

THE UNIVERSITY OF CHICAGO

# Greenhouse Gas Emissions Inventory Report 2012–2019

January 2021



THE UNIVERSITY OF  
CHICAGO

Office of  
Sustainability

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# Introduction

## Executive Summary

The University of Chicago Greenhouse Gas Emissions Inventory Report 2012-2019 is the latest release of the greenhouse gas emissions inventory and has been updated from the 2016 and 2018 releases of the inventory results.

This report includes a brief background on environmental sustainability at the University of Chicago, a look how the University's greenhouse gas emissions are calculated, a summary of changes from the previous releases of the inventory results, and the results of the University's current greenhouse gas emissions inventory.

The greenhouse gas emissions inventory includes the University of Chicago Hyde Park campus, excluding the medical campus.

## The University of Chicago

The University of Chicago is located in the Hyde Park community on Chicago's South Side, 15 minutes south of the city center. Chicago's Hyde Park campus covers 217 acres and includes more than 135 buildings operated and managed by Facilities Services. These buildings host and support multiple academic programs, research, arts, and culture. Various space functions include classrooms, laboratories, administration, athletics, recreation, dining, and residential. Facilities Services ([facilities.uchicago.edu](https://facilities.uchicago.edu)) is responsible for the design, construction, renovation, operation, and maintenance of campus and residential buildings, property, and infrastructure.

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## UChicago Sustainability

The University of Chicago is committed to creating a sustainable campus. With its tradition of rigorous inquiry, the University is positioned to evaluate the challenges of sustainability and create measurable results.

One such challenge is climate change, a complex and global phenomenon that requires an in-depth understanding of greenhouse gas emissions. These emissions are a reflection of natural resource consumption across several sources, so understanding the scopes and sources of emissions is a critical step in campus sustainability planning. Managing greenhouse gas emissions is one of the University's top sustainability priorities.

Raising visibility and awareness of environmental issues on campus, and engaging students, faculty, and staff to develop and implement sustainable initiatives is also important.

The University of Chicago [Sustainability Plan](#) includes goals in nine areas: Climate Change and Energy, High Performance Buildings, Multi-Modal Transportation, Waste Reduction, Food Systems, Green Space, Water Conservation, Environmentally Preferable Procurement, and Building Awareness and Partnerships.

The Climate Change and Energy area of the Sustainability Plan outlines the 2025 goal. In April 2020, the University announced a new greenhouse gas emissions reduction goal of a 50% reduction by 2030; this new goal applies to 2021 through 2030. The 2025 goal is applicable to this report.

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## 2025 Goal

Greenhouse gas emissions reduction is the key sustainability goal as the University seeks to understand and reduce its contribution to climate change.

**2025 goal: the University has a goal to reduce its greenhouse gas emissions by 20% by 2025.**

Greenhouse gas emissions are tied to all major campus operations, including buildings, transportation, waste, food, landscape, and procurement. Each of these areas is included in the Sustainability Plan, with energy efficiency in buildings as the top priority. By reducing building energy use, the University reduces greenhouse gas emissions and realizes major economic benefits.

The first step in managing greenhouse gas emissions is quantifying the emissions. The University's greenhouse gas emissions inventory provides a clear understanding of the emissions profile. Understanding the inventory enables the Office of Sustainability ([sustainability.uchicago.edu](https://sustainability.uchicago.edu)), in collaboration with Facilities Services Operations and various partners across campus, to develop and implement sustainability initiatives targeted to areas of specific concern or inefficiency. Further, it allows the monitoring of sustainability progress for cost effectiveness, environmental benefit, and social responsibility.

# Reporting and Methodology

## Inventory Overview

Greenhouse gas emissions inventory data was collected for fiscal years 2009 through 2019. The inventory was completed according to widely accepted referenced standards and approved calculation tools. The greenhouse gas emissions were quantified using Sustainability Indicator Management and Analysis Platform (SIMAP™). The referenced standards used for the greenhouse gas emissions inventory include *The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* (2004), *The Climate Registry General Reporting Protocol, Version 2.0* (2013), and *The Climate Registry General Reporting Protocol, Version 3.0* (2019).

## Calculations

Emissions from greenhouse gases (such as carbon dioxide, methane, and nitrous oxide) can be calculated by taking the amount of fossil fuel consumed and multiplying it by the appropriate emissions factor and global warming potential.

The global warming potential is used to convert metric tons of specific greenhouse gases to metric tons of carbon dioxide equivalents [MT eCO<sub>2</sub>]. This conversion is based on the

gas's relative impact on climate change compared to that of carbon dioxide. The global warming potential indicates the contribution each gas makes to climate change relative to carbon dioxide.

For example, emitting a metric ton of methane (CH<sub>4</sub>) has the same impact on climate change as emitting 28 metric tons of carbon dioxide. The global warming potentials of several prominent gases relative to CO<sub>2</sub> are reported in Table 1.1. By converting all emissions into the same unit, MT eCO<sub>2</sub>, the contribution of emissions sources can be more easily aggregated and compared. This also enables comparison between organizations. Therefore, the units of measure shown at right are used for greenhouse gas emissions.

