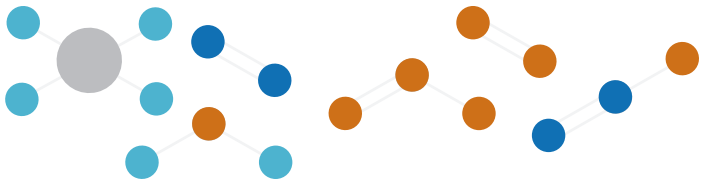
NC STATE UNIVERSITY

2013 GREENHOUSE GAS INVENTORY

Document Prepared by Facilities Operations



OVERVIEW

BACKGROUND

Many students, faculty and staff at NC State University (NC State) are minimizing the university's impact on the environment and on greenhouse gas emissions. Recognizing this contribution, the Chancellor signed the American College and University Presidents' Climate Commitment (ACUPCC) in 2008. This commitment requires that the university develop a Climate Action Plan (CAP) as well as conduct a greenhouse gas (GHG) inventory every other year. The inaugural GHG inventory was completed in 2008 and in 2010 NC State developed its Climate Action Plan, which detailed the university's strategies to work toward climate neutrality by 2050. This report serves as the third GHG inventory for NC State and an opportunity to track progress toward the goal of neutrality.

BOUNDARIES

NC State is comprised of multiple campuses and more than 100 satellite offices, which amount to more than 20 million square feet of building space and a population of about 45,000. The three campuses included in this GHG inventory are Central, North, Centennial and Centennial Biomedical as well as satellite offices for which NC State manages the utility accounts. Satellite offices not included in this report have their utility accounts managed by another unit or are a joint endeavor between NC State and North Carolina Agricultural and Technical State University.

SCOPES & TIME FRAME

Greenhouse gases are described in scopes. Scope I is direct emissions from the institution. Scope II emissions are from purchased utilities, and Scope III emissions are indirect emissions from the institution. Scopes I and II emissions are based on the calendar year 2013 for the possible implementation of federal or state requirements. Scope III emissions are based on fiscal year 2012- 2013, since most university departments track records based on the fiscal calendar.

METHODOLOGY

The calculations are based on the Climate Registry, Clean Air Cool Planet's Campus Carbon Calculator version 6.9 and Atmosfair.

RESULTS & COMPARISONS

Figures 2 and 4 on the following pages illustrate the 2013 GHG emissions for NC State. Figures 5 and 6 illustrate the reduction in GHG emissions. There has been a 13.5 percent overall reduction with electricity, refrigerants and commuting accounting for the largest decrease in total emissions. Overall, the emissions reduced from 270,069 metric tons of carbon dioxide equivalent (MTCDE) in 2008 to 233,627 MTCDE in 2013. The majority of GHG emissions from the university are from electricity, natural gas and commuting. Scope I emissions account for 42.8 percent and Scope II comprise 42.3 percent of the total emissions. GHG emissions for North and Cental Campuses reduced by 24 percent from 2010 due in part to the new Combined Heat and Power (CHP) installation located at the Cates Utility Plant.

GROWTH

Currently the campus enrollment is projected to grow from 34,009 in 2013 to 37,000 by 2020. This increase in student population is estimated to increase NC State's GHG emissions by approximately nine percent at today's current trends.

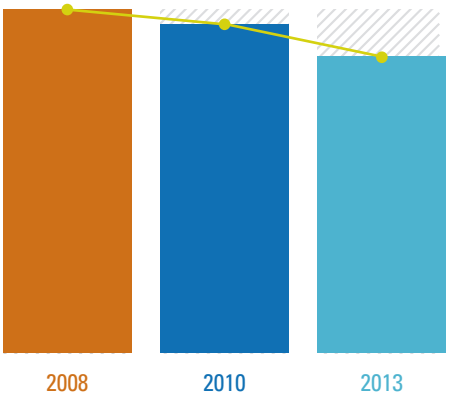
Figure 6 illustrates the university's growth over time in two scenarios; one being Business As Usual less the reductions from the recommendations in the 2010 Climate Action Plan. As indicated by this figure, the university is making significant progress in reducing its GHGs from the implementation of various projects (CHP, etc.) detailed in the CAP and the efforts of the university community.

