



Carbon Footprint and Strategies for Reducing GHGs in the City of College Park

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- Introduction
- College Park Community GHG Emissions
- College Park Government Operation GHG Emissions
- Policy Recommendations

Introduction

Background & Key Findings

- Greenhouse gas emissions (GHGs) cause climate change
- Think global, act local
- Residents demand sustainable future
- Remain competitive with peer communities

Primer on GHG Inventory

Community Inventory *(Last performed in 2007)*

- 2007, 2010, 2013
- Emissions within CP
- By UMD & City (non-UMD)
- Data from MWCOG, utilities (Pepco & Washington Gas), UMD, & the government

Gov. Operations Inventory *(Last performed in 2007)*

- 2007, 2013, 2014
- Includes all operations and activities financed by CP
- Includes city staff air travel and commuting outside CP
- Data from the government

- **MTCO₂e** (Metric ton carbon dioxide equivalent)
 - Unit to measure GHGs
- **MMBTU** (Million British Thermal Units)
 - Unit to measure energy created
- **Carbon Intensity** (MTCO₂e/MMBTU)
 - For each unit of energy created, the amount of GHGs emitted
- **Clean Electricity** (Purchase by UMD and government)
 - Electricity generated from clean energy (Zero GHGs)
 - Focus on **gross GHGs**
 - Net = Gross – Purchased Clean Electricity

Community Scale

- Between 2007 and 2013
 - CP community GHGs decreased by 3%
 - With purchasing clean electricity, UMD GHGs decreased faster (Net)
- Fastest growing source is transportation-based emissions
- Largest potential to reduce GHGs is from electricity

Government Scale

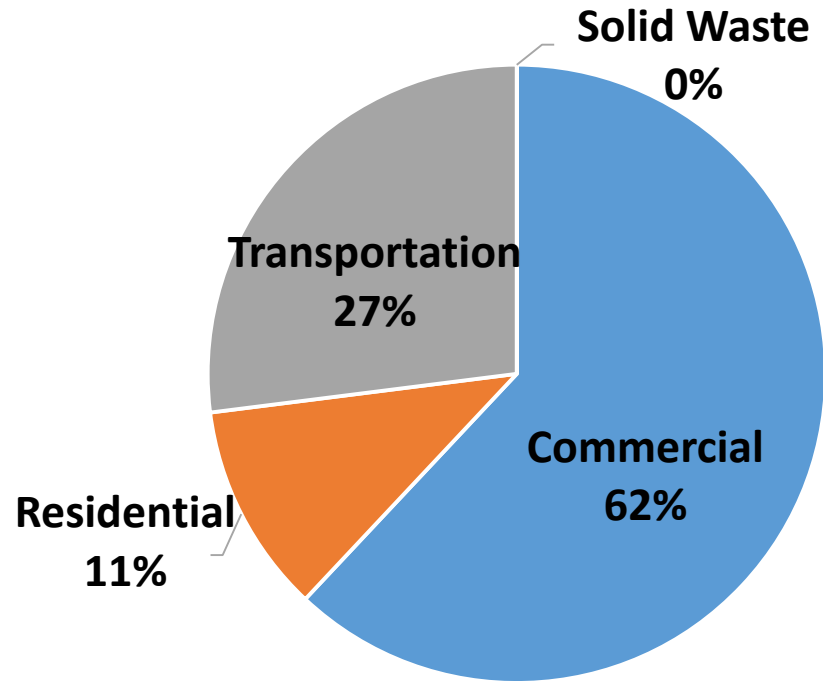
- Government operations represent less than 1%