Common Name	Chemical Formula	GWP
Carbon dioxide	CO <sub>2</sub>	1
Methane	CH <sub>4</sub>	28
Nitrous oxide	N <sub>2</sub> O	265

Source: [IPCC Fifth Assessment Report](#)

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## Units of Measure

Carbon Intensity  
kilograms equivalent carbon dioxide per square foot per fiscal year  
[kg eCO<sub>2</sub>/sqft/FY]

Absolute Emissions  
metric tons equivalent carbon dioxide per fiscal year  
[MT eCO<sub>2</sub>/FY]

Where:

eCO<sub>2</sub> = equivalent carbon dioxide

FY = fiscal year

MT = 1 metric ton = 1,000 kilograms

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# Reporting and Methodology

## Temporal Boundary

The temporal boundary is fiscal years 2012 through 2019. The University's fiscal year is July 1 through June 30. For example, fiscal year 2012 is July 1, 2011, through June 30, 2012. See page 7 for more information.

## Organizational Boundary

The operational control approach was used to define the organizational boundary, since this is how the University can make the most impact for a positive change. Operational control is defined as having the authority to introduce and implement operating policies. Under the operational control approach, emissions from each operation within the University's operational control must be reported.

## Operational Boundary (Scopes)

Emissions from scopes 1, 2, and 3, as applicable to the University of Chicago, are tracked and reported, as indicated in Table 1.2.

## The 2025 goal is based on carbon intensity (emissions per square foot) and includes scopes 1 and 2.

Greenhouse gas emissions from refrigerants and chemicals, including HFCs (hydrofluorocarbons) and PFCs (perfluorocarbons), are omitted from this report and will be included, as appropriate, when verifiable and reliable data is available. The following greenhouse gases are also not reported as they are not present on campus: SF<sub>6</sub> (sulfur hexafluoride) and (NF<sub>3</sub>)<sup>3</sup> (nitrogen trifluoride).

The following greenhouse gases are tracked and reported: CO<sub>2</sub> (carbon dioxide), CH<sub>4</sub> (methane), and N<sub>2</sub>O (nitrous oxide).

Scope 1: Direct Emissions (mandatory reporting)

- Combusting fuels on campus for heating and cooling
- Combusting fuels to power campus-owned transportation vehicles
- Off-gassing of fertilizers used on campus
- Fugitive release of refrigerants and chemicals that are greenhouse gases (not reported)

Scope 2: Indirect Emissions (mandatory reporting)

Off-campus combustion of fuels to produce electricity, steam, or chilled water for the campus

Scope 3: Other Indirect Emissions (optional reporting, not included in 2025 goal)

- Air and ground travel for University business and air travel for study abroad (fuel combusted in personal or transit vehicles/aircraft)
- Solid landfilled waste (landfill methane and/or emissions from incineration only)
- Transmission and distribution losses from scope 2 electricity

# Reporting and Methodology

**Table 1.2: Data Compiled for the Greenhouse Gas Emissions Inventory**

<b>Institutional</b>	<b>Unit of Measure</b>
Student, Faculty, and Staff Population	[count/FY]
FICM Gross Area	[sqft/FY]
<b>Scope 1: Direct Emissions (mandatory reporting)</b>	<b>Unit of Measure</b>
Distillate Fuel Oil #2	[gallons/FY]
Natural Gas	[MMBtu/FY]
Unleaded Fuel (University-Owned Fleet and UGo Shuttles)	[gallons/FY]
Diesel Fuel (University-Owned Fleet and UGo Shuttles)	[gallons/FY]
Refrigerants and Chemicals, Fugitive Emissions <sup>†</sup>	[pounds/FY]
Fertilizer, Nitrogen	[pounds N/FY]
<b>Scope 2: Indirect Emissions (mandatory reporting)</b>	<b>Unit of Measure</b>
Electricity	[kWh/FY]
<b>Scope 3: Other Indirect Emissions (optional reporting)</b>	<b>Unit of Measure</b>
Business Travel (Air, Automobile)	[miles/FY]
Study Abroad Travel (Air)	[miles/FY]
Landfilled Waste	[short tons <sup>‡</sup> /FY]

<sup>†</sup>Omitted from reporting. Expected to be a very small amount of overall University emissions. Reporting is anticipated when verifiable and reliable data is available.

<sup>‡</sup>1 short ton = 2,000 pounds



# Reporting and Methodology

## Target Base Year

The target base year is used as a basis for setting and tracking progress toward a greenhouse gas emissions reduction goal. In other words, the target base year is used to assess greenhouse gas emissions performance. For example, to assess performance for fiscal year 2019, the greenhouse gas emissions from fiscal year 2019 are compared to the greenhouse gas emissions from the target base year.

The target base year can be calculated or selected based on when reliable and verifiable emissions data are available. If calculated, the target base year is an average of annual emissions over several consecutive years. This is done to account for unusual fluctuations (such as weather) in greenhouse gas emissions that would make a single year's data unrepresentative of the University's typical emissions profile. The target base year emissions should be as close to a "typical" year as possible.

