

Radford University's 2020 Greenhouse Gas Inventory

July 1, 2019 – June 30, 2020

Summary

Radford University conducts an annual inventory of its greenhouse gas emissions. The process collects data about emissions sources related to university operations and calculates the association between these operations and greenhouse gas emissions. The inventory described here encompasses the period from July 1, 2019 to June 30, 2020. The total greenhouse gas emissions for 2020 are 1,313,313 metric tons of carbon dioxide equivalent (MTCO₂e).

This report summarizes the 2020 Greenhouse Gas Inventory (GGI), provides important information pertaining to certain measured criteria, and benchmarks Radford University's 2020 performance against university inventories conducted since 2010 (the baseline year for RU's greenhouse gas inventory).

Introduction

In 2009, Radford University became a signatory of the American College & University President's Climate Commitment (ACUPCC). As such, the University pledges to pursue net carbon neutrality and to provide students with the knowledge and skills they need to be successful in meeting the challenges of the 21st Century. (See Appendix B). The ACUPCC requires that signatories conduct a GGI during the first year of participation to establish a baseline emissions calculation. The participant then submits a GGI annually, as it enables the university to analyze emissions sources, track progress towards target goals, and ultimately reduce the campus's contribution to climate change. Radford University has conducted a GGI each year since 2010, with the exception of 2015.

Methods

For the initial GGI in 2010, Radford University selected the Clean Air-Cool Planet Campus Carbon Calculator (CCC) as the tool for calculating and analyzing its emissions, as it was the preferred tool of the ACUPCC. The CCC was developed and managed by the University of New Hampshire. Radford University used the CCC for each GGI from 2010 – 2017. In 2018, the University of New Hampshire launched SIMAP

Sustainability

- **Directly Financed Air Travel:** SIMAP calculates total air travel mileage using the Average Cost per Mile of commercial air travel. All employee air travel is processed through Christopherson Business Travel, which provides the total cost of directly financed air travel. Due to the COVID-19 pandemic, all non-essential air travel ceased on March 1, before the usual season of extensive conference travel.
- **Study Abroad Air Travel:** The Director of the Center for Global Education and

Results and Discussion

SIMAP processes all data with emissions conversion factors and calculates energy consumption, amounts of three different greenhouse gases, emissions from each source and scope, and total metric tons of carbon dioxide equivalent (MTCO_{2e}).

Top 10 Sources	Greenhouse Gas Emission MTCO _{2e}
Purchased Electricity	21,813.53
On-Campus Stationary (Steam Plant)	8,762.57
Faculty, Staff, & Student Commuting	3,654.63
Transmission & Distribution Losses	1,119.59

Emissions by Scope

Emissions sources are categorized based on their origin and are referred to as Scopes 1, 2, and 3. Scope 1 emissions are direct sources from campus and include on-campus steam production, mobile fuel usage, refrigerants, and fertilizers. Scope 2 refers to off-campus emissions sources that are directly linked to campus operations, primarily purchased electricity. Scope 3 emissions are indirect emissions linked to university activities. These emissions include university travel, solid waste disposal, water treatment, and faculty, staff, and student com-

- 3. Faculty, Staff, and Student Commuting – 9.61% of Total Emissions:** In FY2019 Faculty, Staff, & Students logged an estimated 12,659,479, miles in their personal vehicles during their regular daily commute to and from campus. This is a Scope 3 emission source. Faculty parking pass holders (80% of all faculty) have an average, one-way daily commute of 31.2 miles (3,444,480 miles annually). Staff parking pass holders (83% of all staff) have an average, one-way daily commute of 13 miles (4,109,695 miles annually). Student commuter parking pass holders (10% of all students) have an average, one-way daily commute of 29.1 miles (5,105,304 miles annually).

Due to the COVID-

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COVID-19 Pandemic and Radford University Greenhouse Gas Emissions

From March 22 through June 29, 2020, Radford University moved to remote learning and remote operations in response to the COVID-19 pandemic. During this time, only essential workers reported to campus, while most other employees worked remotely. All non-essential business travel was prohibited, all study abroad travel was cancelled, and the majority of students did not return to campus for the remainder of the spring 2020 semester.

As a result, Radford University's net greenhouse gas emissions decreased by 3,953.52 MTCO_{2e}, or 9.4%, from 2019 to 2020.

