

# Driving Down Pollution

ACCELERATING CLEANER CARS IN VIRGINIA



## **Driving Down Pollution**

JANUARY 2024

This report was prepared by the Southern Environmental Law Center with independent analysis provided by Greenlink Analytics.

The mission of the Southern Environmental Law Center is to protect the basic right to clean air, clean water, and a livable climate; to preserve our region's natural treasures and rich biodiversity; and to provide a healthy environmental for all.

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*Virginia needs to accelerate efforts to curb tailpipe pollution and bring cleaner cars to the Commonwealth. Transportation is by far the leading source of climate-harming emissions in Virginia, and it is also a primary source of toxic air pollutants. Cleaner vehicles are better for our environment, our health, and our economy, while also providing savings for consumers.*

*Landmark legislation in 2021 adopting the Clean Cars standards is the most significant step Virginia has taken so far to cut tailpipe pollution. This commonsense measure calls for both lower-emission fossil fuel-powered vehicles and a steadily increasing number of zero-emission vehicles, such as electric vehicles (EVs), in the Commonwealth.*

*EV sales in Virginia are beginning to take off. We need to keep the Clean Cars standards in place and adopt additional measures to move away from polluting vehicles more rapidly. Though not without challenges, this transition will bring substantial benefits to Virginians. Smart policy measures related to EV charging and electric rates can help ensure a smooth and equitable shift to cleaner cars.*

## **WHY DOES TAILPIPE POLLUTION MATTER?**

The transportation sector is the largest source of greenhouse gas (GHG) emissions in Virginia. Transportation produces almost half our carbon dioxide (CO<sub>2</sub>) emissions — the most common GHG — and over 53% of that pollution is from passenger cars and light-duty trucks.<sup>1</sup> This pollution is the primary driver of the growing climate crisis.

Climate change is already impacting our environment, health, economy, and quality of life. A few of the many serious impacts of a changing climate include:

- **Longer and more intense heat waves**, which reduce air quality and cause a range of illnesses especially likely to harm children and the elderly.<sup>2</sup>
- **Heavier, more frequent rainfalls and slower moving hurricanes**, which increase inland flooding and cause injuries, fatalities, and property damage.<sup>3</sup>
- **Sea level rise**, which threatens the economy, critical infrastructure, and Virginia's coastal communities, including the Hampton Roads region — which has the highest rate of sea level rise on the East Coast.<sup>4</sup>

Substantial and rapid reductions in tailpipe pollution and other GHG emission sources are needed to avoid — or at least minimize — these and other harmful impacts of a changing climate.

Passenger cars and light-duty trucks are also a major source of harmful “criteria pollutants,” such as particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide, and ozone.<sup>5</sup> These pollutants and other air toxics from vehicle tailpipes can harm the environment. For example, airborne nitrogen from vehicles is a major source of pollution impacting the Chesapeake Bay.<sup>6</sup> Criteria pollutants and other air toxics also have serious public health impacts. Exposure to this type of transportation pollution, however, is not equally distributed across all populations<sup>7</sup> and this raises serious equity concerns.

## OPTIONS FOR CONTROLLING TAILPIPE POLLUTION

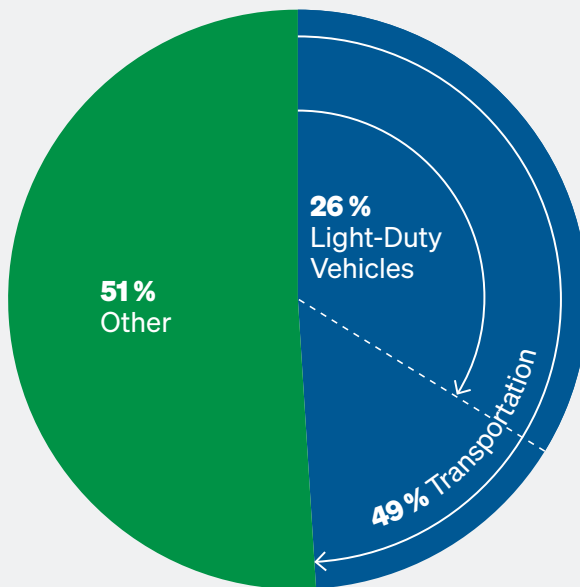
The federal Clean Air Act authorizes the U.S. Environmental Protection Agency (EPA) to issue tailpipe pollution standards for new motor vehicles<sup>8</sup> and prohibits states from adopting their own standards.<sup>9</sup> At the time the Clean Air Act was adopted, California already regulated tailpipe emissions at the state level. Recognizing these efforts — as well as the state’s poor air quality — Congress did not preempt California’s authority to set its own, more stringent standards.<sup>10</sup>

