Greenhouse Gas Inventory Update

PREPARED FOR: BRYN MAWR COLLEGE

THE STONE HOUSE GROUP
BUILDING STEWARDSHIP
June 2023

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Introduction

Bryn Mawr College is committed to environmental sustainability, and views sustainability as vital to the College's mission as a socially responsible institution. This report provides a summary and analysis of the College's FY 2023 GHG emissions inventory, comparing it to previous emissions data that was collected in 2008, 2014, and 2019. In FY 2022, Bryn Mawr College demonstrated its commitment to sustainability by further reducing net emissions.

This Greenhouse Gas (GHG) Emissions Inventory identifies and quantifies Bryn Mawr College's anthropogenic sources[1] of greenhouse gases, and is an essential measurement for addressing contributions to climate change. The data presented in this report adhere to methodologies that are consistent with the WRI GHG Protocol[2] in order to accurately account for each category of emissions at Bryn Mawr College. The GHG Inventory was developed utilizing SIMAP® (Sustainability Indicator Management & Analysis Platform), a carbon accounting platform. The mission of SIMAP® is to help institutions, colleges and universities track their footprints so they can meet their sustainability goals as effectively and efficiently as possible.

[1] Anthropogenic sources of GHG emissions occur as a direct result of human activity.
[2] The Greenhouse Gas Protocol, developed by the World Resources Institute and the World Business Council for Sustainable Development, is the industry standard for accounting and reporting greenhouse gas emissions.

Sources of Emissions

Greenhouse gases absorb and trap thermal energy in Earth's atmosphere, contributing to the greenhouse effect and global climate change. The six primary GHGs are Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Sulfur Hexafluoride (SF_6), Hydrofluorocarbons (HFCs), and Perfluorinated Compounds (PFCs). All of these gases are released in vast quantities as a result of human activity, and each one contributes differently to the increase in global average temperature.

Two key ways in which these gases differ from each other are: (1) their ability to absorb and trap heat and (2) the amount of time they remain in the atmosphere. In order to compare the impacts of these GHGs, a factor called the Global Warming Potential (GWP) was developed. GWPs are a relative measurement of how much heat a greenhouse gas traps in the atmosphere over a given period of time, using CO_2 as the reference (GWP = 1). Methane, for example, has a GWP of 28[3] since it is more volatile than carbon dioxide over its lifetime. As a result, these GWP values can be used to convert the emissions of each GHG to Carbon Dioxide Equivalent, or Cde.

This report will measure Bryn Mawr's greenhouse gas emissions in Metric Tons of Carbon Dioxide Equivalent (MTCDe), and will group the sources of emissions based on the categories utilized by the WRI GHG Protocol. These categories are called "Scopes" and are defined as follows:

Scope 1 – Direct Emissions

Certain activities on campus directly result in the emission of greenhouse gases. Scope 1 emissions are easy to measure since each source is within the control of the College.

- **Stationary Combustion of Fossil Fuels:** Heating oil and natural gas are used to heat facilities on the Bryn Mawr College campus, and emit carbon dioxide and other GHG's as they are consumed.
- **Mobile Combustion of Fossil Fuels:** The fleet of college-owned vehicles uses gasoline, diesel, and natural gas fuels, which contribute additional carbon dioxide and other GHG emissions as they are consumed.
- **Refrigerants and Chemicals:** Various refrigerants are used across campus in air conditioning systems, discharging greenhouse gases with very high GWP.
- **Fertilizer Application:** Synthetic fertilizers that are used on the College grounds utilize nitrogen as the active ingredient, which results in the release of nitrous oxide as the fertilizer interacts with the soil.

[3] Values for GWP are based on the UN's Intergovernmental Panel on Climate Change *Assessment Report 5* (IPCC AR5)

Scope 2 – Indirect Emissions from Purchased Utilities

Other activities on campus indirectly result in the emission of greenhouse gases through the purchase of utilities, such as electricity. Although they occur elsewhere where electricity is generated, Scope 2 emissions are attributable to the consumer since customers are creating the demand for the purchased commodity.

- **Electricity:** The electricity consumed on Bryn Mawr's campus that is purchased from electric generators influences the emission of greenhouse gases elsewhere. Scope 2 emissions are calculated using the Market-Based Approach, Market-based emissions take into account the specific attributes of the electricity that an organization purchases, such as the generation source and the location. This method allows organizations to report emissions reductions from the use of renewable energy and other low-carbon sources of electricity that they have purchased, even if those sources are not located on their own property. In FY 2022, Bryn Mawr purchased 15,915 MWh's of Green-e certified Wind REC's, which offset 100% of emissions from purchased electricity. The REC's were provided by Constellation New Energy, and were bundled & sold as a NewMix product representing wind generated REC's, primarily from Texas and Oklahoma as well as other states.

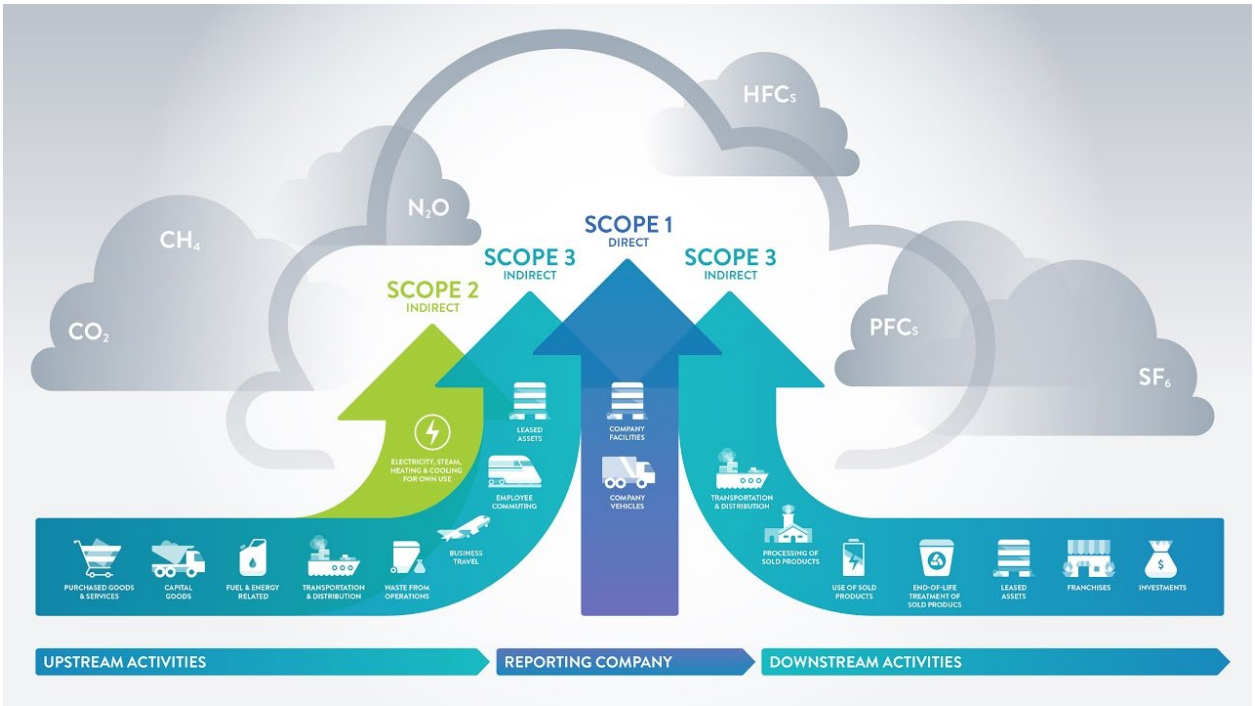
Scope 3 – Indirect Emissions (Other)

