

North Carolina has already taken important steps toward an electrified transportation future, with actions by the state government, local governments, non-governmental organizations, and the private sector, including utilities and EV-related companies.

North Carolina Executive Order (EO) 80 from 2018 seeks to increase the number of zero-emission vehicles (ZEVs) in the state to at least 80,000 by 2025 and to establish interstate ZEV corridors. EO 246, signed in early 2022, increases the total targeted number of registered ZEVs to at least 1,250,000 by 2030 and aims for 50% of in-state new vehicle sales to be zero-emission by 2030. Since the issuance of EO 80, the state has reached over [51,000](#) registered ZEVs. These EOs build on the strategies laid out in the [North Carolina ZEV Plan](#) and the [North Carolina Motor Fleet ZEV Plan](#).

For medium- and heavy-duty electrification, the state signed a [Multi-State Zero Emission Medium- and Heavy-Duty \(MD, HD\) Vehicle Memorandum of Understanding](#) in July 2020, along with 17 other states and the District of Columbia. This agreement establishes a commitment to make 100% of MD and HD sales ZEV by 2050 and at least 30% by 2030. On October 25, 2022, Governor Cooper signed EO 271, which directs the North Carolina Department of Environmental Quality to propose that the Environmental Management Commission adopt an Advanced Clean Trucks (ACT) program to ensure the mass deployment of ZE trucks and buses in the state. During the 2023 budget cycle, the legislature included language that prohibited ACT's regulatory process from proceeding further. Still, EO 271 was an important signal from the governor's office that North Carolina needs more proactive policymaking to prepare for electric vehicles (EVs), especially medium- and heavy-duty EVs. North Carolina also has multiple incentives (e.g., tax exemptions, high occupancy vehicle lane access, funding for charging infrastructure) and regulations (e.g., EV goals for fleets, rates for charging) that support ZEV targets and reduce emissions. North Carolina requires that EV drivers pay an annual fee of \$180, which is approximately equivalent to what a comparable conventional vehicle owner would pay in gasoline tax, serving as a disincentive to EV adoption.

As of 2023, North Carolina ranks third in the Southeast for charging deployment per capita with 811 fast charger ports and 2,601 level 2 ports, a 60% growth in total ports from July 2022.<sup>1</sup> The state's commitment to EVs also extends to the local level. The City of Charlotte, a member of the American Climate Cities Challenge, is an ambitious leader. Under its [Strategic Energy Action Plan](#), the City is seeking to transition its fleet to EVs by 2030 and is installing charging stations. The City also has 17 battery electric bus (BEB) chargers with 31 ports, making it the largest active BEB fleet on the East Coast.<sup>2</sup> Charlotte worked around delays in EV



<sup>1</sup> Clean Energy (June 2023). Transportation Electrification in the Southeast: North Carolina. [North Carolina - Transportation Electrification in the Southeast - Aug 2023](#) ([cleanenergy.org](#))

<sup>2</sup> City of Charlotte (2022). Strategic Energy Action Plan (SEAP) Annual Report. [TITLE](#) ([charlottenc.gov](#))

manufacturing and global supply shortages in 2022 but continued to advance electrification and GHG emissions reduction efforts including developing an EV 101 training for city staff and partnering with Centralina Clean Fuels Coalition to conduct an EV ride-and-drive event and first responder EV training.

Additionally, on June 1, 2020, the city implemented the [Sustainable and Resilient Fleet Policy \(SFP\)](#), which enables a focus on purchasing the lowest-emitting vehicle depending on usage, vehicle class, and available technology. Throughout 2022, the city has continued to deploy its Automatic Vehicle Locators (AVL), which allowed the city to collect data on vehicle patterns and identify opportunities to reduce carbon emissions, ultimately identifying 24 vehicles for decommissioning and 20 underutilized vehicles that will be given to other departments.<sup>3</sup> In 2022, the city received its first all-electric Ford Mustang Mach-E, Ford F-150 Lightning, and Aebi Schmidt eSwingo 200+ Bike Lane Street Sweeper.

