

**Written Testimony to the
Subcommittee on Clean Air, Climate, and Nuclear Safety,
Senate Committee on Environment and Public Works,
U.S. Senate**

Cleaner Cars: Good for Consumers and Public Health

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Chair Markey, Ranking Member Ricketts, and esteemed members of this subcommittee: Thank you for the opportunity today to discuss the benefits of cleaner cars in the United States.

My name is Kathy Harris, and I lead the clean cars portfolio at the Natural Resources Defense Council (NRDC). NRDC is an international nonprofit of scientists, lawyers, and environmental specialists dedicated to protecting natural resources, public health, and the environment. Founded in 1970, NRDC has more than 3 million members and online activists, and we are committed to improving public health, tackling the climate crisis, and creating a more affordable clean energy future.

I have structured my testimony as follows:

- 1) The Importance of Reducing Emissions from The Transportation Sector to Improve Air Quality and Health
- 2) The Environmental and Health Benefits of Transitioning to A Zero-Emission Vehicle Future
- 3) The Economic Benefits of Zero-Emission Vehicles
- 4) The State of the Electric Vehicle Market
- 5) Federal Support for the Growing Electric Vehicle Market

1. The Importance of Reducing Emissions from the Transportation Sector to Improve Air Quality and Health

To address the climate crisis and improve public health, the United States must work to decarbonize the transportation sector, which is now the largest source of greenhouse gas emissions. In the United States, 22 percent of all climate pollution comes from on-road vehicles.¹

¹ Environmental Protection Agency. Notice of Proposed Rule Making: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles. 40 CFR Parts 85, 86, 600, 1036, 1037, and 1066. April 12, 2023. Hereafter “NRPM”. Also see, U.S. EPA, “Fast Facts on Transportation Greenhouse Gas Emissions,” <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>.

The transportation sector is also a major source of other toxic pollution in the United States. Emissions from cars and trucks on the road include pollutants such as particulate matter (PM), nitrogen oxides (NOx), sulfur oxides, which are detrimental to air quality and human health. According to the Environmental Protection Agency, 54 percent of NOx emissions come from mobile sources with 20 percent of that coming from light-and-medium duty vehicles.² Further, light- and medium- duty vehicles account for approximately 19 percent of PM 2.5 emissions as well. Exposure to these emissions can cause asthma attacks, heart attacks, strokes, cancer, and premature death.

Together, these pollutants not only harm the environment and our air, but also human health. The American Lung Association notes that 4 in 10 Americans live in communities that are impacted by unhealthy levels of air pollution.³ Communities of Color and lower income communities tend to bear the brunt of these emissions and have been historically overburdened with pollution from the transportation sector.

2. The Environmental and Health Benefits of Transitioning to a Zero-Emission Vehicle Future

A key strategy to reducing emissions from mobile sources is to transition to zero-emission vehicles (which can include battery electric vehicles, such as the Nissan Leaf or Chevy Blazer EV, plug-in hybrid electric vehicles, such as the Toyota Prius- or RAV4-Prime, and fuel cell electric vehicles), which, as the name indicates, release zero tailpipe emissions when utilizing the onboard battery. The American Lung Association highlights that shifting to zero-emission vehicles (including passenger and commercial trucks) could reduce transportation NOx emissions by 92% by 2050, fine particulate matter by 61%, and greenhouse gas emissions by 93%.⁴ Reducing these emissions in turn will help to improve health and decrease hospital visits and premature death associated with emissions from gasoline and diesel vehicles.

Electric vehicles (EVs) charge by utilizing power from the electric grid. While emissions from the tailpipe is zero, there are emissions from producing the fuel – in this case electricity. Emissions from producing electricity will vary depending on the mix of resources used (e.g., natural gas, coal, nuclear, wind, solar, etc). However, on today's average U.S. mix which includes coal and natural gas, these vehicles still produce fewer overall emissions than their gasoline counterparts (as show in Figures 1-3).⁵ And overall EV emissions will continue to get cleaner over time as we clean up the electric grid and add more renewable energy sources onto the electric grid.

