

# St. Cloud State University

## Greenhouse Gas Emissions Inventory 2.0

### **FY 2010-2012**



ST. CLOUD STATE  
UNIVERSITY.

**EDUCATION FOR LIFE.**

**Report Issue Date: 01.10.13**

*Prepared to meet the requirements of the  
American College & University Presidents'  
Climate Commitment*

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# A. Executive Summary

## Overview

St. Cloud State University President Earl H. Potter III signed the American College & University Presidents Climate Commitment (ACUPCC). Signatories of the ACUPCC have agreed to create Climate Action Plans for accelerating research and educational efforts to equip society to re-stabilize the earth's climate and reducing their campus greenhouse gas (GHG) emissions. They have also agreed to publicly report their plans and subsequent progress reports and adaptations to the plan.

In September, 2010, a Greenhouse Gas Emissions Inventory was completed for St. Cloud State University for fiscal years 2004-2009 and was submitted to the ACUPCC. In January of 2012, the first climate action plan was prepared and submitted.

This document shall serve as St. Cloud State University's second Greenhouse Gas Emissions Inventory, and documents the emissions for fiscal years 2010, 2011, and 2012. This information can be used to track trends and evaluate progress towards the university's goal of becoming climate neutral by 2035.

## Methodology

Under the direction of John Frischmann, Facilities Construction Coordinator, GLTArchitects created this inventory, interviewing campus sources and vendors to collect data on six separate categories:

- **Institutional Data**
- **On-Campus Stationary Fuel Use**
- **Purchased Electricity**
- **Agriculture (Fertilizer Use)**
- **Refrigeration**
- **Transportation**

Emissions were only tracked for properties owned by the University. The temporal boundary for the inventory was set at FY 2010–FY 2012.

The data gathered was entered into the *Campus Carbon Calculator* (software developed by Clean Air-Cool Planet and the primary calculator used by the institutions that are a part of the ACUPCC). The Calculator converted the information into greenhouse gases, and reported it as CO<sub>2</sub> equivalents (eCO<sub>2</sub>) to estimate the carbon footprint of the University. The eCO<sub>2</sub> is reported in metric tons.

It should be noted that version 6.8 was used for this inventory. Since the last inventory that utilized version 6.4, significant updates have been made to the calculator to more accurately account for emissions based on the latest research. All of the source data from the previous study was reentered into to the new calculator. As a result, some of the emissions values in this report may not match those of the prior report.

## Results

SCSU emitted 44,802 metric tons of eCO<sub>2</sub> in FY 2012. Total emissions have decreased by 5,160 metric tons since FY 2009, a reduction of 10 percent.

SCSU emits approximately 3.1 metric tons of eCO<sub>2</sub> per student. Signatory institutions in St. Cloud State University's peer group (per IPEDS) emit a range of 1.9 to 11.6 metric tons of eCO<sub>2</sub> per student. Signatory public universities in Minnesota emit a range of 1.6 to 12.5 metric tons eCO<sub>2</sub> per student.

Emissions per square foot of building area in FY 2012 were 14.3 metric tons of eCO<sub>2</sub>/SF. This number has been trending downward as SCSU has renovated buildings, pointing to increased energy efficiency. It is also a result of eliminating the use of #6 oil and instead using natural gas in on-campus stationary plants. SCSU's peer signatory institutions (per IPEDS) have emissions per square foot ranging from of 6.7 to 28.6 metric tons of eCO<sub>2</sub>/SF. Minnesota signatory institutions have emissions per square foot ranging from 10.4 to 26.1 metric tons of eCO<sub>2</sub>/SF.

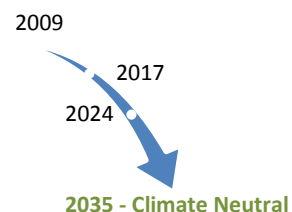
The most significant source of eCO<sub>2</sub> emissions for SCSU is electricity purchased from Xcel Energy. This source, coupled with transmission and delivery (T & D) losses, accounts for 42 percent of SCSU's total GHG emissions in FY 2012.

On-campus stationary sources of GHG emissions, such as boilers, account for 9,974 metric tons of eCO<sub>2</sub>, or 22 percent of total emissions. As a percentage of total carbon emissions, on-campus stationary sources have been trending downward as St. Cloud State University switched from use of #6 oil to natural gas.

Air travel is responsible for 10 percent of emissions, and daily commuting totals 24 percent of emissions in FY 2012. However, the data related to commuting is less reliable than other data collected.

## Greenhouse Gas Emissions Target

Carbon neutrality goals were established as part of St. Cloud State University's 2012 Climate Action Plan. The targeted carbon neutrality date for St. Cloud State University is 2035, with a short-term target of a 15% reduction by 2017 and a mid-term target of a 40% reduction by 2024 relative to 2009 emissions.



## Conclusion

The greatest impact on its carbon emissions St. Cloud State University could make would be to reduce or eliminate its reliance on purchased electricity and by continuing to find alternatives to fossil fuel combustion in its stationary on-campus plants.

## B. Acknowledgements

### St. Cloud State University

#### Buildings and Grounds Management

Tim Norton, Director of Facilities Management  
John Frischmann, Facilities Construction Coordinator  
Joe Teff, Safety Administrator

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Russ Roth, Gas Service Co.  
Kris Erickson, Northway Oil  
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Betty Jeanne Trobec, Trobec's Bus Service  
Sue Tschimperle, Holt Tour and Charter  
Gustave A. Larson Company  
Central MN Refrigeration  
Carlson & Stewart Refrigeration  
Weidner's Mechanical Contractors

## C. Summary and Overview

The American College and University Presidents' Climate Commitment (ACUPCC) was formed by a small group of higher education institutions concerned that the earth's climate is rapidly destabilizing. The ACUPCC signatories recognize global climate change as the defining challenge of the 21st century.

The commitment also acknowledges the important role universities play in research, education and modeling solutions relative to this challenge. Since its inception, the ACUPCC has grown from 12 founding members to 665 signatories.

As a signatory to the American College and University President's Climate Commitment (ACUPCC), St. Cloud State University has committed to eliminating our greenhouse gas (GHG) emissions in a reasonable period of time. An inventory of current and past GHG emissions has been completed and will be updated every other year to measure our progress. Additionally, SCSU has agreed to create and implement a Climate Action Plan with a target date and interim milestones for achieving campus climate neutrality. We have agreed to integrate sustainability into the curriculum and make it part of the educational experience. SCSU has also agreed to make the action plan, inventory, and periodic progress reports publically available.

This report summarizes the second Greenhouse Gas Emissions Inventory for St. Cloud State University. The inventory includes data collected for fiscal years 2010, 2011, and 2012. Because of a change in the ACUPCC reporting deadline and the dates of SCSU's fiscal year, we were able to include three years of data in this inventory. The inventory was prepared in accordance with the guidelines established by the ACUPCC. This report also includes some analysis, comparing the new results to those of the first inventory and to measure the progress that St. Cloud State University is making towards our established emissions goals.