College Park Community GHG Emissions

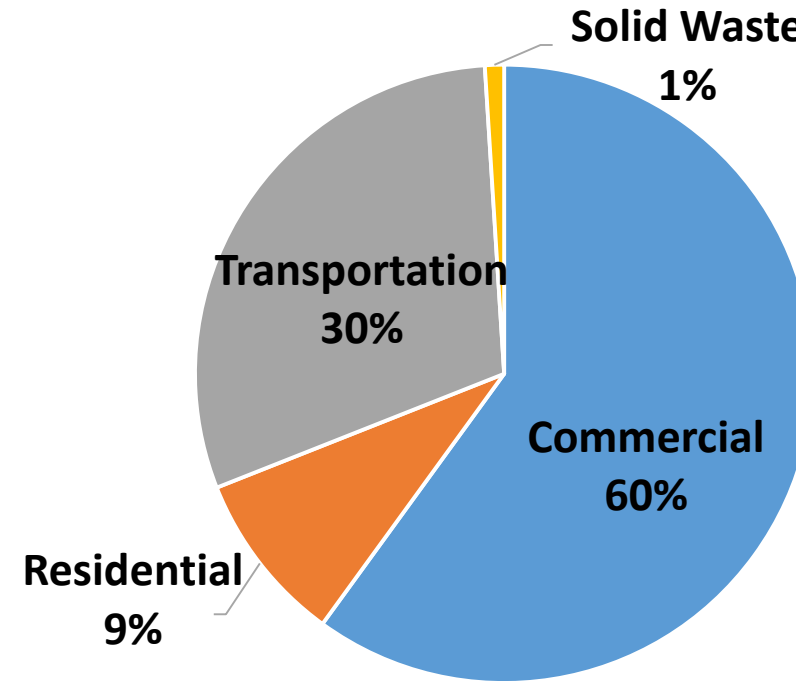
By sector and source

CP Community GHGs by Sector, 2007 & 2013

CP Community GHGs, 2007
(466,967 MTCO₂e)



CP Community GHGs, 2013
(453,403 MTCO₂e, 3%↓)



CP Community GHGs by UMD and City, 2007 & 2013

% of Total GHGs	2007	2013
City	58%	57%
UMD	42%	43%

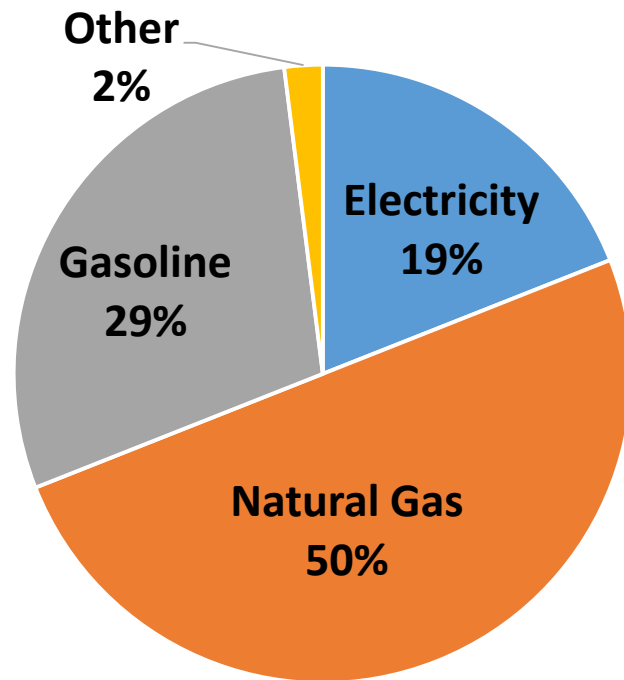
07-13%	Gross GHGs	Net GHGs
City	-4%	-4%
UMD	-1%	-7%
Total	-3%	-6%

- UMD accounts for over 40%
- GHGs in City decreased
 - Economic recession
 - Loss of large building (e.g., Washington Post)

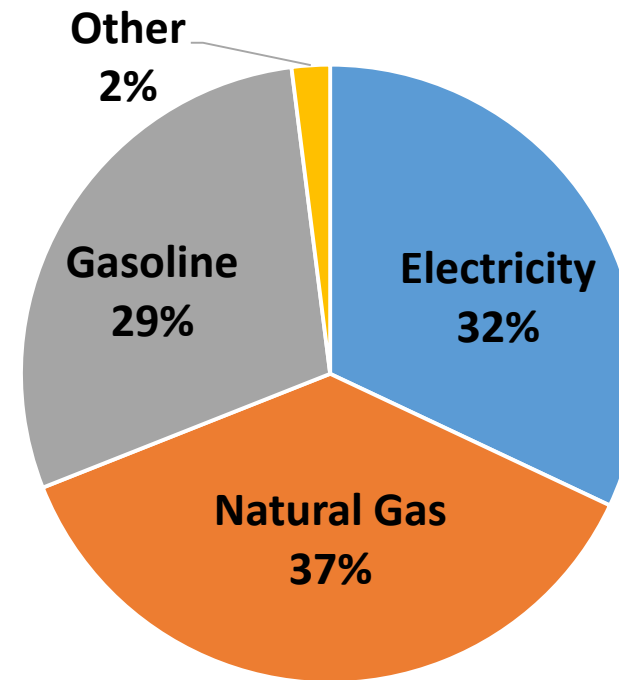
- Purchased Clean Electricity
 - 14,579 MTCO_{2e} in 2013
- UMD decreased faster in Net GHGs scenario

CP Community GHGs and Energy by Source, 2013

Energy by Source, 2013



GHGs by Source, 2013



CP Carbon Intensity by Source, 2007 & 2013

Source	2007	2013
Electricity	0.152	0.134
Natural Gas	0.053	0.053
Gasoline	0.073	0.073

Note: Carbon Intensity(MTCO₂e/MMBTU), for each unit of energy created, the units of GHGs

- **Fuel Mix of Electricity Generation for CP**
 - 2007: Coal 42%, Natural Gas 13%
 - 2013: Coal 35%, Natural Gas 20%



CP Community GHGs and Energy Change Rate, 07-13

	Energy 07-13%	GHGs 07-13%
City		
Building (Electricity)	-5%	-17%
Building (Natural Gas)	-4%	-4%
Transportation (Gasoline)	8%	8%
UMD		
Building (Electricity)	9%	-4%
Building (Natural Gas)	-2%	-2%
Transportation (Gasoline)	-0.02%	-0.03%
Total	1%	-3%

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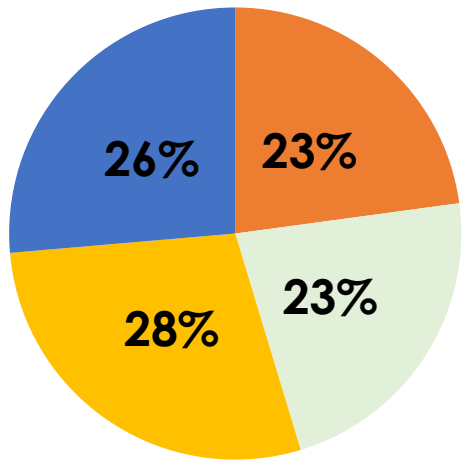
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College Park Government Operation GHG Emissions

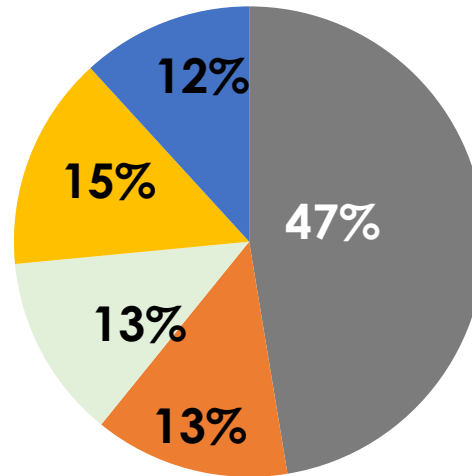
By sector

CP Government GHGs by Sector, 2007 & 2013

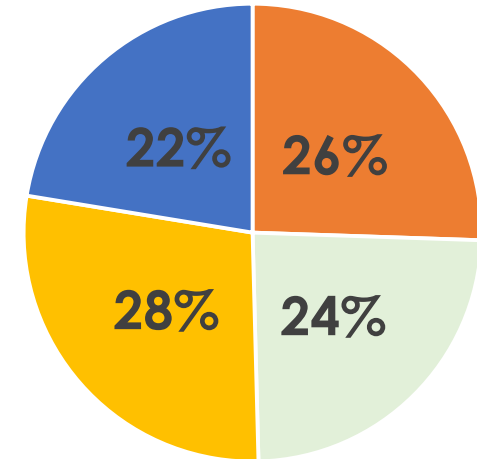
2007
(2,053 MTCO₂e)