The Clean Air Act also allows most states to adopt California’s more protective standards. To address the concerns of vehicle manufacturers about the proliferation of a variety of standards, the law prohibits any other state from setting its own standards.<sup>11</sup> As a result, Virginia has two options for tailpipe pollution standards: (1) follow the federal standards, or (2) follow the California state standards.

The Clean Cars standards are the California state standards that address pollution from new passenger cars and light-duty trucks.<sup>12</sup> Other states have a long history of curbing tailpipe pollution by adopting the Clean Cars standards.<sup>13</sup> To date, 17 other states have adopted the standards, and together these states account for over 35% of new light-duty vehicle sales nationwide.<sup>14</sup>

## CO<sub>2</sub> Emissions

According to the most recent data available from the Virginia Department of Environmental Quality, transportation is the largest source of carbon pollution in Virginia and light-duty vehicles are responsible for most of those emissions.



Va. DEQ, Greenhouse Gases: 2016-2019 Inventory (2019), available at <https://perma.cc/FN37-SJXY>.



## VIRGINIA'S CLEAN CARS STANDARDS

In 2021, the General Assembly chose to adopt the Clean Cars standards — the *only* option for Virginia to have standards that are more protective than the federal baseline. The Air Pollution Control Board unanimously adopted these standards in December 2021. The Clean Air Act requires two years of lead time between adoption of the standards and enforcement,<sup>15</sup> and the Clean Cars standards took effect in Virginia in January 2024 (model year 2025).

While the technical requirements under the Clean Cars standards can be complex, the basic regulatory structure is simple. The Clean Cars standards apply to:

- vehicle manufacturers;
- selling new;
- passenger cars and light-duty trucks;
- in states that have adopted the standards.

Under the Clean Cars standards, vehicle manufacturers must meet:

- **Low-Emissions Vehicles (LEV) standards**, which limit the average tailpipe emissions from all passenger cars and light-duty trucks, including fossil fuel-powered vehicles, delivered for sale in Virginia. These average emission standards become more stringent over time.

*and*

- **Zero-Emissions Vehicle (ZEV) standards**, which require a certain percentage of ZEVs (generally EVs) be delivered for sale in Virginia. This percentage increases over time, and the standards should result in at least 8% of new car deliveries being EVs in 2024.<sup>16</sup>

## VIRGINIA'S TWO OPTIONS FOR TAILPIPE POLLUTION STANDARDS:

### Federal Tailpipe Standards

The federal tailpipe pollution standards are developed by EPA through a public rulemaking process. Though the Biden administration has strengthened the federal standards for passenger cars and light-duty trucks after significant rollbacks by the Trump administration, the federal tailpipe pollution standards are still weaker than California's state standards.

### State Emissions Standards

The state tailpipe pollution standards are developed by the California Air Resources Board (CARB) through a public rulemaking process. CARB knows that other states utilize these standards and works closely with these states throughout the rule development process. After CARB develops a regulation, other states may adopt and enforce the standards only after EPA approves them and grants a waiver.

The Clean Cars standards do not apply to auto dealers or individuals, and the standards do not apply to medium- or heavy-duty vehicles (like box or semi-trucks) or farm and off-road vehicles. The standards also do not ban the sale of fossil fuel-powered cars. Even in model year 2035, when 100% of new vehicles delivered for sale must be ZEVs, up to 20% of those vehicles can be plug-in hybrid electric vehicles (PHEVs) that have gas tanks. Nor do the standards have any impact on existing vehicles or used vehicle sales; they only apply to new passenger cars and light-duty trucks.

