



2016

Green Fleet Annual Report

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Background

Local Law #9 of 2015, establishing a Sustainable Green Fleet Policy was adopted by the Ulster County Legislature in August of 2015 and approved by the County Executive in September of 2015. While vital to the operation and function of County Government, the Green Fleet Law recognizes the environmental and economic impact of fleet operations and details ways in which to reduce these costs and impacts. The law sets forward requirements to inventory the fleet, monitor the fuel use, optimize the vehicle use of existing vehicles, and requires the purchase of new green fleet vehicles to meet a green fleet goal.

The monitoring and implementation of the Green Fleet Law is a collaborative effort between various Executive Departments, including the Department of the Environment, the Department of Public Works (Fleet Manager), as well as UCAT, UC Purchasing Department and others.

Reporting Requirements

The Green Fleet Law requires that a report is prepared each year on or before March 1st and filed with the County Executive and the Ulster County Legislative Standing Committee assigned with the Department of the Environment and any other Committee as determined by the Clerk of the Legislature.

The report shall include but not be limited to:

- Documentation of fuel use and emission associated with the fleet;
- Information addressing the intent and purpose of the law (Section 1), the fleet inventory (Section 3), and the Green Fleet Policy implementation strategies (Section 5);
- Assessment of goals as outlined in policy and whether they have been attained; and,
- Recommendations regarding actions to be taken in order to meet the goals as well as recommendations as to specific changes or modifications to the policy.

Key Fleet Statistics

Number of Vehicles

As of the end of year in 2016, the County's inventory included 419 vehicles (not including certain types of heavy equipment in DPW) in 26 different departments/divisions. This number is down from 424 vehicles included in the 2015 inventory.

Retired/Auctioned Vehicles

Nine passenger vehicles, four vans, nine pickup trucks, one bus, and thirty-five pieces of construction equipment (including dump trucks, tractors, flatbeds, Oshkosh trucks, gradalls,

backhoes, mowers, chippers, and other equipment) were determined to be surplus and were auctioned in 2016. A full list of auctioned vehicles is included as Appendix C.

New Vehicles

The UC DPW Fleet Manager continues to work with departments to review the intended use and need for each vehicle request. The most efficient vehicle practicable is procured ensuring "right-sizing" of the fleet as we move forward. The following new vehicles were purchased in 2016. A total of 20 vehicles were received in 2016 and added to the inventory as of year end 2016.

- UCAT received one new Chevrolet Cutaway bus in 2016,
- Three 2017 Chevrolet Volt plug-in hybrid electric vehicles (PHEVs), four Ford Fusion Energis (PHEVs), and one Ford Fusion hybrid were received by the County in 2016.
- Five 2017 Ford Explorer vehicles were received by the Sheriff's Office in 2016.
- One sign truck, two tri-axel trucks, and three single axel trucks (2017 International diesel) were received by Department of Public Works Highways Division in 2016
- One 2017 Ford F-250 was purchased in 2016 and received by the County in 2017.
- One 2017 Ford F-150, one 2017 Ford Fusion hybrid, and one 2017 Ford Transit Connect were ordered in 2016 and will be received in 2017.

2016 Fuel Use and Emissions

In 2016, the County used a total of 248,528 gallons of unleaded fuel and 263,529 gallons of diesel fuel. Fuel is used and dispensed under the following systems:

- A credit card procurement system (WexOnline) that allows vehicle drivers to fuel up at any service station (almost all unleaded vehicles and a few smaller diesel trucks use this system);
- Diesel tanks maintained by DPW at the Quarry and Substations as well as a fuel truck terminal pickup for diesel highway equipment; and,
- Diesel tanks and unleaded tanks at UCAT for use and operation of the UCAT bus fleet.

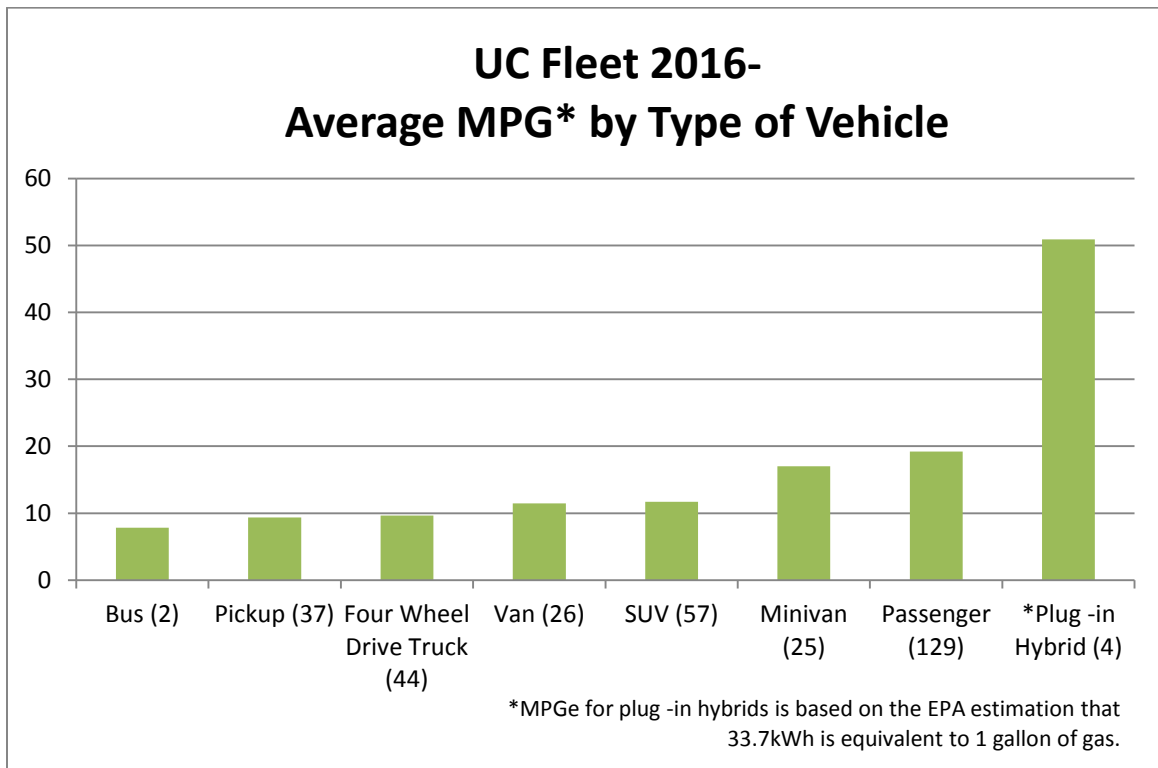
Approximately half of all the fuel used is monitored by reviewing the WexOnline system transactions (which allow each fuel fill-up to be linked to a specific driver and specific vehicle). In addition, fuel use records for the refilling of the diesel tanks maintained by DPW (which allow for tracking total volume of fuel dispensed and are linked to user cards but are not tracked to a specific vehicle) and records from UCAT (which are linked to vehicles and drivers) were also reviewed. To compile this report 17,050 individual fueling records from the WexOnline system

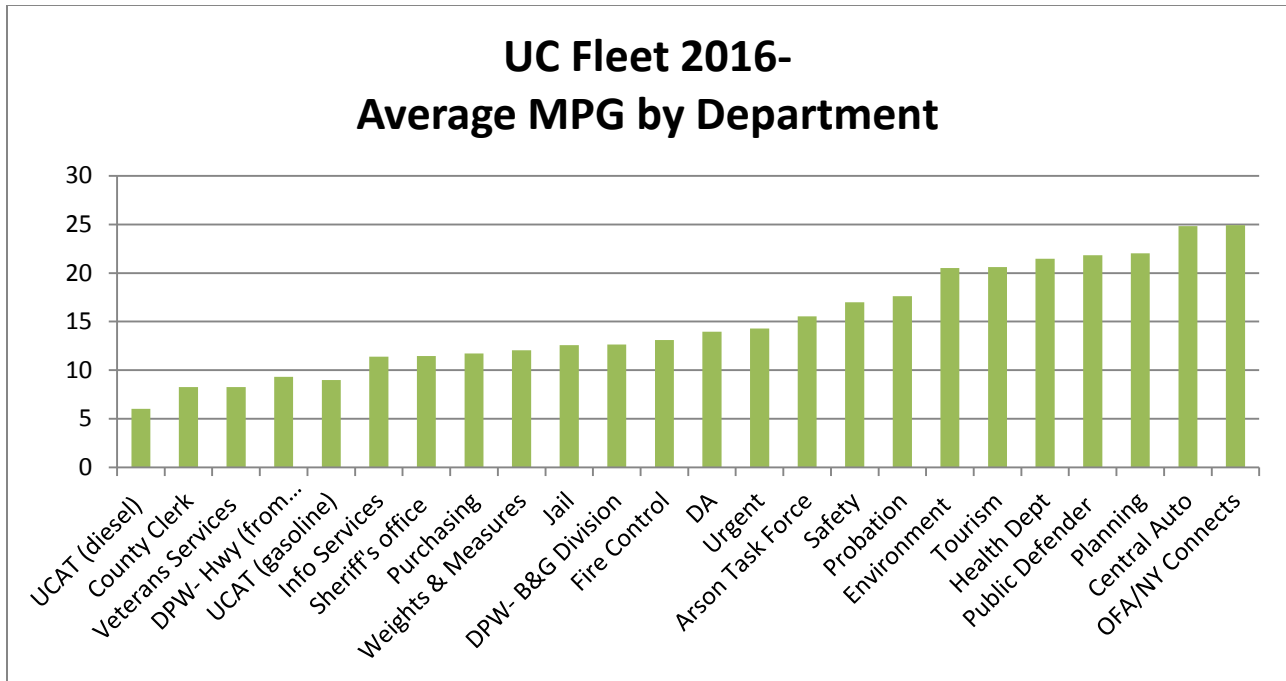
were reviewed, 302 fueling records for DPW Highway Division diesel tanks and terminal pickups were reviewed as well as records from UCAT.

