Texas Department
of Motor Vehicles
HELPING TEXANS GO. HELPING TEXAS GROW.

2023

Alternatively Fueled Vehicle Report

Table of Contents

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. As defined by statute for the purposes of this report, AFVs are motor vehicles capable of using fuels other than gasoline or diesel fuel and hybrid vehicles.

There were 591,794 AFVs registered in Texas at the end of fiscal year (FY) 2023. Although AFVs represent less than 2.3% of the total number of vehicles registered, their numbers have grown by 127.8% in the last five years (Chart 1), significantly outpacing the 3.2% in growth of overall vehicle registrations during the same period (Chart 2).

Chart 1

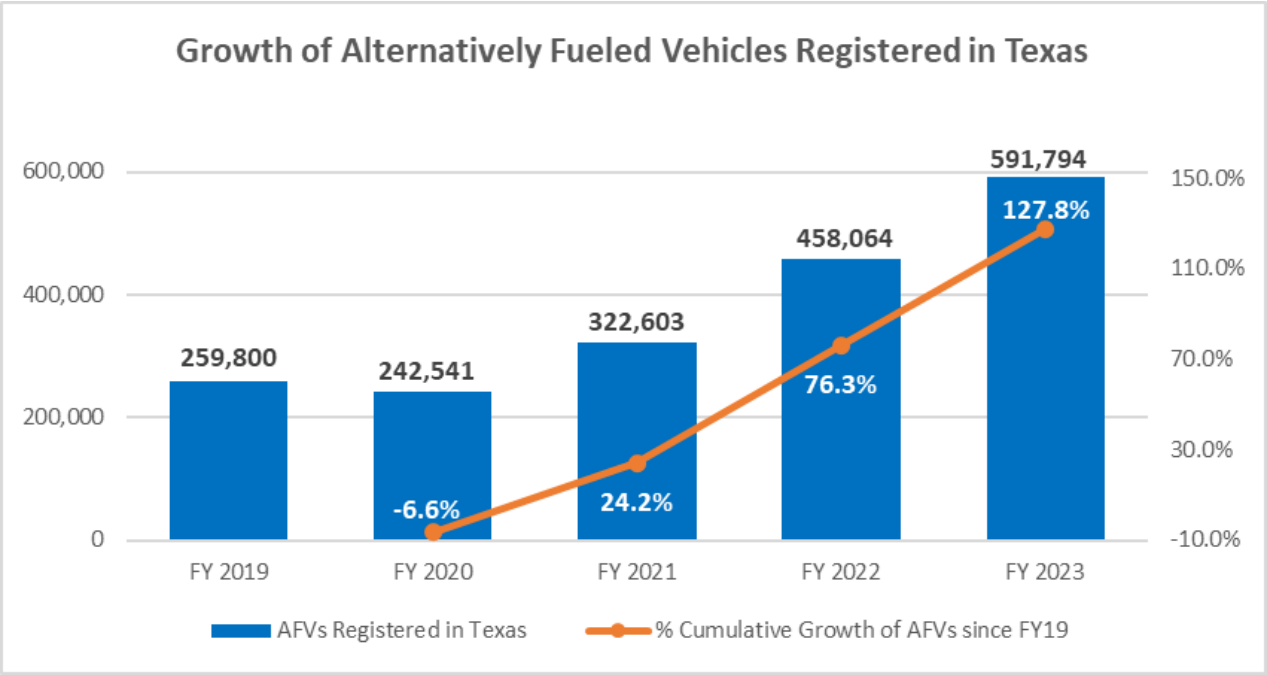


Chart 2

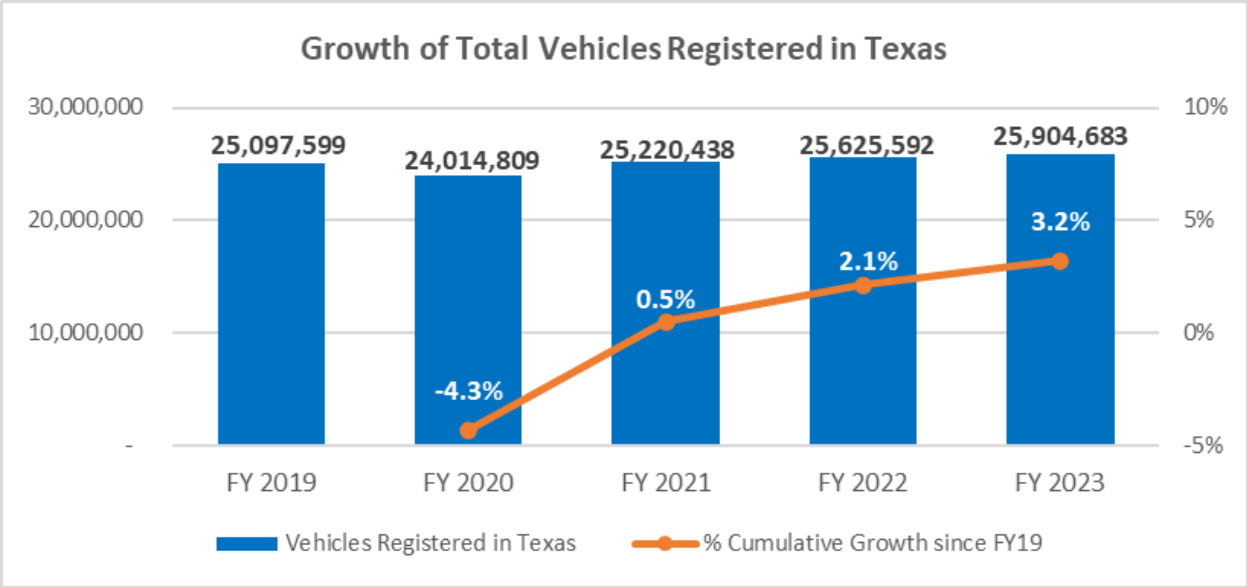


Chart 3 shows the breakdown by fuel type of AFVs registered in Texas. Electric and gas hybrids remain the predominant AFV type, representing just over 69% of registered AFVs, but that share has decreased by 17.4 percentage points in the last five years. Over the same period, electric vehicles registered as a percentage of all AFVs have increased 18.3 percentage points with electric vehicles now accounting for almost 30% of registered AFVs.

Chart 3

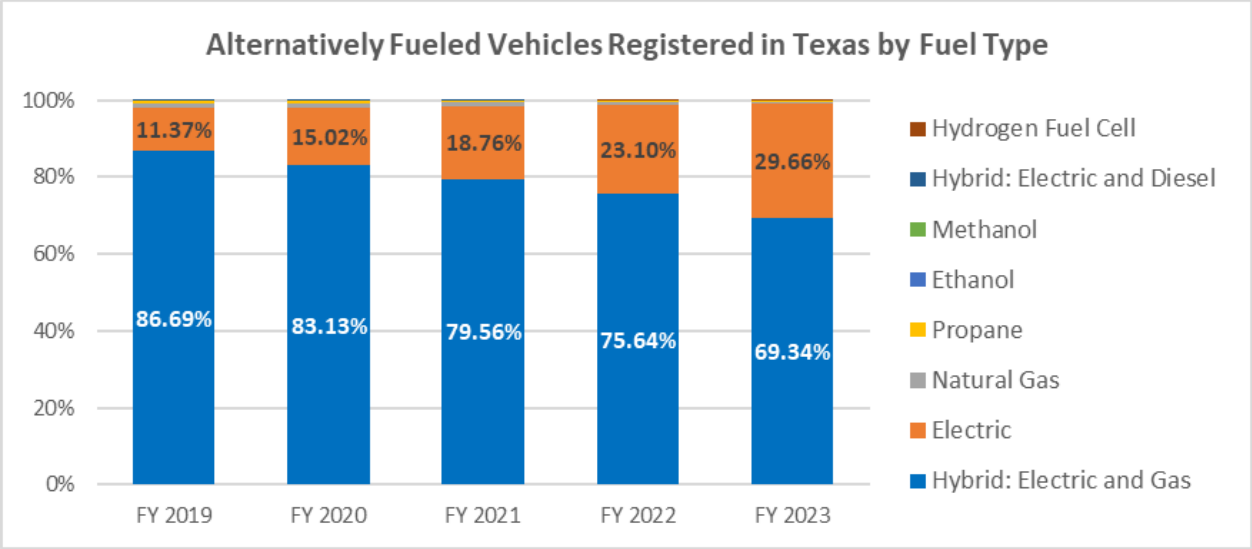
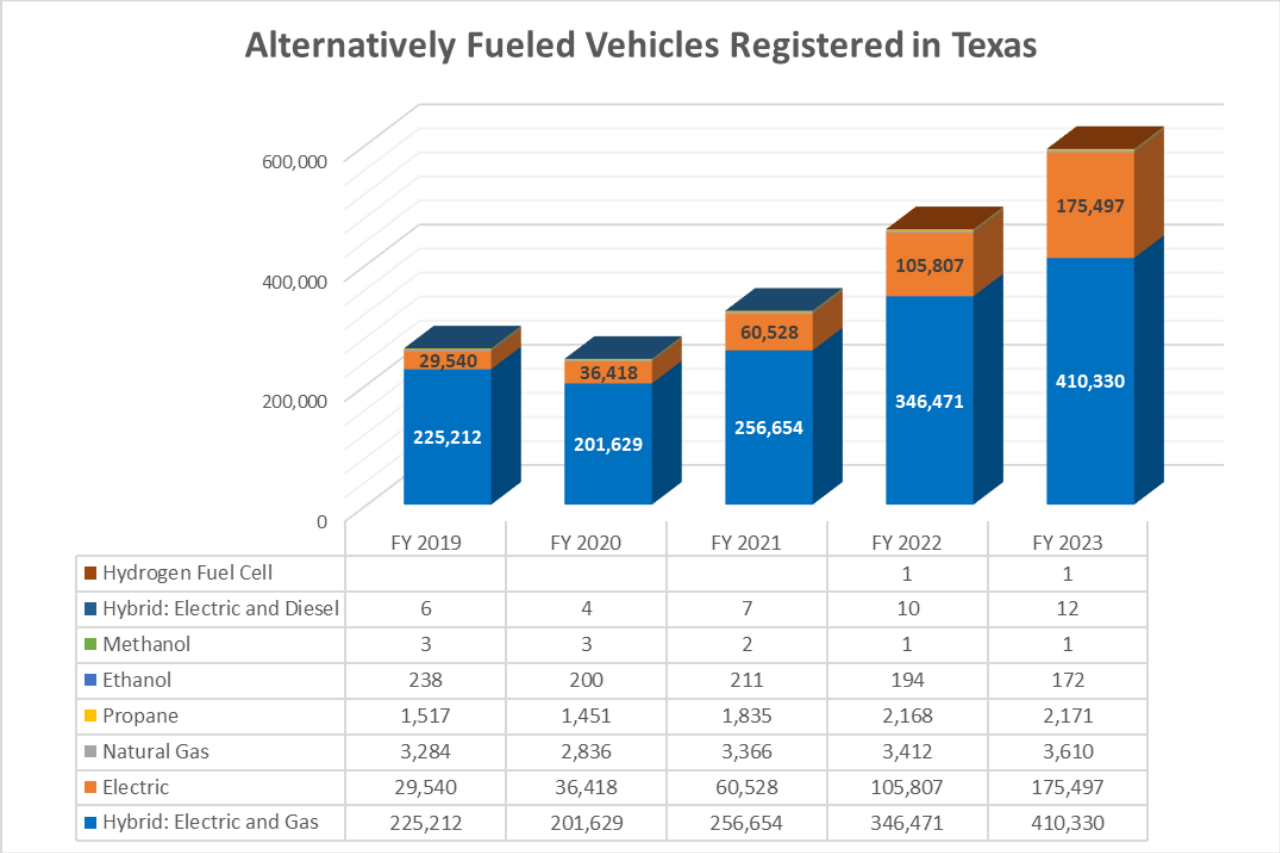


Chart 4 summarizes AFV registration data from the last five years. In that time, the number of registered AFVs in Texas has increased by 331,994 (127.8%), primarily driven by increases in electric and gas hybrids of 185,118 (82.2% increase) and electric vehicles of 145,957 (494.1% increase).

Chart 4



	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Hydrogen Fuel Cell				1	1
Hybrid: Electric and Diesel	6	4	7	10	12
Methanol	3	3	2	1	1
Ethanol	238	200	211	194	172
Propane	1,517	1,451	1,835	2,168	2,171
Natural Gas	3,284	2,836	3,366	3,412	3,610
Electric	29,540	36,418	60,528	105,807	175,497
Hybrid: Electric and Gas	225,212	201,629	256,654	346,471	410,330

Methodology

A Vehicle Identification Number (VIN) is a unique alphanumeric identifier that has been assigned to individual vehicles by vehicle manufacturers since 1954. While its form and function have 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, some vehicles like trailers are not self-propelled and do not use fuel. In FY 2023, there were more than 2.6 million (10.4%) registered vehicles where the fuel type could not be determined or was not indicated; however, that number includes almost 2.4 million (9.2%) trailers that do not use fuel. Since FY 2021, the department has extracted the trailer populations from the *Fuel Type Unknown* category and shown them as a separate line item in the data tables at the end of the report.