2013
(3,477 MTCO₂e, 29% ↑)



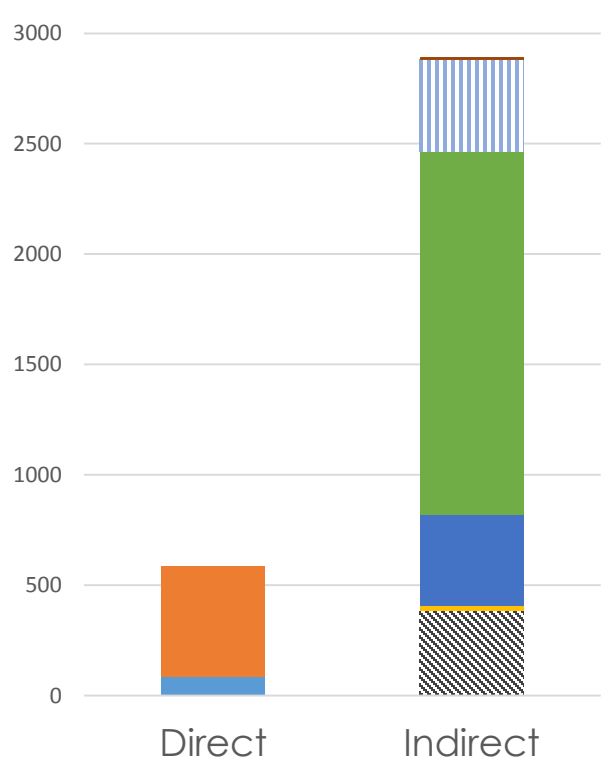
2013 w/o Solid Waste
(1,829 MTCO₂e)



- Solid Waste Facilities
- Buildings & Facilities (Ele & Gas)
- Street Lights & Traffic Signals
- Vehicle Fleet (Diesel & Gasoline)
- Employee Commute (Gasoline)

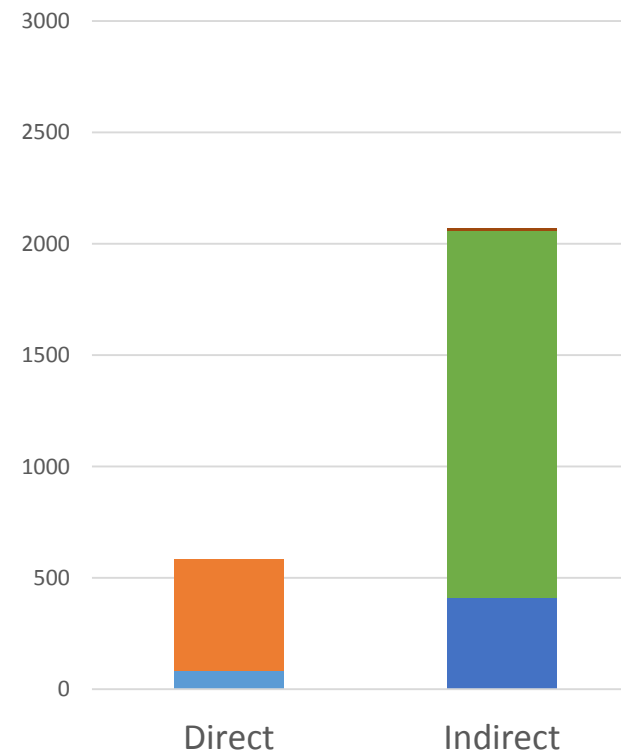
CP Government Gross & Net GHGs, 2013

CP Gov Gross GHGs



- Vehicle Fleet (Air)
- ▨ Street Lights (PEPCO Owned)
- Solid Waste Facilities
- Employee Commute
- Street Lights (City Owned)
- ▨ Buildings & Facilities (Ele)
- Vehicle Fleet (vehicle)
- Buildings & Facilities (Gas)

