PRINCE GEORGE'S COUNTY
MARYLAND

Petroleum Reduction Consumption Plan

and

Renewable Energy Action Plan

Maryland Smart Energy Communites Grant Program

Disclaimer

This document was prepared by Michael Baker Jr., Inc. on behalf of the Prince George's County Department of Environmental Resources (DER) and Office of Central Services (OCS) using the most current information available at the time it was authored. The document has been designed as a living document and is subject to change. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the Prince George's County Government or any agency thereof.

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Prince George's County

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Executive Summary

A mere glance at the diversity of Prince George's County (the County) confirms its role as a cultural and economic leader of tomorrow. Located in the heart of the Baltimore/Washington corridor, the County borders Washington D.C. and is just 37 miles south of the city of Baltimore. Encompassing almost 500 square miles, Prince George's County has an urban atmosphere that still manages to provide a scenic and peaceful place to live, work, and play. The County serves nearly 900,000 residents and employs over 7,000 individuals.

The Maryland Energy Administration (MEA) administers the Maryland Smart Energy Communities (MSEC) program, funded through the Strategic Energy Investment Fund (SEIF). The SEIF is divided into specific funding allocations, including allocations for general energy efficiency, energy efficiency projects that benefit low-to-moderate income Marylanders, and renewable energy / transportation.

The purpose of the MSEC program is to encourage local governments to adopt certain policies related to energy efficiency, renewable energy, and transportation petroleum consumption reduction, putting plans in place to achieve the goals established in those policies. In exchange, MEA will provide funding to local governments to enable projects that increase energy efficiency, increase the use of renewable energy, or to reduce petroleum consumption, all of which will benefit the local government and promote affordable, reliable, and clean energy. In addition, the MSEC initiatives were designed to help local governments reduce their greenhouse gas (GHG) emissions, as legislated by the Greenhouse Gas Emissions Reduction Act of 2009 (GGRA).

To become a Maryland SEC and receive grant funds, the County was required to submit a successful grant application for two of the three policy options. The County chose to implement the renewable energy and petroleum reduction policies. The grant agreement was signed in May 2013 and allows the County to be eligible for funding provided the timely submission of three deliverables, which are due no later than December 31, 2013, for each policy:

1. Select a baseline year and calculate the total petroleum consumption reduction and renewable energy generation goals.
2. Develop a policy committing the local government to those goals.
3. Develop a Petroleum Consumption Reduction Plan (PCRP) and a Renewable Energy Action Plan (REAP).

Based on the stipulations outlined in the grant agreement between MEA and the County, the County has allocated the grant funds as outlined in the table below.

Table ES- 1: Prince George's County Smart Energy Communities Grant Budget

Funding Allocations	Planned Expenditures
Policy & Baseline Development	$29,960.16
Project Planning	$68,261.53
Project Administration	$5,166.31
Energy Efficiency Projects Benefiting Low-to-Moderate Income Residents	$60,000.00
Direct Project Costs - PCRP	$250,000.00
Direct Project Costs - REAP	$230,000.00
Total	$643,388.00
Total Grant Funding Available	**$643,388.00**

Petroleum Consumption Reduction Plan & Renewable Energy Action Plan

The *Prince George's County Smart Energy Communities Policy* was signed by the County's Deputy Chief Administrative Officer on September 25, 2013. The policy declared the County's intent to take a leadership role in reducing transportation petroleum consumption and increasing renewable energy generation by partnering with the Maryland Energy Administration (MEA) and enrolling as a Smart Energy Community. Specifically, the policy identified calendar year (CY) 2012 as the baseline year and documented the following objectives:

- **To reduce conventional, centralized electricity generation serving applicable County Government buildings by meeting 20 percent of those buildings' electricity demand with distributed, renewable energy generation by 2022 as compared to a baseline of CY 2012.**
- **To reduce the County Government's applicable on-road vehicle petroleum consumption by 20 percent by CY 2018 as compared to a baseline of CY 2012.**
- **To actively participate in the Maryland Smart Energy Community program as part of the County's ongoing commitment to sustainability.**
- **To reduce the County Government's generation of greenhouse gas emissions.**

Based on the select fleet petroleum consumption of 1,640,376 gallons in CY 2012, the County has committed to a goal of reducing petroleum consumption by 328,075 gallons by 2018. The County is currently meeting the renewable energy goal of 10,595,251 kilowatt hours (kWh) through the generation of an estimated 25,657,729 kWh of renewable energy from existing sources. Table ES- 2 highlights the strategies identified in the PCRP and REAP and illustrates total reductions in petroleum, conventional energy use, and greenhouse gases. Estimated costs and cost savings are also presented.

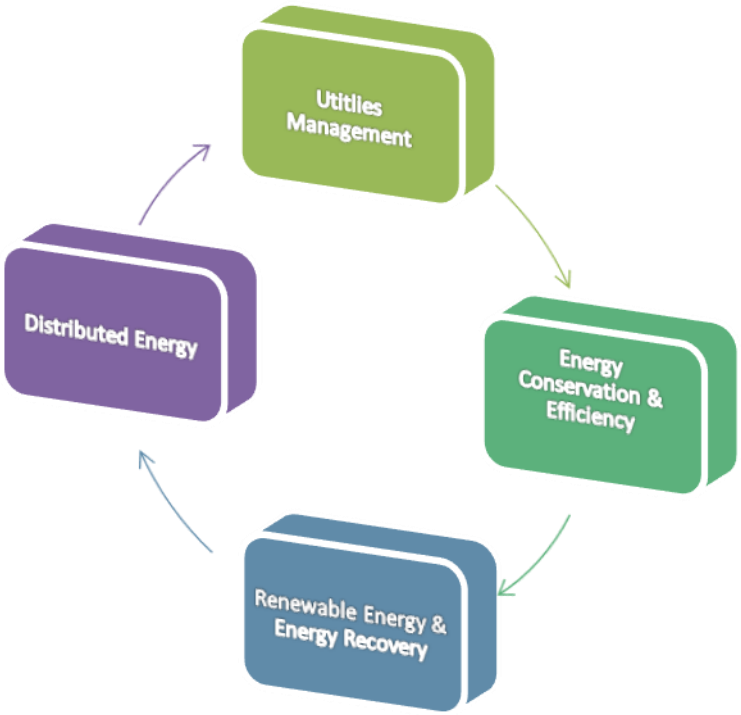
Table ES- 2: Petroleum Consumption Reduction and Renewable Energy Strategies Summary

	Petroleum Consumption Reduction Strategy	Annual Reduction (gal.)	Annual GHG Reduction ($MTCO_2$)	Grant Funds	County/ Other Funds	Total Cost	Annual Cost Savings
1	1-to-1 vehicle replacement	103,256	921.0	$0.00	$2,045,750	$2,045,750	$1,265,803
2	County Fleet Efficiency (Planned, Non-Behavioral)	49,974	418.1	$250,000	$2,794,125	$3,031,125	$170,411
3	County Fleet Efficiency (Behavioral)	48,552	433.1	$0.00	$0.00	$0.00	$165,562
4	Adoption of Biodiesel (B10)	36,512	24.4	$0.00	$43,525	$43,525	NA
5	Conversion of Refuse Trucks to Natural Gas	90,119	206.6	$0.00	$1,700,000	$1,700,000	$159,511
	PCRP Totals	**328,412**	**2,003.3**	**$250,000**	**$6,583,400**	**$6,833,400**	**$1,761,287**
	Renewable Energy Strategy	**Annual Renewable (kWh)**	**Annual GHG Reduction ($MTCO_2$)**	**Grant Funds**	**County / Other Funds**	**Total Cost**	**Annual Cost Savings**
1	Existing 404 kW Solar PV	527,479	372.2		NA – Existing		$15,824
2	Existing Landfill Gas	25,130,250	17,730.7		NA – Existing		$2,363,723
3	2.4 MW Solar PV at Landfill	2,944,800	2,077.7	NA – Power Purchase Agreement			$88,344
4	Solar PV at County Animal Shelter	50,307	35.5	$230,000	NA	$230,000	$1,509
5	Solar PV Electric Car Charging Stations (3 dual-head)	42,479	29.0	NA	$100,000	$100,000	$1,274
	Renewable Energy Totals	**28,695,315**	**20,245.1**	**$230,000**	**$100,000**	**$330,000**	**$2,470,674**
	Petroleum Consumption & Renewable Energy Totals	**NA**	**22,248.3**	**$480,000**	**$6,683,400**	**$7,163,400**	**$4,231,961**

The strategies outlined in the PCRP and the REAP will exceed the goals of the grant agreement and will result in an annual GHG reduction of approximately 22,248 $MTCO_2e$. In addition to the grant funds of $480,000 allocated to the implementation of the strategies, an estimated capital cost of approximately $7 million will be required. An estimated annual cost savings of over $4.2 million will result from purchasing less petroleum products and conventional electricity.

Successful completion of this first round of grant requirements makes the County eligible for future grant funds offered through the MSEC program and is in line with the County's Sustainable Energy Program, which coordinates the County's efforts to reduce energy consumption, cost, and greenhouse gas emissions in buildings and the transportation sector. This is achieved via the implementation of policies, plans, and programs such as the 2008 Energy Policy, the Energy Efficiency and Conservation Strategy, Utilities Management Program, and Draft Climate Change Action Plan. The mission of the Sustainable Energy Program is to provide reliable, sustainable, and environmentally sound energy solutions that enhance the quality of life of Prince George's County residents while concomitantly maximizing energy savings. Figure ES- 1 illustrates the County's Sustainable Energy Program Framework.

Figure ES- 1: Sustainable Energy Program Framework



Part I: Introduction

Prince George's County, Maryland (the County) is 500 square miles in size and is located immediately adjacent to the District of Columbia and 37 miles south of Baltimore. The County serves nearly 900,000 residents by operating 496 utility accounts ranging from offices to streetlights and 3,682 vehicles ranging from refuse trucks to sedans. To lessen the County government's environmental impact, the County is participating in the Maryland Energy Administration (MEA) Maryland Smart Energy Communities (MSEC) program.

The purpose of the MSEC program is to encourage local governments to adopt certain policies related to energy efficiency, renewable energy, and transportation petroleum consumption reduction, putting plans in place to achieve the goals established in those policies. In exchange, MEA will provide funding to local governments to enable projects that increase energy efficiency, increase the use of renewable energy, or to reduce petroleum consumption, all of which will benefit the local government and promote affordable, reliable, and clean energy. In addition, the MSEC initiatives were designed to help local governments reduce their greenhouse gas (GHG) emissions, as legislated by the Greenhouse Gas Emissions Reduction Act of 2009 (GGRA).

To become a Maryland SEC and receive grant funds, the County was required to submit a successful grant application for two of the three policy options. The County chose to implement:

1. An increased reliance on renewable energy generated within the county;
2. An overall reduction of petroleum use in the County's fleet vehicles.

The grant agreement was signed in May 2013 and allows the County to be eligible for funding provided the timely submission of three deliverables, which are due no later than December 31, 2013, for each policy:

1. Select a baseline year and calculate the total petroleum consumption reduction and renewable energy generation goals.
2. Develop a policy committing the local government to those goals.
3. Develop a Petroleum Consumption Reduction Plan (PCRP) and a Renewable Energy Action Plan (REAP).

Based on the stipulations outlined in the grant agreement between MEA and the County, the County has allocated the grant funds as outlined in Table 1 below.

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The *Prince George's County Smart Energy Communities Policy* was signed by the County's Deputy Chief Administrative Officer on September 25, 2013. The policy declared the County's intent to take a leadership role in reducing transportation petroleum consumption and increasing renewable energy generation by partnering with the MEA and enrolling as a Smart Energy Community. Specifically, the policy identified calendar year (CY) 2012 as the baseline year and documented the following objectives:

- **To reduce conventional, centralized electricity generation serving applicable County Government buildings by meeting 20 percent of those buildings' electricity demand with distributed, renewable energy generation by 2022 as compared to a baseline of CY 2012.**
- **To reduce the County Government's applicable on-road vehicle petroleum consumption by 20 percent by CY 2018 as compared to a baseline of CY 2012.**
- **To actively participate in the Maryland Smart Energy Community program as part of the County's ongoing commitment to sustainability.**
- **To reduce the County Government's generation of greenhouse gas emissions.**

Based on the select fleet petroleum consumption of 1,640,376 gallons in CY 2012, the County has committed to a goal of reducing petroleum consumption by 328,075 gallons by 2018 through a combination of education and outreach and the purchase of more fuel efficient and alternatively fueled fleet vehicles. Based on the strategies outlined in the PCRP, the County will achieve a petroleum consumption reduction of 328,412 gallons which will result in a greenhouse gas reduction of 2,003 metric tons of carbon dioxide ($MTCO_2$) by CY 2018.

