**National Aeronautics and Space Administration**

**Fleet Alternative Fuel Vehicle Program Fleet Report for FY 2017**

**February 15, 2018**

This National Aeronautics and Space Administration (NASA) Fleet Alternative Fuel Vehicle (AFV) Report for Fiscal Year (FY) 2017 presents the Agency's data on the number of AFVs acquired in FY 2017 and its planned acquisitions for FY 2018, the projected acquisitions for FY 2019 and the forecasted acquisitions for FY 2020. This report has been developed in accordance with the Energy Policy Act of 1992 (EPAct) (42 U.S.C. 13211-13219) as amended by the Energy Conservation Reauthorization Act of 1998 (Public Law 105-388) (ECRA), and Energy Policy Act of 2005 (EPAct).

## Legislative Requirements

EPAct requires that 75 percent of all covered light-duty vehicles acquired for Federal fleets in FY 2016 and beyond must be AFVs (where the fleets have 20 or more vehicles, are capable of being centrally fueled, and are operated in a Metropolitan Statistical Area (MSA) with a population of more than 250,000 based on the 1980 census). Certain emergency, law enforcement, and national defense vehicles are exempt from this requirement.

In 2016, Executive Order (EO) 13693: *Planning for Federal Sustainability in the Next Decade*, established a per-mile Greenhouse Gas (GHG) emissions performance metric for federal fleets. Section 3(g)(ii) of E.O. 13693 requires federal agencies to reduce fleet-wide per-mile GHG emissions, relative to agency baselines for FY 2014, by:

- Not less than 4 percent by the end of FY 2017
- Not less than 15 percent by the end of FY 2021
- Not less than 30 percent by the end of FY 2025.

## NASA's Approach to Compliance with EPAct, FAST Act and E.O 13693

To achieve compliance with the legislative mandates of EPAct, FAST Act and E.O. 13693; NASA has developed a compliance strategy including the acquisition up to the maximum percent of new, covered light-duty vehicles as AFVs, and strongly supports the use of alternative fuel in these vehicles, where alternative fuel options are available. NASA will continue to acquire light-duty vehicles with higher fuel efficiency, and further reduce GHG emissions by using alternative fuel where available. NASA recognizes that AFV fueling infrastructure is extremely limited in most areas of the country. As such, NASA has developed AFV fueling

infrastructure at those NASA Centers where it is not readily commercially available and justified by usage volumes, while mindful of the cost to the American people.

**NASA Fleet Compliance for FY 2017**

NASA acquired 238 light-duty vehicles (LDVs) during FY 2017, of which 163 were considered EPAct covered acquisitions and 146 were AFVs. For the LDV acquisitions NASA received 150 EPAct credits. NASA also gained an additional 5 credits for the use of biodiesel fuel and the acquisition of dedicated light, medium, and heavy-duty AFVs. In total NASA attained 155 credits, thereby exceeding EPAct requirements by 20 percentage points.

**Summary of NASA's FY 2017 AFV Acquisitions**

A number of vehicles that were leased and purchased by NASA were considered not "covered" vehicles. Of the total of 238 light-duty vehicles acquired in FY 2017 the following were exempt from compliance:

- 47 were exempt due to geographic assignment; vehicles are housed outside of a MSA.
- 22 were exempt as Law Enforcement vehicles.
- 6 were exempt as Non-covered vehicles.

**NASA's Fleet AFV Acquisitions for FY 2018, FY 2019 and FY 2020**

Below is the detailed information on planned, projected and forecasted vehicle acquisitions for NASA in FY 2016, 2017 and 2018.

## 2017 AFV Report: Planned Data (FY2018)

**1. Planned Light-Duty Vehicle Acquisitions and Exemptions**

| | Acquisitions | | |
|---|---|---|---|
| | Leased | Purchased | Total |
| Total Light-Duty Vehicle Acquisitions | 140 | 0 | 140 |

| | | | |
|---|---|---|---|
| Exemption: Fleet Size | 0 | 0 | 0 |
| Exemption: Foreign | 0 | 0 | 0 |
| Exemption: Geographic | 0 | 0 | 0 |
| Exemption: LE Vehicle | 0 | 0 | 0 |
| Exemption: Non-covered Vehicle | 0 | 0 | 0 |
| Exemption: Non-MSA Operation | 0 | 0 | 0 |
| ***Total EPAct-Covered Vehicles*** | ***140*** | ***0*** | ***140*** |

**2. Planned Alternative Fuel Vehicle Acquisition Detail**

| Vehicle Type | Fuel | LE | Acquisitions | | | EPAct Credits |
|---|---|---|---|---|---|---|
| | | | Lease | Purchase | Total | |
| *Light Duty Vehicles* | | | | | | |
| Sedan/St Wgn Subcompact | E85 FF | No | 50 | 0 | 50 | 50 |
| LD Minivan 4x4 (Passenger) | E85 FF | No | 40 | 0 | 40 | 40 |
| LD Pickup 4x4 | E85 FF | No | 35 | 0 | 35 | 35 |
| LD SUV 4x4 | E85 FF | No | 15 | 0 | 15 | 15 |
| *Medium Duty Vehicles* | | | | | | |
| MD Pickup | E85 FF | No | 45 | 0 | 45 | 45 |
| ***Totals:*** | | | ***185*** | ***0*** | ***185*** | ***185*** |

**3. Planned EPAct Acquisition Credits Summary**

| | |
|---|---|
| Base AFV Acquisition Credits: | 185 |
| Zero Emission Vehicle (ZEV) Credits: | 0 |
| Dedicated Light Duty AFV Credits: | 0 |
| Dedicated Medium Duty AFV Credits: | 0 |
| Dedicated Heavy Duty AFV Credits: | 0 |
| Biodiesel and Renewable diesel Fuel Usage Credits:[4] | 0 |
| ***Total EPAct Credits:*** | ***185*** |
| ***Overall EPAct Compliance Percentage:*** | ***132 %*** |

## 2017 AFV Report: Projected Data (FY2019)

### 1. Projected Light-Duty Vehicle Acquisitions and Exemptions

| | Acquisitions | | |
|---|---|---|---|
| | **Leased** | **Purchased** | **Total** |
| Total Light-Duty Vehicle Acquisitions | 254 | 0 | 254 |
| Fleet Exemptions: Fleet Size | 0 | 0 | 0 |
| Fleet Exemptions: Foreign | 0 | 0 | 0 |
| Fleet Exemptions: Geographic | 0 | 0 | 0 |
| Fleet Exemptions: Non-MSA Operation | 0 | 0 | 0 |
| Vehicle Exemptions: LE Vehicle | 24 | 0 | 24 |
| Vehicle Exemptions: Non-covered Vehicle | 0 | 0 | 0 |
| Vehicle Exemptions: Non-MSA Operation | 146 | 0 | 146 |
| Total EPAct-Covered Vehicles | 84 | 0 | 84 |

**2. Projected Alternative Fuel Vehicle Acquisition Detail**

| Vehicle Type | Fuel | LE | Acquisitions | | | EPAct Credits |
|---|---|---|---|---|---|---|
| | | | Lease | Purchase | Total | |
| Light Duty Vehicles | | | | | | |
| Sedan/St Wgn Compact | E85 FF | No | 25 | 0 | 25 | 25 |
| Sedan/St Wgn Compact | GAS HY[3] | No | 14 | 0 | 14 | 14 |
| Sedan/St Wgn Compact | GAS HY[3] | Yes | 2 | 0 | 2 | 0 |
| Sedan/St Wgn Midsize | E85 FF | Yes | 12 | 0 | 12 | 0 |
| Sedan/St Wgn Subcompact | CNG DE | No | 2 | 0 | 2 | 2 |
| Sedan/St Wgn Subcompact | E85 FF | No | 29 | 0 | 29 | 29 |
| LD Minivan 4x2 (Passenger) | E85 FF | No | 18 | 0 | 18 | 18 |
| LD Minivan 4x2 (Passenger) | E85 FF | Yes | 1 | 0 | 1 | 0 |
| LD Pickup 4x2 | E85 FF | No | 56 | 0 | 56 | 56 |
| LD SUV 4x2 | E85 FF | No | 3 | 0 | 3 | 3 |
| LD SUV 4x2 | E85 FF | Yes | 3 | 0 | 3 | 0 |
| LD SUV 4x2 | GAS HY[3] | No | 5 | 0 | 5 | 5 |
| LD Van 4x2 (Cargo) | E85 FF | No | 7 | 0 | 7 | 7 |
| LD Van 4x2 (Passenger) | E85 FF | No | 18 | 0 | 18 | 18 |
| LD Pickup 4x4 | E85 FF | No | 11 | 0 | 11 | 11 |
| LD SUV 4x4 | E85 FF | No | 14 | 0 | 14 | 14 |
| LD SUV 4x4 | E85 FF | Yes | 4 | 0 | 4 | 0 |
| LD Van 4x4 (Cargo) | E85 FF | No | 1 | 0 | 1 | 1 |
| Medium Duty Vehicles | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| MD Other | E85 FF | No | 8 | 0 | 8 | 8 |
| MD Pickup | E85 FF | No | 13 | 0 | 13 | 13 |
| MD Van (Cargo) | CNG DE | No | 1 | 0 | 1 | 1 |
| MD Van (Cargo) | E85 FF | No | 24 | 0 | 24 | 24 |
| MD Van (Passenger) | E85 FF | No | 5 | 0 | 5 | 5 |
| Totals: | | | 276 | 0 | 276 | 254 |

