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TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

STATE OF TECHNOLOGY DEPLOYMENT & INVESTMENT IN MANUFACTURING

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CONNER SMITH, ATLAS PUBLIC POLICY

REPORT TAKEAWAYS



NATIONAL EV MARKET POISED FOR RAPID GROWTH

Transportation electrification is taking hold in the United States with increasing investment and funding supporting the deployment of electric vehicles (EVs) and charging infrastructure across all vehicle classes. Since 2010, a cumulative 1.6 million passenger EVs have been sold with increasing deployment of electric buses and trucks.

Investment in the EV sector is on the rise and states across the country are seizing the opportunity to increase deployments of EVs and EV charging across all vehicle types.

SOUTHEAST BEHIND IN ALL EV ASPECTS EXCLUDING MANUFACTURING

This brief defines key indicators that outline the state of transportation electrification in Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee ('Southeast'). Overall, the Southeast is behind other regions in the country in terms of passenger EV adoption, EV charging deployment, government funding, and utility investment in transportation electrification.

However, the region claims a large proportion of the nation's passenger EV manufacturing investment and employment which is on the rise with new models entering the market. The region is also home to several medium- and heavy-duty manufacturing facilities as well as EV charging station manufacturers that all stand to grow through an expansion of the EV market in the region.

WOULD INCREASE EV ADOPTION AND ECONOMIC GROWTH FOR THE BENEFIT OF ALL

The Southeast states have a significant opportunity to create a virtuous cycle with these investments by developing public policy that accelerates demand for EVs and EV charging. For example, infrastructure deployment could be supported by \$86 million in pending utility investment across Florida, North Carolina, and South Carolina. Medium- and heavy-duty EV deployment could also see a large boost with more than \$350 million in Volkswagen Settlement funding remaining that could go to support transportation electrification.



Since 2010, a cumulative 1.6 million passenger EVs have been sold with increasing deployment of electric buses and trucks.

EXECUTIVE SUMMARY

EV MARKET EXPERIENCED ACCELERATED GROWTH IN RECENT YEARS, MORE TO COME

The EV market continues to grow in the United States and electrification has extended beyond passenger cars to include medium-and heavy-duty vehicles. Reductions in the cost of batteries have added a flurry of new passenger EV models with several vehicles exceeding 300 miles in range [1]. There are now more than 52 models of EVs offered on the market compared to just two in 2010 and at least 30 more are expected to be released by the end of 2021 [2, 3]. Electric truck and bus availability has increased with EV options offered across all primary transit, school, and shuttle bus sizes as well as EV versions of delivery, refuse, and freight trucks [4]. Automakers, startups, and electric truck and bus manufacturers have pledged at least \$64 billion to support transportation electrification in the United States [5].

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SOUTHEAST MANUFACTURING JOB MARKET STANDS TO BENEFIT MORE

Investment commitments in EV manufacturing in the United States is estimated to support at least 38,000 existing and planned jobs [5]. The passenger vehicle (auto) sector overall contributes more than 900,000 direct manufacturing jobs. This indicates that EVs account for between four and five percent of the passenger vehicle manufacturing employment in the country. Passenger EVs also made up between six and seven percent of new passenger vehicle sales since 2019 [6, 7]. The six states comprising the Southeast including Alabama, Florida, Georgia, North Carolina, South Carolina and Tennessee are positioned to benefit from this growth in EV investment and manufacturing. The region represents 18

percent of the national population and claims at least 14 percent or 5,800 of the more than 41,500 passenger EV manufacturing jobs. In terms of passenger EV-specific manufacturing investment, the Southeast claims 28 percent or \$6.7 billion of the more than \$24 billion reported throughout the country.



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SOUTHEAST LAGS IN EV SALES AND INFRASTRUCTURE DEPLOYMENT, BOTH ABSOLUTE AND PER CAPITA



While the region is more successful than others such as the Central Atlantic in terms of attracting EV manufacturing investment, it falls behind other regions in passenger EV and EV charging deployment as well as in electric utility and government support for transportation electrification.

Only 140,000 passenger EVs have been sold across the Southeast since 2011. This represents just 10% of the nation's roughly 1.6 million all-time passenger EV sales, below its 18% share of the population.

The region's proportion of the national passenger EV market is inflated by the fact that Florida has the third-highest passenger EV sales in the country. Georgia also contributes an outsized portion of the region's EV sales in relation to the state's share of the population as a result of an EV tax credit that was in place between 2013 and 2015 [8].

By comparison, the 12 states that are a part of the California-led Zero Emission Vehicle (ZEV)¹ program claim 60 percent of all U.S. passenger EV sales while making up only 31 percent of the population [9]. The Southeast represents 18 percent share of the population but has only 13 percent of the country's 92,000 EV charging ports while ZEV states host more than 50 percent of charging ports.



¹ ZEV States indicate all states that have adopted the California-led ZEV program requiring automakers to sell an increasing proportion of ZEVs in their state (<https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program>). States besides California included in this classification are Connecticut, Colorado, Maine, Maryland, Massachusetts, New York, New Jersey, Rhode Island, Oregon, Vermont, and Washington.

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

States throughout the Southeast lack the policy support seen in ZEV states and have also fallen behind non-ZEV states including Virginia in allocating government funding resources to support medium- and heavy-duty electrification. The Southeast has collectively invested \$85 million in government funding and \$34 million in utility funding for transportation electrification projects. This is less than four and one percent of the national totals, respectively. No states in the region have active state level rebates for all-electric vehicle purchases. By comparison, EV rebates and tax credits have been adopted by 10 out of the 12 ZEV states [10]. Virginia alone has invested twice as much through its Volkswagen Settlement funds for EVs and EV charging than the entire Southeast region combined [11].

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However, every state in the region besides Georgia has begun to implement transportation electrification strategies since 2018 to kickstart EV and EV charging deployment. Alabama and Florida have EV charging deployment plans in place while both North Carolina and Tennessee have infrastructure plans supported by passenger EV deployment targets. South Carolina has initiated a broad-based stakeholder engagement initiative bringing together major players like electric utilities and state agencies to coordinate around EV market support.

AVAILABLE FUNDS TO SUPPORT MARKET GROWTH

Increasing government funding and utility investment are immediate resources at the disposal of states across the Southeast. Georgia and Florida, which lead the region in both passenger EV and EV charging deployment, are the only two states with approved utility programs supporting transportation electrification.

The region has spent only 15% of the total \$427 million allocated to the region through the Volkswagen Settlement allocation and more than 73% of the region's government funding for transportation comes from federal sources. On the utility side, there is more than \$86 million in pending utility investment awaiting approval [12].

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This utility investment is concentrated mostly in North Carolina, which showed policy leadership in July 2020 by joining the Multi-State Medium- and Heavy-Duty ZEV MOU, which includes trucks, delivery vans, and transit and school buses, and commits states to 100 percent zero emission truck and bus sales by 2050 [12].

Implementing new policies including passenger EV and EV charging incentive programs and dedicating funding to both passenger and medium- and heavy-duty EVs will indicate state-level support for the EV market. This support would build on policy momentum established in transportation electrification strategies implemented since 2018 and strengthen partnerships between state agencies, electric utilities, and businesses. It would also create a virtuous cycle where EV manufacturing investment continues to grow in step with the regional market as states across the Southeast catch up with neighboring states and regions in deployments of EVs and EV charging across all vehicle classes.

INTRODUCTION

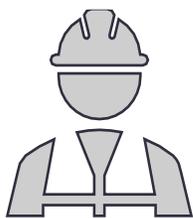
Transportation electrification is taking hold in the United States with a cumulative 1.6 million passenger electric vehicles (EVs) sold and increasing deployment of medium- and heavy-duty vehicles with a focus on electric buses and trucks. Investment in the EV sector is on the rise and states across the country are seizing the opportunity to invest in this technology. Investments in transportation electrification continue to be announced despite the decline in sales and production delays across the auto sector in 2020.



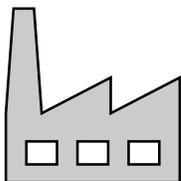
This brief, produced by Atlas Public Policy with support from the Southern Alliance for Clean Energy (SACE), defines key indicators that outline the state of transportation electrification in Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee ('Southeast'). Indicators include investment and employment related to EV manufacturing, deployment of passenger EVs and EV charging, and government and electric utility funding for transportation electrification. This brief also includes information on policy efforts and initiatives to promote clean transportation and key opportunities in each state to further advance the clean vehicle market across the region.

Below is a brief summary of each of the indicators assessed in this report. All the data references in this report are from the Atlas EV Hub, www.atlasevhub.com.

Acknowledgement: This work was supported by the Southern Alliance for Clean Energy.



PASSENGER EV MANUFACTURING EMPLOYMENT: This indicator represents the number of direct manufacturing jobs associated with the production of passenger EVs only as most medium- and heavy-duty vehicle manufacturers as well as charging service providers do not report employment figures. This figure is tied to specific facilities and is typically reported directly by automakers in press releases. All reports are aggregated on the Atlas EV Hub. In some cases, jobs tied directly to EV production are not reported. The data used in this report are through August 2020.



PASSENGER EV MANUFACTURING INVESTMENT: This refers to the amount of funds committed by automakers and private companies to support the development of passenger EVs. Total U.S. private investment figures include investments committed for medium- and heavy-duty vehicles as well as EV charging. This is often reported in coordination with jobs announcements and state-based investments are typically tied to specific facilities. All of these announcements are aggregated on the Atlas EV Hub. The data used in this report are through August 2020.



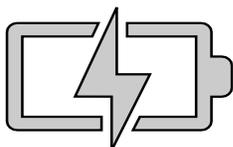
EV SALES: Passenger EV sales are available on the EV Hub via multiple data sources. The EV sales data for all states are available at the national level by vehicle make and model and include all-electric, plug-in hybrid electric, and all passenger vehicles. No sources report data on sales of medium- and heavy-duty EVs. There is a month and a half lag on the availability of these data and the data used in this report are through June 2020.



ELECTRIC UTILITY INVESTMENT: The EV Hub tracks all electric utility filings submitted to regulatory commissions at the state level to summarize and aggregate EV-related investments proposed by investor-owned utilities. This includes EV charging rate programs and pilots, which typically do not propose additional investment by the utility. The utility filings dashboard reflects both EV programs proposed by utilities that await commission approval as well as investment that has been approved or denied by commission orders. This is updated on a case by case basis as new utility filings are recorded and the data used in this report are through August 2020.



GOVERNMENT FUNDING FOR EVs: These data from the EV Hub attempts to aggregate all federal, state, and local government funding programs dedicated to transportation electrification, including funding allocated through the Volkswagen Settlement as well as programs administered by the federal government. This is updated on a case by case basis as new funding announcements are recorded and the data used in this report are through August 2020.



EV CHARGING DEPLOYMENT: The EV Hub also contains data on passenger EV charging infrastructure deployment via the U.S. Department of Energy's Alternative Fuel Station Locator. This dataset includes information on station location, charging type (Level 2 or DC fast charging), and charging network (e.g., ChargePoint) in addition to several other data points. These numbers are updated frequently and the data used in this report are through August 2020.

EVS IMPROVE PUBLIC HEALTH, REDUCE GREENHOUSE GASES, AND SAVE CONSUMERS MONEY

Though this brief does not focus on the air pollution and greenhouse gas reductions and the consumer savings that transportation electrification delivers, these benefits are real and significant.

According to a recent report by the American Lung Association, transitioning to electric cars, trucks, and buses will result in significant health benefits, emissions reductions, and healthcare cost [13].

Nationwide, shifting to an all-electric fleet in 2050 would save 6,300 lives, cut greenhouse gas emissions 1.4 billion metric tons, and save \$72 billion in healthcare costs, including \$9.3 billion in the Southeast states featured in this brief.

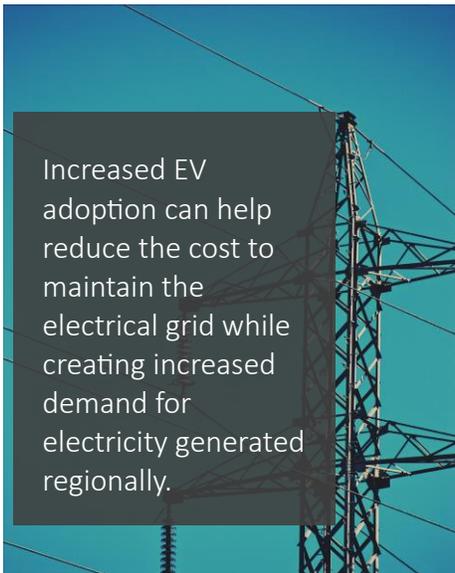
Consumer Reports also published a white paper calculating the maintenance costs savings EV drivers could experience [14]. The key finding: analysis of real-world maintenance and repair cost data from thousands of Consumer Reports members shows that EV owners pay half as much as gasoline vehicle owners are paying to repair and maintain their vehicles. Researchers looked at vehicles with mileage ranges of zero to 50,000 miles, 50,000 to 100,000 miles, and 100,000 to 200,000 miles to account for both new and used vehicles. Over the lifetime of vehicles, a driver of an EV will pay \$0.03 per mile on maintenance, while driving a gasoline vehicle costs \$0.06 per mile. All told, owning an electric vehicle will save the typical driver \$6,000 to \$10,000 over the life of the vehicle, compared to owning a comparable gas-powered vehicle.

EV BENEFITS

Transportation electrification can offer a range of benefits from improved air quality through direct emission reductions to lower electricity rates for all ratepayers. The list below highlights some of the primary benefits related to EV adoption.

EVS CAN PUT DOWNWARD PRESSURE ON ELECTRICITY RATES

Increased EV adoption can help reduce the cost to maintain the electrical grid while creating increased demand for electricity generated regionally. Utilities can reduce the average cost of delivering electricity by shifting EV charging to off-peak times through the implementation of EV time-of-use (TOU) rates and other mechanisms. A higher number of EVs on the road not only reduces consumption of imported transportation fuel, but also supports the reliability of the electrical grid for all customers [15]. Between 2012 and 2019, increasing EV adoption has generated \$800 million in revenue over costs for California's two largest utilities due to the implementation of EV rates encouraging charging at off-peak times [16].



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EVS HAVE NO TAILPIPE EMISSIONS

Transportation is the largest contributor to greenhouse gas emissions nationwide and on-road vehicles contribute to 82 percent of emissions from mobile sources [17]. While they have no tailpipe emissions, the electricity used to charge an EV is also cleaner compared to gasoline on an energy equivalent basis because of the efficiency of using grid electricity to operate an electric vehicle. Nationwide, driving an EV is equivalent to driving a gasoline powered vehicle with a fuel economy of 88 miles per gallon [18]. Increasing the number of EVs on the road is one of the key suggestions made by the American Lung Association to address public health impacts due to poor air quality [19].

EVS SPUR INVESTMENT AND CREATE JOBS IN DOMESTIC MANUFACTURING AND SUPPLY CHAINS

Investment in the Global EV sector has almost doubled since the end of 2018 and automakers, manufacturers, and startups have committed \$64 billion to the EV and EV charging sectors in the United States [5]. This has generated a wave of new employment opportunities and direct passenger EV manufacturing jobs are set to make up at least five percent of the national auto manufacturing workforce. The clean vehicle industry is predicted to support at least 250,000 jobs throughout the national supply chain [20].

The clean vehicle industry is predicted to support at least 250,000 jobs throughout the national

EVS CAN SAVE DRIVERS AND FLEETS MONEY OVER THE LIFETIME OF THEIR VEHICLES COMPARED TO DRIVING CONVENTIONAL VEHICLES

As a result of lower fuel and maintenance costs compared to conventional vehicles, EVs have been shown to have lower total cost of ownership (TCO) over the lifetime of the vehicle in an increasing number of cases [21, 22].

EVs have shown to have lower total cost of ownership over the lifetime of the vehicle.



THE NATIONAL LANDSCAPE

The U.S. passenger EV market has accelerated rapidly over the last decade and more than 1.6 million vehicles have been sold since the first mass-market EVs were released in 2010. Back then, high battery prices were prohibitive to the development of long-range EVs and the first all-electric vehicles offered less than 100 miles of range. This changed as the cost of batteries fell by more than 80 percent between 2010 and 2018 and automakers like Tesla led the development of long-range EVs with ranges exceeding 300 miles [1]. There are now more than 52 models of EVs offered on the market compared to just two in 2010 and at least 30 more are expected to be released by the end of 2021 [2, 3]. Automakers and startups have pledged at least \$64 billion to support transportation electrification in the United States [5]. Figure 1 shows all-time totals for key EV indicators in the United States.

FIGURE 1: ALL-TIME U.S. EV INDICATORS THROUGH AUGUST 2020



EV Manufacturing Employment

- Jobs (direct manufacturing): 41,500
- Facilities: 25



EV Manufacturing Investment*

- Investment (manufacturing): \$24 billion
- Investment (total): \$64 billion



EV Sales**

- 1.6 million
- Tesla share: 40%



EV Charging Deployment

- Level 2: 73,693 ports
- DC Fast Charging Total: 17,592 ports
- Total: 91,299 ports



Utility Investment

- Approved: \$2.6 billion
- Pending: \$937 million



Government Funding for EVs***

- Trucks and Buses Total: \$1.2 billion
- Charging Total: \$582 million
- Total: \$2.1 billion

* EV manufacturing investment represents commitments made to specific facilities in the United States. Total investment figures represents all high level commitments from automakers, startups, and other manufacturers.

** EV Sales have only been reported through June 2020, all other data is through August.

*** Government funding for light-duty vehicles is not tracked by the EV Hub.

Source: Atlas EV Hub

Atlas Public Policy is tracking at least \$20.2 billion in direct manufacturing investment supporting more than 31,500 EV manufacturing jobs in the passenger vehicle sector in the United States. However, not all automakers report the amount of funds or jobs directly tied to the transportation electrification

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components of their operations. This also does not include employment figures from EV charging companies, which do not report these statistics. This means that total EV sector investment is likely much higher with automakers and other companies pledging at least \$64 billion to EVs and EV charging in the United States including investment in medium- and heavy-duty vehicles.

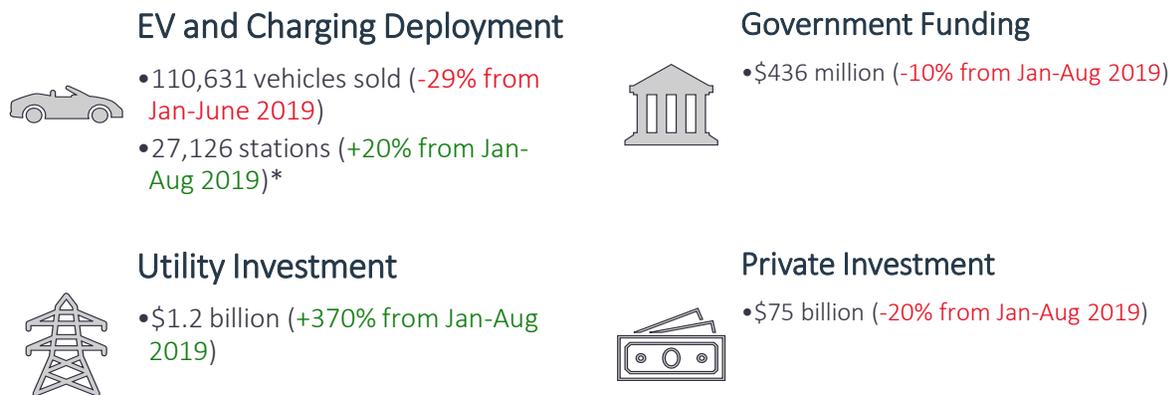
Direct EV manufacturing jobs make up between four and five percent of the total direct auto manufacturing jobs reported by the Bureau of Labor Statistics (BLS). According to the BLS, the passenger vehicle (auto) industry as a whole accounted for almost four million jobs as of July 2020, roughly 900,000 of which are direct manufacturing jobs [6]. The Alliance for Automotive Innovation estimates a higher figure, claiming the auto industry supports more than seven million jobs nationwide [23]. Indirect and supply chain jobs contributed by the EV and EV charging sectors (e.g., electricians) are not directly reported, however some research groups estimate the number of jobs supported by clean vehicles nationwide.