As of 2021, all vehicle manufacturers have complied with the ZEV portion of the Clean Cars standards.<sup>17</sup> This is in part because the standards allow for the use of compliance flexibilities — in particular, the banking, selling, and trading of credits generated by ZEV sales — to meet targets.



STEPHANIE GROSS



## THE BENEFITS OF THE CLEAN CARS STANDARDS

By combining LEV and ZEV standards, the Clean Cars standards will bring *both* cleaner fossil fuel-powered vehicles *and* a greater number and variety of ZEVs to the Commonwealth and provide numerous benefits to Virginians.

### Combat Climate Change

Electricity to power an EV in Virginia emits less than 17% of the CO<sub>2</sub> emitted by an equivalent gas car, and the grid will only get cleaner over time.<sup>18</sup> The Clean Cars standards are projected to reduce Virginia's CO<sub>2</sub> emissions by approximately 139.2 million metric tons from 2026 to 2040, as measured along the entire well-to-wheel lifecycle.<sup>19</sup>

### Improve Public Health and Equity

Widespread transition to EVs could, by 2050, yield more than \$1.3 billion in avoided annual health costs in Virginia and avoid 115 premature deaths, more than 1,780 asthma attacks, and nearly 8,190 lost workdays each year.<sup>20</sup> And transportation pollution disproportionately harms low-wealth communities and communities of color.<sup>21</sup>

### Save Virginians Money

An increasing number of competitively priced EVs are already on the market, and the price of many EVs are expected to soon reach parity with fossil fuel-powered vehicles.<sup>22</sup> Owning an EV also saves the typical driver between \$6,000 and \$10,000 over the lifetime of the vehicle compared to a fossil fuel-powered car due to reduced fuel and maintenance costs.<sup>23</sup> EV drivers typically spend the equivalent of \$1 per gallon for a full charge, and a typical EV can be driven 150 to 400 miles before it needs to be recharged.<sup>24</sup>

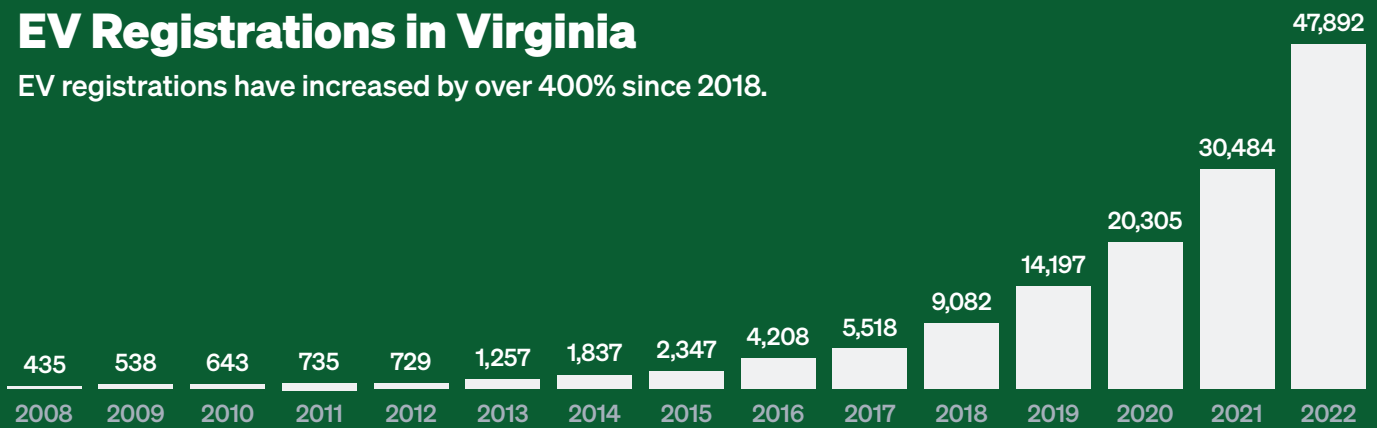
### Bring Economic Growth

Beyond making more EVs available for purchase in the Commonwealth, the Clean Cars standards could produce almost 30,000 new jobs in Virginia<sup>25</sup> and result in \$814.5 million in total net benefits.<sup>26</sup> EVs also keep more money in Virginia's economy, since they are powered by Virginia's electricity grid, rather than out-of-state oil companies.



