



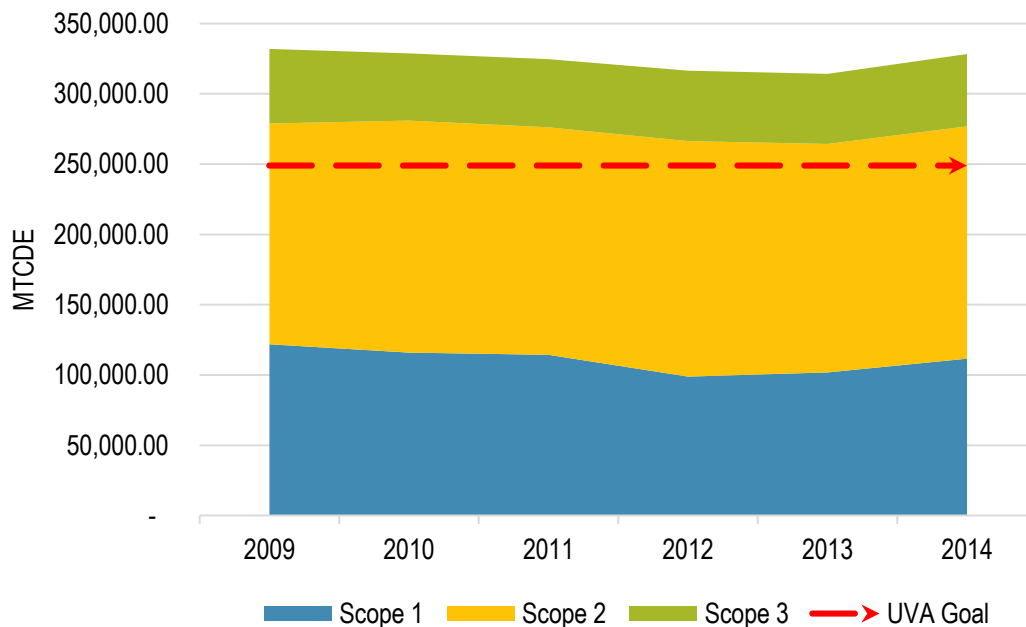
University of Virginia Greenhouse Gas Report Calendar Year 2014

Executive Summary

In 2009, the University of Virginia’s Board of Visitors committed to reduce greenhouse gas (GHG) emissions University-wide 25% below 2009 levels by 2025. U.Va.’s greenhouse gas footprint is calculated and analyzed annually by the Office for Sustainability, and reviewed by others in Facilities Management, to evaluate progress towards this goal. The following report, prepared by the Office for Sustainability, explains U.Va.’s methodology, the current footprint, and provides an analysis of the inventory to target areas for further reductions to meet the 2025 goal.

In Calendar Year 2009, the baseline year for emissions analysis, the total greenhouse gas emissions amounted to 331,875 Metric Tons of Carbon Dioxide Equivalent (MTCDE)¹. In 2014, emissions decreased to 328,198 MTCDE, resulting in a **1.11% reduction** in emissions compared to CY2009. Compared to last year (CY2013), emissions have increased by 4.46%.

Total Net Emissions by Scope



The leading factor hampering reduction efforts is University growth in building square footage and population. With the construction of 40 new facilities since 2009, the University’s total gross square footage (GSF) has increased by 6.33%. Since 2009, there has been a population increase of 3,997 people, a 10% increase from 2009.

U.Va.’s goal is absolute – the total emissions include additional growth in the footprint. Of the total emissions, 29,725 MTCDE can be attributed to new construction or acquired buildings (additional square footage). If these emissions had not been added, emissions would have been **reduced by 10.06%** from the 2009 levels rather than 1.11%. From 2013 to 2014 alone, an additional 12,541 MTCDE can be attributed to square footage growth. Thus, without the growth from just this past year, U.Va. would have seen a 6.29% reduction in net emissions from 2013 rather than just a 4.46% increase.

¹ See [Appendix A](#) for Raw Data Summations. Clean Air Cool Planet emissions factors are updated annually based on the global warming potentials in the most current Intergovernmental Panel on Climate Change’s Assessment Report, thus, MTCDE totals from previous years change slightly from year to year.

Footprint

The University of Virginia spans roughly 1,682 acres within the City of Charlottesville and Albemarle County. Since 2009, forty new buildings have been constructed or acquired, causing an increase in gross square footage consuming energy (illustrated in the chart below)². Additionally, between 2009 and 2014, the University has seen a 10% increase in the population of students, staff, and faculty. This steady growth is expected to continue in the future. All normalization for growth (either per capita or per GSF) uses these values for growth:

	2009	2010	2011	2012	2013	2014	Total % Increase from 2009
GSF	15,574,997	16,267,978	16,326,629	16,538,113	16,571,342	16,560,494	6.33%
Population³	39,782	39,262	39,893	39,836	42,421	43,779	10.05%

Methodology

The methods for a GHG inventory are important because they define how the boundary is established and what is included. U.Va.'s methodology is aligned with the American College and University Presidents' Climate Commitment guidance⁴, which references [The Climate Registry's General Reporting Protocol](#) and the [Greenhouse Gas Protocol Corporate Accounting and Reporting Standard](#). The [Clean-Air Cool Planet calculator](#) version 7.0, which uses global warming potentials from the Intergovernmental Panel on Climate Change's Assessment Reports, was used to calculate emissions. Clean Air-Cool Planet (CA-CP) is a science based, non-profit, non-partisan organization dedicated to finding and promoting climate change solutions. Their efforts focus on providing tools to help organizations calculate their greenhouse gas emissions and assisting organizations in finding ways to reduce these emissions. The CA-CP process, which is the method most widely used by institutes of higher education in the United States, includes normalization factors for analysis, such as operating budget and research space to allow colleges and universities of a variety of sizes to compare results.

The CA-CP spreadsheet calculates a carbon footprint by focusing on emissions in the form of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and refrigerants with global warming potentials. Emissions of methane, nitrous oxide and refrigerants are converted to carbon dioxide equivalent units in order to estimate total carbon emissions for the University. The spreadsheet focuses on the major emission sources on campus, which include purchased electricity, energy production on campus, transportation, waste, agriculture, and refrigerants.

BOUNDARY

On the most basic level, University emissions include any emissions tied to the functioning of the University. These emissions are divided into three scopes. An "Operational Control Approach" best aligns with the boundaries established for this inventory – "accounting for GHG emissions from operations under its operational control, which refers to the authority to introduce and implement operating policies at an operation."⁵ Owned properties contiguous to main Grounds (which fall both in the City of Charlottesville and Albemarle County) are included in the boundary. Leased properties, U.Va. Foundation properties, the College at Wise, and U.Va. property in other geographic locations are not included in the greenhouse gas footprint boundary.

² See [Appendix B](#) for a list of new buildings since 2009

³ Population numbers retrieved from the University of Virginia Office of Institutional Assessment and Studies

⁴ Source: <http://rs.acupcc.org/instructions/ghg/>

⁵ Source: <http://rs.acupcc.org/instructions/ghg/>

SCOPES

Scope 1: This refers to any emissions directly coming from sources that are owned or controlled by the University. This includes:

- On Campus Stationary sources (heating energy fuel consumption)
 - Natural Gas
 - Coal
 - Distillate Oil
 - Propane
- Direct transportation
 - University buses
 - University fleet/vehicles
 - University jet
- Refrigerants and chemicals
- Fertilizer application

Scope 2: This refers to indirect GHG emissions that are a consequence of activities that take place within the organizational boundaries of the institution, but occur at sources owned or controlled by another entity. Since heating and cooling is included in scope 1, at U.Va. this only includes:

- Purchased electricity

Scope 3: This refers to all indirect emissions not covered in Scope 2. The following are included in U.Va.'s footprint:

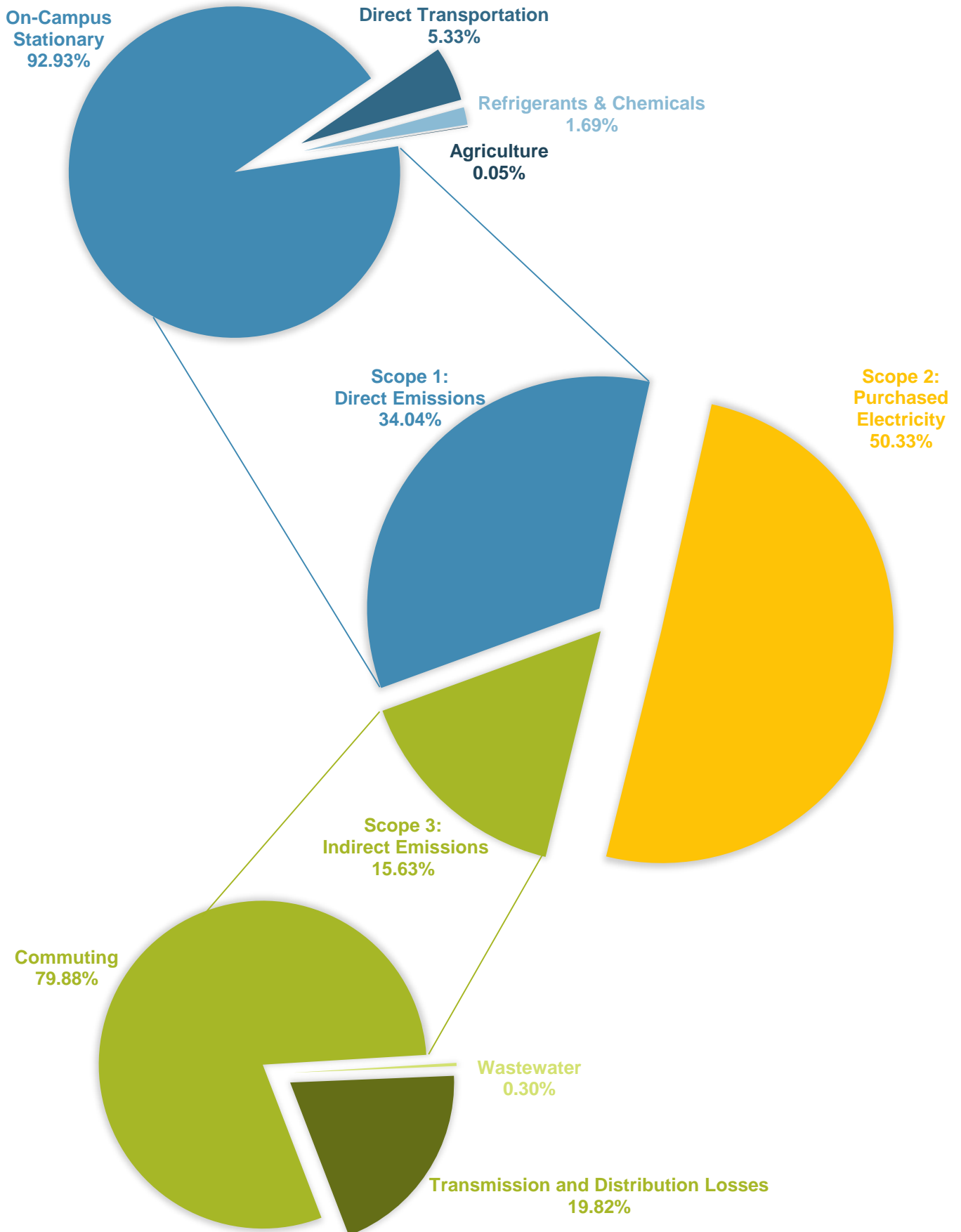
- Commuting (faculty, staff, and students)
- Solid (landfill) waste
- Wastewater
- Transmission and Distribution losses

Scope 3 Emissions Sources Not Included: Study abroad travel, holiday-related travel, and work-related travel have not been included because University-wide reporting methods do not currently exist. Likewise, purchased paper has not been included because a method of accurately accounting for paper purchasing on a University-wide basis is not available.

2014 Emissions by Scope

The following pie charts reflect the total emissions reported for 2014 using the Clean Air Cool Planet Campus Carbon Calculator. The University's largest greenhouse gas emissions come from Purchased Electricity (50%), followed by On-Campus Stationary energy sources (32%), and then Commuting (12%):

2014 EMISSIONS BY SCOPE



Trend Analysis

The following pages provide a review of all emissions produced by the University and how the footprint has been affected by aspects such as population growth, new construction or acquisitions, weather, and active efforts to reduce emissions.

Sections

- **Total GHG Emissions**
- **Electricity**
- **Heating (On-Grounds Stationary Sources)**
- **Impact of Weather**
- **Cooling**
- **Transportation**
- **Overall Growth**
- **Impact of Delta Force**
- **Health System vs. Academic Buildings**

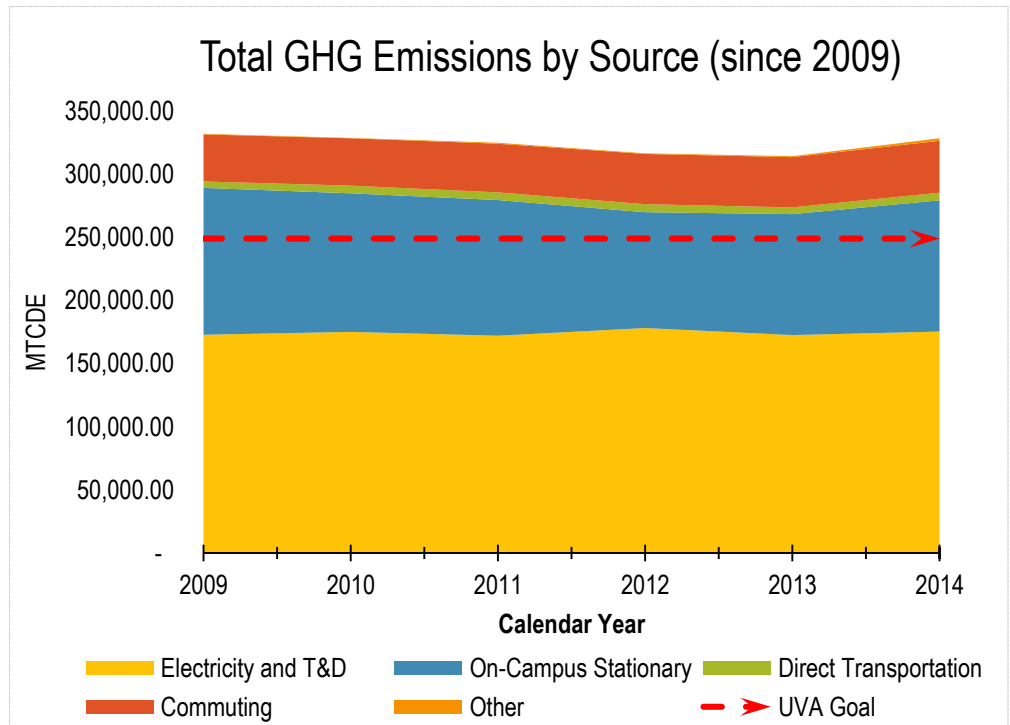
Total GHG Emissions

U.Va.'s GHG emissions stem from four distinct sources: Electricity, On-Campus Stationary, Direct Transportation, and Commuting. Between 2009 and 2014, U.Va. emitted roughly 1.94 million MTCDE in total. With the increase in population and new construction, emissions spiked significantly between 2013 and 2014.

Total Emissions

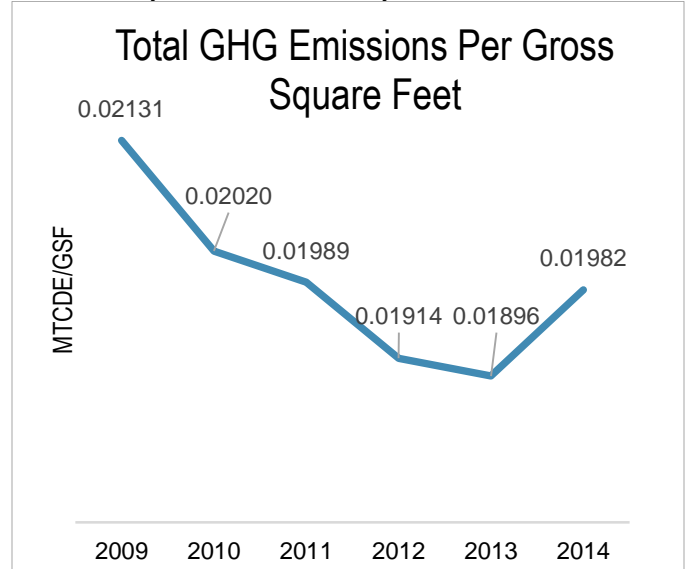
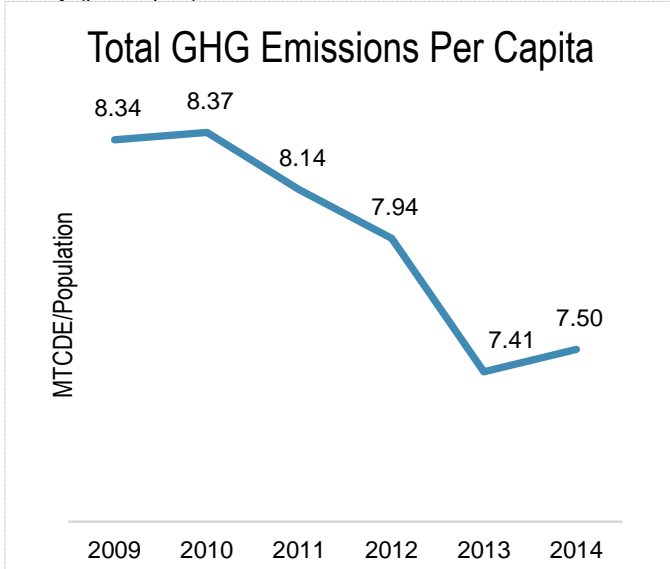
	2009	2013	2014	% change from '13	% change from '09
MTCDE Total	331,874.74	314,170.79	328,198.45	4.46%	-1.11%
Population	39,782	42,421	43,779	3.20%	10.05%
MTCDE/person	8.34	7.41	7.50	1.22%	-10.14%

Summing up all categories of emissions, in 2014, the University saw a **1.11% reduction** in net total emissions since 2009.



Normalizing total net emissions to account for population, GHG intensity (per capita) has been reduced **10.14%** from 2009 levels.

Normalizing total net emissions to account for building growth, GHG intensity has been reduced by **7%** from 2009 levels.