Scope 3 comprises the remaining "other" indirect sources of greenhouse gas emissions. These are generally emissions that occur as a result of an organization's business activity, such as the purchasing of supplies, waste generation, employee & student travel, and commuting. Scope 3 emissions are the most difficult emissions to measure accurately, and there is industry-wide acceptance that overlap exists between the Scope 3 inventories of different organizations. Therefore, it is best to account for as much of the Scope 3 inventory as is possible, given the data that is available.

- **Faculty/Staff Commuting:** As faculty and staff commute to and from Bryn Mawr, their mode of transportation generates greenhouse gases that are attributable to the College – unless they walk or bike to campus. These emissions are estimated based on the zip codes to/from which people are traveling each day, along with an average value for vehicle fuel economy.
- **Student Commuting:** Although a large majority of students are boarded at Bryn Mawr College's residence halls for the semester, there are some students that require transportation to and from the campus each day.

- **Directly Financed Air Travel:** Air travel that is directly financed by the College is required to be included in the Scope 3 emissions inventory. This generally includes air travel by students, faculty, and staff to attend conferences and events.
- **Study Abroad Travel:** Emissions from students flying to their study abroad locations throughout the world are Scope 3 emissions.
- **Solid Waste:** Emissions resulting from managing the institution's waste are Scope 3 emissions. Bryn Mawr College currently hauls waste to the Conestoga Landfill where methane gas is collected and used to fuel generators that send electricity into the PJM electric grid.
- **Waste Water:** Bryn Mawr's waste water flows to the City of Philadelphia's waste water treatment facilities.
- **Paper Purchasing:** Bryn Mawr College purchases thousands of pounds of paper per year. Purchasing paper with recycled content helps to reduce Scope 3 emissions.
- **Food Purchasing:** Estimated emissions from producing, transporting, and preparing food are included in this year's inventory. Organic food as well as locally grown & sourced food help to reduce emissions from food purchasing.
- **Electricity Transmission & Distribution Losses:** As electricity flows over the wires between the power plant and the point where it is consumed, a portion of the energy is lost. This inefficiency results in power plants producing extra electricity in order to deliver what each consumer actually needs. The emissions associated with this extra power generation are attributed to T&D losses, and are counted as part of the Scope 3 inventory.
- **Fuel and Energy Related Activities (FERA):** FERA emissions covers indirect emissions that result from the production, transportation, and use of fuels and energy purchased by the organization. This category includes the following sources of emissions:
    - Extraction and production of purchased fuels: Emissions from the extraction and production of fossil fuels such as coal, oil, and natural gas that are purchased by the organization.
    - Production and delivery of purchased electricity, heat, and steam: Emissions from the generation, transmission, and distribution of electricity, heat, and steam that are purchased by the organization.
    - Transmission and distribution losses: Emissions from the transmission and distribution of electricity, heat, and steam, which can be lost in the process.
    - Use of sold fuels and energy: Emissions from the use of fuels and energy sold by the organization, such as natural gas or electricity.
    - Upstream transportation and distribution: Emissions from the transportation and distribution of fuels and energy upstream in the value chain.

The graphic below summarizes Scope 1, 2, and 3 sources of GHG emissions.



Source: [WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard (PDF)], page 5.

Future Categories of Emissions

GHG accounting is evolving as organizations increasingly recognize the importance of reducing their environmental impact and responding to the urgent need to address climate change. One significant evolution in GHG accounting has been the development of more robust and standardized frameworks for tracking and reporting emissions, such as the Greenhouse Gas Protocol and the Science Based Targets initiative. These frameworks provide organizations with clear guidelines for measuring and reporting their emissions and help ensure consistency and comparability across different organizations and industries.

Another important trend in GHG accounting is the growing emphasis on Scope 3 emissions, as organizations recognize the importance of taking a more comprehensive approach to measuring and reducing their environmental impact. This includes understanding and addressing emissions that occur outside of their direct control, such as those associated with their supply chain, customer use of their products, and employee commuting. Scope 3 emissions including activities that are not directly controlled by the organization. There are 15 categories of Scope 3 emissions, as defined by the Greenhouse Gas Protocol. We have used gray highlighting to identify Scope 3 emissions categories that are not currently included in Bryn Mawr College's GHG Inventory.

1. **Purchased goods and services:** Emissions from the production of goods and services purchased by the organization. Paper purchases are included in Bryn Mawr's GHG Inventory; however, the organization purchases many other goods and services such as: furniture and computers.
2. **Capital goods:** Emissions from the production of capital goods such as buildings, equipment, and vehicles.
3. **Fuel and energy-related activities:** Emissions from the production, transportation, and use of fuels and energy purchased by the organization.
4. **Upstream transportation and distribution:** Emissions from transportation and distribution of products and materials upstream in the value chain.
5. **Waste generated in operations:** Emissions from waste generated by the organization's operations.
6. **Business travel:** Emissions from employee travel related to business activities.
7. **Employee commuting:** Emissions from employee commuting to and from work.
8. **Upstream leased assets:** Emissions from leased assets upstream in the value chain.
9. **Downstream transportation and distribution:** Emissions from transportation and distribution of products and materials downstream in the value chain.
10. **Processing of sold products:** Emissions from the processing of products sold by the organization.

