



Albany County Local Government Operations Greenhouse Gas Inventory

A Preliminary Report for Baseline Year 2013

A report developed for the CSC Service
Strategy for Albany County

Report date: October 13, 2014



Key Findings

Albany County, with support from Climate Action Associates and the Capital District Regional Planning Commission, began a 2013 municipal operations greenhouse gas (GHG) inventory as part of Climate Smart Communities Regional Coordinators Pilot Program. This report summarizes data gathered and analyzed thus far. Some of key findings include:

- The County spent approximately **\$6.5 million on energy** in 2013 and created almost **35,000 metric tons of GHG emissions** from its operations.
- Sixty-nine percent of the GHG emissions from County operations came from the energy consumed in **County-owned buildings and facilities**. Therefore, the County should focus on energy conservation in its facilities to bring down emissions and costs.
 - Some of the data regarding County facilities needs to be verified. For example, 10 National Grid utility accounts were found to be associated with the Ann Lee Home complex, with \$260,000 in energy costs in 2013, despite the fact that this facility was closed in 2008 (under the direction of the Berger Commission). Further investigation is needed to clarify the status of these 10 accounts.
- In order to set realistic targets to reduce GHG emissions, the County may need to clarify how authority is distributed in the County government and identify the offices that have control at a practical level over the different parts of the government's operations. Research and discussions completed for this report suggest that the decision-making power needed to take action on reducing GHG emissions falls into three basic groups:
 - 1) **County Executive's Office**, who oversees the largest portion of County operations, including the Department of Public Works and the Department of General Services (DGS), who manages all County vehicles not associated with the Sewer District or the Sheriff;
 - 2) **Sewer District**, including all facilities, operations and vehicle use related to the functioning of the County's two wastewater treatment plants; and
 - 3) **Sheriff's Department**, whose operations cover the County Correctional Facility, the Emergency 911 (E911) Communication Center and vehicles used in police operations, such as those vehicles used for the Stop DWI program.
- The **County Executive's Office was responsible for 46 percent of the GHG emissions** from County operations in 2013 and for almost **\$3.3 million in County energy costs**.
 - Within the County Executive's Office, almost \$1.5 million was spent on energy costs for DGS operations. The costs and GHG emissions from DGS operations originate primarily from the consumption of electricity and natural gas in the buildings that the DGS manages. DGS manages a wide range of facilities for the County, including the Times Union Center, the Judicial Center, the Ann Lee Home, the County Nursing Home and the County Office Building at 112 State Street, among several others.

GHG Accounting Overview and Sources Included

Municipal GHG inventories are a crucial starting point for climate action by providing a baseline for setting realistic emissions reduction targets and measuring the impact of future actions. The information in this report can help Albany County reduce energy use, save taxpayer dollars and cut GHG emissions. The inventory is being performed in accordance with the Local Government Operations Protocol (LGOP), a protocol developed by The Climate Registry and ICLEI – Local Governments for Sustainability.

Communities typically chose one or more recent prior years to set a baseline. Albany County selected 2013 as the baseline year for this GHG inventory. When the preliminary assessment is finalized, the information in this report will serve as a baseline from which to track progress and measure the impact of future actions taken to reduce GHG emissions.

GHG Sources

This preliminary assessment considers most major GHG sources with a few exceptions, as noted below. The data reported will likely represent greater than 90-95 percent of GHG emissions from County operations:

- Electricity consumption. This creates indirect emissions because the actual emissions occur at power plants, but the LGOP requires them to be included in the analysis due to the fact that municipalities can lessen these emissions by reducing their use of electricity. All metered use is considered in this study. National Grid is the main provider for Albany County but Central Hudson also provides electricity to some Department of Public Works (DPW) facilities.
- Stationary fossil fuels. These fuels include natural gas, propane and fuel oil. Natural gas usage was collected from National Grid bills and a small amount of fuel oil was reported for a few DPW facilities. The County reported no use of propane.
- Transportation fossil fuels. These fuels include gasoline, diesel, natural gas and electricity (for plug-in vehicles), used in both on-road fleet vehicles and off-road equipment. The County reported only gasoline and diesel usage in its combined fleet.
- Water Delivery and Wastewater Treatment. Emissions are produced when energy is used to pump water to deliver it to filtration plants (prior to consumption) and to wastewater treatment plants (after use). Additional GHG emissions, such as methane and nitrous oxide, are produced during wastewater treatment. Albany County has a Sewer District that operates two wastewater treatment plants (WWTP) that serve a total of about 200,000 residents. The process used at these facilities produces no methane but does produce nitrous oxide, a powerful GHG that is included in this inventory. Nitrous oxide is 310 times more powerful at trapping heat in the atmosphere than carbon dioxide.
- Solid waste emissions from landfills. Albany County does not own or operate a landfill and so it has no direct emissions. The LGOP provides communities the option of estimating a small indirect footprint from solid waste generated by government facilities but the County elected not to use it for this preliminary assessment. Emissions from solid waste are often not included because the volume generated by government operations is difficult to measure and this source is usually less than 1-2 percent of a typical inventory.