## ACUPCC Requirements

1. Initiate development of a plan to achieve climate neutrality

Within 2 months of signing:

Create institutional structures to guide development and implementation of plan

Within 1 year of signing:

Complete a comprehensive inventory of all greenhouse gas emissions and update every other year (First inventory completed in 2010)

Within 2 years of signing:

Develop an institutional action plan for becoming climate neutral (Completed in 2012)

2. While plan is being developed, initiate 2 or more tangible actions to reduce greenhouse gases
3. Make the documents publicly available by submitting to the ACUPCC Reporting System

## D. Methodology

The group on campus primarily charged with providing data for the inventory was Buildings and Grounds Management, under the direction of Tim Norton, Director of Facilities Management. GLTArchitects was hired to facilitate the process, identify the information needed, track the information, create a history and journal of the collection effort, calculate the GHG Emissions, publically post the information to the ACUPCC website, and prepare this report.

This inventory includes data from fiscal years (FY) 2010, 2011, and 2012, covering the period of time from July 1, 2009 to June 30, 2012.

The inventory includes data related to all properties owned by the University, including the main campus and the Minnesota Highway Safety Research Center. Leased spaces (University Welcome Center, Coborn Plaza Apartments, and the Twin Cities Graduate Center) were not included in the study. Institutional data was collected, including building square footages; operational budgets; and staff, faculty, and student counts. This allows for limited peer-to-peer comparisons to be made based on per person and per square foot calculations.

SCSU agreed to collect data from the operational boundaries recommended by the ACUPCC, namely all Scope 1 and Scope 2 emissions, and part of Scope 3 emissions. Scope 1 refers to the GHG emissions occurring from sources that are owned or controlled by the institution, including on-campus stationary combustion of fossil fuels, mobile combustion of fossil fuels by university owned/controlled vehicles, and “fugitive” emissions. Fugitive emissions result from releases of GHGs from refrigeration and fertilizer use. Scope 2 emissions refer to indirect emissions generated in the production of electricity consumed by the institution and includes transmission and delivery losses. Scope 3 emissions refer to all other indirect emissions – those that are a consequence of the activities of the University, but occur from sources not owned or controlled by the institution. Scope 3 emissions required to be tracked by the ACUPCC include all air travel, and staff, faculty, and student commuting to and from campus.

Data was gathered from both on-campus sources as well as University vendors. Where possible, data from vendors was cross-checked with data from University sources to verify accuracy.

The Clean Air –Cool Planet Campus Carbon Calculator was again used to document the GHG Inventory. This calculator is recommended by the ACUPCC because it is comprehensive, relatively easy to use, and easily accessible. Improvements have been made to the calculator to align it specifically with the requirements of the ACUPCC GHG Inventory. It should be noted that version 6.8 was used for this inventory. Since the last inventory that utilized version 6.4, significant updates have been made to the calculator to more accurately account for emissions based on the latest research. All of the source data from the previous study was reentered into to the new calculator. As a result, some of the emissions values in this report may not match those of the prior report.

## E. Inventory Results

### Institutional Data

Since FY 2009, SCSU's operating budget has increased a modest 3.26 percent, or just over 1 percent per year.

Total student enrollment peaked in FY 2011 at 18,650 and declined to 17,603 in FY 2012. This is only slightly higher than the FY 2009 enrollment of 17,529. Compared to FY 2009, there were fewer full-time students in FY 2012 and more part-time students.

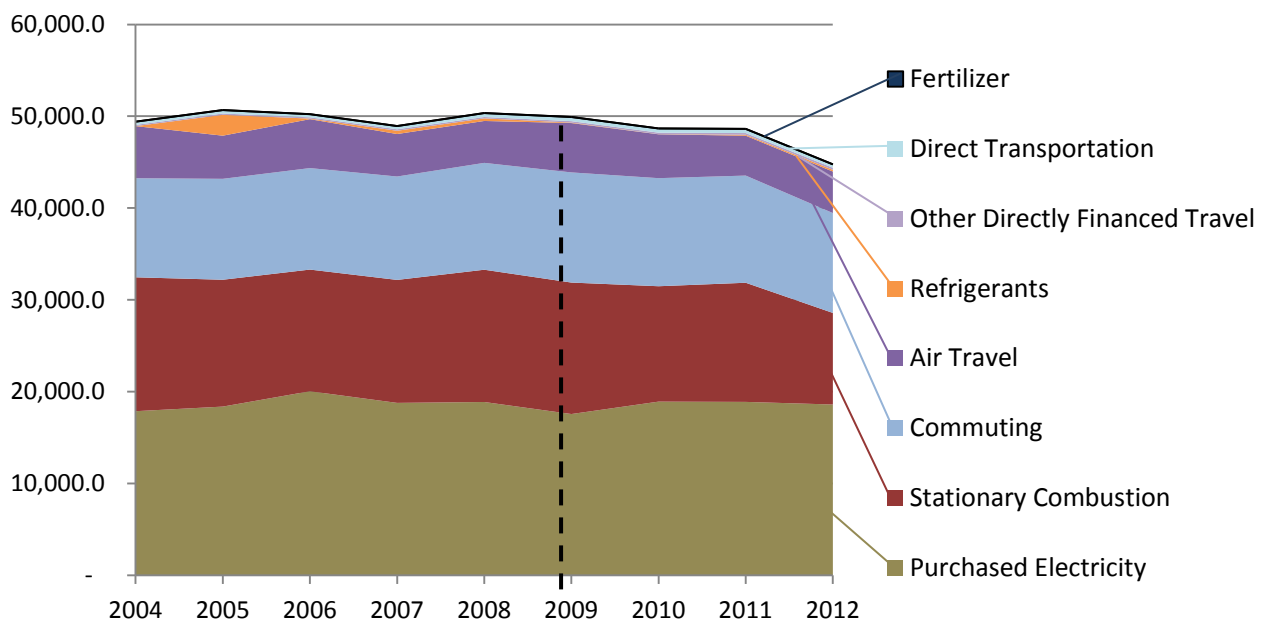
Since FY 2010, the faculty/staff full-time-equivalent has been reduced about 9 percent, with a decrease in the number of full-time employees and an increase in part-time employees.

Building area has stayed relatively stable, going from 3,136,924 in 2009 to 3,127,862 in 2012.

