



2021

Alternately Fueled Vehicle Report

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The Texas Department of Motor Vehicles

The Texas Department of Motor Vehicles is a dynamic state agency with the mission “to serve, protect and advance the citizens and industries in the state with quality motor vehicle related services.” In addition to licensing vehicle dealers, awarding grants to law enforcement to combat motor vehicle crimes and issuing operating authority and oversize/overweight permits to motor carriers, the department oversees the issuance of tens of millions of vehicle registration stickers and millions of vehicle titles annually.

Executive Summary

The Texas Department of Motor Vehicles reports the number of alternatively fueled vehicles (AFV) registered in Texas to the Texas Legislature annually pursuant to [Texas Transportation Code §502.004](#). For the purposes of this report, AFVs are motor vehicles capable of using fuels other than gasoline or diesel fuel and hybrid vehicles.

The number of AFVs registered in Texas at the end of FY 2021 was 322,603. Although AFVs represent just over 1% of the total number of vehicles registered, their numbers have grown by almost 52% since FY 2016 (Chart 1), significantly outpacing the growth in overall vehicle registrations (Chart 2).

Chart 1

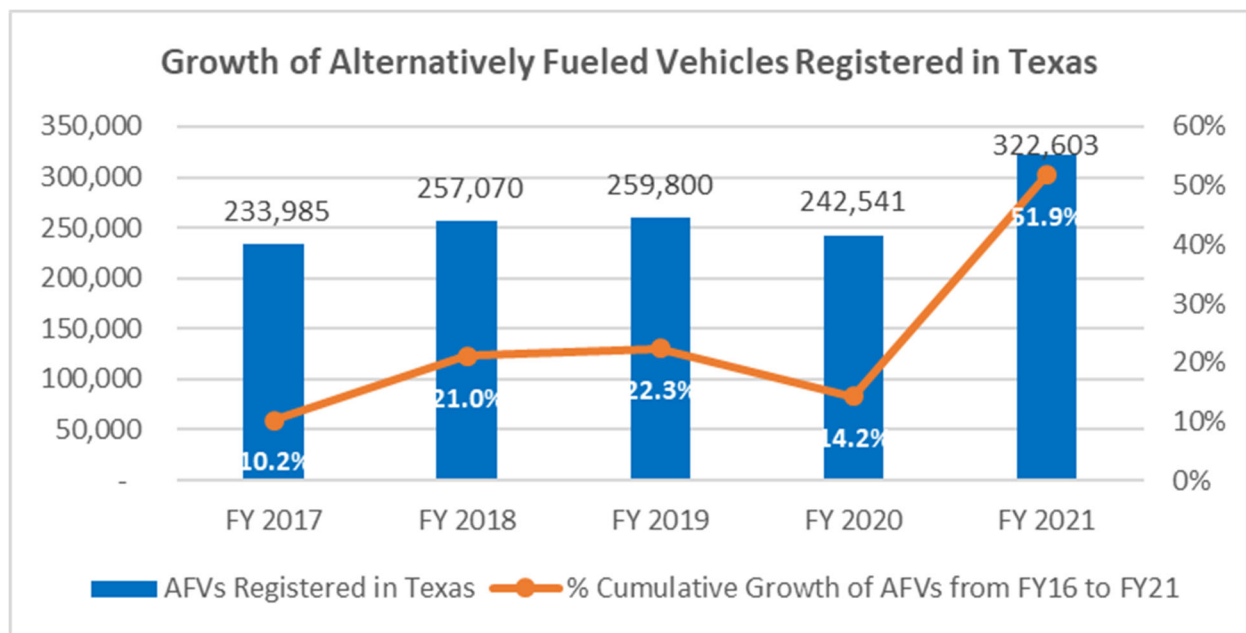


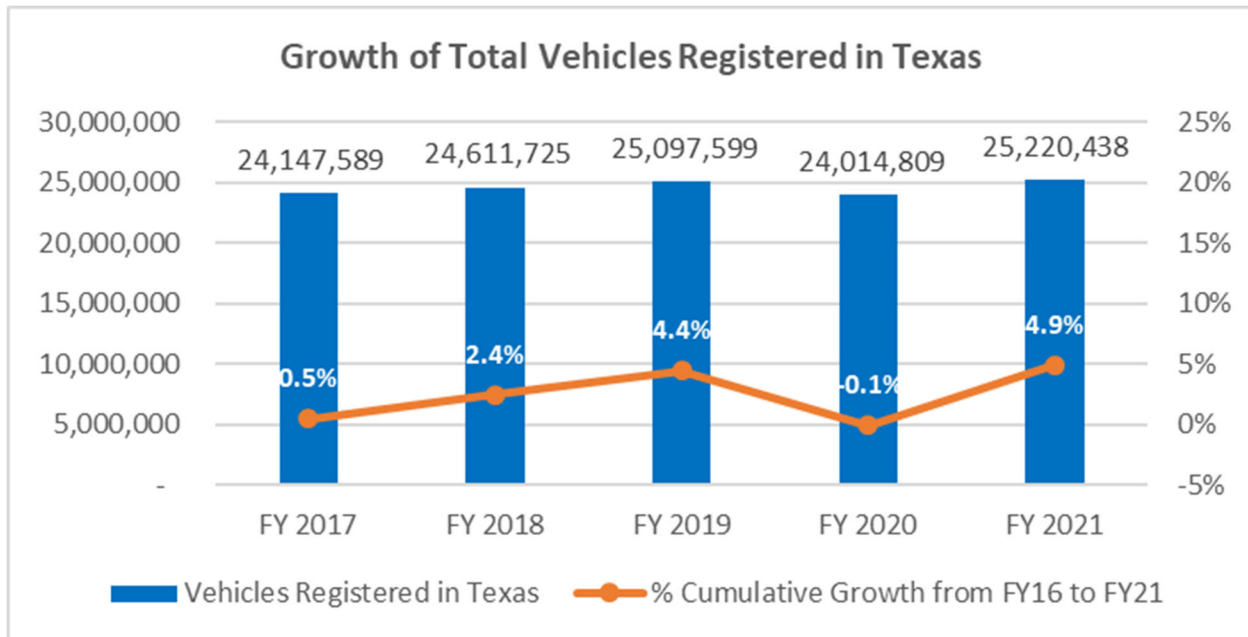
Chart 2

Chart 3 shows the breakdown by fuel type of AFVs registered in Texas. Electric and gas hybrids remain the predominant AFV type, representing just under 80% of AFVs registered, but that has decreased by more than 13 percentage points in just the last several years. Over the same period, electric vehicles registered as a percentage of all AFVs have grown by more than 13 percentage points.

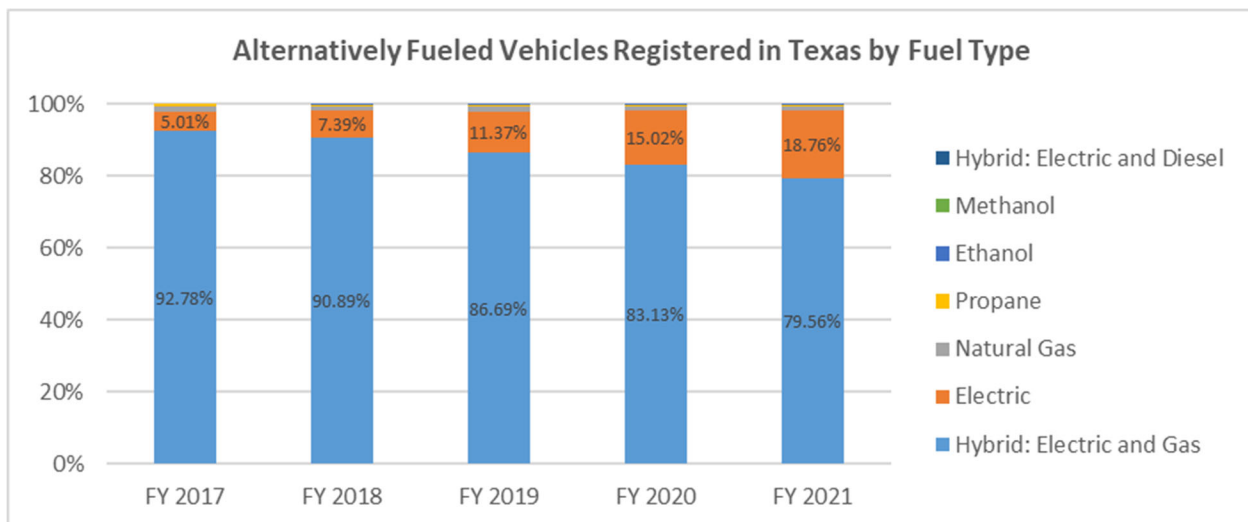
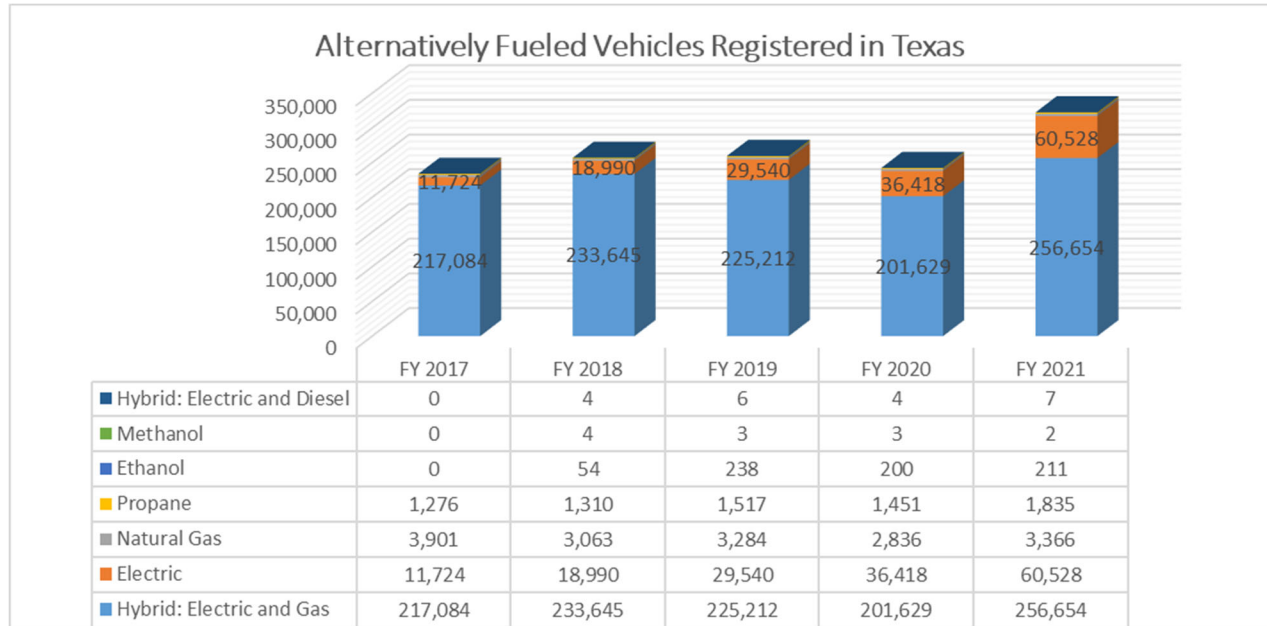
Chart 3

Chart 4 summarizes AFV registration data from the last five years. Since FY 2016, the number of registered AFVs in Texas has increased by 110,183, primarily driven by an increase in electric vehicles of 52,131 (620.83%).

Chart 4



Methodology

A Vehicle Identification Number (VIN) is a unique alphanumeric identifier that has been assigned to vehicles by vehicle manufacturers since 1954. While its form and function has changed over time, the standard 17-character VIN used today was developed by the National Highway Traffic Safety Administration and has been required for all over-the-road vehicles, including passenger cars, multi-purpose passenger vehicles, trucks, buses, incomplete vehicles and motorcycles, since 1981.

Data Limitations Related to VIN Decoding

Third party VIN decoding software is used to determine the fuel types of vehicles registered in Texas. The software can decode VINs back to 1966, but some VINs cannot be decoded due to errors in the automated decoding process, VINs assigned by the manufacturer not including fuel type, or VINs assigned by the department that do not include vehicle-specific information. Additionally, vehicles in the database like trailers are not self-propelled and do not utilize fuel. In FY 2021, there were more than 4.2 million (16.81%) registered vehicles where the fuel type could not be determined or was not indicated; however, that number includes 2.4 million (9.49%) non-motorized vehicles (e.g., trailers) that do not use fuel. Beginning with this year's report and moving forward, the department will seek to identify trailer populations within the *Fuel Type Unknown* group.

Data Limitations Related to COVID-19

On March 13, 2020, Governor Greg Abbott declared a state of disaster in all Texas counties in response to the global COVID-19 pandemic, and three days later requirements to register vehicles were waived to ensure customers were not required to physically visit a county tax assessor-collector's office to perform in-person transactions. The waiver resulted in fewer registration transactions in the last part of FY 2020 and the first part of FY 2021. The waiver ended on April 14, 2021, and since that time vehicle registration numbers continue an upward trend to expected levels.

Fuel Types and Associated Registered Vehicles

Below are brief descriptions of the various fuel types in use today by self-propelled vehicles. The fuels identified as alternative for purposes of this report include electricity, natural gas, propane, ethanol, methanol and hybrid vehicles. Fuel descriptions were sourced from the United States Department of Energy [Alternative Fuels Data Center](https://afdc.energy.gov)¹.

Gasoline

Gasoline, a transparent, petroleum-derived liquid that is used primarily as a fuel in internal combustion engines, is the most common type of vehicle fuel and is used by more than 17 million (68.38%) vehicles in the state.

¹ <https://afdc.energy.gov>

Flexible (Flex)

Flexible fuel vehicles are designed to operate using either gasoline or gasoline-ethanol blends containing up to 85% ethanol. Over 2 million (8.2%) vehicles in Texas can use flexible fuel, making the total number of vehicles registered in Texas that can use gasoline and/or flexible fuel 19.3 million or 76.58% of registered vehicles.

Diesel

Diesel includes products commonly referred to as kerosene, light cycle oil, #1 diesel fuel, #2 diesel fuel, aviation jet fuel, renewable diesel, biodiesel, distillate fuel, cutter stock, heating oil or simply diesel fuel. There are over 1.3 million (5.33%) diesel fueled vehicles registered in Texas.

Electricity

Electric vehicles are wholly powered by electricity and use battery packs to store and release energy. There are 60,528 (0.24%) electric vehicles registered in Texas. Although a small fraction of the total vehicles registered in Texas, this category represents the largest percentage of increase of any alternatively fueled vehicle type year-over-year. The number of electric vehicles registered in Texas has grown by 52,131 (620.83%) since FY 2016.

Hybrid: Gasoline and Electric

Gasoline and electric hybrids can use either fuel type, or both in combination, to propel a vehicle as determined by the design of the vehicle. There are varying degrees in which the vehicle utilizes the electric motor versus the gasoline-powered motor. In some instances, the two motors work together to provide power to the drivetrain. In other instances, the gasoline motor is only used to recharge the batteries for the electric motor. There are 256,654 (1.02%) gasoline and electric hybrid vehicles registered in Texas. This is an increase of 28.91% from FY 2016.



Hybrid: Diesel and Electric

These hybrid vehicles are similar to gasoline and electric hybrids but utilize diesel fuel rather than gasoline. There are 7 diesel and electric hybrid vehicles registered in Texas.

Propane

Propane is a hydrocarbon gas that is stored under pressure inside a tank where it turns to liquid. As pressure is released, the liquid propane vaporizes and turns into gas that is used for combustion. There are 1,835 propane fueled vehicles registered in Texas.