Fleet emissions were then calculated based on the total volume of unleaded fuel consumed, total volume of petro-diesel fuel consumed, and the total volume of biodiesel consumed. The summary of total gallons consumed, miles driven, fuel cost and emissions is included as Appendix A.

Miles per Gallon (MPG) and Miles per Gallon Equivalent (MPGe) Analysis

For all fleet vehicles that have individual fueling records (those tracked in the WexOnline system) an mpg analysis was performed. This analysis does not include DPW Highway Division Heavy Vehicles or UCAT buses. For the plug-in hybrids, an MPGe (miles per gallon equivalent) analysis was performed. This analysis considers both the unleaded fuel and the electricity required to operate the vehicle and uses the EPA's estimation that 33.7 kWh is equivalent to 1 gallon of gas. The MPGe analysis is a way to compare the total energy (gas and electric) required to operate the car, or to put it another way, it's a measure of overall efficiency. However, it is important to note that since the County's electricity is from renewable (zero emission) sources, when calculating the emissions from the electric vehicles, only the actual unleaded fuel consumed was considered and not the MPGe.





Green Fleet Goals and Implementation

The Policy has multiple stated goals and intents. The following is a summary of the implementation and monitoring of the Green Fleet Policy as it relates to certain goals and intents.

Fleet Inventory and Fuel Monitoring

The Green Fleet Policy requires extensive monitoring of the fleet composition as well as fuel consumption. Because of the variety of departments, vehicles, fuel types, vendors and fueling systems, as well as the diversity of operations, there is a tremendous amount of data to collect and synthesize for this analysis. As systems continue to be refined and improved to track and monitor the fleet and fuel consumption, the precision, accuracy and ability to describe operations at any one point in time will only continue to improve.

For example, in order to track the fuel uses with more precision for the Highways and Bridges division of DPW, a new fuel tracking system, FuelMaster, was purchased and installed at all of the substation tanks and pumps during 2016. The system is currently being prepared for use (data is being input and the system is being tested) and should be fully operational by the second quarter of 2017. When fully deployed, this will allow for automatic, accurate tracking of mileage and fueling data for all highway diesel vehicles that fuel at substation tanks.

Right-Sizing of the Fleet

The Fleet Manager continues to actively manage the fleet for efficiency. The removal of older, more inefficient vehicles is one way this is completed, as is documented by Appendix C. The Fleet Manager also works with departments to determine their needs and provides vehicle

alternatives which, although they may not technically be a green vehicle, are the most cost and fuel efficient vehicle for the job. For example, several larger vans used by Buildings & Grounds and Veterans' have been replaced with Ford Transits. The new vehicles take approximately half as much fuel to drive the same distance as the old vehicles.

Green Vehicle Procurement

It is a stated goal of the Green Fleet Policy that by 2020, 5% of the fleet will be Green vehicles. Based on the 2016 year end inventory of 419 vehicles, 21 Green vehicles would be required to meet this goal.

As of year end (2016), the County has 14 Green vehicles as per the policy definition including the following:

- Six Hybrid UCAT Buses
- Four PHEV Ford Fusion Energis
- Three PHEV Chevy Volts
- One Hybrid Ford Fusion

This tally of green vehicles does not include clean diesel trucks at DPW, clean diesel buses in the UCAT fleet, or the other vehicles in the UCAT fleet that operate on biodiesel.

In 2017, the County is in the process of procuring an additional 11 PHEVs and 1 battery electric vehicle (BEV), which will bring the total Green vehicle inventory to 26. This will exceed the Green Fleet requirement three years before the 2020 goal.