### Carbon Dioxide Emissions (eCO<sub>2</sub>)

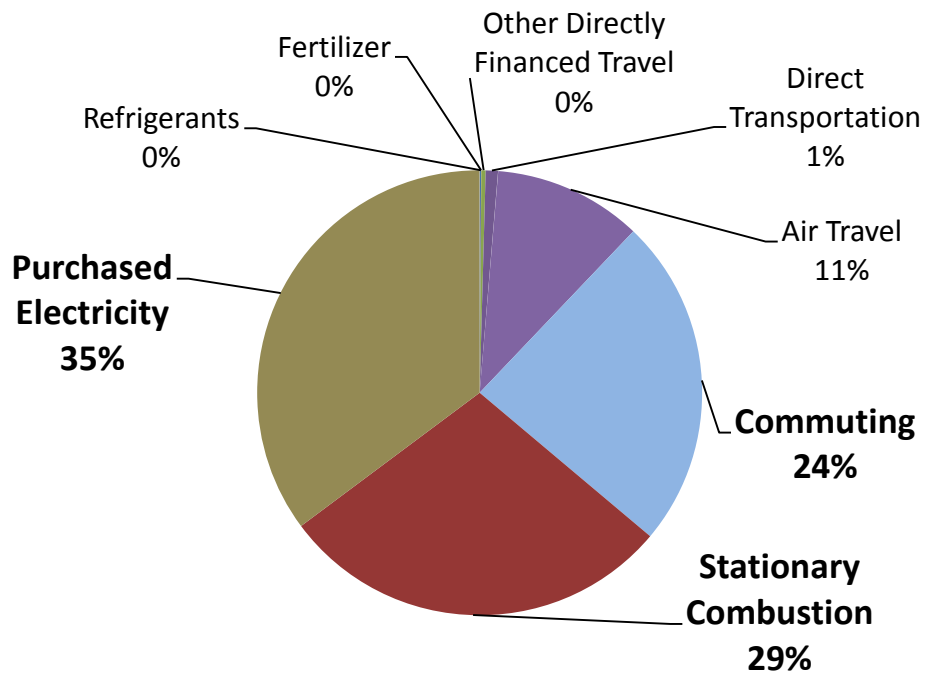
SCSU emitted the equivalent of 44,802 metric tons of eCO<sub>2</sub> in FY 2012. In comparison, FY 2009 saw total eCO<sub>2</sub> emissions of 49,925 metric tons. Therefore, total emissions have decreased by 5,160 metric tons since FY 2009, a reduction of 10 percent. Purchased electricity (including transmission and delivery losses) is responsible for 42 percent of emissions. On-campus stationary sources such as boilers account for 22 percent of emissions. Air travel is responsible for 10 percent of emissions, and daily commuting totals 24 percent of emissions.

### Total Emissions by Sector (in Metric Tons of eCO<sub>2</sub>)

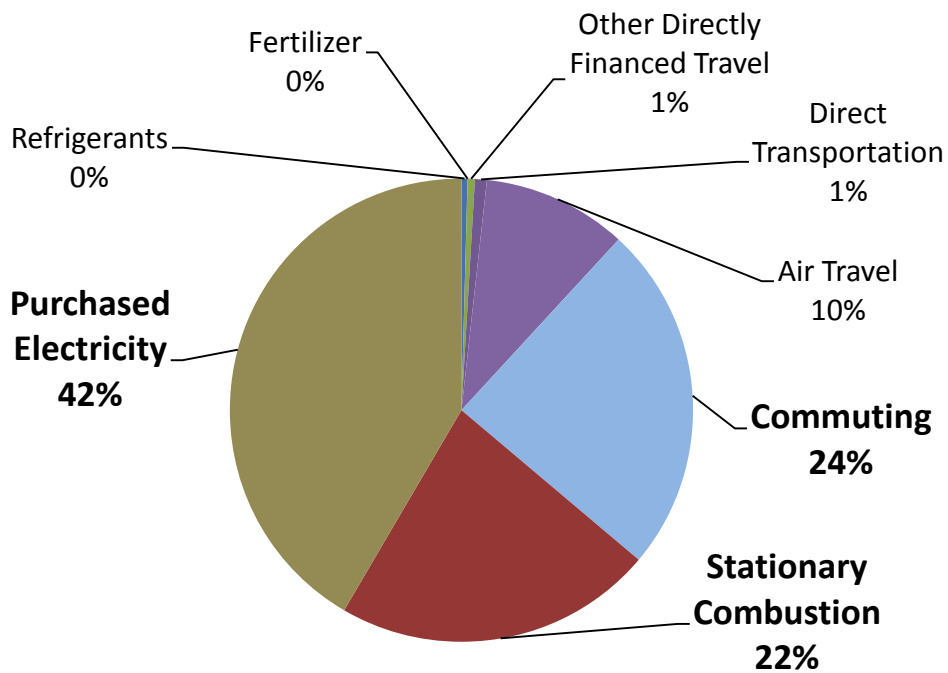




### 2009 Total Emissions by Sector



### 2012 Total Emissions by Sector



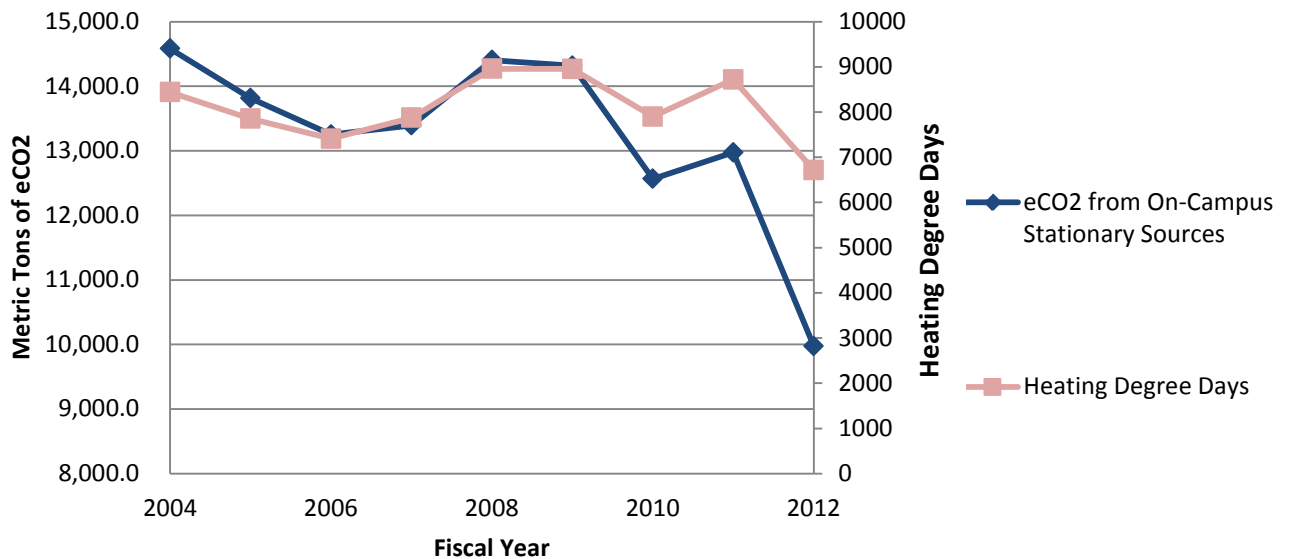
## Scope 1 Emissions

Scope 1 Emissions are direct GHG emissions occurring from sources that are owned or controlled by the institution.