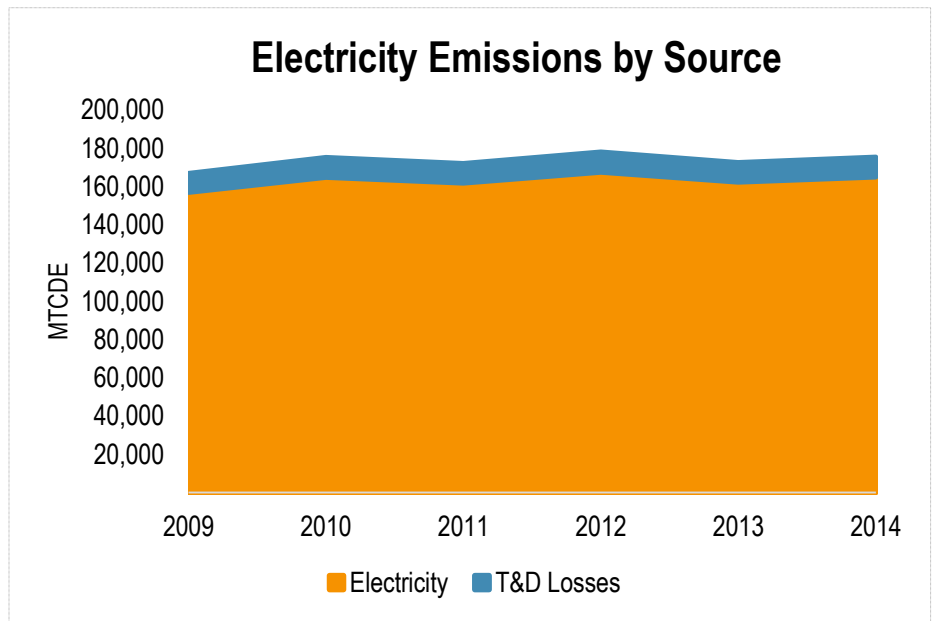
Electricity Emissions

Electricity consumption is U.Va.'s largest source of greenhouse gas emissions, accounting for about 1 million MTCDE of emissions from 2009 to 2014. U.Va. purchases 100% of its electricity from Dominion Virginia Power. This electricity is used primarily for cooling and core electrical services like lighting and plug loads. Due to the fact that transmission and distribution (T&D) losses stem from electricity, it is included in this category despite technically being tracked as a part scope 3 emissions. With the construction of many new buildings (such as the East Chiller Plant in 2013), net emissions for electricity have increased. However, when normalizing for building growth, electricity emissions intensity (per square foot) has decreased since 2009.

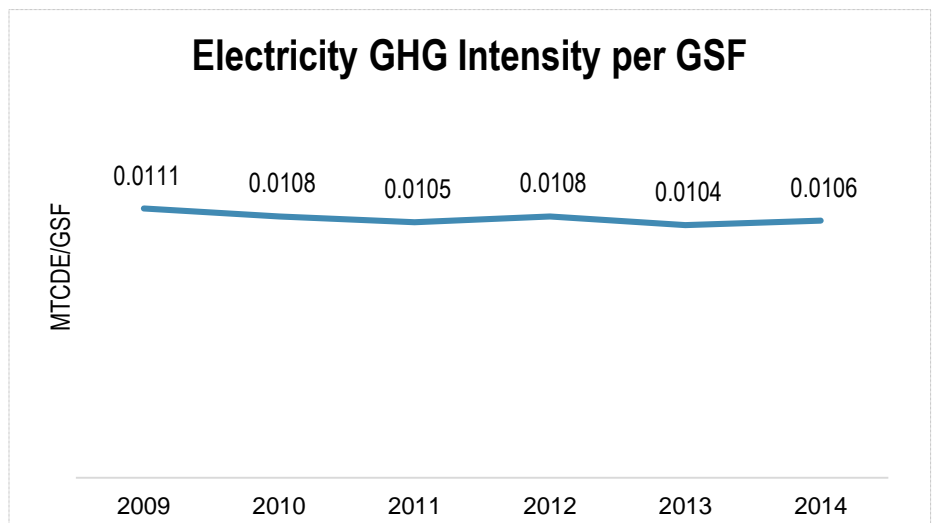
Total Electricity Emissions

	2009	2013	2014	% change from '13	% change from '09
Total MTCDE⁶	166,844.34	172,411.21	175,399.79	1.73%	5.13%
GSF	15,574,997	16,571,342	16,560,494	-0.07%	6.33%
Total MTCDE/GSF	0.01071	0.01040	0.01059	1.80%	-1.13%

There has been a **5.13% increase** in emissions from electricity use compared to 2009.



Normalizing for the large increase in new buildings at U.Va. (in the form of total gross square feet), electricity emissions have seen a **1.13% reduction** since 2009.



⁶ The 2009 loss factor percentage for T&D was changed from Clean Air Cool Planet report to reflect all other years

Heating Emissions (On Campus Stationary Sources)

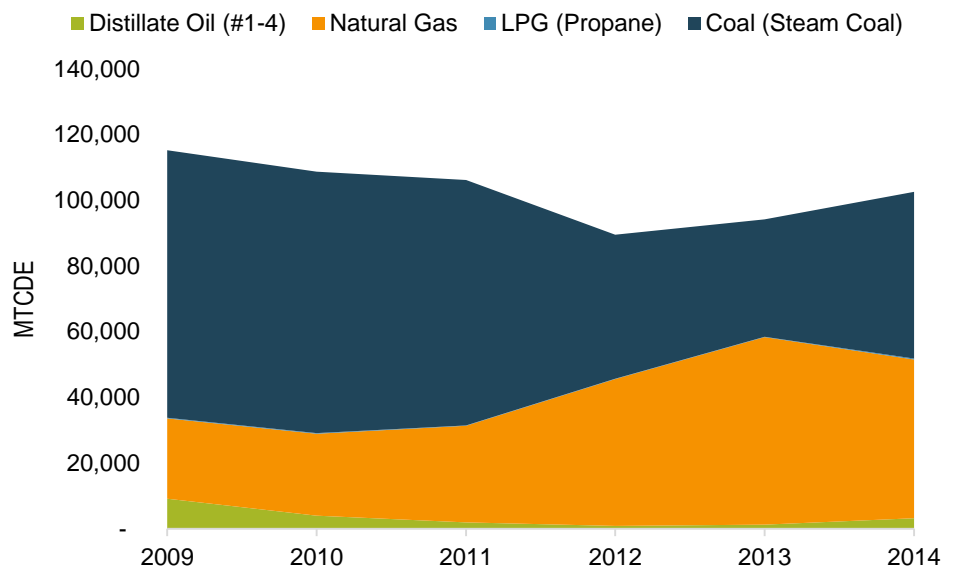
The majority of U.Va.'s scope 1 emissions come from On-Campus Stationary fuels used for heating. The sources include coal, natural gas, distillate oil, and propane gas. With the gradual decrease in use of coal and distillate oil, the use of natural gas has increased to keep up with current demands as well as that of new buildings being built. This reduction of coal and distillate oil use has been carrying U.Va.'s emissions reductions and is the reason that of the four major emitters, **this category is the only one to have decreased its net GHG emissions since 2009.**

Total Heating Emissions

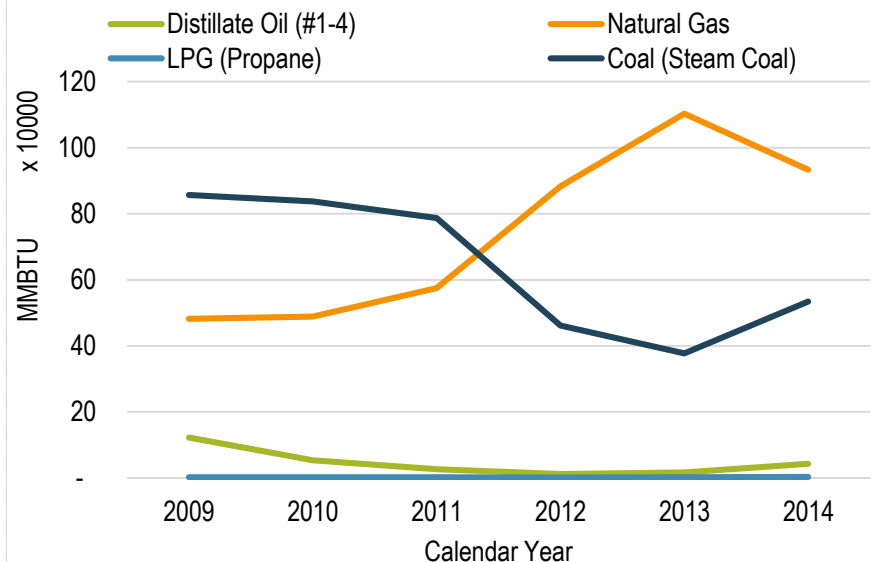
	2009	2013	2014	% change from '13	% change from '09
Heating MTCDE Total	116,306.38	95,849.50	103,817.32	8.31%	-10.74%
MMBTU Total	1,463,487.61	1,499,435.73	1,514,850.04	1.03%	3.51%
MTCDE/MMBTU	0.07947	0.06392	0.06853	7.21%	-13.76%

A **10.74% reduction** in net emissions due to heating has occurred since 2009. As illustrated, this reduction is mainly due to the increased use of natural gas instead of coal to manage the University's energy load. The discrepancy in reduction between 2013 and 2014 is due to a colder winter than normal and a lack of natural gas supply during the coldest peaks. When taking energy load into account and normalizing it to emissions (MTCDE per MMBtu), there is even a further **reduction of 13.76%**.

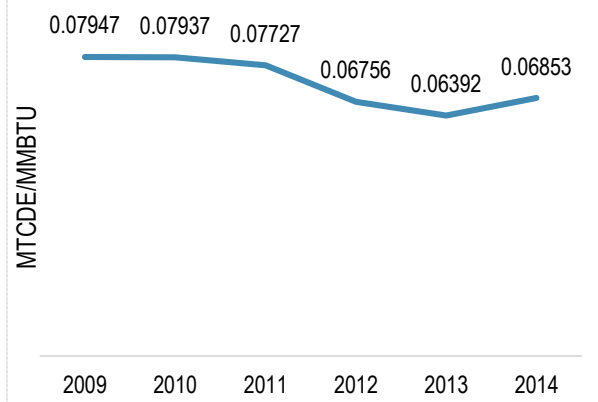
GHG Emissions per Source



Heating Source Energy Consumption



Emissions per Energy Used



Impact of Weather

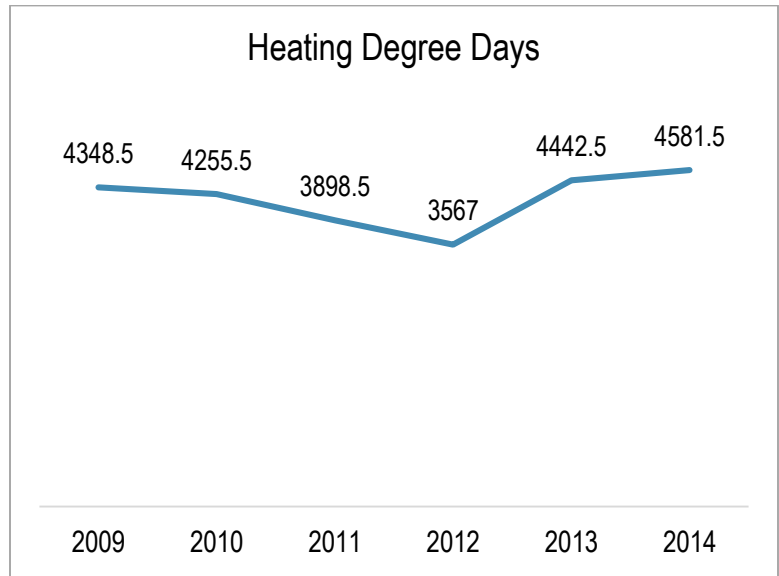
With a steady increase in heating degree days have occurred since 2009, or the amount of energy needed to maintain the warmth of a building, heating emissions should consequently increase. However, due to reduction of coal and distillate oil use, U.Va.'s emissions have significantly decreased, especially when normalizing for the influx in heating degree days.

[Virginia District Degree Day Data](#) was retrieved from NESDIS, which used a 65°F base:

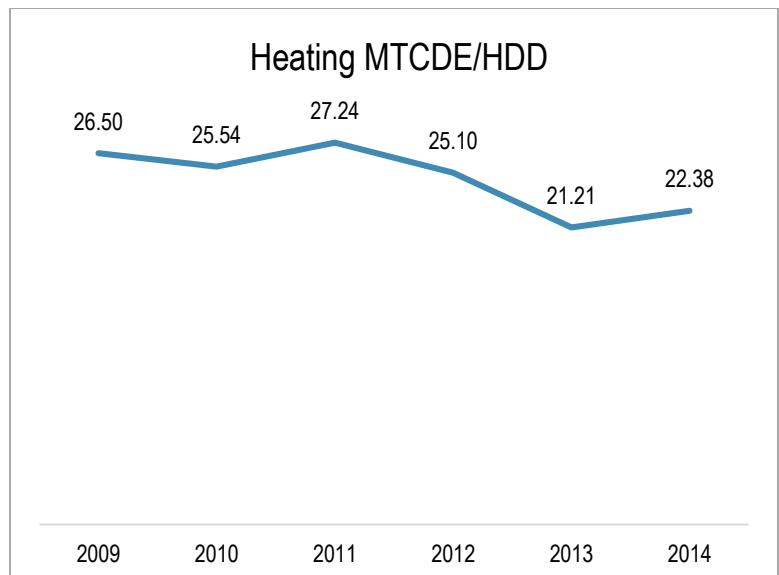
GHG Intensity – Heating Emissions per Heating Degree Day

	2009	2013	2014	% change '13	% change '09
Heating Degree Days	4,348.50	4,442.50	4,581.50	3.13%	5.36%
On-Campus Stationary (MTCDE)	116,306.38	95,849.50	103,817.32	8.31%	-10.74%
MTCDE/HDD	26.75	21.58	22.66	5.03%	-15.28%

From 2009 to 2014, there was a **5.36% increase** in Heating Degree Days. Thus, in the past five years, the need for using energy to heat buildings has increased.



While net emissions were only reduced by 10.74%, when accounting for the fact that there has been an increase in colder days, there has been a **15.28% reduction** of overall heating emissions (MTCDE per heating degree day) from 2009 to 2014.



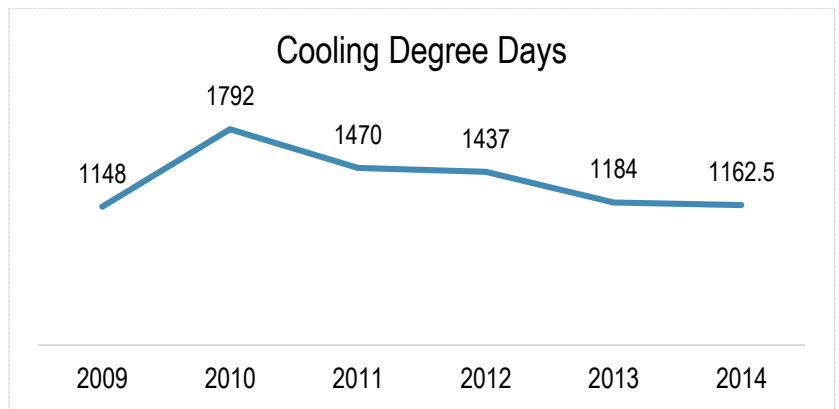
Cooling Impact

Since the University of Virginia is a school located in the southern United States, a lot of energy is used for cooling every building on Grounds. This cooling is produced by the multiple cooling plants around grounds and is responsible for our greatest amount of water consumption. The use of so much water has a consequent electricity load which is where the greenhouse gas emissions stem from. With the increase in chiller plant efficiency and decrease in water use for cooling, emissions have and will see greater reduction.

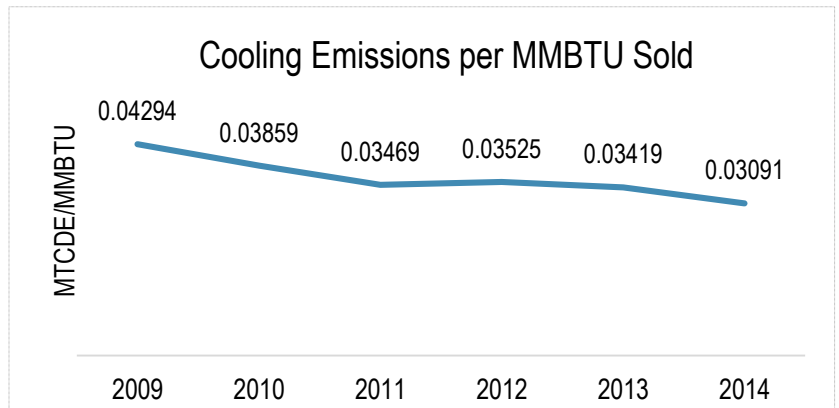
GHG Intensity – Chiller Plant Emissions per Cooling Degree Day

	2009	2013	2014	% change '13	% change '09
Cooling Degree Days	1148	1184	1162.5	-1.82%	1.26%
Chiller Plant Energy Use + T&D Losses (MMBTU)	837,558.31	1,013,729.46	1,052,746.37	3.85%	25.69%
Total Emissions (MTCDE)	35,965.59	34,659.41	32,537.23	-6.12%	-9.53%
MTCDE/CDD	31.33	29.27	27.99	-4.39%	-10.66%
MTCDE/MMBTU	0.04294	0.03419	0.03091	-9.60%	-28.02%
MTCDE/GSF	0.00472	0.00372	0.00332	-10.93%	-29.70%

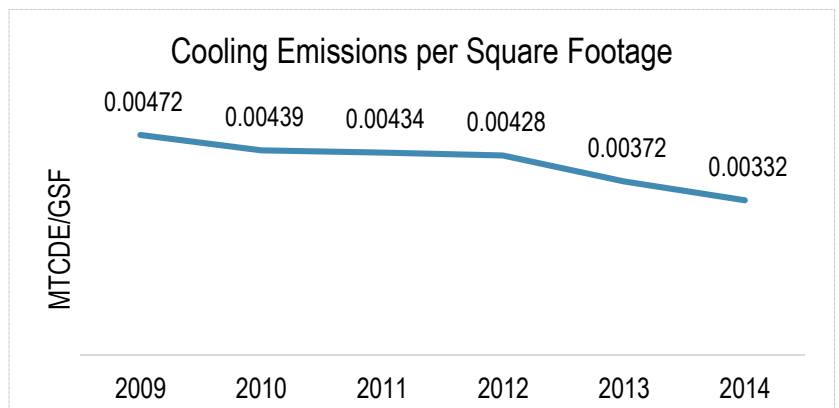
From 2009 to 2014, the overall need to cool buildings has increased slightly by 1.26%. However, looking at overall trends in the past 30 years, the average CDD is 1284.02. Thus, from this value, the 2014 CDD is **9.46% lower** than values in the past showing an overall decrease in the need for cooling.



When normalizing for the amount of energy consumed by the University (MTCDE per MMBtu), cooling emissions have steadily decreased. Comparing with 2009 levels, the 2014 emissions have seen a **28.02% reduction**.



Accounting for the increase in gross square footage and additional need for cooling since 2009 (MTCDE per GSF), cooling emissions have seen an overall **29.7% reduction**.

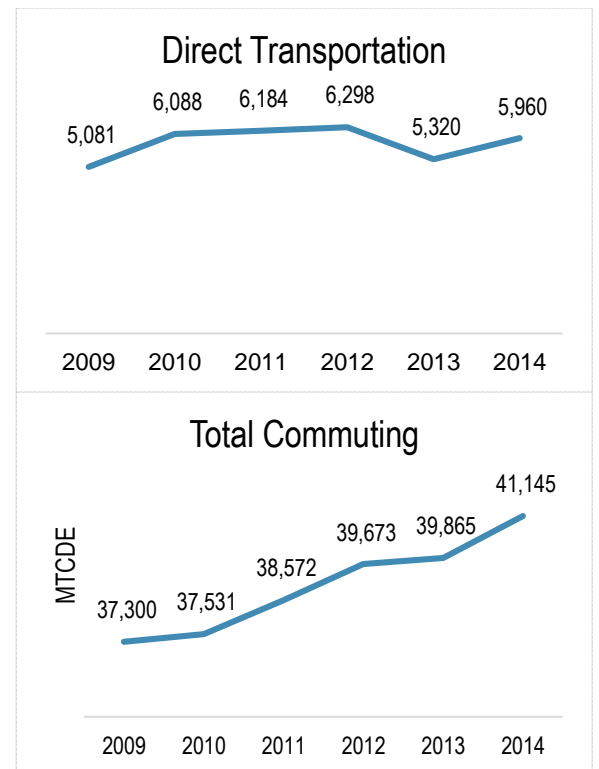
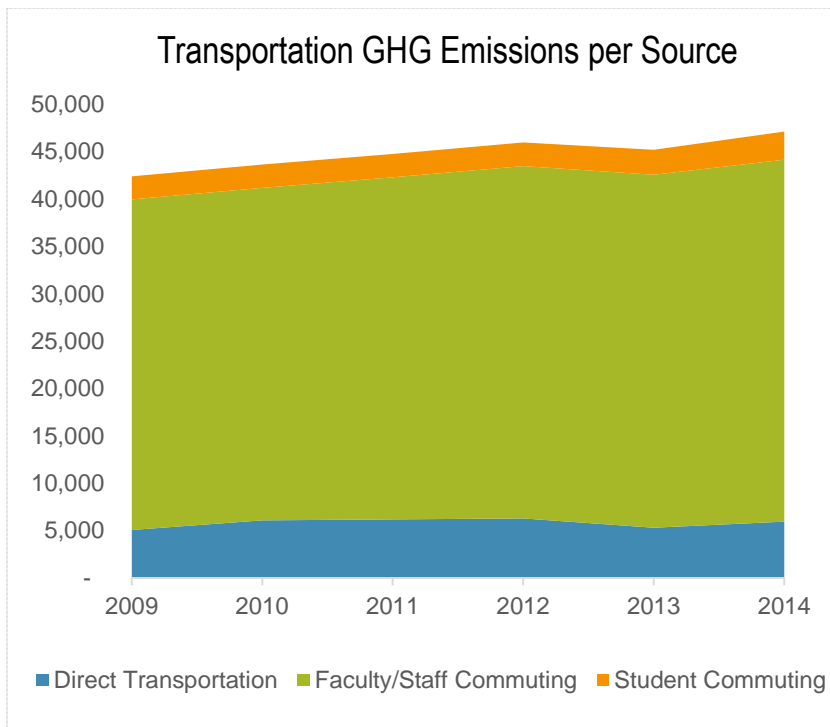


Transportation Emissions

U.Va.'s scope 1 direct transportation emissions come from the University fleet, which includes the University Transit System buses, University-issued cars and maintenance vehicles, and the University jet. The remainder of the transportation emissions are a part of scope 3 and include faculty, staff, and student commuting. This commuting number comes from a summation of the amount of student, faculty, and staff commuters we have along with the approximate miles they travel. In total, transportation emissions account for about 15% of U.Va.'s total net emissions and have steadily been increasing. Adding up both fleet and commuting, U.Va. shows an increase in emissions from transportation.

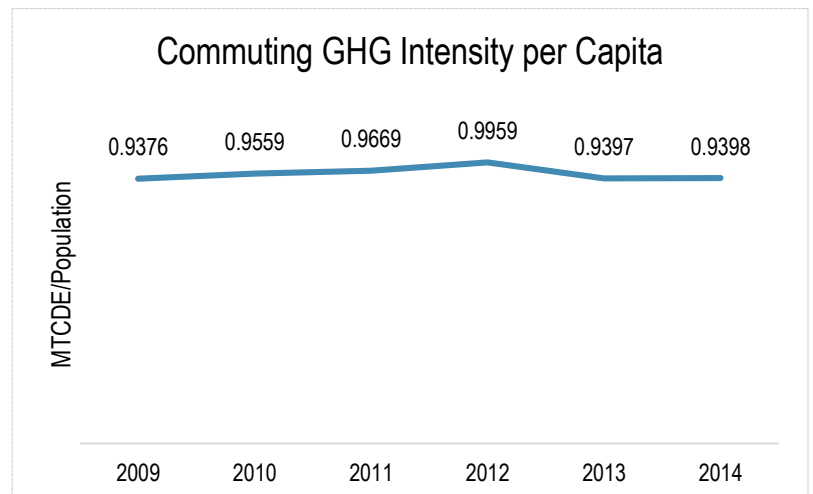
Total Transportation Emissions (MTCDE)

	2009	2013	2014	% change from '13	% change from '09
Fleet MTCDE	5,080.87	5,320.22	5,960.14	12.03%	17.31%
Commuting MTCDE	37,299.96	39,864.88	41,144.82	3.21%	10.31%
Population	39,782	42,421	43,779	3.20%	10.05%
Commuting GHG Intensity per Capita	0.93761	0.93974	0.93983	0.01%	0.24%



When accounting for population growth, commuting GHG emissions are generally on par with 2009, with a slight **0.24% increase** from 2009, after going through a steady increase from 2009 to 2012.

Since the fleet is not significantly affected by population growth, it was not included in the per capita analysis. Despite this, direct transportation has seen a **17.31% increase** in emissions since 2009. On average the University Jet accounts for **37% of direct transportation emissions**.



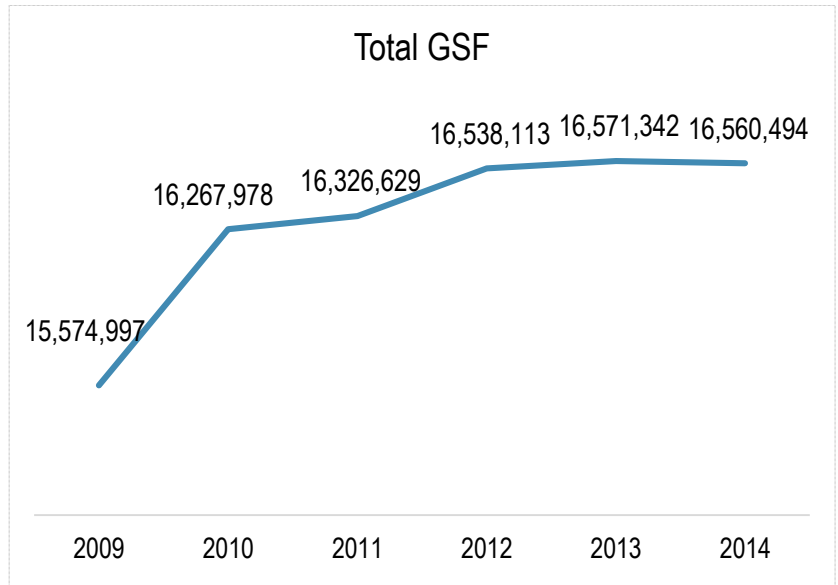
Overall Growth

Along with population increase, building growth also has a significant impact upon greenhouse gases. With the addition of 40 new or acquired buildings since 2009, the University has seen a general influx in greenhouse gas emissions in all three scopes. While on-campus stationary emissions have decreased due to the previously mentioned reductions, emissions from everything else have increased. Analyzing emissions from all three Scopes by normalizing for the increase in gross square footage, emissions have actually seen a 6.99% reduction since 2009:

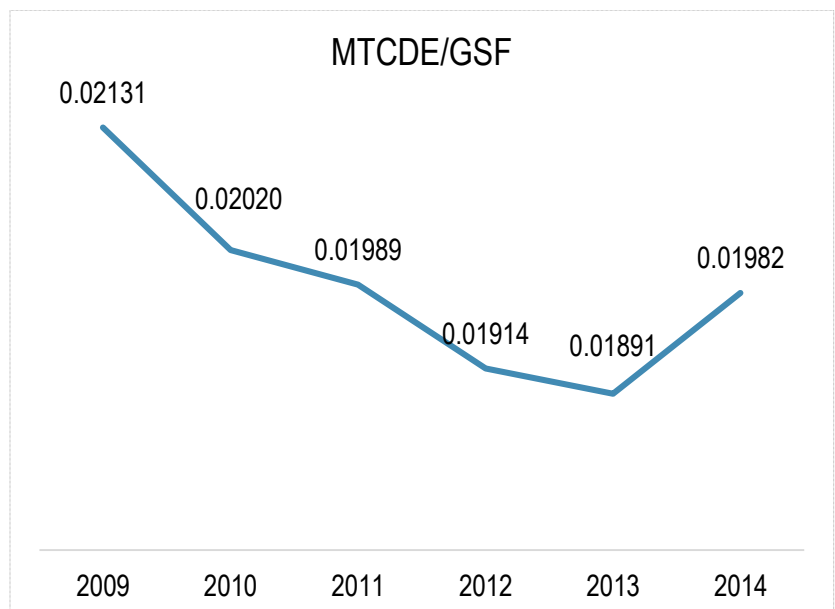
Overall Growth Analysis

	2009	2013	2014	% change from '13	% change from '09
Net Total MTCDE	331,875	314,171	328,198	4.46%	-1.11%
Total GSF	15,574,997	16,571,342	16,560,494	-0.07%	6.33%
MTCDE/GSF	0.02131	0.01896	0.01982	4.53%	-6.99%

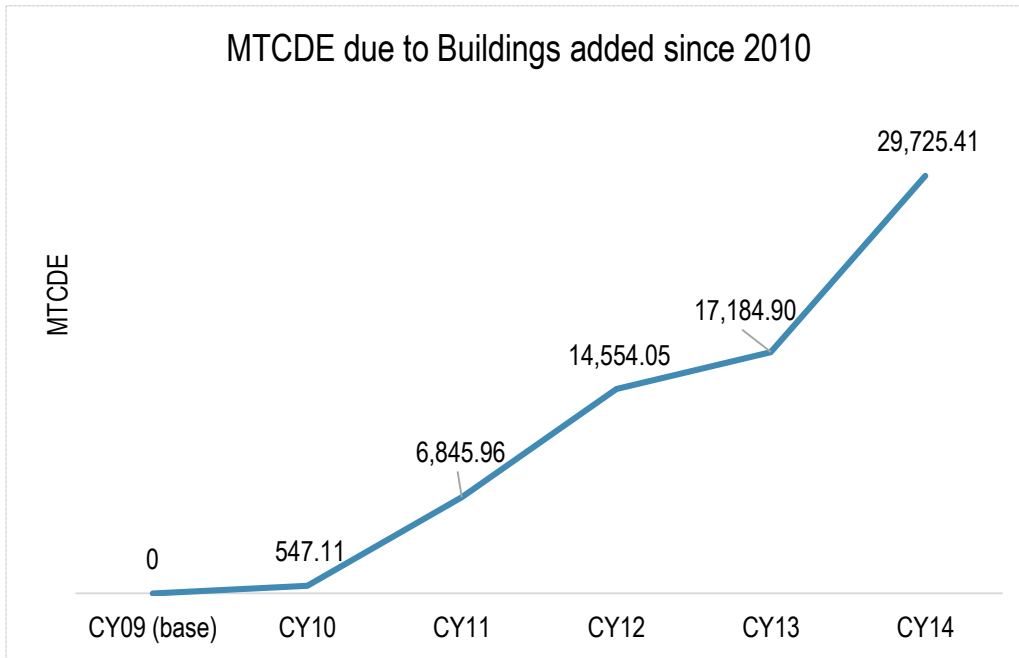
With about a million of gross square foot increase in building size since 2009, a **6.33% increase** in total size, emissions would be expected to significantly increase.



However, due to efforts in reduction of these emissions, when analyzing emissions on a per gross square foot basis, there has been a **6.99% reduction** from 2009 to 2014.



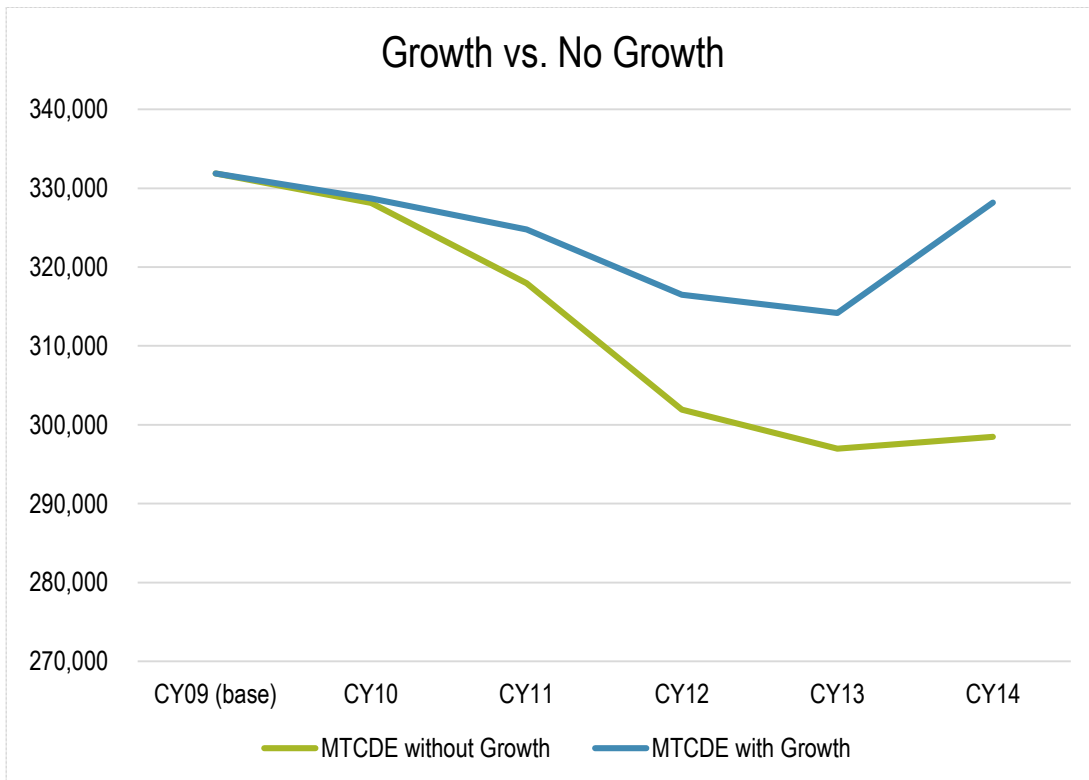
Of these total emissions, about 3,000 MTCDE has come from buildings built since 2010:



Subtracting these emissions from Net Emissions yields the emissions that U.Va. would have produced without growth:

	2009	2013	2014	% change from '13	% change from '09
MTCDE With Growth	331,875	314,171	328,198	4.46%	-1.11%
MTCDE Without Growth	331,875	296,986	298,473	0.50%	-10.06%

If gross square footage remained the same as 2009 levels, GHG intensity would have seen a **10.06% reduction** in emissions:



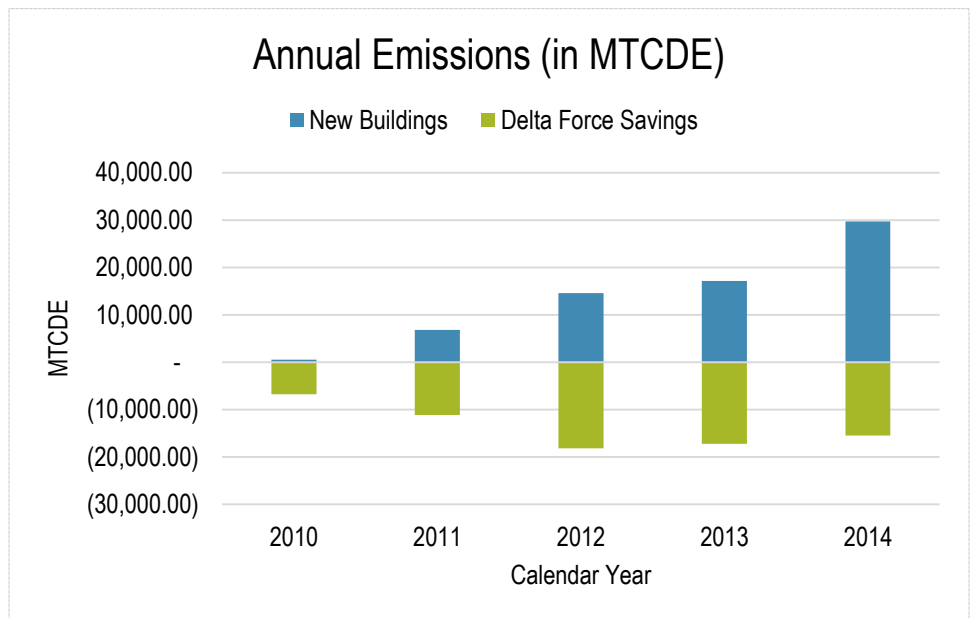
Impact of Delta Force

Delta Force is an interdisciplinary team-based approach to optimize the performance and sustainability of the most energy intensive buildings that exist on Grounds. Each building's Delta Force team includes facility coordinators, staff and trades, building occupants, and external consultants led by Facilities Management and Energy Engineers from the Office for Sustainability. Delta Force projects include HVAC retro-commissioning, re-lamping, envelope improvements, and additional energy conservation measures. These projects have a significant impact upon the energy consumption of a building.

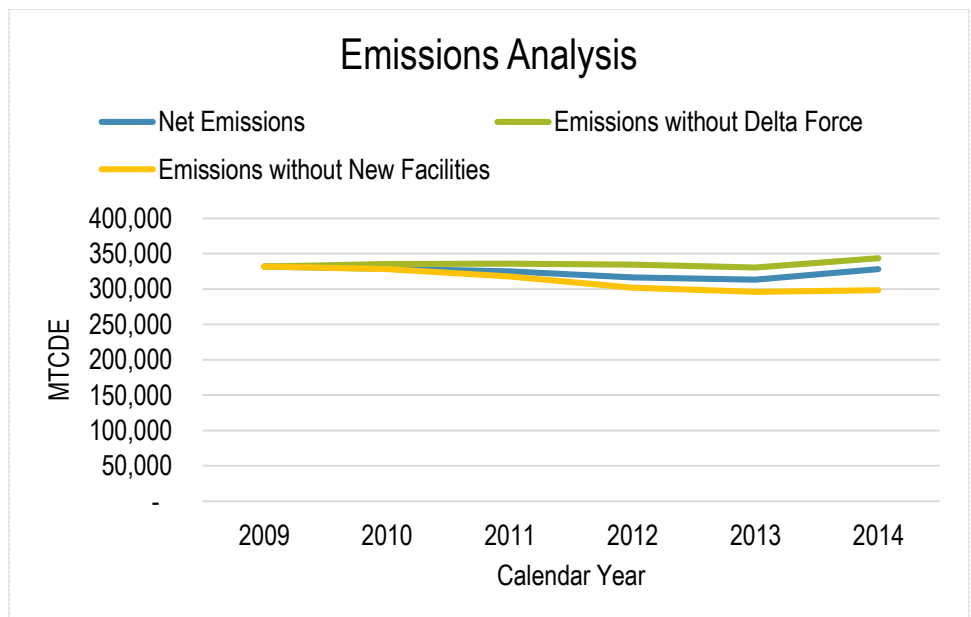
Emissions since 2010:

Calendar Year	MMBTU		MTCDE		
	New Buildings	Delta Force Savings	New Buildings	Delta Force Savings	% reduction from NET possible
2010	5,715.85	80,359.06	547.11	6,765.59	-2.02%
2011	80,414.67	138,198.58	6,845.96	11,162.62	-3.32%
2012	169,034.75	206,718.67	14,554.05	18,141.68	-5.42%
2013	180,274.04	199,452.64	17,184.90	17,208.14	-5.19%
2014	303,982.86	182,646.29	29,725.41	15,473.10	-4.50%

Since 2008, Delta Force has been one of the main drivers in building emissions reduction. In 2014, Delta Force initiatives showed a **52% reduction** from possible emissions coming from new buildings specifically.



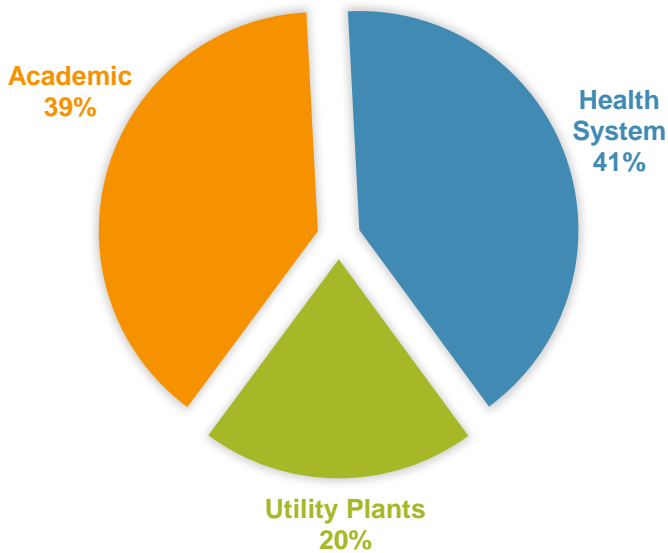
Without growth from new facilities, Delta Force initiatives alone would have decreased emissions by 4.93% in 2014. When considering all University net emissions, Delta Force was responsible for a **4.5% reduction** from possible total emissions in 2014.



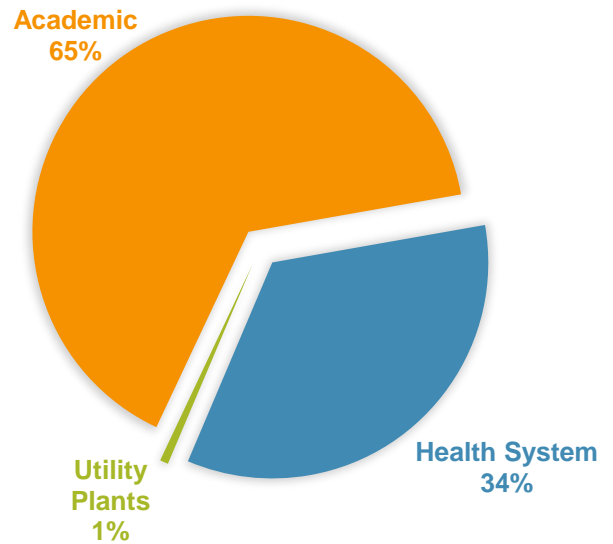
Health System vs. Academic Building Emissions

The University of Virginia's Health System and Academic Buildings account for the majority of the University's total greenhouse gas emissions. Upon initial analysis the Health System emits roughly two-fifths of total University emissions, or more specifically 40.75% of net total emissions. With future separation of the utility plants' service to either district, much of the 20.23% of emissions coming from utility plants will be placed in the Health System wedge. Despite the health system having the largest emissions footprint, it only accounts for 34.17% of the total gross square footage of the University. Thus, a disproportionate amount of greenhouse gases stem from the Health System when compared with Academic buildings.

2014 EMISSIONS BY DISTRICT



2014 GSF BY DISTRICT



Moving Forward

With heating being the only sector that has had a significant decrease in emissions despite growth, efforts to reduce emissions by reducing coal are having an impact. With the continuing reduction of coal use by utilization of natural gas and other more alternative energies as well as efficiency projects, further reductions will be achieved. With electricity and the resulting emissions from transmission and distribution losses accounting for a little over 53% of overall emissions, more attention should be focused on that specific sector. Currently, plant-level (both chilled water and heating) efficiency projects retro-commissioning projects such as Delta Force and I re-lamping projects have kept emissions from skyrocketing due to growth.

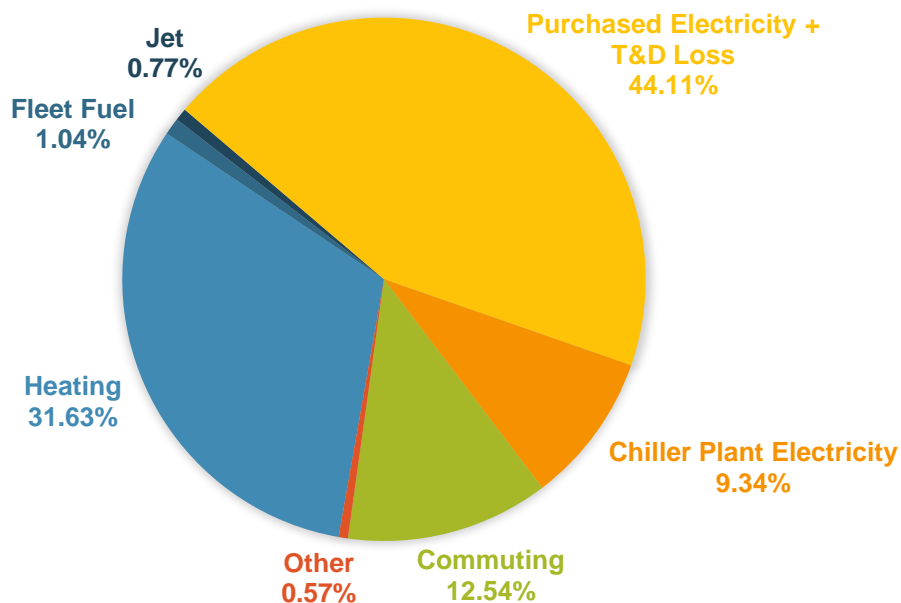
With continued and more aggressive electricity-related efficiency projects, this number can be projected to decrease. Chiller plants alone account for about a fifth of total electricity use. Continuing projects like system optimization, condensate recovery, reverse osmosis purification of blowdown water, and spring water collection will help reduce total emissions coming from electricity use by chiller plants.

Of the 2% of overall emissions produced by direct transportation, the University Jet accounts for about 1%. With reduction of its use and emissions, we could see a reduction as great as about 2,500 MTCDE.

While this report hits the majority of U.Va.'s emissions, there is still progress to be made in accurately assessing the University's footprint. More centralized reporting for business travel, study abroad, and paper purchasing would allow additional scope 3 sources to be quantified. Additionally, there is progress being made in analyzing the emissions impact of sulfur hexafluoride (SF6), which is used in the certification of lab hoods. Once there is an accurate representation of its impact, efforts can be made in reducing this impact by replacing its use with less GHG-intensive alternatives.

With about 10 years left to meet the 25% by 2025 reduction goal, combatting new emissions due to growth is feasible, but will require deliberate planning, especially with a large hospital project coming online before 2025. This planning will require articulating an Energy and Emissions Action Plan to project growth as well as the impact of potential strategies.