FUTURE INVENTORIES

The following are reccommendations for improving the accuracy of the GHG Inventory:

- The commuting emissions are based on an annual survey of students, faculty and staff. In future inventories, it is recommended to develop comprehensive commuting surveys that are taken by semester to improve the accuracy and sensitivity of the commuting habits of the campus population.
- This inventory did not include the GHG emissions from purchased products. It is recommended for future inventories to include items purchased from the university's purchasing departments which would help develop guidelines to reduce GHG emissions from purchased products.
- The only offset included in this inventory is for composting. Future inventories should explore offset opportunities through land assets, renewable energy installations or other means.

FIGURE 1. GHG EMISSIONS



13.5% DROP

NC State realized a 13.5% overall reduction in greenhouse gas emissions from 2008 to 2013.

FIGURE 2. 2013 GHG EMISSIONS BY SOURCE

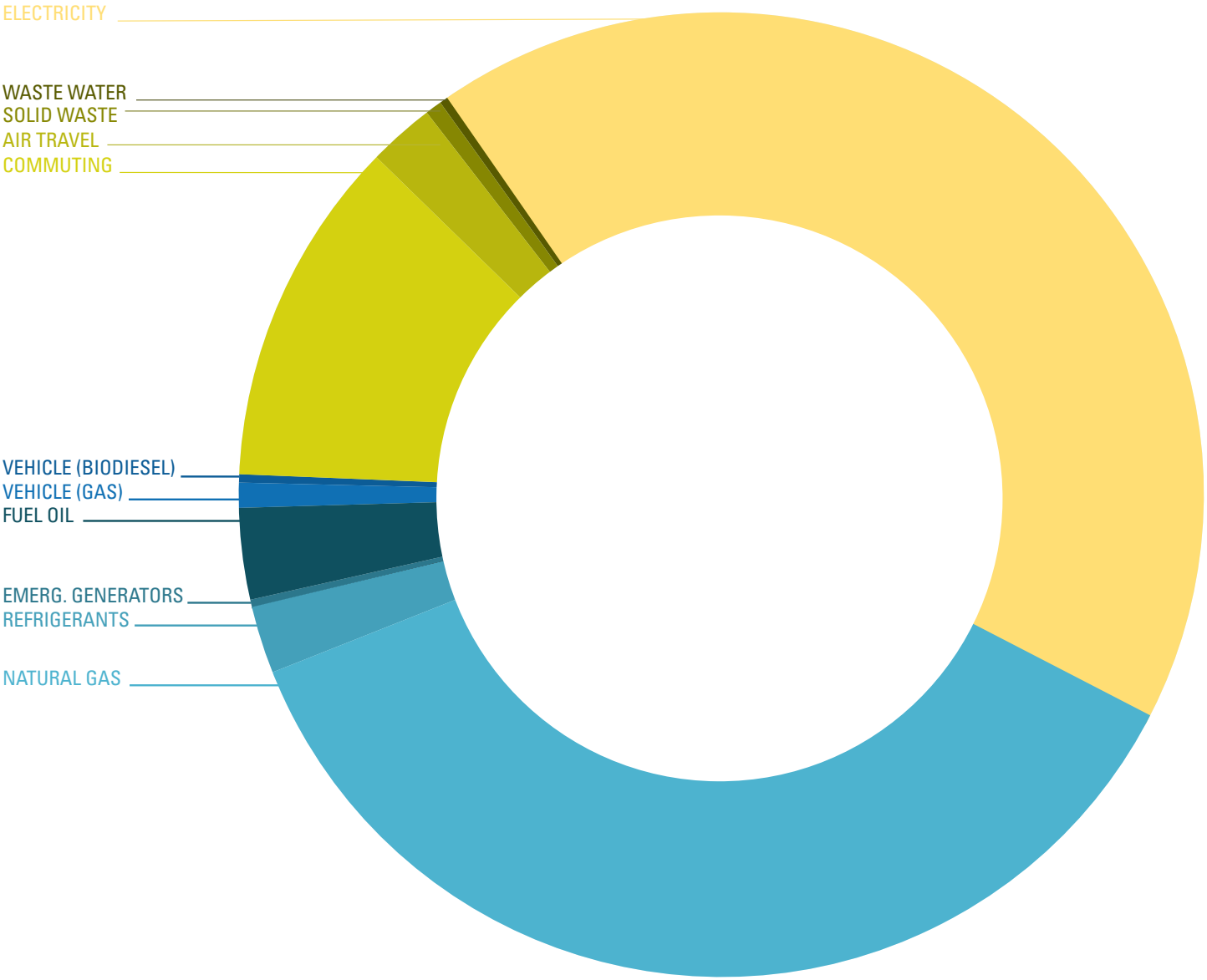


FIGURE 3. IMPACT OF NEW COMBINED HEAT AND POWER UTILITY PLAN ON CENTRAL AND NORTH CAMPUS EMISSIONS

SOURCE	2010 (MTCO2e)	2013 (MTCO2e)	2010-2013 ANNUAL DIFF. (%)
NATURAL GAS	38,703	58,026	50%
FUEL OIL	8,355	1,609	(81%)
ELECTRICITY	92,887	46,421	(50%)
TOTAL	139,944	106,056	(24%)

FIGURE 4. 2013 GHG EMISSIONS BY SCOPE

SOURCE	EMISSIONS (MTCDE)	EMISSIONS (%)
SCOPE 1		
NATURAL GAS	85,349	36.5%
REFRIGERANTS	5,244	2.2%
EMERGENCY GENERATORS	412	0.2%
FUEL OIL	6,966	3.0%
VEHICLE (GAS)	2,064	0.9%
VEHICLE (BIODIESEL)	720	0.3%
FERTILIZERS	55	0.02%
SCOPE 2		
ELECTRICITY	98,919	42.3%

SOURCE	EMISSIONS (MTCDE)	EMISSIONS (%)
SCOPE 3		
COMMUTING	27,329	11.7%
AIR TRAVEL	5,519	2.4%
SOLID WASTE	1,334	0.6%
WASTE WATER	204	0.09%
PAPER PURCHASING	1	0.000%
OFFSETS		
COMPOSTING	(490)	-0.21%
TOTAL		
	233,627	100.00%