CP Gov Net GHGs



Policy Recommendations

Policy Discovery and List

- Surveyed cities with similar population (29-35K), most in California
- Compiled list of GHG reduction and general sustainability ideas (2 lists in final report)
 - List 1: One pager, organized by type
 - List 2: Name, description, and cities employing the policy
- In-depth analysis of the following policies

Mitigation Policies Evaluated

- Retrofitting College Park Streetlights
- Purchasing RGGI Allowances
- Reducing Solar Soft Costs
- Employee Work from Home
- Voluntary Residential Composting
- Encouraging LEED Construction
- Property Assessed Clean Energy (PACE)
- Small Town Energy Program (STEP) Coach in College Park*
- Community Choice Aggregation

Small Town Energy Program (STEP) Individual Energy Coaching

- Cater recommendations via individual household energy audits
- STEP UP: University Park program 2010-2013
 - External funding source, inflated price tag
 - Good predictive model for cost of upgrades and engagement
- We designed minimalist budget for \$13K/year, 50 house visits/year
- Three year program (\$39,000 investment):

	Houses upgraded	Total GHG Reductions (MTCO ₂ e)	Energy Cost Savings/Year (Homeowners)	Payback using Social Cost of Carbon (\$37 per MTCO ₂ e)
Total over 3 years	114*	1,783.8 (1.4 MTCO ₂ e per house per year)	\$32,167 (\$282 per house per year)	.6 years to the City

* assumes 76% success rate

- Compared with other peer communities, CP's GHG-emission level is relatively low
- College Park's gross GHG emissions has reduced since 2007
 - Community scale decreased
 - Government scale increased
- Most significant reduction: transportation-based
- Most feasible policies: purchased electricity

Thank you!

GHGs (MTCO₂e), Community-scale inventory, 2007-2013

	2007	2010	2013	07-13%	10-13%
Residential					
Electricity	27633	25656	23408	-15.3%	-8.8%
Natural Gas	22531	16115	16400	-27.2%	1.8%
Commercial					
UMD					
Electricity	53945	52019	51613	-4.3%	-0.8%
Natural Gas	135184	125827	132931	-1.7%	5.6%
Propane	416	323	587	41.1%	81.7%
Diesel fuel	78	144	37	-52.6%	-74.3%
City					
Electricity	85698	79725	71172	-17.0%	-10.7%
Natural Gas	12867	15809	17447	35.6%	10.4%
Transportation					
UMD					
Gasoline	3863	3871	3862	0.0%	-0.2%
Diesel	633	370	3873	511.8%	946.8%
Natural Gas	2	1	0	-100.0%	-100.0%
E85	20	228	234	1070.0%	2.6%
B5	2144	2659	0	-100.0%	-100.0%
City					
Gasoline	114878	121371	124279	8.2%	2.4%
Diesel	4161	4396	4501	8.2%	2.4%
Aviation	453	150	157	-65.3%	4.7%
Solid Waste	2471	3441	2902	17.4%	-15.7%
Total GHGs	466967	452105	453403	-2.9%	0.3%

GHGs (MTCO₂e), Government-scale inventory, 2007-2014

	2007	2013	2014	07-14%	13-14%
Solid Waste Facilities	0	1,648	1,616	-	-1.94%
Buildings & Facilities	469	83 (467*)	95 (475*)	-79.74% (1.28%*)	14.46% (1.17%*)
Street Lights & Traffic Signals	461	0 (440*)	0 (442*)	- (-24.21%*)	-
Vehicle Fleet	581	512	515	-11.35%	0.59%
Employee Commute	541	410	410	-24.21%	0
Total	2,053	2,653 (3,477*)	2,634 (3,457*)	28.4% (68.44%*)	-0.64% (-0.55%*)

*: Net emissions without RECs