

An aerial photograph of a white Tesla Model 3 parked at a Supercharger station. The car is connected to a charging station. The station has several red and white charging units. The car is parked in a designated parking space marked with white lines. The background shows a paved parking lot with some cracks.

# **ELECTRIC VEHICLES ARE THE FUTURE. THE FUTURE IS NOW.**

**A briefing paper on why U.S. policymakers should prioritize transportation electrification.**

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# Table of Contents

A Once-in-a-Century Moment for the Transportation Industry.....	3
State of Play on U.S. Investments in Transportation Electrification .....	4
Ensuring Equity and Affordability in Transportation Electrification.....	7
Conclusion .....	10
References .....	10

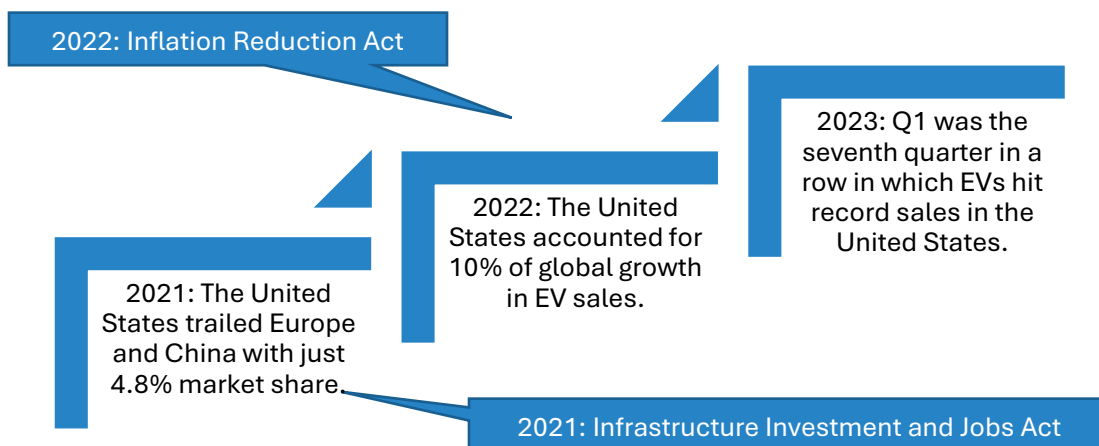
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# A Once-in-a-Century Moment for the Transportation Industry

The transportation sector is electrifying at unprecedented rates with more passenger vehicles, trucks, buses, and even bikes and scooters hitting the road every day. All told, transportation electrification is a multi-trillion-dollar industry, but the United States has been slow to capitalize on this market growth until recently. The United States represented just 4.8 percent of the global electric vehicle (EV) market in 2021 and the transportation equipment sector saw the international trade deficit balloon from \$15 billion in 2009 to a \$141 billion that same year [1, 2]. As other countries ramped up their EV manufacturing and deployment, the United States conceded jobs, trade revenue, and other economic benefits, not to mention global recognition as a sector leader, to Europe, China, and other parts of the world.

There are signs, however, that the United States is beginning to close the gap and grow its domestic EV market. At the end of 2022, multi-billion-dollar EV battery and assembly plants were announced in Ohio, Georgia, and South Carolina, each expected to create thousands of local jobs [3]. EV sales during the first quarter of 2023 were 54 percent higher compared to the same time period in 2022. At 8.8 percent, the first quarter of 2023 set a record high market share value for domestic light-duty EVs, the seventh quarter in a row to set such a record, see Figure 1 [4].

Figure 1: EV growth in the United States



Sources: [1, 5, 4]

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New federal policy and funding programs have spurred a resurgence in the U.S. EV market. Investments from the 2021 Infrastructure Investment and Jobs Act (IIJA) and the 2022 Inflation Reduction Act (IRA) have encouraged the expansion of EV manufacturing and the greater deployment of EVs and charging infrastructure. The IIJA alone includes \$50.3 billion of EV-eligible funds and, between its passage and March 2023, nearly 93,000 EV-related manufacturing jobs and \$95.6 billion investments have been announced [6, 7]. The IRA introduced numerous EV-specific tax credits which, when combined with other direct investments, add up to as much as \$100 billion [8].

Policy has also helped to ensure that equity and affordability plays a central role in the electrification transition. Traditionally underserved communities disproportionately suffer cost, health, and quality of life burdens born by the transportation sector and have the most to gain from electrification. Initiatives such as the Biden Administration's Justice40 are guiding transportation electrification such that benefits will be felt directly and immediately by these communities, aiming to ensure that they will not be left behind.