The County is currently generating an estimated 25,657,729 kilowatt hours (kWh) of renewable energy from solar installations at the Consolidated Warehouse and Fleet Maintenance facilities and from the landfill gas-to-energy (i.e., waste-to-energy) system located at the Brown Station Road Sanitary Landfill. Based on existing strategies and strategies outlined in the REAP, the total reduction in conventional electricity generation of 28,695,315 kWh will result in a GHG reduction of 20,245 $MTCO_2$. Based on a CY 2012 estimate of 52,976,253 kWh, the County is currently exceeding the 20 percent renewable generation goal of 10,595,251 kWh.

Based on guidance from the MEA, the PCRP and REAP must contain all of the components illustrated in Table 2.

Table 2: Prince George's County's Fulfilment of MEA Guidance

	MEA Guidance Requirement	Prince George's County Document Location
1	**A Policy, which establishes the goals of the PCRP and REAP.**	Referenced throughout the document. A signed copy is attached as Appendix A.
2	**Executive Summary of Baseline, Goal and Plans**	Executive Summary / Part I: Introduction
a	Community Characteristics	Executive Summary / Part I: Introduction
b	Overview of Electricity Consumption	Executive Summary / Part II: Policy and Baselines
c	Existing Renewable Capacity	Executive Summary / Part II: Policy and Baselines
d	Outline for Reaching 20 Percent Goals	Part III: Petroleum Consumption Reduction Plan Part IV: Renewable Energy Action Plan
3	**Baseline Narrative**	Part II: Policy and Baselines
4	**Detailed Plans**	Part III: Petroleum Consumption Reduction Plan Part IV: Renewable Energy Action Plan
5	**References Resources**	Part V: Document Update Procedures & Resources

Part II: Policy and Baselines

Policy

The *Prince George's County Smart Energy Communities Policy* was signed by the County's Deputy Chief Administrative Officer on September 25, 2013. The policy declared the County's intent to take a leadership role in reducing transportation petroleum consumption and increasing renewable energy generation by partnering with the MEA and enrolling as a Smart Energy Community. Specifically, the policy identified CY 2012 as the baseline year and documented the following objectives:

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Petroleum Consumption Baseline and Reduction Goal

This summary documents the development of the County's 2012 petroleum consumption baseline and represents the fulfillment of the County's commitments to develop a CY 2012 baseline and establish a 20 percent petroleum consumption reduction goal which will be achieved by 2018.

The County's baseline petroleum consumption was developing using CY2012 data from the County's fleet operations database. Model year (MY), make, model, gallons of fuel consumed, fuel type, miles traveled and miles per gallon data were summarized for each vehicle. As illustrated in Table 3, there are 3,682 vehicles in the County fleet which were categorized by vehicle type. A gasoline gallon equivalent (GGE) factor of 1.13, obtained from tools located on the MEA SEC website, was applied to the gallons of diesel fuel consumed to equate the energy content of diesel and gasoline and provide an even comparison for measuring petroleum consumption reduction in the future.[1]

Following collaboration and an established agreement with MEA, the County removed fire and police emergency response vehicles and transit vehicles from consideration to arrive at the applicable fleet or "select fleet" figures, which are highlighted in yellow in Table 3. The select fleet includes a total of 2,386 vehicles and a petroleum consumption of 1,640,376 gallons which takes into account the application of the GGE factor. The County's petroleum consumption reduction goal is 328,075 gallons by 2018.

[1] http://energy.maryland.gov/Govt/smartenergycommunities/

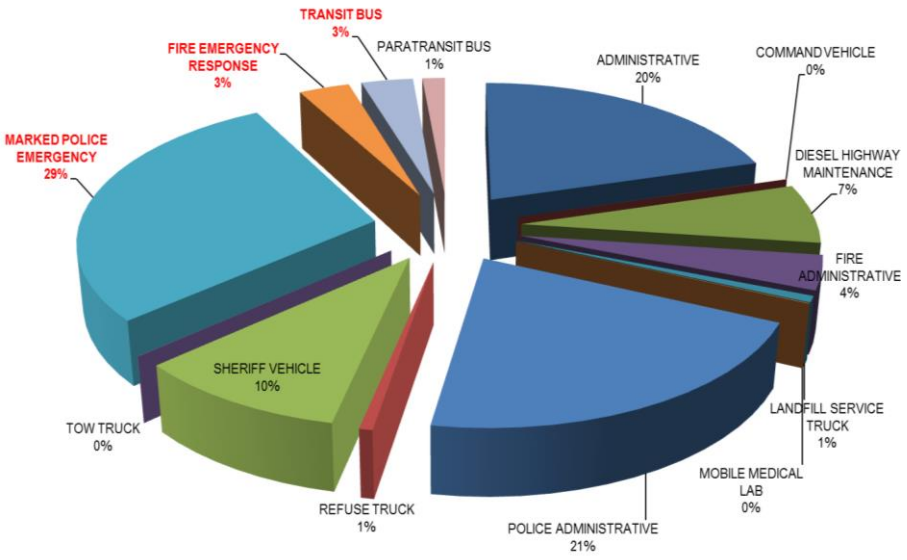
Table 3: Prince George's County Calendar Year 2012 Fleet Summary

	Vehicle Count	Annual Miles Traveled	Fuel Quantity (gal.)	Fuel Quantity (GGE) Applied (gal.)	Average MPG	20 % Reduction (gal.)
Total Fleet	**3,682**	**44,413,759**	**4,001,095**	**4,193,502**	**11.10**	**838,700**
ADMINISTRATIVE	749	4,747,740	290,170	292,087	16.36	58,417
COMMAND VEHICLE	1	2,007	786	888	2.55	178
DIESEL HIGHWAY MAINTENANCE	249	1,464,686	197,612	223,265	7.41	44,653
FIRE ADMINISTRATIVE	144	1,394,786	92,404	92,949	15.09	18,590
LANDFILL SERVICE TRUCK	26	171,433	17,097	19,320	10.03	3,864
MOBILE MEDICAL LAB	2	1,380	465	484	2.97	97
POLICE ADMINISTRATIVE	768	10,073,031	557,729	557,904	18.06	111,581
REFUSE TRUCK	23	278,488	79,751	90,119	3.49	18,024
SHERIFF VEHICLE	371	4,464,682	269,467	269,756	16.57	53,951
PARATRANSIT BUS	52	777,596	82,648	93,392	9.41	18,678
TOW TRUCK	1	1,267	188	212	6.74	42
MARKED POLICE EMERGENCY	*1,058*	*15,887,674*	*1,332,945*	*1,332,945*	*11.92*	*266,589*
FIRE EMERGENCY RESPONSE	*118*	*1,806,010*	*260,100*	*293,883*	*6.94*	*58,777*
TRANSIT BUS	*120*	*3,342,979*	*819,732*	*926,297*	*4.08*	*185,259*
Select Fleet	2,386	23,377,096	1,588,317	1,640,376	14.72	328,075
Percent of Total	65%	53%	40%	39%		

As illustrated in Figure 1, fire and police emergency response vehicles represent 32 percent of the County's total fleet with transit buses representing 3 percent. Administrative vehicles, which include police and fire administration vehicles, make up the largest percentage of the fleet at 44 percent. The select fleet represents 65 percent of the total fleet vehicles.

Emergency vehicles were not included in the baseline because service quality is paramount to their functionality. There are no guarantees that the use of alternative-fuel vehicle technology (at present or by 2018) will not impact vehicle performance. In addition, the County is expected to increase its public safety staff over the

Figure 1: Prince George's County Total Vehicles (3,682) by Vehicle Type

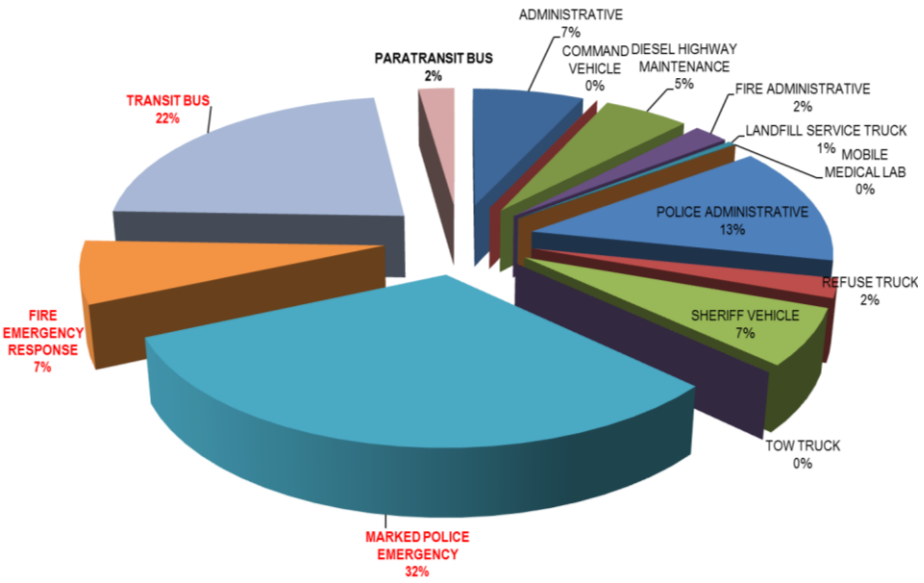


next several years to meet the goals of community improvement projects such as the Transforming Neighborhood Initiative, negating any potential vehicle replacement and retirement benefits, as the vehicle fleet expands to accommodate additional staff. Administrative fire and police vehicles were included in the select fleet and represent 25 percent of the total fleet.

The County can have a minimal impact on the petroleum consumption in the transit bus fleet in the next five years; as a result, those vehicles were not included in the baseline. This is consistent with MEA's desire to focus on short-term (five-year) goals rather than taking a longer-term approach. There are no scheduled replacements or retirements in the next five years and while the County will strive to work the transit contractors / operators, the County has little influence with respect to fuel reduction strategies and the enforcement of those strategies.

Figure 2 illustrates the total fuel consumed in the County by vehicle type. Nearly 40 percent of the total fuel consumed in CY 2012 was used in fire and police emergency response vehicles, while 22 percent was used in transit buses. Of the 22 percent of fuel used in transit buses, 83 percent was used in model year 2008 vehicles, which meet the most up-to-date EPA emission standards. The select fleet represents approximately 40 percent of the County's total transportation petroleum consumption.

Figure 2: Prince George's County % of Total Fuel (GGE) Consumed by Vehicle Type



Electricity Consumption Baseline and Renewable Energy Generation Goal

This section documents the development of the County's 2012 electricity consumption baseline and represents the fulfillment of the County's commitments to develop a CY 2012 baseline and establish a conventional centralized 20 percent electricity consumption reduction goal which will be achieved by 2022.

The County's CY 2012 electricity consumption baseline was calculated based on CY 2012 account billing information from Pepco, BGE and WGES. Total electricity consumption, excluding schools and libraries, was summarized by account. As illustrated in Table 4, consumption data was obtained for 496 accounts and the accounts were categorized by type (see Appendix B for details on categorization).

Following collaboration and an established agreement with MEA, the County removed schools, libraries, buildings categorized as fire (public safety), traffic lights (including red light cameras), and street and outdoor lighting from the total consumption to arrive at the applicable electricity consumption or "select consumption" figures, which are highlighted in yellow in Table 4. As determined through consultation with MEA:

- Schools and libraries were not included in the baseline estimate because the County does not have the jurisdiction necessary to implement strategies impacting the electricity consumed in those buildings.
- Buildings classified as fire (public safety) were excluded because many of them are not owned by the County and they do not fall within the County's operational control.
- Traffic lights and street and outdoor lighting were removed because the County intends on approaching conventional energy use reduction for these categories through the implementation of energy efficient lighting technology (such as LED), rather than through renewable energy sources.

The County included renewable energy generation estimates for the 404 kW solar installations located at the Consolidated Warehouse and Fleet Maintenance facilities and for the landfill gas-to-energy (i.e. waste-to-energy) system located at the Brown Station Road Sanitary Landfill. The solar usage data for CY 2012 was obtained directly from the solar provider. Only the on-site power plant (four 1,050 kW electric generators = 4.2 MW) and the power plant at corrections (three 850 kW electric generators = 2.55 MW) were included in the quantification of the renewable energy generated at the landfill site (see Table 4 and Appendix B).

The select consumption includes a total of 177 accounts and an electricity consumption of 52,976,253 kWh. In addition, the County estimated a total of 25,657,729 kWh generated from renewable sources (solar and landfill) during CY 2012. These values are illustrated in green text in Table 4. The following estimate is based on the methodology presented in MEA's *Renewable Energy Assessment Planning and Financing Webinar* (slide 5), held on September 5, 2013:

The 20 Percent Renewable Generation Goal =	Select Consumption * 20 Percent
	52,976,253 * 20 Percent = 10,595,251 kWh renewable generation
Current Renewable Energy Generation =	25,657,729 kWh
Current Renewable Energy Generation Shortfall =	10,595,251 – 25,657,729 = (15,062,478 kWh) Surplus Renewable

The County is currently exceeding the 20 percent renewable generation goal with existing solar PV and landfill gas.