11. **Use of sold products:** Emissions from the use of products sold by the organization.
12. **End-of-life treatment of sold products:** Emissions from the disposal or recycling of products sold by the organization.
13. **Downstream leased assets:** Emissions from leased assets downstream in the value chain.
14. **Franchises:** Emissions from franchised operations. We do not believe that this category applies to Bryn Mawr College.
15. **Investments:** Emissions from investments in other organizations.

Tracking and reporting Scope 3 emissions can provide organizations with valuable insights into the full lifecycle emissions of their products and services and identify areas where they can reduce their environmental impact. Accounting for emissions that result from furniture and computer purchases can be relatively straight forward, and Bryn Mawr can adopt sustainable purchasing policies that help to reduce these emissions. Some emissions categories are more difficult to measure. For example, quantifying emissions that result from the end-of-life treatment of sold products would require a detailed understanding of how Bryn Mawr community members utilize items purchased at the campus bookstore. Creating awareness of the sources of Bryn Mawr College's emissions is an important step in managing and reducing the College's environmental impact. GHG accounting standards will continue to evolve over time, which standardize data collection processes and will allow the College to measure all 15 Scope 3 emissions categories.

Methods of Data Collection and GHG Emissions Calculation

Information for this report was gathered by Bryn Mawr College Facilities Services staff following a comprehensive process of working with stakeholders throughout campus to obtain necessary data. A spreadsheet was used to track the information that was needed and helped streamline the data collection process.

THE STONE HOUSE GROUP reviewed data, and clarified estimates & calculations with the College, as needed. Bryn Mawr utilized Sustainability Indicator Management & Analysis Platform (SIMAP) online software to calculate campus emissions. SIMAP is an emissions calculation tool created by The Sustainability Institute at the University of New Hampshire that is recommend as the industry standard by both Second Nature and AASHE. SIMAP's calculations were made using the emissions factors provided by The Climate Registry (2021) the US Environmental Protection Agency, the Intergovernmental Panel on Climate Change, and the reporting protocol provided by the WRI/WBCSD GHG Protocol Corporate Reporting Standard.

Members of THE STONE HOUSE GROUP who completed the calculations and analysis for this report have completed coursework with the GHG Management Institute, and have extensive education, professional training, and experience to complete this type of GHG emissions inventory effort.

Greenhouse Gas Offsets

Various on-site and off-site projects can be used to reduce an organization's gross greenhouse gas emissions, all of which fall under the category of "GHG Offsets." The College currently purchases Renewable Energy Credits (REC's) that offset emissions from all electric consumption, which were 15,915 MWh's of Green-e certified Wind REC's in FY 2022. A REC represents the environmental attributes, but not the electrons, of 1 MWh of renewable energy generation on the electricity grid. REC's are a tool used to track when and where renewable energy is generated, who it is sold to, and who is using it. When electricity is generated, the electrons are all mixed together on the grid, and there is no way to know the sources from which they were generated. REC's make it possible for consumers to choose clean energy and not have it be claimed by anyone else.

Bryn Mawr purchases REC's that are Green-e certified, meeting the environmental standards established by the non-profit Center for Resource Solutions. Bryn Mawr College generates on-campus non-additional offsets through preservation of trees in the College's Morris Woods. In 2018 & 2019, the College undertook a detailed assessment of trees on campus, determining that are 1,298 large trees on the main campus. An additional 1,702 trees are located on the Morris Woods area of campus, which the College has no plans for development. Since the trees located in Morris Woods are being preserved, they are being count as a 37 MTCDe carbon offset. This internal carbon offset project has not been verified by a third party, such as the American Carbon Registry or Verified Carbon Standard. Therefore, the offset is being categorized as a non-additional offset in each year that a GHG Inventory is conducted for Bryn Mawr College. Similarly, new tree plantings that occurred in FY 2022 were accounted for as non-additional carbon offsets. Bryn Mawr College planted 100, 2" caliper native trees in a designated area on campus for the sole purpose of off-setting its carbon foot print. This is in addition to the normal annual tree planting program. Together, these trees sequestered 0.37 MTCDe, and over time as the trees grow, the amount of carbon dioxide sequestered by these trees will increase.

Additionally, Bryn Mawr College generates off-campus non-additional offsets through the planting of trees in Blair County, PA at two projects sites. The College partnered with the Pennsylvania Environmental Council, the Altoona Water Authority and others to plant 36,500 trees on a 52 acre site referred to as project Murph and plant 61,600 trees on an 88 acre site referred to as Kittanning Run. Through the partnership, Bryn Mawr College has rights to claim the carbon benefits of the tree planting projects as a non-additional offset to campus GHG emissions. THE STONE HOUSE GROUP utilized an online tool called i-Tree to assess the carbon impacts of tree planting at these project sites. i-Tree is a state-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban and rural forestry analysis and benefits assessment tools. The i-Tree tools can help

strengthen forest management and advocacy efforts by quantifying forest structure and the environmental benefits that trees provide.

In FY 2022, Project Murph mitigated 99.1 MTCDe of emissions while Kittanning Run mitigated 167.4 MTCDe. The charts below show the impacts of tree planting by species through the initial 5 years of the project. As the trees mature to their fifth year, the total amount of carbon mitigation will increase to 1,005 MTCDe. These trees are protected for the next 50 years.

Blair County Tree Planting
PA DEP Email, 11/14/2022

Project Murph (Blair County 52 Acres)

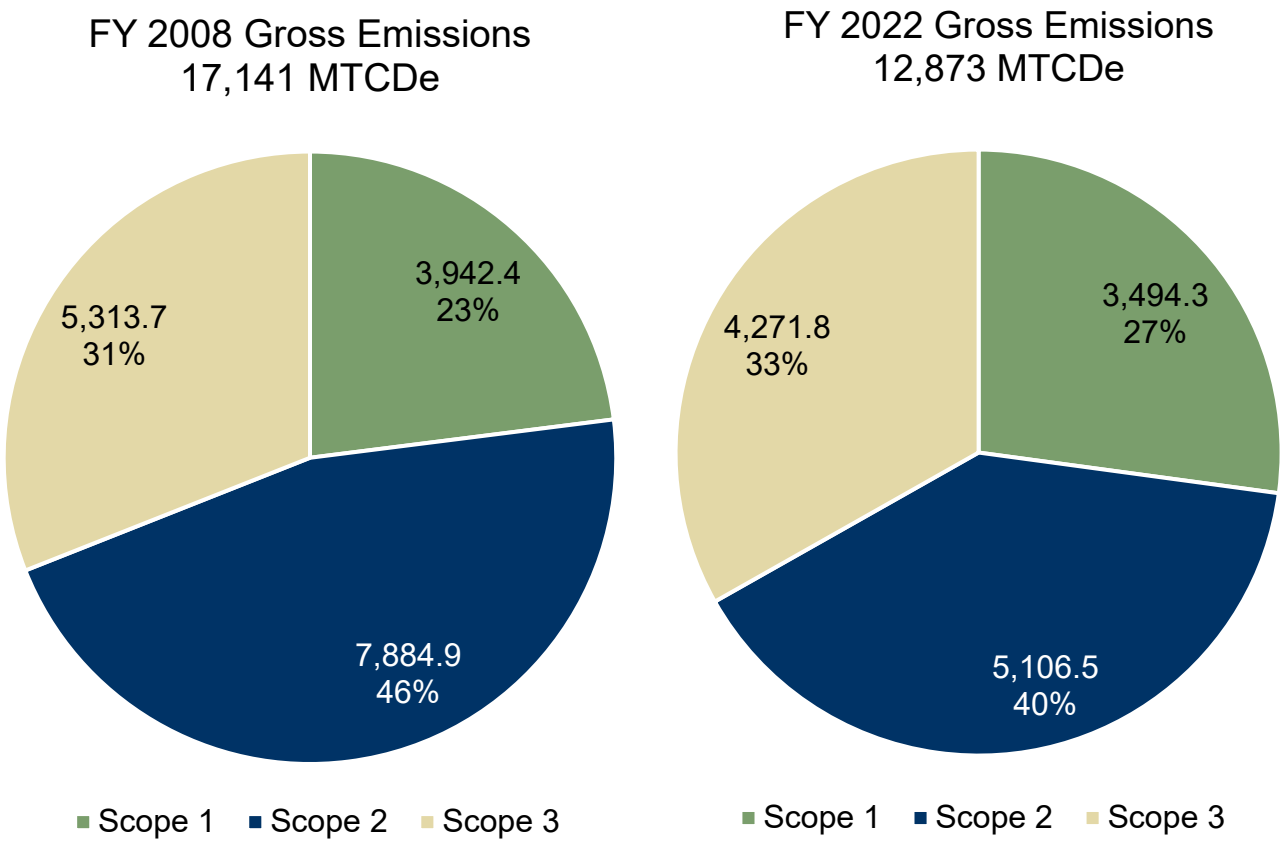
Tree Type (Common Name)	Quantity	Year 1 Carbon Sequestration per Tree (lbs per tree)	Years 2 - 4 Carbon Sequestration per Tree (lbs per tree)	Year 5 Carbon Sequestration per Tree (lbs per tree)	Year 1 Carbon Sequestration (lbs.)	Year 1 Carbon Sequestration (MTCDe)	Years 2-4 Carbon Sequestration (MTCDe)	Year 5 Carbon Sequestration (MTCDe)
Red Spruce	3,000	5	10	13	15,000	6.8	13.6	17.7
White Pine	4,000	13	27	47	52,000	23.6	49.0	85.3
Northern Red Oak	4,000	6	14	27	24,000	10.9	25.4	49.0
White Oak	3,500	2	6	7	7,000	3.2	9.5	11.1
Black Cherry	3,500	6	14	25	21,000	9.5	22.2	39.7
Chestnut Oak	3,500	3	8	8	10,500	4.8	12.7	12.7
Black Locust	2,000	7	14	24	14,000	6.3	12.7	21.8
Quaking Aspen	2,000	4	9	16	8,000	3.6	8.2	14.5
Big Tooth Aspen	2,000	3	8	14	6,000	2.7	7.3	12.7
American Crabapple	1,500	4	10	15	6,000	2.7	6.8	10.2
Black Chokeberry	1,500	6	17	20	9,000	4.1	11.6	13.6
Yellow Poplar	4,000	7	16	37	28,000	12.7	29.0	67.1
Gray Dogwood	2,000	9	18	42	18,000	8.2	16.3	38.1
TOTALS	36,500				218,500	99.1	224.3	393.4

Kittanning Run (Blair County 88 Acres)

Tree Type (Common Name)	Quantity	Year 1 Carbon Sequestration per Tree (lbs per tree)	Years 2 - 4 Carbon Sequestration per Tree (lbs per tree)	Year 5 Carbon Sequestration per Tree (lbs per tree)	Year 1 Carbon Sequestration (lbs.)	Year 1 Carbon Sequestration (MTCDe)	Years 2-4 Carbon Sequestration (MTCDe)	Year 5 Carbon Sequestration (MTCDe)
Red Spruce	6,000	5	10	13	30,000	13.6	27.2	35.4
White Pine	6,800	13	27	47	88,400	40.1	83.3	144.9
Northern Red Oak	6,800	6	14	27	40,800	18.5	43.2	83.3
White Oak	6,000	2	6	7	12,000	5.4	16.3	19.0
Black Cherry	6,000	6	14	25	36,000	16.3	38.1	68.0
Chestnut Oak	6,000	3	8	8	18,000	8.2	21.8	21.8
Quaking Aspen	3,000	4	9	16	12,000	5.4	12.2	21.8
Big Tooth Aspen	3,000	3	8	14	9,000	4.1	10.9	19.0
American Crabapple	3,000	4	10	15	12,000	5.4	13.6	20.4
Black Chokeberry	3,000	6	17	20	18,000	8.2	23.1	27.2
American Hazelnut	3,000	12	21	32	36,000	16.3	28.6	43.5
Black Locust	3,000	7	14	24	21,000	9.5	19.0	32.7
Yellow Poplar	3,000	7	16	37	21,000	9.5	21.8	50.3
Silky Dogwood	3,000	5	9	18	15,000	6.8		24.5
TOTALS	61,600				369,200	167.4	359.1	611.9

Comparison to Previous GHG Emissions Inventories

Bryn Mawr College uses FY 2008 (June 1, 2007 – May 31, 2008) data as the College's Base Year for emissions. A GHG Inventory was most recently completed using FY 2014 operating data. Both the 2008 and 2014 inventories will be used as comparison points for the FY 2019 GHG Emissions presented in this report. In this report, gross emissions reflect all campus emissions and net emissions account for Renewable Energy Credits and Carbon Offsets that the College has retired.



Figures 1 & 2: Base Year (2008) net GHG emissions totaled 17,141 MTCDe (left). FY 2022 net GHG emissions totaled 12,873 MTCDe (right).

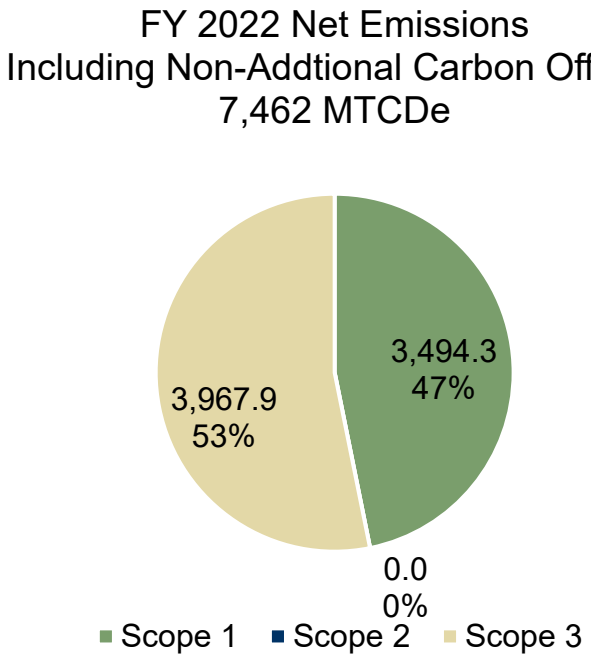


Figure 3: FY 2022 net GHG emissions, including non-additional offsets, totaled 7,462 MTCDe.

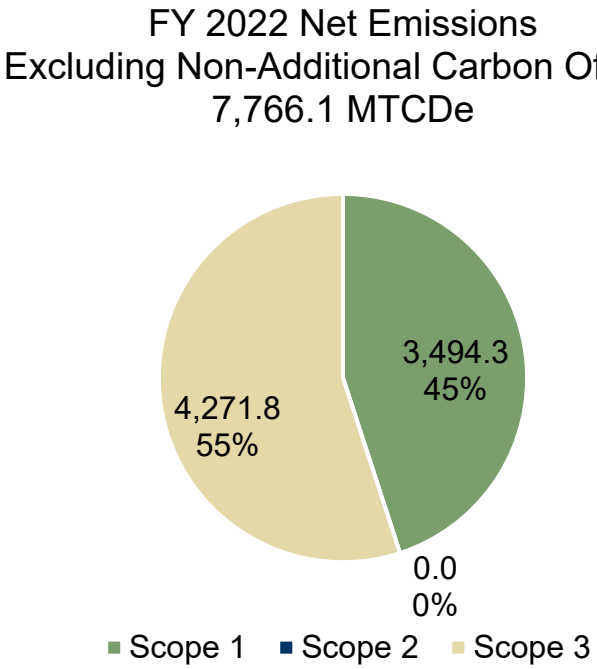


Figure 4: FY 2022 net GHG emissions, excluding non-additional offsets, totaled 7,766.1 MTCDe.

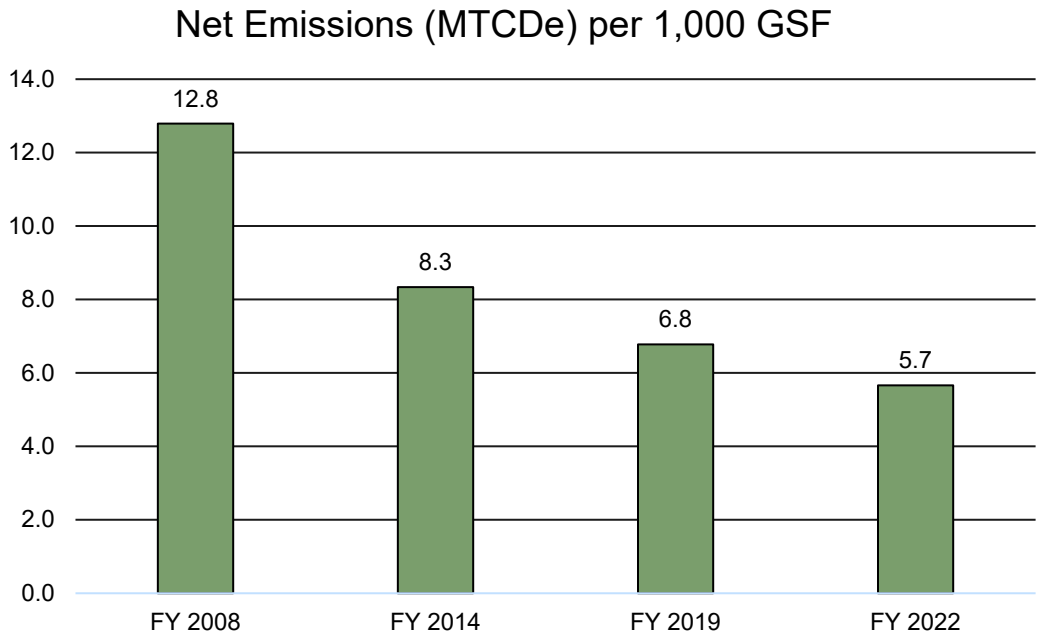


Figure 5: Comparison of Net GHG Emissions per 1,000 gross square feet of building space.

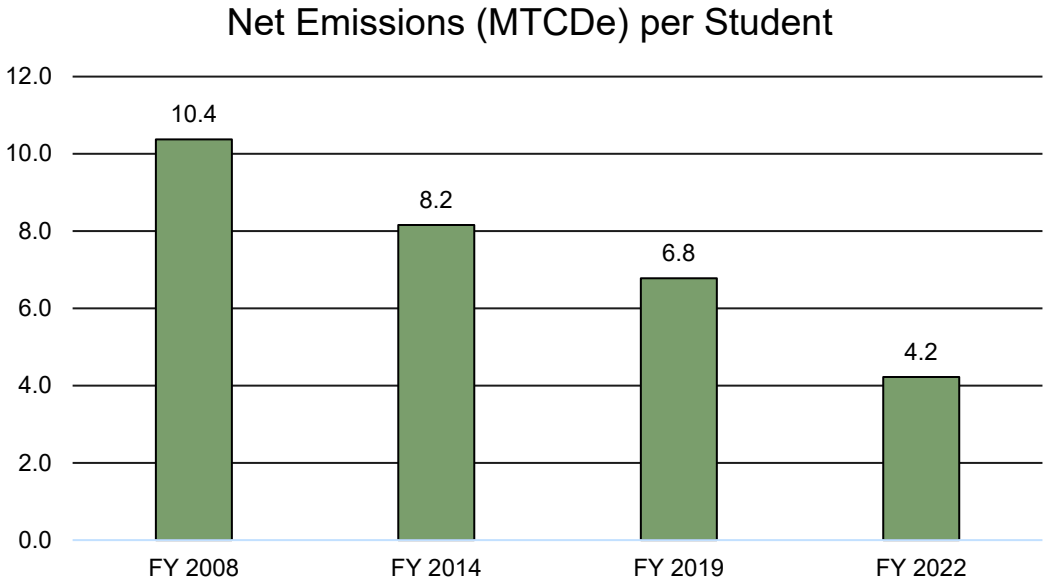


Figure 6: Comparison of Net GHG Emissions per FTE student.

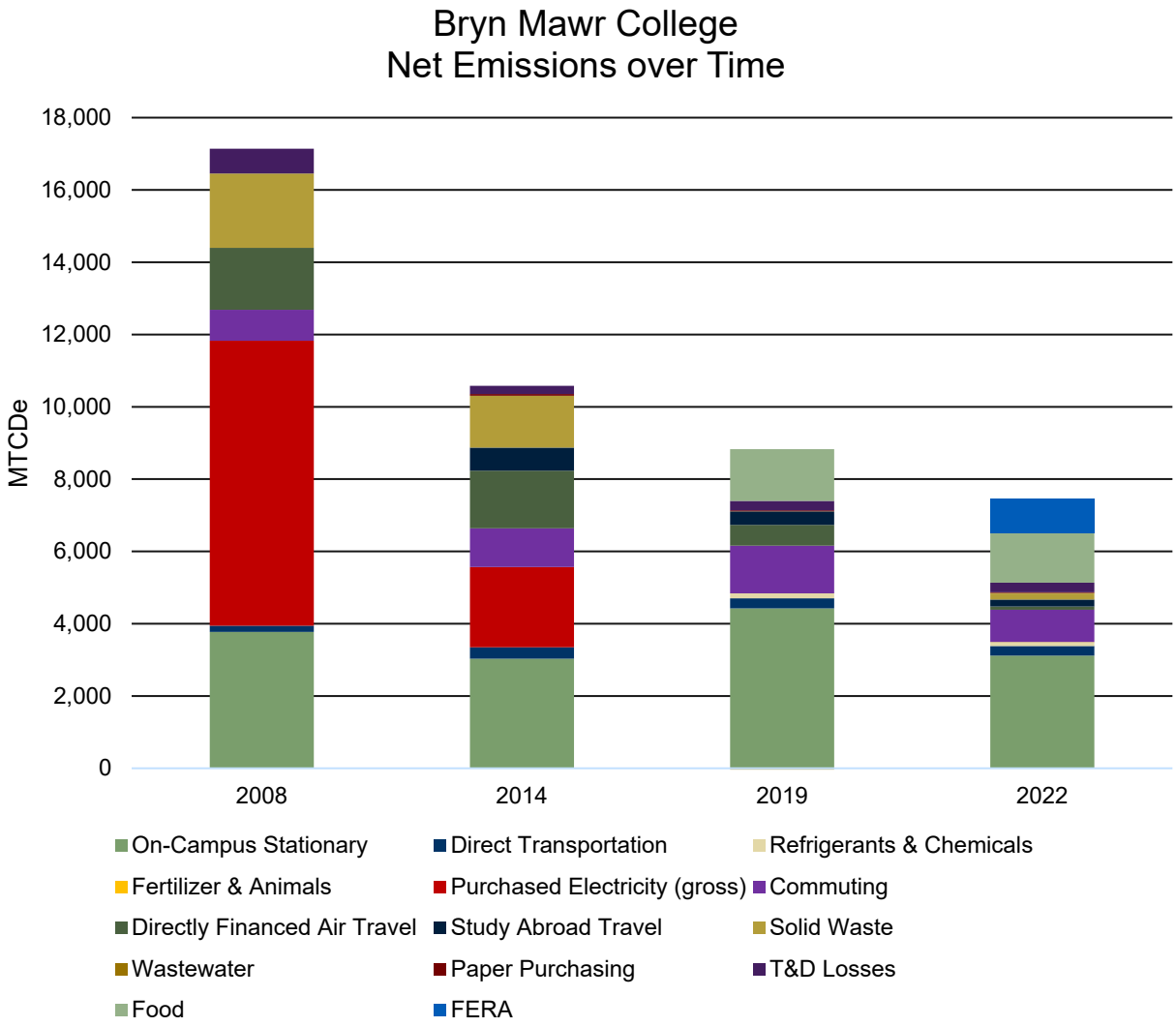


Figure 7: Comparison of net campus emissions, by category and fiscal year.

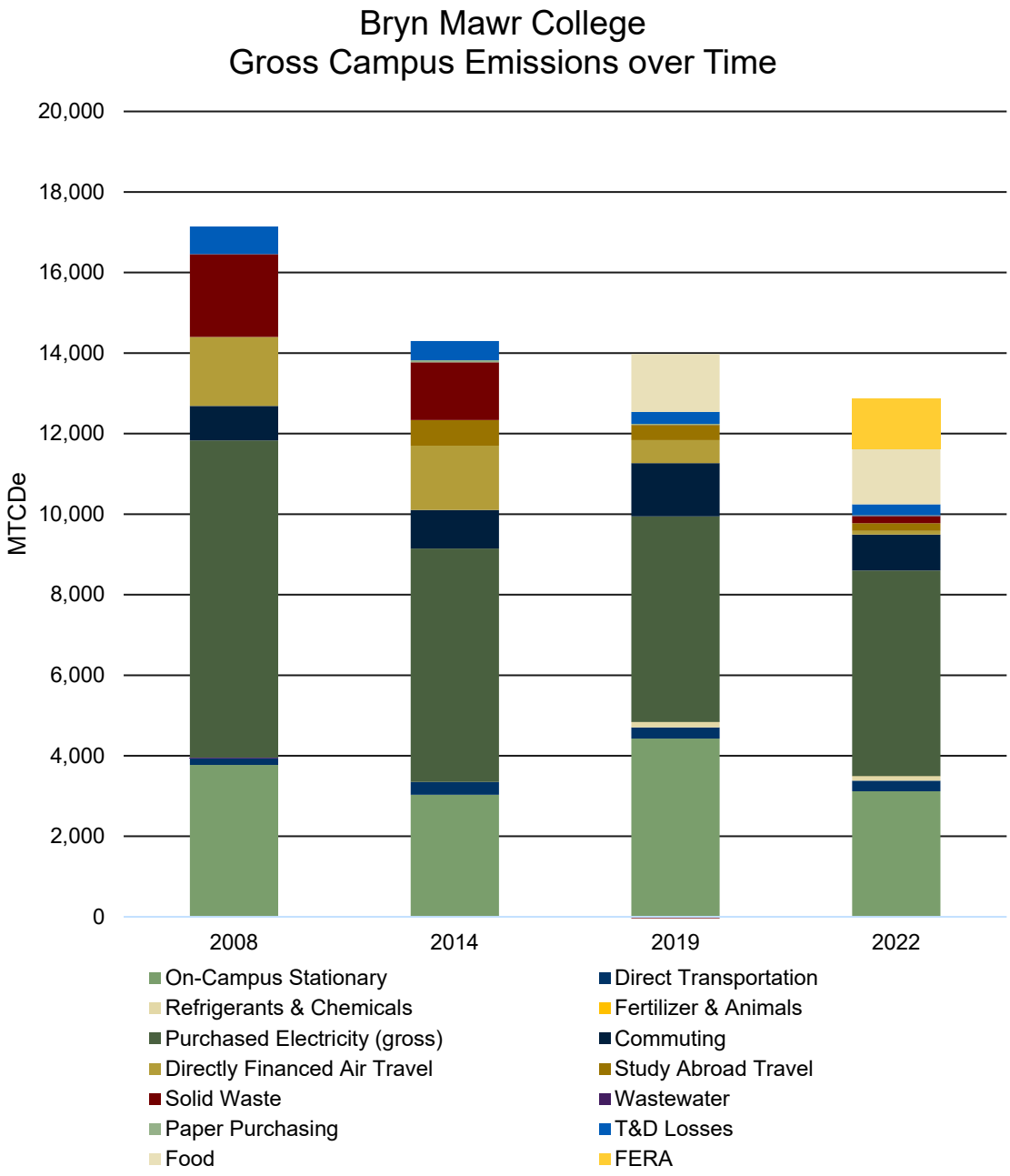


Figure 8: Comparison of gross campus emissions, by category and fiscal year.

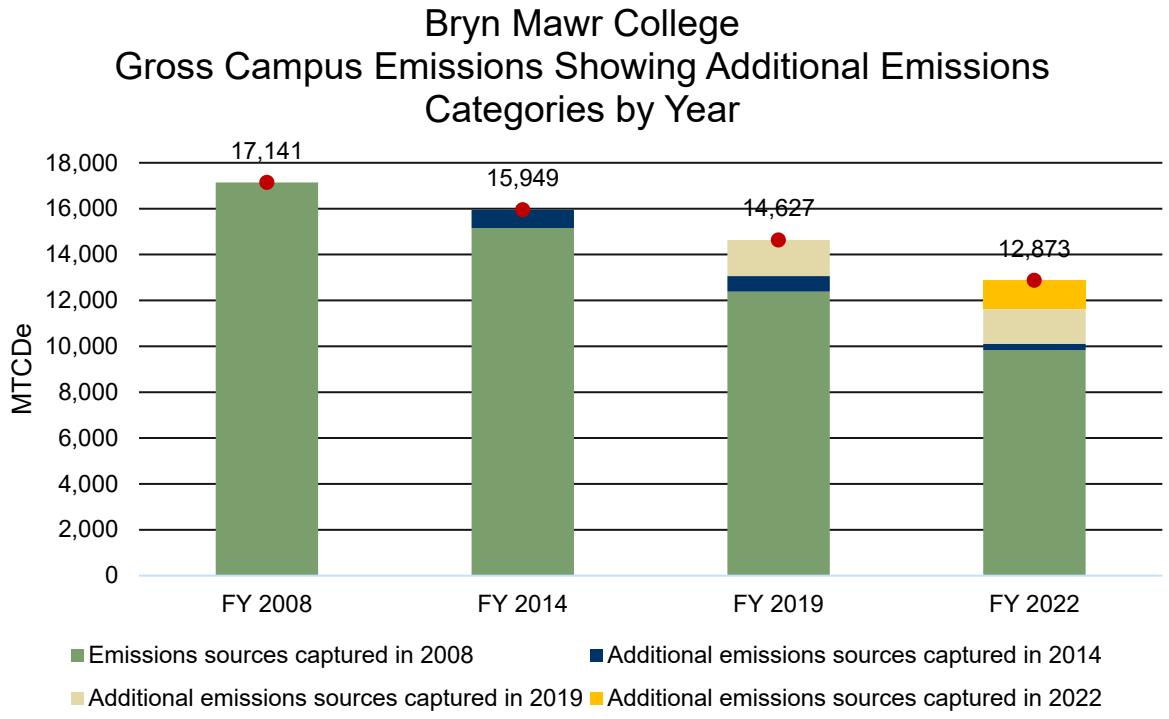


Figure 9: Illustration of new gross emissions categories, by fiscal year.

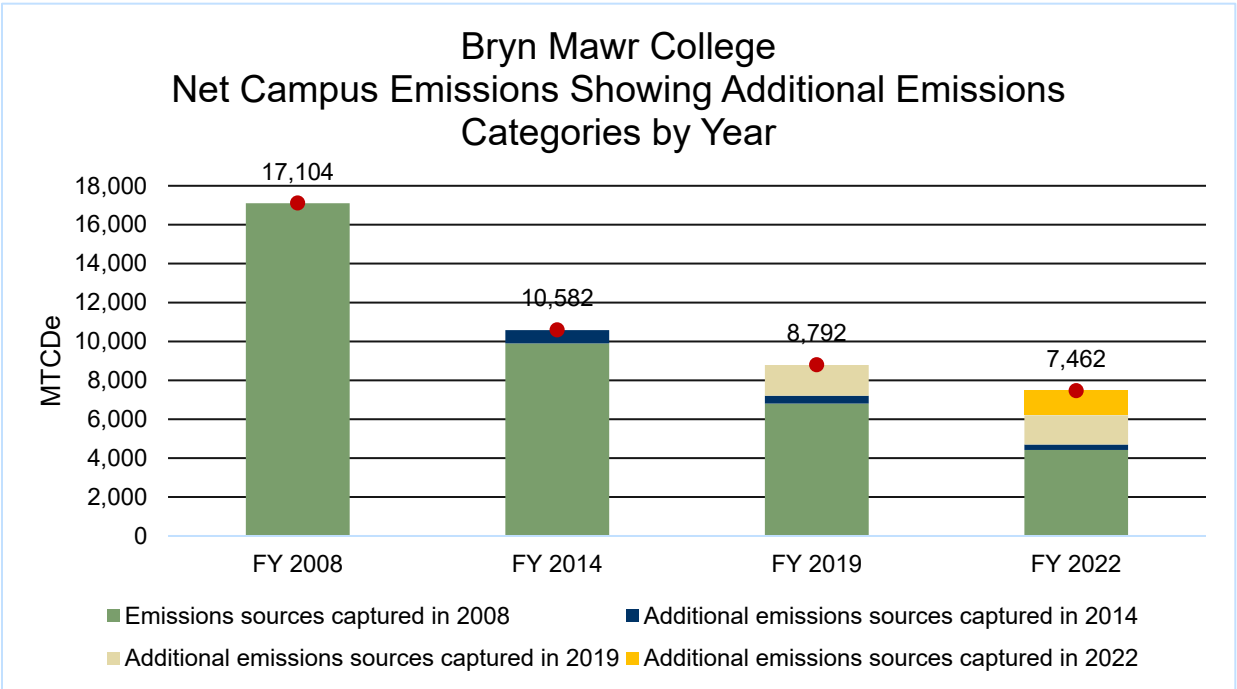


Figure 10: Illustration of new net emissions categories, by fiscal year.

Bryn Mawr College,
FY 2022 GHG Inventory Summary

	2008 GHG Inventory (Base Year)		2014 GHG Inventory		2019 GHG Inventory		2022 GHG Inventory		2022 % Change vs. Base Year	2022 % Change vs. 2019	2022 GHG Inventory, Only Including Base Year Categories
	MTCDE	% of Net	MTCDE	% of Net	MTCDE	% of Net	MTCDE	% of Net	% Change	% Change	MTCDE
Scope 1	**3,942.4**	**23%**	**3,349.3**	**32%**	**4,839.3**	**55%**	**3,494.3**	**40%**	**-11%**	**-28%**	**3,381.3**
On-Campus Stationary	3,771.0	22%	3,030.3	29%	4,425.7	50%	3,116.8	35%	-17%	-30%	3,116.8
Direct Transportation	171.4	1%	319.0	3%	278.7	3%	264.5	3%	54%	-5%	264.5
Refrigerants & Chemicals	0.0	0%	0.0	0%	134.1	2%	112.5	1%			0.0
Fertilizer & Animals	0.0	0%	0.0	0%	0.8	0%	0.5	0%			0.0
Scope 2	**7,884.9**	**46%**	**2,220.5**	**21%**	**0.0**	**0%**	**0.0**	**0%**	**-100%**	**0%**	**0.0**
Purchased Electricity	7,884.9		7,336.5		5,797.9		5,106.5		-35%	-12%	5,106.5
Purchased Wind REC's	0.0		-5,116.0		-5,797.9		-5,106.5				-5,106.5
Purchased Electricity (net)	7,884.9	46%	2,220.5	21%	0.0	0%	0.0	0%			0.0
Scope 3	**5,313.7**	**31%**	**5,263.2**	**46%**	**3,990.1**	**45%**	**4,271.8**	**49%**	**-20%**	**7%**	**1,345.4**
Faculty Commuting	857.1	5%	956.9	6%	257.6	3%	165.3	2%			165.3
Staff Commuting					790.1	9%	655.7	7%			655.7
Student Commuting	0.0	0%	111.6	1%	274.1	3%	72.1	1%			
Directly Financed Air Travel	1,714.1	10%	1,594.9	15%	560.6	6%	86.9	1%	-95%	-85%	86.9
Other Directly Financed Travel	0.0		0.0	0%	11.2	0%	2.9	0%			
Study Abroad Travel	0.0		638.0	6%	374.7	4%	191.1	2%			
Solid Waste	2,056.9	12%	1,435.4	14%	-37.1	0%	169.0	2%	-92%	-556%	169.0
Wastewater	0.0		0.0		3.5	0%	15.7	0%			
Paper Purchasing	0.0		47.8	0%	23.7	0%	15.2	0%			
T&D Losses	685.6	4%	478.5	5%	297.6	3%	268.6	3%	-61%	-10%	268.6
Food	0.0	0%	0.0	0%	1,434.1	16%	1,375.2	16%			
Fuel-and Energy-Related Activities (FERA)	0.0	0%	0.0	0%	0.0	0%	1,254.2	14%			
Offsets	**-37.0**	**0%**	**-251.0**	**-2%**	**-37.0**	**-0.4%**	**-303.9**	**-3.5%**			
Compost	0.0	0%	-214.0	-2%	0.0	0%	0.0	0%			
Non-Additional Sequestration, Morris Woods	-37.0	0%	-37.0	0%	-37.0	-0.4%	-37.0	-0.4%			
Non-Additional Sequestration, Tree Planting	0.0	0%	0.0	0%	0.0	0.0%	-266.9	-3.0%			
GROSS TOTAL CAMPUS GHG EMISSIONS	**17,141.0**		**15,949.0**		**14,627.3**		**12,872.6**		**-25%**	**-12%**	**9,833.2**
NET TOTAL CAMPUS GHG EMISSIONS, Excluding Non-Additional Offsets	**17,141.0**		**10,833.0**		**8,829.4**		**7,766.1**		**-55%**	**-12%**	**4,726.7**
NET TOTAL CAMPUS GHG EMISSIONS, Including Non-Additional Offsets	**17,104.0**	**100%**	**10,582.0**	**100%**	**8,792.4**	**100%**	**7,462.2**	**100%**	**-56%**	**-15%**	**4,726.7**
Campus GSF	1,340,225		1,269,335		1,297,065		1,318,065		-2%	2%	
Student Enrollment (FTE)	1,649		1,297		1,686		1,767		7%	5%	
MTCDE Net Emissions per 1,000 GSF	12.8		8.3		6.8		5.7		-56%	-16%	3.6
MTCDE Net Emissions per Student	10.4		8.2		5.2		4.2		-59%	-19%	2.7

= FY 2022 new emissions category

Figure 11: Detailed report of emissions by category for fiscal years 2008, 2014, 2019, and 2022.