EVs are expected to drive job growth in the auto industry and a 2009 report estimated that transportation electrification would support 350,000 direct and indirect jobs nationwide by 2030 [24]. BW Research estimates that total employment in the clean vehicles sector was around 250,000 before COVID-19 hit in early 2020 [20]. The research firm found that the clean vehicles sector lost 38,200 jobs, or 15 percent of the total workforce, through June 2020 due to the pandemic. Direct manufacturing employment across the auto sector fell 30 percent between March and May as plants were shuttered [6].

Passenger vehicle sales were also down industry wide as a result of the pandemic. EVs fared better than conventional vehicles throughout the first quarter and sales remained mostly flat compared to 2019. Between January and June 2020, passenger EV sales were down 29 percent compared to a 24 percent drop for the conventional market overall compared to the first half of 2019 [7, 25]. Both sales and employment have begun to recover from the low points reached in April and May 2020. Direct employment across the auto sector is down only 10 percent from pre-pandemic levels and EV sales rebounded in June with almost twice as many passenger EV sales in June compared to May [7, 6].

The EV market is expected to improve through the remainder of 2020 and Woods Mackenzie only reduced their projections for global EV market growth by two percent as a result of the pandemic. The analyst group still expects the number of global EVs to increase by a factor of 35 through 2040 [26]. Passenger EV sales have already begun to recover in the United States and there have been several bright spots for the EV sector in the United States through August 2020. Automakers, bus and truck manufacturers, and charging companies have committed more than four times as much to U.S.-based investments in EVs compared to the first eight months of 2019 [5]. Charging station deployment and utility investment are also up considerably while government funding is only down 10 percent for the year through August. Figure 2 provides a summary of U.S. EV indicators in 2020.

FIGURE 2: 2020 U.S. EV SUMMARY STATISTICS THROUGH AUGUST COMPARED TO 2019



*ChargePoint reported a large number of charging station deployments on one day in June 2020 that is not included in this tally.

Source: Atlas EV Hub

The EV charging market has grown in step with the vehicle market. Since the beginning of 2018, the number of charging stations around the country has increased by roughly three times and there are now more than 91,000 charging ports deployed at more than 30,000 locations throughout the United States. More than 17,500 of these are DC fast charging ports, roughly half of which are only available to Tesla drivers on their proprietary network [26].

The charging sector has been bolstered by both utility and private investment. Electric utilities in 26 states have committed more than \$2.2 billion to programs dedicated to EV charging since 2012. These programs could support up to 143,000 Level 2 and 4,300 DC fast charging stations across the country. California and New York account for roughly 85 percent of this investment [27]. Private companies including Electrify America and Tesla have invested roughly \$2.8 billion to expand the nation’s charging networks.

Private and utility investment is not limited to the passenger vehicle market and there has been a surge in deployment of electric trucks and buses over the last several years. Both the federal and state governments have allocated more than \$2.1 billion to transportation electrification, more than 90 percent of which has occurred since the start of 2018 [11]. More than 17 percent of public funding has come from Volkswagen Settlement awards and states have yet to award 80 percent of the more than \$2.8 billion paid out by the automaker, meaning that there will likely be substantially more investment in EVs using settlement funds in the future [28].

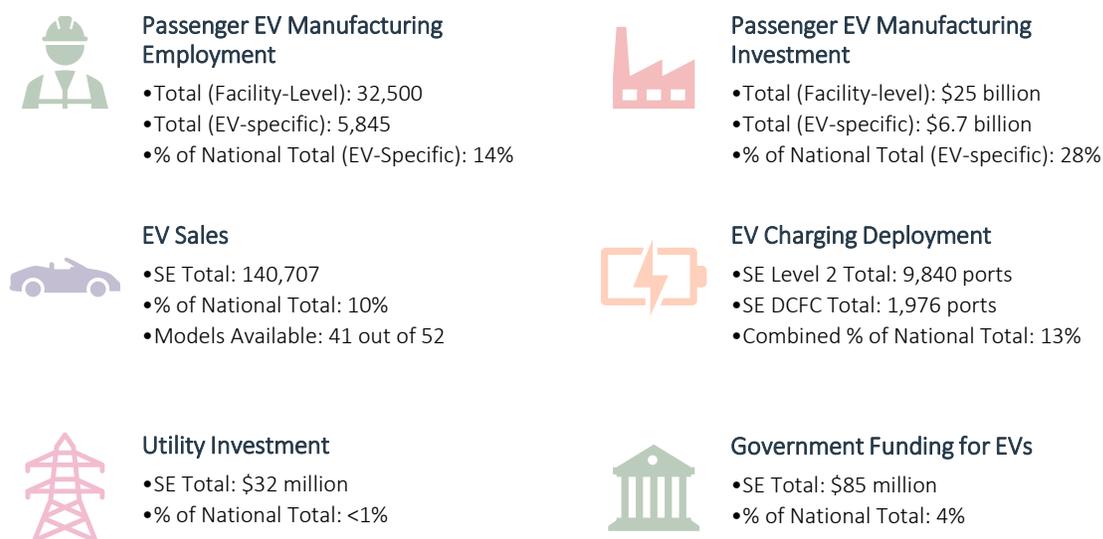
Public agencies, businesses, fleet operators, charging service providers, individuals, and other stakeholders in the EV sector can capitalize on large funding opportunities drawing from sources of government, utility, and private investment to advance transportation electrification. Untapped funding is only one of the factors leading to large growth projections for EVs in the United States and increasing charging deployment and model availability are among other factors feeding into these expectations. Bloomberg New Energy Finance predicts in their 2020 EV Outlook that EVs will account for 60 percent of U.S. passenger vehicle sales by 2040. This growth is also expected in the medium- and heavy-duty vehicle markets and the outlook projects that zero emission trucks will account for a third of all new commercial vehicle sales and electric buses will make up 67 percent of global fleets by 2040 [29]. BNEF expects the

United States to be a leader in the medium- and heavy-duty EV market, although further policy action and a wider distribution of resources will likely be necessary for the benefits of transportation electrification to reach all regions.

EV INDICATORS ACROSS THE SOUTHEAST

As a region, the Southeast—comprising Alabama, Florida, Georgia, North Carolina, South Carolina and Tennessee—accounts for 18 percent of the national population per census data from 2019 [30]. On a per person basis, the region is underrepresented in every major EV indicator other than EV manufacturing investment. The region is especially underrepresented in utility and government funding for transportation electrification per person, claiming less than one percent of the nation’s utility investment and only four percent of government funding. Figure 3 presents the aggregate totals and per person percentages for each indicator across these six states and places the region in a national context.

FIGURE 3: EV INDICATORS IN THE SIX STATES OF THE SOUTHEAST THROUGH AUGUST 2020



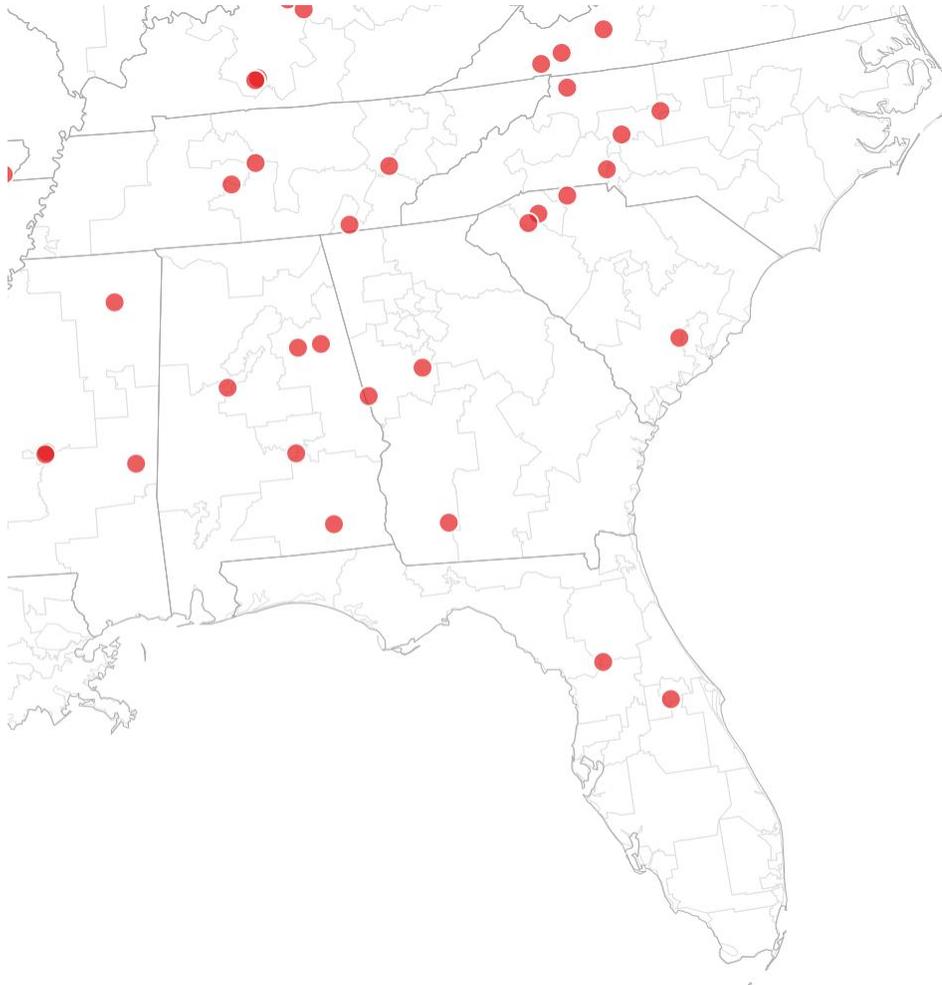
EV manufacturing is strong in the Southeast but the region claims less of the nation’s EV sales and EV charging stations compared to their population. The region is significantly underrepresented in utility and government funding for transportation electrification per person, representing 18 percent of the U.S. population but less than one percent of utility investment and only four percent of government funding. The total population in the region as of 2019 was 53,775,651.

Source: Atlas EV Hub

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The Southeast benefits from a high concentration of EV manufacturing facilities with four out of the six states hosting sites responsible for the mass manufacturing of passenger EVs and batteries. All told, there are 22 facilities dedicated to passenger vehicle, bus, and truck production in the Southeast according to research compiled by BlueGreen Alliance [31]. These are shown in Figure 4 below.

FIGURE 4: MANUFACTURING FACILITIES IN THE SOUTHEAST FOR BOTH CONVENTIONAL AND EV LIGHT-, MEDIUM-, AND HEAVY-DUTY VEHICLES



The Southeast is home to 22 facilities dedicated to the production of EVs and conventional vehicles across all classes including light-, medium-, and heavy-duty vehicles.

Source: Blue Green Alliance [31]

Research from BlueGreen Alliance estimates that the auto industry and medium- and heavy-duty manufacturing sector combined support more than 95,400 jobs in the Southeast both in direct manufacturing and indirectly throughout regional supply chains, not including dealerships [31]. Data compiled by the trade association Autos Drive America on international automaker investment and employment reports a total of 48,000 direct manufacturing jobs across all classes of vehicle production in the region.

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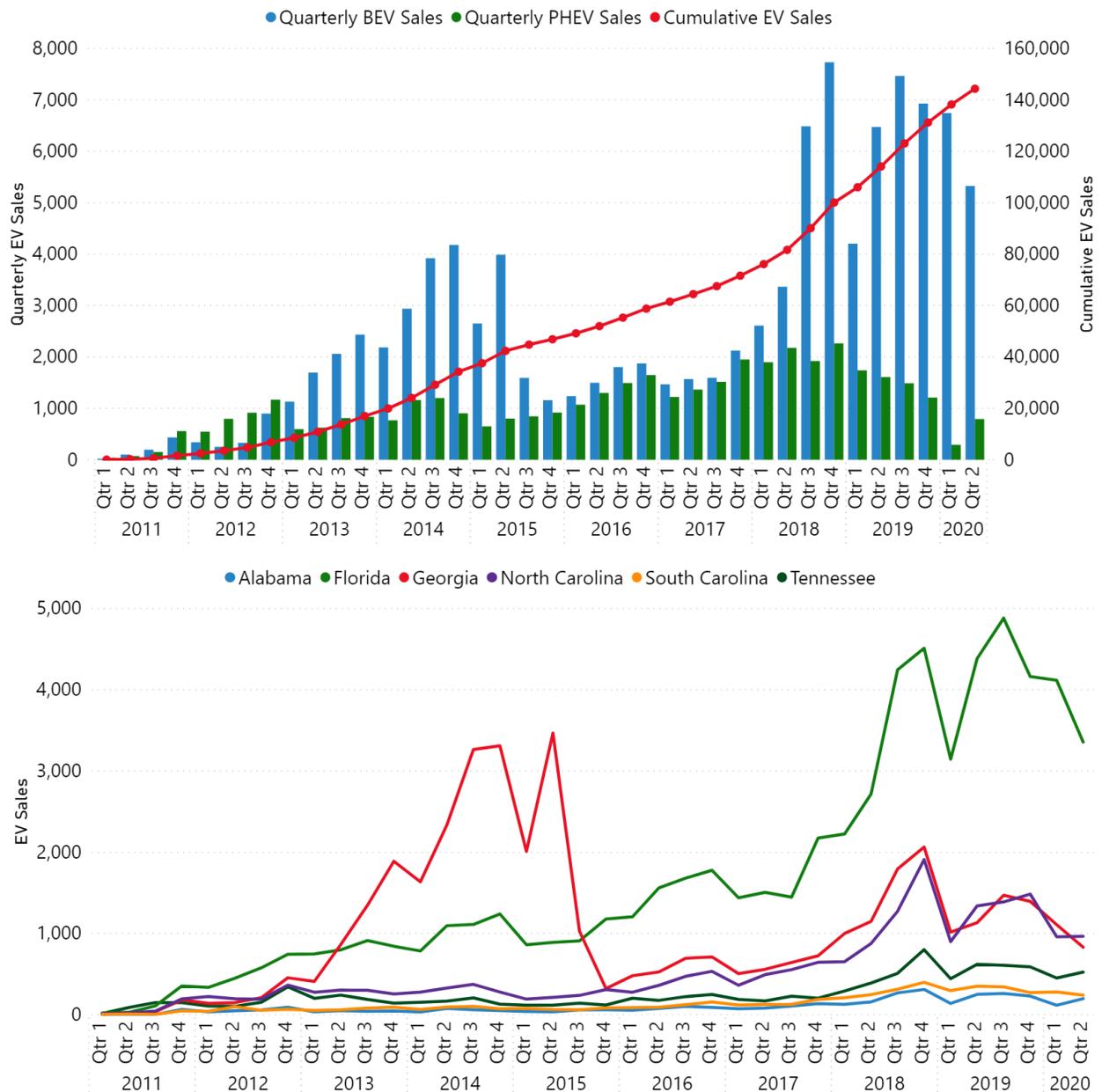
Including dealerships, international automakers and their suppliers employ more than 424,000 across the region's auto sector and have invested at least \$38 billion in the passenger vehicle industry in the Southeast [32]. This does not include medium- and heavy-duty manufacturing, which either do not operate or report dealership or storefront employment. This data also does not include information for American automakers Ford, Fiat-Chrysler, and General Motors, although the only major manufacturing facility in the region is General Motors' Spring Hill facility in Tennessee which employs 3,700 people and does not currently make EVs [33].

At least 5,800 of the auto sector jobs in the Southeast are EV-specific jobs spread across the six passenger EV and battery facilities located in Alabama, Georgia, South Carolina, and Tennessee accounting for more than \$6.7 billion in direct investment. Job figures associated with EV production have not been reported for Volvo's plant in Charleston, South Carolina. There is also a general shortage of information on the employment and investment figures associated with medium- and heavy-duty vehicle manufacturing operations as well as any EV charging operations in the Southeast, which are not directly tracked on the Atlas EV Hub. Because of these gaps, it is likely that EV-related employment is greater in the Southeast than is reported in commitments tied to specific facilities. The potential for job growth from EV charging expansion is particularly high as the market grows to support an increasing number of EVs in the region.

The Southeast's share of jobs compared to the national total remains low relative to the region's population due to Tesla's existing 10,000 jobs in their Fremont, California facility and another 10,000 projected for the newly announced Gigafactory planned in Austin, Texas [34]. EV jobs in the Southeast are only slightly lower than the 6,150 jobs existing or planned in the Midwestern auto belt due to large EV commitments from Ford and General Motors [35, 36]. Existing passenger EV and battery manufacturing commitments in the Southeast are driven entirely by Daimler, Nissan, SK Innovation, Volkswagen, and Volvo. EV investment and manufacturing could increase in the Southeast if automakers including Hyundai-Kia, Toyota, Honda, and General Motors commit to produce EVs at their facilities in the region. The Southeast stands to benefit the most from the acceleration of EV manufacturing at these existing facilities from major automakers and the region does not currently have any passenger EV startups. Companies including Rivian, Lordstown Motors, and Nikola all operate facilities in other regions and plan to employ at least 3,250 people at their plants. This represents eight percent of the EV-specific employment in the country even though none of these startups have delivered a vehicle to a customer, indicating significant economic opportunities associated with newcomers to the EV market.

While the Southeast has made major progress in building EVs, the region has fallen behind on efforts to make EVs an attractive offering for consumers in these states. With 140,700 EVs sold since 2010 throughout the region, the Southeast is underrepresented in the national EV market with only 10 percent of EV sales compared to its 18 percent share of the population. The neighboring Central Atlantic region consisting of Delaware, Maryland, New York, New Jersey, Pennsylvania, Virginia, and Washington DC accounts for an almost equal 18 percent share of the national population but claims 188,400 EV sales, 13 percent of the national total. Figure 5 shows the trends in EV sales throughout the region and at the state level through June 2020.

FIGURE 5: EV SALES IN THE SOUTHEAST THROUGH JUNE 2020



Georgia and Florida have driven EV sales in the Southeast and account for the large spikes seen in 2014 and 2019 respectively. Georgia led the region in EV sales after implementing a statewide EV tax credit in 2013 that was ended in 2015. The removal of this tax credit led to a decline in sales in Georgia and since 2016, Georgia and North Carolina have made up a similar portion of the region’s sales.