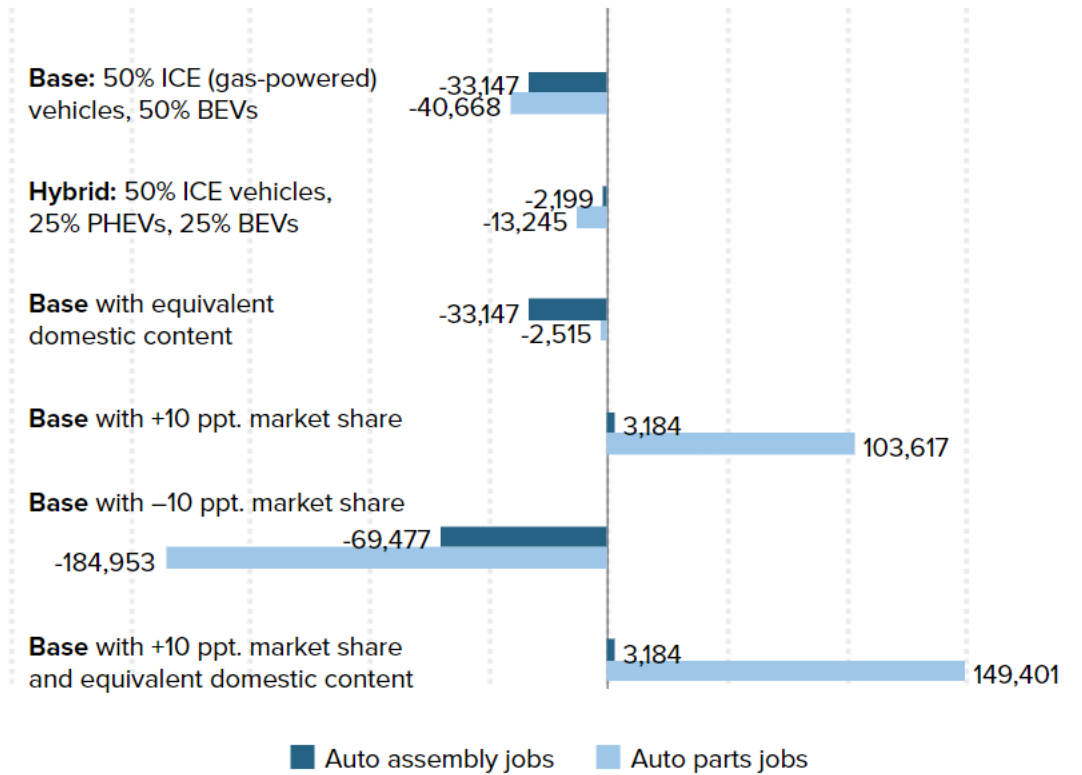
## State of Play on U.S. Investments in Transportation Electrification

The United States has a storied history of innovation in transportation, going back more than a century to do the days of Henry Ford and the Model T. In order to continue to lead in the multi-trillion-dollar global transportation industry, it must be at the forefront of all facets of transportation electrification, including battery research and development, charging infrastructure deployment, and vehicle and battery manufacturing.

The EV transition is well underway. Sales of internal combustion engine vehicles peaked in 2017 and the EV share of global passenger vehicle sales is expected to rise to 30 percent by 2026 [9]. The growth of the global EV market presents an opportunity to create tens of thousands of American jobs if U.S. manufacturers are able to boost their share of domestic auto and auto parts sales as shown in Figure 2 [10]. By embracing the building and selling of EVs and their components, and creating a favorable environment for domestic EV adoption, the United States can secure its position in the global market and drive economic growth.

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Figure 2: Change in U.S. auto jobs in 2030 under various EV market scenarios



Note: Passenger vehicle electrification will lead to a net loss of U.S. auto jobs unless the U.S. auto sector increases its domestic market share of EVs.

Source: [10]

Global manufacturers and battery suppliers have committed nearly \$1 trillion to electrifying transportation. Of these investments, more than \$200 billion is targeted at the United States with three-quarters of those funds being committed since 2021. In addition, investor-owned electric utilities have been approved by regulatory commissions to invest \$5.3 billion in transportation electrification, largely to deploy charging infrastructure.