### 3. Projected EPAct Acquisition Credits Summary

| | |
|---|---|
| Base AFV Acquisition Credits: | 254 |
| Zero Emission Vehicle (ZEV) Credits: | 0 |
| Dedicated Light Duty AFV Credits: | 0 |
| Dedicated Medium Duty AFV Credits: | 0 |
| Dedicated Heavy Duty AFV Credits: | 0 |
| Biodiesel and Renewable Diesel Fuel Usage Credits:[4] | 2 |
| Total EPAct Credits: | 256 |
| Overall EPAct Compliance Percentage: | 305 % |

## 2017 AFV Report: Forecast Data (FY2020)

### 1. Forecast Light-Duty Vehicle Acquisitions and Exemptions

| | Acquisitions | | |
|---|---|---|---|
| | **Leased** | **Purchased** | **Total** |
| Total Light-Duty Vehicle Acquisitions | 173 | 0 | 173 |
| Fleet Exemptions: Fleet Size | 0 | 0 | 0 |
| Fleet Exemptions: Foreign | 0 | 0 | 0 |

| | | | |
|---|---|---|---|
| Fleet Exemptions: Geographic | 0 | 0 | 0 |
| Fleet Exemptions: Non-MSA Operation | 0 | 0 | 0 |
| Vehicle Exemptions: LE Vehicle | 11 | 0 | 11 |
| Vehicle Exemptions: Non-covered Vehicle | 0 | 0 | 0 |
| Vehicle Exemptions: Non-MSA Operation | 131 | 0 | 131 |
| Total EPAct-Covered Vehicles | 31 | 0 | 31 |

**2. Forecast Alternative Fuel Vehicle Acquisition Detail**

| Vehicle Type | Fuel | LE | Acquisitions | | | EPAct Credits |
|---|---|---|---|---|---|---|
| | | | Lease | Purchase | Total | |
| Light Duty Vehicles | | | | | | |
| Sedan/St Wgn Compact | E85 FF | No | 3 | 0 | 3 | 3 |
| Sedan/St Wgn Compact | E85 FF | Yes | 2 | 0 | 2 | 0 |
| Sedan/St Wgn Compact | GAS HY[3] | No | 3 | 0 | 3 | 3 |
| Sedan/St Wgn Compact | GAS HY[3] | Yes | 3 | 0 | 3 | 0 |
| Sedan/St Wgn Midsize | E85 FF | No | 1 | 0 | 1 | 1 |
| Sedan/St Wgn Midsize | E85 FF | Yes | 4 | 0 | 4 | 0 |
| Sedan/St Wgn Subcompact | E85 FF | No | 61 | 0 | 61 | 61 |
| LD Minivan 4x2 (Cargo) | E85 FF | No | 3 | 0 | 3 | 3 |
| LD Minivan 4x2 (Passenger) | E85 FF | No | 42 | 0 | 42 | 42 |
| LD Pickup 4x2 | E85 FF | No | 7 | 0 | 7 | 7 |
| LD Pickup 4x2 | GAS HY[3] | No | 1 | 0 | 1 | 1 |
| LD SUV 4x2 | E85 FF | No | 1 | 0 | 1 | 1 |
| LD Van 4x2 (Cargo) | E85 FF | No | 1 | 0 | 1 | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| LD Van 4x2 (Passenger) | E85 FF | No | 4 | 0 | 4 | 4 |
| LD SUV 4x4 | E85 FF | No | 1 | 0 | 1 | 1 |
| LD SUV 4x4 | E85 FF | Yes | 1 | 0 | 1 | 0 |
| LD SUV 4x4 | GAS HY[3] | No | 3 | 0 | 3 | 3 |
| Medium Duty Vehicles | | | | | | |
| MD Other | E85 FF | No | 14 | 0 | 14 | 14 |
| MD Pickup | E85 FF | No | 4 | 0 | 4 | 4 |
| MD Van (Cargo) | E85 FF | No | 21 | 0 | 21 | 21 |
| MD Van (Passenger) | E85 FF | No | 6 | 0 | 6 | 6 |
| Totals: | | | 186 | 0 | 186 | 176 |