Convertible

Convertible vehicles have engines that are easily converted from gasoline to propane. There are 2,811 convertible vehicles registered in Texas.

Natural Gas

Natural gas primarily consists of methane that is compressed and used by or through a compressed natural gas (CNG) system. It can be used in the form of CNG or liquefied natural gas (LNG) to fuel vehicles. Conventional gasoline and diesel vehicles can be retrofitted for CNG; however, VIN decoding would not indicate that the engine had been converted. There are 3,366 compressed natural gas fueled vehicles registered in Texas.



Ethanol

Ethanol can be produced from many high-starch plant sources and is primarily used as an octane enhancer when blended with gasoline but can also be used in higher concentrations by vehicles designed to accommodate its use. There are 211 ethanol fueled vehicles registered in Texas.



Methanol

Methanol, also known as wood alcohol, has chemical and physical properties like ethanol. There are 2 methanol fueled vehicles registered in Texas.

Hydrogen Fuel Cell

Hydrogen fuel cells harness a chemical reaction to create electricity and propel a vehicle making them similar to hybrid electric vehicles. This is a relatively new technology for use in motor vehicles and, therefore, there are not many vehicles available to consumers. The Texas Department of Motor Vehicles has no records indicating there are any vehicles registered in Texas using this fuel type.



Appendix A – Vehicles Registered in Texas by Fuel Type – FY 2021

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 256,654 | 1.02% |
| Electric | 60,528 | 0.24% |
| Natural Gas | 3,366 | 0.01% |
| Propane | 1,835 | 0.01% |
| Ethanol | 211 | 0.00% |
| Hybrid (Diesel) | 7 | 0.00% |
| Methanol | 2 | 0.00% |
| Subtotal, AFV | 322,603 | 1.28% |
| Gasoline | 17,244,692 | 68.38% |
| Flexible | 2,067,804 | 8.20% |
| Diesel | 1,343,897 | 5.33% |
| Convertible | 2,811 | 0.01% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 275,206 | 1.09% |
| Fuel Type Unknown** | 1,570,235 | 6.22% |
| Trailers | 2,393,190 | 9.49% |
| Subtotal, Non-AFV | 24,897,835 | 98.72% |
| Total Vehicles Registered | 25,220,438 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process or the VIN not designating a fuel type.

Appendix B – Vehicles Registered in Texas by Fuel Type – FY 2020

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 201,629 | 0.84% |
| Electric | 36,418 | 0.15% |
| Natural Gas | 2,836 | 0.01% |
| Propane | 1,451 | 0.01% |
| Ethanol | 200 | 0.00% |
| Hybrid (Diesel) | 4 | 0.00% |
| Methanol | 3 | 0.00% |
| Subtotal, AFV | 242,541 | 1.01% |
| Gasoline | 15,024,613 | 62.56% |
| Flexible | 1,945,689 | 8.10% |
| Diesel | 1,188,617 | 4.95% |
| Convertible | 2,926 | 0.01% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 291,046 | 1.31% |
| Fuel Type Unknown** | 5,319,377 | 22.15% |
| Subtotal, Non-AFV | 23,772,268 | 98.99% |
| Total Vehicles Registered | 24,018,809 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer.

Appendix C – Vehicles Registered in Texas by Fuel Type – FY 2019

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 225,212 | 0.90% |
| Electric | 29,540 | 0.12% |
| Natural Gas | 3,284 | 0.01% |
| Propane | 1,517 | 0.01% |
| Ethanol | 238 | 0.00% |
| Methanol | 3 | 0.00% |
| Hybrid (Diesel) | 6 | 0.00% |
| Subtotal, AFV | 259,800 | 1.04% |
| Gasoline | 16,845,463 | 67.12% |
| Flexible | 2,168,253 | 8.64% |
| Diesel | 1,276,164 | 5.08% |
| Convertible | 3,830 | 0.02% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 329,708 | 1.31% |
| Fuel Type Unknown** | 4,214,381 | 16.79% |
| Subtotal, Non-AFV | 24,837,799 | 98.96% |
| Total Vehicles Registered | 25,097,599 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer.

