MIT Center for Energy and Environmental Policy Research

The Roosevelt Project

Industrial Heartland Electric Vehicle Case Study Working Paper Series

Environmental Justice Motor Vehicle and Charging Infrastructure Ecosystems

Massachusetts Institute of Technology

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The Transition to Electric Vehicles from the Perspective of Auto Workers and Communities
by Sanya Carley, David Konisky, Jennifer M. Silva, Shaun Khurana and Naomi Freel

Driving toward Environmental Justice & Health: Challenges, Opportunities & Tools for an Equitable Electric Vehicle (eV) Transition
by Jalonne L. White-Newsome, Colleen Linn and Kira Rib

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by Amanda K. Woodrum and Kathleen Mulligan-Hansel

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Environmental Justice Motor Vehicle and Charging Infrastructure Ecosystems
by Keith Cooley

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The Roosevelt Project

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Case Study Working Paper Series

Environmental Justice Motor Vehicle and Charging Infrastructure Ecosystems

by Keith Cooley

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The Roosevelt Project
A New Deal for Employment, Energy and Environment

About the Roosevelt Project

The Roosevelt Project takes an interdisciplinary approach to the transitional challenges associated with progress toward a deeply decarbonized economy. The project aims to chart a path forward through the transition that minimizes worker and community dislocations and enables at-risk communities to sustain employment levels by taking advantage of the economic opportunities present for regional economic development. The first phase of the project involved an analytical assessment of cross-cutting topics related to the transition. The second phase of the project assesses the transition through the lens of four regional Case, working with local partners on the ground in the Industrial Heartland, Southwest Pennsylvania, the Gulf Coast, and New Mexico. The project was initiated by former Secretary of Energy, Ernest J. Moniz, and engages a breadth of MIT and Harvard faculty and researchers across academic domains including Economics, Engineering, Sociology, Urban Studies and Planning, and Political Science.

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White Paper #9
Environmental Justice Motor Vehicle and Charging Infrastructure ecosystems

The distributed effects of transitioning the Heartland (Michigan, Ohio, and Indiana) toward deep decarbonization in response to the growing impact of climate change will be of great importance to workers who are caught up in the change … to people of color in general and especially to the African American (AA) communities that stand to lose the most as the automotive industry migrates from a fossil fuel driven economy to a low carbon version of the same. The summary below looks at and provides policy support recommendations for:

- The historic role of AA workers in the motor vehicle industry, their struggle for equality, and their current economic state
- Impacts of and access to electric charging infrastructure for low-income communities as decarbonized energy systems become the norm

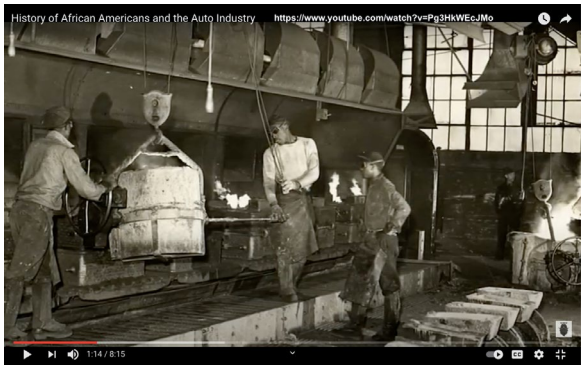
The AA workforce inside the Motor Vehicle Industry

Note: the terms "African American" and "Black" are used interchangeably throughout this section

1914 – 1950s: At the turn of the last century when Henry Ford declared that he would pay qualified workers the unheard of salary of $5/day, it set the automotive industry on a path to dominate manufacturing in the Heartland. It instilled a strong work ethic in his employees and assured that workers could buy the products they made. In time, Ford was joined by General Motors and Chrysler as leaders in motor vehicle production globally and nationally. It was during this time that a powerful and socially conscious Union prodded the automotive industry to provide heretofore unheard-of benefits for the represented workforce including wages, unemployment insurance and pension plans. (U.A.W. and the Auto Industry). By 1955 wages across the so-called "Big 3" autos were competitive with each other but 35% higher than average salaries for the national workforce. Add in fringe benefits like paid vacation, paid holidays, cost of living increases and unemployment insurance and automotive jobs were seen as the path to "the middle class" (i.e. owning a home, a car, a boat, sending your kids to college or other post-secondary educational options, and enjoying overall economic security).