### 3. Forecast EPAct Acquisition Credits Summary

| | |
|---|---|
| Base AFV Acquisition Credits: | 176 |
| Zero Emission Vehicle (ZEV) Credits: | 0 |
| Dedicated Light Duty AFV Credits: | 0 |
| Dedicated Medium Duty AFV Credits: | 0 |
| Dedicated Heavy Duty AFV Credits: | 0 |
| Biodiesel and Renewable Diesel Fuel Usage Credits:[4] | 2 |
| Total EPAct Credits: | 178 |
| Overall EPAct Compliance Percentage: | 574 % |

## Notes:

1. Rows identified with LE "yes" show EPAct credits granted for acquisition of law enforcement (LE) and emergency/emergency response (E/ER) vehicles. DOE has determined that credits will not be granted for acquisition of these vehicles beginning with FY2010 and in all years after FY2010. FAST users are advised to carefully review the role any such credits are playing in overall compliance with EPAct's acquisition requirements for their organization(s).
2. For years prior to 2009, EPAct acquisition credits were not granted for acquisition of vehicles with hybrid fuel configurations (e.g., gas-electric hybrid configurations). Beginning with 2009 and continuing forward for all subsequent years, vehicles with these fuel

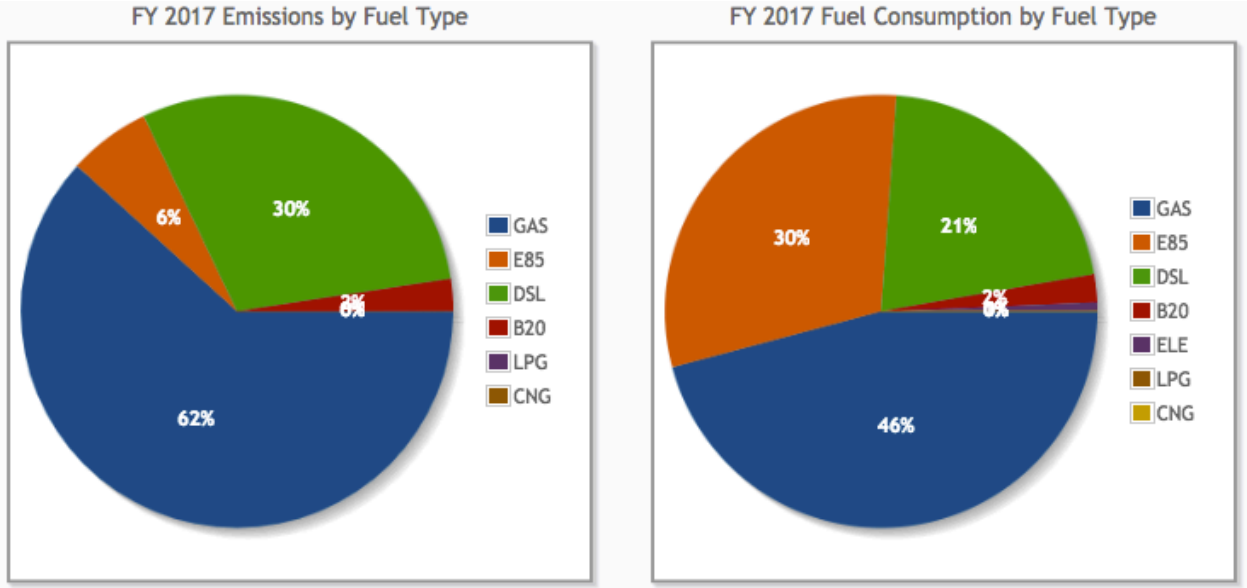
configurations are considered alternative fueled vehicles and corresponding credits are granted and shown, if appropriate, in the above tables.