Appendix D – Vehicles Registered in Texas by Fuel Type – FY 2018

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 233,645 | 0.95% |
| Electric | 18,990 | 0.08% |
| Natural Gas | 3,063 | 0.01% |
| Propane | 1,310 | 0.01% |
| Ethanol | 54 | 0.00% |
| Methanol | 4 | 0.00% |
| Hybrid (Diesel) | 4 | 0.00% |
| Subtotal, AFV | 257,070 | 1.04% |
| Gasoline | 17,510,554 | 71.15% |
| Flexible | 2,231,880 | 9.07% |
| Diesel | 1,258,596 | 5.11% |
| Convertible | 4,473 | 0.02% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 336,527 | 1.37% |
| Fuel Type Unknown** | 3,012,625 | 12.24% |
| Subtotal, Non-AFV | 24,354,655 | 98.96% |
| Total Vehicles Registered | 24,611,725 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer.

Appendix E – Vehicles Registered in Texas by Fuel Type – FY 2017

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 217,084 | 0.90% |
| Electric | 11,724 | 0.05% |
| Natural Gas | 3,901 | 0.02% |
| Propane | 1,276 | 0.01% |
| Ethanol | - | 0.00% |
| Methanol | - | 0.00% |
| Hybrid (Diesel) | - | 0.00% |
| Subtotal, AFV | 233,985 | 0.97% |
| Gasoline | 17,237,827 | 71.39% |
| Flexible | 2,215,878 | 9.18% |
| Diesel | 1,369,414 | 5.67% |
| Convertible | 5,756 | 0.02% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 715 | 0.00% |
| Fuel Type Unknown** | 3,084,014 | 12.77% |
| Subtotal, Non-AFV | 23,913,604 | 99.03% |
| Total Vehicles Registered | 24,147,589 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer.

Appendix F – Vehicles Registered in Texas by Fuel Type – FY 2016

| FUEL TYPE | REGISTERED VEHICLES | PERCENT OF TOTAL |
|----------------------------------|---------------------|------------------|
| Hybrid (Gasoline) | 199,096 | 0.83% |
| Electric | 8,397 | 0.04% |
| Natural Gas | 3,889 | 0.02% |
| Propane | 1,038 | 0.00% |
| Ethanol | - | 0.00% |
| Methanol | - | 0.00% |
| Hybrid (Diesel) | - | 0.00% |
| Subtotal, AFV | 212,420 | 0.88% |
| Gasoline | 16,622,760 | 69.17% |
| Flexible | 2,127,669 | 8.85% |
| Diesel | 1,327,585 | 5.52% |
| Convertible | 6,549 | 0.03% |
| Hydrogen Fuel Cell | - | - |
| Fuel Type Undisclosed* | 555 | 0.00% |
| Fuel Type Unknown** | 3,734,699 | 15.54% |
| Subtotal, Non-AFV | 23,819,817 | 99.12% |
| Total Vehicles Registered | 24,032,237 | 100.00% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer.