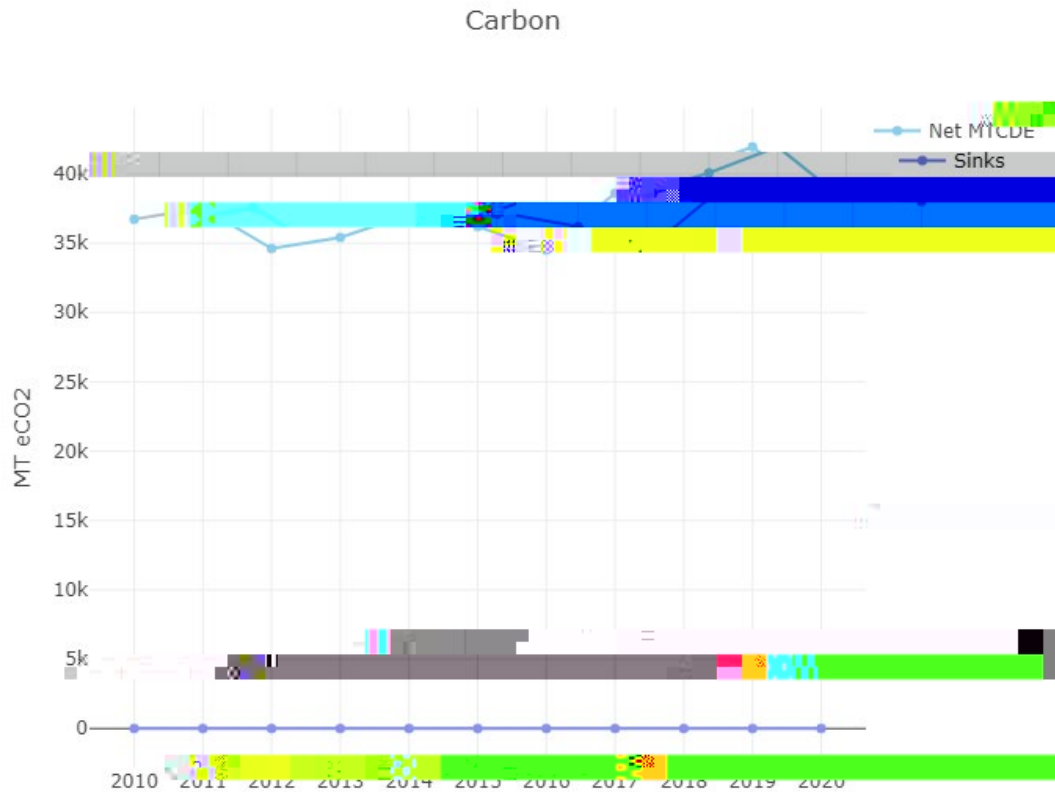
Significant emissions reductions included:

- Air Business Travel – 37.57%
- Faculty, Staff, & Student Commuting – 25.74%
- Ground Business Travel – 21.24%
- On Campus Stationary Power – 7.55%
- Purchased Electricity – 5.33%

While some of these categories may remain lower throughout the course of the pandemic, others will likely return to pre-pandemic levels immediately with the return to on-campus operations.