# EV Registrations in Virginia

EV registrations have increased by over 400% since 2018.



Source: Drive Electric VA, *Virginia Electric Vehicle Registrations by Jurisdiction (2008-2022)*, available at <https://bit.ly/3RP4xXb>.

## THE GROWTH OF EV SALES IN VIRGINIA

The vehicle market is moving towards electrification. Most major auto manufacturers have committed to phasing out fossil fuel-powered vehicle sales over the next two decades. At least 15 major manufacturers have promised to electrify a significant portion of their vehicles by 2030, and others, like Honda, Mitsubishi, and Hyundai, aim to have 100% ZEV sales by 2040 or earlier.<sup>27</sup>

EV ownership in Virginia has accelerated as well. In 2008, just 435 EVs were registered in Virginia.<sup>28</sup> By 2018, that number had grown to over 9,000 and by 2022, there were almost 48,000 EVs registered in the Commonwealth.<sup>29</sup> Experts estimate that approximately 10% of all new cars registered in Virginia in 2023 will be EVs or PHEVs.<sup>30</sup> That is a significant increase from around 7% in 2022<sup>31</sup> and puts vehicle manufacturers on track to meet the requirements of the Clean Cars standards in the Commonwealth.

The Clean Cars standards will help bring more EVs — and their associated benefits — to Virginia more quickly. To meet the pollution standards, vehicle manufacturers choose to send EV inventory to states that have adopted the Clean Cars standards first, and they can decide to send these vehicles to parts of the states where they are most likely to sell. Even though nearly 70% of Virginia drivers would consider buying an EV in the near future,<sup>32</sup> before the Clean Cars standards went into place one-third of EVs registered in Virginia were purchased out of state.<sup>33</sup> The Virginia Automobile Dealers Association supported adoption of the standards in part to gain better access to EV inventory.

That said, the transition to EVs will not happen overnight. The Clean Cars standards only apply to new vehicle sales, and used vehicle sales dominate the market in Virginia. Even in model year 2035, when the Clean Cars standards would require 100% of new car sales be ZEVs, it is projected that around 75% of the vehicles on the road will still be powered by fossil fuels.<sup>34</sup>

## GUIDING THE EV TRANSITION

The transition to zero-emissions transportation has significant environmental, health, economic, and consumer benefits and needs to accelerate. It is also essential to address the challenges in making this transition and to ensure that it is as smooth and equitable as possible.

### Reducing Environmental and Community Impacts

EVs offer a significant net benefit for the environment compared to fossil-fueled vehicles,<sup>35</sup> but the EV industry has its own impacts. Many of these impacts arise from the increased demand for minerals and the manufacturing of batteries and battery components. Mining for those minerals, much like drilling for oil and gas, can have significant effects on local air and water quality, and large development projects can raise local land use issues. As with any other industrial activity with potential environmental or health impacts, EV-related projects should be subject to strong siting, air, water, and hazardous materials protections to protect communities and the environment.

In addition, we should look to the environmental adage “reduce, reuse, recycle” when designing EV supply chains to reduce mineral demand and decrease the need for mining. EV battery recycling, for example, is already a viable and growing industry in the United States.<sup>36</sup> The recycling and reuse of batteries will reduce the demand for mining and impacts related to battery disposal while allowing us to make the most of the minerals needed for EV technology.

Many EV manufacturers are also working to develop new battery chemistries to reduce the need for the most scarce and resource-intensive minerals.<sup>37</sup> Because batteries (and the associated minerals) make up a large percentage of the cost of producing an EV, vehicle manufacturers have a strong incentive to innovate to reduce mineral needs. The shift to new materials can reduce the environmental impacts of mining, as well as the demand for rare earth metals like nickel and cobalt that are not domestically abundant and may have ethical sourcing concerns.<sup>38</sup>

Although it is critical to electrify the vehicles we continue to use, EVs are not a silver bullet that will address all the harmful impacts of car dependence. We also need to reduce the amount of driving we do. Coupling the transition to EVs with providing better access to transit, rail, and other alternatives to driving and implementing growth policies that promote development patterns less reliant on cars will create a cleaner transportation system for everyone.