² NRPM, pages 10- 11. April 12, 2023

³ American Lung Association. (2022). Zeroing In on Healthy Air: State of the Air 2022.

<https://www.lung.org/getmedia/13248145-06f0-4e35-b79b-6dfacfd29a71/zeroing-in-on-healthy-air-report-2022.pdf>

⁴ *Ibid.*

⁵ U.S. Department of Energy. Electric Vehicle Emissions Calculator. Alternative Fuels Data Center. Retrieved April 14, 2023, from https://afdc.energy.gov/vehicles/electric_emissions.html

Figure 1: National Averages of annual all electric light-duty vehicles compared to gasoline and other fuel sources.

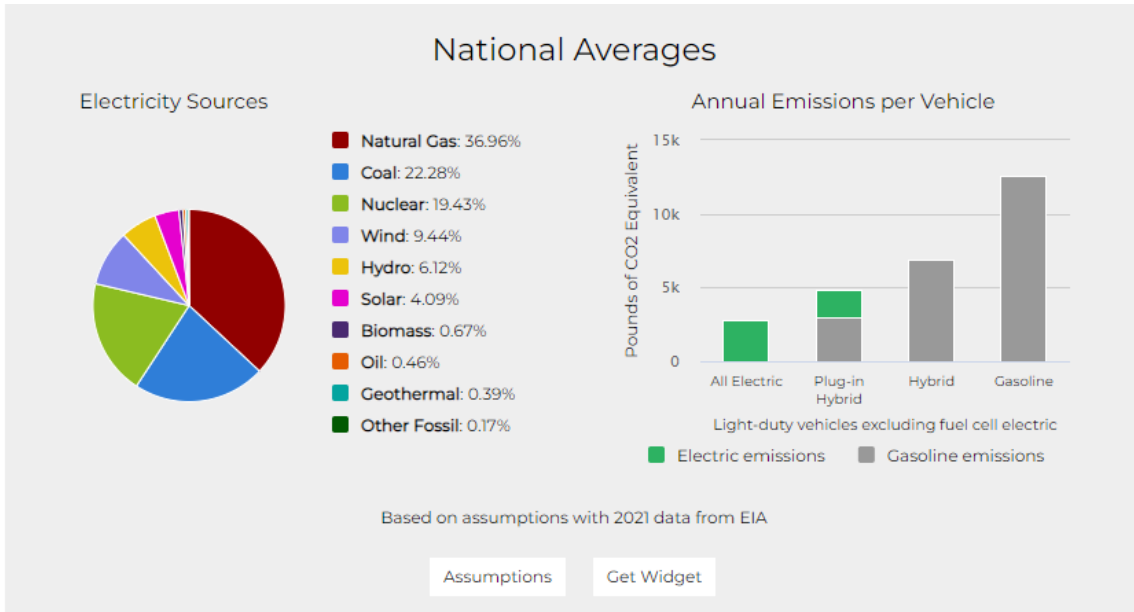


Figure 2: Emissions of annual all electric light-duty vehicles compared to gasoline and other fuel sources.

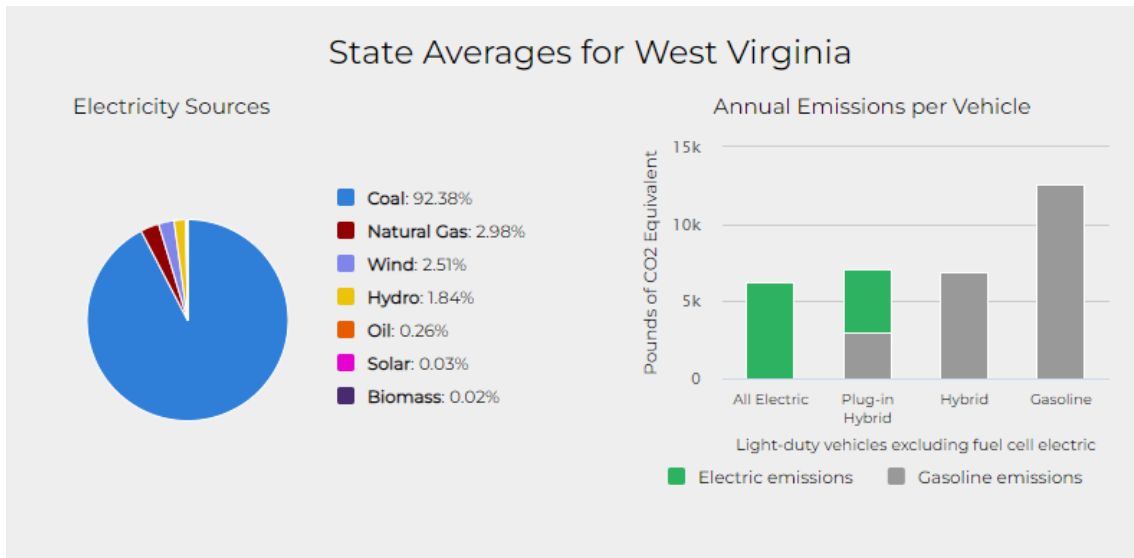
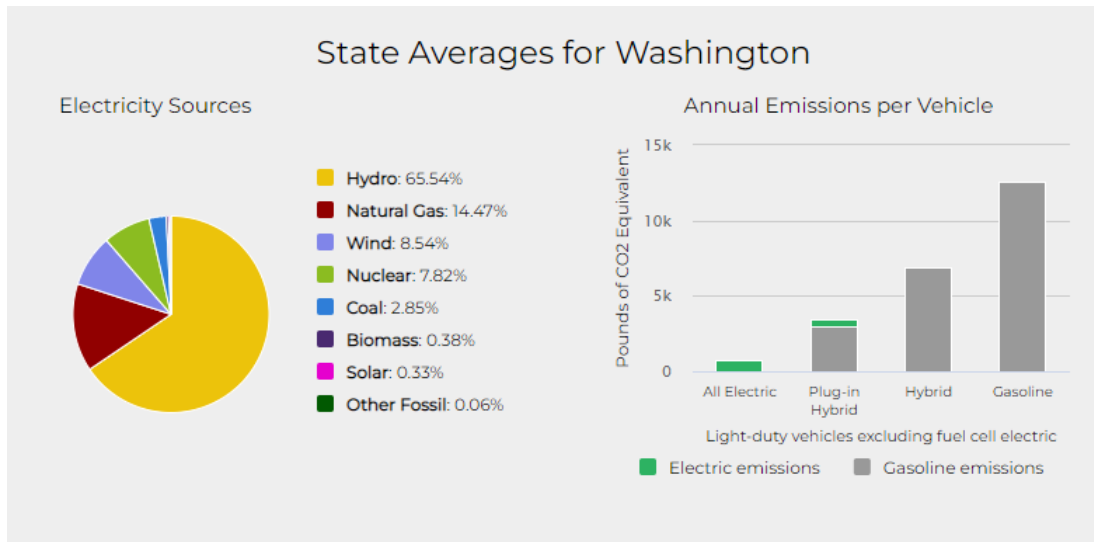


Figure 3: Emissions of annual all electric light-duty vehicles compared to gasoline and other fuel sources.



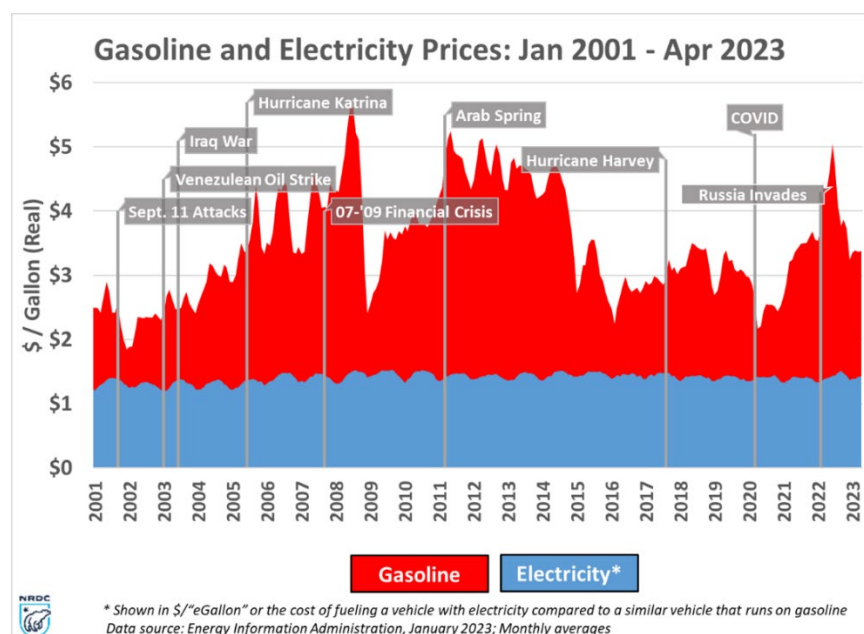
3. The Economic Benefits of Zero-Emission Vehicles