In 2016, Chevy Volts were purchased through an aggregate bid with an additional \$5,000 per vehicle DEC rebate which led to a total reduction of approximately \$10,000 from the MSRP for the vehicles. This brought the purchase price of the vehicle down to that of a comparable gas vehicle. The County will continue to take advantage of any NYS aggregated purchases and/or rebate opportunities for vehicles as available.

Electric Vehicle Charging Network

The County's network of nine electric vehicle charging stations (located at the County Office Building, County Courthouse, Department of Public Works, Probation, SUNY Kingston Center, Ulster Avenue Office Complex, Golden Hill, Law Enforcement Center, and Trudy Resnick Farber in Ellenville), funded through the NYSERDA and ChargeNY initiative, continues to provide multiple levels of benefits. The stations provide infrastructure for the widespread deployment of electric vehicles through the County fleet; they provide a comprehensive network of chargers for employees as well as needed publically accessible EV charging infrastructure. All of these benefits are directly in line with the stated intents of the Green Fleet Policy.

As the County continues to deploy electric vehicles in our fleet, and the public ownership of electric vehicles increases, there is a need to continue to expand the charging station infrastructure on County property. To this end, the County applied to NYS DEC funding in December of 2016 to install an additional six charging stations on County property (two at Golden Hill, two at Ulster Ave Office Complex, one at the County Office Building, and one at the

SUNY Ulster campus in Stone Ridge). The County was awarded \$71,258.36 of DEC funding for these projects in early 2017 and expects to have installations complete by summer 2017.

The County's charging network provides access to workplace charging to 97% of the County's workforce. This is significant on several levels. First, the County's greenhouse gas inventory not only includes emissions associated with building operation and the county fleet but includes emissions associated with employee commutes (22% of the total GHG emissions). More fuel efficient vehicles are one significant way to decrease the emissions and environmental impact associated with employees commuting to and from work. Second, the availability of workplace charging is documented as a significant factor influencing the purchase of an electric vehicle. If and when an employee purchases an EV, the benefits (decreased emissions) extend beyond their commute which is a benefit to the entire community. Workplace charging not only reduces the County's GHG emission and carbon footprint but leads to wider community and regional benefits.

The multiple funding sources which the County has taken advantage of have acknowledged the multiple benefits of EV charging infrastructure and have had slightly different policy objectives. The NYSERDA ChargeNY initiative explicitly sought to increase infrastructure for workplace charging and fleet charging, with public charging as an ancillary benefit. The NYS DEC funding is meant to fund "public charging and/or clean fleet charging." The State, like the County, acknowledges the multiple layers of benefits to these units and we are confident that we can accommodate multiple user groups at the charging stations while giving priority to certain groups at certain times (i.e. fleet vehicles during work hours).

EV Charging Station Usage

Detailed information on the usage of the County's network of stations (by the public and the UC fleet) are included as Appendix B. However, it should be noted that:

- Four Ford Fusion Energis (PHEVs) were received and deployed in 2016. In addition, three Chevy Volts (PHEVs) were received in late 2016 and deployed late 2016 early 2017. The Ford Fusion Energis have averaged 60 mpg. We expect even better mileage from the Volts as they have a greater electric range.
- The Ulster County Regional Chamber of Commerce sponsored the public charging session costs in 2016 and will continue to do so in 2017.
- Public charging stations at County buildings were used 1,388 times in total from January through December 2016. These charging sessions consumed approximately 9,388 kWh of electricity. It is estimated that 3,943 kg of greenhouse gas emissions were avoided due to that usage.
- Of that total usage, hybrid plug-ins in the County fleet accounted for 380 of the charging sessions and consumed approximately 2218 kWh of electricity.

Biodiesel

The County continues to use biodiesel blend (B5) at UCAT with the exception of times of continuous cold temperatures when the fuel gels and causes operational problems. Biodiesel is derived from plant and animal sources versus petro-diesel which is refined from crude petroleum. Biodiesel is generally considered a greener, more sustainable alternative to petro-diesel since it is not fossil fuel based and the regeneration of the plant and animal stock fixes (absorbs) the CO₂ emissions associated with the burning of the biodiesel product. The use of biodiesel reduced greenhouse gas emissions (CO₂E) by nearly 28,700 kg in 2016.

Education and Presentations

All departments receiving electric vehicles have been trained on the use of the cars, charging stations, the goals of the Green Fleet Policy, the availability of workplace charging and other ways to green their commute (including reduced UCAT fares for County employees and ride sharing resources). In addition, the County's Green Fleet efforts have been presented to audiences across the state through NYS DEC and NYSEDA sponsored forums including webinars and conferences. The County has also lent technical support and resources to municipalities in Ulster County seeking funding for EV charging stations and other green fleet efforts. Numerous municipalities are seeking funding from DEC for public charging stations in their communities which will only help to increase the number of local EV drivers as well as the attractiveness of Ulster County to EV tourists.

Recommendations

The County charging station network, which became operational in July of 2015, has experienced increased use. The charging station network is used by three distinct user groups: employees operating fleet vehicles, workplace charging users, and the general public. The largest user group (as measured by individual charging sessions) are the public users. At this time, workplace charging does not represent significant usage, however that could change in the future. Among these user groups, fleet vehicle charging is an obvious priority as vehicles must be charged and ready for use in order to be most efficient. As we anticipate further increases in use, Ulster County should continue to take advantage of available funding (e.g. NYSEDA, NYS DEC) to defray the cost of green vehicles and cover the cost of charging stations.

Based on a detailed review of EV charging records, we have not found that the public users leave vehicles plugged in at stations for excessive lengths of time. The median public charging session charge time in 2016 was 1 hour and 43 minutes and the median time plugged in at a station was 2 hours and 28 minutes. This data, based on over 1,000 individual charging sessions, shows that the vast majority of users are using the station as intended during shorter stops and trips and, in fact, 94% of charging sessions in 2016 were less than 4 hours in duration. While the stations may occasionally be used for longer periods, this is not the typical usage pattern. We believe small changes in signage would be adequate in addressing the relatively small instances of mis-use. At this time, our recommendation is that the Ulster County Legislature consider revising their current policy that limits non-electric vehicles to occupying the charging station spots for no longer than two hours to a new policy that clearly prohibits non-electric vehicles from occupying these spots.

APPENDIX A

TABLE 1- Number of vehicles, distance driven, fuel used, cost and GHG emissions reported by department (2016)

Department	Number of Vehicles	Distance Driven (miles)	Fuel (gallons)	Cost (\$)	Emissions in kg CO2e
Office for the Aging/NY Connects	4	12,366	496	\$807	4,414
Dept Social Services	35	590,529	19,935	\$31,853	177,421
Central Auto	8	26,563	1,070	\$1,764	9,521
Environment	1	3,440	168	\$285	1,493
Planning	1	1,129	51	\$88	456
Health Dept	16	139,917	6,514	\$10,689	57,975
Public Defender	1	3,206	147	\$246	1,306
District Attorney	8	55,481	3,232	\$5,308	28,767
Probation	19	104,656	5,939	\$9,726	52,859
Safety	3	17,386	1,022	\$1,614	9,099
Urgent	17	104,167	7,282	\$12,829	64,805
Arson Task Force	2	17,067	1,097	\$1,817	9,763
Tourism	1	8,705	422	\$682	3,759
Fire Control	2	10,621	810	\$1,362	7,205
Jail	18	146,527	11,639	\$19,037	103,586
Sheriff's office	62	891,607	77,783	\$126,780	692,268
Purchasing	1	7,402	632	\$1,003	5,626
Weights & Measures	2	16,156	1,340	\$2,116	11,928
DPW- B&G Division	31	138,274	10,935	\$19,318	97,324
DPW- Hwy (from WexOnline)	60	670,504	71,944	\$118,495	640,302
DPW-Hwy (diesel tank deliveries and pickup)	84	UNK	119,046	\$181,333	1,216,650
Veterans Services	6	77,629	5,980	\$9,343	53,219
Info Services	7	11,274	988	\$1,538	8,796
County Clerk	2	5,075	614	\$961	5,462
UCAT (diesel)	22	869,704	144,483	\$241,287	1,432,895
UCAT (gasoline)	6	166,413	18,480	\$29,383	186,177
TOTAL	419	4,095,798	512,049	\$829,664	4,883,076

**APPENDIX B-
Ulster County Electric Vehicle Charging Stations- Detailed Usage Report (2016)
Pursuant to Resolution No. 332 of 2015**

	All Vehicles	Fleet	Public- Excluding Fleet
Total Energy Usage (kwh)	9,388	2,218	7,170
Total Cost to County (@\$0.109 kwh)	\$1023.29	\$241.76	\$781.53
Number of Charging Sessions	1,388	380	1,008
Average Energy per Session (kwh)	6.76	5.84	7.11
Average cost per session (@\$0.109 kwh)	\$0.74	\$0.63	\$0.75
Greenhouse Gas Avoided (kg)	3,943	932	3,012
Gallons of Gas Saved	1,178	278	900
Median Time Charging*			1 hr 43 min