The results of the greenhouse gas emissions inventory data integrity analysis indicated that in order to comply with *The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* (2004), the target base year should be calculated using an average of fiscal years 2012 through 2014 because of the following reasons:

- This average is typical of the University's emissions profile.
- The data from these years is verifiable and reliable.

## The target base year is an average of greenhouse gas emissions for fiscal years 2012, 2013, and 2014.

Therefore, the decision was made to begin the inventory at fiscal year 2012, but still keep the fiscal years 2009 through 2011 data on file for historical purposes. The result is that the University of Chicago official greenhouse gas emissions inventory begins at fiscal year 2012.

## Analysis

The greenhouse gas emissions inventory was evaluated in two ways:

- Absolute Emissions  
[MT eCO<sub>2</sub>/FY]
- Carbon Intensity  
(emissions per square foot)  
[kg eCO<sub>2</sub>/sqft/FY]

Carbon intensity is used for the 2025 goal.

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## 2025 Goal Reporting Summary

2025 goal: The University has a goal to reduce its greenhouse gas emissions by 20% by 2025.

The 2025 goal is based on carbon intensity (emissions per square foot) and includes scopes 1 and 2.

The 2025 goal is measured by comparing 2025 greenhouse gas emissions to the target base year greenhouse gas emissions.

The target base year is an average of greenhouse gas emissions for fiscal years 2012, 2013, and 2014.

Emissions from scope 3, as applicable to the University of Chicago, are tracked and reported, although they are not part of the 2025 goal.

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# Summary of Updates

The below items were updated from the FY2012–FY2018 University of Chicago greenhouse gas emissions inventory.

## Global Warming Potentials

The global warming potentials from the Intergovernmental Panel on Climate Change remain the same as reported in the FY2012–FY2018 greenhouse gas emissions inventory; the Fifth Assessment Report remains the most current version. Therefore, global warming potentials did not change for the FY2012–FY2019 inventory, as noted in Table 2.2

## Emissions Factors

Regional emissions and generation resource integrated database (eGRID) emissions factors were updated (see Table 2.2) by the United State Environmental Protection Agency to eGRID2018. This update had significant impact on scope 2 emissions (electricity), as discussed on the following pages. This update also impacted scope 3 emissions transmissions and distribution losses from scope 2 electricity. However, scope 3 is not part of the 2025 goal. For a summary of what is new in eGRID2018, refer to the [United States Environmental Protection Agency](#).

## Additional Updates

Table 2.1 contains a summary of carbon intensity and U.S. EPA eGRID emissions factors by reporting period and fiscal year. This table demonstrates that greenhouse gas emissions inventories are dynamic. When new data, information, emissions factors, and/or global warming potentials become available that were not available during the reporting period, they are incorporated in the next reporting period, as appropriate.

When regional United States EPA eGRID emissions factors are updated, they are applied retroactively, where applicable, making the greenhouse gas emissions inventory dynamic. To demonstrate this point, Table 2.2 summarizes the emissions factors used for scope 2 electricity for the most recent three reporting periods.

Refer to Table 2.1:

- Target base year: In reporting period 1, the target base year was reported as 25.5 kg eCO<sub>2</sub>/sqft in the Sustainability Plan

(November 2016). This includes scopes 1, 2, and 3, and includes commuting. For subsequent reporting periods, the target base year was reported as 16.5 kg eCO<sub>2</sub>/sqft. This decline is because the subsequent reporting periods did not include scope 3 or commuting and the global warming potentials were updated from GWP 4 to GWP 5. Scope 3 was not included since it is not part of the 2025 goal. Commuting was eliminated entirely from the inventory since a recent commuting survey had not been conducted, and reliable and verifiable commuting data was no longer available.

- Fiscal years 2016 and 2017: The carbon intensity decreased from reporting period 2 to 3 due to an update of emissions factors from eGRID2014 to eGRID2016.
- Fiscal year 2018: The carbon intensity decreased from reporting period 3 to 4 due to an update of emissions factors from eGRID2016 to eGRID2018.



# Summary of Updates

Table 2.1: Summary of Total Carbon Intensity [kg eCO <sub>2</sub> /sqft] and U.S. EPA eGRID Emissions Factors by Reporting Period and Fiscal Year				
Fiscal Year	Reporting Periods			
	1	2	3	4
	FY2012-FY2015 [kg eCO <sub>2</sub> /sqft]	FY2012-FY2017 [kg eCO <sub>2</sub> /sqft]	FY2012-FY2018 [kg eCO <sub>2</sub> /sqft]	FY2012-FY2019 [kg eCO <sub>2</sub> /sqft]
	Scopes 1,2, and 3	Scopes 1 and 2	Scopes 1 and 2	Scopes 1 and 2
Target Base Year	25.5*	16.5	16.5	16.5
2015	25.2	16.3 eGRID2014	16.3 eGRID2014	16.3 eGRID2014
2016	NA	15.9 eGRID2014	14.9 eGRID2016	14.9 eGRID2016
2017	NA	15.5 eGRID2014	14.5 eGRID2016	14.5 eGRID2016
2018	NA	NA	14.7 eGRID2016	14.2 eGRID2018
2019	NA	NA	NA	14.4 eGRID2018

\*Includes scopes 1, 2, and 3, and includes commuting. In all subsequent reporting periods, scopes 1 and 2 are included for the 2025 goal, and commuting is excluded.