Source: Atlas EV Hub [8]

Georgia’s majority share of the region’s passenger EV sales between 2013 and 2015 was driven by enacting a statewide EV tax credit. When the credit was removed in 2015, Georgia’s passenger EV sales dropped, and Florida took the lead. Together, the two states account for 75 percent of all passenger EV

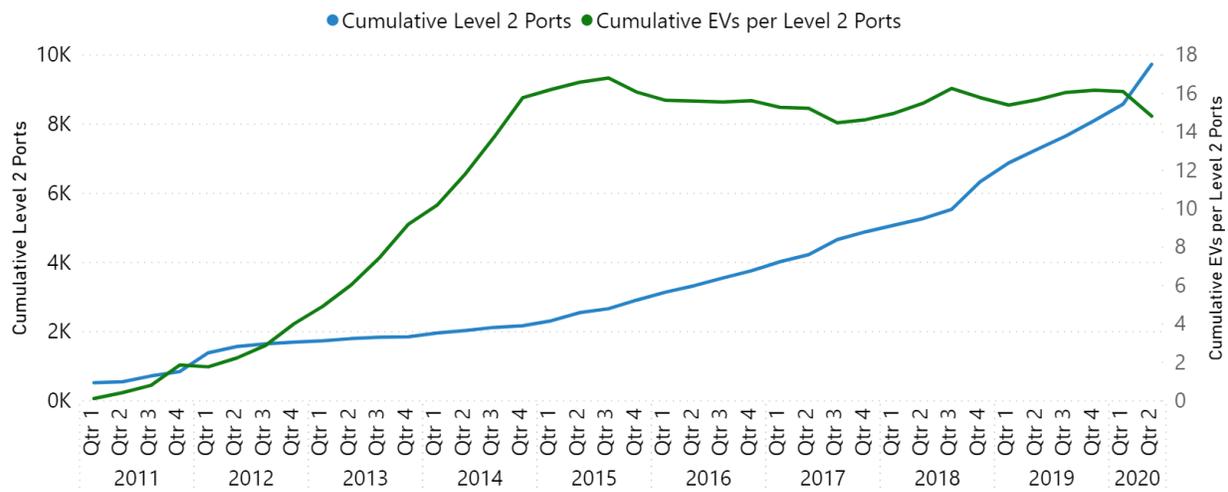
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sales in the region despite making up only 53 percent of the population. Lower EV sales in the Southeast compared to regions like the Central Atlantic could be partly connected to limited passenger EV model availability. The Central Atlantic region has 48 passenger EVs offered for purchase, seven more than are on offer in the Southeast. The International Council on Clean Transportation notes that passenger EV model availability is a limiting factor on passenger EV market growth regionally [37].

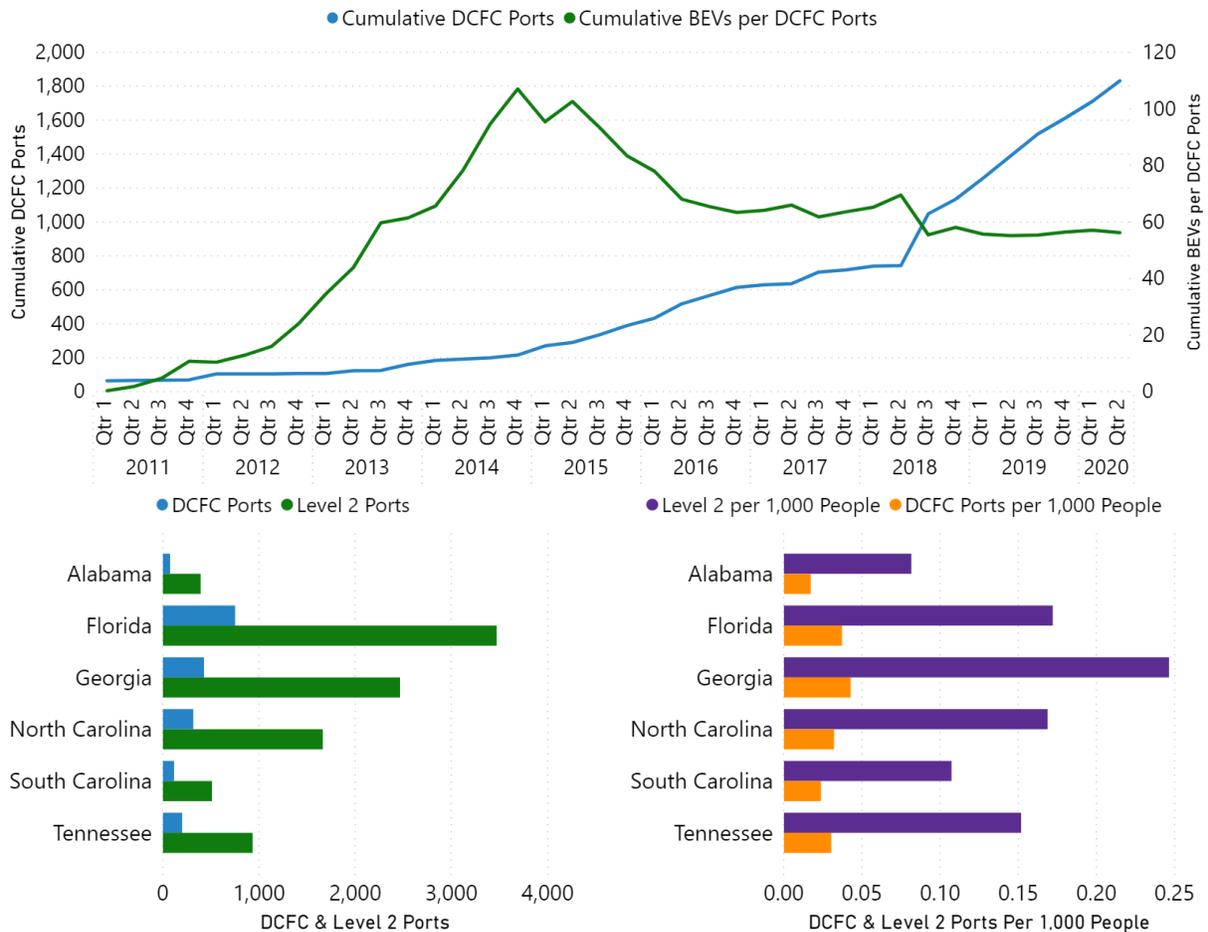
At least 30 EV models are expected to reach the market throughout the country in 2021, including the first electric pickup trucks from Rivian, Lordstown Motors, and Tesla [3]. Pickup trucks dominate passenger vehicle sales in the United States and the Ford F-150 was the top-selling vehicle in 2019 both nationally and regionally [8]. Woods Mackenzie anticipates significant growth in this subsector of the passenger EV market and major automakers including Ford and General Motors are planning to bring EV pickups to market in before the end of 2022 [38]. The introduction of electric pickup trucks could be particularly beneficial to the EV market in the Southeast, although states will have to allow startups like Rivian and Lordstown Motors to sell directly to customers to ensure these new offerings are available in regional markets. Colorado took this step in March 2020 by enacting legislation allowing all startups and manufacturers of EVs to sell directly to customers without setting up a dealership [39].

In addition to having a more limited number of passenger EVs than other regions, the Southeast is also underrepresented in terms of EV charging deployment with 11,819 total charging ports, 13 percent of the national total. Roughly 17 percent of these are DC fast charging ports. Florida and Georgia, the only two states with approved utility investment in EV charging, lead the region in terms of deployment with 62 percent of the total. Figure 6 highlights some of the trends in EV charging deployment throughout the region.

FIGURE 6: EV CHARGING DEPLOYMENT AND TRENDS ACROSS THE SOUTHEAST



TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST



EV charging deployment has grown significantly since 2015. The region now has an average of almost 60 BEVs per DC fast charging port, down from 110 BEVs per DC fast charging port in 2014. Georgia and Florida lead charging deployment for the region.

Source: Atlas EV Hub [26]

State agencies in the Southeast have invested only \$85 million of state funding to support transportation electrification. This represents less than four percent of all state government funding for EVs and EV charging nationwide, far below the Southeast’s 18 percent share of the total population. Utility investment in the Southeast is even lower with only \$32 million in approved programs supporting EVs and EV charging. This is less than one percent of the total approved utility investment in transportation electrification across the country. Low approval levels in the Southeast are due in part to the loss of \$25 million in potential investment from two programs, one that was withdrawn by Duke Energy in Florida and another that was denied by the commission in North Carolina. Alabama and Tennessee have no recorded investor-owned utility filing activity supporting EVs [27].

As it stands, the region has an opportunity to capitalize on significant funding resources that are already available. The six states have only awarded \$68 million of the \$363 million in total Volkswagen Settlement funds that they are allowed to spend on EVs and so far, only 35 percent of those awards have gone towards EVs and EV charging [40]. There is also at least \$86 million in utility investment pending commission approval. The following sections will provide a deeper dive into the specific opportunities and challenges facing each of the six states in the Southeast.

ALABAMA

ALABAMA HIGHLIGHTS

- Alabama claims large share of Southeast auto manufacturing
- 2019 Rebuild Alabama Infrastructure Plan promotes the development of EV Infrastructure across the state
- \$2 million approved in Alabama's 2021 Budget for EV Awareness and EV Charger Deployment
- Alabama is 43rd in nation in EV sales and 47th in DC fast charging per person
- EV sales down 19% in first half of 2020 compared to 2019

OVERVIEW

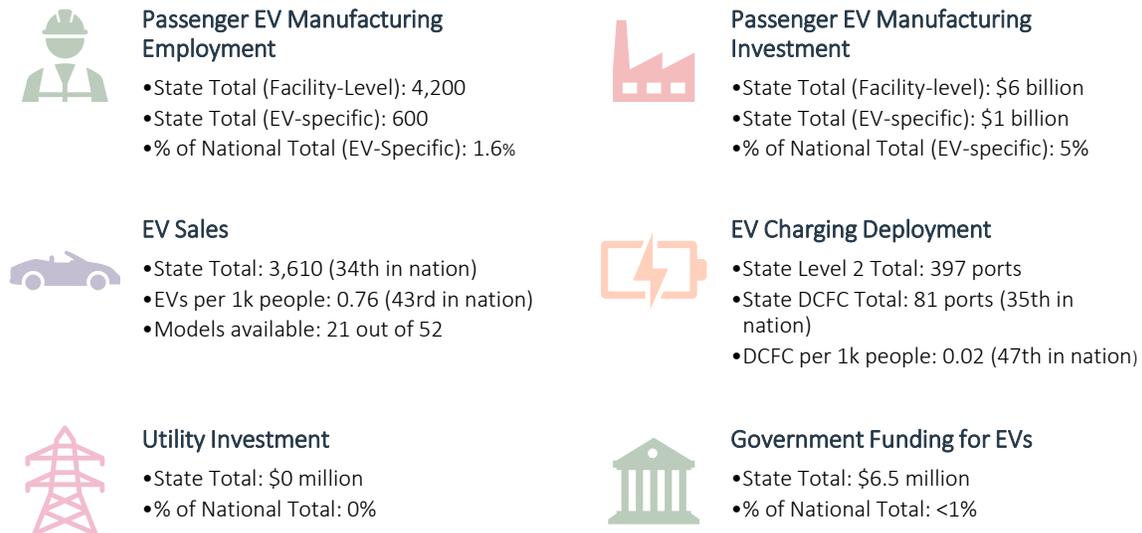
Alabama accounts for eight percent of the population in the Southeast and is the 24th largest state in the country. It has the smallest number of charging stations and EV sales out of all the states in the region. Despite accounting for a smaller proportion of the southeast region in population and EV sales, Alabama has attracted up to \$1 billion in EV-specific manufacturing investment and \$12 billion in total investment in passenger vehicle manufacturing [32, 41]. BlueGreen Alliance data shows 20,200 direct and indirect passenger and medium- and heavy-duty vehicle manufacturing jobs exist across the state [31]. The state's own Made in Alabama site reports 40,000 total jobs supplied by the passenger vehicle sector in the state, roughly 14,000 of which are direct manufacturing jobs [42]. Autos Drive America estimates a similar number with 13,400 direct manufacturing jobs and 79,000 total jobs supported by the passenger vehicle sector alone [32]. With several in-state facilities including Honda, Hyundai, and Toyota, all of which have electrification plans, there is potential for future passenger EV production and job creation. As of August 2020, Daimler is the only automaker to have announced plans to produce EVs and EV batteries in Alabama.

Alabama policymakers see the benefits the EV sector brings to the state and have allocated at least \$2 million from the 2021 general budget to promote EV demand and awareness [43]. This supports the state's commitment to build out a statewide passenger EV charging network through the 2019 Rebuild Alabama Infrastructure Plan. The state is also in the position to invest in medium- and heavy-duty EVs and passenger EV charging and was allocated \$25.4 million through the Volkswagen Settlement in 2017. Since 2018 Alabama has also secured \$6.5 million through the Low-No Transit Bus Program for electric transit buses. And the recent 2019 Rebuild Alabama Infrastructure Plan also points towards Alabama's

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

commitment to support further electric vehicle infrastructure across the state. Figure 7 compares Alabama to the country as a whole and shares state-level EV indicators.

FIGURE 7: EV INDICATORS IN ALABAMA THROUGH AUGUST 2020



Alabama (population of 4,903,185) represents eight percent of the population in the Southeast region and 1.6 percent of the national population, ranking it as the 24th most populous state in the country. This means Alabama is behind on EV and EV charging deployment on a per person basis, however, the state is ahead in both the region and nationally for EV manufacturing investment and employment. The state accounts for a small amount of the Southeast region's government funding for EVs and has no recorded electric utility investment.

Source: Atlas EV Hub

AUTOMAKERS AND EV INVESTMENTS

Alabama is home to several large passenger vehicle manufacturing facilities and data from BlueGreen Alliance show 20,200 direct and indirect auto and medium- and heavy-duty vehicle manufacturing jobs [18]. Autos Drive America estimate that the passenger vehicle sector alone provides \$11.8 billion in investment to the state as well as 13,400 direct manufacturing jobs and 79,000 total passenger vehicle jobs [32]. Daimler is the only automaker planning to invest directly in passenger EV and battery manufacturing in Alabama and has committed more than \$1 billion and bring 600 EV battery manufacturing jobs to the state. The automaker plans to make batteries for the upcoming EQ line of EV models for the U.S. market at the Tuscaloosa plant [41]. On the medium- and heavy-duty electrification side, Alabama's only major transit bus manufacturer, New Flyer, has invested more than \$50 million supporting 750 jobs at their Anniston plant. The facility, which became operational in 2017, produces both conventional and electric transit buses [44]. Medium- and heavy-duty EV jobs are typically not reported and are not included in total EV-specific job counts [45].

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

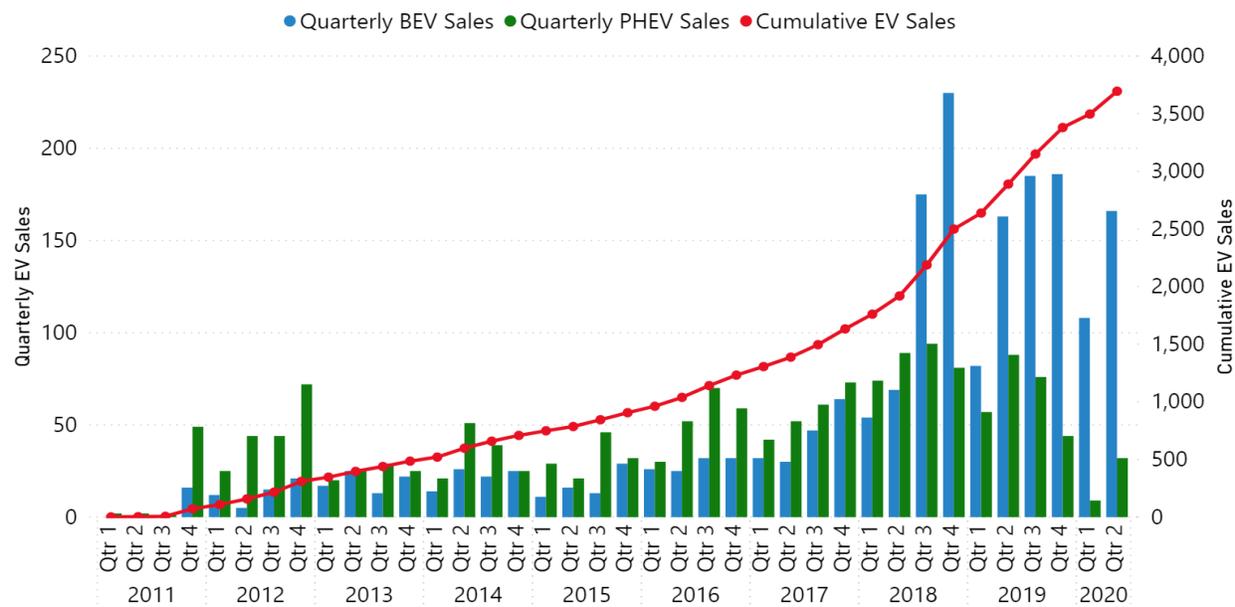
Although Daimler provides the only EV-specific employment in Alabama, Alabama employment in the EV sector could accelerate as automakers with in-state facilities including Honda, Hyundai, and Toyota, make good on their electrification plans and investment commitments. On August 15, 2020, Toyota announced an additional \$830 million in investment for their shared facility with Mazda in Huntsville, although there are currently no plans to make EVs there [46]. Similarly, neither Hyundai nor Honda have announced plans to produce EVs at their respective facilities in the state.

PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

On a per capita basis, Alabama is underrepresented both nationally and in the Southeast in terms of all major EV indicators besides manufacturing investment and employment [30]. Although Alabama is the 24th most populous state in the nation, it ranks 43rd and 35th in terms of EV and DC fast charging deployment per person.

Alabama has the lowest EV sales in both absolute and per person terms in the Southeast region. Between January 2010 and June 2020, Alabama drivers purchased 3,697 EVs, only 2.6 percent of the regional total with just 0.76 EVs per 1,000 people. Low EV sales compared to regional and national levels are partially driven by limited EV model availability where only 21 out of 52 offered EVs on the market nationwide as of August 2020 were sold in Alabama. Oregon, which has a similar population size as Alabama, had 34 EV models offered for purchase and more than eight times the all-time EV sales [8]. Oregon is also a part of the ZEV program requiring automakers to sell an increasing number of EVs in the state over the coming years [10]. Like other states in the region, Alabama’s sales trends also reflect declines during the first two quarters of 2020, which mirror sales trends at the national level due to COVID-19. Alabama’s passenger EV sales fell by 19 percent in the first half of 2020 compared to 2019, reflecting declines seen at the national level due to COVID-19. Figure 8 shows the trend in EV sales in Alabama over time through June-2020.