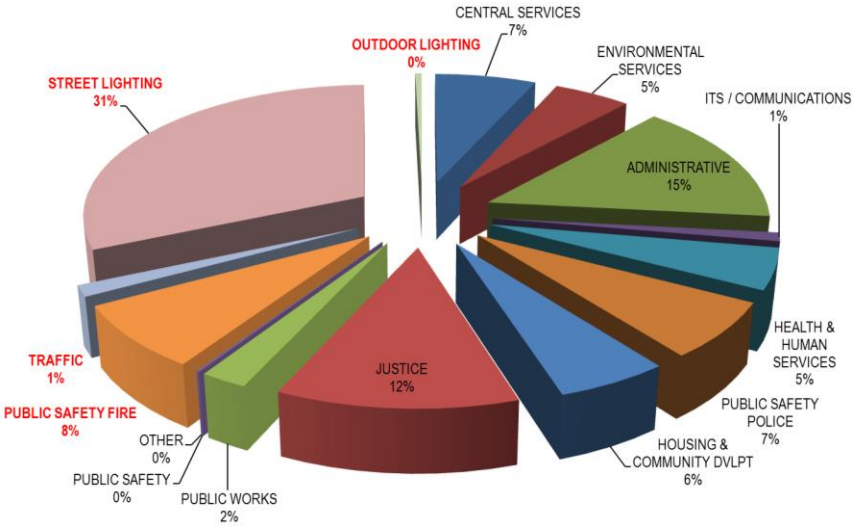
Table 4: Prince George's County Calendar Year 2012 Electricity Consumption Summary

Category	Total Number of Utility Accounts	Total 2012 kWh	% of Total	20% Reduction	20% Reduction (Consumption - Renewable) * 20%
Total Consumption	**496**	**89,288,856**	**100%**	**17,857,771**	**12,726,225**
Total Renewable Generation	NA	***25,657,729***			
SOLAR	NA	527,479			
LANDFILL	NA	25,130,250			
Select Consumption Total	**177**	**52,976,253**	**59%**	**10,595,251**	**5,463,705**
CENTRAL SERVICES	33	5,975,994	7%		
ENVIRONMENTAL SERVICES	22	4,548,774	5%		
ADMINISTRATIVE	11	13,306,869	15%		
ITS / COMMUNICATIONS	6	922,703	1%		
HEALTH & HUMAN SERVICES	10	4,442,003	5%		
PUBLIC SAFETY POLICE	14	6,082,002	7%		
HOUSING & COMMUNITY DVLPT	10	4,971,927	6%		
JUSTICE	11	10,542,195	12%		
PUBLIC WORKS	56	2,067,617	2%		
PUBLIC SAFETY	2	115,957	0.13%		
OTHER	2	212	0.00%		
Excluded Consumption Total	**319**	**36,312,603**	**41%**	**7,262,521**	**2,130,975**
PUBLIC SAFETY FIRE	49	6,918,786	8%		
TRAFFIC	246	1,213,045	1%		
STREET LIGHTING	3	27,799,238	31%		
OUTDOOR LIGHTING	21	381,533	0%		

Figures 3 and 4 do not include the renewable electricity generated at the landfill or by the solar installations. Detailed calculation methodologies and assumptions regarding the landfill calculations can be found in Appendix B.

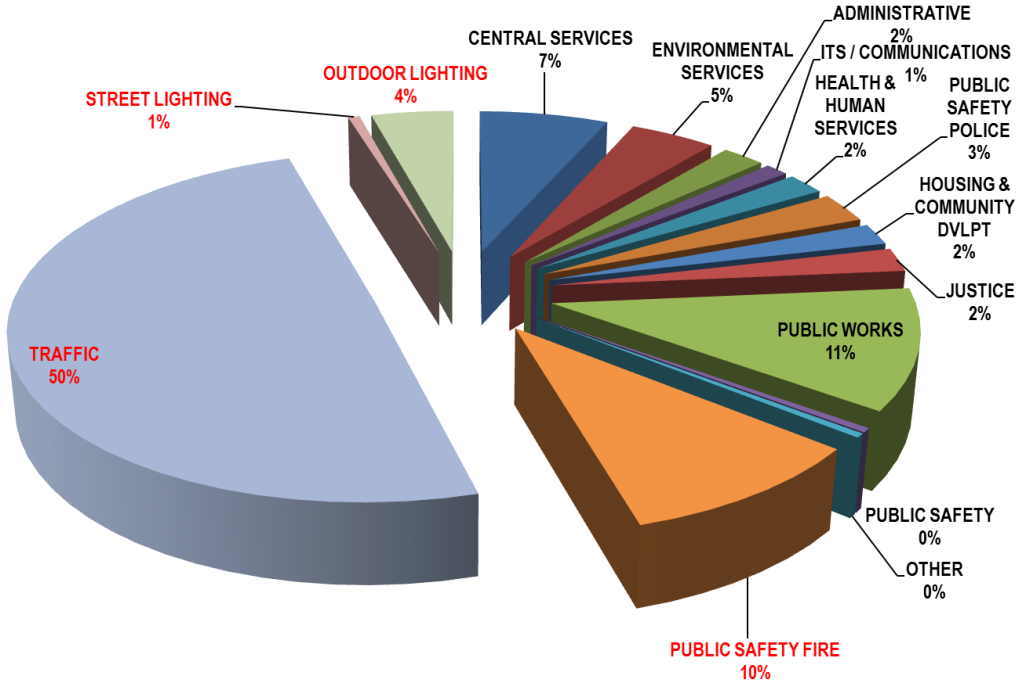
Figure 3 illustrates the total electricity consumed in the County by account type. Public safety (fire) represented 8 percent of the total electricity consumed in CY 2012, while 32 percent was used for outdoor / street lighting and traffic applications. The select categories represent approximately 60 percent of the County's total electricity consumption.

Figure 3: Prince George's County % of Total Electricity Consumption by Account Category



As illustrated in Figure 4, public safety (fire) represents approximately 10 percent of the total electricity accounts. Outdoor / street lighting and traffic represent 55 percent of the County's total Accounts by account category. The select consumption accounts represent approximately 35 percent of the total accounts in the County. These percentages are meant to illustrate a breakdown of the total accounts, but are deceptive. For example, while there are nearly 250 traffic accounts, traffic accounts make up only 1 percent of the total electricity consumption in the County.

Figure 4: Prince George's County Total Electricity Accounts (496) by Account Category



Appendix B illustrates how the accounts were classified into categories. In addition, the appendix includes the calculation methodology and the assumptions made to estimate the renewable energy generated by the landfill for use at the landfill on-site power plant and the corrections power plant.

Part III: Petroleum Consumption Reduction Plan

As illustrated in the baseline section of this plan, the County has established a 20 percent petroleum consumption reduction goal of 328,075 gallons by 2018. The County Government has demonstrated a commitment to implement petroleum consumption reduction that will continue into the future, as documented in the County's Smart Energy Communities Policy.

The PCRP outlines the strategies the County will implement to reach the 20 percent reduction goal. Each strategy is outlined in terms of total gallons reduced and cost and detailed calculation methodologies can be found in Appendix D.

A. Petroleum Consumption Reduction Strategies

The following strategy groups represent a combination of policies or plans in place at the time of the analysis, and additional policies needed to meet the petroleum consumption reduction goal:

1. 1-to-1 (1:1) Vehicle Replacements (Not Yet Planned)
2. County Fleet Efficiency (Planned, Non-Behavioral)
3. County Fleet Efficiency (Behavioral)
4. Adoption of Biodiesel (B10)
5. Conversion of Select Refuse Trucks from Diesel to Natural Gas

1. 1:1 Vehicle Replacements (Not Yet Planned)

The 1:1 vehicle replacements represent replacements that go beyond the County's existing 2014 fleet renewal schedule and the planned County fleet efficiency measures. The objective of this strategy is to replace existing vehicles with more fuel-efficient alternatives. The vehicles identified for replacement do not overlap with the County's currently planned replacements under fleet renewal or the County Fleet Efficiency Plan. The vehicle replacements would be timed throughout the CY 2014-2018 implementation period based on County needs and resources. A list of all the existing County vehicles considered for replacement and the CY 2012 baseline data associated with those vehicles can be found in Appendix C.

The following vehicles were selected as replacements because they are fuel efficient and possess similar administrative and storage capacities to the vehicles they are replacing. All costs are based on model year (MY) 2014 vehicles and represent only the capital costs associated with vehicle purchases; maintenance and operating costs are not incorporated.

- Cars are replaced with the 2.4L Chevy Malibu ($22,140) rather than a $26,860 Chevy Impala
- SUVs are replaced with the Ford Escape EcoBoost ($22,700) rather than a $43,600 Chevy Tahoe
- Vans and pickups are replaced with the Ford Transit Connect ($22,425) rather than a $26,710 Chevy Express Van or a $25,575 Chevy Silverado

Petroleum consumption reduction was determined by using the CY 2012 average miles per gallon (mpg) by vehicle type (car, sport utility vehicle (SUV), van or pickup) and the average replacement vehicle mpg illustrated in Table 5.

Table 5: Petroleum Consumption Reduction Potential and Cost Associated with the 1:1 Vehicle Replacement Strategy

Existing Vehicles			Replacement Vehicles		Annual Gallons Reduced	Replacement Vehicle Cost (per vehicle)	Total Capital Cost	Total Incremental Cost Savings[1]
Type	Number	MPG	Type	MPG				
Car	15	19.47	Chevy Malibu 2.4L	29.0	10,293	$22,140	$332,100	$70,800
SUV	34	13.18	Ford Escape w/ EcoBoost	24.7	58,416	$22,700	$771,800	$710,600
Pickup	42	11.11	Ford Transit Connect	29.5	34,547	$22,425	$941,850	$132,300
Total	**91**	**13.26**		**27.6**	**103,256**		**$2,045,750**	**$913,700**

1. The alternative replacement vehicles listed above are less costly than the traditional replacement vehicles; the total incremental cost represents a savings to the County.

2. County Fleet Efficiency (Planned, Non-Behavioral)

As illustrated in Table 6, the County has identified several fleet efficiency initiatives that have already been planned and will result in a petroleum consumption reduction of 49,974 gallons. For the purposes of this analysis, these initiatives have been grouped together into one strategy. Each initiative is described in detail below and all cost information was obtained from the County and represents only the capital costs associated with each initiative; maintenance and operating costs are not incorporated.

Table 6: County Fleet Efficiency (Planned, Non-Behavioral) Strategies Summary

Petroleum Consumption Reduction Strategy	Year Implemented	Annual Petroleum Reduction (gallons)	Grant Funds	County / Other Funds	Total Cost
Purchase 6 Plug-In Hybrids or Other High MPG Vehicles for Motor Pool	2014 (Y1)	5,139	$170,000	N/A	$170,000
▪ Design/Install EV charging stations			$50,000	N/A	$50,000
▪ Purchase EV charging stations			$30,000	N/A	$30,000
▪ Install on-line car sharing system and install LPG infrastructure			N/A	$13,000	$13,000
Fleet Renewal	2014 (Y1)	8,192	N/A	$1,339,525	$1,339,525
Purchase & Install LPG Fuel Station at Landfill	2014 (Y1)	N/A	N/A	$35,000	$35,000
Purchase 10 Plug-In Hybrids or Other High MPG Vehicles for Motor Pool	2015-2018 (Y2-5)	8,566	N/A	$310,000	$310,000
▪ Train Mechanics on Plug-In Hybrid Tech.	2015-2018 (Y2-5)	N/A	N/A	$4,250	$4,250
▪ Install solar EV Infrastructure at McCormick Complex (proposed)	2015-2018 (Y2-5)	N/A	N/A	$50,000	$50,000
Purchase 5 LPG Animal Control Vans	2015-2018 (Y2-5)	3,559	N/A	$195,000	$195,000
Purchase 36 High MPG Compact SUV's[2]	2015-2018 (Y2-5)	24,518	N/A	$847,350	$847,350
Total	**2014-2018**	**49,974**	**$250,000**	**$2,794,125**	**$3,044,125**

2. The dramatic differences between the gallons saved for SUV-related strategies in Table 5 and Table 6 reflect a vast difference in the documented MPG of the vehicles being retired and the vehicles chosen to replace them.

