their insights are paraphrased throughout. The summary is intended to be representative of the listening series key themes and messages and do not necessarily reflect the views of all participating speakers and their organizations.

WEBINAR 1

FRAMING AND MOTIVATION

The goal of the first listening series webinar was to frame the issues surrounding equity in ZEV access. Participants discussed the importance of expanding access, what it means to provide equitable zero-emission mobility solutions, and how governments can make ZEV policies more equitable. Specific topics covered in the discussion are summarized below.

Expanding ZEV access has major social and environmental benefits. Investments in transportation reflect our societal values, and disadvantaged and underserved communities have been ignored in many markets. Racial disparities have emerged from centuries of lack of investment and structural discrimination, including building highways or rail lines directly through low-income communities and communities of color. These groups face disproportionately large health impacts from climate change and environmental pollution, and ZEVs offer great potential to reduce pollution and improve public health, particularly for those who are most vulnerable. Expanding ZEV access is an opportunity to include marginalized communities in a new solution that alleviates inequalities. The unfortunate reality is that the fossil fuel industry lobbies against ZEV policies by obscuring the benefits they can deliver to diverse communities and by spreading misinformation suggesting that ZEVs are for the rich only. From a moral and practical perspective, a large coalition is needed to support clean transportation, which cannot be done if ZEVs are perceived as an exclusive privilege.

There is a big difference between reaching a mainstream market and reaching historically marginalized communities. Policymakers need to recognize and reconcile historic disparities and focus on those that have been marginalized. These communities stand to benefit most from the transition to ZEVs. Furthermore, the barriers to ZEV adoption are typically greatest for low-income communities and communities of color; if we can make ZEVs work for those with the toughest barriers, ZEVs can work for other communities. One of the city leaders in Portland pointed out that a “targeted universalism” approach—where targeted strategies focused on the most marginalized groups are used to meet universal goals—can promote racial justice and accelerate ZEV market growth simultaneously.

Real progress on equity happens when governments operationalize equity into their planning and policymaking. Policies and programs need to be viewed through the lens of community development. Programs, although well-intentioned, are often built with equity as an afterthought, which can cause additional issues. “Sometimes well-intentioned stakeholders can cause more harm than good if they haven’t thought through a holistic electrification strategy with Equity coded in at the core from the inception of program or policy” (Terry Travis). Equity can’t simply be a component or earmark in government policies and programs. Instead, equity needs to be a process built in from the beginning with a commitment to integrating equity in mission, objective, design, implementation, and evaluation. A term that encapsulates this idea is “operationalizing equity.” All ZEV policies should work to reverse disparities, promote justice, and serve the most vulnerable populations.

“Sometimes well-intentioned stakeholders can cause more harm than good if they haven’t thought through a holistic electrification strategy with Equity coded in at the core from the inception of program or policy.”

—Terry Travis, EVHybridNoire - The nation’s largest network of diverse EV drivers and enthusiasts

Implementing smart policies can improve disparities and influence who can access and benefit from ZEVs. Cultural, economic, social, and geographical differences can all be barriers to adoption. Understanding communities, their mobility needs, and their unique ZEV barriers is a critical first step to providing equitable zero-emission mobility. There is no one-size-fits-all solution, and we need to engage, listen, and empower communities for success. It’s important that people are aware of and understand the technology and can see themselves in ZEVs. Government actions require consultation with disadvantaged communities and community-based organizations (CBOs) or there is risk of ineffectiveness. More broadly, policymakers would ideally think holistically about how ZEV policies can benefit many different groups of people. The “curb cut” analogy is apt example: the policy was designed to help those in wheelchairs, but it has made streets safer and friendlier for everyone. More specifically, ZEV programs would ideally streamline access and support for disadvantaged communities.

Policy outcomes are more important than their objectives. Despite admirable intentions to reduce greenhouse gas emissions or increase ZEV sales, if policy does not recognize and address socioeconomic and racial disparities, inequities can be perpetuated or exacerbated. “Including racial and socioeconomic equity in terms of access, affordability, jobs, and health benefits—and weighing these factors as equally important as climate emission reductions—is when we start to see really transformational policies and programs” (Eleanor Fort).

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—Eleanor Fort, Green For All

ZEV projects and programs generate jobs and economic opportunities, and these would ideally go to communities with the greatest needs. Examples of these opportunities include training programs and targeted hiring. Government contracts frequently go to the same group of well-connected companies. Small businesses—especially those in disadvantaged communities—deserve a fair shot at government investment.

Building internal capacity and education within government agencies should be an ongoing effort around the topics of racism, inequity, and how governments play a role. Seattle is an exemplary example of how to establish a vision and strong commitment to equity, and then implement ZEV and clean energy policies through that lens. Seattle’s Equity and Environment Agenda established a framework that applies to environmental programs and guides how the city works with communities. A 12-member Environmental Justice Committee of community leaders with strong connections with low-income people, people of color, indigenous peoples, immigrants, and refugees, serves as an advisory board and is instrumental in designing city programs. The Government Alliance on Race and Equity is also a good resource to help build capacity and improve understanding of why inequities happen and the government’s role to correct it.

“The only thing worse than not tackling these tough questions is pretending to when you’re not really serious or prepared to follow through.”

—Jeff Allen, Forth

The road ahead to improve racial injustices, inequalities, and uplift marginalized communities is a long, challenging, and critical one. Governments would be smart to under-promise and over-deliver. “The only thing worse than not tackling these tough questions is pretending to when you’re not really serious or prepared to follow through” (Jeff Allen).

WEBINAR 2

MAKING ZEVS AFFORDABLE: IMPROVING INCENTIVES TO ENSURE EQUITABLE ACCESS

Financial incentives are key to overcome ZEVs' upfront affordability barrier and give impetus to the early market while technology costs fall. This webinar explored what is known about where and to whom ZEVs are being sold, the use of incentives, and how enhanced programs for low- and moderate-income consumers are working. Participants discussed how incentive programs could be improved to be more inclusive for all, as summarized below.

Several ZEV incentive programs include specific design elements or dedicate a fraction of funding to promote more equitable access and overcome affordability barriers for lower-income consumers, including those in California, Connecticut, Massachusetts, New York, Oregon, and Québec. Equity approaches vary and include issuing increased rebates for low- and moderate-income households, incentivizing vehicle scrappage and replacement, providing rebates for used ZEVs, and restricting incentive eligibility based on vehicle price or consumer income. The situation is somewhat different in European markets like Germany and Norway, where there are fewer equity considerations but many incentive mechanisms in place which have tended to benefit higher-income consumers. The used ZEV market in Norway, Québec, and other high ZEV adoption areas is growing quickly and has great potential to expand access.

It is important to set an appropriate baseline when assessing how equity-focused incentive programs are working. Research by the Center for Sustainable Energy shows that new car buyers are not representative of the population at large. New car buyers are more frequently white, older, degree holders, residence owners, and higher income; this is where a lot of the social inequities lie. Equity-focused incentive programs appear to have some early success in diversifying ZEV access. This is especially clear when data is normalized to new car buyer demographics: recent data in California show that 58% of ZEV consumers who received rebates were white compared to 85% of new vehicle buyers nationwide. About half of rebated ZEV consumers are 50 years of age or older, which is similar to the age distribution of all new car buyers. Growth of the secondhand ZEV market may help alleviate income disparities in purchases. In Oregon, about 25% of incentive applications are for the "Charge Ahead" rebate, which provides additional rebates for income-eligible households for both new and used ZEVs. In Québec, where up to \$4,000 CAD are available for used ZEVs, surveys indicate that the average income of ZEV adopters is declining, yet disparities in gender and education remain.

Governments can improve incentives and maximize their effectiveness in several ways. Incentive access would ideally be streamlined for low-income and disadvantaged communities. Immediately issuing financial incentives at the point-of-sale can improve access for people with low income and liquid assets. Incentives would also ideally include carveouts for outreach and engagement. It is critical to have local community leaders who understand government incentives and local transportation challenges serve as ambassadors and build community interest and acceptance. Outreach by NGOs and CBOs helps to inform communities about ZEVs, their benefits, available

incentives, and builds trust between governments and communities who may otherwise be skeptical. These groups can speak to communities in a culturally and linguistically appropriate way.

“Funding community-led outreach and engagement is key to creating equitable access to incentive programs” (Terea Macomber). For effective outreach, aligning incentives with other programs and criteria like household income or census tract can help streamline efforts by NGOs and CBOs to help communities leverage government support. One especially accessible and integrated program is California’s Clean Vehicle Assistance Program, which issues grants and affordable financing for people with income below 400% of the Federal Poverty Level. The program uses Salesforce’s Customer Relationship Management software on the back end to facilitate integration with other programs.

“Funding community-led outreach and engagement is key to creating equitable access to incentive programs.”

—Terea Macomber, GRID Alternatives

Providing support for low-income consumers typically requires more funding per vehicle, and governments will face budgetary decisions and will need to define goals. Governments would ideally think holistically through program design and implementation, including incentive design, implementation strategy, and effective engagement. “We have the data to be smart and strategically target incentives to those who need them most...that will improve cost effectiveness” (Brett Williams). The Center for Sustainable Energy administers several U.S. state incentive programs and publicly provides the data and analysis needed for stakeholders to analyze and refine incentive programs to meet goals. Strategies include increasing rebate values within program design, issuing targeted incentives and funding, and effectively engaging CBOs and their communities. For example, policymakers in Oregon defined a minimum amount of money to be set aside for equity-focused ZEV projects each year.

“We have the data to be smart and strategically target incentives to those who need them most... that will improve cost effectiveness”

—Brett Williams, Center for Sustainable Energy

Governments may also face decisions about how to balance and allocate incentive funding for personally-owned ZEVs versus alternatives like electric bikes, mass transit, and shared mobility. This is especially important for dense urban areas, and governments will need to understand how communities use transportation and identify potential gentrification and displacement impacts. There is often a perception that electrifying transit is an equity solution on its own, but this reinforces the idea that electric cars don’t make sense for underserved communities. It will be critical to carefully assess which transportation options are most helpful for different communities and individuals. Recognizing that there is no one size fits all solution,

California has proposed modifying its Clean Cars 4 All program to provide up to \$7,500 for vehicle scrappage and allow for more flexible use of incentive dollars, including clean vehicle or electric bike procurement, transit passes, carsharing membership, and other options.