The prospect of landing one of those jobs spurred a migration from the South of hundreds of thousands of Blacks seeking opportunities beyond the limitations of racist Jim Crow-era policies following the end of the Civil War and slavery (tens of thousands heading to automotive assembly lines) … as well as the influx of Polish, Italian, German, and English immigrants from overseas.

As has often been seen in other sectors of American society, while white workers, including immigrants, were quickly assimilated into the automotive work environment, Blacks were routinely forced to work at the dirtiest and often the most dangerous jobs. Even though labor unions like the UAW worked with Civil Rights organizations, little progress was made up through the 1960's in reducing racial bias when it came to jobs, especially those outside the traditional work assignments for AAs in the foundries, janitorial, and other menial work. (It bears mentioning that while the UAW fought to win better jobs for AAs at this time, they were also felt by those same workers to be paternalistic, not accepting "Negroes as equal")



African American workers in auto plant

William Lattimore, an AA auto worker in the 1930s and 40s observed that even though he was a chief steward in the UAW at Dodge Foundry "… we were sort of frustrated as Negro union members because of the many – because the white elements within the Dodge plant refused to accept the Negro brothers and sisters as equals ….". Mr. Lattimore eventually quit the union in the 1950s because, as he related to the oral interviewer, he "… got tired of seeing the people he trained promoted over his head …."

George Crockett Jr., an African-American attorney, jurist, and Michigan state representative who was appointed a consultant to the UAW in 1944 after his work with the Fair Employment Practice Committee said that "… there are no ideological differences between me and the UAW, unless UAW has different ideas from mine on Negro liberation and Negro equality - and then there's a big difference…."

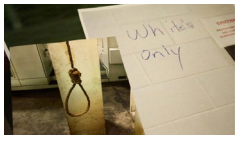
In some southern plants, separate drinking fountains, big signs ("Negroes and Whites"), as well as separate rest rooms were customary. And because AAs were often at the end of the seniority line, they were especially vulnerable to layoffs and unemployment when auto plants reorganized work or shut down.

1960s – present day: Now, thanks to Civil Rights legislation and grassroots activism, Black auto workers occupy jobs in almost every sector of the workforce, both union and salaried, from the lowest rung of the workforce ladder into the leadership ranks. Additionally, the Big 3 have:

- Provided Corporate education programs that allow Black workers to attend college and move into management jobs
- Become leaders in philanthropy to AA communities
- Created jobs for the "hard core" unemployed
- Developed Diversity & Sensitivity training programs for all employees (FCA, GM, Ford)
- Developed programs to "groom" Blacks to become "tiered" suppliers to the industry (e.g. Minority Business Development Councils whose Board chairs were often Big 3 execs)

It is also worthy of note that the UAW has been a force for good with respect to communities impacted by motor vehicle assembly operations. One clear example can be found in recent reports of air pollution complaints by a Stellantis (formerly Fiat/Chrysler) plant in Detroit. UAW member Jerry King plays a key role in the Community Benefits Ordinance that Stellantis has agreed to follow. As Chair of the Neighborhood Advisory Council Mr. King has a leadership role in assuring that the health and welfare of fence line communities is a major consideration for business operations, automotive and otherwise.

Nevertheless, racism, bias, and harassment continue to surface inside automotive plants. Examples include nooses, racially insulting signs (e.g. swastikas & "whites only"), and racial slurs. Black workers claim the behavior continues in spite of company pledges to crack down on offenders.



The UAW leadership is also seen by AAs as publicly speaking out but doing little to end pervasive racism in auto plants. Herb Boyd, reporting for the The Institute of the Black World 21st Century (IBW21) offers, that black workers were becoming increasingly invisible as automation and overseas competition became issues, a reflection of the fact that the UAW had generally lost touch with their base … especially minorities.

When one takes opinions like those expressed above … and sees the auto industry as a small reflection of national attitudes (viz. racism is a deep, enduring, and abiding reality of American life as expressed by Heather McGhee in "The Sum of Us") … it is easy for someone like me to argue that the plight of the AA worker gets conveniently "pushed aside" as Labor and Management battle over union influence in new plants located in the South and/or transitioning to electric vehicle facilities. Caught up in denying the truth that little will change until whites realize what racism has cost them too … and begin to operate "… in their own rational economic self-interest …." it is all too easy to "keep doing what we been doing"

From an economic point of view, AA fortunes are mixed: 2007 Black auto wages continue to outpace wages for their counterparts doing similar work in non-auto sectors by ~ 11% (viz. $17.08/hr. vs $15.44/hr.)

