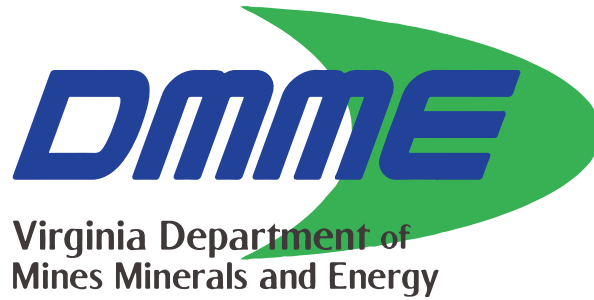




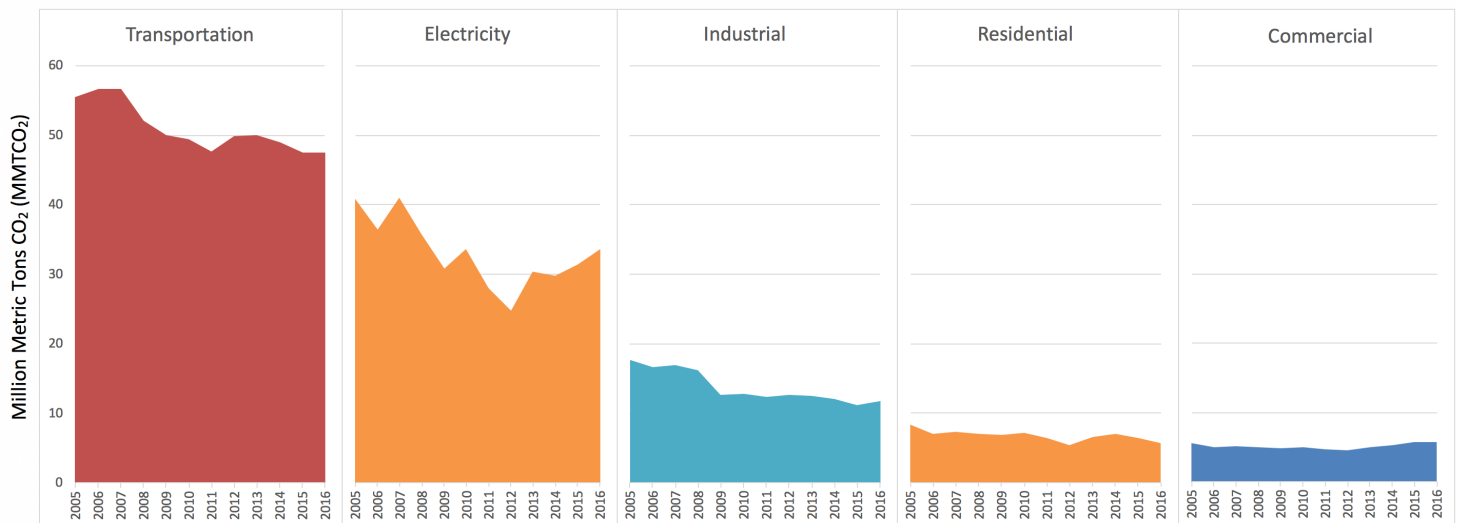
Virginia Alternative Transportation Fuels Report 2018

Prepared by Virginia Clean Cities for The Virginia Department of Mines, Minerals, and Energy January 4, 2019

Transportation forms an integral part of Virginia's economy and environment and the transportation sector is the largest end-use energy-consuming sector in the state according to the 2018 Virginia Energy Plan. In 2017, Virginia's drivers spent \$33.5 million on 13 million gallons of imported gasoline and diesel per day to fuel their vehicles. Each gallon of gasoline produces 19 pounds of carbon dioxide (CO₂), making transportation the largest energy user, the largest source of carbon dioxide, and a large expense for a product produced out of state or out of the country.

Virginia Clean Cities connects with fleets, biofuel producers, and station operators to present this status of fleets, fuel production, and stations in the transition to cleaner, domestic, and/or renewable fuels. Data was collected by Virginia Clean Cities through infrastructure development, emails and phone from January 1, 2017 to December 31, 2018.

Virginia's Carbon Dioxide Emissions by Fossil Fuel Combustion Sector 2005-2016



Emission estimates are based on energy consumption data from EIA's State Energy Consumption, Price, and Expenditure Estimates (SEDS) updated January 4 2019
<https://www.eia.gov/state/seds/seds-data-complete.php?sid=US#CompleteDataFile>

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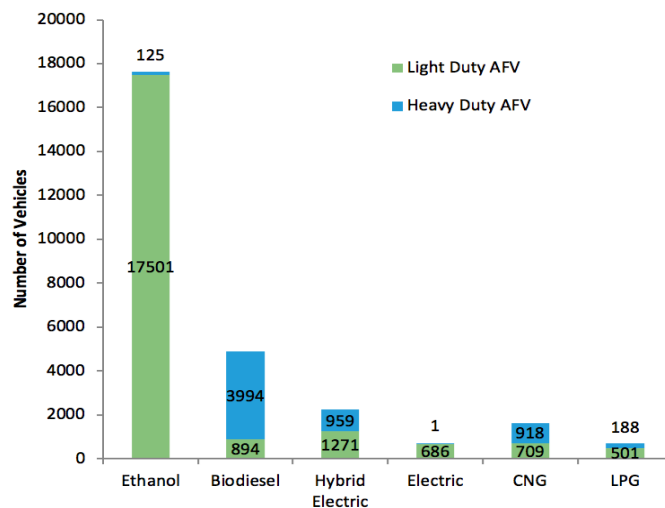
SECTION I: ALTERNATIVE FUEL FLEET VEHICLES SUMMARY

For the year ending December 31, 2018, the Commonwealth of Virginia saw a minor decrease in the number of tracked alternative fuel fleet vehicles by 1.15%. At 27,747 vehicles in 100 green fleets, the current percentage of alternative fuel vehicles used in tracked clean fuel Virginia fleets is 41 percent of their fleets. Ethanol, electric, and propane vehicles made minor net gains in the past year, while decreases were seen in natural gas and in biodiesel. The vehicles reported are in service with clean fleets, designated by operating 5 or more clean fuel vehicles, and include business fleets and local, state and federal government fleets.

Table 1-1 and Figure 1-1. Alternative Fuel Fleet Vehicles in Virginia: 2018

Fuel Type	CNG	E85	HEV	ELEC	BD	LPG	AFV Total
2017 Totals	1812	17161	2230	669	5526	671	28069
2018 Totals	1627	17626	2230	687	4888	689	27747
1-Year Difference	-185	465	0	18	-638	18	-322
Change	-10%	2.7%	0%	2.7%	-11.6%	2.7%	-1.2%

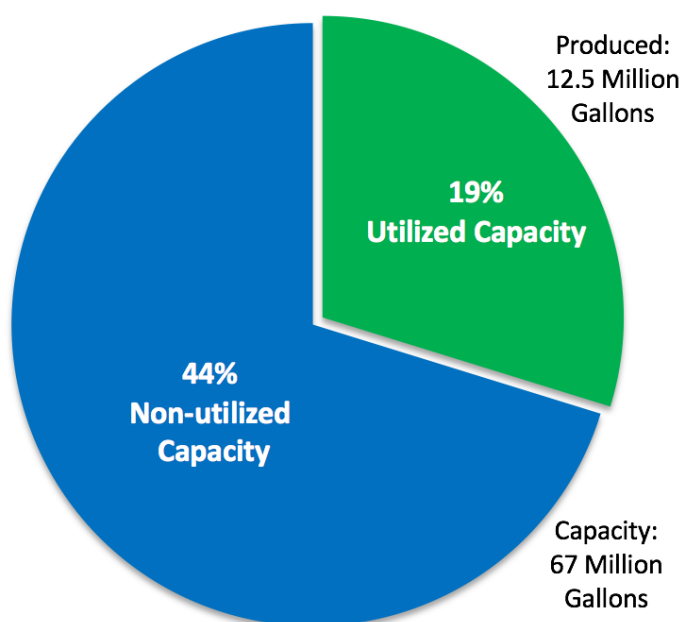
The graph to the right shows the total alternative fuel fleet vehicles broken into light and heavy-duty classifications. A light duty vehicle is considered to be a class 1 through class 3 vehicles while a heavy-duty vehicle is class 4 through class 8.



SECTION II: RENEWABLE BIOFUEL PRODUCTION SUMMARY

Virginia is host to a rich agricultural economy and numerous corporations and entrepreneurs developing biofuels from plant or recycled materials as a replacement for or mixture with traditional transportation fuels of gasoline or diesel. Virginia research universities have developed advanced biofuels technologies. Currently there are two biodiesel facilities in operation within the Commonwealth of Virginia, with 2018 seeing the final production and closure of the 60-million gallon per year Green Plains ethanol production facility. Including Green Plains, these facilities have a production capacity of 67 million gallons and produced 12.5 million gallons 2018, a 19% utilization of capacity.

Figure 2-1. Biofuel Production Capacity Achieved in Virginia: 2018



SECTION III: ALTERNATIVE FUEL STATION SUMMARY

The total number of alternative fuel stations reported for the Commonwealth of Virginia in 2018 is 825. Of those stations, 598 are public and 169 are private access stations such as individual fleet facilities. Virginia had a growth of 67 electric vehicles charging stations, marking a 15% growth for the year. Through the USDA Biofuels Infrastructure Partnership, Virginia added 5 new E85 stations, marking a 14% growth rate from year. Overall, there were 73 new stations reported in Virginia in 2018. The largest future infrastructure projects are in electric, and it is expected that additional stations from Electrify America and from EVGo for electric charging will be deployed in 2019.

Figure 3-1. Alternative Fuel Stations in Virginia: 2018

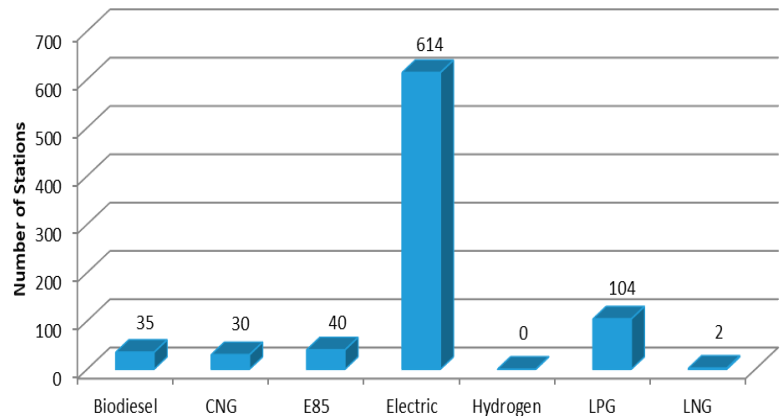
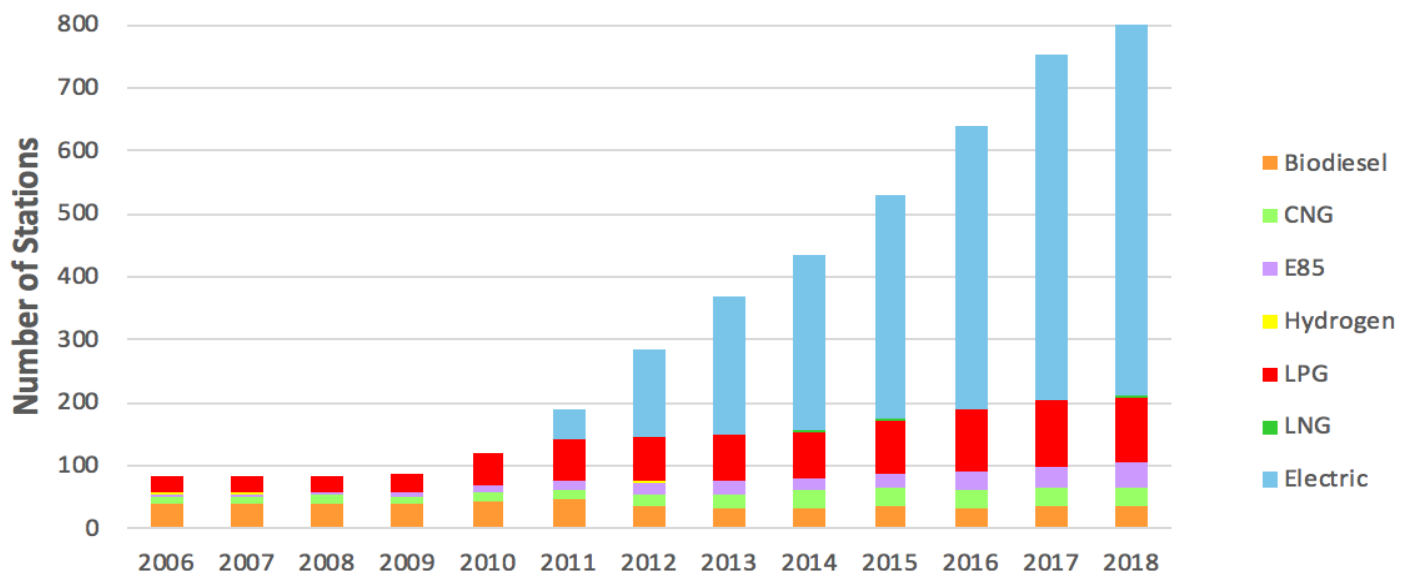