- Refrigerant usage. Most refrigerants, such as those used in building and vehicle cooling systems, are classified as GHGs. Data on the amounts of refrigerants used in the large HVAC systems of Albany County's administrative buildings was not available at the time of this report; the contractors who maintain these systems did not record on their invoices the type or quantity of refrigerants they used during maintenance calls. The Albany County Hockey Facility uses a refrigerant called R-22 (also know as Freon), which is not classified as a GHG under the LGOP. For most conventional facility applications, refrigerants can be excluded from a basic GHG assessment since they are difficult to estimate and amount to less than 2 percent of a typical GHG inventory.
- Employee commute. This is an optional source in the LGOP for indirect emissions associated with employees traveling to work. These were not included in this preliminary inventory for Albany County. This GHG source is usually only included when a local government plans to set goals and create incentives to try to reduce emissions from commuting. Such incentives include actions like giving preferential parking and free charging for employees who drive plug in electric vehicles.

Data Organization

Climate Action Associates used the LGOP model and worked with Albany County to identify useful categories for organizing the data. Emissions were analyzed by operational sector, by managing office, by budget group, by individual facility and by fuel type. Operational sectors were used as the high-level categories for GHG emissions (Table 1.).

Table 1. Sectors and Fuel Types Included in this Report

Sectors	Fuel Types Reported*
Buildings & Other Facilities	Natural Gas, Fuel Oil and Electricity
Vehicle Fleet	Gasoline and Diesel
Wastewater Treatment	N/A

*The County did not report any use of propane.

To provide standardized units across fuel types, energy use was measured in million British Thermal units (MMBtu) and GHG Emissions were measured in metric tons of carbon dioxide equivalents (MTCDE). Energy costs were recorded as nominal values from 2013; expenditures were not adjusted for inflation due the fact that the baseline year chosen is a recent year.

Climate Action Associates collated the data from Albany County into one consolidated Excel spreadsheet that includes embedded formulas for calculating energy use, energy costs and GHG emissions. The tabs in this workbook are organized by fuel type and all of the data was categorized according to the associated managing office, account code, budget group and sector. All raw data, calculations, tables and figures are contained in the workbook entitled:

"Albany_County_GHG_Workbook_2013.xlsx."

Emissions and Energy Costs by Sector

In 2013, across all sectors, Albany County's operations produced a total of 34,882 metric tons of GHG emissions. The County's emissions came from fossil fuel combustion, electricity consumption and wastewater treatment (which produced nitrous oxide). The County consumed 411,665 MMBtu of energy and spent over six million dollars on energy costs (\$6,128,860). Shaving just 10 percent off this cost through energy conservation and efficient vehicle procurement would save over \$600,000 annually.

The fuel consumption by County facilities and by the County's vehicle fleet together accounted for about 97 percent of the County's GHG emissions. The remaining 3 percent came from nitrous oxide produced during the treatment of wastewater (Figure 1). (GHG emissions from the energy used to run the Albany County wastewater treatment plants is included in the Buildings and Other Facilities sector; see the facility analysis section below for more details). Eighty-two percent of the energy costs in 2013 came from the natural gas, electricity and fuel oil consumed by the County's buildings and other facilities (Figure 2).

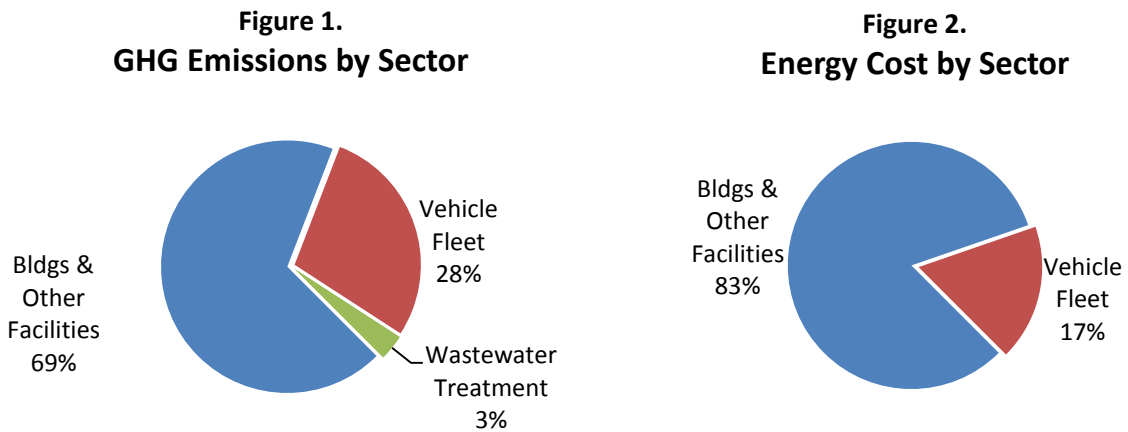


Table 2 shows the amount of GHG emissions produced, the amount of energy used and the cost of the energy consumed across all sectors; these amounts cover all of the County's operations, including the Sewer District, the Times Union Center and the Correctional Facility.

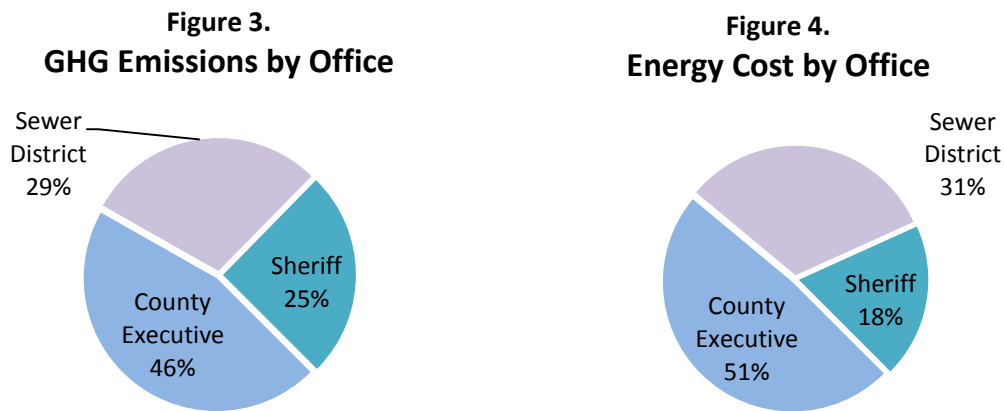
Table 2. Annual Energy Use, Cost and Emissions for 2013, by Sector

Sector	GHG Emissions (MTCDE)	Energy Use (MMBtu)	Energy Cost (USD)
Buildings & Other Facilities	23,842	368,055	\$5,038,662
Vehicle Fleet	9,874	43,610	\$1,090,198
Wastewater Treatment	1,166	N/A	N/A
Total Government	34,882	411,665	\$6,436,601

Emissions and Energy Costs by Managing Office

The first section of this report examined energy use and GHG emissions by operational sector. Another method of analyzing this data is to examine the relationship between emissions and the government entities that hold the authority to initiate facility upgrades that would reduce emissions. The term “managing office” refers to the primary authority within the government who is responsible for facility maintenance and decision-making regarding energy-related upgrades. Three main offices were found to play a primary role in this kind of decision-making in Albany County: the County Executive, the Sewer District and the Sheriff.

The County Executive’s office was the source of about half of the emissions and half of the energy costs for Albany County (Figure 3 and Figure 4). The GHG emissions associated with the County Executive’s office were close to twice as many and those from the Sheriff’s office. In part this is a reflection of the scale of the operations overseen by the County Executive’s office.



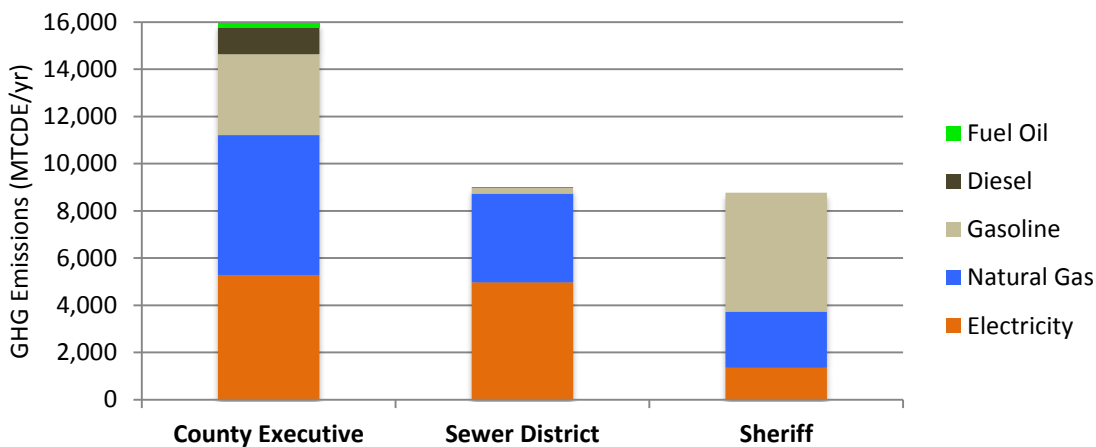
The amount of energy used by each office illustrates this difference in the scale of operations: about **204,000 MMBtu per year** for the County Executive and about **77,000 MMBtu per year** for the Sheriff (Table 3). The County Executive oversees the operations of a wide range of departments and large facilities, including several administrative office buildings, the Judicial Center, the Times Union Center, the Ann Lee Home and the Nursing Home, among others. The Sewer District’s operations are more focused, centered on the two wastewater treatment plants. The Sheriff oversees two main facilities: the County Correctional Facility and the emergency 911 call center. The breakdown of energy costs across these three offices also reflects the scale of their respective operations (Figure 4).

Table 3. Annual Energy Use, Cost and Emissions for 2013, by Managing Office

Managing Office	GHG Emissions (MTCDE)	Energy Use (MMBtu)	Energy Cost (USD)
County Executive	15,941	203,836	\$3,282,768
Sewer District	10,166	131,244	\$1,974,126
Sheriff	8,775	76,586	\$1,179,708
Total Government	34,882	411,665	\$6,436,601

In addition to emissions from energy use in buildings and facilities, each of the three offices produced emissions in 2013 from the use of vehicles, with the Sheriff's office being the largest producer of GHG emissions from gasoline. The County Executive and the Sewer District had similar levels of electricity consumption in 2013, but operations under the County Executive reported higher consumption levels of gasoline and other fuels (Figure 5). The County Executive was the only office reporting any use of fuel oil (by several of the DPW sub-stations located in more rural locations) and a substantial use of diesel fuel (also in DPW operations).

Figure 5.
GHG Emissions from Offices by Fuel Type



County Executive Emissions and Energy Costs by Budget Group

Because the County Executive's office is such a large consumer of energy and because it oversees a diverse set of entities, more detailed analysis of its operations was warranted. Three main budget groups were the sources of most of the emissions and costs: the Department of General Services (DGS), DPW and Residential Health Care. Because this analysis was done by budget group, energy expenditures for the inactive Ann Lee Home and the active Nursing Home were combined under the unified account code labeled "Residential Health Care"; after the consolidation in 2008 the two facilities (the Anne Lee Home and the Nursing Home) were combined into one operating entity. A fourth "Other" group was developed for this analysis, composed of the budget groups under the County Executive whose emissions were three percent or less of the total emissions associated with the County Executive's office.

The DGS emerged as the largest producer of emissions from the operations overseen by the County Executive's office (Figure 6). The breakdown for costs was similar to that for emissions, except that the costs for the "Other" group were higher than those for the Residential Health Care budget group (Figure 7).

Figure 6.
County Executive GHG Emissions by Budget Group

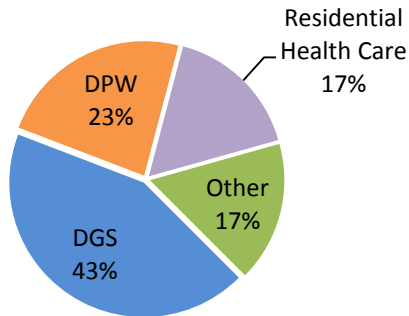
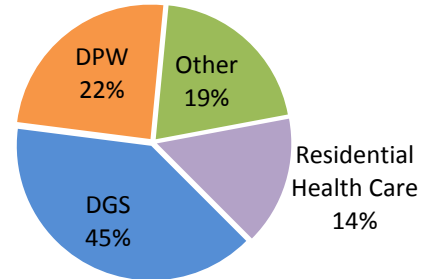


Figure 7.
County Executive Energy Cost by Budget Group



Almost **\$1.5 million** was spent on DGS operations in 2013 (Table 4). The GHG emissions from DGS operations originate primarily from the consumption of electricity and natural gas in the buildings that the DGS manages. The emissions from the DPW (the second largest emitter), on the other hand, originate mainly from consumption of gasoline and especially diesel by the DPW vehicle fleet.

Table 4. Annual Energy Use, Cost and Emissions for the Executive's Office for 2013, by Budget Group

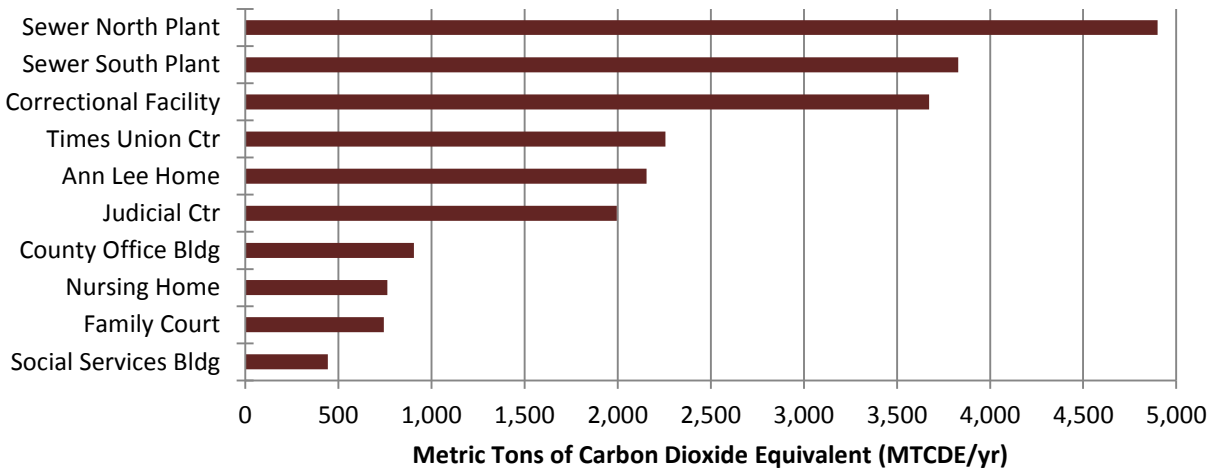
Budget Group	GHG Emissions (MTCDE)	% of GHG Emissions	Energy Use (MMBtu)	Energy Costs (USD)	% of Energy Costs
Dept of General Services (DGS)	6,905	43%	101,638	\$1,483,607	45%
Dept of Public Works (DPW)	3,712	23%	29,449	\$728,854	22%
Residential Health Care	2,637	17%	43,885	\$459,591	14%
Other Subtotal	2,687	17%	28,865	\$610,716	19%
<i>Dept of Social Services</i>	473	3%	6,172	\$146,930	5%
<i>Board of Elections</i>	314	2%	5,343	\$84,039	3%
<i>Dept of Health</i>	388	2%	3,791	\$82,913	3%
<i>Hockey Facility</i>	364	2%	5,565	\$97,051	3%
<i>District Attorney</i>	289	2%	905	\$22,830	1%
<i>Dept of Probation</i>	287	2%	2,977	\$86,044	3%
<i>Dept for Children, Youth & Families</i>	245	2%	768	\$19,226	1%
<i>Dept of Mental Health</i>	159	1%	1,307	\$36,468	1%
<i>County Clerk</i>	119	1%	1,881	\$31,382	1%
<i>Unassigned</i>	49	0%	155	\$3,831	0%
Totals	15,941	100%	203,836	\$2,975,026	100%