Purchase 6 Plug-In Hybrid or Other High MPG Vehicles for Motor Pool

During fiscal year (FY) 2014, $170,000 of grant funds will be used to procure a new motor pool fleet of six Plug-In Hybrid Electric Vehicles (PHEVs). The County identified 33 administrative vehicles, MY 1999-2009 Chevrolet Cavaliers, for

replacement. The replacement fleet traveled a total of 155,322 miles with an average fuel efficiency of 22.93 mpg in CY 2012 and consumed 6,774 gallons of petroleum. By contrast, the mpg equivalence for vehicles in the six-unit PHEV fleet is 95 mpg which corresponds to an annual petroleum consumption of 1,635 gallons and a savings of 5,139 gallons.

Additional infrastructure to support this endeavor includes:

- A $50,000 grant fund investment to design/install the EV charging stations installation at the Peppercorn facility to provide for charging of pool vehicles and, potential, public vehicles in the future.
- A $30,000 grant fund investment for the purchase of EV charging stations for installation at the Peppercorn facility to provide for charging of pool vehicles. Three dual-head, Level 2 charging systems will be installed with dedicated parking spaces. The option is available for the installation of Level 3 chargers with pay capability for employees and/or the public.
- A $13,000 County/other funds investment for the installation of automated motor pool hardware and software at the Peppercorn and Largo facilities to allow an on-line car sharing system for pool vehicles.

Fleet Renewal

Fifty-seven (57) fleet vehicles will be replaced by more fuel-efficient vehicles in FY 2014. The replacement of these vehicles will result in a reduction in fuel consumption of 8,192 gallons (based on a CY 2012 fuel use of 27,424 gallons/year versus fuel use after replacement of 19,232 gallons/year). The County estimates using approximately $1,339,525 of County/Other funds on fleet renewal.

Plug-in Hybrid Vehicle Pooled Fleet-Beyond 2014

Using the same fuel economy and cost statistics as the Plug-in Hybrid Vehicle Pooled Fleet for FY 2014, the next phase of this endeavor (2015-2018) will involve the purchase of ten PHEVs at a cost of $310,000 in County/Other funds. The estimated fuel reduction resulting from this initiative is 8,566 gallons.

Additional infrastructure to support this endeavor includes:

- $4,250 in County/Other funds to provide ATS or Ford factory training for mechanics on Ford plug-in hybrid technology.
- $50,000 in County/Other funds for the installation of electric vehicle infrastructure at the proposed McCormick location to provide for charging of pool vehicles. With dedicated parking space, there will be three dual-head, solar powered, Level 2 charging systems. The option is available for the installation of two-Level 3 chargers with pay capability for employees and/or the public. This initiative is also addressed in the REAP as solar PV will be used to power the charging stations.
- Fleet reduction of 20-30 pool vehicles at the proposed McCormick location that consist of DPWT, DER, and DPIE vehicles. These are older, less efficient, and/or low usage vehicles that will be replaced by PHEVs.

LPG Vans for Animal Control

An estimated $195,000 in County/Other funds will be used to purchase five animal control vans powered by propane auto-gas as replacements for current vehicles exceeding replacement criteria. An average County van traveled 8,313 miles per year with an average fuel consumption of 11.68 mpg in CY 2012. The replacement of these vans will result in a petroleum consumption reduction of 3,559 gallons.

Replacement of SUVs, Pickups and Vans

Approximately $847,350 in County/Other funds will be used to purchase a combination of 36 high mpg compact SUV's and pickups to replace older, low efficiency SUV's and pickups exceeding replacement criteria. The two additional years of fleet renewal will result in a petroleum consumption reduction savings of 16,384 gallons. Additionally, the conversion of six pickups as well as six vans to LPG will provide consumption reductions of 3,863 and 4,270 gallons, respectively. These initiatives will produce a combined petroleum consumption reduction of 24,518 gallons.

Additional Infrastructure

An estimated $35,000 in in County/Other funds will be used to purchase and install propane auto-gas fuel station at the landfill. This would provide an anchor fueling site for the expansion of propane auto-gas fleet to landfill and other departments in the area.

3. County Fleet Efficiency (Behavioral)

To achieve a maximum petroleum consumption reduction of 5 percent, the County is committed to implementing behavioral fleet management strategies. These strategies seek to educate County staff, centralize vehicles to encourage work-related carpooling and educate County departments regarding the true cost of vehicle use. Given the total miles driven in CY 2012, a 5 percent petroleum reduction will reduce petroleum consumption by 48,552 gallons. The fuel reduction resulting from these strategies remains constant whenever the initiative is utilized. Total costs were not estimated for this initiative.

4. Adoption of Biodiesel (B10)

Given the current amount of diesel fuel affecting this initiative (361,505 gallons), a conversion of all diesel fuel to a B10 biodiesel blend would reduce fuel consumption by approximately 10% or 36,512 gallons at an incremental operating cost of $43,525 over diesel fuel. It should be noted that the amount of diesel fuel used by the County totals 451,625 gallons. The difference (90,119 gallons) between the diesel fuel affecting this initiative and the total diesel fuel used by the County is account for in the strategy which converts select refuse trucks from diesel to natural gas. Biodiesel has a lower energy content than conventional diesel, which results in a slightly lower petroleum offset. The cost estimate reflects current data indicating that B10 is approximately eight cents more per gallon than conventional diesel. It is assumed that no capital costs will be needed to implement this strategy.

5. Conversion of Select Refuse Trucks from Diesel to Natural Gas

This strategy quantifies the petroleum consumption reduction of converting select refuse trucks from diesel to natural gas. The strategy implementation varies by scenario and can be included at full implementation, 50 percent implementation, or no implementation. Full implementation represents the conversion of all 26 trucks for a petroleum reduction of 90,119 gallons. The total cost of full implementation is estimated at $1,700,000 and includes the costs of retrofitting the current fleet ($1.3 million) as well as the cost of installing two slow-fill stations ($400,000). Operating and maintenance costs are not included in the cost estimates (e.g., any fuel or repair cost differentials between conventional diesel trucks and natural gas trucks were not estimated).

The County is currently investigating opportunities to create biofuels onsite at the Brown Station Landfill and may incorporate or substitute onsite biofuels use for natural gas use should the technology become viable within the life of this document.

B. Total Petroleum Consumption and GHG Reduction

As illustrated in Table 7, combined implementation of all of the strategies listed above will result in a total petroleum reduction of 328,412 gallons and a corresponding GHG reduction of 2,003 $MTCO_2$ at a total cost of $6,833,400. All of the strategies listed below will be implemented between 2014 and 2018. Figure 5 illustrates the percent breakdown of total petroleum reduction by strategy.

Table 7: Total Petroleum Consumption Reduction Plan Benefits and Costs

	Petroleum Consumption Reduction Strategy	Total Petroleum Reduction (gal.)	Total GHG Reduction ($MTCO_2$)	Grant Funds	County/ Other Funds	Total Cost	Annual Cost Savings
1	1-to-1 vehicle replacement	103,256	921.0	$0.00	$2,045,750	$2,045,750	$1,265,803
2	County Fleet Efficiency (Planned, Non-Behavioral)	49,974	418.1	$250,000	$2,794,125	$3,031,125	$170,411
3	County Fleet Efficiency (Behavioral)	48,552	433.1	$0.00	$0.00	$0.00	$165,562
4	Adoption of Biodiesel (B10)	36,512	24.4	$0.00	$43,525	$43,525	NA
5	Conversion of Refuse Trucks to Natural Gas	90,119	206.6	$0.00	$1,700,000	$1,700,000	$159,511
	Total	**328,412**	**2,003.3**	**$250,000**	**$6,583,400**	**$6,833,400**	**$1,761,287**

Figure 5: Percent Petroleum Consumption Reduction by Strategy

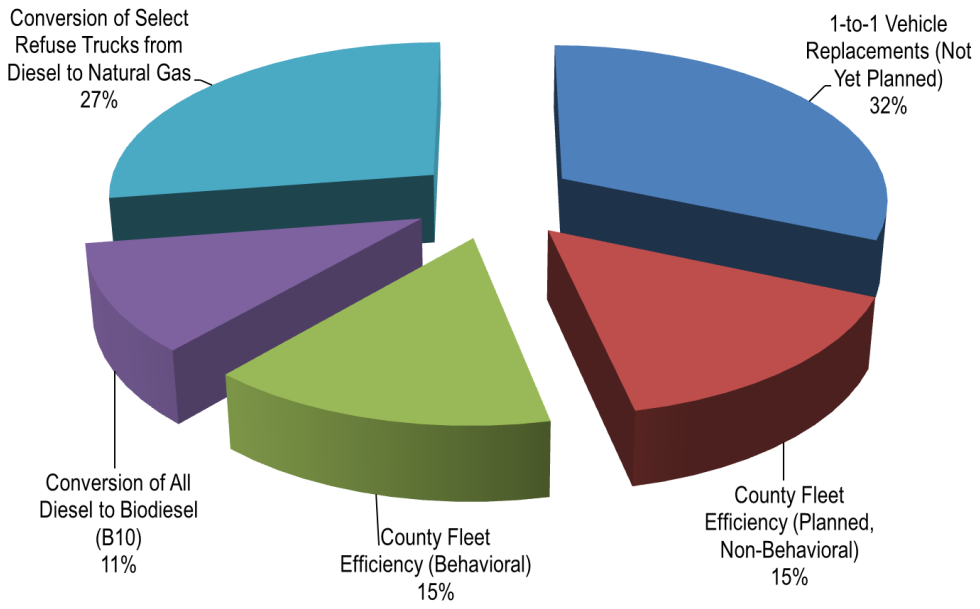
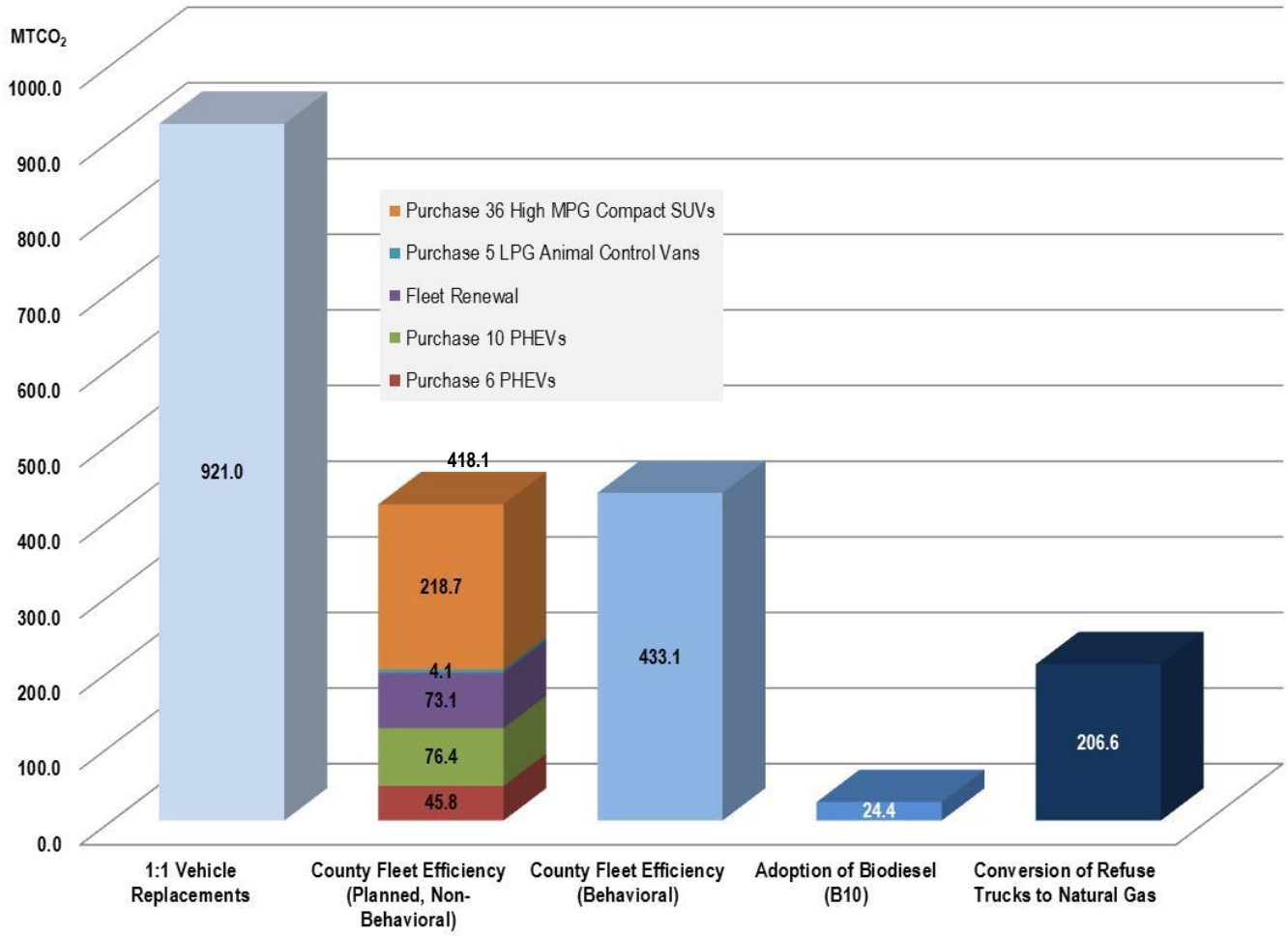


Figure 6 illustrates total GHG reductions by petroleum consumption reduction implementation strategy. The County Fleet Efficiency (Planned, Non-Behavioral) strategy is comprised of several initiatives represented in Figure 6 as a stacked column. Implementation of the petroleum consumption reduction strategies result in a total GHG remission reduction of 2,003 $MTCO_2$. Detailed calculation methodologies and assumptions can be found in Appendix D.