Governments also face decisions about how to fund road infrastructure. Taxing gasoline has been the predominate method of infrastructure funding in the United States, and annual ZEV fees of up to \$225 are emerging in some states. Providing incentives and simultaneously issuing annual fees in an early market sends conflicting price signals that undermine the effectiveness of incentives in spurring adoption, especially among those with lower incomes. The punitive impacts of annual fees appear to outweigh any positives, and governments will need to do their due diligence to fairly address the issue of ZEVs paying into infrastructure funding. ZEV drivers currently pay disproportionate amounts compared to combustion car drivers, and other methods like electricity- or VMT-taxes are more fair but harder to implement.

WEBINAR 3

MAKING ZEVS CONVENIENT: ENSURING CHARGING OPTIONS FOR ALL

Expanded charging infrastructure at homes, workplaces, and public locations increases driver confidence, extends vehicle operating functionality, and helps overcome practical barriers. Lack of access to dependable charging infrastructure can be a strong barrier to ZEV adoption. This webinar explored infrastructure investments to date and how efforts to guide more equitable deployment have worked. Participants discussed how to implement well-designed policies and allocate infrastructure support to increase access in underserved areas, as summarized below.

Innovative government, utility, industry, and NGO actions are working to deploy more accessible charging infrastructure. These include infrastructure planning, direct deployment at residential and public locations, permitting in the public right-of-way, adopting EV-ready building codes, and providing incentives for home, multi-unit dwelling, workplace, and public chargers.

Some of the early efforts to guide more equitable infrastructure deployment have faced challenges. Charging infrastructure can be viewed by some as a symbol of displacement and gentrification. Acceptance is tied to vehicle access: complementary actions like fair financing, rebates, workforce development, and carsharing can help. Deploying infrastructure in low-income areas is not the same as ensuring access to electric mobility; the focus should be on serving people, not increasing infrastructure counts. “Infrastructure investments aren’t inherently equitable... we have to be really intentional if we want to create equitable access and provide benefits, centering on the communities we want to serve” (Zach Franklin). A good process for any programs designed to increase access is to consult with the communities and people with the biggest barriers about their mobility needs, determine how technology can address these needs, then work backward to design the policies needed to solve them. This broad approach can work for many different communities.

“Infrastructure investments aren’t inherently equitable...we have to be really intentional if we want to create equitable access and provide benefits, centering on the communities we want to serve.”

—Zach Franklin, GRID Alternatives

One promising utility community-centered equity-focused program is underway in California. Pacific Gas & Electric’s \$4 million Empower EV Charger Incentive and Education Program is specifically designed for lower income households and can serve as a model for programs elsewhere. The program addresses the unique barriers that lower-income communities face by partnering with local CBOs, tailoring outreach and education, issuing point of sale incentives for residential infrastructure and panel upgrades, and streamlining charger installations.

“EV infrastructure investments need to be accompanied by information for the average person to understand its purpose and value and how it benefits the greater public good, beyond individuals who can personally afford a ZEV” (Nicole Scott Harris). Targeted investment in areas with disproportionate pollution is a good way to demonstrate benefits and increase community support. Engagement and education are especially important if chargers are built before any ZEVs arrive, or there is risk the chargers are perceived to be there to help someone else. It is also helpful to talk to communities and learn about other places they travel and would like to charge, as alternatives could be equally convenient and lower cost.

“EV infrastructure investments need to be accompanied by information for the average person to understand its purpose and value and how it benefits the greater public good, beyond individuals who can personally afford a ZEV.”

—Nicole Scott Harris, New Jersey Environmental Justice Alliance

Governments may face challenges developing long-range infrastructure plans due to the rapidly changing technology and mobility landscape. Planning tools can help give an idea of where we’re going, but there is a need for flexibility and reevaluation. One thing that doesn’t change is wiring and electricity—new make-ready infrastructure will be useful no matter what kind of charger is installed later, and EV readiness is critical to drive down future costs. EV-ready building codes are an essential tool for supporting equitable investment in infrastructure. Mandating 100% EV-ready-spaces is also feasible and can be attractive to many stakeholders.

Developing infrastructure and vehicle access solutions for bankless communities is another challenge. Community Development Financial Institutions (CDFIs) have experience working with these communities and providing financial products. There is an opportunity to tap in to the CDFI ecosystem to expand vehicle and infrastructure access through fair financing with capped interest rates. The California Beneficial State Bank is a CDFI that can serve as a good model for fair financing that is more racial and gender inclusive. The State Bank uses a combination of lower-interest not-for-profit vehicle loans with down payment assistance, which has proved to be an effective combination.

Policymakers could further expand charging options in several ways. Governments can take inventory of their real estate, buildings, and parking lots and assess which sites are good infrastructure candidates. Adopting right-of-way policies can make it easier for others to invest in and deploy charging infrastructure. Public-private-partnerships with diverse partners from utilities to ride-hailing companies can help fund infrastructure and reach new communities. In the United States, non-profit owners of multi-family housing have credibility with communities and could be key partners in building out charging or administering community electric carsharing. More broadly, equity-focused programs would ideally be as simplified and streamlined as possible.

In the northeast United States, carbon market funds have largely gone to electrifying public transportation. Electrifying transit and school buses, paratransit, carshare,

and other modes can help raise public awareness and exposure and make future public investments in private vehicle-focused programs like residential chargers more palatable. Going forward, there may be an opportunity to direct some carbon market funding to charging infrastructure.

Governments may need to pass new laws to overcome practical barriers hindering infrastructure growth. In Austin, Texas, utility Austin Energy was by law the only company allowed to sell electricity, which limited private sector investment and competition; the city modified local code to enable more investment and allow others to re-sell electricity. In Massachusetts, charging stations were considered “utilities” until a 2014 Department of Public Utilities order declaring that electric vehicle charging stations provide a service and are not subject to utility regulation. Similar barriers may persist in other jurisdictions.

WEBINAR 4

ENSURING THE ECONOMIC ZEV BENEFITS ARE WIDESPREAD

Beyond environmental and social benefits, ZEVs offer the potential for substantial micro- and macro-economic benefits, such as lower per-mile energy costs and new employment opportunities. This webinar explored the promising economic benefits of low-cost zero-emission mobility and workforce development potential in the emerging ZEV economy. Participants discussed opportunities for lower-cost mobility and access to clean jobs given the onset of more ZEVs being deployed, as summarized below.

ZEVs enable lower per-mile costs. More inclusive ZEV access is key to maximizing the individual and societal economic benefits. Multiple shared and electric mobility options exist, but these often are not available in the neighborhoods where communities need them most. Focusing on expanding lower-cost options like electric bikes, scooters, buses, and carshares provides a broader ecosystem of choices so people can still comfortably, reliably, efficiently, and affordably get around without owning a car. It is critical to conduct mobility needs assessments to understand the mobility options that residents are interested in.

There are several exemplary programs that are working to provide the economic benefits of ZEVs to low-income people and people of color that can serve as models for how to expand access. In Huron, California, Green Raiteros is a community-operated rural electric rideshare service that fills a mobility gap predominately for Latino and agricultural communities. Another promising program is the electric carsharing and mobility hub pilot to bring affordable vehicles and infrastructure to affordable housing developments in the San Francisco bay area. A key component is community engagement: residents help guide program design to inform the mix of mobility options at each site, including electric carsharing, electric bikes, free transit passes, and other shared and electric options.

Forth's Electrify Your Ride program in Portland works to help low-income ride-hail drivers secure fair financing through a loan at a local credit union and CDFI. Some car loans available to low-income drivers have interest rates of 15% to 28%, and drivers might owe more than the vehicle is even worth. With greater volumes of used electric vehicles becoming available, there are more options to procure electric vehicles for less than \$10,000 when low interest rates are available. When combined with Oregon's \$2,500 Standard Rebate, \$2,500 Charge Ahead Rebate, and utility Portland General Electric's free public charging program, electric ride-hail drivers can access significant savings compared to combustion cars.

On a broader and longer-term scale, vehicle and emissions regulations can help alleviate the negative externalities from transportation and bolster societal economic benefits. In London, implementation of the Ultra-Low Emission Zone makes it very expensive to access the city center unless you meet strict emissions thresholds. These types of regulations ensure that the ZEV benefits are felt by all parts of society by reducing emissions and reinvesting the funds into cleaner, more efficient, and inclusive transportation options.

Varied impacts on manufacturing require careful planning. On the employment side, there is often concern about ZEVs' effect on job loss in traditional auto manufacturing and servicing. The perception of loss of employment has been a threat to regulations like CO₂ standards and low emission zones in Europe. German manufactures in particular are concerned about ZEVs' employment effects and have argued against such regulations. In Norway, ZEV growth has led to a decline in some service shops' revenue. Union employment concerns can also be a deterrent for governments and larger organizations that seek to transition their fleets to ZEVs. Some of the new job opportunities in the ZEV economy are higher-skilled technical positions and may require more training to ensure people land in a secure and safe economic position.

While there are immense challenges, there are also many opportunities. ZEVs represent an opportunity to change how transportation investments have been traditionally structured and include those who have been left behind in the past. Governments at all levels can contribute and show leadership in developing opportunities for ZEVs to improve local economies and environments. Many sectors have the potential to experience employment and economic growth, including vehicle manufacturing, infrastructure, battery second life and recycling, smart homes, and others. Experts and policymakers need to demonstrate how ZEVs will bring many job opportunities—doing so can broaden stakeholder support and facilitate the transition.

A 2016 study in British Columbia found that reaching 5% ZEV sales would create 1,400 new jobs in the region's ZEV technology supply sector. The province is working on a labor readiness strategy to understand government's role in advancing training and developing the skills needed to support and expand the local ZEV industry. The government is also working with a local technology institution to develop an automotive technician training program focused on ZEVs that will be available to all post-secondary institutions. There are also training modules for how independent repair shops can service and work with new and used ZEVs so that these companies have a stake in the technology rather than view it as a threat. While this doesn't guarantee there will be the same number of jobs in total, the current workforce has access to developing the needed skillset and technical knowledge to be included in the transition.

Electric transportation is growing into an economic powerhouse in California, and ZEV exports were recently valued at about \$3 billion in revenue in 2018. The in-state production of electric cars (Tesla) and buses (Proterra, BYD) is creating jobs and delivering economic benefits. Tesla's Fremont Factory employs about 10,000 people.

Workforce development will be vital to creating economic benefits. Nonprofit organization GRID Alternatives works to make jobs accessible and advance workforce development for low-income communities and communities of color across the United States. In Los Angeles, GRID Alternatives partnered with re-entry organization Homeboy Industries to provide people coming out of the criminal justice system training and job opportunities in the solar sector. The lessons learned from these existing programs can be applied to the ZEV sector. Similar initiatives will be critical for the ZEV market, especially in markets with ambitious market and economic growth goals. The re-entry population and other marginalized groups are an enormous opportunity to meet goals. Leveraging existing programs to ensure adequate resources and partnerships for job training will be key.

To ensure equity in the ZEV transition, investments need to be made in people and not just in capital. “Governments should prioritize incorporating workforce development into existing and new ZEV programs and not treat job training as an afterthought or added benefit” (Zainab Badi). Government resources for workforce development are often limited; a good example bolstering resources for job training is the Clean Energy Fund in Portland, which generates \$40-\$80 million per year for clean energy projects with a focus on low-income and communities of color and includes carveouts for job training. More broadly, governments would also ideally embed ZEVs’ economic benefits into their planning and policymaking.

“Governments should prioritize incorporating workforce development into existing and new ZEV programs and not treat job training as an afterthought or added benefit.”

—Zainab Badi, GRID Alternatives

WEBINAR 5

DIVERSIFYING THE ZEV MARKET

Consumer interest in and exposure to ZEVs is a barrier to widespread adoption. For ZEVs to reach the majority market and beyond, they must become not just known, but also attractive, for all consumers. In this webinar, participants discussed how to better communicate around ZEVs and ensure that ZEV interest increasingly spans across different socioeconomic and cultural groups, as summarized below.

Many efforts by governments, utilities, industry, NGOs, and ZEV enthusiasts are working to broaden awareness and interest. These include public awareness campaigns, online informational materials, social media, and advertising, integrating ZEVs at auto shows, ride-and-drives, informational booths, technical assistance, and coordinated electric vehicle road trips.

Rural communities face unique needs and require unique actions. Speakers pointed out that ride-and-drive events are difficult to hold in less-dense rural areas and require broader geographic distribution and more events to reach more people. Online resources can help bridge this gap, as can targeted social media campaigns and advertising. Rural communities also face challenges with regard to ZEV model availability across segments with more utility, such as vehicles with all-wheel drive and higher ground clearance. Insufficient ZEV supply can be a barrier everywhere, and government regulations are critical to expanding model availability and diversifying the market.

Portland officials are rethinking ZEV outreach and communication strategies.

It is becoming apparent that the early strategies focused on early adopters are insufficient to meet the City's climate goals, and city officials are shifting focus to the people with the biggest barriers. If ZEVs can work for those with the greatest barriers, ZEVs can work for everyone. Additional efforts to get people into ZEVs and understand their benefits are critical complements to all programs. Portland is working hard on outreach and education about Oregon's rebate program, focusing on the used car market and financing programs that allow people with credit challenges to access ZEVs, while also raising awareness through the electrification of other modes such as buses, trucks, and bikes.

One challenge in Portland was that some CBOs did not want the city to use Volkswagen Dieselgate settlement funds for ZEV infrastructure, based on the perception that ZEVs are for the rich. This is a challenge when it comes to laying the foundation for transportation electrification. "We really need to figure out what priorities communities of color and low-income communities have in the first place and design our marketing approach to focus on those priorities so that people really see themselves in an electric future" (Ingrid Fish).

“We really need to figure out what priorities communities of color and low-income communities have in the first place and design our marketing approach to focus on those priorities so that people really see themselves in an electric future.”

—Ingrid Fish, City of Portland

Early best practices and lessons learned are emerging. Working with diverse partners and collaborating with existing networks and organizations is particularly valuable. Bringing ride-and-drive events to where people are already gathering can broaden exposure, capture a wider audience, and have a more diverse mix of participants. Complementing outreach and education with technical assistance is a great way to provide personalized information. Multi-language outreach and informational materials is critical to reach the full market. Engaging and educating local governments is another opportunity; cities interact with community organizations and residents, make fleet decisions, and can demonstrate ZEV leadership through policy and fleet procurement. Some municipalities in Québec allow residents to rent city fleet ZEV on nights and weekends to lower access barriers and increase exposure.

Leveraging the existing ZEV enthusiast community can be effective. In New Zealand, a 6,000-kilometer ride-and-drive road trip was fueled by the ZEV enthusiast and advocate community with minimal financial support from the government. A key element of the road trip was an emphasis on reaching rural areas. In Norway, a partnership between driver and auto dealer associations furnish newly sold ZEVs with a driver kit and access to staff for the first year for all new owner questions. This synergetic approach lowers barriers for any drivers to adopt ZEVs. The Running Electric campaign in Québec partners with local ZEV advocate groups and owner associations to improve the experiences of prospective ZEV drivers at ride-and-drive events.

The used vehicle market has great potential to diversify the market and expand access. Used Nissan LEAF's are available for under \$10,000 in many markets. However, used ZEVs are not a panacea to equitable mobility, so it is important to work with communities to assess if used ZEVs can be a practical option. Unclear and incorrect information about range and functionality can lead to frustrations and distrust. Communication, understanding, and awareness about the capabilities and limitations of used ZEVs is critical. Governments can help by providing, or ensuring others provide, standardized facts about used ZEVs' condition. Diversifying the market through used ZEVs is linked to the key incentive design principles, including incentives for used vehicles, increased low-income incentives, point of sale incentives, and affordable financing.

Outreach, awareness, and communication strategies need to be community driven and tailored to local contexts. Communities should first be consulted regarding what they value before figuring out how ZEVs can play a role, rather than asking communities how they can use ZEVs. “Marketing and outreach efforts need to be nimble to allow for communities to create the stories that reflect their contexts and realities” (Jen Grebeldinger). These efforts are more effective when they reflect the way people live, work, and play. Some especially relevant examples are the videos created by Community Energy Association in British Columbia as part of Accelerate

Kootenays, which showcase ZEVs as a part of the local Kootenay peoples' life. In one video, ZEVs are carrying skis, canoes, bike racks, and Christmas trees, and traveling along windy roads in snowy terrain. These images are critical to myth bust ZEVs' capabilities and help people see themselves in ZEVs.

“Marketing and outreach efforts need to be nimble to allow for communities to create the stories that reflect their contexts and realities.”

—Jen Grebeldinger, Community Energy Association

Governments can help communicate ZEVs and broaden interest in several ways. Governments aren't necessarily the best stakeholder to lead community outreach and marketing, so forming partnerships with diverse CBOs to lead outreach and communications will be key. Governments would also ideally look for media opportunities around new policies or actions, such as press releases and public announcements. Government programs would ideally be simplified and streamlined as much as possible, and governments can provide guidance to state and local agencies for how to standardize processes, reduce red tape, and minimize delays.

REFLECTIONS

The listening series discussions revealed the profound importance of expanding zero-emission mobility equity and access and provided clarity and insight on the key challenges and opportunities going forward. The road ahead to equitable and more inclusive ZEVs is a long, challenging, and critical one. Low-income communities and communities of color face disproportionate health impacts from climate change and environmental pollution, and ZEVs offer great potential to mitigate these impacts and improve public health. All ZEV policies should work to reverse these disparities, promote justice, and serve the most vulnerable populations.

Smarter policies can mitigate disparities and uplift those who have been left behind by influencing who can access the health and economic benefits of ZEVs. Providing equitable ZEV access requires intentional actions, and the focus must be on people and communities. Greater focus on the margins—not the mainstream—is needed, as these are the people who are most vulnerable and stand to benefit most. A targeted universalism approach—where strategies are specifically focused on the most marginalized groups are used to meet universal goals—can promote racial justice and accelerate ZEV growth simultaneously. If ZEVs can work for people with the greatest barriers, ZEVs can work for everyone else too.

It will be critical to view government policies and programs through the lens of community development. Real solutions will be those that are community driven and tailored to local contexts. Understanding communities, their mobility needs, and their unique ZEV barriers is a critical first step to providing equitable zero-emission mobility. There is no one size fits all solution, and governments need to engage, listen, and empower communities for success. Talking to communities and understanding their values, goals, and mobility needs are critical precursors to identifying and providing useful ZEV solutions.

Many opportunities, anecdotes, and recommendations for governments emerged from the five listening series topics summarized above. Several promising and inspiring efforts by NGOs, CBOs, utilities, and governments are underway, and the early examples provide lessons learned and serve as models for others going forward. The sections above also summarize specific opportunities and recommendations for governments to further promote equitable and expanded ZEV access by means of improving incentives, ensuring charging options for all, ensuring the economic ZEV benefits are widely experienced, and diversifying the market.

Beyond the specific opportunities regarding incentives, infrastructure, economic benefits, and communicating ZEVs, a more comprehensive approach to equity and inclusion is needed or there is risk of exacerbating these issues. Inequities and disparities can be perpetuated or worsened unless governments think through these issues in a holistic manner and embed equity from the start. There is a strong need to operationalize equity from the beginning with an uncompromising commitment to integrating equity within mission, objective, design, implementation, and evaluation. Governments will need to be intentional in their policymaking. Building internal capacity and education within government agencies should be an ongoing effort around the topics of racism, inequity, inclusion, and how governments play a role.

It is clear from the discussions that greater and complementary community outreach efforts are needed across the board. All government ZEV incentive, infrastructure, mobility, workforce development, and other programs would be more accessible to underserved communities when there is dedication to community engagement and outreach. Consultation, outreach, and engagement with disadvantaged communities and their CBOs are critical to help communities leverage government support and alleviate risk of ineffectiveness.

This briefing is intended to capture the voices and perspectives of the experts in this space and summarize their insights and recommendations for governments. The experts appeared to agree that coordinated discussions like this listening series are critical to disseminating lessons learned, best practices, and are key to broader success. Adopting the key principles and ideas outlined here is a good first step on the road ahead toward a more just and clean transportation system for all.

ADDITIONAL RESOURCES

There is a growing body of research, literature, and exemplary examples on topics related to expanding ZEV access and equity. A selection of these resources is provided below.

GENERAL INFORMATION

Title and link	Resource type	Organization(s) or author(s)	Key elements
Equity in transportation electrification (2019)	Presentation & webinar	Forth, The Greenlining Institute	<ul style="list-style-type: none"> Overview of transportation equity and its importance and how to design programs and embed equity
Electric vehicles for all: an equity toolkit (2016)	Toolkit	The Greenlining Institute	<ul style="list-style-type: none"> Tips, tools, and resources to improve electric vehicle accessibility for underserved communities
Equitable e-mobility (2019)	Conference paper	Forth	<ul style="list-style-type: none"> Understanding mobility equity and early lessons on partnering with underserved communities
Mobility equity framework: how to make transportation work for people (2018)	Report	The Greenlining Institute	<ul style="list-style-type: none"> Guiding framework to community-centered transportation planning and key equity metrics for program evaluation
Equity & Environment Initiative (2019)	Website	City of Seattle	<ul style="list-style-type: none"> Municipal program promoting equity and environmental progress
Equity & Environment Agenda (2019)	Report	City of Seattle	<ul style="list-style-type: none"> Framework for advancing racial equity within the City's environmental work
Going electric: how everyone can benefit sooner (2019)	Report	Chaitanya Kumar, Green Alliance	<ul style="list-style-type: none"> Discussion of EV adoption in the UK and how the government can help everyone can benefit sooner
Should all cars be electric by 2025? The electric car debate in Europe (2019)	Journal article	Otar, N., and Ryghaug, M.	<ul style="list-style-type: none"> Summary discussion of whether all cars in Europe should be electric by 2025, including social and geographical inequality considerations
Overcoming barriers to clean transportation access for low-income residents (2018)	Policy guidance document	California Air Resources Board	<ul style="list-style-type: none"> Discusses barriers and opportunities to expand ZEV access to people in disadvantaged communities
Charge ahead California: leading with equity (2017)	Factsheet	The Greenlining Institute	<ul style="list-style-type: none"> Summarizes state ZEV goals and the key equity-focused actions to ensure all Californians benefit
Diversity, equity, inclusion statement (2017)	Organization statement	Forth	<ul style="list-style-type: none"> Statement to embed diversity, equity, and inclusion into the organization's mission and operations
Racial equity toolkit: An opportunity to operationalize equity (2015)	Toolkit	Government Alliance on Race & Equity	<ul style="list-style-type: none"> Overview of racial equity tools and how they can be used to integrate and operationalize equity within product and process
The curb-cut effect (2019)	Website	PolicyLink	<ul style="list-style-type: none"> Explanation and discussion of the "curb cut" analogy
The oil industry vs. the electric car (2019)	News story	Gavin Blade, Politico	<ul style="list-style-type: none"> Reporting of how the fossil fuel industry is fighting against the transition to electric vehicles

INCENTIVES

Title and link	Resource type	Organization(s) or author(s)	Key elements
Thought leadership research and reports (2019)	Website	Center for Sustainable Energy	<ul style="list-style-type: none"> Data, analysis, case studies, and other resources on advancing ZEV policy, equity, and market growth
Clean Vehicle Rebate Project program reports (2019)	Website	Center for Sustainable Energy	<ul style="list-style-type: none"> Reports, fact sheets, infographics, and presentations on California's Clean Vehicle Rebate Project
California CVRP Rebate Equity Statistics (2019)	Interactive tool	Center for Sustainable Energy	<ul style="list-style-type: none"> Equity statistics data for rebates issued within low-income and disadvantage communities in California
Ensuring electric vehicles are accessible for all (2018)	Blog	Center for Sustainable Energy	<ul style="list-style-type: none"> Summarizes strategies for improving electric vehicle affordability through incentive design and pilot projects
Oregon Clean Vehicle Rebate Program (2019)	Website	Oregon Department of Environmental Quality	<ul style="list-style-type: none"> Information and resources about Oregon's standard and "Charge ahead" low-income rebates
Rethinking electric vehicle incentives (2018)	University paper	Michael Miller, Colorado Law	<ul style="list-style-type: none"> Analysis and discussion for incentives to promote social benefits and distributive justice in Colorado

CHARGING INFRASTRUCTURE

Title and link	Resource type	Organization(s) or author(s)	Key elements
Empower electric vehicle charger incentive and education program (2019)	Utility filing	Pacific Gas and Electric	<ul style="list-style-type: none"> Pilot program offering point-of-sale infrastructure rebates for low-income customers and complementary education, information, and outreach with CBOs
California approves novel low-income EV charger program (2019)	Blog	Natural Resources Defence Council	<ul style="list-style-type: none"> Summary discussion of PG&E \$4 million low-income EV charger and awareness program
PG&E to deploy EV charging stations in low-income communities (2018)	Blog	The Greenlining Institute	<ul style="list-style-type: none"> Discussion of major new EV equity projects in California, including utility charging investments in MuDs and disadvantaged communities
Northeast corridor regional strategy for electric vehicle charging infrastructure (2018)	Regional strategy report	NESCAUM	<ul style="list-style-type: none"> Utility investment can fill infrastructure gaps where the private sector business case is challenging
Austin Energy sees third party EV charging as win-win (2018)	Article	American Public Power Association	<ul style="list-style-type: none"> Reporting on new city code enabling third party companies to operate and own charging stations
Massachusetts DPU Order 13-182-A (2014)	Public Utilities Order	Massachusetts DPU	<ul style="list-style-type: none"> Order declaring that charging stations are no longer considered a regulated as a utility

ECONOMIC BENEFITS

Title and link	Resource type	Organization(s) or author(s)	Key elements
Bringing clean transportation service to Huron, California (2018)	Blog	UpLiftCA	<ul style="list-style-type: none"> • Describes an innovative rural electric rideshare project delivering economic and environmental justice
Mobility hubs at affordable housing pilot (2019)	Project landing page	TransForm	<ul style="list-style-type: none"> • Overview of affordable housing mobility hub pilot project in the San Francisco Bay Area
Future of mobility: urban strategy (2019)	Strategy report	UK Department for Transport	<ul style="list-style-type: none"> • Discussion of key principles for government to help maximize the benefits of the mobility revolution
The future of car sharing: electric, affordable, and community-centered (2018)	Case study report	Forth	<ul style="list-style-type: none"> • Summarizes insights from low-income electric carsharing pilot project in Portland, Oregon and provides recommendations for success
Electric carsharing in underserved communities (2015)	Report	The Greenlining Institute	<ul style="list-style-type: none"> • Provides success considerations for electric carsharing in underserved communities
Clean Energy Vehicle Economic Opportunities Assessment (2016)	Study	BC Ministry of Energy and Mines	<ul style="list-style-type: none"> • 5% ZEV sales would create 1,400 new jobs in British Columbia's ZEV technology supply sector
Portland Clean Energy Fund (n.d.)	Website	Portland Clean Energy Fund	<ul style="list-style-type: none"> • Overview of program generating local-level funds for clean energy projects with focus on equity and justice
Clean BC: Clean Energy Jobs (n.d.)	Website	Government of British Columbia	<ul style="list-style-type: none"> • Description of labour readiness strategy under development
Advanced Research and Commercialization Program (2018)	Website	Government of British Columbia	<ul style="list-style-type: none"> • Overview of program supporting local company investment and development in clean energy vehicles
EVIPT Canada (2012)	Website	Electrical Joint Training Committee	<ul style="list-style-type: none"> • Course overview of the Electric Vehicle Infrastructure Training Program
Delivering opportunity (2016)	Report	Union of Concerned Scientists, The Greenlining Institute	<ul style="list-style-type: none"> • Opportunity for electric buses and trucks to increase employment in underserved communities in California
California EV exports, already valued at \$3B in 2018, expected to hit \$3.4B in 2019 (2019)	Article	Chris Busch, Energy Innovation	<ul style="list-style-type: none"> • Discussion of booming electric vehicle manufacturing and jobs in California and the policies driving it

DIVERSIFYING THE MARKET

Title and link	Resource type	Organization(s) or author(s)	Key elements
<u>EVHybridNoire Outreach and Education (2017)</u>	Website	EVHybridNoire	<ul style="list-style-type: none"> Website providing outreach and education resources for underserved and diverse communities
<u>Accelerate Kootenays (2019)</u>	Website	Community Energy Association	<ul style="list-style-type: none"> Community driven EV initiative focused on consumer awareness with multiple outreach campaign videos showcasing electric vehicles in diverse terrain
<u>Great EV road trip (2019)</u>	Website	Better NZ Trust	<ul style="list-style-type: none"> News, information, and statistics about the 2019 Great EV Road Trip outreach campaign
<u>Electric for all (2019)</u>	Website	Veloz	<ul style="list-style-type: none"> Multi-million dollar public awareness campaign with links to media videos and webinar presentations
<u>New Hampshire charge forward EV relay (2019)</u>	Website	Drive electric New Hampshire	<ul style="list-style-type: none"> Cross-state EV relay to broaden exposure and media attention throughout rural New Hampshire
<u>Marketing EVs and engaging consumers (2018)</u>	Article	Forth	<ul style="list-style-type: none"> Summary of three consumer engagement campaigns with links to speaker presentations
<u>Electric cars 101 in ten languages (2018)</u>	Informational materials	Forth	<ul style="list-style-type: none"> Multi-language consumer-facing informational materials to increase familiarity and understanding