Normalization and Trends

1. Since 2016, Radford University's total greenhouse gas emissions (MTCO₂e) have increased each year.

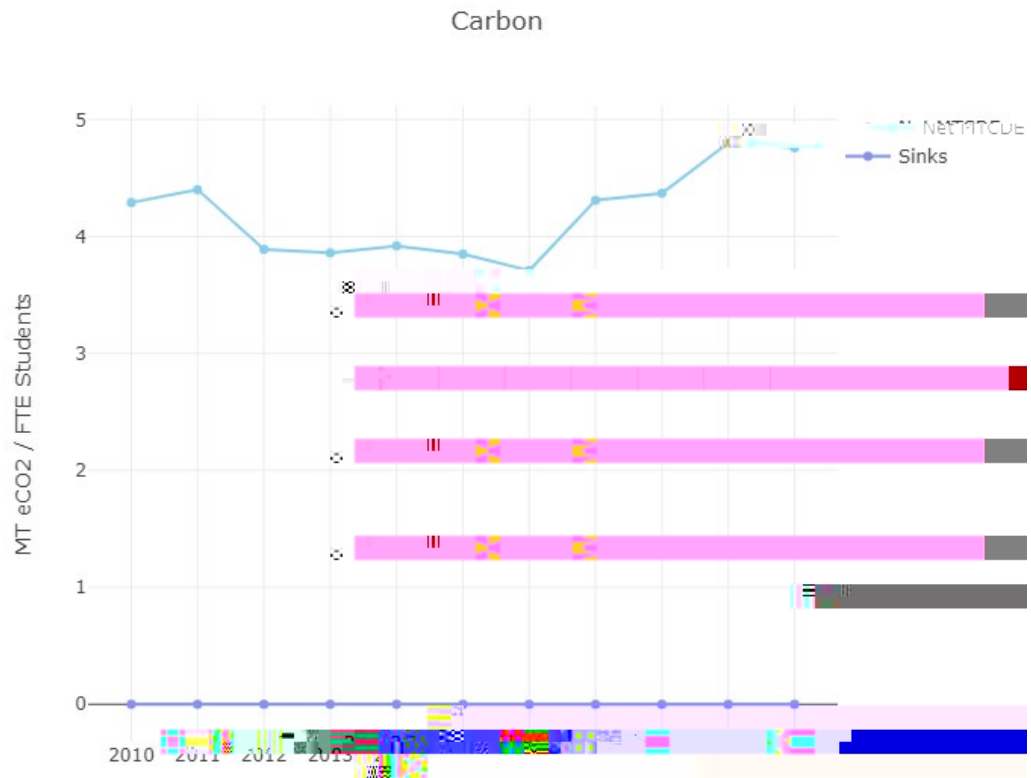


Total Emissions during FY2019 are much less than the 2010 Greenhouse Gas Inventory “Business As Usual” projection for total emissions in 2019.

- Total emissions increased from 37,749.6 MTCO₂e in 2010 to 42,554.39 MTCO₂e in 2019; a total increase of 4,804.8 MTCO₂e or approximately 12.7%.
- The “Business as Usual” projection for 2016 was over 50,000 MTCO₂e, an increase of approximately 12,250 MTCO₂e, or approximately 32%.
- The Radford University Climate Action Plan published in 2013 set a 2020 target of reducing total emissions by 30% from the 2010 baseline, to 26,424.72 MTCO₂e. This target will require a 38% reduction from the 2019 total emissions.

2. Emissions per square foot are lower than in 2010, but have increased consistently between 2016 – 2019.

3. Emissions per student (FTE Enrollment) are increasing.



In 2010, FTE Student Enrollment was 8,558, as compared to 8,746 in 2019, an increase of 2.2%. During this same period of time, gross square footage has increased 10.5% and net greenhouse gas emissions has increased 12.7%.

As such, emissions per student (FTE Enrollment) increased from 4.3 MTCO₂e in 2010 to 4.87 MTCO₂e in 2019, an increase of 13.3%.

Appendix

A. Benchmarking with Other Virginia Institutions of Higher Education

Making meaningful comparisons between higher education institutions is challenging, as each institution is unique, not all emissions inventories are identical, and building square footage and FTE Enrollment fluctuate. For this comparison, all data is publicly available on Second Nature's online reporting dashboard and on STARS reports. Only institutions that have reported since 2016 are included. Second Nature is the organization managing the implementation of Carbon and Climate Commitments (formerly ACUPCC) and there are currently 15 higher education institutions in Virginia that are Second Nature reporting signatories. Radford University is one of only three public higher education institutions in this group (George Mason University and Virginia Commonwealth University). The University of Virginia and Virginia Tech are public universities and are not signatories, but recently reported their emissions in STARS reports.

Because 2019 – 2020 is currently an outlier for greenhouse gas emissions and reporting, the figures below include data between FY2016 and FY2019.

0.03
0.025
0.02
0.015
0.01
0.005
0

*Not a Carbon Commitment signatory. Emissions and building space data from most recent STARS reports.

*Not a Carbon Commitment signatory. Emissions and Enrollment FTE data from most recent STARS reports.

B. Links to Other Reports & Resources

American College and University President's Climate Commitment:

<https://www.radford.edu/content/dam/departments/administrative/Sustainability/Documents/Signed-ACUPCC.pdf>

Radford University Climate Action Plan:

<https://www.radford.edu/content/sustainability/home/initiatives/ClimateActionPlan.html>

Radford University Initial Greenhouse Gas Inventory Narrative, 2010:

<https://www.radford.edu/content/dam/departments/administrative/Sustainability/Documents/greenhouse-gas-narrative.pdf>

Second Nature: