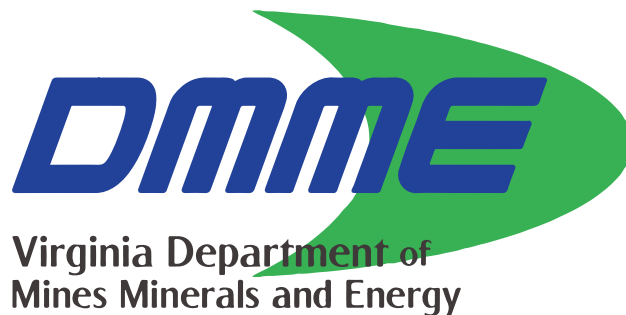




2016 Alternative Transportation Fuels Report

A Comprehensive Report of Alternative Fuel
Fleet Vehicles, Fuel Production, and Stations in Virginia

Prepared for:
The Virginia Department of Mines, Minerals, and Energy



January 15, 2017

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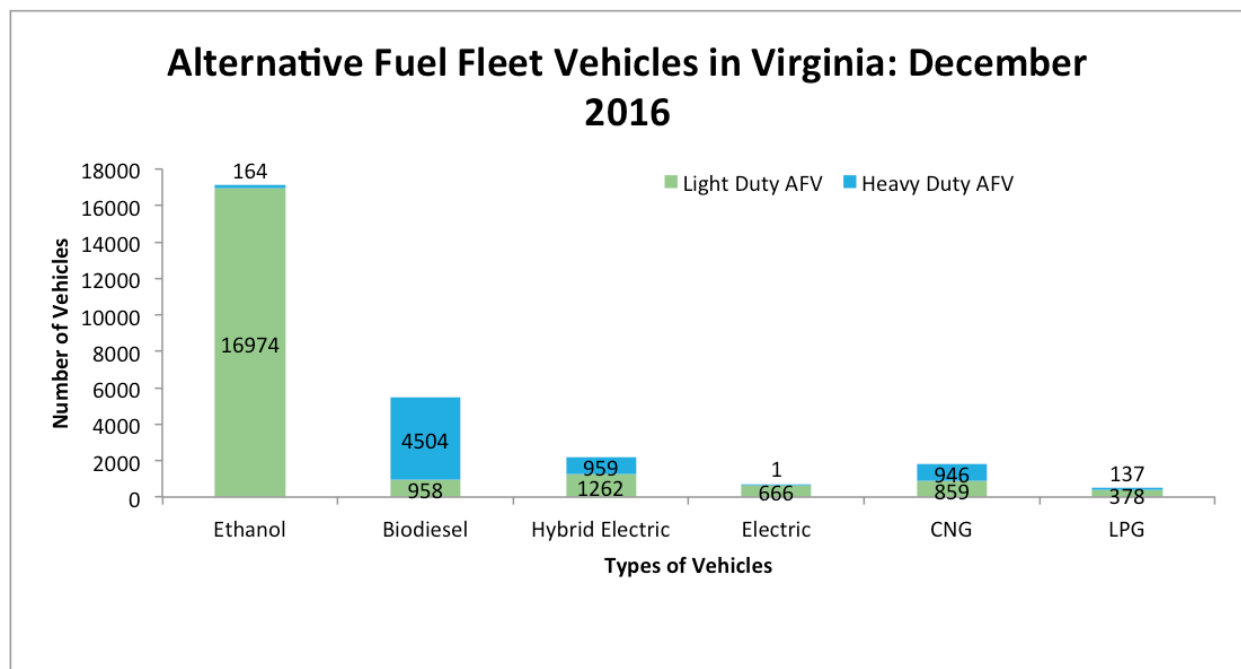
SECTION I: ALTERNATIVE FUEL FLEET VEHICLES SUMMARY

For the year ending December 31, 2016, the Commonwealth of Virginia saw an increase in the number of tracked alternative fuel fleet vehicles by 3.39%. The current percentage of alternative fuel vehicles used in Virginia fleets is 40.55%, with a two-year average of 40.14% and a five-year average of 34.5%. All alternative fuel vehicle types exhibited growth in 2016. There was a significant (42.83%) increase in electric fleet vehicles in 2016. The vehicles reported are in service with private business fleets and local, state and federal government fleets..

Fuel Type	CNG	E85	HEV	ELEC	BD	LPG	AFV Total
2015 Totals	1784	16690	2041	467	5403	510	26895
2016 Totals	1805	17138	2221	667	5462	515	27808
1 year Difference	21	448	180	200	59	5	913
% Growth	1.18%	2.68%	8.10%	42.83%	1.08%	0.98%	3.39%

The majority of the growth in these tracked alternative fuel fleet vehicles were in the number of electric vehicles reported, which increased by a total of 42.83% from 2015. Hybrid electric vehicles also showed growth at high rates, with 180 new fleet vehicles reported in 2016. The graph below 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.