Continued and expanded investments from the private sector, including the regulated utility industry will be essential. In the case of electric utilities, their engagement is necessary to ensure that the electrical grid can reliably accommodate the electricity demand changes that would result from widespread EV adoption.

Government investment also increased substantially in the last two years, thanks to two new federal laws. The Infrastructure Investment and Jobs Act of 2021 allocated over \$50 billion to programs that advance EV infrastructure and manufacturing. The law included a combined \$7.5 billion for the National Electric Vehicle Infrastructure and Charging and

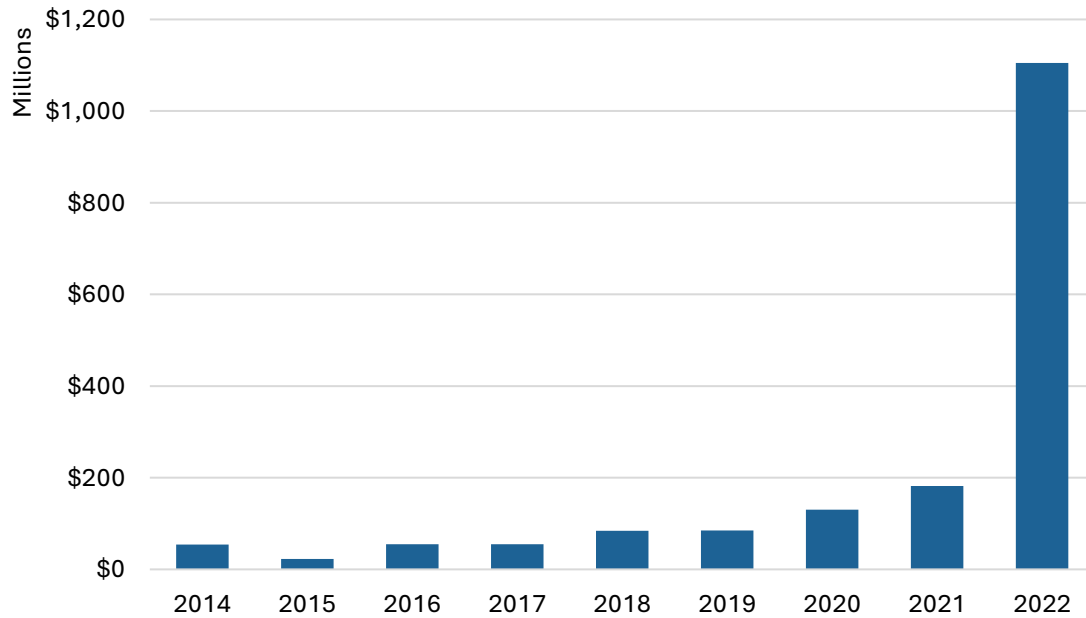
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Fueling Infrastructure Discretionary Grant programs to create a nationwide network of half a million EV chargers by 2030 [11]. This is in addition to over \$1.6 billion of state-led investment in public charging infrastructure from state-run programs and the government settlement with Volkswagen in 2016 [12]. This massive influx of investment in transportation electrification has increased the total number of EV charging ports by 350 percent in the last five years, reaching nearly 155,000 in May 2023 [13].

Another landmark legislation, the Inflation Reduction Act (IRA) of 2022, includes provisions aimed at onshoring various aspects of EV manufacturing. For example, IRA restructures the federal EV tax credit, which goes up to \$7,500 per passenger vehicle, to make eligibility contingent on two factors. Eligibility for half of the credit value requires the battery pack for an EV to be assembled in North America. The second half of the credit is contingent on battery capacity for vehicles placed into service before April 18, 2023. For newer vehicles, a percentage of critical minerals in batteries must be extracted or processed in the United States or a country with which the United States has a free trade agreement, or be recycled in North America [14, 15]. A commercial clean vehicle tax credit of up to \$40,000 is also available for businesses and tax-exempt organizations [16].

On top of funding infrastructure development and encouraging passenger and commercial EV purchases, the federal government has ramped up investments in electrifying public transportation. Fiscal Year 2022 saw over \$900 million awarded through the new \$5 billion EPA Clean School Bus grant program to fund the replacement of 2,490 fossil-powered school buses with electric or low-emission buses [17]. In addition, the Federal Transit Administration's and Bus Facilities Program was allocated \$5.6 billion in part for transit decarbonization grants through the Low or No Emission Grant Program [18, 19].

Figure 3: Low or no emission grant program funding over time



Source: [7]

While the current public investments and incentives for transportation electrification are substantial, they are unlikely to be enough for the U.S. to be a global leader in the EV market. Both Europe and China are already far ahead in adoption and are expected to maintain that lead for some time [9]. Additional involvement from the public and private sectors in the United States is necessary to continue building the necessary charging infrastructure, drive down costs, and accelerate the adoption of electric vehicles on a larger scale. Electric utilities will play a critical role by investing in grid upgrades and smart charging solutions to support the changes in demand for electricity from EVs. Collaboration between government, electric utilities, and the private sector will be essential to create an environment that fosters the transition to electric vehicles and maximizes the benefits of sustainable transportation.

## Ensuring Equity and Affordability in Transportation Electrification

Electrifying the transportation sector holds great potential to alleviate disproportionate burdens on low-income, underserved, and minority communities. Transportation is the largest contributor to greenhouse gas emissions across the United States, but the pollution

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distribution is unequal and concentrated near the source [20, 21]. As the nation's highway system was built out during the 1950s and 1960s, major highways and industrial routes were intentionally built through and around low-income and non-white communities. Not only did this destroy neighborhoods and segregate poor and non-white populations from more affluent parts of town, but it also placed these communities on the front lines of transportation-related emissions [22]. These communities continue to bear the brunt of carbon, smog, and diesel emissions and have higher rates of asthma, lung cancer, and heart disease [23]. Electrifying not just cars but buses, trucks, bikes, and scooters, can reduce the localized impacts of transportation-related emissions on underserved communities.

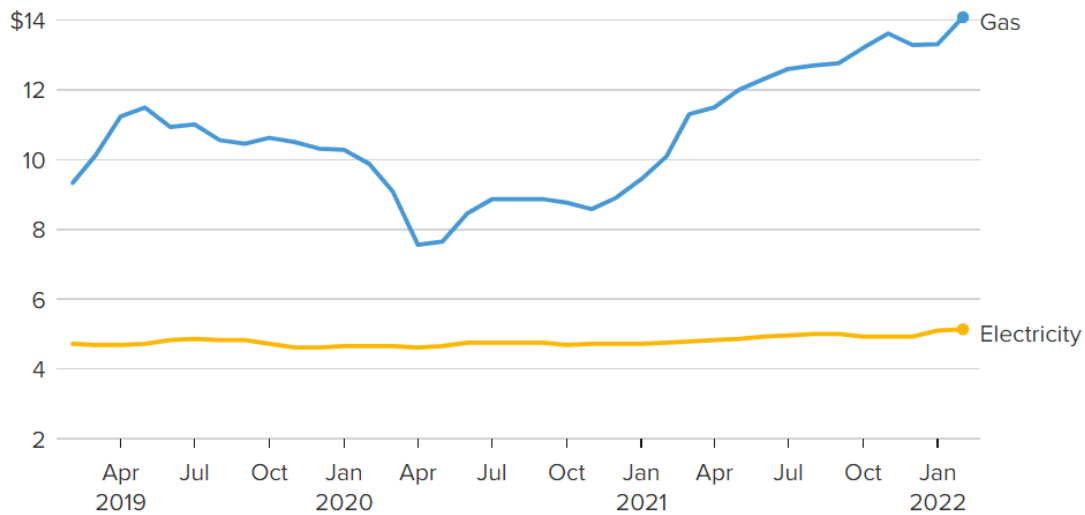
Lower-income communities also have a disproportionately higher cost burden for transportation, spending over a quarter of their income on transportation compared to higher-income groups, who spend closer to one-tenth [24]. EVs provide an opportunity to alleviate some of that cost burden and decrease transportation-related costs, especially over the lifetime of the vehicle. Given the new tax credits offered by the IRA, buying an electric vehicle is more affordable than ever before and allows lower-income consumers to receive a credit at the point of purchase [25]. However, it is in maintenance and operation where the biggest cost-savings can be felt. Given that EVs do not require services such as transmission repairs or oil changes, the average driver can save as much as four cents per mile on maintenance costs [26]. According to a study done by Consumer Reports, which compared popular EVs to their internal combustion engine counterparts, EVs showed a lifetime savings of between \$6,000 and \$10,000 for new cars and an even higher savings for used vehicles [27].