Sponsorship by UC Chamber for 2016 **\$1,000.00**

Public Charging Cost 2016 **\$781.53**

*Charging sessions lasting less than four hours make up 94% of public sessions

Unique User Zip Codes-

Shaftsbury VT, Mendham NJ, New York NY, Chappaqua NY, Elmsford NY, Tarrytown NY, Astoria NY, Averill Park NY, Delmar NY, Schenectady NY, Kingston NY, Accord NY, Bearsville NY, Cottekill NY, Glenford NY, High Falls NY, Kerkhonkson NY, Lake Katrine NY, Port Ewen NY, Saugerties NY, Woodstock NY, Clintondate NY, Elizaville NY, Gardiner NY, Highland NY, New Paltz NY, Red Hook NY, Rhinebeck NY, Wappingers Falls NY, Newtown PA, Chevy Chase MD, and Rockville MD.

Chart 1- Number of Charging Sessions by Week (2016)

Number of Sessions (1,388)

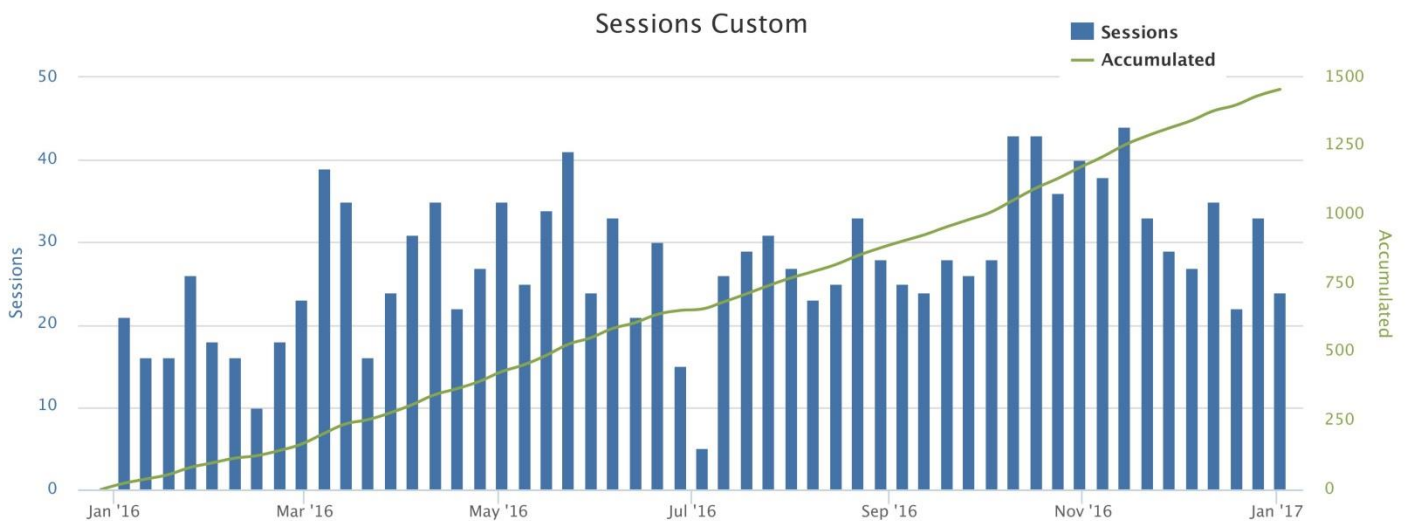


Chart 2- Energy Use by Week (2016)

Total Energy= 9,388 kwh

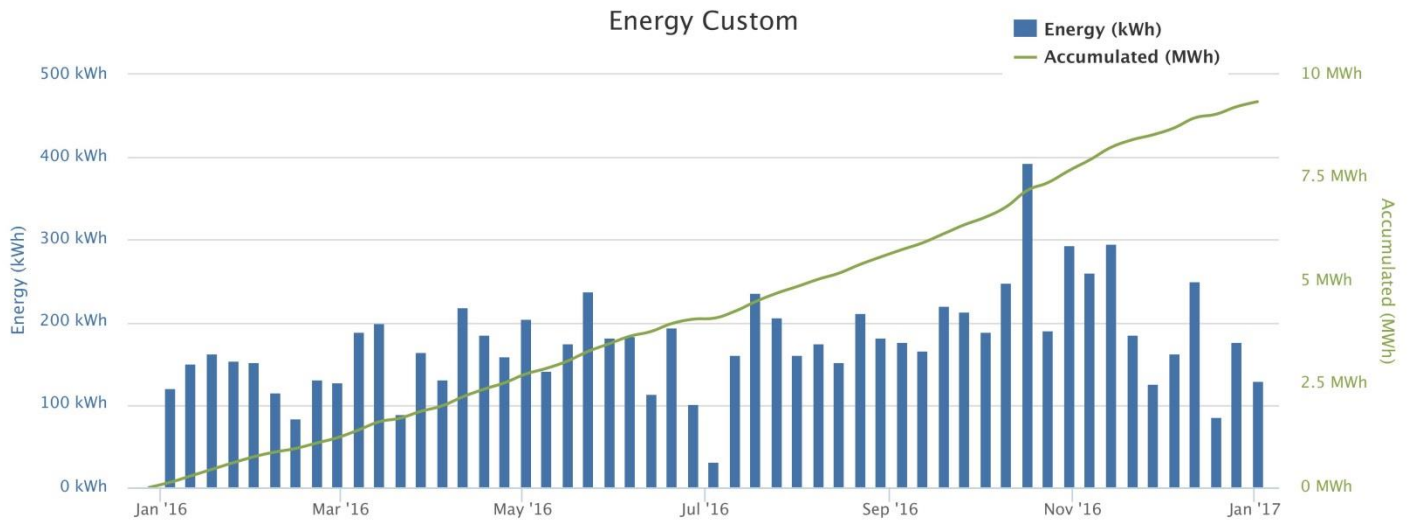
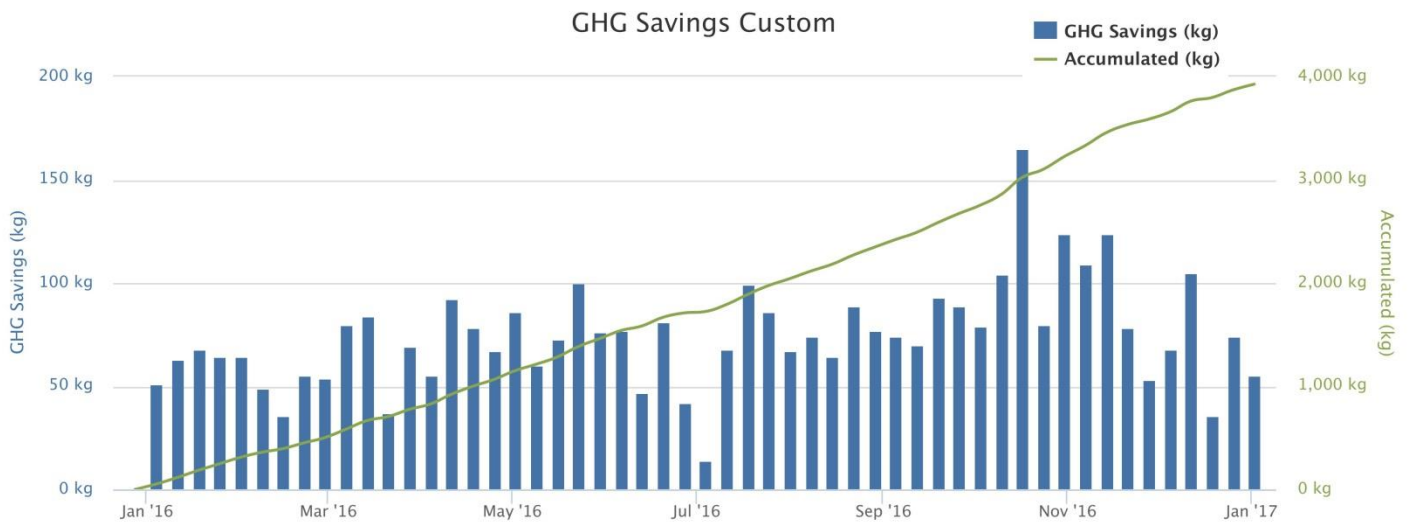


Chart 3- GHG Emissions Avoidance by Week (2016)

Total Energy= 9,388 kwh



APPENDIX C- List of Auctioned Vehicles (Spring 2016)

- Lot #1 consists of one 1999 Ford Taurus Sedan Fleet #9
- Lot #2 consists of one 1998 Chevy K3500 Crew Cab Pickup Fleet #27
- Lot #3 consists of one 2004 Ford FreeStar Mini Van Fleet #44
- Lot #4 consists of one 2004 Dodge Durango SUV Fleet #53
- Lot #5 consists of one 2002 Chevy Impala Sedan Fleet #62
- Lot #6 consists of one 1.998 Ford F150 Pickup Fleet #97
- Lot #7 consists of one 1999 Ford Taurus Sedan Fleet #110
- Lot #8 consists of one 2000 Ford Taurus Wagon Fleet #114
- Lot #9 consists of one 2004 Chevy Astro Minivan Fleet #143
- Lot #10 consists of one 2008 Dodge Durango SUV Fleet #287
- Lot #11 consists of one 2005 Mercedes SLK350 Roadster Fleet #545
- Lot #12 consists of one 2001 Chevy 1500 Pickup Fleet #1110
- Lot #13 consists of one 2001 Chevy 1500 Pickup Fleet #1120
- Lot #14 consists of one 2001 Chevy 1500 Pickup Fleet #1130
- Lot #15 consists of one 2001 Chevy 1500 Pickup Fleet #1140
- Lot #15A consists of one 2001 Chevy 1500 Pickup Fleet #1150
- Lot #16 consists of one 2002 Ford Taurus wagon Fleet #1180
- Lot #17 consists of one 2002 Ford Taurus wagon Fleet #1200
- Lot #18 consists of one 2002 Chevy G3500 Van Fleet #1210
- Lot #19 consists of one 2000 Ford E150XL Van Fleet #1240
- Lot #20 consists of one 2U00 Chevy 1500 Pickup Fleet #1270
- Lot #21 consists of one 1996 Chevy 3500 Pickup Fleet #1290
- Lot #22 consists of one 2002 Chevy 3500 Utility Body Fleet #1480
- Lot #23 consists of one 1998 Chevy 2500 Flatbed Fleet #1500
- Lot #24 consists of one 2005 GMC 3500 Crew Cab Dump Fleet #1720
- Lot #25 consists of one 2005 GMC 3500 Crew Cab Dump Fleet #1820
- Lot #26 consists of one 2005 GMC 3500 Crew Cab Dump Fleet #1840
- Lot #27 consists of one 2006 GMC 3500 Crew Cab Dump Fleet #1850
- Lot #28 consists of one 2005 GMC 3500 Crew Cab Dump Fleet #1880
- Lot #29 consists of one 1997 Chevy 3500 Crew Cab Pickup Fleet #1900
- Lot #30 consists of one 1997 Chevy 3500 Crew Cab Dump Fleet #1950
- Lot #31 consists of one 1988 Ford L8000 Cab & Chassis Fleet #2390
- Lot #32 consists of one 1999 Sterling L9511 Dump Fleet #2520
- Lot #33 consists of one 1986 Ford L8000 70' Boom Fleet #2900
- Lot #34 consists of one 1999 Mack DM690SX Dump Fleet #3170
- Lot #35 consists of one 1999 Mack RD6885 Tractor Fleet #3380
- Lot #36 consists of one 1990 Talbert 35 Ton Lowboy Trailer #3550
- Lot #37 consists of one 1967 Oshkosh Cab & Chassis Fleet #4300
- Lot #38 consists of one 1970 Oshkosh Cab & Chassis Fleet #4370
- Lot #39 consists of one 1970 Oshkosh Cab & Chassis Fleet #4380
- Lot #40 consists of one 1980 Oshkosh Cab & Chassis Fleet #4430
- Lot #41 consists of one 1984 John Deere 510 Backhoe Fleet #5180
- Lot #42 consists of one 1988 Cat IT18B Loader Fleet #5210
- Lot #43 consists of one 1991 Gradall660E Fleet #5540
- Lot #44 consists of one 1997 Gradall XL41 00 Fleet #5560
- Lot #45 consists of one 1996 Midland SA Shoulder Machine Fleet #6010
- Lot #46 consists of one 1980 Dynapac D30 roller Fleet #6280
- Lot #47 consists of one 1995 Eager Beaver VAD67 Roller Fleet #6300
- Lot #48 consists of one 1997 AM General6X6 Army Truck Fleet # 6710
- Lot #49 consists of one 1994 MB Sweepster Motorized Broom Fleet #6790

Lot #50 consists of one 1995 Case 3220 Tractor w/flail mower Fleet #7160
Lot #51 consists of one 1999 Case CX90 Tractor w/flail mower Fleet #7170
Lot #52 consists of one 2000 Case CX90 Tractor w/larm mower Fleet #7180
Lot #53 consists of one 1994 Woodchuck Chipper Fleet # 8240
Lot #54 consists of one 2002 Salsco Chipper Fleet #8270
Lot #55 consists of one 2004 Salsco Chipper Fleet #8280
Lot #56 consists of one 1974 P&H MT250N 25 Ton Crane Fleet #5490
Lot #57 consists of one 2009 Ford E450 Cutaway Bus UC Fleet #53
Lot #58 consists of three (3) air operated Seats.