3. EPAct allows credits toward compliance to be granted for consumption of biodiesel fuel; one (1) credit toward compliance is granted for each 450 gallons of biodiesel consumed, with a maximum of 50% of an organization's credits toward compliance coming from biodiesel consumption.

## Greenhouse Emission (GHG) Per Fleet-wide Mile Reduction Goal

Since it is difficult, to project GHG emission reductions in out years, only actual data is provided for FY 2016. E.O. 13693 established NASA's GHG emission per mile reduction baseline in FY 2014 and established the NASA goals & milestones for out years through FY 2025.

## Actual FY 2017 emission compared to fuel type consumption.



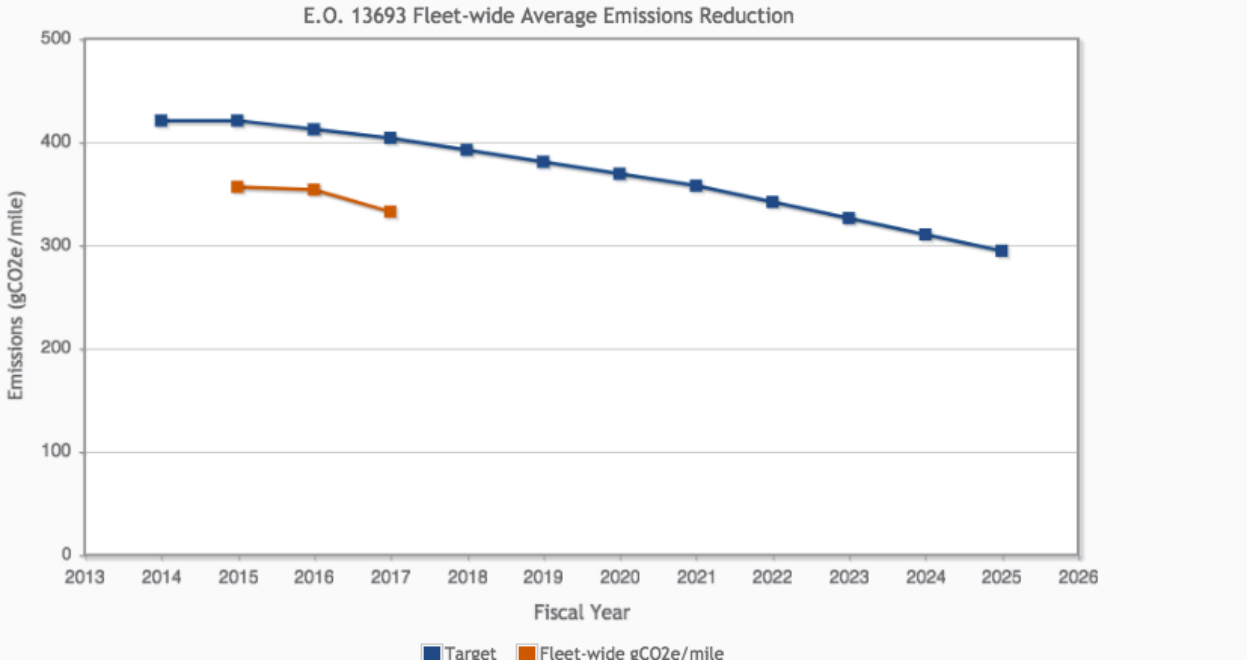
# EO 13693 GHG/mile Progress and Compliance Report

## National Aeronautics and Space Administration — FY2017

**About this Report:** This report provides an overview of the corresponding agency's compliance with the requirement from Executive Order (EO) 13693, "Planning for Federal Sustainability in the Next Decade", which mandates Federal motor vehicle fleets reduce their average greenhouse gas (GHG) emissions. Subject agencies are required to reduce their fleet-wide average GHG/mile by specific targets for each year through FY 2025 relative to an FY 2014 baseline figure established by the Department of Energy (DOE).

When viewed at the agency level, this reports compares annual performance against the DOE-established annual targets, and provides additional detail about the current year's reported consumption in terms of volumes of fuel consumed in subject vehicles and the contributions of that fuel to the resulting emissions metric.

When viewed for individual fleets or for bureaus below the agency level (and for agencies for which FY 2014 baselines and out-year targets have not been established by DOE), this report provides a similar view of the corresponding organization's GHG/mile metric and fuel consumption. No targets for reduction of the GHG/mile metric will be shown, as those targets are established only at the agency level and only for agencies specifically designated as being subject to the EO.



| Fiscal Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Required Reduction | Baseline | | 2.00% | 4.00% | 6.75% | 9.50% | 12.25% | 15.00% | 18.75% | 22.50% | 26.25% | 30.00% |
| Target | 420.22 | | 411.82 | 403.41 | 391.86 | 380.30 | 368.74 | 357.19 | 341.43 | 325.67 | 309.91 | 294.15 |
| Fleet-wide gCO2e/mile | | 356.04 | 353.34 | 332.03 | | | | | | | | |
| Total kgCO2e | 5,198,318 | 4,732,318 | 4,479,513 | 4,070,271 | | | | | | | | |
| Miles | 12,370,447 | 13,291,577 | 12,677,507 | 12,258,631 | | | | | | | | |
| Emissions (kgCO2e) | 5,198,318 | 4,732,318 | 4,479,513 | 4,070,271 | | | | | | | | |
| Alternative Fuels | 1,108,687 | 594,232 | 504,685 | 348,237 | | | | | | | | |
| B100 | 0 | 0 | 0 | 0 | | | | | | | | |
| B20 | 629,012 | 194,668 | 210,606 | 95,095 | | | | | | | | |
| CNG | 82,233 | 66,111 | 106 | 902 | | | | | | | | |
| E85 | 397,442 | 331,306 | 293,972 | 250,419 | | | | | | | | |
| ELE | 0 | 0 | 0 | 0 | | | | | | | | |
| HYD | 0 | 0 | 0 | 0 | | | | | | | | |
| LNG | 0 | 0 | 0 | 0 | | | | | | | | |
| LPG | 0 | 2,147 | 0 | 1,821 | | | | | | | | |
| R100 | 0 | 0 | 0 | 0 | | | | | | | | |
| Petroleum Fuels | 4,089,631 | 4,138,086 | 3,974,829 | 3,722,034 | | | | | | | | |
| DSL | 706,996 | 933,842 | 1,234,412 | 1,209,035 | | | | | | | | |
| GAS | 3,382,635 | 3,204,245 | 2,740,417 | 2,512,999 | | | | | | | | |
| Fuel Consumption (GGE) | 861,899 | 751,888 | 693,845 | 618,839 | | | | | | | | |
| Alternative Fuels | 403,661 | 289,266 | 251,089 | 204,496 | | | | | | | | |
| B100 | 0 | 12 | 0 | 0 | | | | | | | | |
| B20 | 84,971 | 26,297 | 28,450 | 12,846 | | | | | | | | |
| CNG | 12,395 | 9,965 | 16 | 136 | | | | | | | | |
| E85 | 297,643 | 248,114 | 220,155 | 187,538 | | | | | | | | |
| ELE | 8,652 | 4,601 | 2,468 | 3,741 | | | | | | | | |
| HYD | 0 | 0 | 0 | 0 | | | | | | | | |
| LNG | 0 | 0 | 0 | 0 | | | | | | | | |
| LPG | 0 | 277 | 0 | 235 | | | | | | | | |
| R100 | 0 | 0 | 0 | 0 | | | | | | | | |
| Petroleum Fuels | 458,238 | 462,622 | 442,756 | 414,343 | | | | | | | | |
| DSL | 76,420 | 100,940 | 133,429 | 130,686 | | | | | | | | |
| GAS | 381,818 | 361,682 | 309,327 | 283,657 | | | | | | | | |

The majority of vehicles acquired by NASA and other federal fleets are leased from GSA. These leases include maintenance and fuel costs for the vehicles. Annual usage for the Agency is determined through the use of GSA credit card purchase history for alternative fuel. However, since product code standards are not uniform among suppliers of alternative fuels (e.g. ethanol or E-85), it is difficult for credit card vendors to determine the specific fuel purchased. The exception may be natural gas, which is usually purchased at local utility refueling sites, which allows fleets to contact the utility for an accurate accounting of purchased fuel. Alternative fuel consumption data is approximated from proportioning GSA data and internal record keeping efforts.

## Summary

As detailed in this report, NASA exceeded the AFV acquisition requirements of EPAct in FY 2017 and projects to repeat this accomplishment in FYs 2018, 2019 and 2020. In addition, NASA's fleet was able to meet the target set for GHG/mile reduction in FY 2017.