## Managing Impacts To The Electrical Grid

The transition to EVs will require more electricity to power these vehicles. Although concerns have been raised about the ability of the electrical grid to produce, transmit, and distribute sufficient power to meet this demand, Virginia can meet its energy needs, transition to ZEVs, and even reduce electricity rates with the right strategies in place. In addition, EVs increasingly have the ability to *improve* grid stability by providing power back to the grid when it is needed — rather than merely taking power from it.<sup>39</sup>

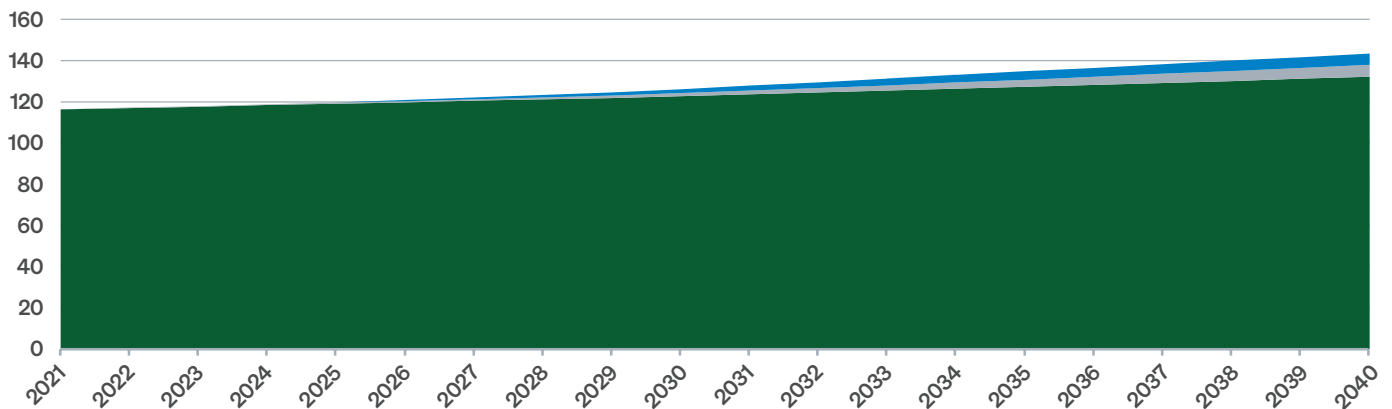
The Clean Cars standards are projected to result in only 4% more electricity demand in Virginia in model year 2040 compared to the increase in electricity sales that would otherwise occur from EVs.<sup>40</sup> Even with the additional demand associated with the Clean Cars standards, electricity demand from EVs are projected to account for less than 9% of total electricity sales 18 years from now.<sup>41</sup> Dominion Energy, the state’s largest public utility, has said it is actively planning to ensure the grid will be able to sustain the demand from more EVs in Virginia.<sup>42</sup>

By comparison, the rapid rise of data centers has led to that industry consuming roughly 20% of the electricity in Virginia today<sup>43</sup> — with growth expected to increase by at least 5% annually over the next 15 years.<sup>44</sup> The regional transmission authority continues to successfully maintain a reliable grid in the face of this massive energy demand.<sup>45</sup> Data center