In addition to the environmental, air quality, and health benefits associated with zero-emission vehicles, there are also significant economic benefits for the economy and drivers.

Zero-emission vehicles save drivers money. Electric vehicles have fewer moving parts than gasoline vehicles, and therefore require less maintenance, helping to reduce the overall cost of ownership of the vehicle. Further, the cost of electricity tends to be cheaper than the cost of gasoline, and electricity prices are significantly more stable than the fluctuating costs of gasoline and diesel. This means that drivers will not only save money “refueling” their vehicles but will also be able to better plan and budget for their monthly transportation costs.

Charging at home is roughly the equivalent of fueling up on a dollar-a-gallon gasoline. And the average price of residential electricity, adjusted for inflation, has stayed close to the dollar-a-gallon equivalent mark for over 20 years, as depicted in the chart below, while gas prices go up and down erratically.

Figure 4: The average price of gasoline compared to the price of electricity⁶



The growing availability of medium- and heavy-duty electric vehicles also offer commercial fleets substantial fuel and maintenance cost savings, causing demand to soar for vehicles well suited for electrification today such as delivery vans, short-haul trucks, and transit buses. The United States can expect to see rapid EV adoption rates as fleet familiarity grows and savings accrue.

While the upfront cost of electric vehicles can be higher than a comparable gasoline vehicle in today’s prices, an analysis by Atlas Public Policy found that in 2022, electric sedans, SUVs and pickup trucks had a lower total cost of ownership than their gasoline counterparts in large part to annual savings in fuel and maintenance costs.⁷ In addition, rural drivers who on average tend to drive further and have larger vehicles stand to benefit the most from electrifying their vehicles. An analysis by the MJ Bradley and Associates on clean transportation strategies for rural communities showed the lifetime savings for an EV ranged from \$27,000 to \$44,000 in the rural areas compared to \$22,000 to \$31,000 in urban areas.⁸

The upfront costs of EVs are also decreasing. The U.S. Department of Energy estimates that electric vehicle battery costs in 2022—which is the most expensive part of an electric vehicle—

⁶ Baumhefner, M. (2017, August 16). Fight Fascists, Save Money: Go Electric. Natural Resources Defense Council. from <https://www.nrdc.org/bio/max-baumhefner/fight-fascists-save-money-go-electric>

⁷ Atlas Public Policy. (2022). Total Cost of Ownership Analysis. <https://atlaspolicy.com/wp-content/uploads/2022/01/Total-Cost-of-Ownership-Analysis.pdf>

⁸ Lowell, D., Van Atten, C., Culkin, J., & Langlois, T. (2020, November). Clean transportation strategies for rural communities in the Northeast and MidAtlantic States. Union of Concerned Scientists.

https://www.ucsusa.org/sites/default/files/2020-11/rural-transportation-opportunities_0.pdf; also see Moura, C. (November, 2021). 5 Ways Rural Drivers Benefit from Electric Vehicles [Blog post]. Union of Concerned Scientists. <https://blog.ucsusa.org/cecilia-moura/5-ways-rural-drivers-benefit-from-electric-vehicles/>

were nearly 90% cheaper than in 2008, with battery costs now reaching about \$153/kwh.⁹ And the International Council on Clean Transportation (ICCT) estimates that electric vehicles will reach price parity with gasoline vehicles across multiple classes between 2024-2032.¹⁰