Figure 6: Total Greenhouse Gas Reduction by Strategy



Part IV: Renewable Energy Action Plan

As illustrated in the policy and baseline section of this document, the County is currently exceeding the 20 percent renewable energy generation goal of 10,595,251 kWh. Since 2008, with the development of the County Government Energy Policy, the County Government has demonstrated a commitment to continue implementing energy savings measures, reduce the County Government's generation of Greenhouse Gas emissions, and increase the use of renewable energy. That commitment will continue into the future, as illustrated in the County's Smart Energy Communities Policy

A. Renewable Energy Action Strategies

Though the County is meeting the renewable energy generation goal, the following strategies have been identified for quantification and implementation under the Maryland SEC REAP:

- 2.4 MW Solar PV installation at the landfill
- Installation of three dual-head, solar powered EV charging stations at the (proposed) McCormick Complex
- 41 kW Solar PV installation at the County Animal Shelter

Table 8 outlines the total kWh of renewable energy that will be generated under full implementation of the REAP as well as associated GHG emission reduction benefits and the years of implementation.

Table 8: Renewable Energy Generation Strategies Summary

	Renewable Energy Strategy	Year Implemented	Annual Conventional Electricity Reduction (kWh)	Annual GHG Reduction ($MTCO_2$)	Grant Funds	County / Other Funds	Total Cost	Annual Cost Savings
1	Existing 404 kW Solar PV	Existing	527,479	372.2	NA – Existing			$15,824
2	Existing Landfill Gas	Existing	25,130,250	17,730.7	NA – Existing			$2,363,723
3	2.4 MW Solar PV at Landfill	2014 (Y1)	2,944,800	2,077.7	NA – Power Purchase Agreement			$88,344
4	41 kW Solar PV at County Animal Shelter	2014 (Y1)	50,307	35.5	$230,000	NA	$230,000	$1,509
5	Solar PV Electric Car Charging Stations (3 dual-head)	2015-2016 (Y2-Y3)	42,479	29.0	NA	$100,000	$100,000	$1,274
	Total	**2014-2022**	**28,695,315**	**20,245.1**	**$230,000**	**$100,000**	**$330,000**	**$2,470,674**

The existing solar usage represents data for CY 2012, which was obtained directly from the solar provider. Similarly, the existing landfill gas generation estimate was based on a study conducted by the County which includes actual and forecast data. The total kWh for the 2.4 MW solar installation and the EV charging stations were calculated using MEA's Renewable Energy Technology Annual Generation Worksheet, which was provided to MSEC applicants. The MEA-supplied worksheet assumes a 14 percent capacity factor for solar PV (1,227 hours/year). Cost savings were estimated assuming that the average cost of conventional electricity supplied to the County is 0.09$/kWh and the average cost of solar power is 0.06$/kWh. The cost savings for the solar PV projects does not include any benefit from selling back power not used by the County.

The solar PV at the landfill will be installed under a power purchase agreement and the County is not expected to incur any capital costs (grant or County/Other) for installation.

The electric vehicle charging stations were assumed to require 5.77 kW installations per charger head for a total of 34.62 kW. Based on an average cost of $4.39/W for the purchase and installation of solar PVs, the costs for arrays needed to power the EV charging stations, estimated at approximately $150,000 total, were split between the PCRP ($50,000) and the REAP ($100,000).

The size of the solar PV installation at the County Animal Shelter was back-calculated based on funding. The average cost/watt of purchase and installation was assumed to be $4.39/W and the total funding available for purchase and installation is $180,000. Using these figures, the maximum size of the system would be 41 kW. The remaining $50,000 will be used for design of the PV system.

All of the kWh in Table 8 were multiplied by a conversion factor of 7.0555×10^{-4} metric tons CO_2 / kWh to arrive at the total GHG reduction. This factor was obtained from EPA (http://www.epa.gov/cleanenergy/energy-resources/refs.html) and is based on the Emissions & Generation Resource Integrated Database (eGRID) U.S. annual non-baseload CO2 output emission rate to convert reductions of kilowatt-hours into avoided units of carbon dioxide emissions.

B. Additional Renewable Energy Policies / Strategies

In addition to the quantified strategies above, the County is also incorporating the following strategies, which have not been quantified, but will assist the County in continuing to rely more strongly on renewable energy generation.

Clean Energy Legislation

On November 19, 2013, The Prince George's County Council unanimously approved Council Bill 83-2013, a piece of legislation requiring clean energy systems for new County buildings and major renovations of public buildings. The legislation makes Prince George's County the first jurisdiction in the State of Maryland to fund clean energy systems in all new public buildings and major renovations of public buildings. The legislation requires the county to budget an additional 2% into the total cost of a building or renovation to pay for the required installation of 1 kilowatt (KW) of clean energy for every 1,000 square feet of gross floor area in the building. Council Bill 83-2013 applies to all permanent, public buildings, and major projects renovating at least 50-percent of the gross floor area. Council Bill 83-2013 defines Clean Renewable Energy as "technology or a system that employs solar, wind or geothermal energy."

Responsible Solar Siting

In an effort to encourage solar installations on brownfields, mine sites, parking lots and other "less productive" lands, the MEA has launched the Responsible Solar Siting Initiative that offers incentives and other assistance to solar developers. At the same time, the MEA is endeavoring to make solar installations easier and cheaper by streamlining permitting and inspection processes.

Energy CAP Software Implementation

The County is currently working on improving utility bill management through the implementation of Energy CAP energy management software. Once fully implemented, the software will assist the county in auditing bills for errors, producing energy and GHG reports, identifying areas for improvement, and meeting the goals of the REAP.

Renewable Energy Financing Options

Energy consumption presents a significant burden to organizational budgets, puts undue stress on global fuel supplies and reduces air quality through emissions. The county has already taken decisive steps to adopt responsible energy consumption and management practices, including extraction of methane from landfill decomposition, installation of solar arrays, and efficiency improvement of its vehicle fleet.

There are numerous financing vehicles available to the County and seeking multiple funding sources can help the County set and achieve significant goals. The County will continue to seek funding alternatives to leverage County funds and efforts to implement renewable energy generation projects.

- State Sources such as the MEA Smart Energy Community Grant and the Responsible Solar Siting Initiative (RSSI), which will award grant funding for specified efforts to install Parking Lot Solar Canopies in ideal locations, such as stadiums, Park and Ride lots, airports and malls or other large retail areas. The grant cap is $400,000 per award for projects meeting specific size, location, installation and use parameters.
- Power Purchase Agreements (PPAs) allow governments to partner with private developers to offset cost and risk associated with construction and maintenance of solar facilities. The renewable energy gains provided by PPAs can further the government's ability to pursue grant funding and incentives with low risk of investment.
- Solar Renewable Energy Certificates (SRECs) are available to trade with participating states through SRECTrade. Emphasis has been placed on solar electricity and will frequently trade higher than other renewable energy types.

Part V: Summary

Based on the select fleet petroleum consumption of 1,640,376 gallons in CY 2012, the County has committed to a goal of reducing petroleum consumption by 328,075 gallons by 2018. The County is currently meeting the renewable energy goal of 10,595,251 kilowatt hours (kWh) through the generation of an estimated 25,657,729 kWh of renewable energy from existing sources. Table 9 highlights the strategies identified in the PCRP and REAP and illustrates total reductions in petroleum, conventional energy use, and greenhouse gases. Estimated costs and cost savings are also presented.

Table 9: Petroleum Consumption Reduction and Renewable Energy Strategies Summary

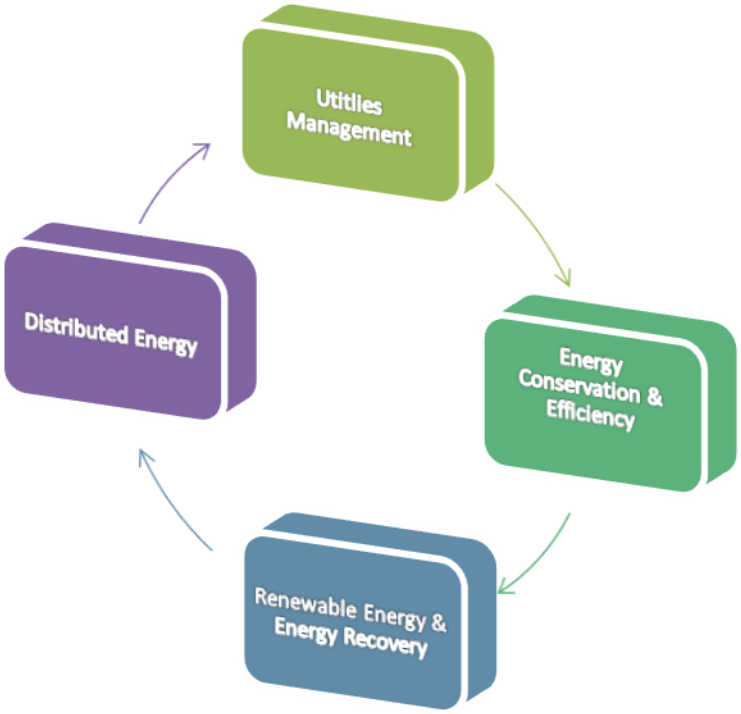
	Petroleum Consumption Reduction Strategy	Annual Reduction (gal.)	Annual GHG Reduction ($MTCO_2$)	Grant Funds	County/ Other Funds	Total Cost	Annual Cost Savings
1	1-to-1 vehicle replacement	103,256	921.0	$0.00	$2,045,750	$2,045,750	$1,265,803
2	County Fleet Efficiency (Planned, Non-Behavioral)	49,974	418.1	$250,000	$2,794,125	$3,031,125	$170,411
3	County Fleet Efficiency (Behavioral)	48,552	433.1	$0.00	$0.00	$0.00	$165,562
4	Adoption of Biodiesel (B10)	36,512	24.4	$0.00	$43,525	$43,525	NA
5	Conversion of Refuse Trucks to Natural Gas	90,119	206.6	$0.00	$1,700,000	$1,700,000	$159,511
	PCRP Totals	**328,412**	**2,003.3**	**$250,000**	**$6,583,400**	**$6,820,400**	**$1,761,287**
	Renewable Energy Strategy	**Annual Renewable (kWh)**	**Annual GHG Reduction ($MTCO_2$)**	**Grant Funds**	**County / Other Funds**	**Total Cost**	**Annual Cost Savings**
1	Existing 404 kW Solar PV	527,479	372.2	NA – Existing			$15,824
2	Existing Landfill Gas	25,130,250	17,730.7	NA – Existing			$2,363,723
3	2.4 MW Solar PV at Landfill	2,944,800	2,077.7	NA – Power Purchase Agreement			$88,344
4	Solar PV at County Animal Shelter	50,307	35.5	$230,000	NA	$230,000	$1,509
5	Solar PV Electric Car Charging Stations (3 dual-head)	42,479	29.0	NA	$100,000	$100,000	$1,274
	Renewable Energy Totals	**28,695,315**	**20,245.1**	**$230,000**	**$100,000**	**$330,000**	**$2,470,674**
	Petroleum Consumption & Renewable Energy Totals	**NA**	**22,248.3**	**$480,000**	**$6,683,400**	**$7,150,400**	**$4,231,961**

The strategies outlined in the PCRP and the REAP will exceed the goals of the grant agreement and will result in an annual GHG reduction of approximately 22,248 $MTCO_2e$. In addition to the grant funds of $480,000 allocated to the implementation of the PCRP and REAP strategies, an estimated capital cost of approximately $7 million will be required. An estimated annual cost savings of over $4.2 million will result from a decreased reliance upon petroleum products and conventional electricity.

Successful completion of this first round of grant requirements makes the County eligible for future grant funds offered through the MSEC program and is in line with the County's Sustainable Energy Program, which coordinates the County's efforts to reduce energy consumption, cost, and greenhouse gas emissions in buildings and the transportation sector. This is achieved via the implementation of policies, plans, and programs such as the 2008 Energy Policy, the Energy Efficiency and Conservation Strategy, Utilities Management Program, and Draft Climate Change Action Plan. The mission of the Sustainable Energy Program is to provide reliable, sustainable, and environmentally sound energy solutions that enhance

the quality of life of Prince George's County residents' while concomitantly maximizing energy savings. Figure 7 illustrates the County's Sustainable Energy Program Framework.