### Projected Electricity Sales in Virginia

2021-2040

Million MWh

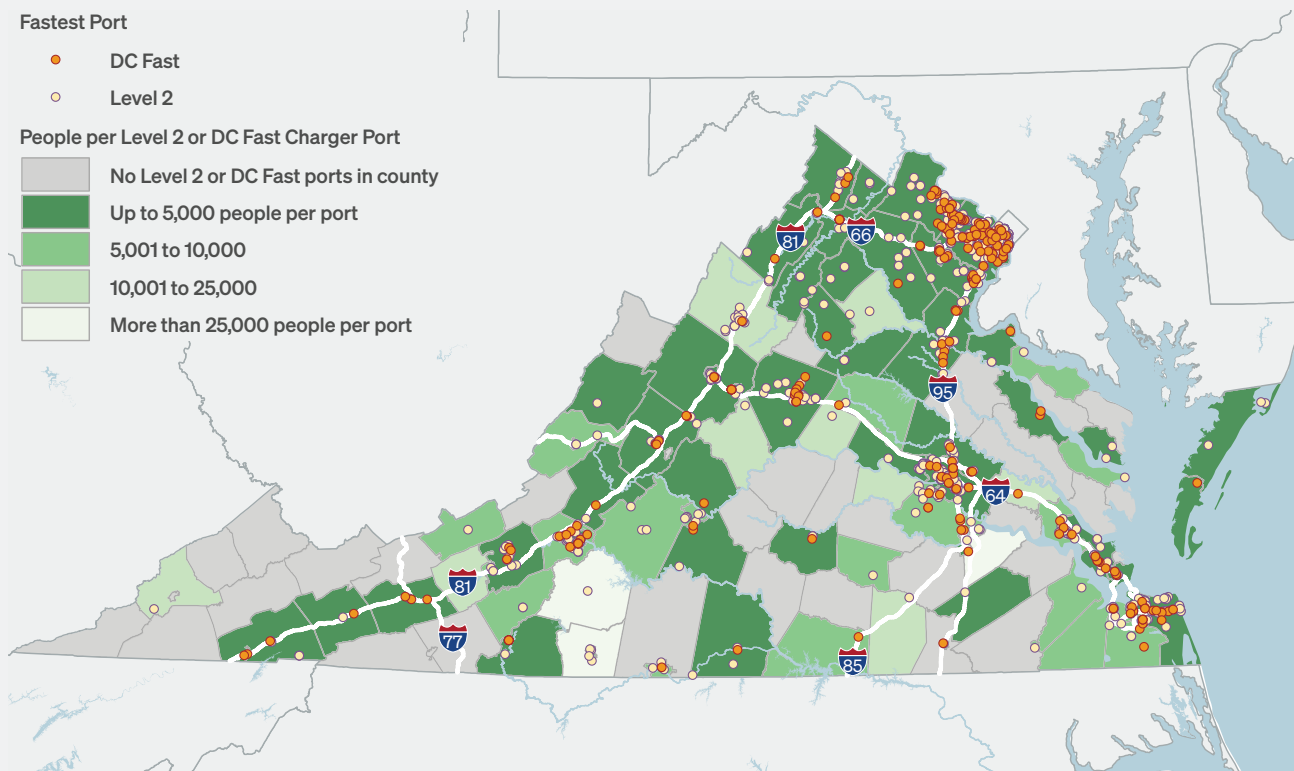


Source: Greenlink Analytics analysis for the Southern Environmental Law Center (Oct. 2023) (available upon request).



# EV Charging Stations in Virginia

Public charging station location, speed, and port density per person, by locality

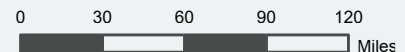


Map created by: Miller Cochran (mcochran@selcnc.org)

Last updated: November 21, 2023

Sources: US Census Bureau, Commonwealth of Virginia, Alternative Fuels Data Center

Note: Many stations have multiple ports. Data is from September 2023



demand is largely concentrated in just a few areas in Virginia, placing a greater strain on transmission and distribution infrastructure in those areas, whereas EV-related electricity demand will be more evenly distributed.

Moreover, according to a report from the State Corporation Commission, if utilities adopt smart policies such as time-of-use rates, widespread EV adoption could put downward pressure on electricity rates and lead to savings for all ratepayers whether they drive an EV or not.<sup>46</sup> Both customers and utilities can benefit if people are encouraged to charge their vehicles at times when the grid produces more power than it needs. Utilities can recoup the cost of grid upgrades by selling electricity that would otherwise go unused at a lower rate during these times, and EV drivers can charge their cars more affordably if they plug in at low-demand times.

## Ensuring Adequate Charging Infrastructure

Private charging infrastructure — chargers installed at homes, workplaces, and by businesses and governments to charge vehicle fleets — dominates the EV charging market, and an estimated 90% of EV drivers nationally can install charging infrastructure at home.<sup>47</sup> For those who have the option, home charging is often the most convenient and affordable way to charge. Virginia recently enacted some key policies to provide the right to install a charger in multi-family dwellings, but more steps are needed by the state and localities to make it easy and affordable for residents to install charging in new buildings.

The Commonwealth, local governments, and the private sector are also expanding the public charging network to provide affordable charging



options for those who cannot charge at home to facilitate fast charging for longer-distance trips and quick “recharges” on the road. As of December 2023, there were 1,418 public charging stations statewide.<sup>48</sup> This is an approximately 75% increase in the number of charging stations since 2020.<sup>49</sup>

Virginia’s Department of Environmental Quality has already allocated \$14 million in funding from the Volkswagen emissions cheating settlement to expand charging infrastructure that puts an estimated 93% of Virginians within 30 miles of a fast charger,<sup>50</sup> and the pace of charger deployment is expected to accelerate. Virginia is receiving over \$100 million from the federal infrastructure act to continue to build out

public charging infrastructure,<sup>51</sup> and there are other federal grant opportunities for public and private charger installation.<sup>52</sup> In addition, the federal Inflation Reduction Act provides tax incentives for private charging infrastructure, including home chargers.<sup>53</sup>

It will take many years to fully transition to EVs, and existing and planned public charging stations are expected to meet Virginian’s public charging needs through the end of this decade.<sup>54</sup> While Virginia has a ways to go to build a seamless and comprehensive public charging network, we are on track to get there with the support of additional policies to encourage an efficient, effective, and equitable charging system.



## OPPORTUNITIES AND NEXT STEPS

Additional action is needed at the federal, state, and local level to accelerate the transition to cleaner vehicles and capitalize on the multiple benefits of shifting away from fossil fuel-powered vehicles. Some of the most important opportunities at the state level include:



### Retain the Clean Cars standards

These standards are the single most effective step Virginia has taken to reduce tailpipe pollution and they must be fully implemented.



### Provide EV purchase incentives

Although prices are coming more in line with comparable fossil fuel-powered vehicles, the higher upfront costs of EVs remain a major barrier. Federal incentives in the Inflation Reduction Act are helping close this gap, and the General Assembly adopted — yet has failed to fund — one of the most comprehensive and thoughtful EV purchase incentive statutes in the country in 2021. The General Assembly should provide funding for rebates to make EVs more affordable and accessible.



### Fund EV chargers in rural and low-wealth areas

Funding should be allocated to provide public EV chargers in rural and underserved urban areas. These areas are far less likely to have sufficient chargers installed under current federal programs and by the private sector. This will hasten the transition to EVs and ensure equitable access to charging.



### Adopt smart policies for utilities

The General Assembly should direct the State Corporation Commission to pursue policies to encourage and prepare for the transition to EVs, such as time of use rates.



### Make new development EV-ready

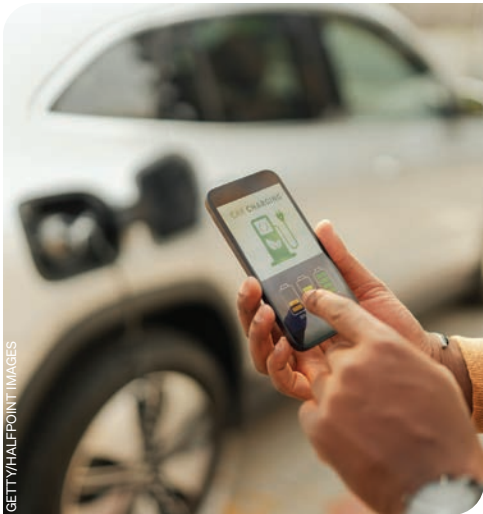
The Commonwealth should ensure that new multi-family and commercial buildings are EV-ready, including by updating building codes to support EV charging infrastructure and require EV-ready parking spaces.

With these and other steps, Virginia can drive down tailpipe pollution and bring significant benefits to our environment, health, economy, consumers, and quality of life. Let's get moving!

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