Additionally, tax credits from the Inflation Reduction Act, as well as state and manufacturer rebates also can help to lower the upfront cost of electric vehicles. A recent report by Energy Innovation and ICCT shows that IRA will increase access to EVs and allow them to be at cost parity several years earlier, allowing for a jump in market share from 34% by 2030 to as high as 61% by 2030.¹¹

Further, there are additional economic benefits from reduced pollution and health costs as a result of the transition to zero-emission vehicles. The American Lung Association estimates that transitioning the transportation sector to zero-emission vehicles and non-combustion electricity generation could generate over \$1.2 trillion in public health benefits through 2050, as well as \$1.7 trillion in climate benefits from avoided costs of having to address and adapt to severe climate change.¹²

4. The State of the Market

A global transition to ZEVs is underway, and now the United States must determine if we will lead this transition or miss out on the benefits the transition can bring to our shores. This is not dissimilar to the technology transitions from landlines and payphones to mobile smartphones; from VHS tapes to on-demand services; or modern-day computers that are a billion times faster than the computer we put on Apollo 11 to send Neil Armstrong to the moon.¹³ Most automakers now see the transition to ZEVs as inevitable and necessary, and many have committed to transitioning their full ZEV fleet within the next decade.¹⁴

Sales of electric vehicles in the United States continue to increase annually. According to the Alliance for Automotive Innovation, electric vehicles accounted for 7 percent of the new vehicles sold in the United States 2022—an increase from 4.4 percent in 2021. In December

⁹ U.S. Department of Energy. (2023, January 9). FOTW #1272, January 9, 2023: Electric vehicle battery pack costs in 2022 are nearly half the cost in 2015. Energy.gov. <https://www.energy.gov/eere/vehicles/articles/fotw-1272-january-9-2023-electric-vehicle-battery-pack-costs-2022-are-nearly>

¹⁰ Slowik, P., Isenstadt, A., Pierce, L., & Searle, S. (2022, October). Assessment of light-duty electric vehicle costs and consumer benefits in the United States in the 2022–2035-time frame. International Council on Clean Transportation. <https://theicct.org/wp-content/uploads/2022/10/ev-cost-benefits-2035-oct22.pdf>

¹¹ Energy Innovation. (2023, January). Analyzing the Impact of the Inflation Reduction Act on EV Uptake in the U.S. [Report]. <https://energyinnovation.org/wp-content/uploads/2023/01/Analyzing-the-Impact-of-the-Inflation-Reduction-Act-on-EV-Uptake-in-the-U.S..pdf>

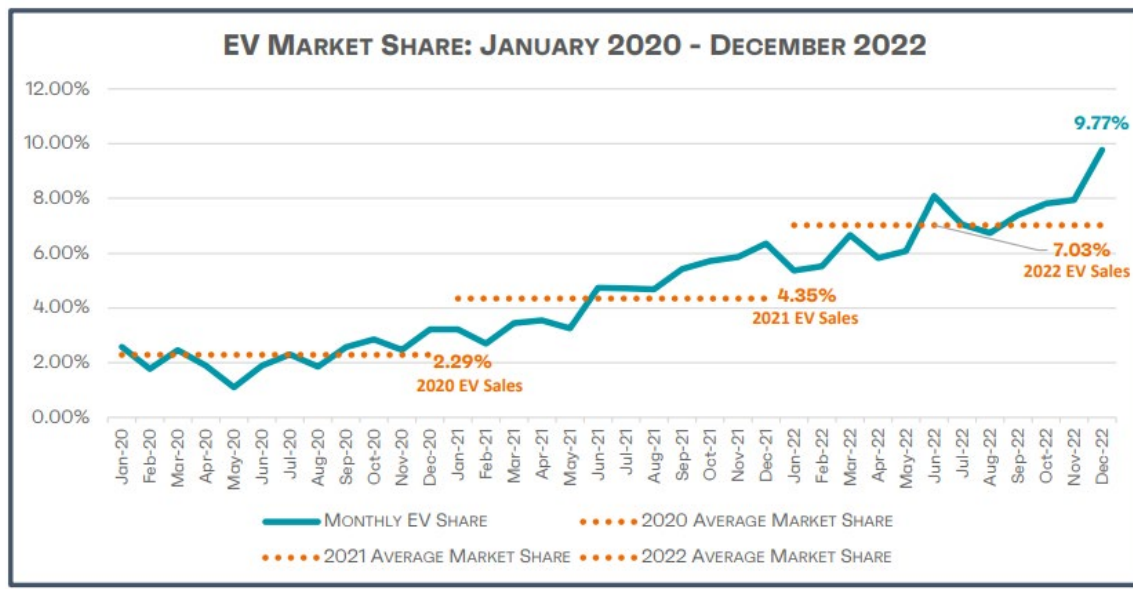
¹² American Lung Association. (2022). Zeroing In on Healthy Air: State of the Air 2022. <https://www.lung.org/getmedia/13248145-06f0-4e35-b79b-6dfacfd29a71/zeroing-in-on-healthy-air-report-2022.pdf>