### Stationary Combustion

Stationary combustion refers to the burning of fuels to produce steam, heat or power using equipment in a fixed location such as boilers. In FY 2012, it accounted for 22 percent of SCSU's eCO<sub>2</sub> emissions.

### On-Campus Stationary Source Emissions and Heating Degree Days



The level of emissions related to on-campus stationary sources has directly correlated to the local weather patterns. For example, the winter was much milder during FY 2012. However, the emissions have dropped at a greater pace than can be attributed to weather alone.

Since the last inventory, St. Cloud State University has completely eliminated using #6 fuel oil in its boilers, and instead uses natural gas. This switch results in a reduction of 26 kg of eCO<sub>2</sub>/MMBtu.

The gross building area has remained relatively stable since 2009. Currently under construction are a 52,000 s.f. addition to the National Hockey Center and the 100,000 s.f. Integrated Science and Engineering Laboratory Facility (ISELF). These two projects will add nearly 5 percent to the gross building area of the campus. While they are designed to be efficient, they are still energy-intensive spaces that will create a net gain in heating, cooling, and electricity demand once they open in 2013.

## Mobile Combustion

Mobile combustion refers to the burning of fuels by institution-own transportation devices such as cars, trucks, and maintenance equipment. In FY 2012, it accounted for only 0.8 percent of St. Cloud State University's eCO<sub>2</sub> emissions. However, it is worth noting that 7,325 fewer gallons of gasoline were purchased in FY 2012 compared to FY 2009, a 17 percent reduction.

Since the last inventory, St. Cloud State University has significantly reduced its vehicle fleet. A partnership has been created with Enterprise Rent-a-Car to provide vehicles on an as-needed basis under the state contract.

Minnesota now requires that all diesel fuel sold in the state for vehicle use must contain at least 5% biodiesel (B5), and this is reflected in the calculations. In addition, all gasoline sold in Minnesota must contain at least 10% ethanol (E10). By August 30, 2015, 20 percent of the volume of gasoline sold in Minnesota will be required to be ethanol. St. Cloud State University no longer directly purchases E85 because of the changes to the vehicle lease arrangement.

State agencies, of which SCSU is a part of, are required to achieve strict reductions in fuel usage in agency-owned on-road vehicles and increase their use of alternative fuels by 2015.

SCSU is currently the only higher education member of the Drive Electric Minnesota Initiative. This organization is a partnership of state and local government, utilities, private business and nonprofit entities working together to bring electric vehicles and plug-in charging infrastructure to Minnesota. SCSU has purchased three GEM vehicles that are 100% electric powered. Because they are recharged from the regular power grid, their emissions are included in the Purchased Electricity category.

## Fugitive Emissions

Fugitive emissions are due to the intentional or unintentional release of eCO<sub>2</sub> in the production, processing, transmission, storage and use of fuels and other substances. Emissions resulting from the use of refrigeration equipment and fertilizers would fall under this category. Refrigerants and chemicals accounted for only 0.4 percent of St. Cloud State University's 2012 eCO<sub>2</sub> emissions. Fertilizer accounted for 0.01 percent of the 2012 emissions.

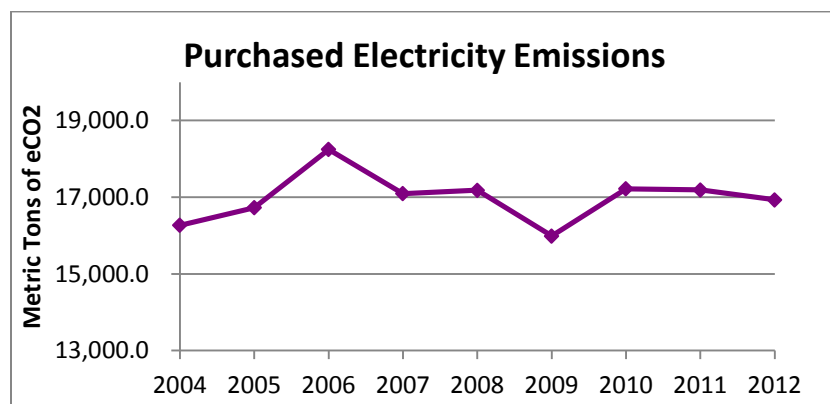
In the future, refrigerants will comprise an ever smaller quantity of eCO<sub>2</sub> emissions. The refrigerants with the worst ozone-depleting potential (designated as Class I substances) have already been completely phased out in the United States, except for exemptions allowed under the Montreal Protocol. Class II substances, which are transitional substitutes for many Class I substances, are being phased out now. As a developed country and a party to the Montreal Protocol, the U.S. must incrementally decrease HCFC consumption and production, with a reduction to at least 90 percent below baseline in 2015 and a complete HCFC phaseout by 2030.

## Scope 2 Emissions

Scope 2 Emissions are indirect GHG emissions that are a consequence of activities that take place within the organizational boundaries of the institution, but that occur at sources owned or controlled by another entity.

### Purchased Electricity

Purchased electricity is responsible for 38 percent of St. Cloud State University's 2012 eCO<sub>2</sub> emissions. Transmission and delivery losses associated with this electricity accounts for another 4 percent of the 2012 emissions.



St. Cloud State University purchases all of its electricity from Xcel Energy. Minnesota has enacted a Renewables Portfolio Standard that requires Xcel Energy to generate or procure a specific percentage of their electricity from renewable sources as follows:

2010	15 percent
2012	18 percent
2016	25 percent
2020	30 percent

Of the 30 percent in 2020, at least 25 percent must be generated by solar energy or wind energy conversion systems and the remaining five percent by other eligible energy technology.

Because of this requirement, electricity from Xcel Energy has lower emissions than the rest of its United States sub-region. Therefore, we entered a custom fuel mix into the calculator to more accurately account for the emissions. We obtained the percentages of the fuel mix for years 2009-2011 directly from Xcel Energy. Fuel sources for prior years were not readily available, and their 2012 figures were not complete at the time of the study. We adjusted the 2004-2009 figures using the 2009 fuel sources to be able to more accurately track the trends. We used the 2011 fuel sources for both 2011 and 2012 figures.

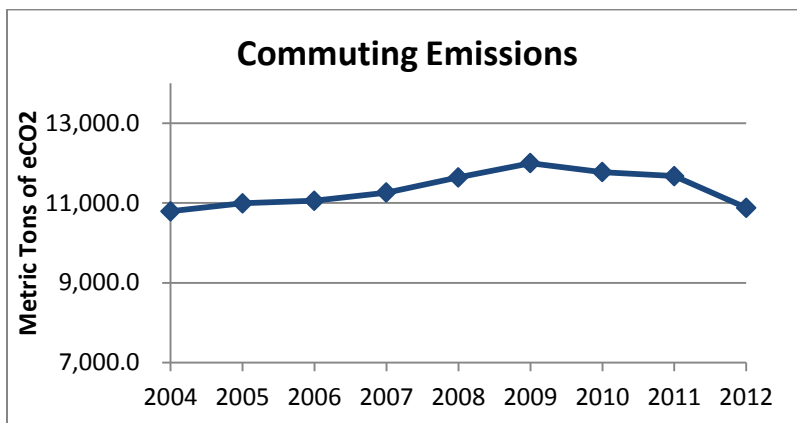
As noted earlier, the addition to the National Hockey Center and the ISELF building will add nearly 5 percent to the gross building area. While they are designed to be efficient, they are still energy-intensive spaces that will create a net increase in electricity usage once they open in 2013.

## Scope 3 Emissions

Scope 3 emissions required to be tracked by the ACUPCC include all air travel, and staff, faculty, and student daily commuting to and from campus. Obtaining Scope 3 data was challenging, as monitoring miles traveled by air, rental vehicle, personal vehicle, bus travel, or light rail is not done systematically.

### Commuting

This category includes emissions from staff, faculty and student daily commuting to and from campus, whether by personal vehicle or public transportation. It does not account for transportation to and from students' permanent residences for weekends or holidays. Student commuting is responsible for 15 percent of St. Cloud State University's 2012 eCO<sub>2</sub> emissions, and staff and faculty commuting account for another 9 percent, for a total of 24 percent of emissions due to commuting.

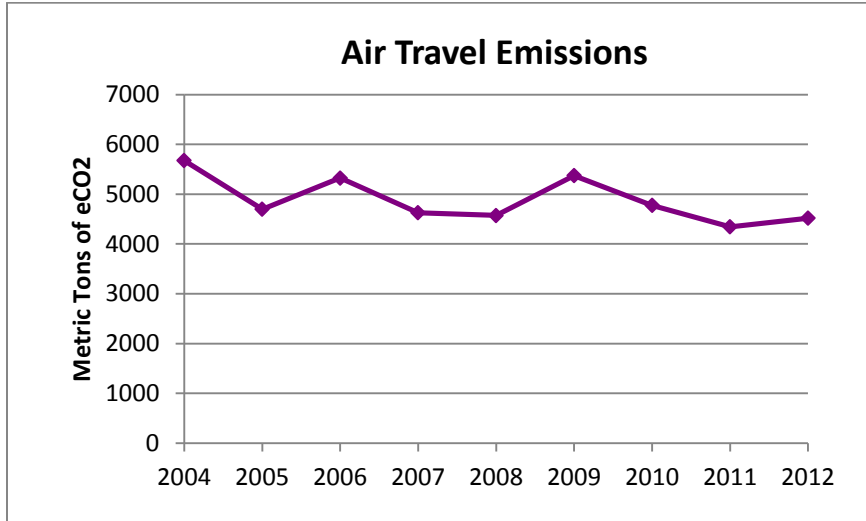


Obtaining Scope 3 commuting data was challenging. Information regarding where off-campus students live while attending school was difficult to obtain. Information from surveys conducted in 2002 and in 2004 that had some of the information needed for determining the commuting habits of the faculty, staff and students, was extrapolated to complete the prior inventory. The same method was used to extrapolate figures for this inventory based on current enrollment and staffing figures. Therefore, the emissions from commuting have changed in direct proportion to changes in enrollment and staffing.

We are working with St. Cloud State University Public Safety Department to develop a questionnaire that will be completed with the parking permit application to obtain more current and accurate figures in the future. It should be noted that many of the signatories to the ACUPCC identified compiling accurate commuting data as being particularly challenging.

## Air Travel

This category includes emissions resulting for air travel paid for or through the institution. This includes study abroad travel, student academic and athletic trips, and air travel associated with staff training or recruiting. Study abroad air travel is responsible for 6 percent of all of St. Cloud State University's 2012 eCO<sub>2</sub> emissions, and other University air travel is responsible for another 4 percent, for a total of 10 percent of all of the emissions.



The economy directly impacts the amount of air travel that is undertaken. As the University budget has become tighter, fewer flights have been taken. Students have been impacted by the economy as well, resulting in fewer or shorter study abroad flights. As the economy rebounds, it is possible that air travel, and its associated emissions, will return to previous levels.

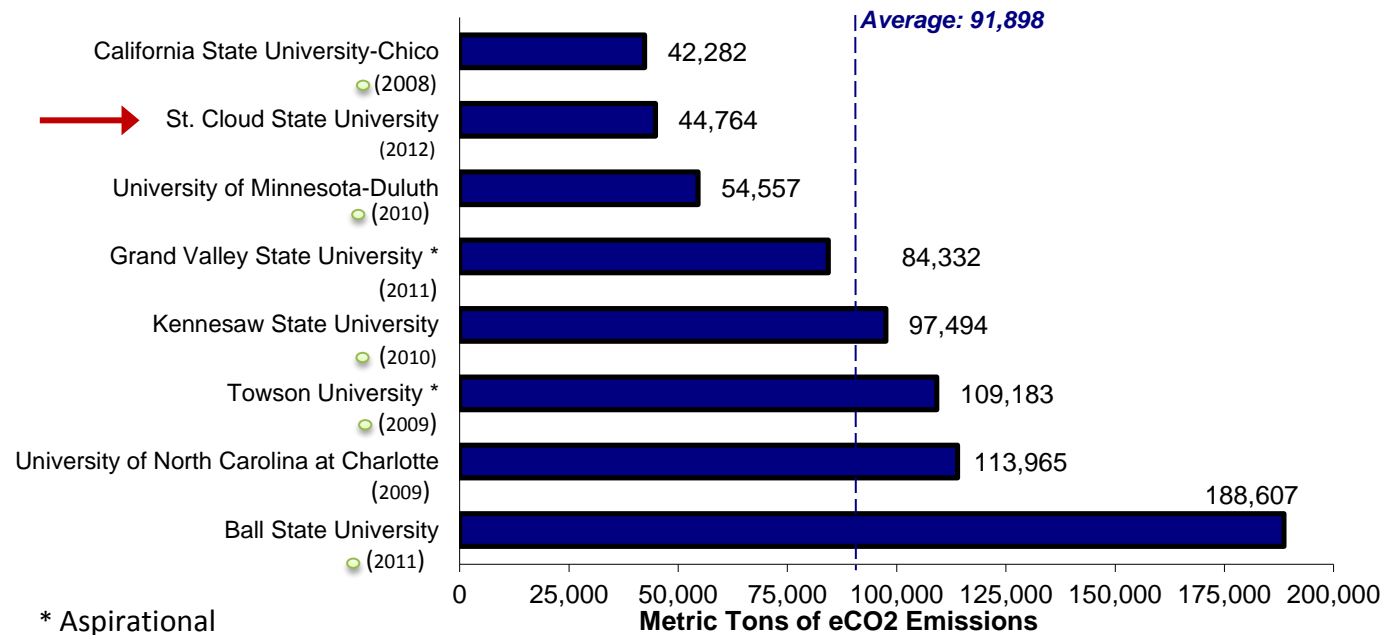
## Other Directly Financed Travel

This category includes emissions resulting from transportation provided by others for the benefit of the University, such as rental car miles, charter bus miles, and personal vehicle mileage that was reimbursed by the University. This accounts for less than 1 percent of St. Cloud State University's total emissions.

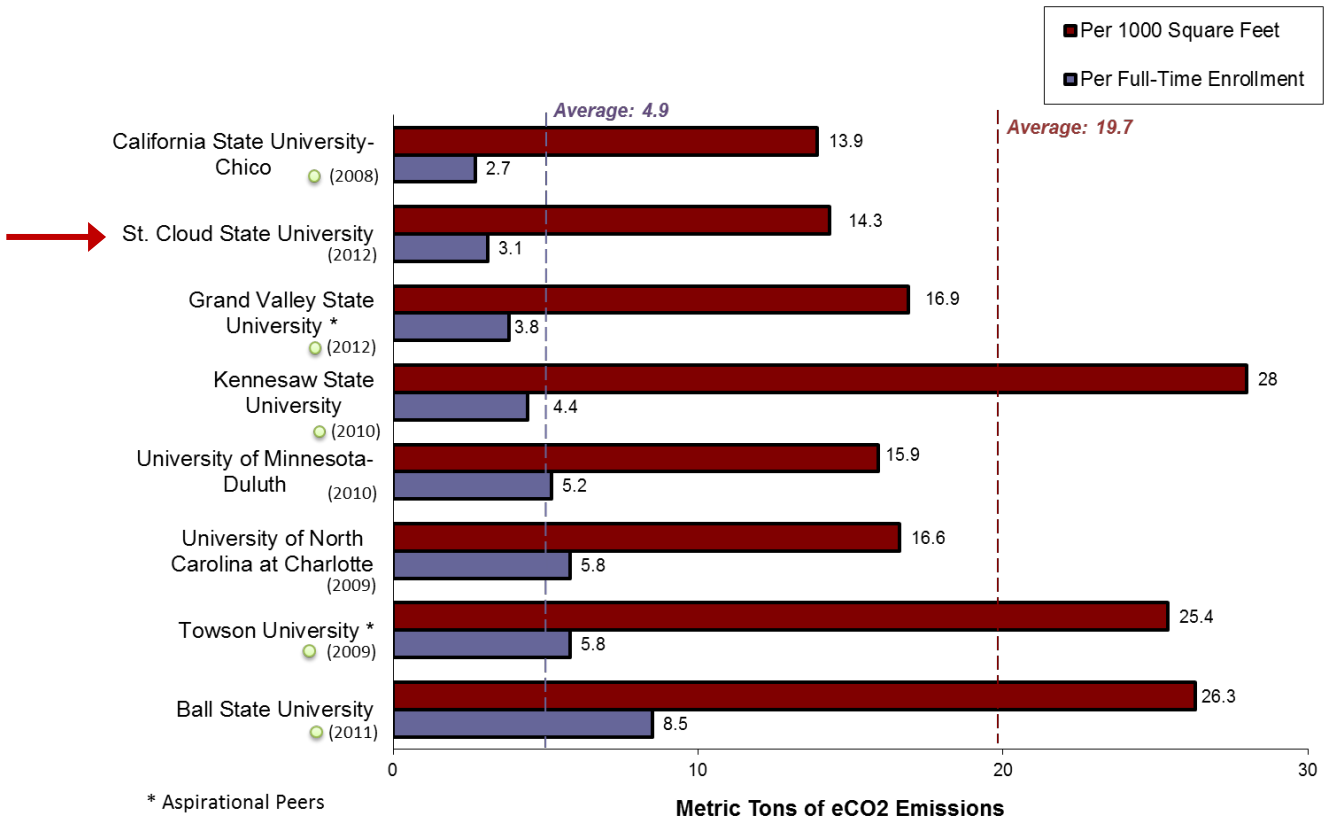
## F. Comparisons to Peer Institutions

The St. Cloud State University Office of Strategy, Planning & Effectiveness has identified 27 peer institutions. Ten of those institutions are ACUPCC signatories. One additional peer institution had become an ACUPCC signatory but has since withdrawn. Six of these institutions have been recognized by *The Princeton Review's Guide to 322 Green Colleges: 2012 Edition*, and have been denoted with a green dot on the charts below. St. Cloud State University was not included on that list. Three of the peer institutions are past due on required ACUPCC submittals, so they have been excluded from the following charts. Historically, not all institutions have had the same reporting date. Therefore, the latest information from the ACUPCC reporting website has been used. The year of the reported data is included below the name of each institution.

### Comparison of Net Emissions of Peer Institutions



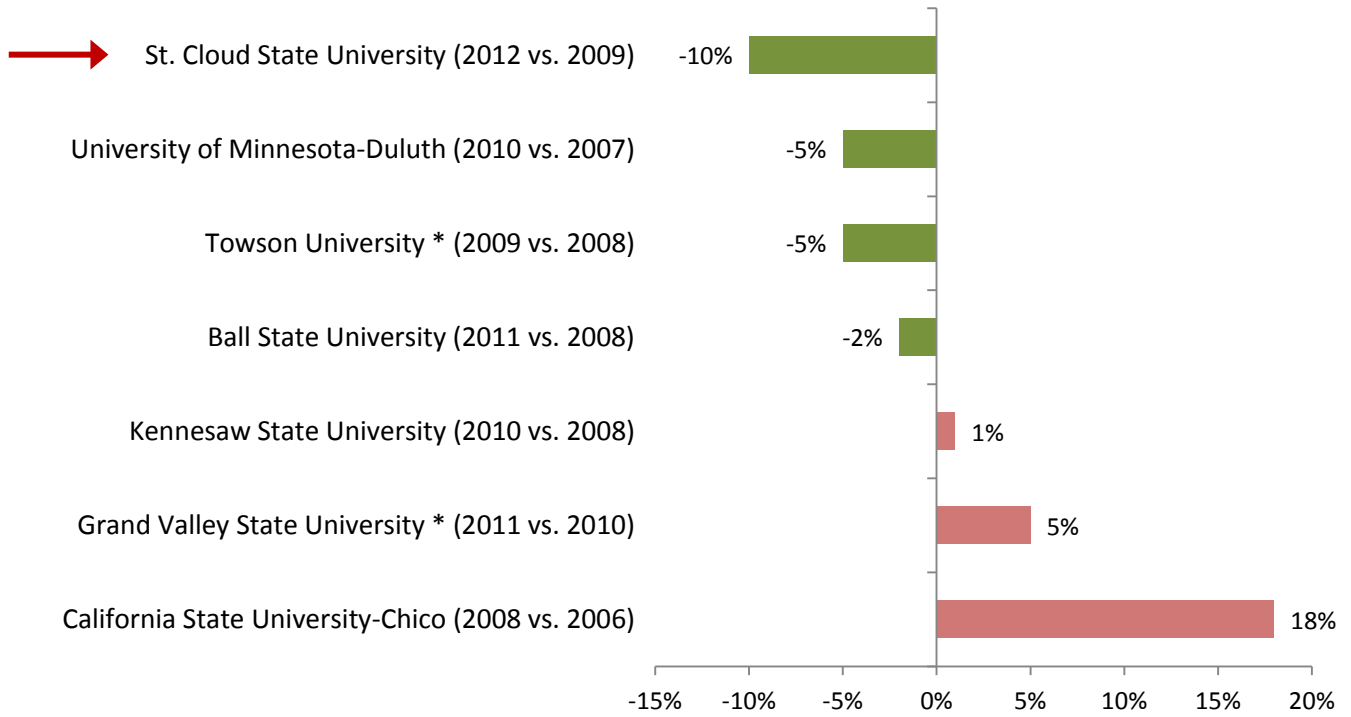
## Normalized Comparison of Peer Institutions