The emissions and expenditures by the Board of Elections are included in this analysis due to the fact that the Board of Elections was storing voting machines in former Ann Lee Home complex and, as a result, paid three of the utility accounts associated with that facility in 2013. The emissions and costs associated with these three utility accounts were not included under the Residential Health Care code (despite being associated with the Ann Lee Home complex) because the Board of Elections paid these three particular utility bills. For an analysis of the energy use, emissions and costs associated with the Ann Lee Home complex as a physical entity, see the section above on buildings and facilities.

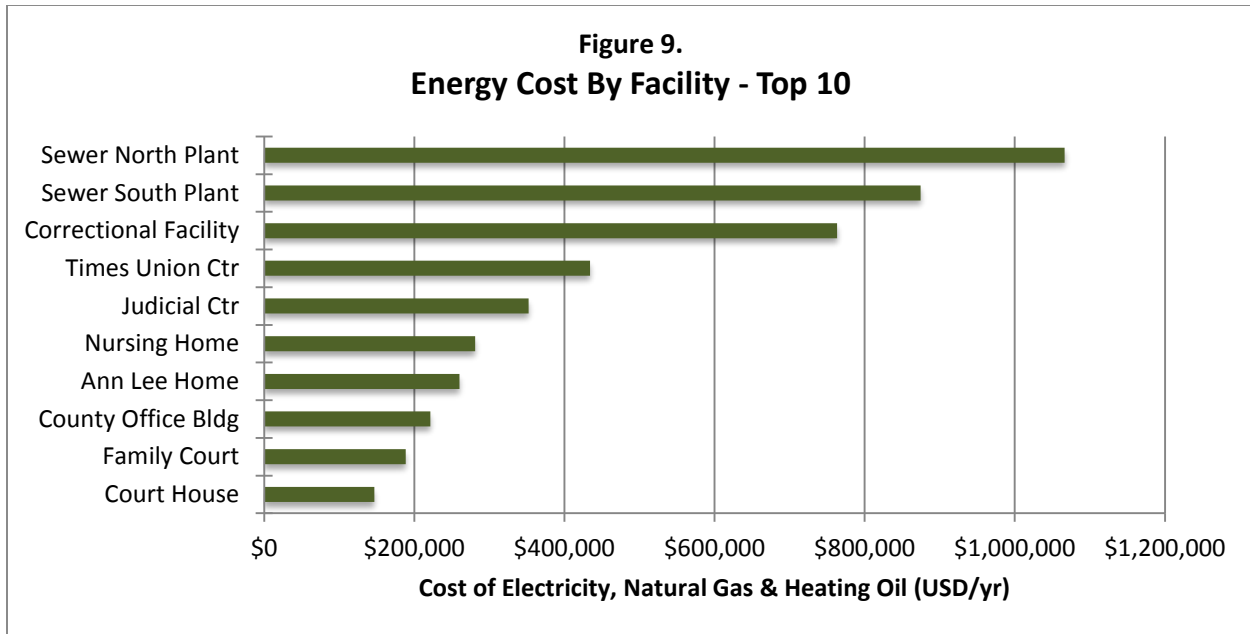
County Facilities (69% of GHG Emissions, 83% of Energy Costs)

County facilities made up the largest share of GHG emissions at **23,842 MTCDE in 2013**. Albany County operates a total of 36 facilities that were examined in this study. These facilities consume natural gas, electricity and fuel oil. Figures 8 and 9 show GHG emissions and energy costs for the top 10 facilities. Of those 10, the highest sources of emissions were the Sewer District’s North and South Plants and the County Correctional Facility (Figure 8).