Table 3-1. Alternative Fuel Station Growth in Virginia: 2018

Year	B5-B20	CNG	E85	EV	H2	LPG	LNG	Total
2016	30	29	31	458	0	103	2	653
2017	35	29	35	547	0	104	2	752
2018	35	30	40	614	0	104	2	825
Growth	0.0%	3%	14%	15%	0%	0%	0.0%	11%

Although some fuel types showed no growth, the net total number of alternative fuel stations in Virginia increased by 9.7%. Over the last 4 years, electric vehicle charging stations have exhibited the largest growth and have become the most prevalent alternative fuel station in Virginia, attributed to the low cost of infrastructure, and the need for per-vehicle infrastructure at workplaces and destinations. Liquefied natural gas (LNG) and hydrogen stations have continually made up the smallest proportion of stations and this held true for 2018. Overall, the total number of alternative fuel stations in Virginia has continued to increase as alternative fuel use continues to expand, as seen in Figure 3-2 below.

Figure 3-2. Ten-Year Growth of Virginia Alternative Fuel Stations by Fuel Type: 2018



SECTION IV: ALTERNATIVE FUEL STATION LOCATIONS

In order to observe the geographic distribution of these stations, clean fuel infrastructure maps are presented below. This map reflects planned and current stations that are both public and private. This map does not show all of the stations tracked by Virginia Clean Cities due to the fact that the Department of Energy only tracks stations with biodiesel blends with at least 20% biodiesel. The station totals presented in this report include all blends of biodiesel. This interactive mapping tool is hosted by the Department of Energy and can be found at the alternative fuel data center and at afdc.energy.gov/stations/ with data submitted throughout the year by Virginia Clean Cities.

Figure 4-1. Biodiesel (B20) and Ethanol (E85) Stations

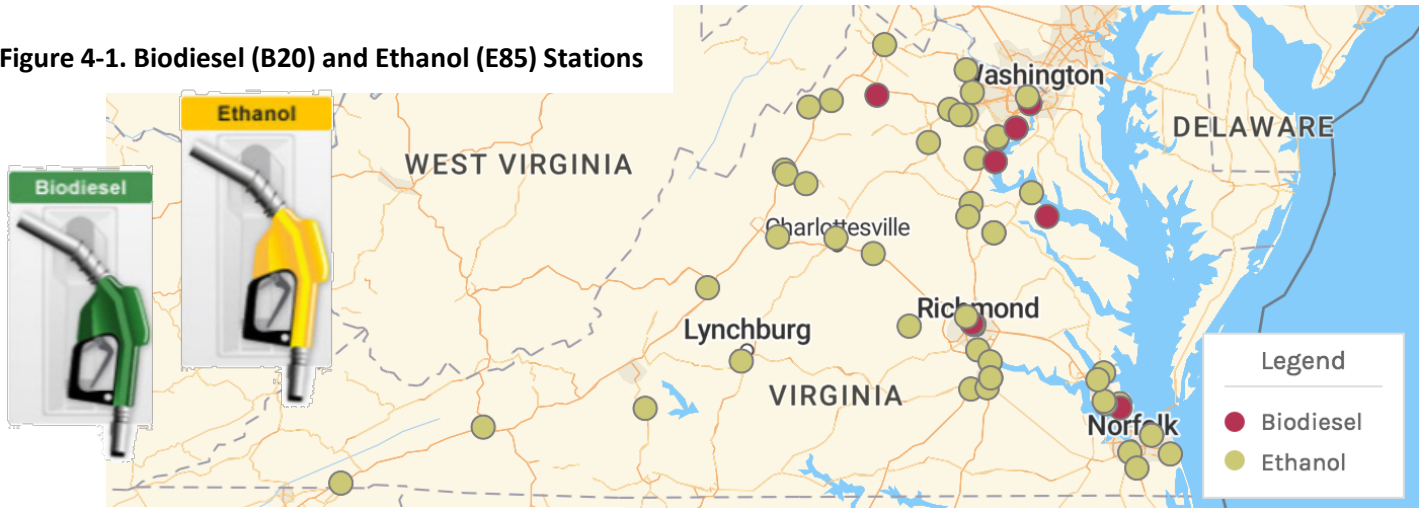


Figure 4-2. Electric and Hydrogen Fueling Stations

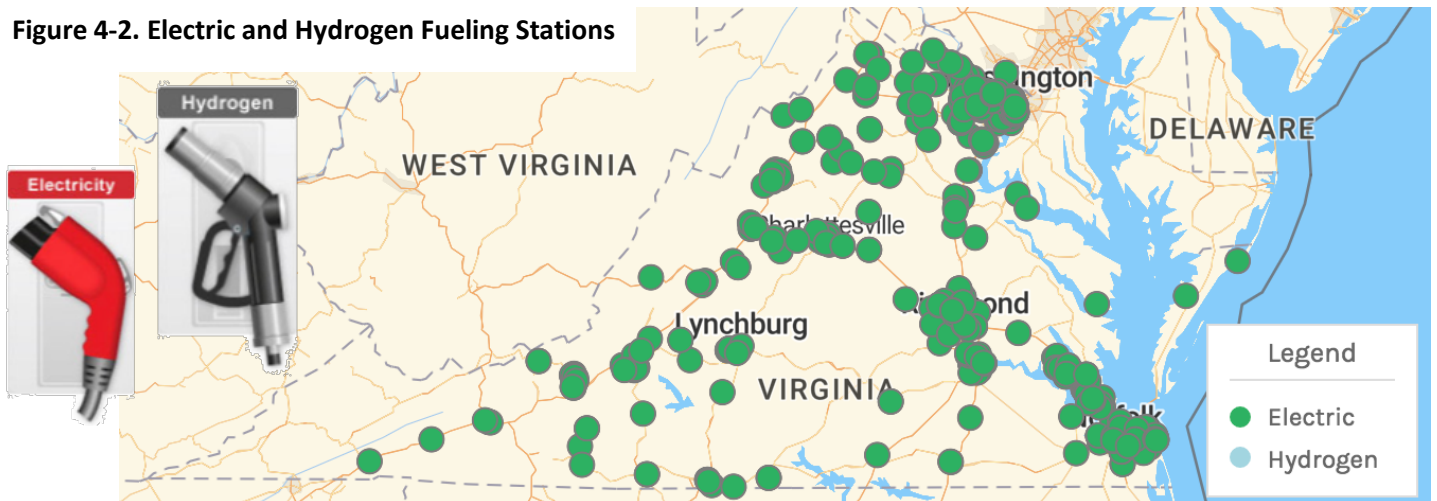


Figure 4-3. Natural Gas (CNG), Liquefied Natural Gas (LNG), and Propane (LPG) stations