## The Case for EVs in North Carolina

Motivations for EV action in North Carolina include economic development benefits like manufacturing investments and jobs; the need to reduce greenhouse gas emissions and air pollutants, such as particulate matter (from diesel vehicles) and nitrogen oxides, which adversely impact public health, especially for communities of color; and concerns over the adverse energy security impacts associated with oil dependence.

## Jobs and Economic Development

EVs benefit economic development, and North Carolina is poised to grow its EV industry. Already, it is home to more than a dozen companies involved in the EV supply chain, including those focused on charging stations, batteries, lithium inputs, electronic controls, and electronic devices used in motors and charging (Fig. 1). Economic benefits beyond the supply chain include growth in electricity generation and distribution,

grid and infrastructure investments, vehicle sales, and associated advertising and marketing services. Federal programs like the National Electric Vehicle Infrastructure (NEVI) program and others (see Federal Funding in NC, page 4) have sourcing and manufacturing requirements called the "Buy America Requirements," which dictate percentages of vehicles and chargers that must be assembled in North America, as well as percentages of critical minerals for batteries that must be sourced from non-foreign entities of concern (FEOC), to be eligible for federal funding incentives. This has spurred trillions of dollars in investment across the US, but especially in North Carolina.



Figure 1: EV Manufacturing Investments in NC  
(Source: US Department of Energy)

<sup>3</sup>Centralina Regional Council (April 2021). City of Charlotte Sustainable Vehicle Policies. <https://centralina.org/region-of-excellence-award-winners/city-of-charlotte-sustainable-vehicle-policies/#:~:text=The%20Sustainable%20and%20Resilient%20Fleet,class%2C%20usage%20and%20available%20technology>.

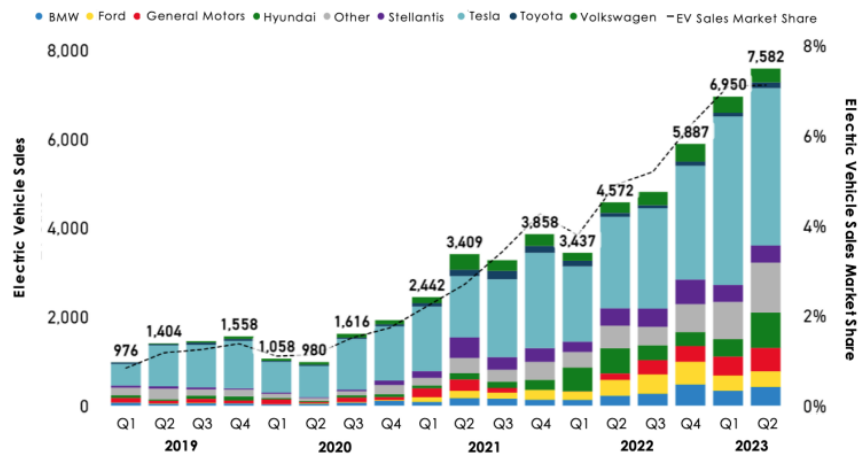
According to the 2023 fourth annual "Transportation Electrification in the Southeast" report by Atlas Public Policy, North Carolina generated 11,723 jobs in the EV industry (including assembly, parts, charging infrastructure, and battery manufacturing and recycling), with a 15% growth from July 2022. With 450,000 total jobs in the state's manufacturing sector, North Carolina is attracting new EV industry participants. UK-based EV startup [Arrival](#) has based its North American headquarters in Charlotte and is building its second micro-factory in Mecklenburg County. [Toyota](#) has announced plans to invest \$13.9 billion in an EV battery plant near Greensboro, Vietnam-based [VinFast](#) plans to invest \$4 billion in its first North American EV assembly and battery manufacturing facility at the Triangle Innovation Point in Chatham County. VinFast's 1,800-acre facility is designed to reach a capacity of 150,000 vehicles per year in phase 1 and will begin operations in 2025.