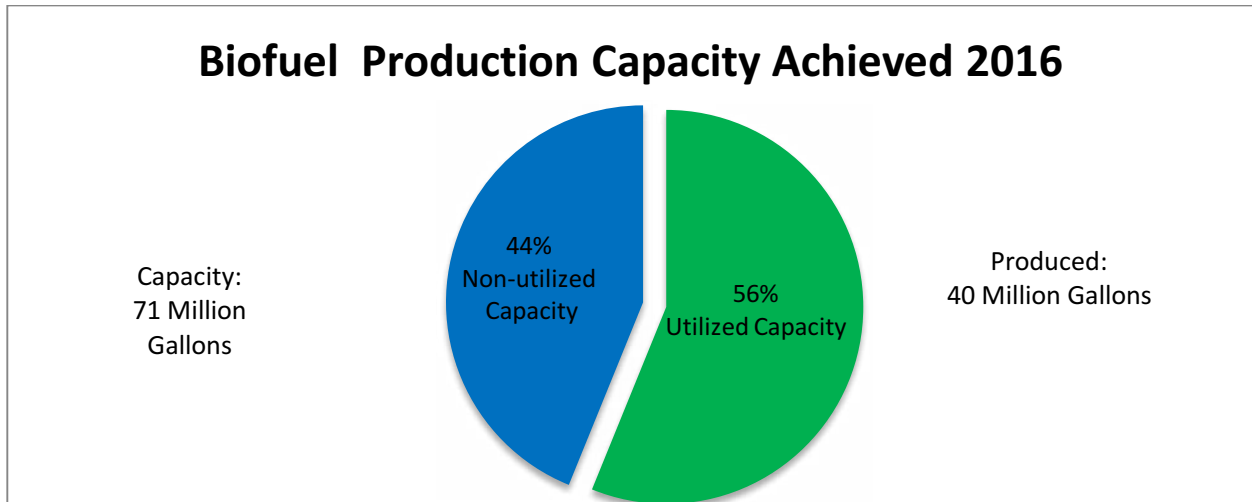
Figure 1-1. Alternative Fuel Fleet Vehicles in Virginia: 2016¹



SECTION II: BIOFUEL PRODUCTION SUMMARY

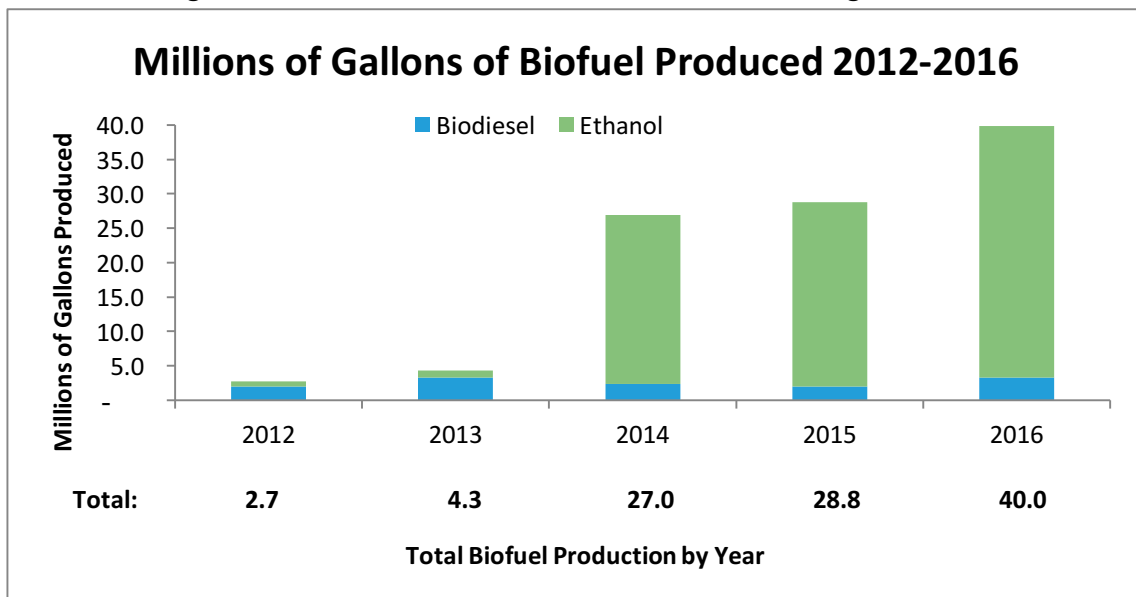
Currently there are three biodiesel facilities and two ethanol facilities in operation within the Commonwealth of Virginia. These facilities have a production capacity of 71 million gallons and produced just over 40 million gallons in 2016, a 56% utilization of capacity. This is an increase of 21% over the capacity produced from last year.