FIGURE 8: EV DEPLOYMENT IN ALABAMA THROUGH JUNE 2020



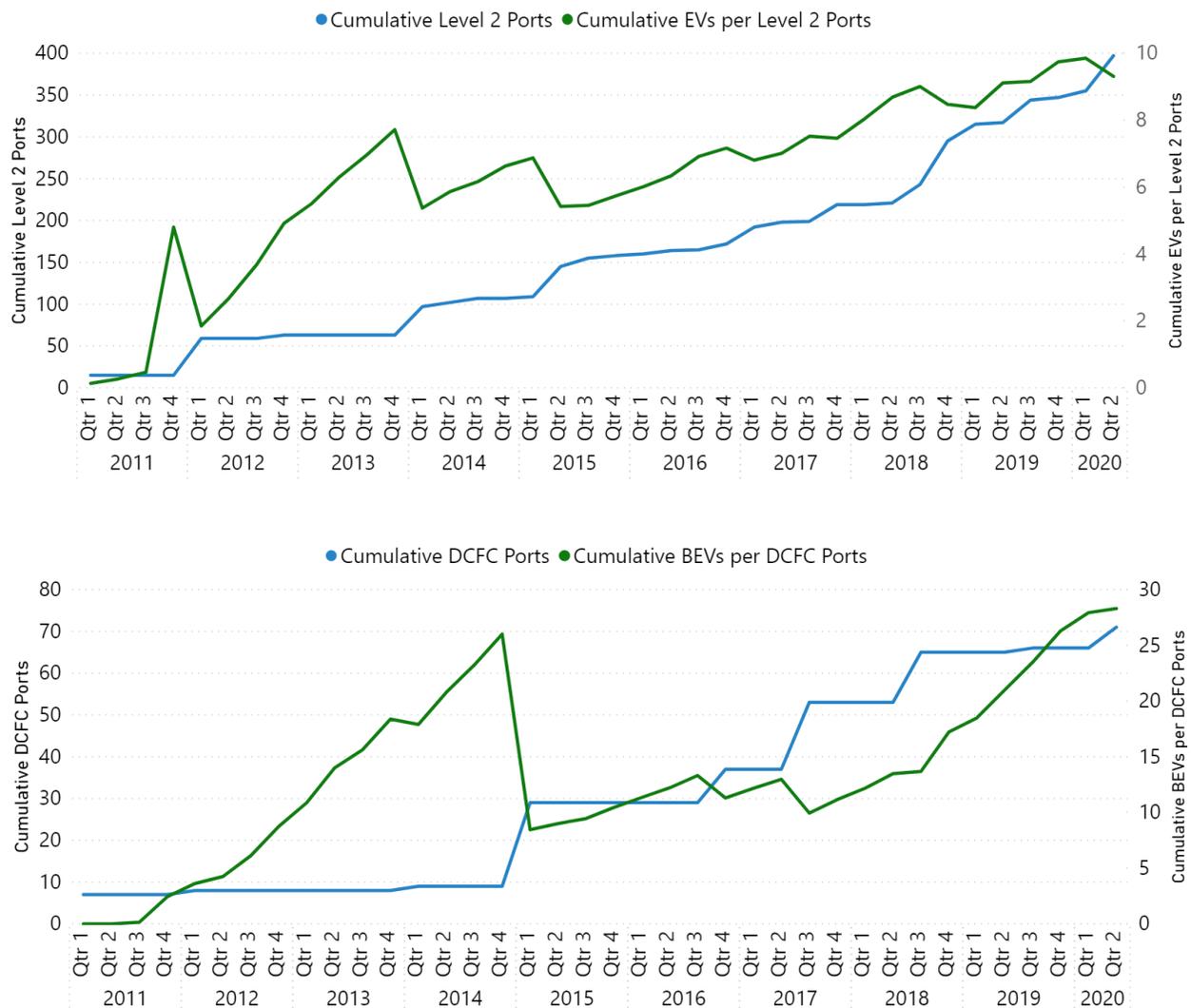
Alabama accounts for only 2.6 percent for the Southeast’s EV sales despite making up 9 percent of the population.

Source: Atlas EV Hub [2]

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

The state also falls behind in terms of EV charging deployment with less than half a percent of the nation’s charging stations. Regionally, Alabama has the fewest stations in the region on both a per person and absolute basis. Alabama currently has only 397 Level 2 and 81 DC fast charging ports, less than four percent of the regional total. Using Oregon as a baseline again, Alabama has almost four times less charging infrastructure despite having almost equal populations. EV drivers in Oregon benefit from supportive policies including EV charging rebates and electric utility programs supporting charging deployment [10]. Alabama utilities have developed EV rates and invested in port electrification, however utilities in the state have no recorded utility investment in passenger EV charging deployment [47]. Figure 9 shows EV charging deployment over time in the state relative to EV sales.

FIGURE 9: EV CHARGING DEPLOYMENT OVER TIME IN ALABAMA



Alabama’s EV deployment is increasing faster than charging station growth with an increasing ratio of EVs to charging ports since 2015.

Source: Atlas EV Hub [26]

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

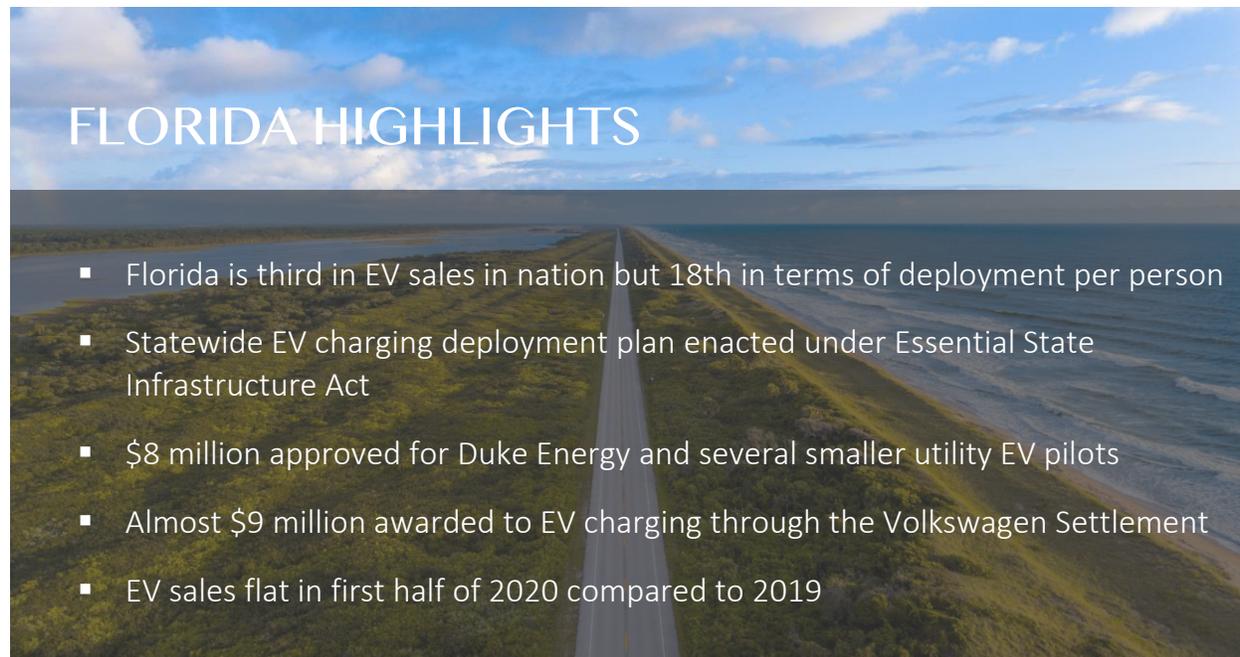
Recent policy activity and support from Republican policymakers could help to accelerate the passenger and EV charging markets in Alabama. Republican State Senator Gerald Allen wrote an article expressing strong support for the state's EV industry, citing a total auto sector job creation figure of 40,000 for the state [43]. Senator Allen also cited the 2019 Rebuild Alabama Infrastructure Plan as a key turning point for the state in its support of broader transportation electrification. Although the plan implemented annual registration fees for EV drivers, 25 percent of funds raised by this fee will be directed to the state's Transportation Infrastructure Grant Program to provide grants for charging infrastructure [48]. Alabama's 2019 Rebuild Alabama Infrastructure Plan complements other public investments made in electric vehicle infrastructure throughout the state.

GOVERNMENT AND UTILITY FUNDING

The Volkswagen Settlement represents Alabama's greatest opportunity to accelerate deployment of medium- and heavy-duty EVs as well as passenger EV charging. Through its Volkswagen Settlement allocation of \$25.4 million, Alabama has awarded \$5.8 million for specific projects. EVs and EV charging have received only two percent of these awards so far. More money has been awarded to medium- and heavy-duty EVs in Alabama through federal grants. Between 2018 and 2020, Alabama has received awarded \$6.4 million through the Low-No Transit Bus Program for electric transit buses [11]. The state saw its first electric transit buses enter operation in November of 2019 at Alabama A&M University and there are currently no reports of electric trucks in the state [49].

Alabama utilities are also in a position to support transportation electrification in Alabama. The utility Alabama Power has already developed EV charging rates that include commercial fleet vehicles, creating a savings potential for public and private fleet operators who are eligible to receive funds for medium- and heavy-duty EVs through the Volkswagen Settlement. On the passenger vehicle side, individual drivers and fleets both stand to benefit from the rollout of the "Alabama Electric Vehicle Infrastructure Plan" outlining a pathway to invest \$3.24 million in EV charging corridors through the Volkswagen Settlement [50]. Establishing EV charging rates and infrastructure plans are productive early steps for the state, although more supportive policy and investment is needed to accelerate deployment of EVs and EV charging to levels seen in other states in the region and states with strong EV and EV charging markets such as Oregon [10].

FLORIDA

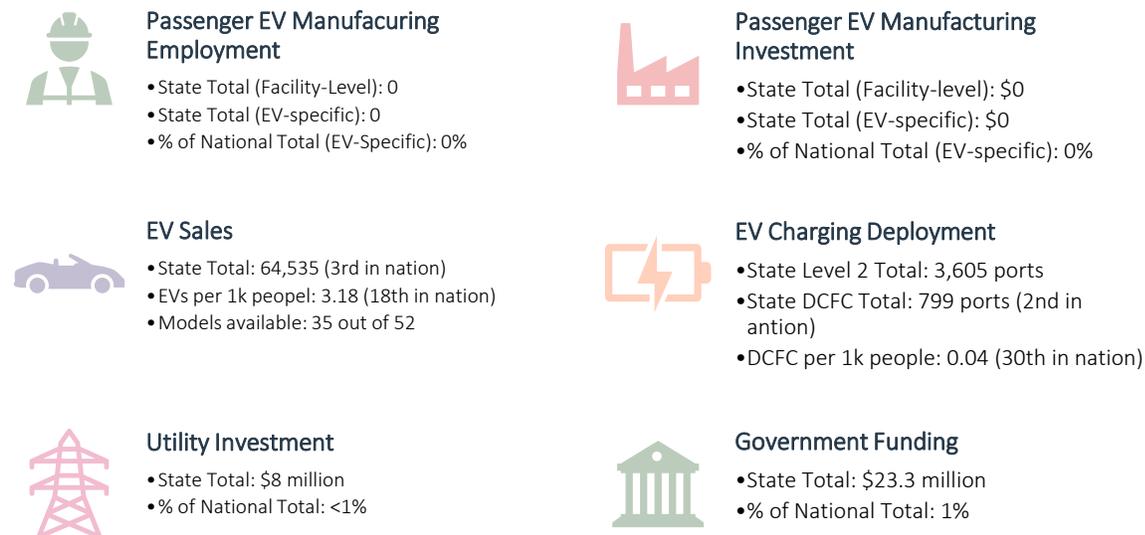


OVERVIEW

Florida's is the third-largest state in the country by population and accounts for 36 percent of the Southeast regional population. It is also the third-largest passenger EV market in the country in terms of new vehicle sales. Florida leads the Southeast in terms of total EV sales, accounting for almost half of the region's EV market. Despite the strong passenger EV market, Florida has not attracted any large investments in EV manufacturing and there is no major passenger or medium- and heavy-duty vehicle plants in the state. According to Autos Drive America, almost all of the state's 52,000 passenger vehicle sector jobs are indirect. There are only 550 direct passenger vehicle sector jobs in the state, the second-lowest in the Southeast region after North Carolina [32].

Policymakers are paying attention to Florida's growing share of the EV market and are developing comprehensive plans to promote charging network expansion. Recent legislation under the 2020 Essential State Infrastructure Bill requiring public agencies to develop coordinated, statewide strategies to deploy charging infrastructure could help to further support the deployment of EVs throughout the state [51]. This plan will inform the rollout of charging stations funded through the Volkswagen Settlement and the state has already awarded \$8.9 million to support EV charging. Florida's total allocation through the Settlement is worth \$166 million and medium- and heavy-duty EVs are eligible for all of the funding not designated for passenger EV charging. The only funding to date for medium- and heavy-duty EVs in Florida has come from the Low-No Transit Bus Program. Since 2016, transit agencies in Florida have received \$14.7 million for electric transit buses through the program. As a whole, Florida is behind in both government and utility investment in transportation electrification compared to its population. Figure 10 compares Florida to the nation as a whole and shares state-level EV indicators.

FIGURE 10: EV INDICATORS IN FLORIDA THROUGH JUNE 2020



Florida has almost no EV manufacturing while having a greater portion of EV sales and charging deployment compared to its portion of the southeast population, which is 36 percent (21,477,737 people). The state is the third largest in the nation and accounts for 6.5 percent of the national population and one percent or less of both utility and government funding for EVs.

Source: Atlas EV Hub

AUTOMAKERS AND EV INVESTMENTS

Florida currently does not have any major passenger or medium- and heavy-duty vehicle manufacturing facilities. However, the state claims the third highest passenger EV sales and supports a large indirect passenger vehicle sector primarily through training centers and dealerships. Almost all of the state’s 52,000 auto sector jobs are dealership jobs [32]. With recent policy and government funding directed towards accelerating the EV charging market, Florida could benefit from jobs associated with infrastructure. EV charging employment and related employment are not reported by charging service providers and these data were not included in this report.

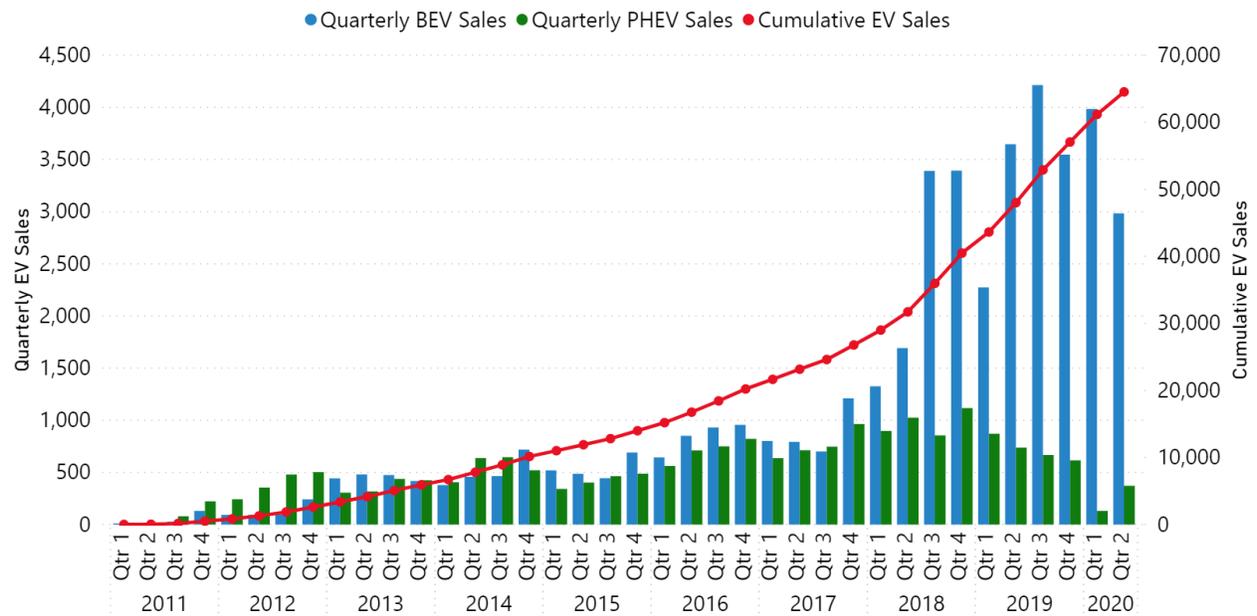
PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

Although it claims the highest total passenger EV sales in the Southeast region, Florida’s per person EV deployment and model availability is slightly lower than Georgia’s with 3.13 EVs per 1,000 people and 35 out of 52 models on the market for sale [8]. However, Florida’s sales numbers have been trending upward more steadily compared to Georgia between 2015 and 2020. Nationally, Florida ranks third in terms of total passenger EV sales but 18th in terms of deployment per person. Florida’s per person EV deployment is lower than other states with comparable total EV sales like New York and Washington. Washington’s EV sales come in just below Florida, although the per person deployment is 2.5 times higher. On the other hand, while some states have seen large passenger vehicle sales declines through the first half of 2020 as a result of COVID-19, Florida’s auto market appears more resilient. Florida’s EV sales were almost flat for

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the first half of 2020 compared to 2019 while the national EV market fell by 29 percent [8]. Florida's passenger EV market has surged in recent years and almost 60 percent of the state's sales have occurred since the start of 2018. Figure 11 shows the trend in EV sales over time in Florida through June 2020.

FIGURE 11: EV SALES IN FLORIDA THROUGH JUNE 2020

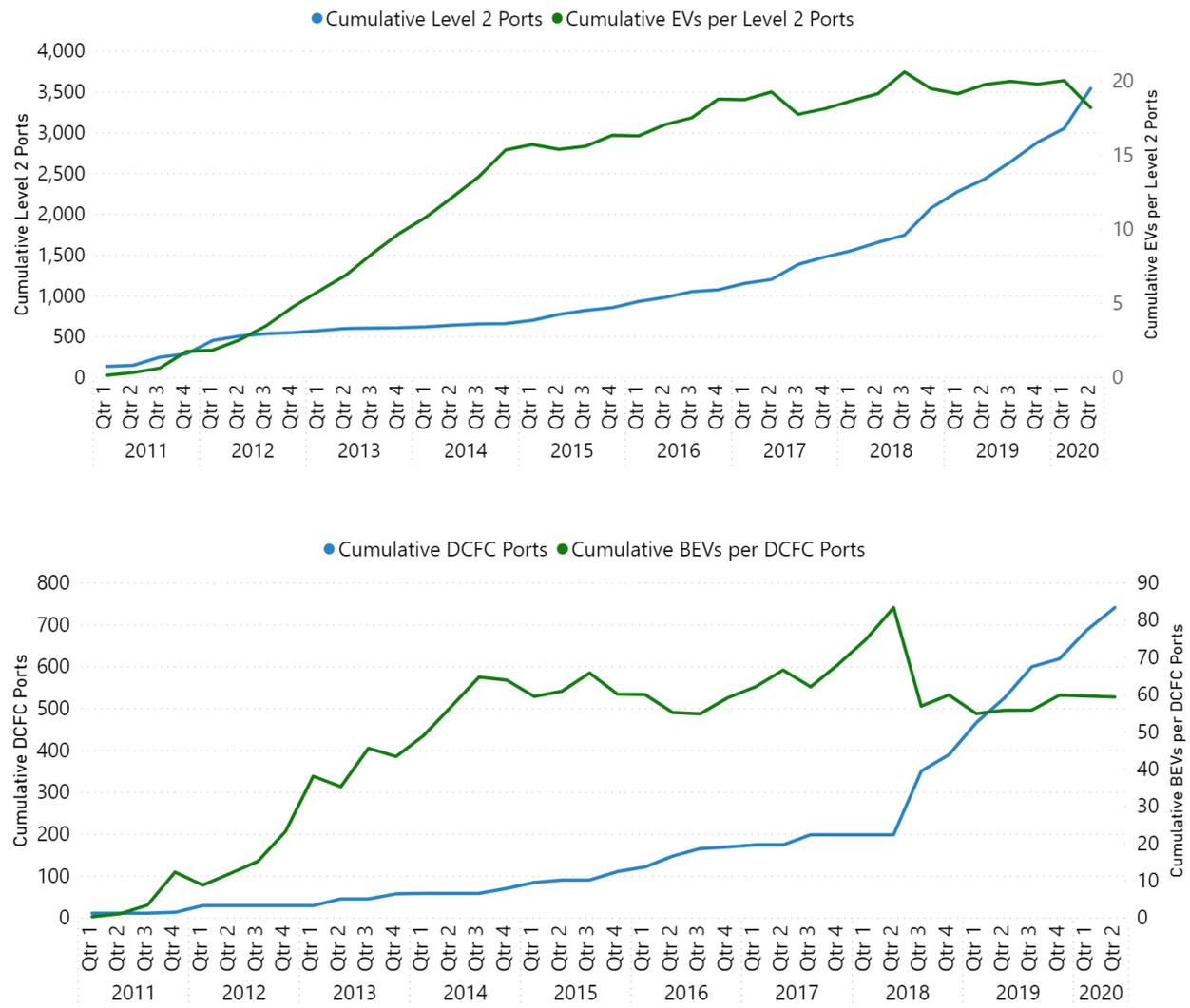


Florida accounts for almost half of the region's EV sales and an increasing proportion of the nation's sales since 2017.

Source: Atlas EV Hub [8]

Florida also hosts one of the largest EV charging networks and has the second-highest total DC fast charging deployment in the nation after California. As is the case with EV sales, EV charging deployment per person is much lower in Florida compared to other leading state. Florida ranks 30th in the nation in terms of DC fast charging deployment per person while Washington, which has similar total EV sales, ranks 9th. Within the Southeast region, Georgia has deployed more DC fast charging per person compared to Florida and ranks 25th nationally. Figure 12 shows the deployment of EV charging over time in the state.

FIGURE 12: EV CHARGING DEPLOYMENT OVER TIME IN FLORIDA



Florida has seen a spike in DC fast charging deployment since 2019. Despite this, there are still more than 60 BEVs per available port. Level 2 deployment has grown more steadily over time.

Source: Atlas EV Hub [26]

GOVERNMENT AND UTILITY FUNDING

While Florida’s EV market has grown significantly over the past decade, state legislators have been slow to implement supportive policies such as EV or EV charging rebate programs. Further policy implementation is required if Florida is to match the EV market growth anticipated from major government and utility investments in states like Washington and New York. For example, Washington has roughly a third of the population compared to Florida and three times as much government funding for transportation electrification [11]. New York, which has a comparable population to Florida, has dedicated more than 16 times as much government funding to transportation electrification projects. With a \$701 million approval

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for an EV charging program spanning six utilities in July 2020, New York's utility investment in transportation electrification dwarfs Florida's [27].

Florida was also one of the last states in the country to release its Beneficiary Mitigation Plan outlining how it intends to make use of its \$166 million Volkswagen Settlement allocation [52]. Since releasing the plan in mid-2019, the state has awarded \$8.6 million for EV charging in July 2020 and enacted new legislation in June 2020 directing state agencies to develop and implement charging station deployment strategies [53].

Supporting the rollout of the new EV charging legislation, Florida Power and Light filed a new program seeking to provide increased access to DC fast charging on highway corridors in the state. However, the program does not propose any direct investment in the EV charging sector and instead lays the groundwork for new rates and regulations supporting the implementation of a statewide network. The utility has committed to deploying 1,000 charging stations through their EVolution program announced in September 2019. The utility did not report any details on investments related to this deployment [54]. Duke Energy's approval for \$8 million to invest in 500 Level 2 and 30 DC fast charging stations in 2017 through their Park & Plug program remains the state's only commission-approved utility investment [27, 55]. In September 2020, Duke also committed to electrify all of their fleet vehicles across all service territories by 2030 [56].

Utility programs are positioned to support the rollout of statewide EV charging deployment strategies. In June 2020, Florida's Governor Ron DeSantis signed the Essential State Infrastructure Bill into law, which supports the expansion of EV Charging infrastructure and long-term planning for an increase in Florida's passenger EV market [51]. This legislation coupled with funding from the Volkswagen Settlement could see Florida claim even more of the EV and EV charging markets in the Southeast. Florida remains less suited to attract EV manufacturing investment based on the absence of major vehicle plants in the state, though it has an opportunity to support the medium- and heavy-duty vehicle and passenger EV charging markets as it rolls out government programs.

Florida has an opportunity to support medium- and heavy-duty EV deployment with 95 percent of their Volkswagen Settlement funds unspent [28]. The state's only award so far was a \$8.6 million for passenger EV charging and the state's only funding for medium- and heavy-duty EVs has come from the Low-No Transit Bus Program. More than \$14.7 million has been awarded for electric transit buses since 2016, fueling commitments to transit bus electrification at the local and regional level [11]. In 2019, Miami-Dade County pledged to electrify 50 percent of its transit bus fleet by 2035. The Department of Transportation and Public Works made the first strides toward fulfilling this commitment in November 2019 with the purchase of 33 electric buses for their fleet [57].

Nearby in West Palm Beach, Florida Power & Light pioneered the state's first deployment of electric school buses and seeks to explore bi-directional power flow (referred to as vehicle-to-grid or V2G) applications with these vehicles. While there has been some momentum in bus electrification, Florida is behind other states in support for the electric truck market. According to research published by the North American Council for Freight Efficiency, Florida is not characterized as a leading market for electric trucks [58]. The state is able to increase the growth potential of the electric truck and bus markets by allocating VW Settlement funds for these technologies and leveraging electric utility programs to support charging infrastructure as has been the case in favorable markets like California and New York.

GEORGIA



OVERVIEW

Georgia is the eight-largest state in the country by population and accounts for 18 percent of the Southeast regional population. The state has deployed more passenger EVs and EV charging relative to its population than any other state in the Southeast. Nationally, Georgia ranks 12th in terms of EV sales and 25th in terms of DC fast charging deployment per person. Georgia's share of the national and regional passenger EV market has declined since 2015 when the statewide EV tax credit was ended. Policymakers proposed legislation in 2019 that would reinstate the tax credit, although no action has been taken to pass the bill.

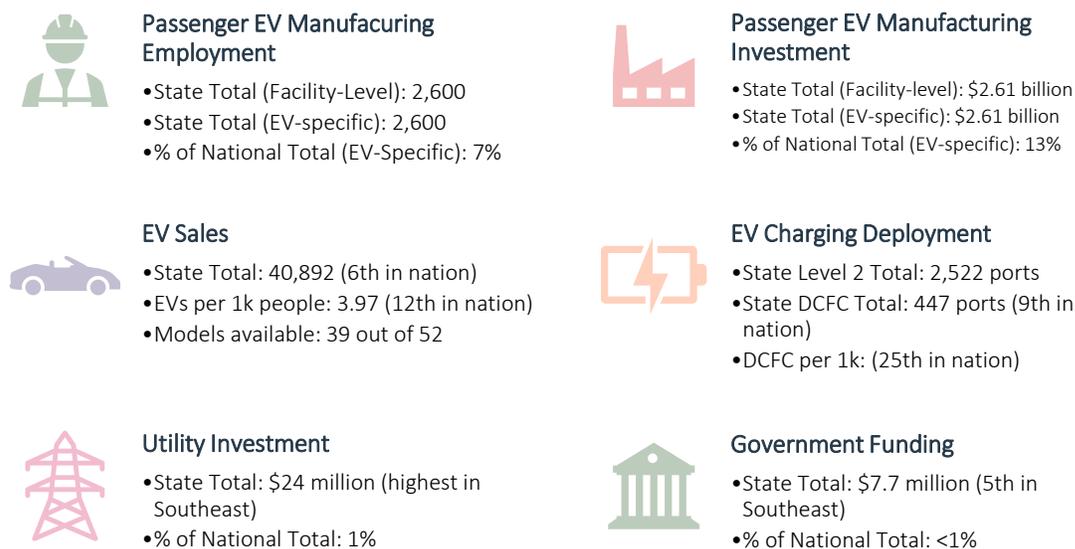
Georgia's large share of the region's passenger EV market helped attract a \$2.6 billion investment in EV battery manufacturing from SK Innovation. EV investments from automakers or medium- and heavy-duty vehicle manufacturers such as Blue Bird were not available or publicized at the time of this report [59]. According to BlueGreen Alliance data, Georgia's clean and conventional vehicle manufacturing of light-medium-, and heavy-duty vehicles support 3,260 direct jobs not including the 2,600 employees expected at the SK Innovation battery plant. Autos Drive America report higher figures with 5,300 direct jobs and 71,800 total electric and conventional passenger vehicle sector jobs in the state including indirect and dealership employment [32]. Other automakers including Kia and BMW also have a presence in Georgia, though neither currently produce EVs in Georgia.

In addition to Georgia's automaker and manufacturing investments, Georgia benefits from significant government and utility funding for transportation electrification projects. Since 2018, transit agencies across the state have been awarded \$7.7 million in federal funding through the Low-No Transit Bus Program to procure EV transit buses and charging infrastructure. Georgia Power is preparing the grid for increased EV adoption and in December 2019, the Commission approved the utility's \$24 million plan to

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invest in grid upgrades and passenger EV charging infrastructure [27]. Figure 13 compares Georgia to the nation as a whole and shares state-level EV indicators.

FIGURE 13: EV INDICATORS IN GEORGIA THROUGH JUNE 2020



Georgia (population of 10,617,423) represents 18 percent of the total population in the Southeast and three percent of the national total as the eight most populous state in the country. The state has the sixth-highest passenger EV sales in the nation and the highest per person EV deployment in the Southeast. The state also has the highest approved utility investment in the region. Georgia falls behind all other states besides Alabama in the Southeast in terms of government funding for EVs.

Source: Atlas EV Hub

AUTOMAKERS AND EV INVESTMENTS

Georgia maintains a strong presence of automakers and manufacturers, although Kia’s facility in West Point is the state’s only large passenger vehicle plant. Kia has no current plans to produce EVs despite the automaker’s commitments to ramp up EV sales in the United States market through 2021 [60]. However, Kia is among several automakers that will source batteries from a new plant being constructed in Georgia by SK Innovation. On June 25, 2020, the South Korean manufacturer announced an additional \$940 million in investment on top of \$1.67 billion already committed to building out their facility in Commerce, Georgia. The new plant will support 2,600 workers who will manufacture EV batteries for automakers including Ford, Daimler, Volkswagen, and Hyundai-Kia [61].

Georgia also is home to medium- and heavy-duty vehicle manufacturing and hosts the headquarters of Blue Bird, one of the nation’s leading school bus manufacturers. Their operations in Fort Valley, Georgia employ more than 2,000 people, but the company does not report any jobs tied directly to manufacturing of their electric models [62, 63]. According the BlueGreen Alliance data which does not include the SK

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Innovation battery plant, Georgia's clean and conventional vehicle manufacturing sectors spanning both passenger and medium- and heavy duty vehicles support at least 3,260 jobs [31].

Other automakers have seen the state's potential as a regional supplier and Autos Drive America reports that passenger vehicle brands have invested \$2.4 billion in the state supporting 72,000 direct and indirect jobs [32]. BMW has already invested \$56 million in technician training centers, one of which is near their plant in Spartanburg, South Carolina and another which is located in Atlanta, Georgia. These centers will equip technicians with the knowledge needed to service an increasing number of EVs in the region and support the growth of the transportation electrification market overall [64].

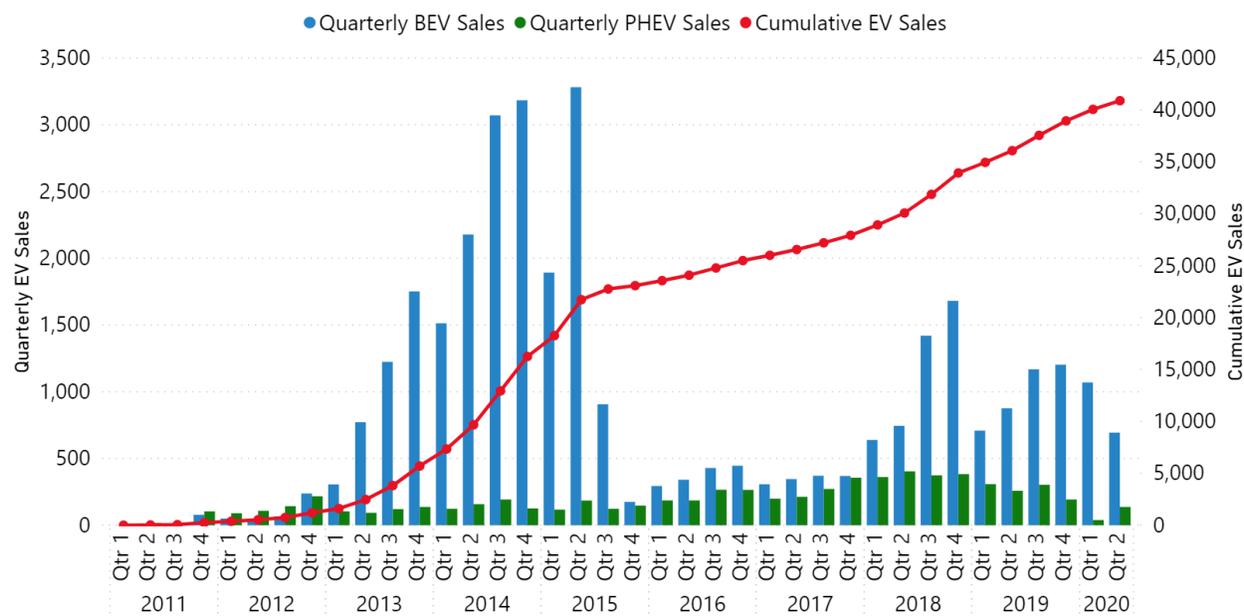
Georgia is also home to a charging infrastructure facility of industrial manufacturing giant Siemens. The company manufactures their VersiCharge product in Norcross. The company is testing smart charging technology and has partnered with the New York electric utility Consolidated Edison to implement a residential charging pilot [65].

PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

While the state's total EV deployment is only lower than Florida, Georgia has deployed more EVs and EV charging relative to its population than any other state in the Southeast with 3.97 EVs per 1,000 people. The state is the nation's sixth largest EV market in terms of total passenger EV sales and Georgia drivers are able to purchase 39 out of the 52 EV models on the market, placing it at the top of the region in that category as well [8]. Georgia's passenger EV market grew rapidly in 2013 when the state's EV tax credit went into effect and the state claimed 13 percent of all U.S. EV sales at the high point in the second quarter of 2015. The tax credit offered drivers \$5,000 toward the purchase of an EV. Concerns of high spending associated with the incentive led to its expiration in July 2015 [66, 8].

Following the expiration of the tax credit and implementation of a \$200 annual registration fee in the second half of that same year, Georgia's EV sales fell by 65 percent between 2015 and 2016 [66, 8]. Georgia's EV market has recovered slightly since the decline seen between 2015 and 2016, although sales are down again as a result of nationwide declines brought on by the COVID-19 pandemic. Georgia's passenger EV sales fell by 10 percent in the first half of 2020 compared to 2019. Figure 14 shows the pattern in EV sales over time in Georgia through June 2020.

FIGURE 14: EV SALES IN GEORGIA THROUGH JUNE 2020



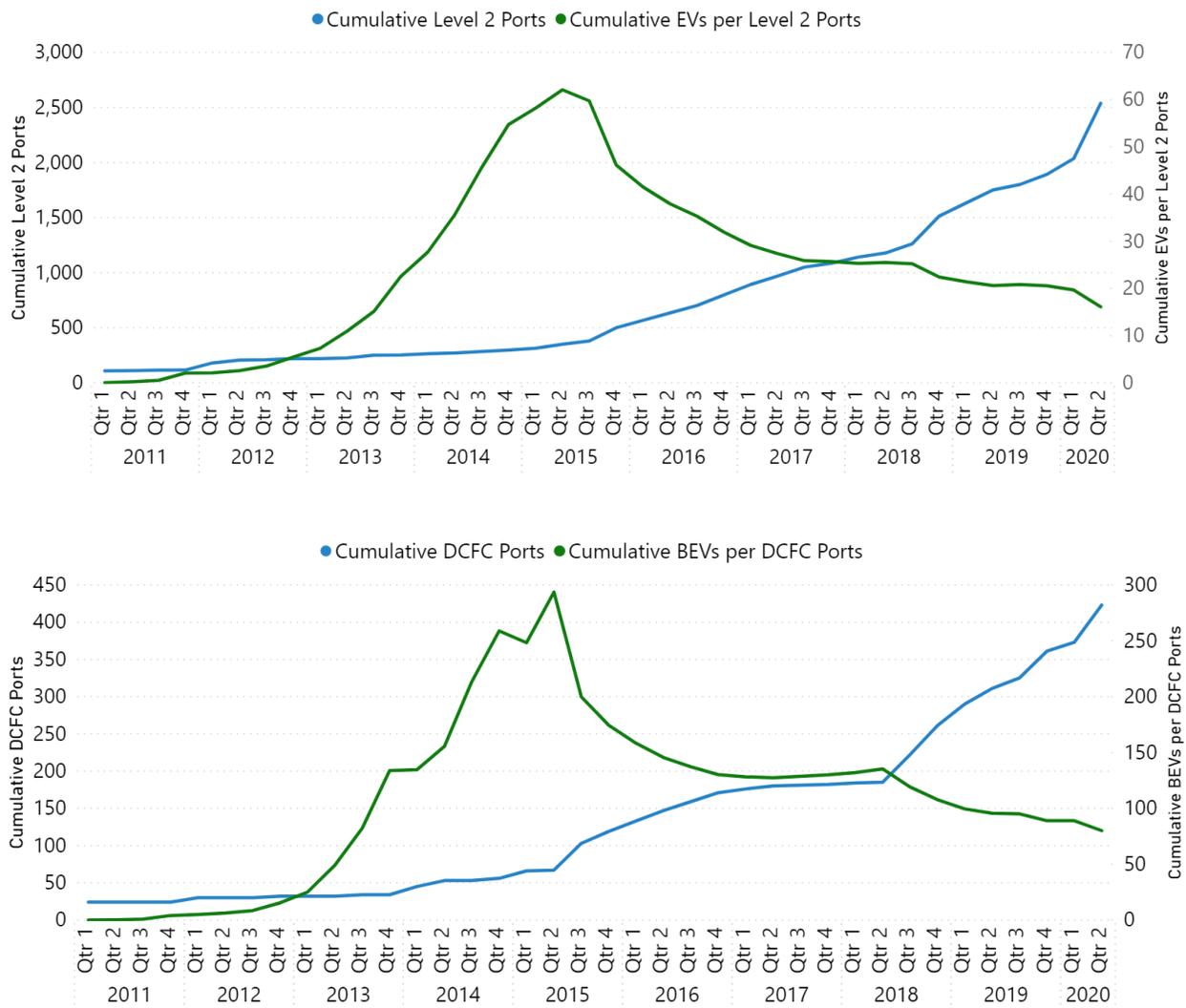
Georgia accounts for 30 percent of the region’s EV sales despite a 65 percent decline in the state’s sales between 2015 and 2016 after the removal of the statewide EV tax credit.

Source: Atlas EV Hub [8]

Georgia’s EV market has outperformed the national average throughout the pandemic, declining by only 10 percent for the first half of the year compared to the national drop of 29 percent. Georgia policymakers continue to try to bring the EV market back to the heights seen in 2015 and in 2019, legislation was introduced to implement a new \$2,500 EV tax credit [67]. However, the bill has not seen any activity since April 2019 [68]. Georgia will need to find new ways to encourage passenger EV adoption if it wishes to remain one of the top 10 EV markets in the country. More than 56 percent of the state’s all-time sales through June 2020 occurred before 2016. States with similar all-time EV sales show an opposite trend where New Jersey have seen 80 percent of their EV sales since 2016 [8]. New Jersey has an active statewide EV rebate in place that has contributed to a five-fold increase in EV sales since 2016 which Georgia’s have increased by only 1.7 times.

Georgia’s EV charging market has grown more steadily and Georgia Power has been approved to invest at least \$24 million towards charging deployment and grid upgrades to support this growth. The state has the ninth-highest DC fast charging deployment in the country. On a per person basis, Georgia is behind on charging deployment and is ranked 25th in the nation for DC fast charging ports per 1,000 people. Figure 15 shows the growth in EV charging over time relative to EV sales in Georgia.