Figure 7: Sustainable Energy Program Framework



Part VI: Resources

Resources

The following resources were utilized in the development of this document. Additional resources can be found in the Appendix.

Prince George's County Sustainable Energy Program:
http://www.princegeorgescountymd.gov/sites/CentralServices/Services/FOM/SustainableEnergyProgram/Pages/default.aspx

Prince George's County Office of Central Services:
http://www.princegeorgescountymd.gov/sites/CentralServices/Pages/default.aspx

Prince George's County Department of Environmental Resources:
http://www.princegeorgescountymd.gov/sites/EnvironmentalResources/About/Pages/default.aspx

MEA Smart Energy Communities: http://energy.maryland.gov/Govt/smartenergycommunities/

National Renewable Energy Laboratory (NREL) PV Watts Calculator: http://pvwattsbeta.nrel.gov/pvwatts.php

U.S. Department of Energy Alternative Fuels Data Center:
http://www.afdc.energy.gov/publications/#search/keyword/?q=alternative fuel price report

U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator:
http://www.epa.gov/cleanenergy/energy-resources/refs.html

Appendices

Appendix A: Prince George's County Smart Energy Communities Policy

SEP 30 2013

THE PRINCE GEORGE'S COUNTY GOVERNMENT
Department of Environmental Resources

September 17, 2013

TO: Carla A. Reid, Deputy Chief Administrative Officer
for Economic Development and Public Infrastructure

FROM: Adam Ortiz, Director
Department of Environmental Resources

RE: Prince George's County's Smart Energy Communities
Policy for Renewable Energy and Petroleum Consumption Reduction
under the Maryland Smart Energy Communities Grant

Attached for your review and approval is a policy for renewable energy and petroleum consumption reduction consistent with the requirements under the Maryland Smart Energy Communities (MSEC) grant. The County was recently awarded a MSEC grant in the amount of $643,388.00 by the Maryland Energy Administration. In order to receive the grant funding, the County is required to develop a policy for both renewable energy generation and petroleum consumption reduction. The policy is consistent with existing County policies on energy and climate change.

The purpose of the MSEC grant is to assist the County in reducing its greenhouse gas emissions and improve air quality. The Department of Environmental Resources is partnering with the Office of Central Services and the Housing Authority on this grant project.

Should you have any questions or need additional information, please feel free to contact me at (301) 883-5812.

Attachments

APPROVED DENIED

09/25/13

Carla A. Reid, Deputy Chief Administrative Officer
for Economic Development and Public Infrastructure

Date

cc: Monica J. Johnson, Director
Office of Central Services

Michelle W. Russell, Associate Director
Administrative Services Division

9400 Peppercorn Place, Largo, Maryland 20774

PRINCE GEORGE'S COUNTY

SMART ENERGY COMMUNITIES POLICY

Objectives

- To reduce conventional, centralized electricity generation serving applicable County Government buildings by meeting 20 percent of those buildings' electricity demand with distributed, renewable energy generation by 2022 as compared to a baseline of calendar year (CY) 2012.
- To reduce the County Government's applicable on-road vehicle petroleum consumption by 20 percent by CY 2018 as compared to a baseline of CY 2012.
- To actively participate in the Maryland Smart Energy Community program as part of the County's ongoing commitment to sustainability.
- To reduce the County Government's generation of greenhouse gas emissions.

Policy

It is the policy of Prince George's County, Maryland to reduce overall energy consumption by implementing energy savings procedures and increasing the use of renewable energy sources. County departments are mandated to cooperate with the Office of Central Services and the Department of Environmental Resources in all efforts to achieve the objectives of this Policy.

Policy Term

This Policy is intended to be a living document that can be revised as circumstances dictate. However, it shall be reviewed by the Department of Environmental Resources and the Office of Central Services no less than every five years to assure that it is being kept current.

[1]

Introduction

This policy declares Prince George's County's intent to take a leadership role in [1] Reducing transportation petroleum consumption and [2] Increasing renewable energy generation by partnering with the Maryland Energy Administration and enrolling as a Smart Energy Community.

This policy is not designed to supersede, but rather to complement several existing policies and plans including, but not limited to: the Energy Policy of 2008, the Sustainability Pilot Program, The Energy Efficiency and Conservation Strategy, and the Draft Climate Change Plan.

Implementation of this Policy requires action and cooperation at all levels of the County organization. The objective of this Policy is to provide a framework for a County-wide, ongoing effort. Employees and Departments are encouraged to be creative and innovative in reducing petroleum consumption and increasing the use of renewable energy.

Distribution of Responsibilities

Employees: Employees are encouraged to take individual action to minimize energy consumption. Actions include, but are not limited to:

- Complying with the Smart Energy Communities measures adopted by the County.
- Identifying and recommending actions that can be taken in addition to implemented procedures for reducing petroleum consumption and increasing the use of renewable energy sources.
- Providing feedback on the Smart Energy Communities Policy, including recommendations for improvements.

Department Heads: All Department Heads are responsible for ensuring the successful implementation of the County's Smart Energy Communities Policy. This includes, but is not limited to:

- Designating a lead person in their respective department to represent the department.

- Communicating with employees about the need to conserve energy and the importance of effectively implementing petroleum consumption reduction measures and increasing renewable energy use within their departments.
- Assist in evaluating sites that can host renewable capacity.
- Encourage the use of alternative fuel and advanced technology fleet vehicles.
- Recognizing employees who contribute to the success of the Smart Energy Communities Policy.
- Encouraging and reviewing employee suggestions for additional conservation measures and when appropriate, working with the Office of Central Services and the Department of Environmental Resources to assess technical feasibility and/or cost effectiveness.
- Monitoring and ensuring the success of the Smart Energy Communities Policy within their department.
- Providing feedback on the Smart Energy Communities Policy, including recommendations for improvements to the Policy.

Fleet Vehicles

It is the policy of the County to reduce applicable on-road vehicle petroleum consumption by the County Government's applicable fleet vehicles by 20 percent within 5 years (CY 2018) of the established petroleum baseline calendar year of 2012; further:

- It is the policy of the County to replace conventional fuel vehicles with hybrids whenever it is practical and financially feasible.
- When it is time for replacement of sport utility vehicles (SUVs), they shall be downsized when possible and/or replaced with hybrid vehicles. If a need for cargo carrying capacity exists, 24+ mpg vehicles with expanded cargo carrying capacities shall be considered.
- Prolonged idling of vehicles is strongly discouraged and also illegal.
- Non-business use of County vehicles shall be minimized.
- Consolidation of trips amongst County employees is encouraged.

- Sharing of fleet vehicles across departmental lines is encouraged.
- Opportunities to ensure reliable supplies and increase the use of alternative fuels through partnerships with fuel retailers will be identified.
- Opportunities for electric vehicle changing station installations at County facilities, including those located in preferred parking locations will be identified.

The County will maintain an annual petroleum consumption inventory for all applicable local-government-owned vehicles. This annual inventory will be utilized to demonstrate petroleum consumption reduction progress. The County will provide progress update reports to the Maryland Energy Administration, upon request, following the successful implementation of grant-funded projects.

To ensure that a minimum 20 percent reduction of County petroleum consumption is met within five years (CY 2018) of the established CY 2012 petroleum baseline, the County will establish a Petroleum Consumption Reduction Plan which will outline the process and include a timetable of execution by which the County will accomplish designated tasks in order to reach the goal. The County will amend the Petroleum Consumption Reduction Plan as necessary in order to meet the 20 percent petroleum consumption goal in the most efficient, cost-effective manner.

Renewable Energy

It is the policy of the County to reduce conventional, centralized electricity generation serving the County Government's buildings by meeting 20 percent of those buildings' electricity demand with distributed, renewable energy generation by 2022 as compared to a baseline of CY 2012; further:

- It is the policy of the County to assess the potential for new renewable generation capacity, including:
  - Solar PV for electricity generation
  - Solar Thermal for water or space heating
  - Geothermal, for spec heating and cooling and hot water
  - Wind for electricity generation

- Power Purchase Agreement (PPA) – A legal contract between an electricity generator (provider) and a power purchaser (buyer, typically a utility or large power buyer/trader). Such agreements play a key role in the financing of independently owned (i.e. not owned by a utility) electricity generating assets.
- Renewable Energy – Energy generated from anyone of the following sources: solar, wind, biomass (excluding saw dust), methane from anaerobic digestion of organic materials, geothermal, ocean, fuel cells powered by methane or biomass, poultry litter, and waste-to-energy facilities.
- Renewable Energy Action Plan – Provides details on current and future electricity consumption, estimates required renewable energy production to meet 20 percent of said energy consumption, and design plans with detailed installation measures and time tables that enable the County to reach its 2022 goal.

Appendix B: Electricity Baseline Categories & Landfill Calculations

Prince George's County Calendar Year (CY) 2012 Electricity Usage Summary

Category	Number of Accounts	Total 2012 kWh	% of Total	Broad Category
Total Consumption	**496**	**89,288,856**	**100.00%**	
Abandoned Vehicle Facility	6	135,508	0.15%	OCS
Animal Shelter	1	17,717	0.02%	DER
Bureau of Admin Services	3	531,730	0.60%	Administrative
Central Communications Facility	1	911,430	1.02%	ITS / Communications
Child Day Care Facility	1	238,756	0.27%	HHS
Combine Fleet Facility	1	253,761	0.28%	OCS
Cora B. Wood Center	1	172,904	0.19%	HHS
Corrections Dept	2	1,610,078	1.80%	PSP
Environmental Dept	3	130,222	0.15%	DER
Forestville Maintenance Shop	1	185,642	0.21%	OCS
Heath Dept	7	3,614,981	4.05%	HHS
Housing	1	661	0.00%	HCD
Justice	6	533,601	0.60%	Justice
Landfill Garage	2	233,463	0.26%	DER
OCS/FOM	25	5,401,084	6.05%	OCS
Police Station/Dept	12	4,471,924	5.01%	PSP
Property Maintenance	7	518,763	0.58%	HCD
Public Works & Transp Dept	43	1,042,186	1.17%	Public Works
Public Works Materials Lab & Sign Shop	2	386,206	0.43%	Public Works
Public Works Supply Warehouse	2	36,779	0.04%	Public Works
Solid Waste Management Div	16	4,167,371	4.67%	DER
Storm Drain Maint Div	9	602,446	0.67%	Public Works
Transmitter Site	5	11,273	0.01%	ITS / Communications
Volunteer Rescue Squa	2	115,957	0.13%	Public Safety
County Administration Building (CAB)	2	4,246,648	4.76%	Administrative
County Service Building (CSB)	1	893,921	1.00%	Administrative
Courthouse (CTHS)	5	10,008,594	11.21%	Justice
Harriet Hunter Building (HHB)	1	415,362	0.47%	HHS
Inglewood Center III (IC3)	2	4,452,502	4.99%	HCD
Largo Government Center (LGC)	3	6,394,016	7.16%	Administrative
RMS Building (RMS)	2	1,240,554	1.39%	Administrative
Other	2	212	0.00%	Other
Subtotal of Selected Consumption	**177**	**52,976,253**	**59.3%**	test
Fire Administration	2	313	0.00%	PSF
Fire Dept	45	6,423,310	7.19%	PSF
Fire House	1	180,366	0.20%	PSF
Fire Services Building	1	314,798	0.35%	PSF
Red Light Camera	3	10,194	0.01%	Traffic
Traffic Sig	29	123,291	0.14%	Traffic
Traffic	204	1,017,659	1.14%	Traffic
Other (Traffic?)	10	61,901	0.07%	Traffic
Outdoor Light/Fire Dept	9	353,846	0.40%	Outdoor Lighting
Outdoor Light/Fire Services Building	2	2,751	0.00%	Outdoor Lighting
Outdoor Light/Forestville Maintenance Shop	1	653	0.00%	Outdoor Lighting
Outdoor Light/Harriet Hunter Building (HHB)	1	420	0.00%	Outdoor Lighting
Outdoor Light/Police Station/Dept	2	3,808	0.00%	Outdoor Lighting
Outdoor Light/Public Works & Transp Dept	1	5,699	0.01%	Outdoor Lighting
Outdoor Light/Public Works Supply Warehouse	1	1,479	0.00%	Outdoor Lighting
Outdoor Light/School (Unoccupied)	1	637	0.00%	Outdoor Lighting
Outdoor Light/Storm Drain Maint Div	1	10,543	0.01%	Outdoor Lighting
Outdoor Light/Traffic	2	1,696	0.00%	Outdoor Lighting
Street Lighting/Public Works & Transp Dept	1	27,657,287	30.98%	Street Lighting
Street Lighting/Traffic	2	141,950	0.16%	Street Lighting
Sub Total of Excluded Consumption	**319**	**36,312,603**	**40.7%**	
Landfill*		**25,130,250**		
Solar		**527,479**		
Sub Total Renewable		**25,657,729**		
(Total Select Consumption - Total Existing Renewable Generation)		***27,318,524***	***kWh***	

Broad Category	Key	
	CENTRAL SERVICES	OCS
	ENVIRONMENTAL SERVICES	DER
	ADMINISTRATIVE	Administrative
	ITS / COMMUNICATIONS	ITS / Communications
	HEALTH & HUMAN SERVICES	HHS
	PUBLIC SAFETY POLICE	PSP
	HOUSING & COMMUNITY DVLPT	HCD
	JUSTICE	Justice
	PUBLIC WORKS	Public Works
	PUBLIC SAFETY	Public Safety
	OTHER	Other
	PUBLIC SAFETY FIRE	PSF
	TRAFFIC	Traffic
	OUTDOOR LIGHTING	Outdoor Lighting
	STREET LIGHTING	Street Lighting

***Landfill: Electricity generation from two on-site power plants using a landfill gas (LFG) collection system.**

Step 1: 2012 electricity generation assuming full capacity = (4.2 MW + 2.55 MW) x 1,000 x 365 days x 24 hours = 59,130,000 kWh

Step 2: 2012 net electricity generation assuming 85% net capacity factor (to account for equipment availability, operating load, and parasitic losses) and 50% of LFG availability = 59,130,000 kWh x 0.85 x 0.50 = 25,130,250 kWh

Reference: EPA 2012 LFG Energy Benefits Calculator (http://www.epa.gov/lmop/projects-candidates/lfge-calculator.html)

Appendix C: Vehicle Replacement List

Vehicle Number	Department	Year	Make	Model	Vehicle Type	Qty	Fuel	GGE	End Odometer in 2012	Begin Odometer in 2012	Miles Traveled in 2012	MPG
550055500	Sheriff's Office	2005	CHEVROLET	TAHOE	SHERIFF VEHICLE	713.10	Unleaded	713.10	143,339	125,048	18,291	25.65
020002108	County Council	2011	FORD	EDGE	ADMINISTRATIVE	940.30	Unleaded	940.30	36,323	17,788	18,535	19.71
510050514	Fire Department	2005	CHEVROLET	TRAILBLAZER	FIRE ADMINISTRATIVE	955.60	Unleaded	955.60	116,215	100,398	15,817	16.55
540054656	DER	2006	CHEVROLET	TRAILBLAZER	ADMINISTRATIVE	1073.30	Unleaded	1073.30	74,195	58,254	15,941	14.85
510050002	Fire Department	2010	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1114.90	Unleaded	1114.90	37,985	21,241	16,744	15.02
510051305	Fire Department	2003	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1114.90	Unleaded	1114.90	164,566	148,955	15,611	14.00
700170610	Health Department	2006	CHEVROLET	BLAZER	ADMINISTRATIVE	1151.00	Unleaded	1151.00	132,397	113,421	18,976	16.49
660061728	Public Works	2004	CHEVROLET	BLAZER	ADMINISTRATIVE	1223.80	Unleaded	1223.80	109,766	91,968	17,798	14.54
020002109	County Council	2010	FORD	EXPLORER	ADMINISTRATIVE	1224.50	Unleaded	1224.50	34,456	15,200	19,256	15.73
510051104	Fire Department	2011	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1232.80	Unleaded	1232.80	25,550	7,314	18,236	14.79
510050521	Fire Department	2005	CHEVROLET	TRAILBLAZER	FIRE ADMINISTRATIVE	1292.05	Unleaded	1292.05	103,621	84,147	19,474	15.07
510051103	Fire Department	2011	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1292.30	Unleaded	1292.30	26,237	3,675	22,562	17.46
500001312	Police Department	2012	CHEVROLET	TAHOE	POLICE ADMINISTRATIVE	1323.48	Unleaded	1323.48	17,496	10	17,486	13.21
510050001	Fire Department	2010	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1367.05	Unleaded	1367.05	44,776	28,156	16,620	12.16
500001241	Police Department	2007	CHEVROLET	TAHOE	POLICE ADMINISTRATIVE	1381.10	Unleaded	1381.10	111,892	94,654	17,238	12.48
500001010	Police Department	2001	GMC	YUKON	POLICE ADMINISTRATIVE	1415.68	Unleaded	1415.68	111,842	92,979	18,863	13.32
500001173	Police Department	2005	CHEVROLET	TRAILBLAZER	POLICE ADMINISTRATIVE	1485.50	Unleaded	1485.50	74,792	58,860	15,932	10.73
510051106	Fire Department	2011	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	1577.90	Unleaded	1577.90	32,203	8,873	23,330	14.79
570057150	Homeland Security Police	2011	CHEVROLET	TAHOE	ADMINISTRATIVE POLICE	1614.00	Unleaded	1614.00	31,448	7,451	23,997	14.87
500001380	Police Department	2005	FORD	EXPEDITION	ADMINISTRATIVE	1671.39	Unleaded	1671.39	105,405	86,675	18,730	11.21
570057010	Homeland Security Police	2010	CHEVROLET	SUBURBAN	ADMINISTRATIVE POLICE	1682.00	Unleaded	1682.00	69,607	45,124	24,483	14.56
500001271	Police Department	2002	CHEVROLET	SUBURBAN	ADMINISTRATIVE	1759.24	Unleaded	1759.24	170,009	149,515	20,494	11.65
510050711	Fire Department	2007	FORD	EXPEDITION	FIRE ADMINISTRATIVE	1893.11	Unleaded	1893.11	108,657	87,964	20,693	10.93
510050903	Fire Department	2009	FORD	EXPEDITION	FIRE ADMINISTRATIVE	1975.30	Unleaded	1975.30	79,721	58,740	20,981	10.62
517850605	Fire Department	2005	CHEVROLET	TRAILBLAZER	FIRE ADMINISTRATIVE	1986.40	Unleaded	1986.40	124,843	92,254	32,589	16.41
510050607	Fire Department	2006	FORD	EXPEDITION	FIRE ADMINISTRATIVE	2005.87	Unleaded	2005.87	94,669	71,318	23,351	11.64
500001242	Police Department	2007	CHEVROLET	TAHOE	POLICE ADMINISTRATIVE	2006.84	Unleaded	2006.84	152,318	127,224	25,094	12.50
510051306	Fire Department	2003	CHEVROLET	TAHOE	FIRE ADMINISTRATIVE	2023.00	Unleaded	2023.00	160,537	129,508	31,029	15.34
510050718	Fire Department	2007	FORD	EXPEDITION	FIRE ADMINISTRATIVE	2675.77	Unleaded	2675.77	138,678	106,898	31,780	11.88
500001297	Police Department	2011	CHEVROLET	TAHOE	POLICE ADMINISTRATIVE	2768.30	Unleaded	2768.30	60,021	29,530	30,491	11.01
500001179	Police Department	2005	CHEVROLET	TRAILBLAZER	POLICE ADMINISTRATIVE	3142.10	Unleaded	3142.10	120,321	85,441	34,880	11.10
010101113	County Exec	2011	CHEVROLET	SUBURBAN	ADMINISTRATIVE	3155.10	Unleaded	3155.10	45,430	3,395	42,035	13.32
500001298	Police Department	2011	CHEVROLET	TAHOE	POLICE ADMINISTRATIVE	3173.70	Unleaded	3173.70	65,992	35,691	30,301	9.55
500001169	Police Department	2005	CHEVROLET	TRAILBLAZER	POLICE ADMINISTRATIVE	3444.60	Unleaded	3444.60	111,317	73,156	38,161	11.08
500002714	Police Department	2008	FORD	CROWN VICTORIA	POLICE ADMINISTRATIVE	2146.26	Unleaded	2146.26	112,699	77,610	35,089	16.35
070007604	State's Attorney	2006	CHEVROLET	IMPALA	ADMINISTRATIVE	2160.15	Unleaded	2160.15	90,414	54,382	36,032	16.68
550055785	Sheriff's Office	2007	CHEVROLET	IMPALA	SHERIFF VEHICLE	2338.28	Unleaded	2338.28	111,348	74,794	36,554	15.63
500002754	Police	2008	FORD	CROWN VICTORIA	POLICE	1957.30	Unleaded	1957.30				18.94

Vehicle Number	Department	Year	Make	Model	Vehicle Type	Qty	Fuel	GGE	End Odometer in 2012	Begin Odometer in 2012	Miles Traveled in 2012	MPG
	Department			VICTORIA	ADMINISTRATIVE				90,119	53,050	37,069	
550055779	Sheriff's Office	2007	CHEVROLET	IMPALA	SHERIFF VEHICLE	1517.21	Unleaded	1517.21	146,600	108,600	38,000	25.05
500002784	Police Department	2011	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1401.00	Unleaded	1401.00	55,074	16,531	38,543	27.51
500002783	Police Department	2011	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1892.00	Unleaded	1892.00	58,247	19,437	38,810	20.51
500002667	Police Department	2008	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	2037.70	Unleaded	2037.70	127,883	88,509	39,374	19.32
500002469	Police Department	2005	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1850.90	Unleaded	1850.90	185,666	145,850	39,816	21.51
500002401	Police Department	2003	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1839.51	Unleaded	1839.51	164,376	124,386	39,990	21.74
500002805	Police Department	2011	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1813.30	Unleaded	1813.30	60,241	17,906	42,335	23.35
500002615	Department	2005	CHEVROLET	IMPALA	POLICE ADMINISTRATIVE	1844.80	Unleaded	1844.80	170,704	127,519	43,185	23.41
550055027	Sheriff's Office	2010	CHEVROLET	IMPALA	SHERIFF VEHICLE	2751.70	Unleaded	2751.70	78,757	34,689	44,068	16.01
550055035	Sheriff's Office	2010	CHEVROLET	IMPALA	SHERIFF VEHICLE	2421.70	Unleaded	2421.70	108,380	60,780	47,600	19.66
550055688	Sheriff's Office	1996	FORD	CROWN VICTORIA	SHERIFF VEHICLE	3359.18	Unleaded	3359.18	150,783	97,150	53,633	15.97
0660061435	Public Works	2008	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	902.10	Diesel	1019.37	65,899	55,455	10,444	11.58
660061446	Public Works	2011	DODGE	TRUCK	DIESEL HIGHWAY MAINTENANCE	1281.90	Diesel	1448.55	11,434	939	10,495	8.19
540054866	DER	2008	FORD	TRUCK	ADMINISTRATIVE	474.00	Unleaded	474.00	27,313	16,683	10,630	22.43
660061438	Public Works	2008	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	906.98	Diesel	1024.89	49,568	38,874	10,694	11.79
540054869	DER	2008	FORD	TRUCK	ADMINISTRATIVE	526.40	Unleaded	526.40	62,157	51,090	11,067	21.02
660061447	Public Works	2011	DODGE	TRUCK	DIESEL HIGHWAY MAINTENANCE	109.50	Diesel	123.74	11,857	637	11,220	102.47
540054864	DER	2008	FORD	TRUCK	ADMINISTRATIVE	505.50	Unleaded	505.50	60,197	48,919	11,278	22.31
660061445	Public Works	2011	DODGE	TRUCK PICKUP	DIESEL HIGHWAY MAINTENANCE	1518.00	Diesel	1715.34	11,719	391	11,328	7.46
780578750	Housing & Comm	2007	FORD	TRUCK	ADMINISTRATIVE	761.40	Unleaded	761.40	66,487	55,072	11,415	14.99
660061428	Public Works	2006	CHEVROLET	PICKUP PICKUP	DIESEL HIGHWAY MAINTENANCE FIRE	819.70	Diesel	926.26	99,655	88,190	11,465	13.99
517850006	Fire Department	2000	CHEVROLET	TRUCK	ADMINISTRATIVE	987.75	Unleaded	987.75	124,133	112,561	11,572	11.72
660061475	Public Works	1998	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	853.30	Diesel	964.23	171,344	159,741	11,603	13.60
660061430	Public Works	2006	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	958.13	Diesel	1082.69	98,470	86,842	11,628	12.14
660061449	Public Works	2011	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1362.70	Diesel	1539.85	12,351	712	11,639	8.54
660061414	Public Works	2004	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	861.30	Diesel	973.27	129,790	118,004	11,786	13.68
500001305	Police Department	2005	FORD	TRUCK	POLICE ADMINISTRATIVE	996.81	Unleaded	996.81	101,076	89,211	11,865	11.90
660061441	Public Works	2008	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1057.00	Diesel	1194.41	59,468	47,102	12,366	11.70
660061451	Public Works	2011	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1351.60	Diesel	1527.31	13,241	771	12,470	9.23
660061405	Public Works	2004	CHEVROLET	TRUCK 4X4	DIESEL HIGHWAY MAINTENANCE	869.20	Diesel	982.20	118,662	105,979	12,683	14.59
660061444	Public Works	2011	DODGE	TRUCK	DIESEL HIGHWAY MAINTENANCE	1569.98	Diesel	1774.08	14,150	1,375	12,775	8.14
500001296	Police Department	2001	CHEVROLET	TRUCK	POLICE ADMINISTRATIVE	1231.51	Unleaded	1231.51	199,755	186,942	12,813	10.40
500001295	Police Department	1999	CHEVROLET	TRUCK	POLICE ADMINISTRATIVE	1312.54	Unleaded	1312.54	198,950	185,986	12,964	9.88
660061431	Public Works	2006	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1043.80	Diesel	1179.49	113,539	99,910	13,629	13.06
540054863	DER	2008	FORD	TRUCK	ADMINISTRATIVE	678.40	Unleaded	678.40	44,893	31,022	13,871	20.45
660061450	Public Works	2011	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1568.50	Diesel	1772.40	15,002	223	14,779	9.42
750875209	Landfill	2011	FORD	PICKUP	LANDFILL SERVICE TRUCK	1486.60	Diesel	1679.86	21,380	6,409	14,971	10.07
510050523	Fire Department	2005	FORD	F350	FIRE ADMINISTRATIVE	1365.00	Unleaded	1365.00	125,712	110,266	15,446	11.32
660061439	Public Works	2008	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1264.00	Diesel	1428.32	73,370	57,332	16,038	12.69