Figure 2-1. Biofuel Production Capacity Achieved in Virginia: 2016¹



The chart below shows gallons of biofuel produced in Virginia in both ethanol and biodiesel facilities over the last five years. Biofuel production in the Commonwealth continues to increase, driven by ethanol production. The graph below shows the breakdown of ethanol and biodiesel production, with the total amount of fuel produced per year displayed in millions of gallons.

Figure 2-2. Millions of Gallons of Biofuel Produced in Virginia: 2016²

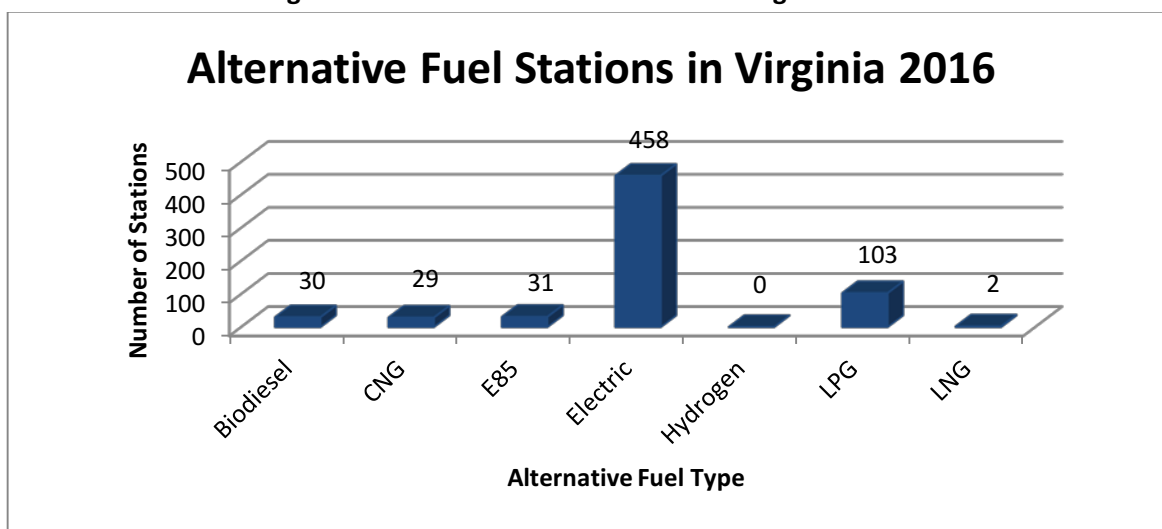


¹ Production data collected by Virginia Clean Cities through phone contact from January 1 to January 12, 2017

SECTION III: ALTERNATIVE FUEL STATION SUMMARY

The total number of alternative fuel stations reported for the Commonwealth of Virginia in 2016 is 653. Of those stations, 499 are public and 154 are private stations. Virginia had a growth of 100 electric vehicle charging stations, marking a 27.93% growth for the year. LPG stations also exhibited a large percent growth with 18 stations opening in 2016 for a growth of 21.18%. There was a decline in the number of biodiesel stations; however, through the USDA Biofuels Incentive Program, Virginia added 11 new E85 stations, marking a 55% growth rate for the year. Around 70% of Virginia's gasoline vehicles (4,851,013) are model year 2001 and newer and therefore are compatible with E15 ethanol. Overall, there were 284 new stations reported in Virginia in 2016.

Figure 3-1. Alternative Fuel Stations in Virginia: 2016²



The growth of each type of alternative fuel station from 2015 to 2016 can be seen below. Although some fuel types showed no growth or negative growth, the total number of alternative fuel stations in Virginia increased by 22.98% with the addition of 284 stations.

Table 3-1. Alternative Fuel Station Growth in Virginia: 2016³

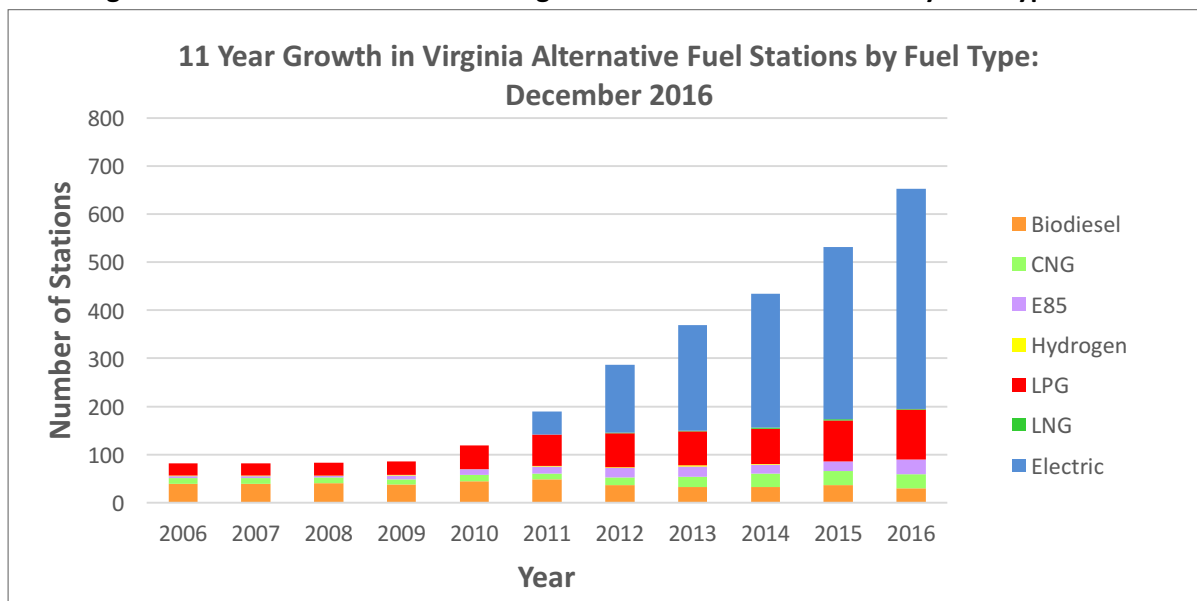
Year	Biodiesel	CNG	E85	Electric	Hydrogen	LPG	LNG	Total
2015	36	30	20	358	0	85	2	531
2016	30	29	31	458	0	103	2	653
Growth	-16.67%	3.33%	55%	27.93%	0%	21.18%	0.0%	22.98%

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. Liquefied natural gas (LNG) and hydrogen stations have continually made up the smallest proportion of stations and this held true for 2016. Liquefied petroleum gas (LPG) has shown growth

² Data collected by Virginia Clean Cities through use of AFDC station locator searches, phone calls, and personal contact from January 1, 2016 to December 31, 2016

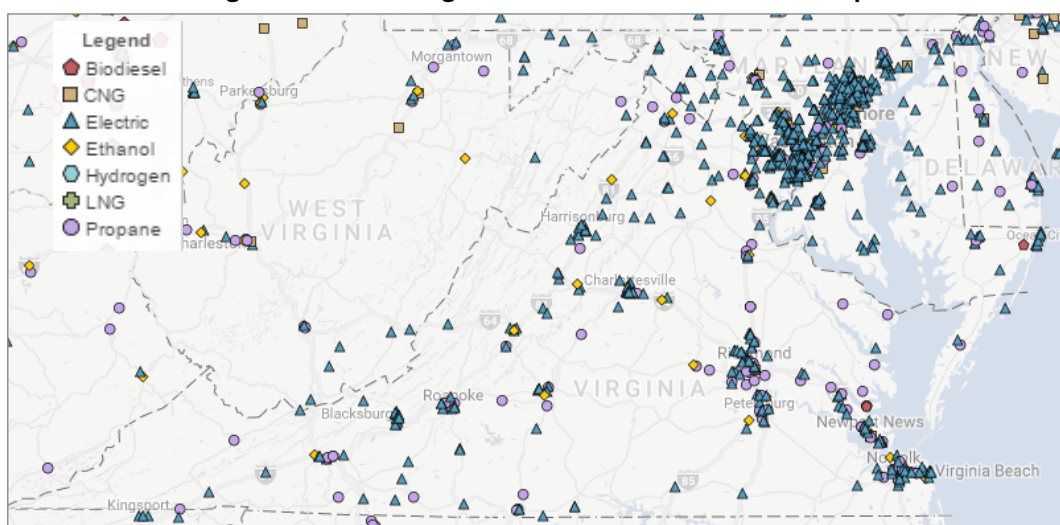
since 2006 but the total number of stations has fluctuated over time. Overall, the total number of alternative fuel stations in Virginia has continued to increase as alternative fuel use continues to expand, as seen in Figure 3-2 below.

Figure 3-2. Eleven Year Growth of Virginia Alternative Fuel Stations by Fuel Type: 2016



In order to observe the geographic distribution of these stations, a map is 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 <http://www.afdc.energy.gov/afdc/locator/stations/>.

Figure 3-3. 2016 Virginia Alternative Fuel Stations Map³



³ Virginia Alternative Fueling Station Locator, Alternative Fuels Data Center, U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. Retrieved January 12, 2017 from <http://www.afdc.energy.gov/afdc/locator/stations/state>