Table 2.2: Global Warming Potentials and U.S. EPA Regional eGRID Emissions Factors for Scope 2 Electricity						
Fiscal Year	Reporting Periods					
	2		3		4	
	FY2012-FY2017 (May 2018)		FY2012-FY2018 (October 2019)		FY2012-FY2019 (January 2021)	
	GWP	EF Version	GWP	EF Version	GWP	EF Version
2012	AR4	rel. 2015, eGRID2012, 10th ed.	AR5	rel. 2015, eGRID2012, 10th ed.	AR5	rel. 2015, eGRID2012, 10th ed.
2013	AR4	rel. 2015, eGRID2012, 10th ed.	AR5	rel. 2015, eGRID2012, 10th ed.	AR5	rel. 2015, eGRID2012, 10th ed.
2014	AR4	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2017, eGRID2014, 11th ed.
2015	AR4	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2017, eGRID2014, 11th ed.
2016	AR4	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2018, eGRID2016, 12th ed.§	AR5	rel. 2018, eGRID2016, 12th ed.
2017	AR4	rel. 2017, eGRID2014, 11th ed.	AR5	rel. 2018, eGRID2016, 12th ed.§	AR5	rel. 2018, eGRID2016, 12th ed.
2018	NA	NA	AR5	rel. 2018, eGRID2016, 12th ed.§	AR5	rel. 2020, eGRID2018, 13th ed.§
2019	NA	NA	NA	NA	AR5	rel. 2020, eGRID2018, 13th ed.§

Global Warming Potential source:  
[IPCC Fourth Assessment Report](#)  
[IPCC Fifth Assessment Report](#)

Emissions Factor source:  
[United States Environmental Protection Agency Emissions and Generation Resource Integrated Database \(eGRID\)](#)

§The latest version of the United States Environmental Protection Agency eGRID emissions factors were released on January 28, 2020 and updated on March 9, 2020, are called eGRID2018, are from 2018 data, and are the thirteenth edition.

Notes:  
 The eGRID sub-region symbol is RFCW.  
 The eGRID region name is RFC West.

# Results

In the previous report for fiscal years 2012 through 2018, 2025 goal carbon intensity had decreased by 11% from the target base year to fiscal year 2018.

As shown in Figure 2.1, University carbon intensity for scopes 1 and 2 decreased by nearly 13% from the target base year to fiscal year 2019. The following page and Appendix A include a more detailed analysis of the results and explain why.

**2025 goal carbon intensity decreased by 13% from the target base year to fiscal year 2019.**

## Scope 2 Electricity

As indicated in Figures 2.2 and 2.3, electricity is the largest contributor to campus greenhouse gas emissions and was 42% of overall campus emissions in fiscal year 2019.

Despite a 7.6 million kilowatt-hour (nearly 6%) increase in electricity consumption from the target base year to fiscal year 2019, carbon intensity scope 2 electricity decreased by

19% from the target base year through the end of fiscal year 2019 and scope 2 electricity absolute emissions decreased by 10%. The increase in electricity consumption from the target base year to fiscal year 2019 can be explained by a nearly 11% (846,460 square feet) increase in total building space within the greenhouse gas emissions inventory organizational boundary.

This electricity emissions decrease is the most significant reason for 2025 goal carbon intensity decrease of 13% from the target base year to fiscal year 2019, and the 3% decrease in absolute emissions for the same time period.

This decline in electricity emissions is attributed to the update by the United States Environmental Protection Agency of electricity regional eGRID emissions factors as noted on page 9. This update caused emissions attributed to scope 2 electricity to decline, despite an increase in usage. The electricity emissions factors decreased by 15% from the target base year to fiscal year 2019, contributing significantly to the decrease

of electricity absolute emissions, electricity carbon intensity, and overall campus carbon intensity from the target base year to fiscal year 2019.

Also important to note is that the consumption of electricity per area (kilowatt hour per gross square feet) decreased almost 5% from the target base year when compared to fiscal year 2019 also contributing to the 19% reduction seen in scope 2 carbon intensity.

## Scope 1 On-Campus Stationary

On-campus stationary sources are the largest contributors to scope 1 greenhouse gas emissions and include natural gas and distillate fuel oil #2. As indicated in Figures 2.2 and 2.3, on-campus stationary sources were the second largest contributor to overall campus greenhouse gas emissions at 28% in fiscal year 2019. Since distillate fuel oil #2 contributes less than 1% of campus greenhouse gas emissions in fiscal year 2019, natural gas was 28% of overall campus emissions.