By the same token, AA employment has experienced a steadily rising trend from 1995 when they accounted for 12.8% of auto workers to 2020 where they represent 18.2% of that workforce. In that 25-year span there have been dips in the numbers, most notably in 2021 when employment dropped to 11%, but a recovery seen over a 2-year span quickly put things back on track.

NOTE: While these data are taken from the U.S. Bureau of Labor Current Population Survey (CPS) and represent auto manufacturing as a whole, one may assume that such trending applies to the "Big 3" as well.

On the other hand, information from U.S. economic experts shows a persistent, troubling and growing wage gap from 1940 (~12% gap) to our present day (~ 20% gap) for black workers vs. white. Again, while these are general data for all employment across the country, there is nothing in the materials to suggest that the trending is any different for the automotive industry in general and for the "Big 3" in particular.

Recommendations in Support of Policy: From this vantage point, considering the pros and cons listed above, as well as the decades long national tragedy of structural racism now being filmed by everyday citizens (e.g. George Floyd, Ahmaud Aubery, Breonna Taylor, etc.), it is hard to be optimistic about the ability to lift up the role(s) of Black workers in automotive as it migrates from a fossil fuel present to a decarbonized future. With that in mind, there are recommendations to be made in support of policy that successfully addresses concerns of workers that would otherwise be adversely affected. They include:

- Embrace *top down accountability for antiracist behavior* in all work environments

  No real change in behavior and/or culture can take place unless the leadership, both Board of Directors and Corporate "C Suite" executives, are fully committed to such change.

  That commitment will hold everyone in the organization accountable to a set of clearly articulated goals, condemning and punishing those who disobey. Swift, fair, and appropriate responses to racist behavior will provide strong incentive for all to abide by the rules.

- Provide family supporting wages/benefits for *all* workers normalized to regional living costs

  The "legacy" automotive industry, as presently configured, provides its workforce with the means to comfortably care for family health and welfare not only while employed but also into retirement. The same menu of salary and benefits must continue if a trained, committed workforce is to be preserved. Attempts to significantly lower wages or benefits now in place will work against industry efforts to retain and/or hire the best workers for the business.

As workers are hired, especially at new plants where regional wages may be below typical auto salaries, acknowledging local cost-of-living impacts as well as competitive industry salaries will be important elements of the larger overall wage algorithm.

In line with that consideration, a recent Detroit News reports that non-unionized auto transplants (e.g. Honda, Kia, etc.) have been thriving for decades with wages that are ~ 16% below the Big 3 but with comparable healthcare plans and 401Ks.

- Document an *equitable* pathway to upward mobility in an open, transparent manner

  NOTE: The issue here is not wage disclosure … it is, rather, upward mobility.

  An equitable and inclusive workforce at every level of the business can only become a reality when the rules for hiring, retaining, and promoting employees are communicated to employees in an open, honest fashion and scrupulously adhered to.

  Any incidents of favoritism, nepotism or prejudice in hiring and promoting will undo the goodwill (often hard won) that fair workplace human resource practices may have created.

- Create a menu of worker benefits that *account for gender, ethnicity, age, etc. as required*

  The kind of benefits that put each worker's needs on par with others vary depending on things like gender, age, ethnicity, and religious beliefs. Hard won safeguards like fair treatment in situations of pregnancy, the ability to worship on company property in ways that do not disrupt work flow/product quotas, and accommodating the needs of workers who are physically challenged have tended to enhance the workplace, not detract from it. These kinds of benefits and safeguards must migrate into new decarbonized industry workplaces too.

- Build pathways that engender and empower *management/labor cooperation*

  There can be little doubt that distractions often play substantial roles in missing agreed upon deadlines, budgets, and goals. When it comes to creating an antiracist environment in the workplace … one free from bias, harassment, and discrimination; spending time and energy bickering between bargaining rights, workplace conditions, etc. keeps the management-labor team from focusing on removing the obstacles to diversity, equity, and inclusion.

  Until labor and management agree to make issues of bias and discrimination a priority, little if any progress will be made.

- Create a workforce in all areas of the business that *reflects national/regional demographics*

  As is true in many areas of American life, African Americans are underrepresented when it comes to health, education, wealth, and lifestyle, while increasingly overrepresented when we look at victims of crime, incarceration rates, police brutality, arrests, and murders.

  As the automotive industry transitions to its decarbonized future it must make a concerted effort to reverse similar trends inside its facilities concerning pay, position, incentives, etc.; doing all that it can to assure that every position in the workplace is populated by workers that reflect the demographics of the region in which it exists.

  And that same determination to build inclusivity *inside* its facilities must expand *externally* … from minority supply chain businesses ahead of the assembly process to its dealer base after assembly. Creative assessment tools should quantitatively document the contribution Blacks and other people of color have been allowed to make in this portion of the industry. Carefully monitoring these data, pushing for increases in AA (should I say BIPOC?) ownership where demographics suggest, and setting aggressive goals for a decarbonized future are a must for the industry

And the Government can play a defining role in moving all of these recommendations to reality

- As large federal rebates and tax credits surface to speed eV transition/adoption, those incentives should flow to companies that:

  Demonstrate transparency and cooperation to industry pay equity, board representation, and the assurance of inclusion of BIPOC at every level of the businesses.

  Show their commitment to building a more diverse workforce from top to bottom. Continued awarding of incentives should tie directly to positive outcomes in this area.

- Finally, updating labor laws through the PRO (Protecting the Right to Organize) Act to address wage disparities between Big Three unionized employees and the non-union transplant workers will assure a "level playing field" as the decarbonization transition advances.

These are the kinds of things that will drive motor vehicle industry trends as a whole to reflect national demographics.

That said, there are many other issues to sort out as the transition picks up speed. Foremost is the impact these changes will have on independent/private owner repair and maintenance (R&M) businesses (e.g. those attached to convenience stores). We need to understand the effect of the ICE-eV transition and construct "thoughtful" federally funded response programs, perhaps through SBA initiatives that could help these shops manage and grow their operations.

The challenge is only exacerbated by modeling that shows eVs are ~ half as expensive to repair and maintain as ICE's. That will have a profound effect on R&M shops and on their workforce, which has a very large Hispanic component.

Impact of & access to electric charging infrastructure for low-income communities

It should come as no surprise that moving away from traditional internal combustion engine (ICE) powered vehicles to electric vehicles (eVs) will benefit us all. The pollution spread by burning fossil fuels (esp. fine particulate matter and oxides of nitrogen) has for many years been directly linked to higher rates of asthma, bronchitis, and heart attacks.

And that is just the tip of the iceberg when it comes to African Americans and health issues driven by traffic related air pollution.

While African Americans are roughly 14% of the country's population, statistics show:

- 24% of Blacks live near highly trafficked roads contributing to racial disparities in exposure to traffic-related air pollution
- 9.7% of Black adults and 13.5% of Black children have asthma vs. 8.1% and 6.4% for whites respectively. Blacks also have the highest rates of asthma mortality (22.3% vs. 8.2% for whites).
- They disproportionately represented 19% of total heat-related deaths from 2004–2018 driven by climate change

So, one would think that the change to eVs would be an easy choice to make. Widespread transportation electrification (TE) has the potential to reduce air pollution and lower greenhouse gas (GHG) emissions in general. It would significantly improve mobility for underserved communities because eV cars, trucks, and buses emit no pollutants or carbon dioxide and the power to run them is generated far more cleanly.

Add to that the additional incentives that the cost to travel in an eV is usually less than the gasoline equivalent of $1 per gallon, electric motors have only a handful of moving parts, and eVs are low-maintenance.

Unfortunately, while the health outcomes would be significantly better, in low income communities (LICs), the purchase process is often stacked against those residents. Low income Black households spend a significant portion of their pretax income on transportation with racial disparities like higher markups on auto loans and higher auto insurance premiums putting many vehicles beyond their reach. Other obstacles only add to the burden:

- One-third of low-income African Americans live in a zero-vehicle household limiting their ability to reach jobs, education, healthy food, and more
- 14% fewer jobs are located near Black residents in major metro areas as gentrification, rising housing costs, and decreasing affordable housing stocks make for longer commutes, limited transportation options, and increased transportation costs
- 17% of Black households\ are "unbanked" (no bank or credit union access) and 30% are "underbanked" which often makes loan securitization difficult

These challenges would be insurmountable without an outside assist … something that policy must address as decarbonization moves forward.

Federal and State governments must provide income-based customer rebates and tax incentives for buying American made eVs, new or used. Income-based swap programs for trading-in internal combustion vehicles for eVs; and car share programs using eVs exclusively should also be choices to which LICs have access. Banks, credit unions, and insurance companies also have a role to play. Instead of perpetuating a system that has higher markups on loans and higher insurance rates for LIC, these institutions can, in partnership with government, commit to open, honest, and transparent financing strategies that make vehicle ownership a reality for low income communities.