Data Limitations Related to Fiscal Years 2020 and 2021 Registration Waiver

On March 13, 2020, Governor Greg Abbott issued a disaster declaration for all Texas counties in response to the emerging pandemic. Three days later requirements to register motor 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 during the second half of FY 2020 and the first half of FY 2021. The waiver ended on April 14, 2021, at which time vehicle registration numbers continued their previous historical upward trend.

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, hydrogen fuel cell, ethanol, methanol and hybrid vehicles. Fuel descriptions were sourced from the United States Department of Energy Alternative Fuels Data Center[1].

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 uses 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 410,330 (1.58%) gasoline and electric hybrid vehicles registered in Texas. This is an increase of 106.1% since FY 2016.

Electricity

Electric vehicles are wholly powered by electricity and use battery packs to store and release energy. There are 175,497 (0.68%) 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 167,100 (1,990%) since FY 2016.

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 or 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 3,610 CNG-fueled 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 2,171 propane-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 172 ethanol-fueled vehicles registered in Texas.

[1] https://afdc.energy.gov

Hybrid: Diesel and Electric

These hybrid vehicles are similar to gasoline and electric hybrids but use diesel fuel rather than gasoline. There are 12 diesel and electric hybrid 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. There is 1 vehicle registered in Texas using this fuel type.

Methanol

Methanol, also known as wood alcohol, has chemical and physical properties like ethanol. There is 1 methanol-fueled vehicle registered in Texas.

Gasoline

Gasoline, a transparent, petroleum-derived liquid that is used primarily as a fuel in internal combustion engines, is the most common fuel type and used by more than 18.8 million (72.67%) vehicles in the state.

Flexible (Flex)

Flexible fuel vehicles are designed to operate using either gasoline or gasoline-ethanol blends containing up to 85% ethanol. Approximately 2 million (7.67%) vehicles in Texas can use flexible fuel, making the total number of vehicles registered in Texas that can use gasoline and/or flexible fuel 20,811,865 million (80.34%).

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 1.6 million (6.15%) diesel-fueled vehicles registered in Texas.

Convertible

Convertible vehicles have engines that are easily converted from gasoline to propane. There are 2,225 convertible vehicles registered in Texas.

Appendix A – Vehicles Registered in Texas by Fuel Type – FY 2023

FUEL TYPE	REGISTERED VEHICLES	PERCENT OF TOTAL
Hybrid (Gasoline)	410,330	1.58%
Electric	175,497	0.68%
Natural Gas	3,610	0.01%
Propane	2,171	0.01%
Ethanol	172	0.00%
Hybrid (Diesel)	12	0.00%
Hydrogen Fuel Cell	1	0.00%
Methanol	1	0.00%
Subtotal, AFV	**591,794**	**2.28%**
Gasoline	18,825,861	72.67%
Flexible	1,986,004	7.67%
Diesel	1,592,323	6.15%
Convertible	2,225	0.01%
Fuel Type Undisclosed*	224,073	0.86%
Fuel Type Unknown**	305,236	1.18%
Trailers	2,377,167	9.18%
Subtotal, Non-AFV	**25,312,889**	**97.72%**
Total Vehicles Registered	**25,904,683**	**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 2022

FUEL TYPE	REGISTERED VEHICLES	PERCENT OF TOTAL
Hybrid (Gasoline)	346,471	1.35%
Electric	105,807	0.41%
Natural Gas	3,412	0.01%
Propane	2,168	0.01%
Ethanol	194	0.00%
Hybrid (Diesel)	10	0.00%
Hydrogen Fuel Cell	1	0.00%
Methanol	1	0.00%
Subtotal, AFV	**458,064**	**1.79%**
Gasoline	18,589,078	72.54%
Flexible	2,063,603	8.05%
Diesel	1,454,229	5.67%
Convertible	2,562	0.01%
Fuel Type Undisclosed*	256,783	1.00%
Fuel Type Unknown**	415,115	1.62%
Trailers	2,386,158	9.31%
Subtotal, Non-AFV	**25,167,528**	**98.21%**
Total Vehicles Registered	**25,625,592**	**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 C – 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 D – 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 E – 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 F – 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 G – 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 H – 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 I – 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	FY 2022 REGISTERED VEHICLES	FY 2023 REGISTERED VEHICLES
Hybrid (Gasoline)	199,096	217,084	233,645	225,212	201,629	256,654	346,471	410,330
Electric	8,397	11,724	18,990	29,540	36,418	60,528	105,807	175,497
Natural Gas	3,889	3,901	3,063	3,284	2,836	3,366	3,412	3,610
Propane	1,038	1,276	1,310	1,517	1,451	1,835	2,168	2,171
Ethanol	-	-	54	238	200	211	194	172
Hybrid (Diesel)	-	-	4	6	4	7	10	12
Methanol	-	-	4	3	3	2	1	1
Hydrogen	-	-	-	-	-	-	1	1
Subtotal, AFV	**212,420**	**233,985**	**257,070**	**259,800**	**242,541**	**322,603**	**458,064**	**591,794**
Gasoline	16,622,760	17,237,827	17,510,554	16,845,463	15,024,613	17,244,692	18,589,078	18,825,861
Flexible	2,127,669	2,215,878	2,231,880	2,168,253	1,945,689	2,067,804	2,063,603	1,986,004
Diesel	1,327,585	1,369,414	1,258,596	1,276,164	1,188,617	1,343,897	1,454,229	1,592,323
Convertible	6,549	5,756	4,473	3,830	2,926	2,811	2,562	2,225
Undisclosed*	555	715	336,527	329,708	291,046	275,206	256,783	224,073
Unknown**	3,734,699	3,084,014	3,012,625	4,214,381	5,319,377	1,570,235	415,115	305,236
Trailers	-	-	-	-	-	2,393,190	2,386,158	2,377,167
Subtotal, Non-AFV	**23,819,817**	**23,913,604**	**24,354,655**	**24,837,799**	**23,772,268**	**24,897,835**	**25,167,528**	**25,312,889**
Total Vehicles Registered	**24,032,237**	**24,147,589**	**24,611,725**	**25,097,599**	**24,014,809**	**25,220,438**	**25,625,592**	**25,904,683**

* 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 J – 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 2021 to FY 2022	FY 2022 to FY 2023	FY 2016 to FY 2023
Hybrid (Gasoline)	9.03%	7.63%	-3.61%	-10.47%	27.29%	35.00%	18.43%	106.10%
Electric	39.62%	61.98%	55.56%	23.28%	66.20%	74.81%	65.87%	1,990.00%
Natural Gas	0.31%	-21.48%	7.22%	-13.64%	18.69%	1.37%	5.80%	-7.17%
Propane	22.93%	2.66%	15.80%	-4.35%	26.46%	18.15%	0.19%	109.15%
Ethanol	-	-	340.74%	-15.97%	5.50%	-8.06%	-11.34%	-
Hybrid (Diesel)	-	-	50.00%	-33.33%	75.00%	42.86%	20.00%	-
Methanol	-	-	-25.00%	0.00%	-33.3%	-50.00%	-	-
Hydrogen	-	-	-	-	-	-	-	-
Subtotal, AFV	**10.15%**	**9.87%**	**1.06%**	**-6.64%**	**33.01%**	**41.99%**	**29.20%**	**178.60%**
Gasoline	3.70%	1.58%	-3.80%	-10.81%	14.78%	7.80%	1.27%	13.25%
Flexible	4.15%	0.72%	-2.85%	-10.26%	6.28%	-0.20%	-3.76%	-6.66%
Diesel	3.15%	-8.09%	1.40%	-6.86%	13.06%	8.21%	9.50%	19.94%
Convertible	-12.11%	-22.29%	-14.38%	-23.60%	-3.93%	-8.86%	-13.15%	-66.03%
Undisclosed*	28.83%	46,967%	-2.03%	-11.73%	-5.44%	-6.69%	-12.73%	40,274%
Unknown**	-17.42%	-2.31%	39.89%	26.22%	-70.48%	-73.56%	-26.47%	-91.83%
Trailers	-	-	-	-	-	-0.29%	-0.38%	-
Subtotal, Non-AFV	**0.39%**	**1.84%**	**1.98%**	**-4.29%**	**4.73%**	**1.08%**	**0.58%**	**6.27%**
Total Vehicles Registered	**0.48%**	**1.92%**	**1.97%**	**-4.31%**	**5.02%**	**1.61%**	**1.09%**	**7.79%**

* 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.