Despite a nearly 11% increase in natural gas consumption from the target base year to fiscal year 2019, carbon intensity attributed to scope 1 on-campus stationary sources declined 1% due to an increased efficiency on a per square foot basis. Like electricity, the increase in natural gas consumption from the target base year to fiscal year 2019 is partly attributed to an increase in total building space within the greenhouse gas emissions inventory organizational boundary. Additionally, fiscal year 2019 had 6% more heating degree days (more heating demand) than the target base year, making the 1% decline slightly better.

## Scope 1 Other

In addition to on-campus stationary sources, scope 1 includes direct transportation (UGo shuttles and University-owned fleet) at 1% of overall campus greenhouse gas emissions in fiscal year 2019, and agriculture (nitrogen in fertilizer) at less than 1% of overall campus greenhouse gas emissions in fiscal year 2019. Refer to Figures 2.2 and 2.3 for additional information.

# Results

## Scope 3

While scope 3 is not part of the 2025 goal, it is important to note the third largest contributor to overall campus greenhouse gas emissions in fiscal year 2019 was business air travel at 20%. Other sources of scope 3 emissions in fiscal year 2019 included solid landfilled waste (4%), transmission and distribution losses from scope 2 electricity (2%), study abroad travel (1%), and business automobile travel (1%). Total scope 3 emissions were 29% of overall campus greenhouse gas emissions in fiscal year 2019. Refer to Figures 2.2 and 2.3 for additional information.

## FY2018 to FY2019

While the 2025 goal is based on a comparison between the target base year (an average of emissions for fiscal years 2012, 2013, and 2014) and the current fiscal year being evaluated, it is interesting to compare the current fiscal year being evaluated (2019) with the previous fiscal year (2018).

Figure 2.1 shows annual carbon intensity from the target base year to FY2019. While the

carbon intensity has decreased annually from the target base year through fiscal year 2018, carbon intensity increased almost 2% from fiscal year 2018 to fiscal year 2019.

This increase in carbon intensity from fiscal year 2018 to fiscal year 2019 occurred because of an increase in electricity emissions from 8.3 kg eCO<sub>2</sub>/sqft in fiscal year 2018 to 8.5 kg eCO<sub>2</sub>/sqft in fiscal year 2019. The same electricity emissions factors were used for fiscal years 2018 and 2019 (eGRID2018, Table 2.2) but electricity consumption in kilowatt hours increased by 3% from fiscal years 2018 to 2019.

Natural gas consumption increased less than 1% from fiscal 2018 to fiscal year 2019 while fiscal year 2019 experienced 5% more heating degree days (more heating demand) than fiscal year 2018. When weather-dependent energy consumption data from fiscal years 2018 and 2019 (found to be natural gas) are weather normalized using the ratio-based method, there is a 6% decrease of natural gas consumption from fiscal year 2018 to fiscal year 2019.



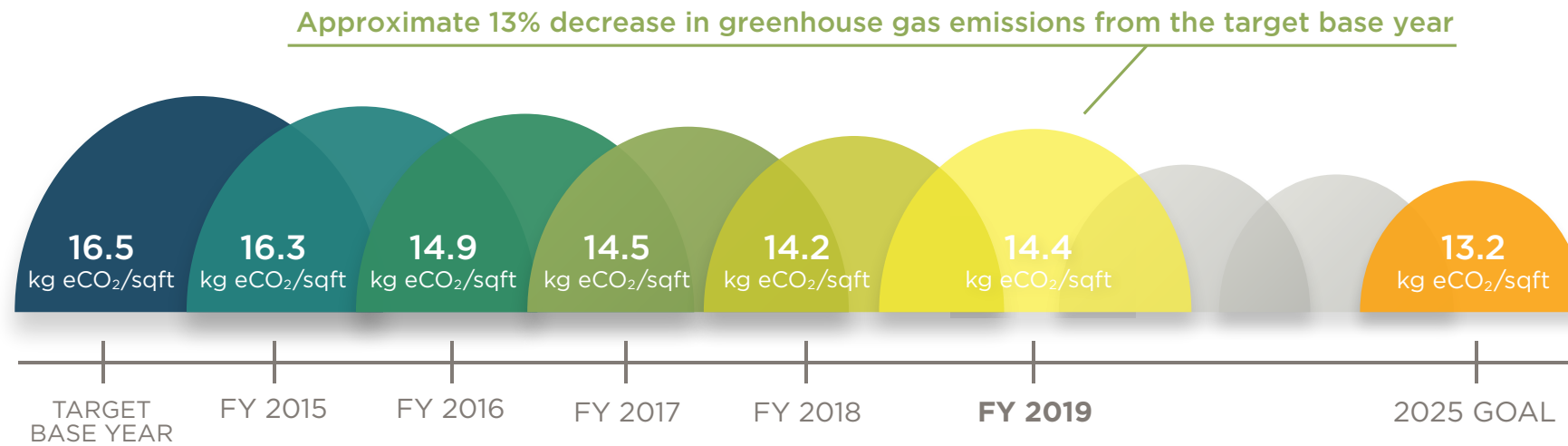
**John Crerar Library, LEED Gold for Commercial Interiors**  
Rendering Courtesy of Payette Associates, Inc.