Of course, acquisition and use of eVs is only one step in this process. Recharging is the next biggest barrier to access and recharging in LICs must be as straightforward, hassle free, and abundant as it is in any other community if TE is to work for us all.

Electric charging/recharging infrastructure issues that must be addressed in LICs include:

- Lack of home garages and shared spaces to charge batteries
- Time required to charge eVs is now longer than the time it takes to refuel an ICE vehicle
- Keeping the inside of the vehicle warm in winter is usually the biggest drain on eV range
- Low-income households spend 3 times as much on utility bills as higher-income households
- The classic "chicken-and-egg" problem exists. There is less interest to invest in public charging stations where eV sales/leases are low, but that very same lack of charging infrastructure is exactly what keeps eV sales/leases at a minimum.

A series of pilot programs are already underway to address many of these issues with State government, public service commissions and utilities working together in California, New York, Colorado, and Oregon.

Millions of dollars are being dedicated to putting charging infrastructure in underserved communities with public utility commissions requiring that ratepayer funds lead to equitable outcomes based on customer class and income as well as … racial equity or environmental justice (EJ) considerations. These programs cover a range of interventions including:

- California utilities have undertaken charging infrastructure programs in disadvantaged communities … to expand eV installations and access programs by more than $1 billion.
- Several cities have experimented with eV sharing programs where vehicles can be centrally housed in optimal locations and charged overnight.
  - Consider, for example, installing public charging stations that prioritize low-income residents, areas with more multifamily housing and garage-free homes, and those with limited access to other transportation options. And rebates are a part of the solution.
  - In addition to that, the U.S. Department of Energy is spurring the deployment of charging infrastructure at workplaces, enabling electric vehicle drivers to double their daily electric commute range.
  - Even the ability to have electricity flow both into and out of plugged-in vehicles—known as "V2G"— turns school buses into potential sources of electricity during peak demand … an extremely useful capability in LICs.

All of these efforts will be accelerated with the $174 billion infusion of funds the Federal government under President Biden proposes for the eV market … including:

- Giving consumers rebates and tax incentives to buy American-made eVs
- Incentivizing a national network of 500,000 charging stations by 2030
- Replacing 50,000 diesel transit vehicles and electrifying at least 20% of yellow school buses

In addition, a heretofore unlikely collaboration of 24 disparate groups including unions, electrical utilities and environmental groups that have sparred in the past over other issues, is now partnering to accelerate this infrastructure growth. The group, known as the National EV Charging Initiative, counts among its members electrical workers who will help supply and install the infrastructure to power EVs as well as advocates who are focused on addressing racial, economic and environmental inequities.

Clearly the country as a whole is coming to grips with the insidious role burning fossil fuel plays in exacerbating the effects of climate change as well as poorer community health and welfare outcomes. While these concerns are problematic for all of us, they are especially hard on those in our society who can least afford to confront them … the young, the old, the poor and the disadvantaged.

As we push decarbonization forward in the transportation arena, the best of what we will learn from the pilot programs mentioned above, while necessary, will not be sufficient to assure that our most vulnerable citizens thrive in that new ecosystem. Recommendations for additional policy support should:

- Authorize states and utility commissions to *mandate and expect regulated utility TE plans to address equity and multiple use cases* for Electric Vehicle Supply Equipment.

  Those plans should be crafted to meet state-wide criteria that include definitions of need beyond income (i.e., pollution burden, community economic condition, tribal status, etc.) setting minimum levels of funding for utility investment and rebate levels that best meet underserved community recipients' needs.

  The promulgation of state-wide success metrics for easier evaluation and peer-to-peer learning in these efforts will force the system to lean towards self-correction and success.
- Task utilities with *addressing broader pollution and economic issues* with TE funds

E-ridesharing and eV sharing programs, properly configured can do much to increase mobility in LICs. The key to successful planning will require utilities to engage the entire community early in the process, including problem identification, goal setting, and building trust among community members through meaningful engagement. In short that means learning the importance of adapting any and all TE plans based on community feedback.

- At the same time, we should encourage more partnerships like The National EV Charging Initiative that mobilizes private capital and forges public-private partnerships to rapidly accelerate the deployment of electric vehicle charging stations and related infrastructure nationwide… especially in low income communities.

  It's time for utilities; automotive OEMs, both foreign and domestic; labor unions; transportation services; and advocates for addressing racial, economic and environmental inequities all to "put some skin in the game". Otherwise it is all just idle talk.