Figure 8.
GHG Emissions by Facility - Top 10



The same four facilities (Sewer North Plant, Sewer South Plant, Correctional Facility, and Times Union Center) that had the highest emissions were also the most expensive in terms of energy costs in 2013 (Figure 9).



Despite the fact that the Ann Lee Home complex was closed in 2008 (under the direction of the Berger Commission), 10 National Grid utility accounts were found to be associated with this facility. One of these accounts was particularly costly; about **\$124,000** was spent in 2013 for natural gas service at a location labeled as Ann Lee Home laundry. At this time, it is unclear if this account is associated with the active Nursing Home. The question of whether some of these 10 accounts are, in fact, associated with active operations at the Nursing Home (and not part of the shuttered Ann Lee Home) is an issue that should be investigated further. Some of the accounts associated with the Ann Lee Home could be mislabeled.

Table 5 lists all of the 36 County-owned facilities that were examined in this report, along with the associated emissions, energy use and energy costs; this table is sorted by total energy cost. Most of the facilities in this list are a single building or a group of closely related facilities. For example, the facility called DPW Main Building includes the salt shed, the truck wash and the administrative building at 499 New Salem Road. In addition, the facility called "Sewer Meter Pits" refers to a group of 21 different National Grid accounts for meters across the County that the Sewer District uses to monitor its operations.

Table 5. Annual Energy Use, Cost and Emissions for 2013, by County Facility

Facility	Electricity (KWh)	Electricity Cost (USD)	Nat. Gas (therms)	Nat. Gas Cost (USD)	Fuel Oil (gal)	Fuel Oil Cost (USD)	GHG Emissions (MTCDE)	Energy Use (MMBtu)	Total Energy Cost (USD)
Sewer North Plant	10,309,269	\$827,045	368,409	\$239,293	0	\$0	4,900	72,016	\$1,066,338
Sewer South Plant	7,133,498	\$652,977	337,391	\$221,658	0	\$0	3,829	58,079	\$874,634
Correctional Facility	4,580,503	\$465,776	445,101	\$297,492	0	\$0	3,673	60,139	\$763,268
Times Union Ctr	4,868,940	\$353,140	163,305	\$81,025	0	\$0	2,257	32,943	\$434,165
Judicial Ctr	2,424,347	\$248,862	245,302	\$103,375	0	\$0	1,996	32,802	\$352,237
Nursing Home	2,644,065	\$279,500	1,641	\$1,402	0	\$0	763	9,186	\$280,902
Ann Lee Home	312,108	\$71,112	388,771	\$189,095	0	\$0	2,156	39,942	\$260,208
County Office Bldg	1,203,342	\$150,232	105,876	\$71,296	0	\$0	906	14,693	\$221,528
Family Court	1,051,900	\$131,403	83,442	\$57,087	0	\$0	744	11,933	\$188,491
Court House	1,326,074	\$146,848	0	\$0	0	\$0	378	4,525	\$146,848
Social Services Bldg	1,165,386	\$128,764	21,079	\$15,975	0	\$0	445	6,084	\$144,739
Hockey Facility	657,281	\$72,732	33,227	\$24,319	0	\$0	364	5,565	\$97,051
DPW Main Bldg	316,843	\$42,414	25,939	\$20,823	5,463	\$21,947	284	4,440	\$85,185
Mercantile Bldg	628,240	\$75,238	5,960	\$4,852	0	\$0	211	2,740	\$80,090
Health Dept Bldg	506,880	\$58,836	15,570	\$11,462	0	\$0	227	3,286	\$70,298
Times Union Parking	363,760	\$39,736	0	\$0	0	\$0	104	1,241	\$39,736
Hall of Records	156,881	\$20,874	13,355	\$10,264	0	\$0	116	1,871	\$31,138
Mental Health & CAC Ctr	180,360	\$26,055	4,262	\$3,767	0	\$0	74	1,042	\$29,822
Cornell Co-op Ext Bldg	204,000	\$23,608	6,956	\$5,538	0	\$0	95	1,392	\$29,146
DPW Westerlo	24,452	\$5,135	0	\$0	3,492	\$14,027	43	572	\$19,162
DPW Knox	31,505	\$5,544	0	\$0	3,166	\$12,721	41	551	\$18,265
E911 Communication Ctr	148,200	\$16,006	1,088	\$1,233	0	\$0	48	614	\$17,239
Spruce St Garage	150,275	\$13,922	0	\$0	0	\$0	43	513	\$13,922
Children's Ctr	104,641	\$13,630	0	\$0	0	\$0	30	357	\$13,630
DPW Coeymans	47,782	\$7,115	0	\$0	1,203	\$4,832	26	331	\$11,947
DPW Rensselaerville	13,808	\$2,895	0	\$0	2,151	\$8,641	26	348	\$11,536
DPW Berne	24,401	\$3,480	0	\$0	1,529	\$6,143	23	297	\$9,623
CE Parking	10,032	\$9,566	0	\$0	0	\$0	3	34	\$9,566
DPW Colonie	38,535	\$5,901	1,315	\$1,395	0	\$0	18	263	\$7,296
Sewer Meter Pits	6,972	\$6,326	0	\$0	0	\$0	2	24	\$6,326
DPW Bethlehem	24,943	\$3,967	0	\$0	0	\$0	7	85	\$3,967
Steadman House	20,000	\$3,051	0	\$0	0	\$0	6	68	\$3,051
Social Services Parking	12,549	\$2,629	0	\$0	0	\$0	4	43	\$2,629
DGS Property Mgmt	6,147	\$1,161	0	\$0	0	\$0	2	21	\$1,161
Lawson Lake	2,113	\$662	0	\$0	0	\$0	1	7	\$662
Hill House	2,091	\$597	0	\$0	0	\$0	1	7	\$597
Totals	40,702,123	\$3,662,732	2,267,989	\$1,307,618	17,004	\$68,312	23,842	366,663	\$5,346,404

The data in the facility list (Table 5) includes outdoor lighting associated with a facility, where applicable. This includes the parking facilities, like the Times Union parking garage and the Social Services parking lot, where the only fuel type consumed was electricity, presumably used for area lighting.

Vehicle Fleet (28% of GHG Emissions, 17% of Energy Costs)

This sector includes all on-road and off-road consumption of gasoline and diesel by the County government; consumption of gasoline and diesel for off-road use, such as for maintenance equipment, is likely quite small. Because the County tracks vehicle fuel consumption using account codes, an analysis by budget group was conducted. This analysis is not defined by the entity that maintains the vehicles; aside from DPW vehicles, the Department of General Services maintains the County's vehicle fleet. The term "budget group" refers to the account codes used in the Albany County budget; the organizing principle in this analysis is defined by who paid the expenditures for the vehicle fuel.

The Sheriff's vehicle fleet was the largest emitter (51%) of GHG emissions, followed by DPW (33%) (Figure 10). The other remaining budget groups contributed three percent of emissions or less; they were grouped together as "Other". The expenditures on vehicle fuel were highest for DPW, who also consumed the largest amount of vehicle fuel for the year (Figure 11).

Figure 10.
GHG Emissions from Vehicles
by Budget Group

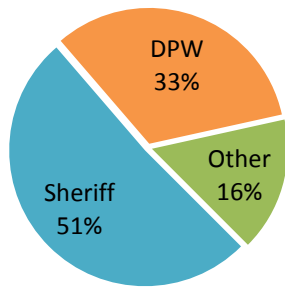
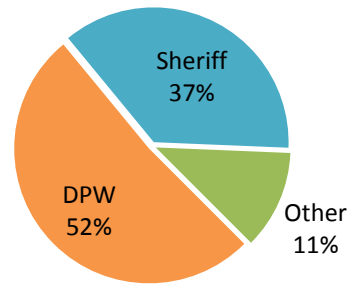


Figure 11.
Vehicle Fuel Cost by Budget
Group



In 2013 the DPW consumed nearly **168,000 gallons** of vehicle fuel, mostly diesel, which has a lower GHG emissions factor than gasoline. As a result, the bulk of vehicle GHG emissions came from Sheriff's Department, who consumed mainly gasoline (Table 6).

Table 6. Annual Vehicle Fleet Energy Use, Cost and Emissions for 2013, by Budget Group (sorted by emissions)

Budget Group	Gasoline (gal)	Diesel (gal)	GHG Emissions (MTCDE)	% of GHG Emissions	Energy Use (MMBtu)	Vehicle Fuel Cost (USD)	% of Vehicle Fuel Costs
Sheriff	127,413	0	5,054	51%	15,833	\$399,201	37%
Dept of Public Works (DPW)	53,613	113,888	3,244	33%	22,561	\$561,873	52%
Other Subtotal	39,087	2,576	1,576	16%	5,217	\$129,124	12%
<i>Sewer District</i>	<i>6,160</i>	<i>2,576</i>	<i>270</i>	<i>3%</i>	<i>1,125</i>	<i>\$26,828</i>	<i>2%</i>
<i>Dept of General Services</i>	<i>8,512</i>	<i>0</i>	<i>338</i>	<i>3%</i>	<i>1,058</i>	<i>\$26,238</i>	<i>2%</i>
<i>District Attorney</i>	<i>7,284</i>	<i>0</i>	<i>289</i>	<i>3%</i>	<i>905</i>	<i>\$22,830</i>	<i>2%</i>
<i>Dept for Children, Youth & Families</i>	<i>6,184</i>	<i>0</i>	<i>245</i>	<i>2%</i>	<i>768</i>	<i>\$19,226</i>	<i>2%</i>
<i>Dept of Health</i>	<i>4,060</i>	<i>0</i>	<i>161</i>	<i>2%</i>	<i>504</i>	<i>\$12,615</i>	<i>1%</i>
<i>Dept of Mental Health</i>	<i>2,139</i>	<i>0</i>	<i>85</i>	<i>1%</i>	<i>266</i>	<i>\$6,646</i>	<i>1%</i>
<i>Dept of Probation</i>	<i>1,909</i>	<i>0</i>	<i>76</i>	<i>1%</i>	<i>237</i>	<i>\$5,954</i>	<i>1%</i>
<i>Unassigned</i>	<i>1,244</i>	<i>0</i>	<i>49</i>	<i>0%</i>	<i>155</i>	<i>\$3,831</i>	<i>0%</i>
<i>Nursing Home</i>	<i>807</i>	<i>0</i>	<i>32</i>	<i>0%</i>	<i>100</i>	<i>\$2,520</i>	<i>0%</i>
<i>Dept of Social Services</i>	<i>706</i>	<i>0</i>	<i>28</i>	<i>0%</i>	<i>88</i>	<i>\$2,191</i>	<i>0%</i>
<i>County Clerk</i>	<i>82</i>	<i>0</i>	<i>3</i>	<i>0%</i>	<i>10</i>	<i>\$244</i>	<i>0%</i>
Totals	220,113	116,464	9,874	100%	43,610	\$1,090,198	100%