# Results

**Figure 2.1: Scopes 1 and 2 Carbon Intensity (Greenhouse Gas Emissions Per Square Foot)**

## UNIVERSITY GREENHOUSE GAS EMISSIONS

Carbon intensity (greenhouse gas emissions per square foot) unit of measure is kilograms equivalent carbon dioxide per square foot (kg eCO<sub>2</sub>/sqft). The 2025 goal is based on scopes 1 and 2 carbon intensity.



**A NOTE ON TARGET BASE YEAR** The target base year is calculated and is the average of the greenhouse gas emissions from fiscal years 2012 through 2014. It is used for setting and tracking progress toward the Sustainability Plan greenhouse gas emissions reduction goal. For example, to assess performance for fiscal year 2019, the greenhouse gas emissions from fiscal year 2019 are compared to the greenhouse gas emissions from the target base year. This comparison reveals an approximate 13% decrease in greenhouse gas emissions. Greenhouse gas emissions for each subsequent year will be compared to the target base year, and performance will be assessed accordingly.

# Results

Figure 2.2: FY2019 Greenhouse Gas Emissions by Source

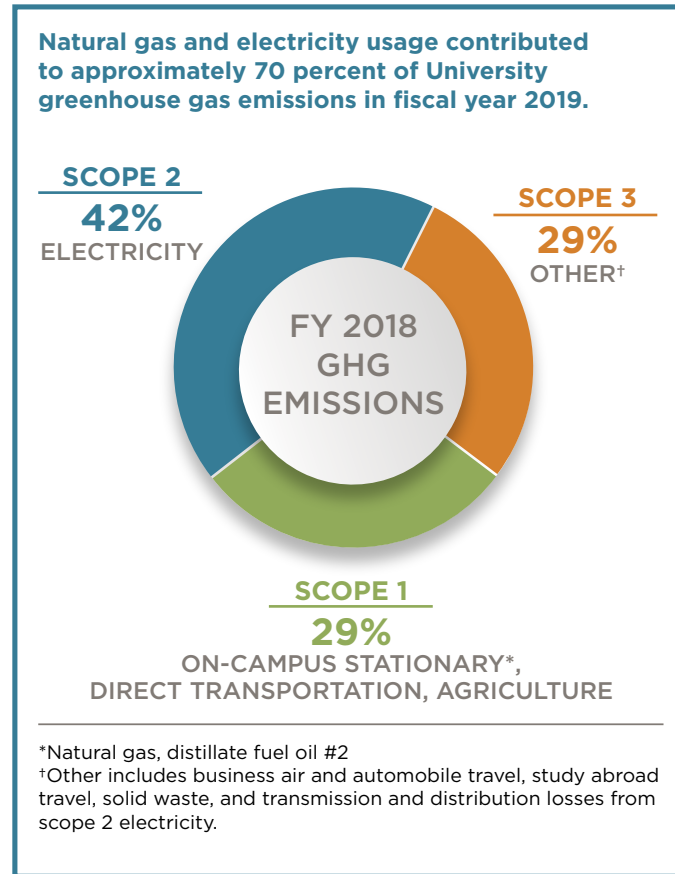
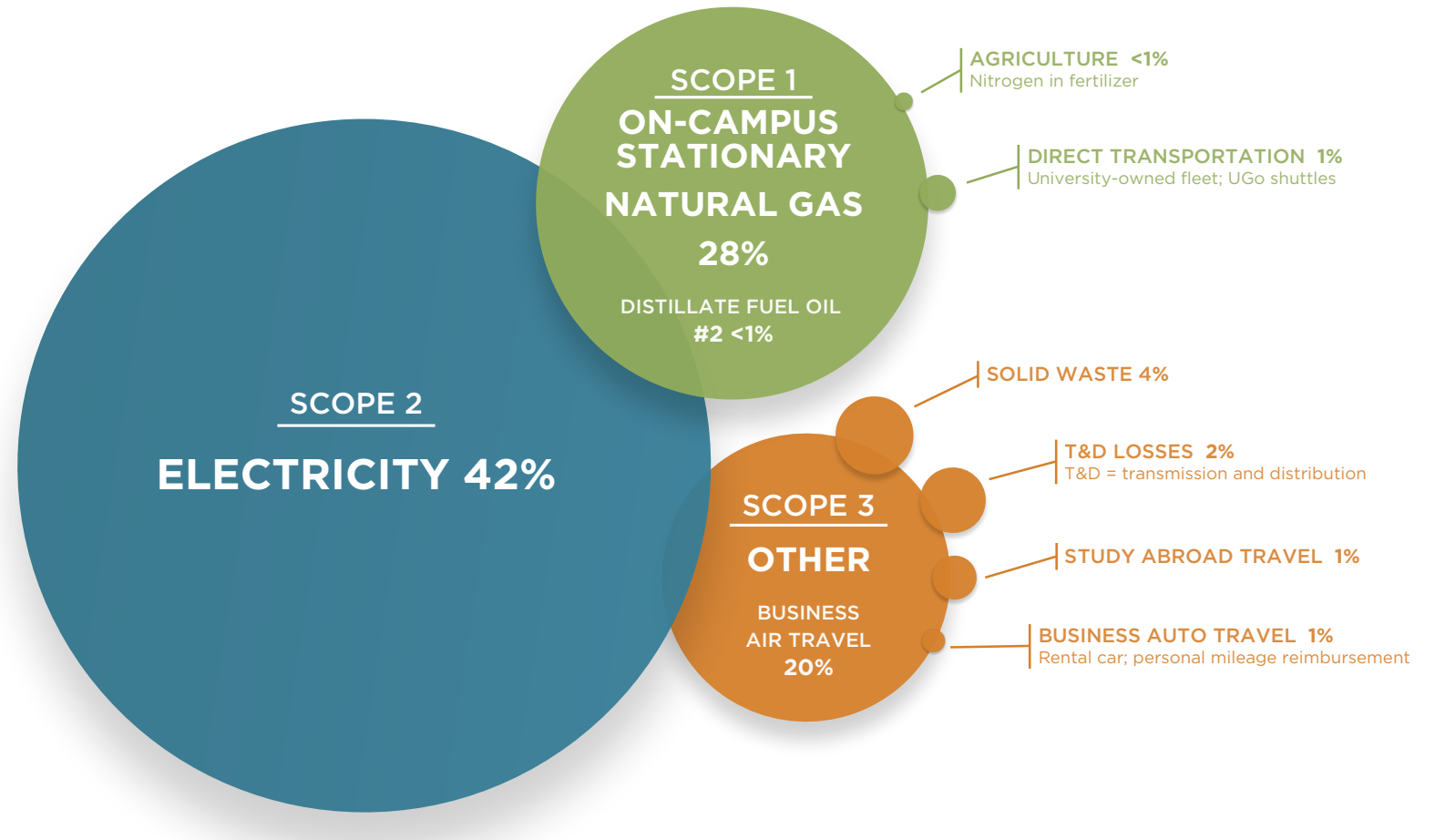