EV charging station manufacturers like [Kempower Inc.](#) have also entered the NC EV market, investing \$41.2 million into its facility in Durham County. The Finland-headquartered company plans to create 300 jobs once it opens in 2023 and intends to produce charging compliant with National Electric Vehicle Infrastructure (NEVI) program requirements. An analysis from the State of North Carolina anticipates the facility will grow the local economy by more than \$726 million. As a result of the state's rapid EV market growth, North Carolina was selected as a partner in the [Everyone Charging Forward](#) program, a \$30-million, 10-year initiative of the Siemens Foundation aiming to create accessible career pathways in the EV manufacturing and charging sectors. The state is positioned to receive \$1.677 million in funding.

### Market Share

North Carolina ranks second in the Southeast for EV market share with 7.1% in Q2 2023 and 70,201 cumulative sales, totaling a 56% growth since July 2022 (Fig. 2). Utility investments in the state remain the same as those in July 2022, with \$24.7 million allocated towards electrification efforts. The adoption of EVs has the potential to avoid \$70 to \$75 million in community costs of carbon pollution between 2020-2060 and decrease our collective spending on oil by roughly \$12 billion per year.<sup>4</sup>

North Carolina EV Sales and Market Share of Sales



Source: Atlas EV Hub

Figure 2: Source: [Transportation Electrification In The Southeast: North Carolina](#). Atlas Public Policy. (June 2023)

<sup>4</sup> Ibid reference 1

## Greenhouse Gas Emission Reductions

Transportation emissions are the largest contributor to North Carolina's GHG profile, accounting for 36% of total emissions.

A substantial opportunity exists to reduce GHG emissions by electrifying the transportation sector. The State's existing Deep Decarbonization Pathways Analysis shows how a combination of

transportation options, including EVs, reduced vehicle miles traveled, and decarbonized fuels can help achieve GHG reduction goals. Nearly half of North Carolina's electricity generation is already from low- or zero-emission sources, further decreasing all-electric and plug-in hybrid vehicle emissions (Fig. 3 & 4).

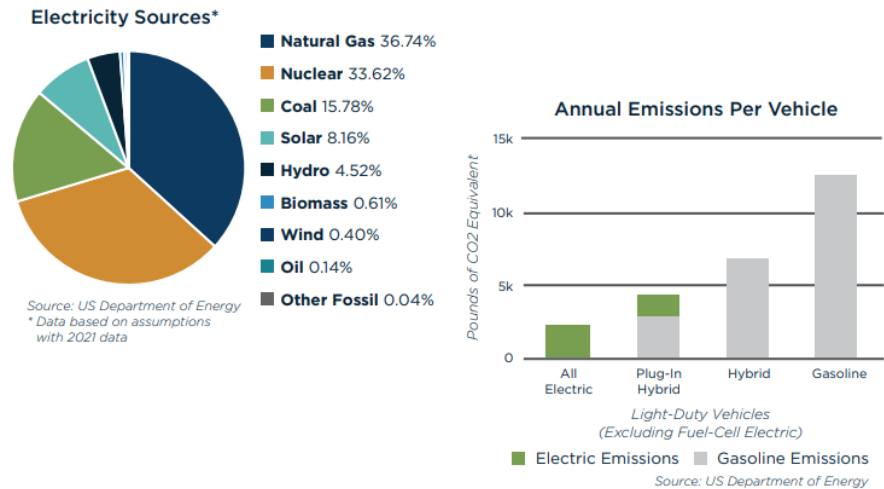


Figure 3 & 4: Source: NCDOT, [Clean Transportation Plan](#). (April 2023)

## National and Energy Security

About 91% of transportation in the United States is powered by oil, and this dependence has bound the United States' national, economic, and energy security to a highly volatile, cartel-influenced global oil market. The [U.S. military spends roughly \\$81 billion](#) annually to safeguard global oil supplies. OPEC member states and national oil companies that don't share U.S. strategic values or interests hold 90% of conventional crude oil reserves. Some economists have estimated that the financial resources spent by the military equates to an implicit [subsidy of up to \\$0.70 per gallon](#) of gasoline. While the U.S. has gone to great lengths to secure supply and reduce volatility globally, not all supply disruptions can be predicted or prevented. And no matter where supply is disrupted, prices everywhere are affected. The recent collapse of the oil market is just the latest such disruption, which has damaged the domestic oil production sector and undermined innovation and investment in electrified transportation. If the U.S. is ever to attain real energy security, we must accelerate the transition away from petroleum-dependent transportation to EVs.

North Carolina ranks among the ten states with the highest total petroleum use, with the transportation sector consuming more than 80% of the total petroleum in the state. North Carolina also imports 177 million barrels of oil annually, translating into roughly \$12 billion spent on oil annually.<sup>5</sup>

<sup>5</sup> US Energy Information Administration State Energy Data System (SEDS) - Petroleum consumption, <https://www.eia.gov/state/seds/seds-data-complete.php?sid=US> and NC Consumption [North Carolina Profile \(eia.gov\)](#)

## Air Quality, Public Health, and Social Equity

Beyond greenhouse gas emissions, the transportation sector is a significant source of other harmful air pollutants—particularly in areas of high population density—that can be lowered substantially through the transition to EVs. Traditional internal combustion engine vehicles have long been leading mobile-source emitters of criteria pollutants the U.S. Environmental Protection Agency considers to be harmful to public health. They include particulate pollution (PM<sub>2.5</sub> and PM<sub>10</sub>), carbon monoxide (CO), volatile organic compounds, and nitrogen oxides (NO<sub>x</sub>). Transportation emissions are linked to health impacts, including asthma, heart attacks, reduced lung capacity, chronic pulmonary and heart disease, and cancer. North Carolina child and adult asthma cases are estimated at 9.4% of the population, meaning 760,000 North Carolinians have asthma. In Charlotte, about 23 deaths per year can be attributed to PM<sub>2.5</sub> and ozone from on-road vehicles.<sup>6</sup> Of additional concern, pollutant exposure disproportionately affects Black, Latino, Indigenous, and low-income communities.

BEVs and PHEVs in electric drive mode have zero tailpipe emissions, drastically improving ambient air quality and health outcomes. Across North Carolina, the benefits of widespread vehicle electrification would be substantial. Each year, the state could avoid 140 premature deaths, \$1.6 trillion in health costs, 2,380 asthma attacks, and 10,525 lost workdays.<sup>7</sup>

## Federal Funding in NC

The Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA) are helping advance the transition to an electric future through funding opportunities like the National Electric Vehicle Infrastructure (NEVI) program and the Charging and Fueling Infrastructure (CFI) Grant Program. Both funding opportunities invest \$7.5 billion to strategically deploy EV charging infrastructure nationwide. The NEVI program provides \$5 billion in funding to build a charging network along alternative fuel corridors, of

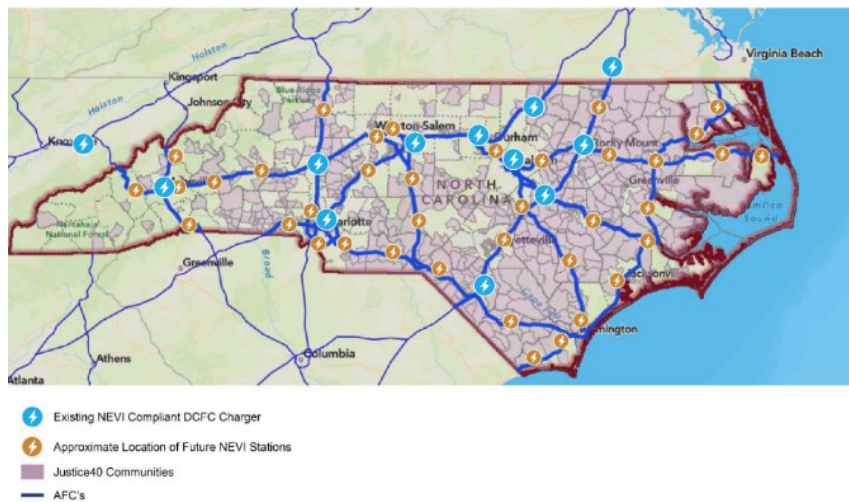


Figure 5: Source: [North Carolina Plan Update for Electric Vehicle \(EV\) Infrastructure Deployment](#). NCDOT. August 1, 2023.