EMISSIONS BY SECTOR



Appendix A: Total MTCDE Raw Data and Summations

All GHG Emissions for 2009:

Select Year -->	2009	Energy Consumption	CO ₂	CH ₄	N ₂ O	eCO ₂
		MMBtu	kg	kg	kg	Metric Tonnes
Scope 1	Co-gen Electricity	-	-	-	-	-
	Co-gen Steam	-	-	-	-	-
	Other On-Campus Stationary	1,443,189.3	114,464,601.9	12,792.8	1,484.7	115,226.8
	Direct Transportation	72,695.2	4,979,560.8	514.0	296.8	5,080.9
	Refrigerants & Chemicals	-	-	-	-	437.3
	Agriculture	-	-	-	125.1	37.3
Scope 2	Purchased Electricity	1,836,452.6	156,260,052.8	5,629.2	2,572.4	157,167.4
	Purchased Steam / Chilled Water	-	-	-	-	-
Scope 3	Faculty / Staff Commuting	476,037.7	33,988,680.9	7,054.5	2,363.3	34,869.3
	Student Commuting	32,678.8	2,401,981.3	198.0	79.6	2,430.6
	Directly Financed Air Travel	-	-	-	-	-
	Other Directly Financed Travel	-	-	-	-	-
	Study Abroad Air Travel	-	-	-	-	-
	Student Travel to/from Home (OPTIONAL)	-	-	-	-	-
	Solid Waste	-	-	(8,961.6)	-	(224.0)
	Wastewater	-	-	532.5	712.3	225.6
	Paper	-	-	-	-	-
	Scope 2 T&D Losses	181,627.2	15,454,290.9	556.7	254.4	15,544.0
Offsets	Additional					-
	Non-Additional					-
Totals	Scope 1	1,515,884.5	119,444,162.6	13,306.8	1,906.6	120,782.3
	Scope 2	1,836,452.6	156,260,052.8	5,629.2	2,572.4	157,167.4
	Scope 3	690,343.7	51,844,953.1	(619.9)	3,409.7	52,845.5
	All Scopes	4,042,680.9	327,549,168.5	18,316.1	7,888.7	330,795.2
	All Offsets					-
						Net Emissions:

All GHG Emissions for 2013:

Select Year -->	2013	Energy Consumption	CO ₂	CH ₄	N ₂ O	eCO ₂
		MMBtu	kg	kg	kg	Metric Tonnes
Scope 1	Co-gen Electricity	-	-	-	-	-
	Co-gen Steam	-	-	-	-	-
	Other On-Campus Stationary	1,469,066.3	93,820,498.8	8,841.4	648.7	94,234.9
	Direct Transportation	62,072.4	4,406,001.5	479.4	279.3	4,501.2
	Refrigerants & Chemicals	-	-	-	-	741.7
	Agriculture	-	-	-	91.7	27.3
Scope 2	Purchased Electricity	1,830,910.4	161,470,572.0	5,612.2	2,564.7	162,375.1
	Purchased Steam / Chilled Water	-	-	-	-	-
Scope 3	Faculty / Staff Commuting	508,374.9	36,297,715.3	7,536.0	2,523.9	37,238.2
	Student Commuting	35,315.2	2,595,873.8	212.5	85.4	2,626.6
	Directly Financed Air Travel	-	-	-	-	-
	Other Directly Financed Travel	-	-	-	-	-
	Study Abroad Air Travel	-	-	-	-	-
	Student Travel to/from Home (OPTIONAL)	-	-	-	-	-
	Solid Waste	-	-	(9,047.9)	-	(226.2)
	Wastewater	-	-	429.9	575.1	182.1
	Paper	-	-	-	-	-
	Scope 2 T&D Losses	113,164.6	9,980,146.3	346.9	158.5	10,036.1
Offsets	Additional					-

	Non-Additional						-
Totals	Scope 1	1,531,138.7	98,226,500.3	9,320.8	1,019.6		99,505.1
	Scope 2	1,830,910.4	161,470,572.0	5,612.2	2,564.7		162,375.1
	Scope 3	656,854.6	48,873,735.4	(522.6)	3,342.9		49,856.9
	All Scopes	4,018,903.6	308,570,807.7	14,410.4	6,927.2		311,737.1
	All Offsets						-
						Net Emissions:	311,737.1

All GHG Emissions for 2014:

Select Year -->	2014	Energy Consumption	CO ₂	CH ₄	N ₂ O	eCO ₂	
		MMBtu	kg	kg	kg	Metric Tonnes	
Scope 1	Co-gen Electricity	-	-	-	-	-	
	Co-gen Steam	-	-	-	-	-	
	Other On-Campus Stationary	1,490,779.5	102,031,951.3	9,819.9	872.9	102,537.6	
	Direct Transportation	81,346.7	5,837,727.9	533.7	366.0	5,960.1	
	Refrigerants & Chemicals	-	-	-	-	1,890.7	
	Agriculture	-	-	-	172.1	51.3	
Scope 2	Purchased Electricity	1,862,647.4	164,269,509.9	5,709.5	2,609.1	165,189.8	
	Purchased Steam / Chilled Water	-	-	-	-	-	
Scope 3	Faculty / Staff Commuting	521,029.2	37,233,932.2	7,592.8	2,549.9	38,183.6	
	Student Commuting	39,801.1	2,924,642.2	252.5	101.5	2,961.2	
	Directly Financed Air Travel	-	-	-	-	-	
	Other Directly Financed Travel	-	-	-	-	-	
	Study Abroad Air Travel	-	-	-	-	-	
	Student Travel to/from Home (OPTIONAL)	-	-	-	-	-	
	Solid Waste	-	-	(8,876.4)	-	(221.9)	
	Wastewater	-	-	369.0	493.6	156.3	
	Paper	-	-	-	-	-	
	Scope 2 T&D Losses	115,126.2	10,153,142.6	352.9	161.3	10,210.0	
Offsets	Additional					-	
	Non-Additional					-	
Totals	Scope 1	1,572,126.2	107,869,679.3	10,353.7	1,411.0	110,439.7	
	Scope 2	1,862,647.4	164,269,509.9	5,709.5	2,609.1	165,189.8	
	Scope 3	675,956.5	50,311,717.0	(309.3)	3,306.2	51,289.2	
	All Scopes	4,110,730.1	322,450,906.1	15,753.9	7,326.3	326,918.7	
	All Offsets					-	
						Net Emissions:	326,918.7

Appendix B: New Buildings since 2009

	Building Number	Building	Year Built	GSF
1	71	SOUTH LAWN NAU HALL	2009	43,143
2	72	SOUTH LAWN GIBSON HALL	2009	46,037
3	598	PRINTING SERVICE CENTER ADDITION	2009	14,940
4	1161	CARTER-HARRISON RESEARCH BUILDING (MR-6)	2009	197,009
5	1162	FOCUSED ULTRASOUND	2009	1,690
6	1164	PRIMARY CARE CENTER ANNEX	2009	13,484
7	1765	EMERGING TECHNOLOGY CENTER MODULAR LAB	2009	2,056
8	8068	BLANDY NEW TRAILER LAB	2009	864
9	8069	BLANDY NEW PROPAGATION GREENHOUSE	2009	1,176
10	9737	ML-DIRECTORS CABIN	2009	1,422
11	9738	ML-SERVICE STORAGE BUILDING	2009	1,536
12	70	SOUTH LAWN COMMONS	2010	22,536
13	264	BAVARO HALL	2010	65,000
14	1147	CLAUDE MOORE MEDICAL EDUCATION BUILDING	2010	60,582
15	214	RICE HALL	2011	100,000
16	215	PHYSICAL AND LIFE SCIENCES BUILDING	2011	100,000
17	448	HUNTER SMITH BAND BUILDING	2011	16,375
18	593	IVY STACKS PUMP HOUSE	2011	216
19	599	2476 OLD IVY ROAD	2011	12,500
20	1146	EMILY COURIC CLINICAL CANCER CENTER	2011	146,000
21	2369	Balz-Dobie House	2011	66,013
22	2370	Watson-Webb House	2011	62,279
23	2371	ERN COMMONS	2011	6,671
24	5513	IMREC STORAGE SHED	2011	160
25	3373	OUTPATIENT SURGERY CENTER MOBILE ORS	2012	2,020
26	5505	DAVENPORT KLOCKNER LANNIGAN TICKET BOOTH	2012	332
27	8075	BLANDY FIELD LAB	2012	4,258
28	238	FM LANDSCAPE SHOP	2013	10,000
29	273	LACY HALL	2013	19,628
30	449	DRAMA EDUCATION BUILDING ADDITION	2013	20,540
31	2372	LILE-MAUPIN HOUSE	2013	58,041
32	2373	TUTTLE-DUNNINGTON HOUSE	2013	57,274
33	2374	SHANNON HOUSE	2013	66,794
34	5562	NORTH GROUNDS RECREATION ADDITION	2013	34,565
35	5591	GEORGE WELSH INDOOR PRACTICE FACILITY	2013	84,688
36	5594	IPF EQUIPMENT FACILITY	2013	1,600
37	5610	MARTHUR SQUASH CENTER	2013	37,749
38	7102	HEATING PLANT STORAGE BUILDING	2013	1,200
39	7186	EAST CHILLER PLANT	2013	22,500
40	604	RECYCLING SORTING FACILITY (Still Under Construction)	2014	1,852