FIGURE 15: EV CHARGING DEPLOYMENT OVER TIME IN GEORGIA



Georgia has a high ratio of EVs to EV charging in 2014 when the state tax credit program was active. Since the program ended in 2015, charging station deployment has grown more steadily while EV sales dropped.

Source: Atlas EV Hub [26]

GOVERNMENT AND UTILITY FUNDING

Georgia’s EV charging and medium- and heavy-duty EV markets have potential to grow as policymakers look to award government funds. Through August 2020, only \$7.7 million of government funding going to support EVs, all of which came from federal sources through the Low-No Transit Bus Program. By comparison, North Carolina accounts for the same proportion of the region’s population but has awarded \$21 million in government funding for transportation electrification [11]. Georgia’s largest opportunity to catch up with other states in the Southeast region lies in remaining Volkswagen Settlement funding. The state has only awarded \$2.2 million in Volkswagen Settlement funds and is yet to award funding to

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

transportation electrification projects. The state has indicated that transit buses in major metro regions like Atlanta will be a priority for the settlement funding and more than 97 percent of the state's \$63 million allocation from the Settlement is unspent and could go towards supporting the deployment of medium- and heavy-duty EVs [28].

Georgia is one of only three states, along with Oregon and Wisconsin choosing not to allocate any settlement money to EV charging. Fortunately for EV drivers in the state, Georgia Power is stepped up to invest in EV charging throughout Georgia and ready the grid for an increasing number of EVs. As a part of a \$24 million EV program approved by the Commission in December 2019, the utility will offering rebates for customers to install charging stations at their residences [69]. The program will also work to install charging for customers at workplace, multi-unit dwelling, and public locations [27]. This investment accounts for 75 percent of all approved utility investment in the Southeast and the state ranks seventh out of all 50 states in total approved utility funding for EVs. Georgia Power customers also benefit from EV time-of-use rates which offer reduced pricing for EV charging done during off-peak hours [70]. Georgia policymakers have an opportunity to partner with Georgia Power and other stakeholders in the EV sector to develop programs and policies to increase Georgia's EV leadership in the Southeast region. Georgia currently has few policies in place to support EV and EV charging market growth [10]. The state can look to neighboring North Carolina's implementation of statewide transportation electrification strategies and others like New Jersey for examples of how to connect funding opportunities through the Volkswagen Settlement with utility programs to develop commitments to EV and EV charging deployment across all vehicle classes. The state has yet to invest in technologies like electric school buses and could display support for manufacturers like Blue Bird by providing them an in-state market for their products as they scale up electric bus production [63].

NORTH CAROLINA

NORTH CAROLINA HIGHLIGHTS

- Only state in Southeast to sign ZEV Truck MOU
- Statewide EV strategy under North Carolina ZEV Plan
- \$76 million investment from Duke Energy pending approval
- North Carolina is 27th in nation in EV sales and 37th in DC fast charging per person
- EV sales down 14% in first half of 2020 compared to 2019

OVERVIEW

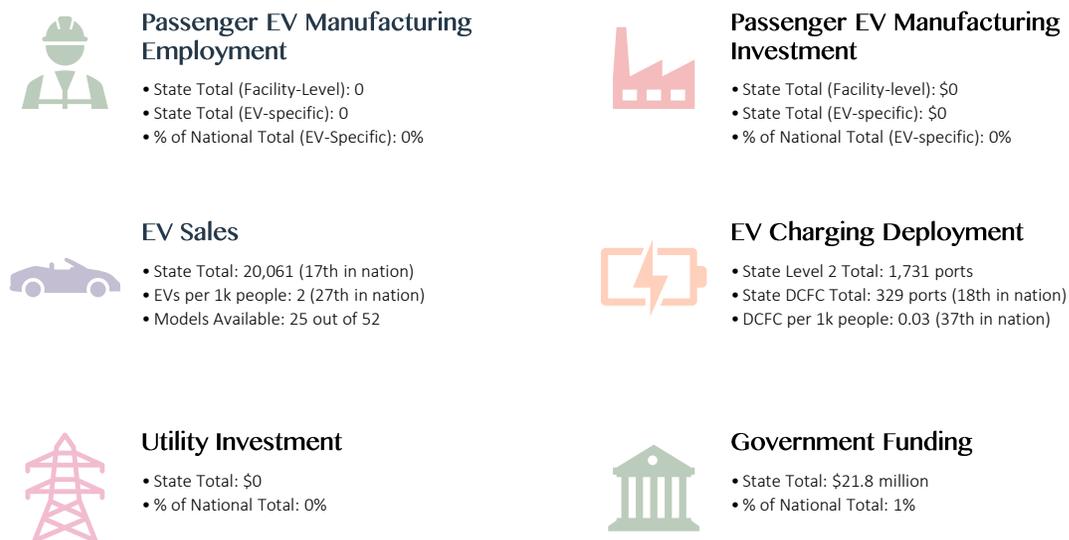
North Carolina, which accounts for 18 percent of the Southeast regional population and three percent of the national total, continues to display transportation electrification policy leadership in the Southeast. As is the case in Florida, North Carolina has no passenger vehicle production facilities. The state has the least amount of both direct and indirect passenger vehicle sector jobs in the Southeast region with only 175 direct and 17,800 total jobs according to Autos Drive America [32]. However, the state is home to major manufacturing facilities for companies in the medium- and heavy-duty vehicle market which are ramping up their electrification investment throughout the United States. These companies have not reported on specific EV-related jobs or manufacturing investment. Independent reporting from research group E2 found that all-electric and plug-in hybrid vehicles contribute 3,000 jobs to the state. It is assumed these jobs are accounted for by the medium- and heavy-duty vehicle manufacturing sector or the EV charging sector as North Carolina does not have any passenger vehicle manufacturing plants [71].

Despite making up an almost equal population compared to neighboring Georgia, North Carolina's EV deployment per person is far lower. The state is ranked 27th nationally in terms of EV sales per person compared to Georgia in the 12th position. Despite lower sales, North Carolina policymakers have taken more policy initiative compared to Georgia in recent years and has higher government funding for EVs compared all to other states in the Southeast region besides Florida. North Carolina caught national attention for signing onto a Memorandum of Understanding (MOU) supporting rapid truck electrification in July 2020. The state received more than \$10 million for electric transit buses through the Low-No Transit Bus Program since 2018. North Carolina only awarded \$27 million out of its total \$92 million allocation through the VW Settlement in July 2020 [11]. Roughly \$9.5 million of this was awarded for EVs and EV charging. EV buses and passenger EV charging are also two of the key focus areas of a \$76 million program filed by Duke Energy in March 2019, which is pending commission approval [27]. Overall, the

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state is behind on all major EV indicators besides government funding compared to its population. Figure 16 compares North Carolina to the Southeast region as a whole and shares state-level EV indicators.

FIGURE 16: EV INDICATORS IN NORTH CAROLINA THROUGH JUNE 2020



North Carolina has no reported EV manufacturing statistics despite being home to several facilities producing trucks and buses. The state is underrepresented in all other EV indicators besides government funding compared to their three percent share of the national population and 18 percent share of the Southeast regional population (10,488,084 people). North Carolina is the ninth largest state in the country by population.

Source: Atlas EV Hub

AUTOMAKERS AND EV INVESTMENTS

According to data from BlueGreen Alliance, North Carolina's auto and medium- and heavy-duty vehicle sectors employ an estimated 18,100 employees. The research group E2 produced a deep dive report into the clean energy and transportation sector employment in North Carolina and found that the all-electric and plug-in hybrid vehicle subsectors employ more than 3,000 people in the state. It is assumed these are indirect jobs in the passenger vehicle sector, as North Carolina does not have any major passenger vehicle manufacturing plants. On the medium- and heavy-duty vehicle side, both Daimler Trucks and Thomas Built Buses operate major manufacturing facilities in the state with each committing to offer increasing EV models [31].

North Carolina is also home to the North American headquarters of Volvo Group and their subsidiary Mack Trucks. Mack operated manufacturing facilities in Pennsylvania and Maryland and it is not reported whether any of their manufacturing takes place at the site in Greensboro. Mack has been working on electric refuse trucks that will be available on the U.S. market in 2021 [72]. Mack's parent company Volvo Trucks has also been working to deliver EVs on the Volvo brand and deployed their first electric short-haul in California as a part of the Volvo LIGHTS project in June 2020 [73]. For Daimler's part, the company has

TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST

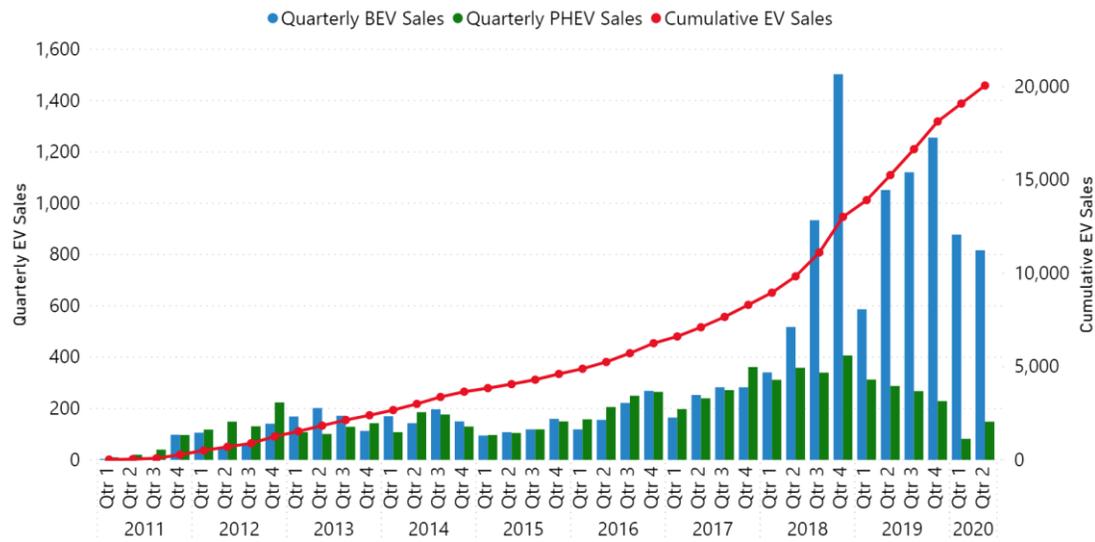
been manufacturing its debut electric freight trucks in their Portland, Oregon facility and plans to unveil at least eight models throughout the country over the next several years [74]. On the school bus side, Daimler's company, Thomas Built Buses, is partnering with South Carolina-based electric bus manufacturer, Proterra. The companies released their first buses in 2019 and are working with school districts across the country to increase the adoption of this technology [75]. North Carolina is well-positioned to benefit from an increase in both investment and employment related to medium- and heavy-duty EV manufacturing as companies like Daimler deliver on EV investment commitments. North Carolina's adoption of the Zero Emission Vehicle (ZEV) Truck Memorandum of Understanding (MOU) committing to 100 percent ZEV truck sales by 2050 creates an in-state market for these manufacturers and provides clear goals for electric truck deployment and investment.

In addition to these vehicle manufacturers, charging solutions specialists ABB and Siemens both operate manufacturing and corporate facilities in North Carolina. In 2018, ABB announced a three-year research initiative with North Carolina State University to explore technologies and power system upgrades required to support rapid deployment of fast charging [76]. The company operates a facility in Mebane, North Carolina that produced public charging infrastructure [31]. Siemens also manufactures their charging technology in North Carolina at their Wendell plant and also operates a facility in Georgia [77].

PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

North Carolina is an emerging EV market within the Southeast context and the state has made significant strides towards implementing policies supporting transportation electrification. More than 20,000 passenger EVs were sold in North Carolina from 2011 through June 2020. North Carolina's passenger EV sales were down 14 percent in the first two quarters compared to the 29 percent decline seen across the country as a result of COVID-19 [8]. While EV sales have been growing in North Carolina, the state ranks only 17th in the nation in terms of EV sales despite being the ninth largest state by population. On a per person basis, North Carolina ranks 27th in EV deployment and 37th in DC fast charging deployment. Slow EV market growth is partially influenced by limited EV model availability in the state. Only 25 out of 52 EV models on the market are offered for purchase in North Carolina. North Carolina has two fewer EVs offered for sale compared to South Carolina which only claims a quarter of the EV sales as their northern neighbor. Figure 17 shows the trend in EV sales over time in North Carolina.

FIGURE 17: EV SALES IN NORTH CAROLINA THROUGH JUNE 2020



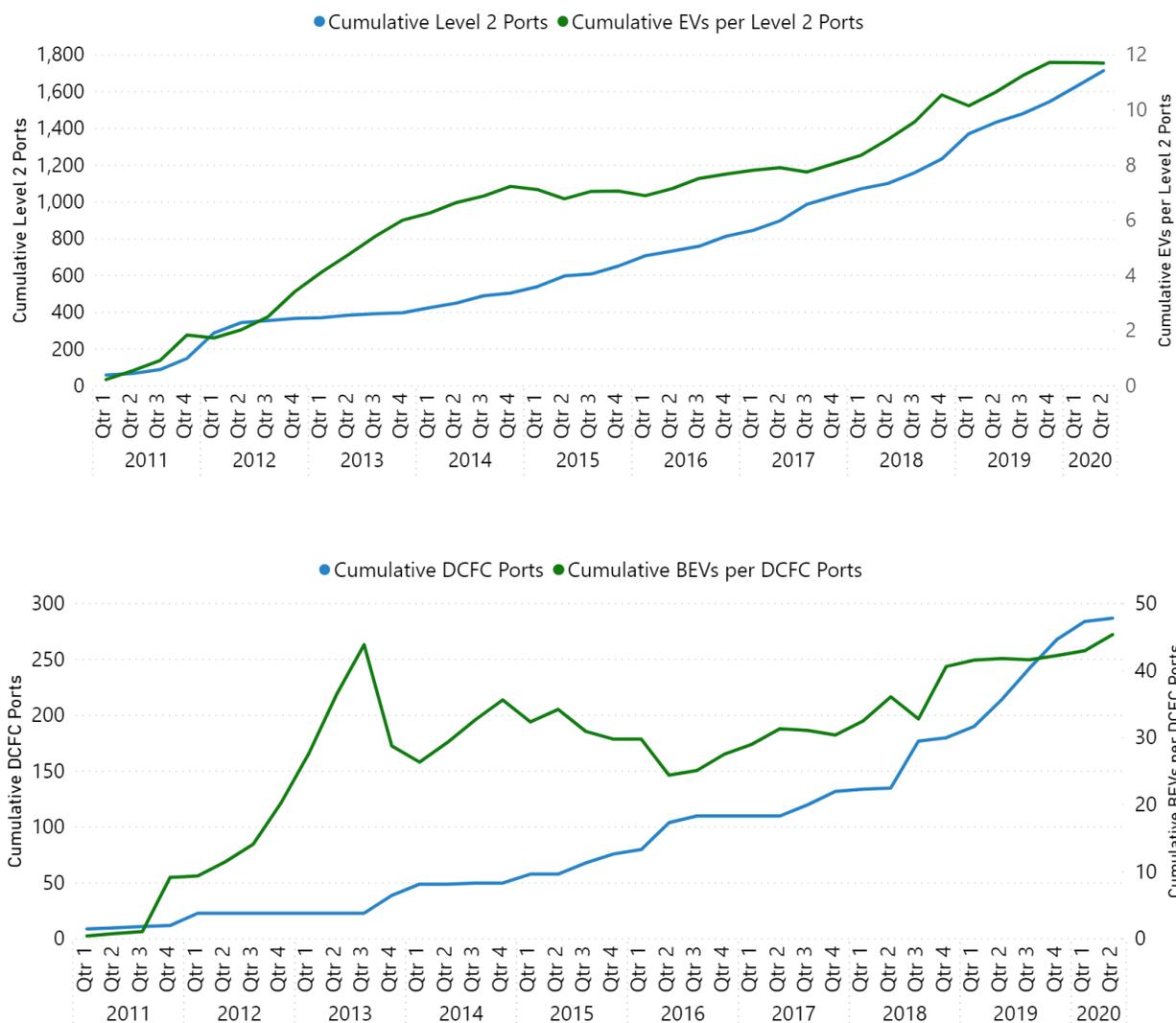
North Carolina accounts for 14 percent of the region’s EV sales despite making up 18 percent of the population (10,488,084 people).

Source: Atlas EV Hub [8]

North Carolina has half of the all-time passenger EV sales compared to neighboring Georgia. Georgia has 15 more EV models offered for sale compared to North Carolina and attributes a majority of its all-time sales to the statewide EV tax credit active between 2013 and 2015 [8]. The tide has begun to turn in the passenger EV market and in 2019, North Carolina had 100 more EVs sold over Georgia.

North Carolina’s EV charging market has also been growing in the last two years, although the state ranks 37th in DC fast charging deployment per person. North Carolina is addressing gaps in the statewide charging network and the state awarded more than \$3 million from the Volkswagen Settlement in July 2020 to expand DC fast charging corridors. This is a similar approach taken by Virginia, which awarded \$14 million through the Volkswagen Settlement in 2018 to develop DC fast charging corridors [11]. Since then, Virginia now ranks 15th in the nation in terms of DC fast charging deployment per person. Virginia ranks eight in terms of total DC fast charging total deployment, well above North Carolina despite having a smaller population. Figure 18 shows EV charging trends over time in the state.

FIGURE 18: EV CHARGING DEPLOYMENT OVER TIME IN NORTH CAROLINA



EV charging deployment has grown more steadily in North Carolina compared to other states in the region. The state accounts for an almost equal proportion of the region’s charging and population.

Source: Atlas EV Hub [26]

GOVERNMENT AND UTILITY FUNDING

While North Carolina is behind other states in the Southeast and neighbors like Virginia in terms of passenger EV and EV charging deployment, the state has made significant strides in transportation electrification policy development in recent years. In 2018, Governor Roy Cooper’s 2018 Executive Order No. 80 outlined a goal for North Carolina Department of Transportation to register at least 80,000 ZEVs by 2025 [78]. The Executive Order also outlines goals to reduce greenhouse gas emissions by 40 percent below 2005 levels. These goals are elaborated upon in the 2019 North Carolina Zero-Emission Vehicle

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(ZEV) Plan that incorporates passenger EV deployment goals outlined in the Executive Order. The plan also includes plans to develop fast charging corridors throughout the state that will be financed in part through the Volkswagen Settlement [79]. According to the state's own data, there were more than 20,000 EVs registered in North Carolina through March 2020 [80]. The ZEV Plan accompanied the release of the 2019 ZEV Motor Fleet Plan which outlined plans for electrifying public fleet vehicles throughout the state [81].

Adopting statewide passenger EV and EV charging strategies is a critical first step to reducing infrastructure gaps. One of the limiting factors behind the state's charging infrastructure deployment to date is the lack of approved utility investment in transportation electrification. Duke Energy's Power Forward program proposed investment worth \$25 million that could have supported more than 1,700 Level 2 and 60 DC fast charging stations in the state [27]. Although there has not been any approved utility investment since then, Duke Energy proposed a larger \$76 million program in March 2019 offering to support a wide range of transportation electrification initiatives including school and transit bus electrification. The program is pending commission approval and represents almost 90 percent of the potential utility investment in the Southeast [27]. The program also proposes to invest in charging infrastructure and if approved, the program could bring 240 new DC fast charging and 4,040 Level 2 charging stations to North Carolina, more than tripling the current level of infrastructure [26]. In North Carolina and their other service territories, Duke Energy committed to electrify all company fleet vehicles by 2030 [56].