Figure 2.3: FY2019 Scopes 1, 2, and 3 Greenhouse Gas Emissions by Source



# Conclusion

Managing greenhouse gas emissions is a top priority for the University of Chicago and it allows for progress in multiple areas of the [Sustainability Plan](#).

In fiscal year 2019, the University completed six preventative maintenance and commissioning (PM + Cx) projects and started seven new PM + Cx projects to develop energy conservation measures (ECM) for completion in fiscal year 2020. The University completed an LED lighting retrofit of over 800 Poulsen lights throughout the campus landscape and kicked off LED lighting retrofits in three buildings. In total, the University implemented over 50 ECMs in fiscal year 2019. Refer to Appendix F.

The results of the UChicago 2012–2019 greenhouse gas emissions inventory indicate progress, but demonstrate the need for additional action, especially in area 2 of the Sustainability Plan, High Performance Buildings.

Since the 2025 goal is based on scopes 1 and 2 carbon intensity, and natural gas and electricity use in campus buildings contribute to approximately 70% of the University's greenhouse gas emissions, reducing electricity and natural gas consumption in campus buildings will make the biggest impact on reducing University greenhouse gas emissions.

Energy efficiency projects are currently underway and planned through 2025, as outlined in the [University of Chicago Greenhouse Gas Emissions Reduction Plan \(FY2018–FY2025\)](#).

Only by collaborating together as a campus community, will the 2025 goal be achieved. For ways to get involved, please visit [sustainability.uchicago.edu](https://sustainability.uchicago.edu).



Science Quadrangle  
Photo by Kate Joyce

Summary of Changes in Carbon Intensity and Absolute Emissions from Target Base Year to FY2019: Scopes 1 and 2

SCOPE 1					SCOPE 2
Other On-Campus Stationary <sup>1</sup>		Direct Transportation <sup>2</sup>	Agriculture <sup>3</sup>	Electricity	
<b>Carbon Intensity</b>					
	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]	
target base year	5.7	0.2	0.001	10.6	
FY2019	5.6	0.2	0.001	8.5	
<b>Absolute Emissions</b>					
	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	
target base year	44,799.4	1,826.1	11.8	82,768.0	
FY2019	49,020.0	2,109.4	8.2	74,085.5	

Fuel oil absolute greenhouse gas emissions decreased by 512.6 MT eCO<sub>2</sub> from the target base year to FY2019. This is in part because the target base year has high fuel oil usage in FY2014 when compared to a typical year. Between FY2018 and FY2019, fuel oil usage increased because of increased usage at the South Steam Plant boiler #2 in FY2019 (200 gallons in FY2018 and 4,100 gallons in FY2019) due to periodic testing.

The natural gas emissions factor change was negligible from the target base year to FY2019. There was a 4,733.3 MT eCO<sub>2</sub> increase in natural gas absolute greenhouse gas emissions from the target base year to FY2019. This increase is due to an increase of natural gas usage of nearly 11% from the target base year to FY2019. This increase is expected as new space goes online; from the target base year to FY2019, FICM gross area in the greenhouse gas emissions inventory increased by over 800,000 square feet.