¹³ Adobe. (2022, November 8). Fast forward: Comparing 1980s supercomputer to modern smartphone. Adobe Blog. <https://blog.adobe.com/en/publish/2022/11/08/fast-forward-comparing-1980s-supercomputer-to-modern-smartphone>

¹⁴ ERM, EDF (September 2022), *Electric Vehicle Market Update*. https://blogs.edf.org/climate411/files/2022/09/ERM-EDF-Electric-Vehicle-Market-Report_September2022.pdf. Also see <https://www.nytimes.com/2023/04/11/business/energy-environment/cars-electric-vehicles-epa.html>.

2022, EVs were almost 10% of new vehicle sales across the U.S. And EV sales were up 44 percent in 2022 even though there was an overall decrease in overall total light-duty vehicle sales of 11 percent.¹⁵ The U.S. market is beginning to catch up with the two other largest markets in the world: Europe, where electric vehicle sales soared to 23% in 2022, with sales surging to a record 38% by December 2022; and China with electric vehicle sales hitting a 30% share by in 2022.¹⁶

Figure 5: EV Market Share: January 2020- December 2022



In addition, growing demand from customers for these vehicles, automakers are also supporting the transition to zero-emission vehicles. Globally, automakers and battery manufacturers have announced over \$860 billion of investments to accelerate the transition to zero-emission vehicles, with more nearly a quarter (\$210 billion) of these investments going to projects in the United States more than any other country in the world.¹⁷ Investments in the U.S. are being spurred with the enactment of the Inflation Reduction Act (IRA) and the Infrastructure Investments and Jobs Act (IIJA), together with state and federal vehicle standards. These investments are helping to onshore the electric vehicle industry—creating jobs in the U.S. and helping to make the country a competitive leader in the electric vehicle industry.

¹⁵ Alliance for Automotive Innovation. (2023). 2022 Q4 Electric Vehicle Report [PDF].

<https://www.autosinnovate.org/posts/papers-reports/Get%20Connected%202022%20Q4%20Electric%20Vehicle%20Report.pdf>

¹⁶ CleanTechnica (February 2, 2023), “[Open the Gates! 25% BEV Share in Europe](#)” and InsideEVs (February 8, 2023), “[China: Nearly 6 Million Plug-in Cars Were Sold in 2022.](#)”

¹⁷ Atlas Public Policy, NRDC (January 2023), https://www.atlasevhub.com/data_story/210-billion-of-announced-investments-in-electric-vehicle-manufacturing-headed-for-the-u-s/#_ftn4. Also see the Alliance for Automotive Innovation (March 2023). The Future Is Electric: Lets Drive Together <https://www.autosinnovate.org/posts/communications/The%20Future%20Is%20Electric%20Infographic>

There are also an increasing the number of makes and models of zero-emission vehicles available to drivers. At the end of 2022, there were 91 electric vehicle models available for sale, including cars, utility vehicles, pickup trucks, and vans.¹⁸ And many automakers have already announced plans to phase out gasoline vehicles from their offerings and increase the number of electric models available in their fleets. Announced plans include:

- General Motors—100% electric vehicle sales in U.S. by 2035 and carbon neutral by 2040¹⁹
- Volvo—will only make electric vehicles by 2030²⁰
- Volkswagen—half of its vehicle sales in the U.S. will be electric by 2030; fully electric a few years later²¹
- Honda—announced a fully electric vehicle lineup by 2040. Estimates that 40% of North American sales will be electric by 2030²²
- Toyota—will introduce 30 new all-electric vehicles by 2030.²³

The United States is also seeing an increase in electric vehicle charging stations. While it is estimated that 80% of electric passenger vehicle charging happens at home,²⁴ a robust charging network helps ensure drivers can charge while enroute, while also providing opportunities for drivers to charge their vehicles who may not have the ability to do so at home or at work. Currently, there are over 155,000 EV charging ports at over 61,000 locations throughout the United States.²⁵

5. Federal Support for the Growing Zero-Emission Vehicle Market

The Inflation Reduction Act and the Infrastructure Investment and Jobs Act will also help to support the growing electric vehicle market. The Inflation Reduction Act is not only providing incentives to drivers to purchase electric vehicles—helping to offset the upfront costs of the vehicles—but also providing robust incentives to vehicle manufacturers to onshore the electric vehicle supply chain here in the United States.

The Infrastructure Investment and Jobs Act has dedicated \$7.5 billion to further expand and buildout a robust network of charging infrastructure throughout the country. These investments

¹⁸ Alliance for Automotive Innovation (March 2023). The Future Is Electric: Lets Drive Together <https://www.autosinnovate.org/posts/communications/The%20Future%20Is%20Electric%20Infographic>

¹⁹ General Motors, “General Motors, the Largest U.S. Automaker, Plans to be Carbon Neutral by 2040,” Press Release, January 28, 2021.

²⁰ Volvo Car Group, “Volvo Cars to be fully electric by 2030,” Press Release, March 2, 2021.

²¹ Volkswagen Newsroom, “Strategy update at Volkswagen: The transformation to electromobility was only the beginning,” March 5, 2021. <https://www.volkswagen-newsroom.com/en/stories/strategy-update-at-volkswagen-the-transformation-to-electromobility-was-only-the-beginning-6875>

²² Honda News Room, “Summary of Honda Global CEO Inaugural Press Conference,” April 23, 2021. Accessed June 15, 2021 at <https://global.honda/newsroom/news/2021/c210423eng.html>.

²³ Toyota Motor Corporation, “Video: Media Briefing on Battery EV Strategies,” Press Release, December 14, 2021. Accessed on December 14, 2021 at <https://global.toyota/en/newsroom/corporate/36428993.html>.

²⁴ ChargeHub. A Beginner’s Guide to Electric Cars: How to Charge an EV at Home. <https://chargehub.com/en/home-charging-guide-electric-vehicles.html>

²⁵ U.S. Department of Energy. Alternative Fuels Data Center Station Locator. <https://afdc.energy.gov/stations/#/analyze?fuel=ELEC> (Accessed April 13, 2023)

will not only increase the amount of charging stations on the United States highways—connecting people across the country—but also build out charging infrastructure in communities.

Most recently, the Environmental Protection Agency proposed multi-pollutant emission standards for Model Years 2027 and Later Light-Duty and Medium-Duty vehicles. Based on the market trends, automaker commitments, and investments coming from the Inflation Reduction Act and the Infrastructure Investment and Jobs Act, EPA estimates that in order to achieve the proposed Model Year 2032 tailpipe greenhouse gas emissions, car companies will find it most cost effective to meet these standards by increasing sales of electric vehicles. For the reasons discussed in this testimony, it is vital that EPA adopt the most stringent standards possible to help accelerate the transition to clean cars and trucks to guarantee the myriad of benefits they bring to the United States and its residents.

6. Conclusion

There are major pollution and emissions problems to address in the United States, and clean cars are a key piece of the solution. States, Congress, key industry players, and consumers are spearheading the transition to zero emissions, but it's up to EPA to finish the job and set the strong standards needed to fully realize a future in which the cleanest vehicles can proliferate. Thank you for the opportunity to testify today on this important and timely matter.