Support for medium- and heavy-duty EVs continues to grow in North Carolina. In addition to the ZEV plans focused on passenger vehicle electrification, North Carolina is targeting rapid electrification of medium- and heavy-duty vehicles. In July 2020, North Carolina was the only southern state and one of just three non-ZEV states to sign a memorandum of understanding (MOU) outlining plans to reach 100 percent ZEV truck sales by 2050 [12]. The state made its first Volkswagen Settlement awards in July 2020, offering \$6 million for electric transit and school buses [11]. The state has also received more than \$10 million for electric transit buses through the Low-No Transit Bus Program since 2016. Support for medium- and heavy-duty EVs will increase if Duke Energy is approved to invest in their program and North Carolina has \$65 million in remaining VW settlement funds that could support electric buses and trucks.

SOUTH CAROLINA

SOUTH CAROLINA HIGHLIGHTS

- EV manufacturing commitments from Volvo
- State home to Proterra, electric transit bus manufacturer
- \$10 million investment from Duke Energy pending approval
- South Carolina 29th in nation in EV sales and 45th in DC fast charging per person
- EV sales down 19% in first half of 2020 compared to 2019

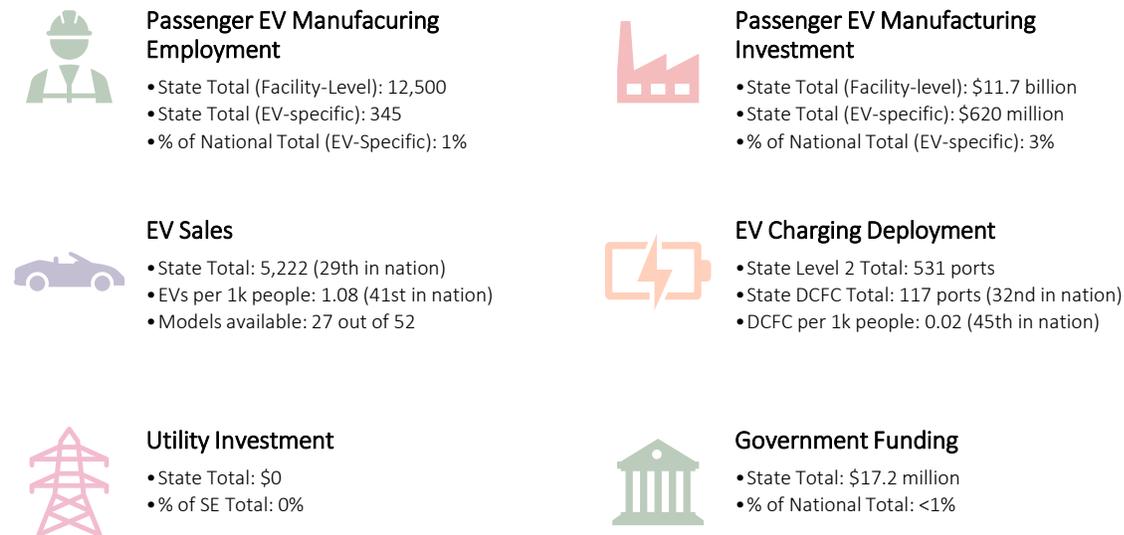
OVERVIEW

Despite only making up nine percent of the Southeast region's population, South Carolina has attracted more than 12 percent of the region's EV manufacturing investment as the home of major facilities run by BMW, Daimler, and Volvo. The state also hosts the headquarters of electric transit bus manufacturer Proterra [82]. South Carolina has also attracted at least \$620 million in EV-specific auto sector investments [83]. Data from Autos Drive America report that the state claims 13,500 direct and roughly 80,000 indirect jobs from the passenger vehicle industry, roughly equal to the levels reported for Alabama [32]. According to BlueGreen Alliance, the state supports more than 20,970 workers in the passenger and medium- and heavy duty vehicle sectors [31].

Policymakers have tried to introduce legislation to expand EV charging infrastructure and EVs in the state, however, these bills have yet to be passed. Despite legislative delays, the Energy Office commenced the Electric Vehicle Stakeholder Initiative in 2020 to increase coordination statewide around the deployment of EVs [84]. The state can also draw on its \$34 million allocation through the 2015 Volkswagen Settlement to support passenger EV charging and medium- and heavy-duty EV deployment. Since 2016, transit agencies in South Carolina have received \$15.8 million for electric transit buses through the Low-No Transit Bus Program.

Overall, the state's manufacturing sector is strong, but it is behind in other areas including EV and EV charging deployment, government funding, and utility investment. Figure 19 compares South Carolina to the Southeast region as a whole and shares state-level EV indicators.

FIGURE 19: EV INDICATORS IN SOUTH CAROLINA THROUGH JUNE 2020



South Carolina (population of 5,148,714) is nine percent of the regional population and is the 23rd largest state in the country. The state has significant EV manufacturing but there is limited data on associated employment numbers. The state is underrepresented in EV and EV charging deployment.

Source: Atlas EV Hub

AUTOMAKERS AND EV INVESTMENTS

South Carolina likely has more EV manufacturing than is reported due to the lack of data on Volvo’s EV-specific employment at their Charleston plant. In January 2020, Volvo announced plans to invest more than \$600 million to build a battery facility and ready their South Carolina plant to produce the all-electric XC90 for the U.S. market by 2022 [82]. BMW also announced increased EV production at their Spartanburg plant, albeit at a more modest pace. The automaker has pledged at least \$20 million to increase production capacity and support 345 jobs related to the production of their plug-in hybrids. BMW has not reported whether the facility will be scaled up to produce all-electric vehicles [83]. Despite these commitments, South Carolina is behind Tennessee, Georgia, and Alabama in terms of announced EV investment and employment.

While South Carolina is behind in the passenger EV sector, they make up for it in transit bus electrification. The state is home to the headquarters of Proterra, one of the nation’s leading electric transit bus manufacturers. The company started out with a \$6 million investment from GM in 2011 and since raised more than \$690 million in investment from BMW, Daimler, and other major automakers and finance conglomerates [5]. The Greenville facility employs more than 250 people and has distributed their buses widely throughout the country, although these employment and investment figures are not included in the state’s EV indicator totals [85]. Some of these buses have ended up staying in-state and South Carolina has awarded \$17 million in both federal and state government funding for electric transit buses [11]. South Carolina also offers one of the nation’s only policies providing tax incentives for battery

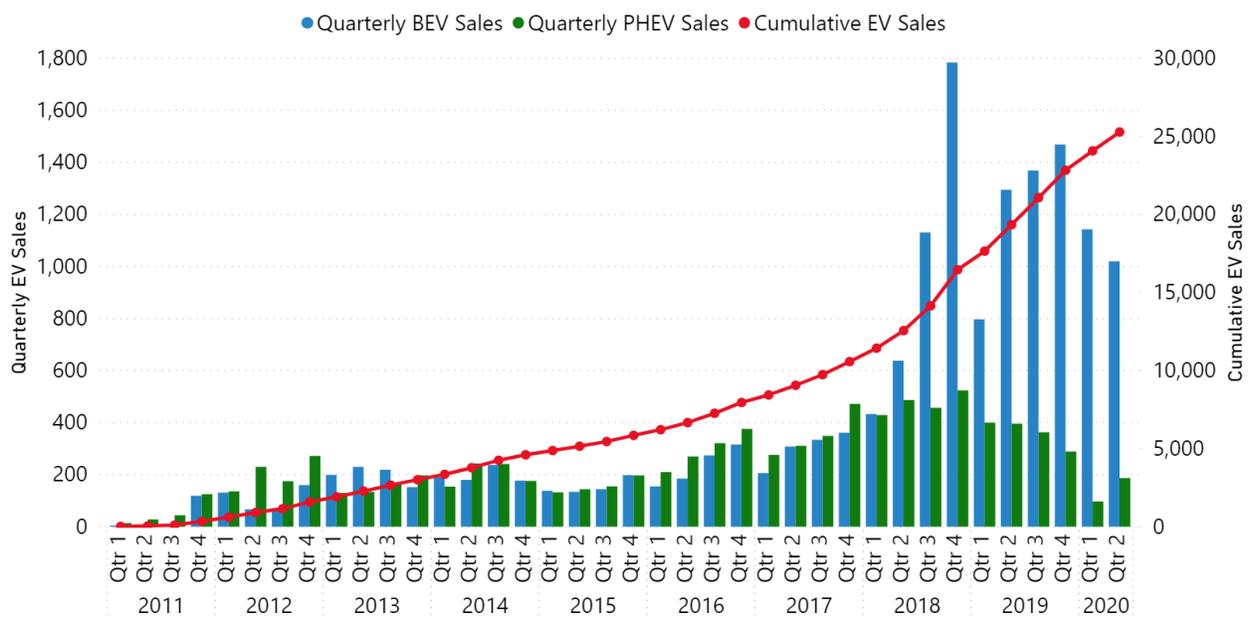
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manufacturing. The policy allows manufacturers to reduce the taxable value of equipment purchased by 20 percent if they guarantee at least \$100 million in investment and 200 jobs [86]. This indicates that the state is looking to attract more EV manufacturing investment.

PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

The presence of EV manufacturing in the state has not yet contributed to a boost in EV adoption among drivers. The state ranks lower than all Southeastern states besides Alabama in terms of EV sales in both per capita and absolute terms. The state claims only four percent of the regional total with 5,222 recorded EV sales. Drivers in the state are able to purchase 27 of the 52 EVs on market, which is low compared to neighboring Georgia which has 39 EVs for sale and a per-person deployment rate more than three times higher. Limited EV model offerings and a lack of policies supporting EV adoption are two of the key factors restricting South Carolina's passenger EV market. Colorado, which has a similar population, ranks sixth in the nation in terms of EV deployment per person and has a total sales count more than six times greater [8]. Colorado EV drivers benefit from statewide EV rebates and rebates for EV charging that have helped create a robust passenger EV market in the state [10]. Like other states in the region, South Carolina sales trends also reflect declines during the first two quarters of 2020, and sales are down 19 percent compared to 2019 due to COVID-19. Figure 20 shows the trend in EV sales over time in South Carolina through June 2020.

FIGURE 20: EV SALES IN SOUTH CAROLINA THROUGH JUNE 2020

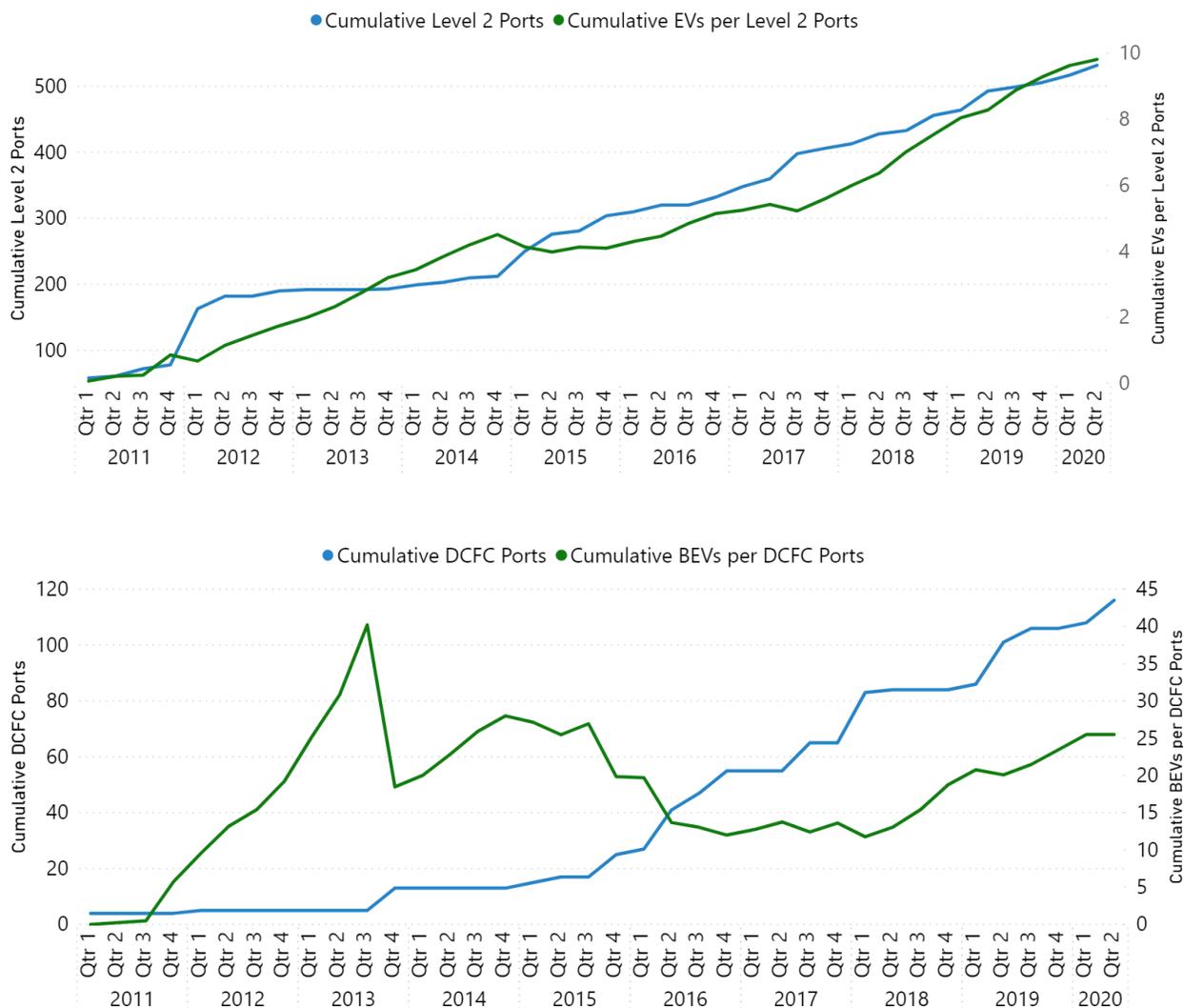


South Carolina accounts for 4 percent of the region's EV sales and less than one percent of the national total.

Source: Atlas EV Hub [8]

Charging deployment in South Carolina is also low with only five percent of the Southeast region's charging falling within its borders. South Carolina is nearly tied with Alabama for the lowest charging deployment per person in the Southeast and both states rank in the bottom 10 nationwide [8]. Figure 21 shows EV charging deployment over time for the state.

FIGURE 21: EV CHARGING DEPLOYMENT OVER TIME IN SOUTH CAROLINA



EV sales have outpaced charging deployment with an increasing ratio of vehicles to charging ports through 2020.

Source: [26]

GOVERNMENT AND UTILITY FUNDING

South Carolina began taking the first steps to develop a statewide EV deployment strategy in 2019 by establishing the Electric Vehicle Stakeholder Initiative. In 2020, the State Energy Office began its stakeholder engagement with surveys, data analysis, and EV workshops for the Initiative with the goal of exploring different pathways to facilitate transportation electrification. This Initiative will also take into consideration funding opportunities through the state’s Volkswagen Settlement funds. As of August 2020, South Carolina has spent \$9 million of their \$34 million allocation and only \$1.4 million has gone towards transportation electrification. All of the states remaining funding for transportation electrification has

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come through the federal Low-No Emission Vehicle program. Public transit agencies in the state have received more than \$15 million for buses since 2016 [11].

The South Carolina EV market has room to grow and Duke Energy is waiting on a commission decision for the state's first and only proposed utility investment worth \$10.4 million [27]. The program could support up to 400 level 2 and 30 DC fast charging stations but has not received any decision from the commission and was filed in 2018. The state has yet to award any funding for electric school buses or trucks, although both categories of vehicles are eligible for unspent Volkswagen Settlement funds. Pending legislation including H 4732 promoting passenger EV charging at state-operated rest areas could jumpstart the development of charging corridors throughout the state [87]. South Carolina can look to Florida and North Carolina for model strategies [10].

TENNESSEE



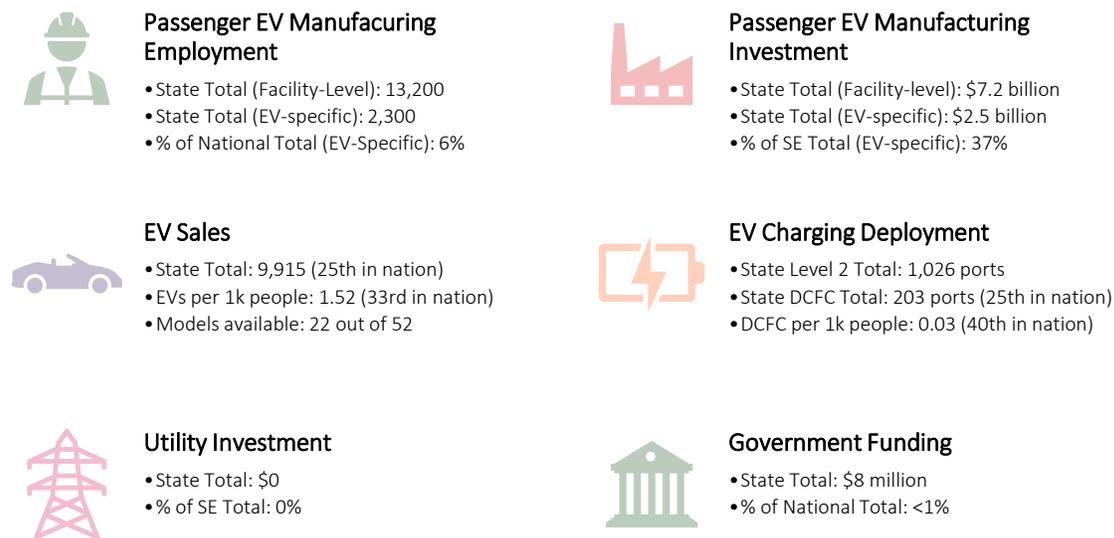
OVERVIEW

Tennessee claims more than 37 percent of the Southeast region's EV manufacturing jobs and investment compared to its 11 percent share of the region's population. A reported \$2.5 billion has been announced by automakers for EV-specific production. Data from Autos Drive America report 15,800 direct jobs and 123,200 indirect passenger vehicle industry jobs in the state, the highest of any in the region [32]. BlueGreen Alliance reports more than 31,600 direct jobs in vehicle manufacturing and supporting sectors in the state [31].

Tennessee is the 16th largest state in the country and ranks 25th in terms of total passenger EV sales. The state ranks lower on a per person basis and is 33rd and 40th out of all states in terms of EV adoption and DC fast charging deployment per person. State officials in Tennessee are looking to accelerate the EV and EV charging market and in 2019 released Drive Electric Tennessee, a multi-agency initiative to deploy 20,000 EVs throughout the state by 2028 [88]. The state is also seeking to increase the deployment of medium- and heavy-duty EVs and has awarded almost \$4 million through the Volkswagen Settlement for electric transit and school buses. Transit agencies in Tennessee have received \$4.2 million through the Low-No Transit Bus Program since 2018.

Despite the strength of the manufacturing sector, the state is behind in all other EV indicators overall. Figure 22 compares Tennessee to the nation as a whole and shares state-level EV indicators.

FIGURE 22: EV INDICATORS IN TENNESSEE THROUGH JUNE 2020



Tennessee (population of 6,829,174) represents 11 percent of the Southeast regional population and two percent of the national total. The state accounts for the largest share of the EV manufacturing investment and employment in the Southeast. However, it is underrepresented in all other EV indicators.

Source: Atlas EV Hub

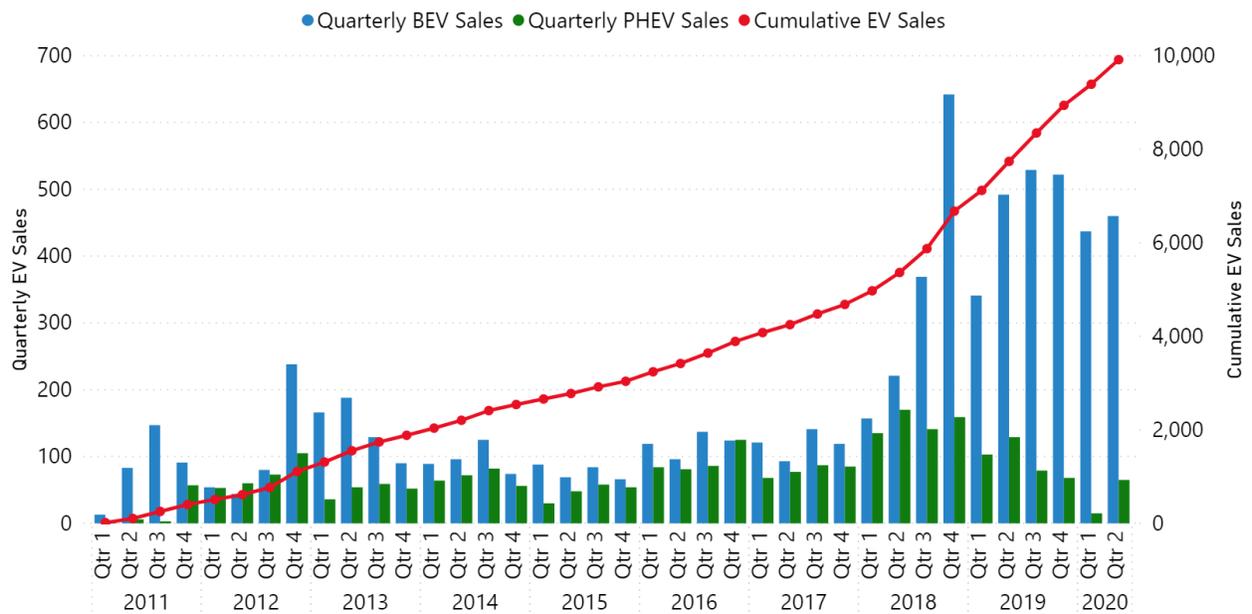
AUTOMAKERS AND EV INVESTMENTS

Like Alabama and South Carolina, Tennessee benefits from a significant presence of passenger vehicle manufacturing within its borders. There are three major vehicle manufacturing plants in the state operated by General Motors, Nissan, and Volkswagen. Volkswagen and Nissan have both targeted the state for EV production, and media reports have rumored that General Motors will produce the debut Cadillac EV, the Lyriq, at the Spring Hill location [89]. Volkswagen is on schedule to produce upcoming EVs including the ID4 by 2022 in Chattanooga due to a commitment to invest \$800 million and create 1,000 jobs [90]. Nissan has been producing the Leaf at their Smyrna facility since 2012 and has committed \$1.7 billion to expand their operation and create 1,300 EV jobs in the state [91]. The state also has some more limited presence of medium- and heavy-duty vehicle manufacturing and BlueGreen Alliance reports more than 31,600 jobs in vehicle manufacturing across all sectors in the Tennessee [32].

PASSENGER EV SALES AND EV CHARGING DEPLOYMENT

The large presence of EV manufacturers in Tennessee has not generated significant growth in the passenger EV and EV charging market. The state is behind other states in the region and has the lowest amount of EV models offered for sale. Tennessee has almost the same population as Massachusetts but accounts for only a third as many EV sales. Massachusetts is the eighth largest EV market in terms of passenger EV sales while Tennessee is ranked 25th [8]. Massachusetts has twice as many EVs offered for sale, indicating a key gap if Tennessee seeks to reach the goals outlined by Drive Electric Tennessee and double EV deployment in the next seven years [88]. Tennessee’s passenger EV market has grown since 2018 and sales were down only 8 percent in the first half of 2020 compared to 2019. This is a less significant decline than the 29 percent drop seen across the national EV sector as a result of COVID-19. Figure 23 shows the trend in EV sales over time in Tennessee through June 2020.

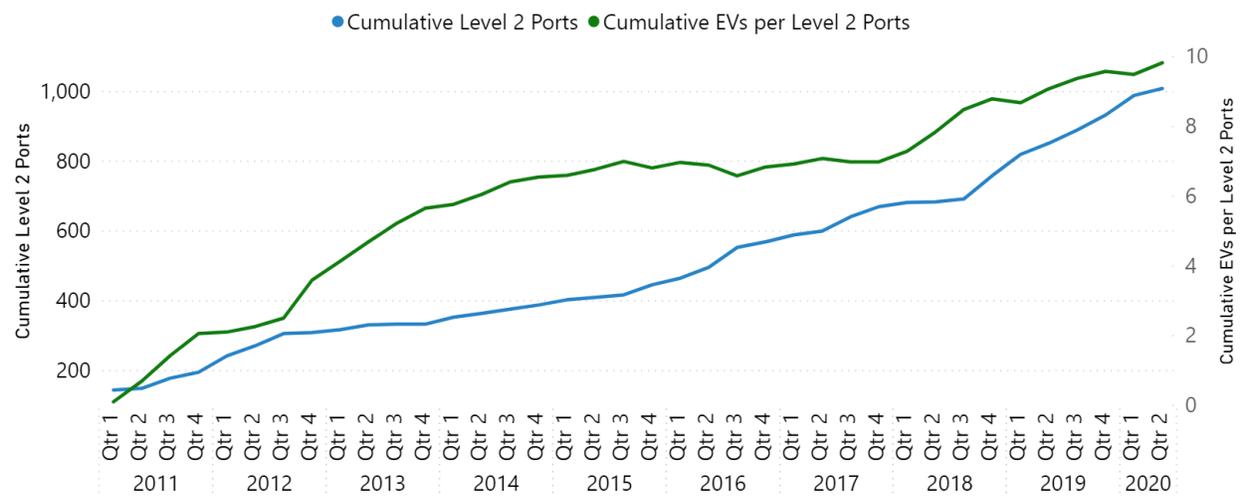
FIGURE 23: EV SALES IN TENNESSEE THROUGH JUNE 2020



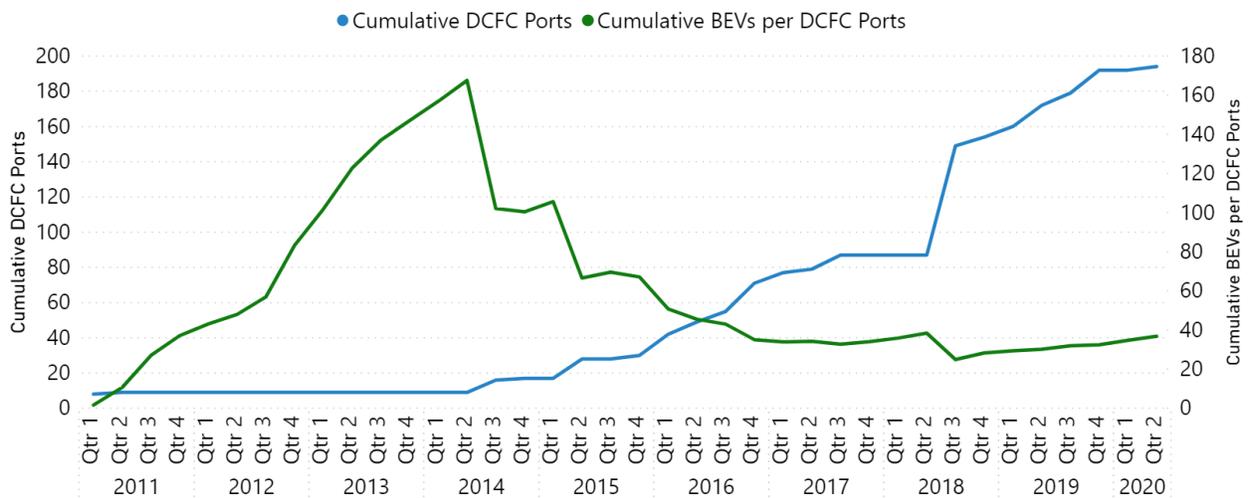
Tennessee accounts for just seven percent of the region’s EV sales and just over one percent of the national total.

Source: Atlas EV Hub [8]

FIGURE 24: EV CHARGING DEPLOYMENT IN TENNESSEE OVER TIME



TRANSPORTATION ELECTRIFICATION IN THE SOUTHEAST



DC fast charging deployment in Tennessee spiked in 2018 while Level 2 deployment has grown more steadily over time. The state accounts for 10 percent of the region’s charging and 12 percent of the population.

Source: Atlas EV Hub [26]

Tennessee ranks even lower in terms of charging station deployment per person, falling in the bottom 10 states for DC fast charging deployment. This is a shortfall that the state seeks to address and the Drive Electric Tennessee initiative has brought stakeholders from utilities to public agencies together to implement comprehensive passenger EV and EV charging deployment plans [92]. The initiative led to the development of the 2019 Electric Vehicle Roadmap which made recommendations that have been adopted by the Tennessee Department of Environment and Conservation as they developed and continue to implement plans for charging stations and corridors [92]. Figure 24 highlights trends in EV charging deployment over time in the state.

GOVERNMENT AND UTILITY FUNDING

Aside from the Drive Electric Tennessee plan, the state has implemented few plans or policies that are supportive of transportation electrification. The state is ahead of only Alabama in terms of government funding for transportation electrification of all the states in the Southeast. Compared to Massachusetts, its equal in population, Tennessee’s funding for EVs and EV charging is more than four times lower [11]. Tennessee has an opportunity to invest greater portions of their Volkswagen Settlement funding in transportation electrification. Out of the \$14 million in awards made so far, EVs have only received \$3.7 million. Roughly 70 percent of the state’s \$45 million in funds has not yet been awarded [28]. The state has also received the least amount of funding through the Low-No Transit Bus Program of all states in the region with only \$4 million in awards since 2018 [11].

In addition to government support, the state can draw on investment from electric utilities to support EVs and EV charging. While there are no recorded filings by investor-owned utilities, the Tennessee Valley Authority (TVA) has already engaged in charging station deployment in Chattanooga [93]. The TVA is also one of the primary stakeholders of Drive Electric Tennessee. The state can leverage these partnerships and networks to implement policies and programs to promote the Drive Electric Tennessee plan and facilitate increased uptake of EVs throughout the state that are currently absent [92].

CONCLUSION

The Southeast has a unique opportunity to expand support for transportation electrification as one of the regions benefitting the most from EV manufacturing investment and employment. The region represents 18 percent of the national population and claims at least 14 percent of the passenger EV manufacturing jobs. The share of passenger EV-specific investment is even higher at 28 percent with at least \$6.7 billion recorded in direct commitments from automakers and battery manufacturers. This does not include the investments being made by medium- and heavy-duty vehicle manufacturers like Daimler, Proterra, New Flyer, and Volvo that all operate facilities in the region and are ramping up electrification efforts nationwide. This also does not include the growing network of suppliers and EV charging manufacturers and providers that are scaling their operations to meet increasing EV deployment.

Dedicating existing funding available through the Volkswagen Settlement is among the most near-term interventions each state in the region can make to support the rollout of passenger EV charging and deployment of medium- and heavy-duty EVs. At least \$360 million of the region's cumulative allocation remains and so far only \$23 million has been awarded to transportation electrification projects. Almost all of the awards made in states in the neighboring Central Atlantic region including Virginia, New York, and New Jersey have gone towards transportation electrification projects. Virginia alone has made awards more than double those of all six states in the Southeast combined [11].

All states in the Southeast except Georgia have existing transportation electrification plans or EV stakeholder initiatives that can be expanded to support the rollout of Volkswagen Settlement funds in the immediate term. States like North Carolina and Tennessee have gone a step further by setting passenger EV deployment targets and establishing partnerships between state agencies and other stakeholders to meet these goals [79, 92]. Prioritizing EVs and EV charging through the Volkswagen Settlement and establishing targets to electrify state fleet vehicles as North Carolina has done are other early steps states in the region can take to advance transportation electrification.

Encouraging electric utility investment and EV rate design is another option for policymakers in the Southeast to leverage existing funding and promote EV adoption. In California, the nation's top EV market across all classes of vehicles, increasing EV adoption and utilization of EV rates encouraging off-peak charging have generated \$800 million in revenue over costs associated with increased demand on the grid. These savings have been passed down to all customers through lower electricity rates and utilities are being funneled into EV programs led by the utilities [16]. California accounts for 58 percent of the nation's \$2.6 billion in approved utility investment supporting transportation electrification while the Southeast has contributed less than one percent of the total [27]. Utility investment has supported a robust EV charging network in the state and California hosts a third of all charging infrastructure in the country while making up only 13 percent of the population [26].

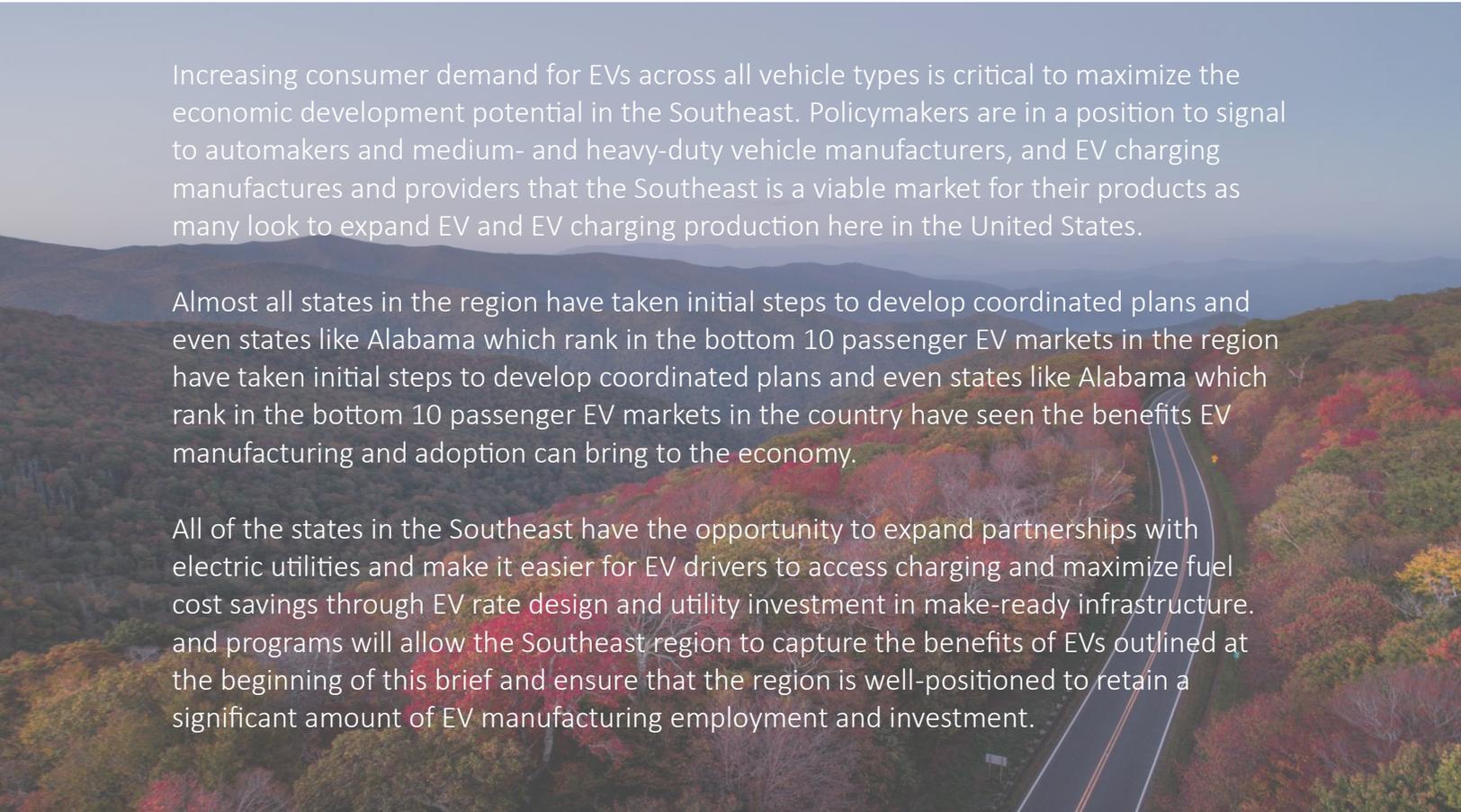
All of the \$32 million in approved electric utility investment in EV charging across the Southeast falls in Georgia and Florida. These two states make up 54 percent of the regional population and claim 63 percent of its all charging infrastructure. Commission approvals of pending transportation electrification programs could see \$76 million of investment from Duke Energy in North Carolina and roughly \$10 million in South Carolina. No states in the Southeast have approved legislation requiring utilities to file transportation electrification plans [10]. The enactment of this policy in Colorado in 2019 led to the proposal of \$103 million in new investment supporting transportation electrification in May 2020 [27]. Utilities in the Southeast could model their investments after the make-ready programs recently approved

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in New York and California. These types of programs significantly reduce the costs associated with installing charging infrastructure where the utility covers all of the upgrades and construction required up to the charging station itself [27]. In August 2020, California also passed legislation under Assembly Bill 841 to set up a system where utilities are required to make downstream investments to support EV charging without the need for commission approval, thus avoiding lengthy regulatory processes [94].

In addition to adopting state EV strategies and requiring utilities to file transportation electrification plan, policymakers in the Southeast have other tools they can draw on to advance transportation electrification. Regional and multi-state commitments such as the ZEV Truck MOU signed by North Carolina and 15 other states have generated significant attention and signaled to electric truck manufacturers where the strongest markets for their products are likely to be located [12]. The adoption of this commitment is one of the factors that led the North American Council on Freight Efficiency to designate North Carolina a higher priority electric truck market than any other state in the Southeast. This could lead to higher electric truck deployment in the state, directly supporting the existing medium- and heavy-duty vehicle manufacturing in North Carolina and attracting further investment [58].

Further policy adoption is required if states in the Southeast are to see the EV deployment levels in ZEV states. Ten out of 12 ZEV states provide rebates or tax credits toward the purchase of an EV while none of the states in the Southeast offer this [10]. Georgia's EV sales trends serve as an example of the impacts of this type of policy where passenger EV sales in the state peaked when tax credits were offered between 2013 and 2015. Sales dropped by 65 percent between 2015 and 2016 when the policy was ended. Rebate programs for medium- and heavy-duty vehicles active in California, Colorado, and New York have also led to increased deployment of EV trucks and buses in those states [4].



Increasing consumer demand for EVs across all vehicle types is critical to maximize the economic development potential in the Southeast. Policymakers are in a position to signal to automakers and medium- and heavy-duty vehicle manufacturers, and EV charging manufactures and providers that the Southeast is a viable market for their products as many look to expand EV and EV charging production here in the United States.

Almost all states in the region have taken initial steps to develop coordinated plans and even states like Alabama which rank in the bottom 10 passenger EV markets in the region have taken initial steps to develop coordinated plans and even states like Alabama which rank in the bottom 10 passenger EV markets in the country have seen the benefits EV manufacturing and adoption can bring to the economy.

All of the states in the Southeast have the opportunity to expand partnerships with electric utilities and make it easier for EV drivers to access charging and maximize fuel cost savings through EV rate design and utility investment in make-ready infrastructure. and programs will allow the Southeast region to capture the benefits of EVs outlined at the beginning of this brief and ensure that the region is well-positioned to retain a significant amount of EV manufacturing employment and investment.

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