Petroleum Consumption Reduction Plan & Renewable Energy Action Plan

Vehicle Number	Department	Year	Make	Model	Vehicle Type	Qty	Fuel	GGE	End Odometer in 2012	Begin Odometer in 2012	Miles Traveled in 2012	MPG
660061410	Public Works	2004	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1206.10	Diesel	1362.89	87,019	70,970	16,049	13.31
500001384	Police Department	2005	DODGE	RAM	POLICE ADMINISTRATIVE	1890.58	Unleaded	1890.58	120,263	103,527	16,736	8.85
540054690	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1293.53	Diesel	1461.69	69,731	52,980	16,751	12.95
750875103	Landfill	2004	CHEVROLET	PICKUP	LANDFILL SERVICE TRUCK	2034.90	Diesel	2299.44	64,682	46,770	17,912	8.80
540054689	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1243.20	Diesel	1404.82	81,773	63,747	18,026	14.50
660061440	Public Works	2008	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	1477.00	Diesel	1669.01	60,718	42,613	18,105	12.26
540054686	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1381.08	Diesel	1560.62	112,996	94,868	18,128	13.13
540054687	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1295.20	Diesel	1463.58	97,222	78,662	18,560	14.33
540054683	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1430.50	Diesel	1616.47	130,968	112,256	18,712	13.08
540054684	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1380.70	Diesel	1560.19	93,649	74,435	19,214	13.92
660061452	Public Works	2011	CHEVROLET	PICKUP	DIESEL HIGHWAY MAINTENANCE	2089.70	Diesel	2361.36	22,488	1,874	20,614	9.86
540054685	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1579.79	Diesel	1785.16	98,491	77,453	21,038	13.32
540054688	DER	2006	CHEVROLET	PICKUP	ADMINISTRATIVE	1537.60	Diesel	1737.49	74,651	50,966	23,685	15.40
750875102	Landfill	2004	CHEVROLET	PICKUP	LANDFILL SERVICE TRUCK	1822.60	Diesel	2059.54	76,824	49,299	27,525	15.10

Appendix D: Prince George's County PCRP Strategy Details and GHG Reduction Calculation Methodologies

1. 1:1 Vehicle Replacements (replacement vehicles come from automaker website)

Vehicle Type	# Vehicle Type Replaced	Total Vehicle Type in Fleet	% vehicle type replaced	Average MPG[1]	Replacement vehicle Type	Replacement vehicle combined MPG[2]	Total miles traveled	Gallons saved based on total miles traveled	Replacement vehicle cost (per vehicle)	Vehicle replacement total cost	Cost savings
SUV	34	332	10.24%	13.18	Ford Escape w/ EcoBoost	24.7	775,799	58,416	$22,700.00	$771,800.00	$710,600.00
Car	15	1,260	1.19%	19.47	Chevy Mailbu 2.4L	29.0	610,098	10,293	$22,140.00	$332,100.00	$70,800.00
Pickup	42	163	25.77%	11.11	Ford Transit Connect	29.5	615,989	34,547	$22,425.00	$941,850.00	$132,300.00
Total	**91**	**1,755**	**5.19%**	**13.26**		**27.6**	**2,001,886**	**103,256**		**$2,045,750.00**	**$913,700.00**

2. County Fleet Efficiency (Planned, Non-Behavioral) Strategies Summary

PCRP Strategy	Gallons saved based on total miles traveled	Grant funds	County/Other funds
Purchase 6 PHEVs for Motor Pool	5,139	$250,000	$0
Purchase fleet management software	NA	$0	$13,000
Purchase 10 PHEV or Other High MPG Vehicles for Motor Pool	8,566	$0	$364,250
Fleet Renewal	8,192	$0	$1,339,525
Purchase 5 LPG Animal Control Vans	3,559	$0	$230,000
Purchase 36 High MPG Compact SUV's	24,518	$0	$847,350
Total:	**49,974**	**$250,000**	**$2,794,125**
Total:			**$3,044,125**

3. County Fleet Efficiency (Behavioral)

	Gallons saved based on total miles traveled	Grant funds	County/Other funds
Travel Reduction Measures (Carpooling, Travel Demand Management, etc.)	**48,552**	**$0**	**$0**

4. Adoption of Biodiesel (B10)

	Current Diesel Fuel used (gallons)[3]	Fuel efficiency impact (assumes biodiesel has 10% lower fuel efficiency)	Additional fuel needed (due to reduction in Fuel Efficiency)	Total Diesel Fuel needed (gallons)	Petroleum content (%)	Petroleum content (gallons)	Petroleum reduced (gallons)	Percent overall reduction	Fuel Costs[4]
B10	**361,505.94**	**0.01**	**3,615.06**	**365,121.00**	**90%**	**328,608.90**	**36,512.10**	**10.00%**	**$43,525**

5. Conversion of Select Refuse Trucks to Natural Gas

Number of vehicles	26
Retrofit cost (per vehicle)	$50,000.00[5]
Total cost of retrofitting	$1,300,000.00
Unit cost of slow-fill station (based on number of vehicles)	$400,000.00[6]
Total cost of implementation	**$1,700,000.00**
Total gallons of petroleum saved through implementation	**90,119**[7]

[1] Total for Average MPG is a weighted average based on the number of vehicles within each of the three vehicle type categories.

[2] Total for replacement vehicle combined MPG is a weighted average based on the number of vehicles within each of the three vehicle type categories.

[3] Diesel value used (361,505.94) is 90,119 gallons less than the total amount of diesel fuel used (451,625). That difference is used in the PCRP strategy of converting refuse trucks to natural gas.

[4] B10 fuel price was derived using B20 as a surrogate. B20 blend is higher in cost than conventional diesel by about 8 cents per gallon; based on average of quarterly costs for Mid-Atlantic: $3.96 for diesel, $4.04 for B20. (http://www.afdc.energy.gov/publications/search/keyword/?q=alternative%20fuel%20price%20report), October, 2013.

[5] http://www.cumminswestport.com/content/377/2010-04_MSW_Management_NGV_Supplement.pdf (page 5)

[6] Source indicates a filling station costs $200,000 to construct and 12 vehicles can be filled simultaneously in 8 hours. Two stations were assumed to be sufficient for this initiative.
(http://www.government-fleet.com/news/story/2012/08/greensboro-builds-cng-station-purchases-cng-recycling-trucks.aspx)

[7] Reflects an average of 3,466.1 gallons reduced per truck.

GHG emissions were calculated for each of the reduction strategies using the following assumptions and methodologies.

1-to-1 Vehicle Replacements

- Total petroleum reduction: **103,256 gallons (gal)**
- Average vehicle production of CO_2: **8,920 grams (g) CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
- Conversion from grams to metric tons: 1,000,000 grams = 1 metric ton (MT)
- (103,256 gal * 8,920 g CO_2 /gal of gasoline consumed) / 1,000,000 g= **921.0 $MTCO_2$ reduced**

County Fleet Efficiency (Planned, Non-Behavioral)

The total GHG emissions reduction for all of the initiatives grouped under this strategy is **418.1 $MTCO_2$**.

- ***Purchase 6 PHEVs of Other High MPG Vehicles for Motor Pool:***
  - Total petroleum reduction: **5,139 gal**

- Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
- Conversion from grams to metric tons: 1,000,000 g = 1 MT
- (5,139 gal * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g = **45.8 MTCO_2 reduced**

- ***Purchase 10 PHEVs or Other High MPG Vehicles for Motor Pool:***
  - Total petroleum reduction: **8,566 gal**
  - Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
  - Conversion from grams to metric tons: 1,000,000 g = 1 MT
  - (8,566 gal * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g = **76.4 MTCO_2 reduced**

- ***Fleet renewal :***
  - Total petroleum reduction: **8,192 gal**
  - Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
  - Conversion from grams to metric tons: 1,000,000 g = 1 MT
  - (8,192 gallons * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g = **73.1 MTCO_2 reduced**

- ***Purchase 36 High MPG Compact SUVs***
  - Total petroleum reduction: **24,518 gal**
  - Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
  - Conversion from grams to metric tons: 1,000,000 g = 1 MT
  - (24,518 gallons * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g = **218.7 MTCO_2 reduced**

- ***Purchase 5 LPG Animal Control Vans***
  - The total GHG reduction of CO_2 saved by switching from gasoline to LPG is offset by the emissions created from using LPG.
  - Total petroleum reduction: **3,559 gal**
  - Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed**
  - Average vehicle production of CO_2 from LPG: **7780.7 g CO_2 / gal of LPG consumed** (http://www.propanecouncil.org/uploadedFiles/REP_15964%20Propane%20Reduces%20GHG%20Emissions%202009.pdf)
  - Conversion from grams to metric tons: 1,000,000 g = 1 MT
  - (3,559 gallons * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g = **31.7 MTCO_2 reduced (gasoline consumption)**
  - (3,559 gallons * 7780.7 g CO_2 / gal of LPG consumed) / 1,00,000 g= **27.7 MTCO_2 produced (LPG use)**

- 31.7 $MTCO_2$ reduced – 27.7 $MTCO_2$ produced =
  4.1 $MTCO_2$ reduced

County Fleet Efficiency (Behavioral)

- Total petroleum reduction: **48,552 gal**
- Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
- Conversion from grams to metric tons: 1,000,000 g = 1 MT
- (48,522 gallons * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g =
  433.1 $MTCO_2$ reduced

Adoption of Biodiesel (B10)

- Total petroleum reduction: **36,512 gal**
- Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed**
- Average vehicle production of CO_2 from B10: **8,251.0 g CO_2 / gal of B10 consumed**
  - B10 reduces CO_2 emissions by 7.5% (Interpolated from http://www.afdc.energy.gov/fuels/biodiesel_benefits.html).
- Conversion from grams to metric tons: 1,000,000 g = 1 MT
- (36,512 gallons * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g =
  325.7 $MTCO_2$ reduced (gasoline consumption)
- (36,512 gallons * 8,251 g CO_2 / gal of B10 consumed) / 1,000,000 g =
  301.3 $MTCO_2$ produced (B10 use)
- 325.7 $MTCO_2$ reduced – 301.3 tons of CO_2 produced =
  24.4 $MTCO_2$ reduced

Conversion of Select Refuse Trucks to Natural Gas:

- Total petroleum reduction: **90,119 gal**
- Average vehicle production of CO_2: **8,920g CO_2 / gal of gasoline consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
- Average vehicle production of CO_2 from natural gas: **6627.9 g CO_2 / gal of natural gas consumed** (http://www.epa.gov/cleanenergy/energy-resources/refs.html)
  - $\frac{0.005306\ metric\ tons\ CO2}{1\ therm} * \frac{1\ therm}{0.80055\ gallons} * \frac{1000000\ grams}{1\ metric\ ton}$
- Conversion from grams to metric tons: 1,000,000 g = 1 MT
- (90,119 gallons * * 8,920 g CO_2 / gal of gasoline consumed) / 1,000,000 g =
  803.9 $MTCO_2$ reduced (gasoline consumption)
- (90,119 gallons * 6627.9 g CO_2 / gal of natural gas consumed) / 1,000,000 g =
  597.3 $MTCO_2$ produced (natural gas use)
- 803.9 $MTCO_2$ reduced – 597.3 tons of CO_2 produced =
  206.6 $MTCO_2$ reduced