<sup>6</sup> Anenberg, S.C., J. Miller, D. Henze, R. Minjares, P. Achakulwisut (2019) The global burden of transportation tailpipe emissions on air pollution-related mortality.

<sup>7</sup> American Lung Association (2020), The Road to Clean Air: Benefits of a Nationwide Transition to Electric Vehicles. <https://www.lung.org/getmedia/99cc945c-47f2-4ba9-ba59-14c311ca332a/electric-vehicle-report.pdf>

which North Carolina expects to receive up to \$109 million over five years.<sup>8</sup> To harness this funding opportunity, North Carolina submitted its statewide [EV Infrastructure Deployment Plan](#) on August 1, 2023. The plan estimates the state will build at least 39 NEVI-compliant stations in addition to the ten existing NEVI-compliant stations in operation.

The CFI program allows for \$2.5 billion in funding over five years through its Corridor Program and Community Program. Both tracks require building charging stations in urban and rural communities, specifically those most vulnerable to climate change and air pollution. The first round of funding allocates \$700 million for fiscal years 2022 and 2023.<sup>9</sup> As North Carolina prepares for widespread EV adoption, the state must continue to apply for available federal funding opportunities as new funding rounds are announced to enable North Carolinians the opportunity to participate in the transition to EVs.

### Key Players

Player	Description
<b>Governor</b>	With strong, high-level leadership from Governor Roy Cooper, North Carolina is poised to emerge as a leader in transportation electrification. Executive Order 80 committed the State to reduce statewide greenhouse gas emissions to 40% below 2005 levels by 2025.
<b>State Agencies</b>	<p>The NC Department of Environmental Quality (DEQ) and the NC Department of Transportation (DOT) developed the ZEV Plan. The NCDOT also signed and agreed to convene a Vehicle Miles Traveled (VMT) reduction task force to prepare a VMT reduction study and develop a Carbon Reduction Program to support existing, current, and future transportation GHG emissions efforts.</p> <p>The NC Department of Administration (DOA) developed the Motor Fleet ZEV Plan to identify the first opportunities for ZEV deployment and strategies for charging. The DEQ Division of Air Quality directs the use of Volkswagen settlement funding and has financial incentives (grants, tax exemptions) for using alternative fuels.</p>
<b>State Legislature</b>	The legislature has enacted some foundational rules that help support EV deployment (e.g., EVSE providers are not to be considered utilities, and EVs are exempt from HOV lane restrictions.) EV registration fees were raised in the 2023 budget cycle to be higher than what gasoline-powered vehicle owners pay in gas taxes, so the legislature should take a holistic approach to road funding that can equitably include the growing number of EVs and ICE vehicles.
<b>Utilities</b>	Utilities in North Carolina have invested in EV charging infrastructure and are positioned to invest more. Duke Power offers residential customers \$1,133 in charger prep credits for

<sup>8</sup>NCDOT (November 2023). National Electric Vehicle Infrastructure (NEVI) Program  
<https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/natiom.nal-electric-vehicle-infrastructure-program.aspx>

<sup>9</sup>U.S. Department of Transportation (n.d.), Charging and Fueling Infrastructure Grant Program  
<https://www.transportation.gov/rural/grant-toolkit/charging-and-fueling-infrastructure-grant-program>