All of these institutions have the same reporting date deadline of January 15, 2013. Therefore, the most current submittals are not yet available on the ACUPCC reporting website. However, six of the peer institutions have submitted at least two prior reports. The following chart shows the amount of improvement each institution has made between the year of the most current report and the year of the previous report. A green bar designates reduction of greenhouse gas emissions, whereas a red bar signifies that more greenhouse gases were emitted per year. Note that according to the report submitted by California State University-Chico, their high increase in reported emissions is due to an increase in enrollment, the use of different commute survey methods between the inventories, and the inclusion of University sponsored travel that was not included in the earlier study.

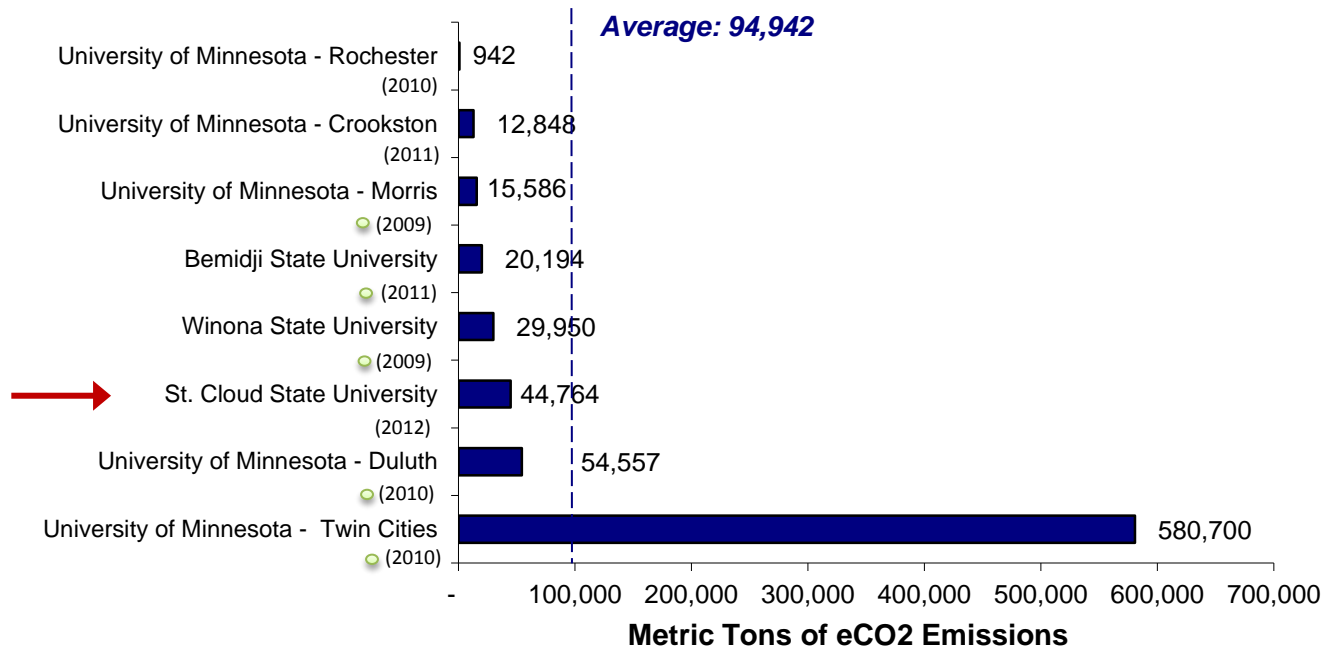


Percent change by Signatory Peer Institutions between latest report and prior report