FIGURE 5. 2008, 2010 & 2013 GHG EMISSIONS SUMMARY

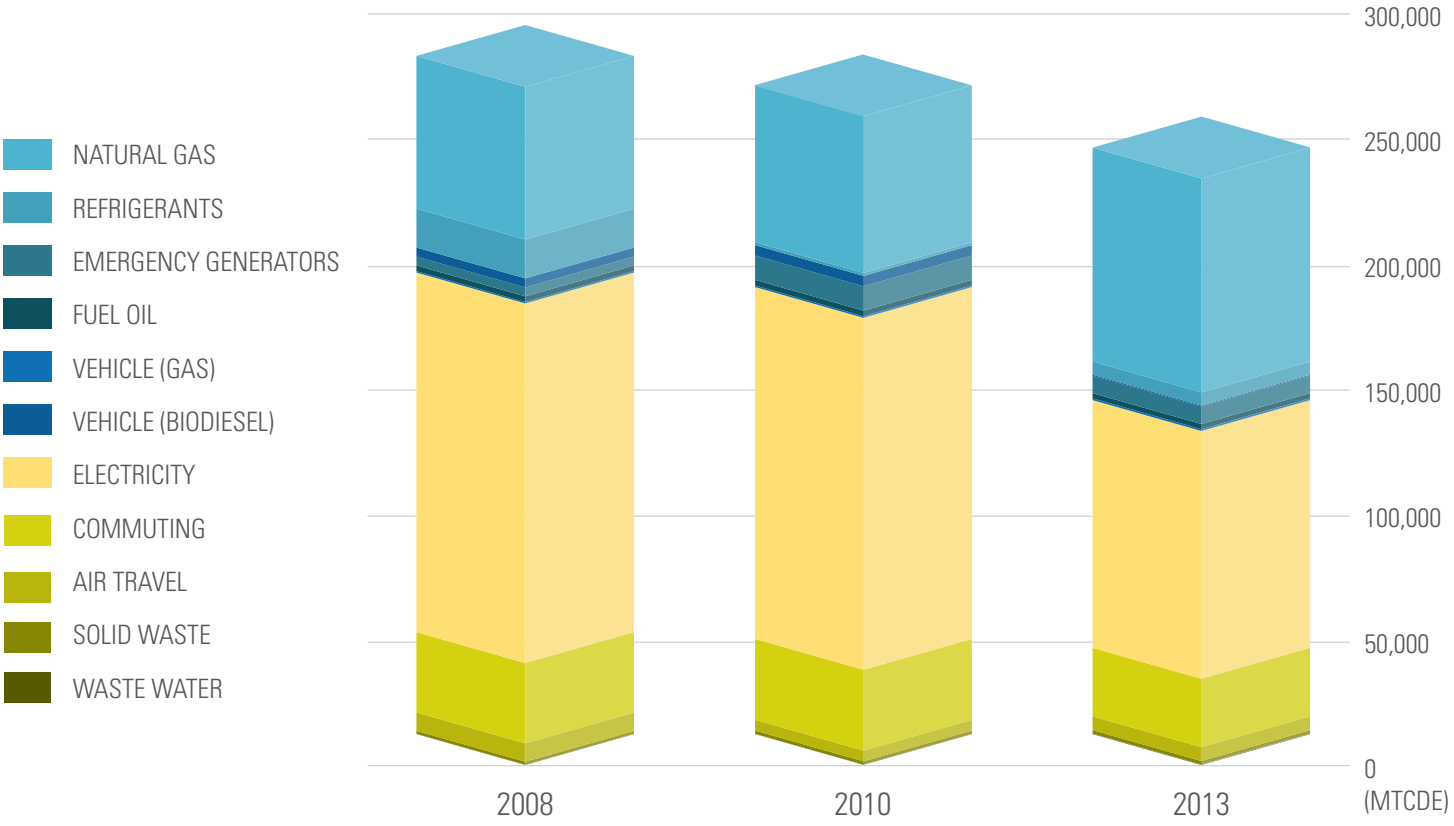
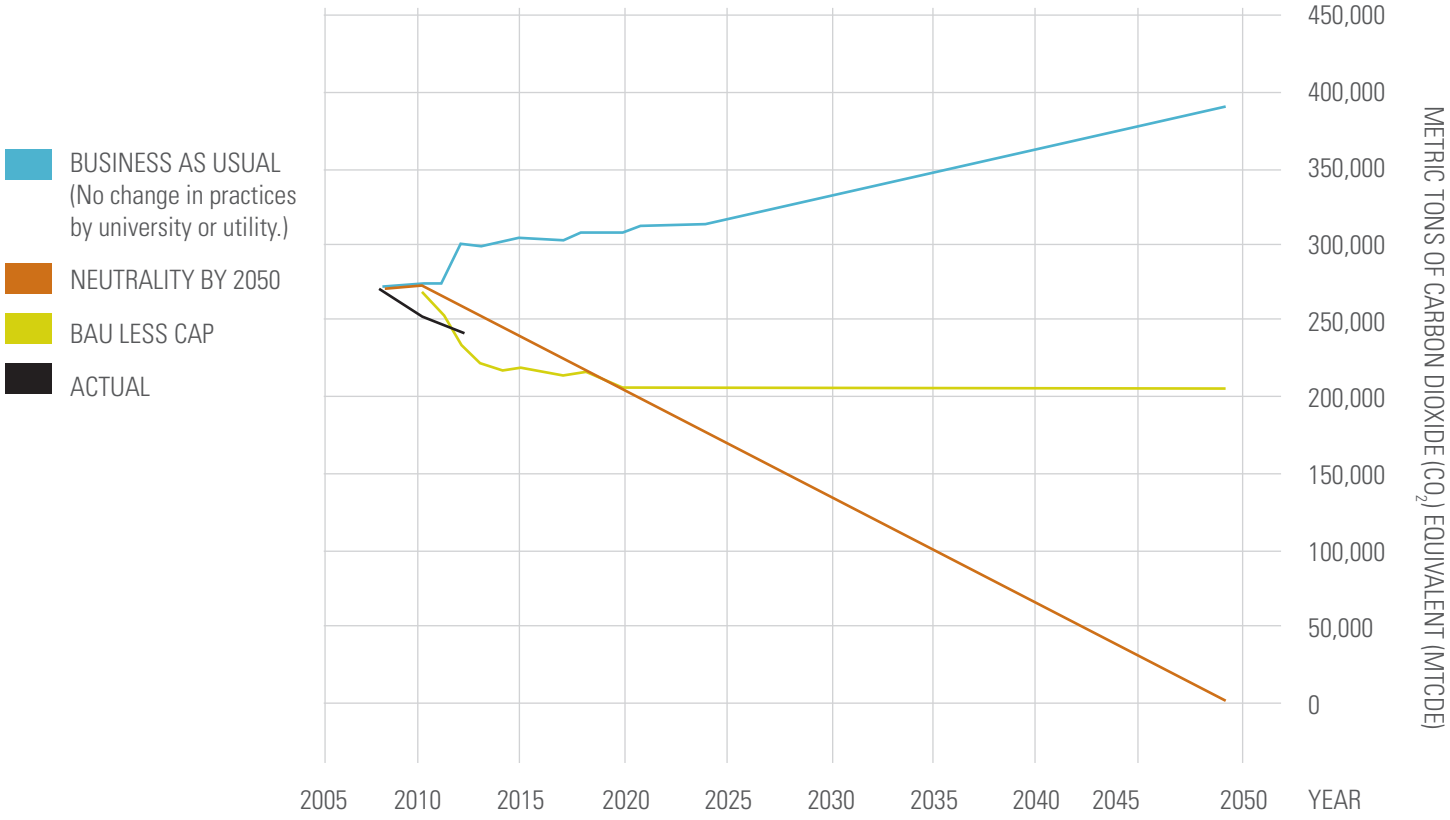