	<p>electrical upgrades to support level 2 or DCFC stations. The same incentive is offered to businesses and commercial home buildings, with rebate amounts varying depending on the project and EV charging station type. Through its Park &amp; Plug program, Duke offers free EVSE, installation, maintenance, warranty, and network connection services to multifamily dwellings, businesses, and public/charter school districts. To advance the North Carolina Utilities Commission's initial 2022 Carbon Plan, Duke Energy Carolinas and Duke Energy Progress crafted a 2023-2024 Carbon Plan and Integrated Resource Plan to reliably execute the energy transition to support fleets and hit the 70% CO2 reduction target by 2050. Duke also plans to aid with the deployment of 30 electric school buses and the viability of vehicle-to-grid technologies.</p> <p>NC electric cooperatives have installed public charging stations at more than 85 locations statewide, and 15 DCFC and level 2 chargers are on the way. The co-ops are also raising awareness about the benefits of EVs through cost-saving calculating tools, ride-and-drive events for EV experiences, and public charging at local offices. To further encourage EV adoption, NC electric co-ops are providing special EV rates and rebates for residential charging and providing support and guidance for building EV-ready homes and installing workplace charging.</p>
<b>EV Supply Chain</b>	<p>Many companies are engaged in EV production and deployment in North Carolina. Siemens, Volvo, ABB, Thomas Built Buses, VinFast, and Arrival all have headquarters in the state. Other EV-related companies with a North Carolina presence include Toyota, EVgo, Charge Point, Nissan, Tesla, Kempower Inc., Texmac, ABT Power Management, Saft America, Livent Corp, Albemarle, Piedmont Lithium, Polypore, Keihin Carolina System Technology, Xtrac, Wolfspeed.</p>
<b>Local Governments</b>	<p>Charlotte, as detailed above, is a clear leader, aiming for 100% ZEVs by 2030 in its fleet. Other interested cities include Raleigh, which recently completed an EV roadmap. The City of Durham and Durham County have an <a href="#">Electric Vehicle and Charging Station Plan</a>. The Town of Chapel Hill offers same-day permitting for residential installations of EV charging stations. There is room for growth in local government leadership in rural areas.</p>

### Policy Opportunities, Pathways, Messages

North Carolina has a rich set of policy opportunities to pursue, with some groundwork already laid.

Key policy levers will be playing out in the next couple of years, including:

- decisions in utility rate cases that impact EVs;
- decisions on how to allocate the \$87 million awarded to North Carolina through the Volkswagen Clean Air Act Civil Settlement, with opportunities to devote funding to EVs and charging infrastructure; and
- legislative decisions on EV purchase incentives, EV infrastructure funds, and more.

Phase 2 of the Volkswagen [mitigation fund](#) released in Dec. 2021 combines the previously proposed funding of phases 2 and 3 into one final phase. DEQ plans to invest \$68 million in two main programs: replacing school and public transit buses and constructing infrastructure for zero-emission vehicles. DEQ released a [new interactive map](#) showcasing all EVs and charging stations funded by the Volkswagen mitigation fund now operating in the state.

Because North Carolina can no longer continue with the Multi-State Zero Emission Medium- and Heavy-Duty Vehicle Memorandum of Understanding, the state must adopt and aggressively push a different suite of policies that will enable the MD and HD EV market to thrive. Such policies include financial incentives (e.g., rebates and tax credits) for vehicle and charging infrastructure purchases, rebates and grants for public charging, workplace charging programs, EV-ready building codes, PUC processes, and ratemaking.

EV advocates should emphasize economic development opportunities in the state, particularly as EV supply chain manufacturing grows in neighboring states of South Carolina, Tennessee, Georgia, and Alabama. North Carolina also has significant lithium reserves in Gaston County, which will be essential to receiving funding as the Buy America Requirements scale up. EV advocates could also illustrate the national security and energy security benefits of electrification, which should resonate with the military communities in the state. Equity issues are also a key consideration for North Carolina.

EV policy success depends on an alignment of players, strategic pathways, and messages. Based on our assessment to date, there are leading policy opportunities concerning the following:

- Implementation of EO 80 and EO 246
- Increasing access through EV-ready building codes and direct-to-consumer EV sales
- Ambitious statewide targets on transit bus electrification
- New EV tariffs and pilots from utilities and co-ops
- Maximizing federal funds allocated for NC's EV infrastructure through the efficient implementation of the NEVI program and Charging and Fueling Infrastructure Grant Program
- Defending against inequitable EV fees and holistically planning for road funding

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