Emissions and Energy Costs by Fuel Type

Across all facilities and fleet operations, Albany County utilizes four main fuel types: electricity, natural gas, gasoline and diesel. Small amounts of fuel oil were also used at several DPW substations in 2013.

Seventy percent of the County's GHG emissions came from the use of natural gas and electricity in buildings and other facilities (Figure 12). Consumption of natural gas in County operations produced more emissions than electricity consumption; this may be a reflection of the fact that nuclear and hydroelectric plants, which have relatively low GHG emissions profiles, produce much of the electricity used in New York State. Although more emissions came from natural gas, the bulk of the County's energy expenditures came from the purchase of electricity. The County spent over half (60%) of its total energy expenditures on electricity in 2013 (Figure 13).

Figure 12.
GHG Emissions By Fuel Type

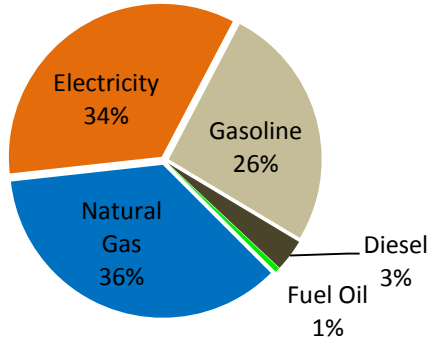
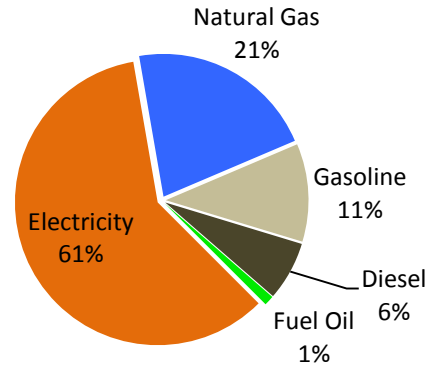


Figure 13.
Energy Cost by Fuel Type



More units of energy were consumed in the form of natural gas (**226,799 MMBtu**) than in the form of electricity (**138,876 MMBtu**) (Table 7). The County spent far more on electricity, however (**almost \$3.7 million**), than on natural gas. The average cost per MMBtu for natural gas in 2013 was only **\$6.00**; for electricity it was over four times higher (**\$28.20 per MMBtu**).

Table 7. Annual Energy Use, Cost and Emissions for 2013, by Fuel Type

Fuel Type	GHG Emissions (MTCDE)	Energy Use (MMBtu)	Energy Cost (USD)
Natural Gas	12,056	226,799	\$1,307,618
Electricity	11,613	138,876	\$3,662,732
Gasoline	8,731	27,352	\$679,778
Diesel	1,143	16,258	\$410,419
Fuel Oil	173	2,381	\$68,312
Totals	33,716	411,665	\$6,436,601

Next Steps and Recommendations

First and foremost, we recommend the County review this report and then meet with the CSC team to discuss options for developing a Climate Action Plan consisting of measures to reduce costs and GHG emissions. In terms of finalizing the GHG inventory, suggestions include:

- Obtain the amounts and types of refrigerants used in the HVAC systems at the County's large administrative buildings, such as the Judicial Center, the County Office Building and the Family Court building, and include that data in the GHG emissions analysis. A review of the invoices for HVAC services revealed that the contractors did not report the amounts or the types of refrigerants used in these buildings.
- Review utility data assignments to facilities as shown in the report's compendium workbook to confirm the status of the accounts tagged to the Ann Lee Home and the Nursing Home. As discussed above, the costs associated with several of the accounts tagged to the Ann Lee Home complex seem too high to be for energy use at vacant buildings.
- A more detailed assessment of vehicle use is recommended to understand how fuel usage is tracked and/or reveal which vehicles are the highest emitters or which are the most costly.