- *Encourage "listening sessions"* to get at the true needs of low-income communities

  Because failed projects are littered with examples of implementers not listening to stakeholders who must live with the consequences, it is imperative that policymakers acquire

Stance toward community	Scale	Impact	Community engagement goals	Message to community	Activities
Ignore	0	Marginalization	Deny access to decision-making process	Your voice, needs, and interests do not matter	Closed door meeting, misinformation
Inform	1	Placation	Provide the community with relevant information	We will keep you informed	Fact sheets, open houses, presentations, billboards, videos
Consult	2	Tokenization	Gather input from the community	We care what you think	Public comment, focus groups, community forums, surveys
Involve	3	Voice	Ensure community needs and assets are integrated into process and inform planning	You are making us think (and therefore act) differently about the issue	Community organizing and advocacy, house meetings, interactive workshops, polling, community forums
Collaborate	4	Delegate Power	Ensure community capacity to play a leadership role in implementation of decisions	Your leadership and expertise are critical to how we address the issue	MOUs with community-based organizations, community organizing, citizen advisory communities, open planning forums with citizen polling
Defer to	5	Community Ownership	Foster democratic participation and equity through community drive decision-making; Bridge divide between community and governance	It is time to unlock collective power and capacity for transformative solutions	Community-driven planning, consensus building, participatory action research, participatory budgeting, cooperatives

input/participation from stakeholders representing all perspectives. That includes low-income advocates; consumer, environmental, and community groups; business representatives; utilities; and government agencies. This group of stakeholders must determine the most beneficial sites and uses for utility investment … moving from ignoring citizens to consulting with them, eventually deferring to their leadership. See table below.

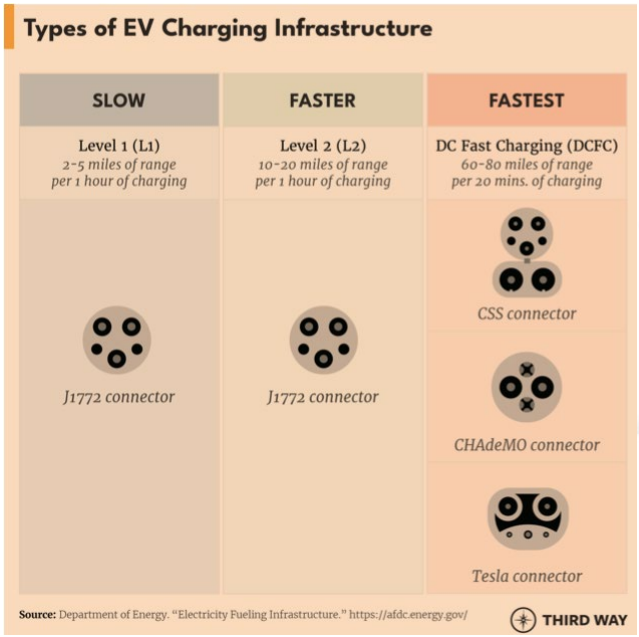
- *Commit to carbon free energy sources* for electricity generation as well as ethical, sustainable life cycle practices for eV batteries

  Unless we decarbonize the energy production needed for transportation services and commit to sustainable life cycle practices … especially for batteries, there is little hope for a just and equitable transition to a decarbonized future.

- *Increase public and workplace charging options* for apartment, multi-use dwellings, townhouses, etc. where private, single family resident home/garage charging is unavailable.

  In circumstances like these where workplace and public charging can be a key enabler for the purchase of an eV, installation of eV charging stations on nonresidential streets in urban villages, co-locating eV car share stations at bus stops and rail stations, and ensuring that shared mobility services (incl. eV share) accept transit card balances for payment would minimize the stress and aggravation eV owners would encounter.

  Equity in charging will also mean making sure faster charging technology is available to LIC including "DC Fast Charging" and, when available, charging over the road.



Courtesy of https://witricity.com/

In line with this, policy supports should create an equity assessment tool (See Greenlining Institute report here) to identify how public charging affects environmental justice, racial equity, and equitable development in the city.

- Prioritize *helping LICs understand the best strategies* for eV usage.

  Successful purchase, use, and general acceptance of eVs will depend on knowing how to get the best out of the vehicle and the charging systems. That includes helping them understand the importance of eVs equipped with heated seats and steering wheels if cold weather is a part of the expected driving experience; recommending eV-only time-of-use (TOU) rates for home

chargers to keep utility bills in check; and encouraging the use of online eV tools and apps where available.

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