FIGURE 7. 2008, 2010 & 2013 GHG EMISSIONS BY SCOPE

	SOURCE	2008 (MTCDE)	2010 (MTCDE)	2013 (MTCDE)	2010-2013 ANNUAL DIFF. (%)
SCOPE 1					
	NATURAL GAS	60,956	62,596	85,349	36%
	REFRIGERANTS	15,500	1,165	5,244	350%
	EMERGENCY GENERATORS	3,631	4,152	412	(90%)
	FUEL OIL	3,533	9,721	6,966	(28%)
	VEHICLE (GAS)	2,249	2,227	2,064	(7%)
	VEHICLE (BIODIESEL)	580	640	720	12%
	FERTILIZERS	11	27	55	107%
SCOPE 2					
	ELECTRICITY	143,494	140,419	98,919	(30%)

FIGURE 6. GHG SCENARIOS WITH CURRENT EMISSIONS



	SOURCE	2008 (MTCDE)	2010 (MTCDE)	2013 (MTCDE)	2010-2013 ANNUAL DIFF. (%)
SCOPE 3					
	COMMUTING	32,060	32,274	27,329	(15%)
	AIR TRAVEL	7,330	4,266	5,519	29%
	SOLID WASTE	1,194	1,315	1,334	1%
	WASTE WATER	95	151	204	35%
	PAPER PURCHASING	1	2	1	(69%)
OFFSETS					
	COMPOSTING	(568)	(442)	(490)	11%
TOTAL		270,069	258,514	233,627	(9.6%)

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CONDUCTED & WRITTEN BY

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SPECIAL RECOGNITION

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EO STATEMENT