Appendix G – Year-Over-Year Comparison – Registered Vehicle Count

| FUEL TYPE | FY 2016 REGISTERED VEHICLES | FY 2017 REGISTERED VEHICLES | FY 2018 REGISTERED VEHICLES | FY 2019 REGISTERED VEHICLES | FY 2020 REGISTERED VEHICLES | FY 2021 REGISTERED VEHICLES |
|--------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Hybrid (Gas) | 199,096 | 217,084 | 233,645 | 225,212 | 201,629 | 256,654 |
| Electric | 8,397 | 11,724 | 18,990 | 29,540 | 36,418 | 60,528 |
| Natural Gas | 3,889 | 3,901 | 3,063 | 3,284 | 2,836 | 3,366 |
| Propane | 1,038 | 1,276 | 1,310 | 1,517 | 1,451 | 1,835 |
| Ethanol | - | - | 54 | 238 | 200 | 211 |
| Methanol | - | - | 4 | 3 | 3 | 2 |
| Hybrid (Diesel) | - | - | 4 | 6 | 4 | 7 |
| Subtotal, AFV | 212,420 | 233,985 | 257,070 | 259,800 | 242,541 | 322,603 |
| Gasoline | 16,622,760 | 17,237,827 | 17,510,554 | 16,845,463 | 15,024,613 | 17,244,692 |
| Flexible | 2,127,669 | 2,215,878 | 2,231,880 | 2,168,253 | 1,945,689 | 2,067,804 |
| Diesel | 1,327,585 | 1,369,414 | 1,258,596 | 1,276,164 | 1,188,617 | 1,343,897 |
| Convertible | 6,549 | 5,756 | 4,473 | 3,830 | 2,926 | 2,811 |
| Hydrogen | - | - | - | - | - | - |
| Undisclosed* | 555 | 715 | 336,527 | 329,708 | 291,046 | 275,206 |
| Unknown** | 3,734,699 | 3,084,014 | 3,012,625 | 4,214,381 | 5,319,377 | 1,570,235 |
| Trailers | | | | | | 2,393,190 |
| Subtotal, Non-AFV | 23,819,817 | 23,913,604 | 24,354,655 | 24,837,799 | 23,772,268 | 24,897,835 |
| Total Vehicles Registered | 24,032,237 | 24,147,589 | 24,611,725 | 25,097,599 | 24,014,809 | 25,220,438 |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process or the VIN not designating a fuel type. Prior to FY 2021, trailers were included in the "Unknown" category.

Appendix H – Year-Over-Year Comparison – Percentage of Change

| FUEL TYPE | FY 2016 to FY 2017 | FY 2017 to FY 2018 | FY 2018 to FY 2019 | FY 2019 to FY 2020 | FY 2020 to FY 2021 | FY 2016 to FY 2021 |
|----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Hybrid (Gas) | 9.03% | 7.63% | -3.61% | -10.47% | 27.29% | 28.91% |
| Electric | 39.62% | 61.98% | 55.56% | 23.28% | 66.20% | 620.83% |
| Natural Gas | 0.31% | -21.48% | 7.22% | -13.64% | 18.69% | -13.45% |
| Propane | 22.93% | 2.66% | 15.80% | -4.35% | 26.46% | 76.78% |
| Ethanol | - | - | 340.74% | -15.97% | 5.50% | - |
| Methanol | - | - | -25.00% | - | -33.3% | - |
| Hybrid (Diesel) | - | - | 50.00% | -33.33% | 75.00% | - |
| Subtotal, AFV | 10.15% | 9.87% | 1.06% | -6.64% | 33.01% | 51.87% |
| Gasoline | 3.70% | 1.58% | -3.80% | -10.81% | 14.78% | 3.74% |
| Flexible | 4.15% | 0.72% | -2.85% | -10.26% | 6.28% | -2.81% |
| Diesel | 3.15% | -8.09% | 1.40% | -6.86% | 13.06% | 1.23% |
| Convertible | -12.11% | -22.29% | -14.38% | -23.60% | -3.93% | -57.08% |
| Hydrogen | - | - | - | - | - | - |
| Undisclosed* | 28.83% | 46,967% | -2.03% | -11.73% | -5.44% | 49,487% |
| Unknown** | -17.42% | -2.31% | 39.89% | 26.22% | -70.48% ² | -57.96% ² |
| Subtotal, Non-AFV | 0.39% | 1.84% | 1.98% | -4.29% | 4.73% | 4.53% |
| Total Vehicles Registered | 0.48% | 1.92% | 1.97% | -4.31% | 5.02% | 4.94% |

* The VIN decoding process returned the fuel type in question as *Undisclosed*.

** Unknown fuel types are the result of an error in the VIN decoding process, the VIN not designating a fuel type, or the vehicle in question not being self-propelled, such as a trailer. Prior to FY 2021, trailers were included in the "Unknown" category.

² This decrease in the *Unknown* group reflects the removal of almost 2.4 million trailers from FY 2021 *Unknown* counts; previously, trailers were included in the population of registered vehicles listed as *Unknown* or *Fuel Type Unknown*.