There is variability in terms of fueling costs, especially as both gas and electricity prices have continued to fluctuate over the past few years. When the price of gas broke records in March 2022, EV owners were saving as much as 17 cents per mile, or \$2,600 per year [28]. There is some concern that, as gas prices go down and electricity prices go up, that savings will shrink, if not disappear altogether [29]. However, gas prices fluctuate more wildly compared to electricity prices which, although vary geographically, tend to be more consistent over time, as shown in Figure 4 [30]. That stability could be valuable to lower-income populations who cannot or have not budgeted for the potential sticker shock of record-breaking gas prices.



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Figure 4: U.S. average cost comparison for 100 miles of driving range for gas versus electric



Source: [31]

Public policy is critical to ensuring that EVs and charging infrastructure are expanded equitably and deliberately to quickly and effectively benefit communities that currently suffer the most from transportation pollution and cost burdens. Justice40 is a federal initiative which requires 40 percent of climate and clean energy benefits be received by disadvantaged communities [32]. The National Electric Vehicle Infrastructure Program (NEVI), which grants funding to states for the purpose of building an interconnected EV charging network, is one of the first Justice40 programs to be implemented. In submitting their NEVI plans, states demonstrated how disadvantaged communities will be included in and directly and indirectly benefit from the electric vehicle transition.

Similarly, the investor-owned utility industry recognizes the market opportunity for growth within previously underserved communities and is targeting new projects and investments in these neighborhoods. Because public engagement is built into the regulatory process, communities have representation and can influence where funding is directed. Atlas has tracked over \$2 billion from electric utilities that is directed towards, primarily, EV charging infrastructure in underserved communities [33].

Low-income, non-white communities suffer the most from localized transportation-related pollution and spend an inordinate proportion of their income on transportation-related expenses. As such, it is this population that has the most to gain from electrifying all on-road vehicles. However, to ensure that that gap is closed and that these benefits are realized,

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policy, investment, and public engagement will need to prioritize and target these communities not eventually but, in many cases, now.

## Conclusion

The transition to electric vehicles presents a significant economic opportunity for the transportation industry in the United States. By leading in EV development, infrastructure, and manufacturing, the United States can secure its leadership position in the global auto industry of the future, which is quickly approaching. Landmark policies such as the Infrastructure Investment and Jobs Act and the Inflation Reduction Act, have already driven significant public and private investments in EVs and charging infrastructure, putting the nation on track to rapidly increase EV adoption as the United States tries to catch up to Europe and China.

The transition to electric transportation can also address stubborn issues of equity and affordability. Low-income and minority communities, which have historically borne the brunt of transportation-related pollution, and the poor who spend upwards of 27 percent of their income on transportation stand to benefit significantly from electrification [34]. The Justice40 Initiative and federal grant programs aim to ensure that EVs and EV infrastructure are expanded equitably, with a focus on directing investments and benefits to such communities. Investor-owned utilities are also targeting projects and investments in underserved neighborhoods, paving the way to improve quality of life in these areas. However, closing the gap and ensuring that historically underserved communities fully benefit from the transition to EVs will require continued prioritization, targeted policies, increased investment, and meaningful public engagement. By addressing these challenges and embracing the economic opportunities of EVs, the United States can deliver on the promise of a sustainable and equitable transportation future.

## References

- [1] I. Fadhil, Y. Chu and L. Jin, "Electric vehicles market monitor for light-duty vehicles: China, Europe, United States, and India, 2020 and 2021," International Council on Clean Transportation, Washington, DC, 2023.

## Electric Vehicles are the Future. The Future is Now.

- [2] Office of Trade & Economic Analysis, "TradeStats Express - U.S. Trade by Product," U.S. Department of Commerce, February 2023. [Online]. Available: <https://www.trade.gov/data-visualization/tradestats-express-us-trade-product>.
- [3] M. Khatib, "4 Stories from Q4," Atlas Public Policy, 13 March 2023. [Online]. Available: <https://www.atlasevhub.com/weekly-digest/4-stories-from-q4/>. [Accessed 12 June 2023].
- [4] M. Khatib, "3 Stories from Q1," Atlas Public Policy, 30 May 2023. [Online]. Available: <https://www.atlasevhub.com/weekly-digest/3-stories-from-q1-2/>. [Accessed 12 June 2023].
- [5] International Energy Agency, "Global EV Outlook 2023," International Energy Agency, 2023.
- [6] Atlas EV Hub, "Infrastructure Investment and Jobs Act (H.R. 3684)," Atlas Public Policy, 4 January 2022. [Online]. Available: <https://iea.blob.core.windows.net/assets/dacf14d2-eabc-498a-8263-9f97fd5dc327/GEVO2023.pdf>.
- [7] T. Taylor and J. Lea, "2022 In Review: A Year of Federal Climate Investments," Atlas Public Policy, Washington, DC, 2023.
- [8] N. Nigro, "Investment in Publicly Accessible EV Charging in the United States (2023)," 2023. [Online]. Available: <https://atlaspolicy.com/wp-content/uploads/2023/05/Investment-in-Publicly-Accessible-EV-Charging.pdf>. [Accessed 12 June 2023].
- [9] C. McKerracher, A. O'Donovan, N. Soulopoulos, A. Grant, J. Lyu, S. Mi, D. Doherty, R. Fisher, C. Cantor, M. Yang, K. Ampofo, Y. Sekine, A. Leach, E. Stoikou, J. Shi, P. Xu, L. M. Yague, A. Haring, P. Geurts, C. Adriaenssens, A. T. Abraham and K. Kareer, "Electric Vehicle Outlook 2023," Bloomberg New Energy Finance, 2023. [Online]. Available: <https://about.bnef.com/electric-vehicle-outlook/>. [Accessed 12 June 2023].
- [10] J. Barrett and J. Bivens, "The stakes for workers in how policymakers manage the coming shift to all-electric vehicles," Economic Policy Institute, 2021. [Online]. Available: <https://www.epi.org/publication/ev-policy-workers/>. [Accessed 12 June 2023].
- [11] O. Minott, "A Status Update on EV Charging Infrastructure Investments in the IIJA," Bipartisan Policy Center, 2022.
- [12] Atlas EV Hub, "Global Private Investment: Market Data," Atlas Public Policy, 2023. [Online]. Available: <https://www.atlasevhub.com/materials/private-investment/>. [Accessed 30 May 2023].

Electric Vehicles are the Future. The Future is Now.

- [13] Atlas EV Hub, "EV Charging Deployment," Atlas Public Policy, 2023. [Online]. Available: <https://www.atlasevhub.com/materials/ev-charging-deployment>. [Accessed 31 May 2023].
- [14] O. Minott and H. Nguyen, "IRA EV Tax Credits: Requirements for Domestic Manufacturing," Bipartisan Policy Center, 2023.
- [15] U.S. Department of the Treasury, "Treasury Releases Proposed Guidance on New Clean Vehicle Credit to Lower Costs for Consumers, Build U.S. Industrial Base, Strengthen Supply Chains," 31 March 2023. [Online]. Available: <https://home.treasury.gov/news/press-releases/jy1379>. [Accessed 12 June 2023].
- [16] Internal Revenue Service, "Commercial Clean Vehicle Credit," U.S. Department of Commerce, 23 January 2023. [Online]. Available: <https://www.irs.gov/credits-deductions/commercial-clean-vehicle-credit>.
- [17] U.S. Environmental Protection Agency, "Awarded Clean School Bus Program Rebates," 5 May 2023. [Online]. Available: <https://www.epa.gov/cleanschoolbus/awarded-clean-school-bus-program-rebates>. [Accessed 9 June 2023].
- [18] Federal Transit Administration, "Low or No Emission Vehicle Program - 5339(c)," U.S. Department of Transportation, 2023. [Online]. Available: <https://www.transit.dot.gov/lowno>. [Accessed 31 May 2023].
- [19] Federal Transit Administration, "Grants for Buses and Bus Facilities Program," U.S. Department of Transportation, 2023. [Online]. Available: <https://www.transit.dot.gov/bus-program>. [Accessed 31 May 2023].
- [20] C. W. Tessum, D. A. Paoletta, S. E. Chambliss, J. S. Apte, J. D. Hill and J. D. Marshall, "PM2.5 pollutants disproportionately and systemically affect people of color in the United States," *Science Advances*, vol. 7, no. 18, 2021.
- [21] U.S. Environmental Protection Agency, "Sources of Greenhouse Gas Emissions," 28 April 2023. [Online]. Available: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#transportation>.
- [22] D. N. Archer, "Transportation Policy and the Underdevelopment of Black Communities," *106 Iowa Law Review* 2125, no. NYC School of Law, Public Law Research Paper No. 21-12, 2021.
- [23] Evergreen Action, "How We Can Advance Environmental Justice by Tackling Transportation Sector Pollution," April 2023. [Online]. Available:

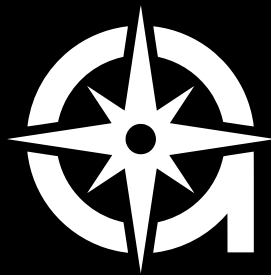
Electric Vehicles are the Future. The Future is Now.

<https://evergreenaction.com/blog/how-we-can-advance-environmental-justice-by-tackling-transportation-sector-pollution>. [Accessed 12 June 2023].

- [24] U.S. Department of Transportation, Bureau of Transportation Statistics, "Transportation Economic Trends, Household Spending on Transportation: Average Household Spending," [Online]. Available: <https://data.bts.gov/stories/s/Transportation-Economic-Trends-Transportation-Spen/ida7-k95k/>. [Accessed 8 June 2023].
- [25] T. Taylor, "IRA to Unlock Billions in EV Funding," Atlas Public Policy, 15 August 2022. [Online]. Available: <https://www.atlasevhub.com/weekly-digest/ira-to-unlock-billions-in-ev-funding/>. [Accessed 12 June 2023].
- [26] U.S. Department of Energy, "FOTW #1190, June 14, 2021: Battery-Electric Vehicles Have Lower Scheduled Maintenance Costs than Other Light-Duty Vehicles," 14 June 2021. [Online]. Available: <https://www.energy.gov/eere/vehicles/articles/fotw-1190-june-14-2021-battery-electric-vehicles-have-lower-scheduled>.
- [27] C. Harto, "Electric Vehicle Ownership Costs: Today's Electric Vehicles Offer Big Savings for Consumers," Consumer Reports, 2020.
- [28] Consumer Reports, "New Consumer Reports analysis shows rising gas prices ramp up savings for EV owners," 10 March 2022. [Online]. Available: [https://advocacy.consumerreports.org/press\\_release/new-consumer-reports-analysis-shows-rising-gas-prices-ramp-up-savings-for-ev-owners/#:~:text=According%20to%20a%20new%20Consumer%20Reports%20analysis%20based,the%20U.S.%29%2C%20compared%20to%20drivers%20o](https://advocacy.consumerreports.org/press_release/new-consumer-reports-analysis-shows-rising-gas-prices-ramp-up-savings-for-ev-owners/#:~:text=According%20to%20a%20new%20Consumer%20Reports%20analysis%20based,the%20U.S.%29%2C%20compared%20to%20drivers%20o). [Accessed 12 June 2023].
- [29] I. Ivanova, "For some electric vehicle owners, recharging now more costly than filling up," USA Today, 13 February 2023. [Online]. Available: <https://www.cbsnews.com/news/electric-car-2023-costs-gas-vehicles/>.
- [30] J. Guynn, "Electricity bills are surging, is it still cheaper to charge an EV than get gas? It depends.," USA Today, 16 February 2023. [Online]. Available: <https://www.usatoday.com/story/money/cars/2023/02/16/cars-gas-ev-fuel-electricity-rates/11267270002/>. [Accessed 12 June 2023].
- [31] J. Rosevear, "These charts show how much it costs to charge EV vs. refueling a gas vehicle," CNBC, 19 March 2022. [Online]. Available: <https://www.cnbc.com/2022/03/19/cost-of-charging-ev-vs-gas-prices.html>.

Electric Vehicles are the Future. The Future is Now.

- [32] The White House, "Justice40: A Whole-of-Government Initiative," 2023. [Online]. Available: <https://www.whitehouse.gov/environmentaljustice/justice40/>. [Accessed 31 May 2023].
- [33] Atlas EV Hub, "Electric Utility Filings: Public Policy," Atlas Public Policy, 2023. [Online]. Available: [https://www.atlasevhub.com/materials/electric-utility-filings/..](https://www.atlasevhub.com/materials/electric-utility-filings/) [Accessed 31 May 2023].
- [34] Bureau of Transportation Statistics, "Transportation Economic Trends, Household Spending on Transportation: Average Household Spending," U.S. Department of Transportation, [Online]. Available: <https://data.bts.gov/stories/s/Transportation-Economic-Trends-Transportation-Spen/ida7-k95k/>. [Accessed 8 June 2023].



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