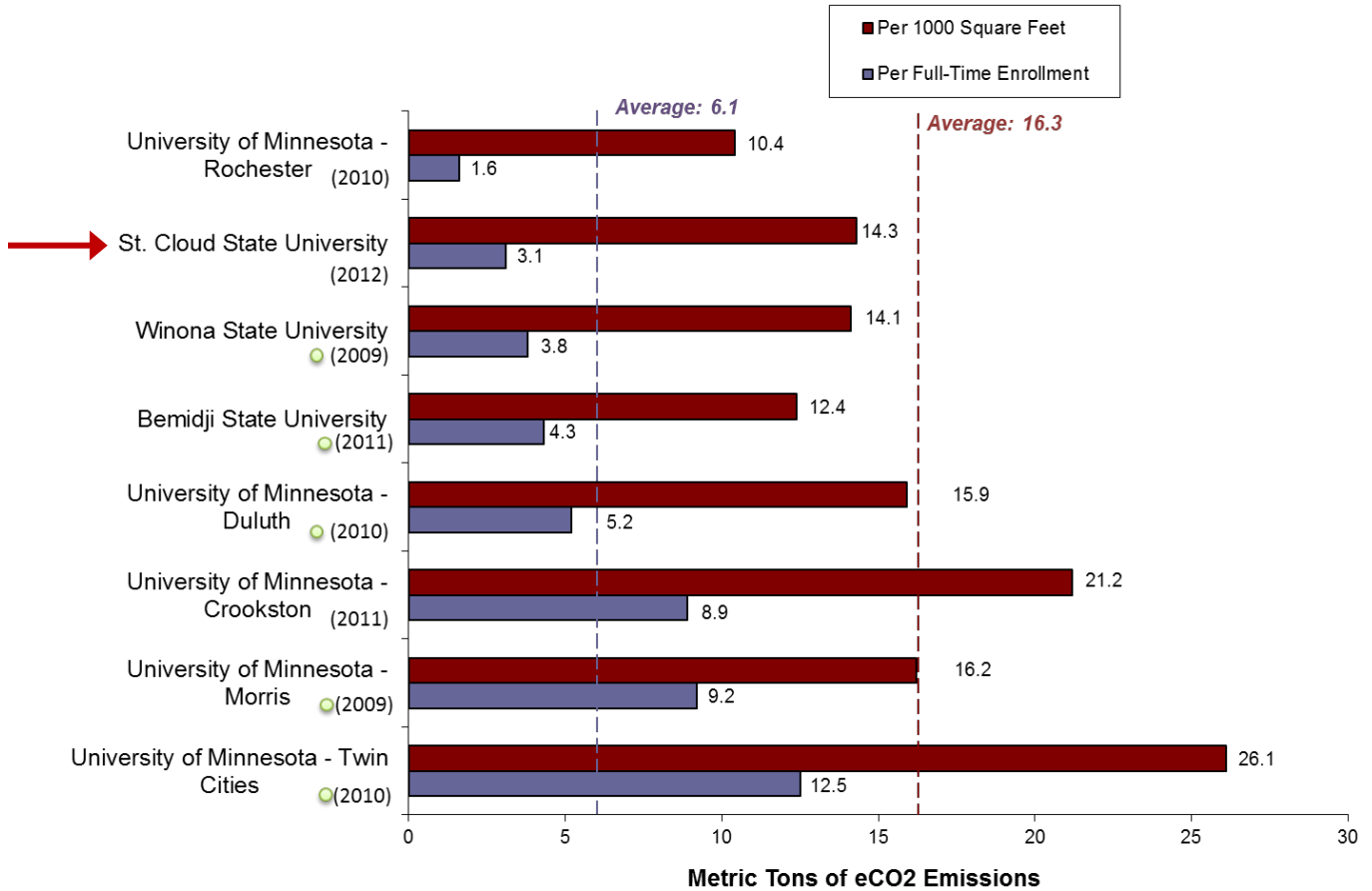


In addition to St. Cloud State University, there are eight public Minnesota universities that are ACUPCC signatories, three of which are also part of MnSCU. Five of these institutions have been recognized by *The Princeton Review's Guide to 322 Green Colleges: 2012 Edition*, and have been denoted with a green dot on the charts below. St. Cloud State University was not included on that list. Metropolitan State University is past due on required ACUPCC submittals, so it has been excluded from the following charts.

### Comparison of Net Emissions of Signatory Minnesota Public Universities

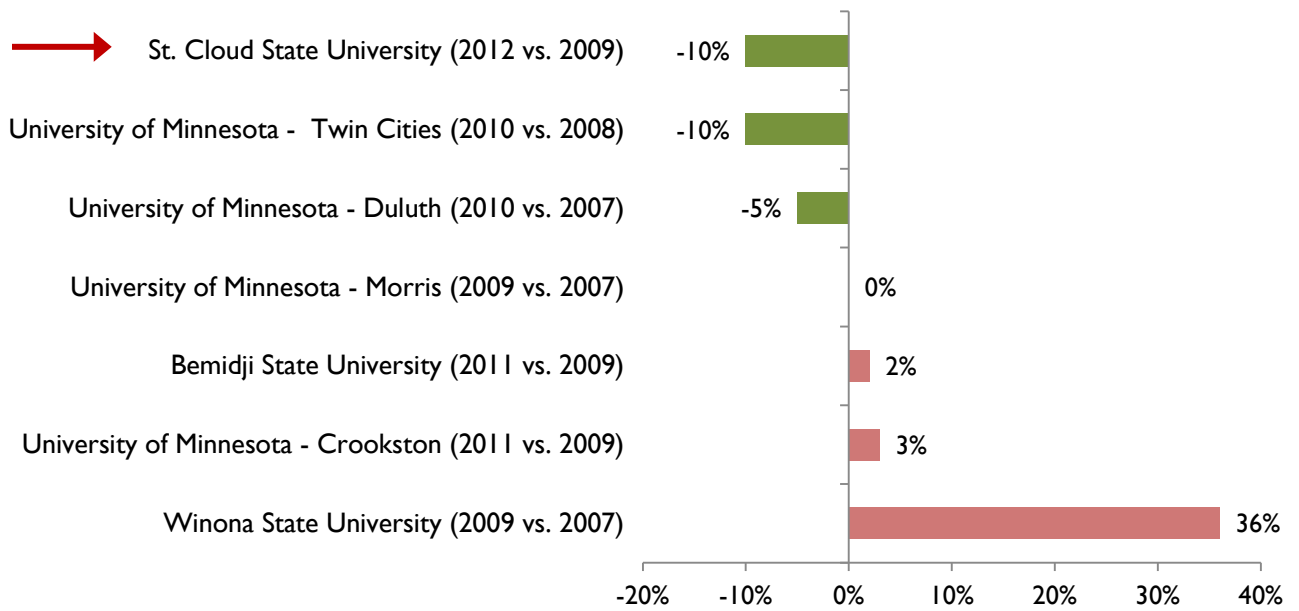


## Normalized Comparison of Signatory Minnesota Public Universities



All of these institutions have the same reporting date deadline of January 15, 2013, with the exception of Bemidji State University, which has a deadline of January 15, 2014. Therefore, the most current submittals are not yet available on the ACUPCC reporting website. However, six of the Minnesota public universities have submitted at least two prior reports. The following chart shows the amount of improvement each institution has made between the year of the most current report and the year of the previous report. A green bar designates a positive improvement (reduction) of greenhouse gas emissions; whereas a red bar signifies that more greenhouse gases were emitted per year. Winona State University did not submit a report with their 2009 submittal, so it is unknown why their 2009 emissions were so much higher than their 2007 emissions.

Percent change by Signatory Minnesota Public Universities between latest report and prior report

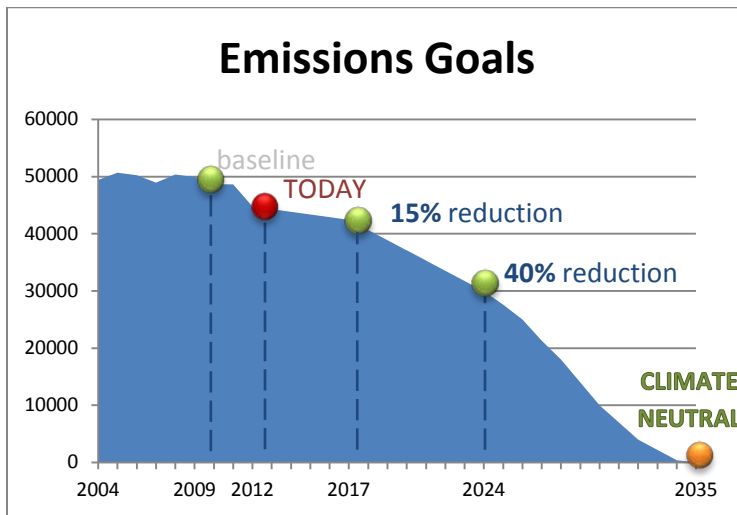


## G. Conclusion

St. Cloud State University has made significant progress towards their intermediate goal of reducing GHG emissions by 15 percent of FY 2009 emissions by 2017. The results of this greenhouse gas inventory have revealed that the FY 2012 emissions are already 10 percent below the FY 2009 numbers.

While many outside factors have contributed to this success, St. Cloud State University should be proud of what they have accomplished.

The challenge going forward will be to maintain these reductions and to implement additional measures to further reduce GHG emissions. This will require the participation and support of the entire St. Cloud State University community and its partners.



This report uses Century Gothic font to reduce toner usage when printed.  
Please consider the environment before printing.