Despite the increase in natural gas usage and absolute greenhouse gas emissions from the target base year to FY2019, the carbon intensity from fuel oil and natural gas combined still decreased by 1% during this same time. The natural gas usage on a per square foot basis in MMBtu per square feet has decreased slightly demonstrating a consistent efficiency.

The emissions factor for diesel fuel decreased by less than 1%. The 998.7 MT eCO<sub>2</sub> increase in diesel greenhouse gas emissions from the target base year to FY2019 is due to the UGo Shuttle transitioning from unleaded gasoline to a more diesel heavy fleet.

The emissions factor for unleaded fuel decreased by less than 1%. The 715.4 MT eCO<sub>2</sub> decrease in absolute gasoline emissions from unleaded fuel is due to the UGo Shuttle transitioning away from unleaded gasoline UGo Shuttles.

The carbon intensity from diesel fuel and unleaded fuel combined remained the same from the target base year to FY2019 while the absolute emissions increased as noted above.

Even with the increase of diesel fuel usage, direct transportation is still only 1% of University greenhouse gas emissions.

Synthetic fertilizer use in FY2019 was less than in the target base year. Fertilizer use fluctuates year to year, but the emissions from fertilizer are negligible. All fertilizer was assumed to be synthetic, even though some of the fertilizer is organic.

The electricity emissions factor decreased by 15%, contributing to the decrease of absolute electricity emissions and carbon intensity from the target base year to FY2019. Absolute emissions decreased by 8,682.5 MT eCO<sub>2</sub> from the target base year to FY2019. This decrease occurred even though the FY2019 electricity usage was 7.6 million kWh more than the target base year electricity usage. The electricity usage per area in kilowatt-hour per square feet declined nearly 5% from the target base year to fiscal year 2019, also contributing to the decrease of electricity carbon intensity. This demonstrates an increased electricity usage per square feet.

FOOTNOTES: <sup>1</sup>Natural gas and distillate fuel oil #2; <sup>2</sup>University-owned fleet and UGo shuttles; <sup>3</sup>Nitrogen in fertilizer

Summary of Changes in Carbon Intensity and Absolute Emissions from Target Base Year to FY2019: Scope3				
SCOPE 3				
	Directly Financed Air Travel	Other Directly Financed Travel <sup>4</sup>	Study Abroad Air Travel	Solid Waste
	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]	[kg eCO <sub>2</sub> /sqft]
target base year	3.3	0.2	0.3	1.0
FY2019	4.2	0.3	0.3	0.8
	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]
target base year	26,111.6	1,345.7	2,352.2	7,877.6
FY2019	36,123.1	2,241.5	2,470.1	7,058.6
	<p>The air travel emissions factor decreased by 5% from the target base year to fiscal year 2019. Absolute greenhouse gas emissions from directly financed air travel increased by 10,011.4 MT eCO<sub>2</sub> from the target base year to FY2019. It is a challenge to identify where the increase is coming from, since travel is overseen by each individual department at the University. A probable reason for the change could be the grand opening ceremonies of the new UChicago Francis and Rose Yuen Campus in Hong Kong, (November, 2018) followed by subsequent ongoing international travel to the campus.</p>	<p>For personal mileage reimbursement, the emissions factor decreased by less than 1%. The 12.3 MT eCO<sub>2</sub> increase from the target base year to FY2019 was impacted by the 34,914 increase in automobile mileage.</p> <p>The emissions factor for rental car mileage decreased by less than 1% from the target base year to FY2019. Activity increased by 2.5 million rental car miles, contributing to an increase of 883.5 MT eCO<sub>2</sub> absolute emissions from the target base year to FY2019.</p> <p>The increase in rental mileage and air mileage aligns with the idea that rental mileage is impacted by air mileage.</p>	<p>From the target base year to FY2019, the emissions factor for study abroad air travel decreased by 5%. The study abroad mileage increased by 547,000 miles from the target base year to FY2019, contributing to the 117.9 MT eCO<sub>2</sub> increase in absolute greenhouse gas emissions.</p>	<p>The emissions factor for solid waste has remained unchanged from the target base year to FY2019, thus the 819.0 MT eCO<sub>2</sub> decrease in absolute emissions from landfilled waste is all due to the 236 short ton decrease in landfilled waste produced.</p>
FOOTNOTES: <sup>4</sup> Rental car and personal mileage reimbursement				



Location-Based Method

ABSOLUTE EMISSIONS	INSTITUTIONAL	SCOPE 1			SCOPE 2	SCOPE 3					SCOPE 1	SCOPE 2	SCOPE 3	SCOPES 1+2	SCOPES 1+2+3
	Area	Other On-Campus Stationary <sup>1</sup>	Direct Transportation <sup>2</sup>	Agriculture <sup>3</sup>	Electricity	Directly Financed Air Travel	Other Directly Financed Travel <sup>4</sup>	Study Abroad Air Travel	Solid Waste	Scope 2 T&D Losses <sup>5</sup>	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	[sqft]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]	[MT eCO <sub>2</sub> ]
% Change Target Base Year to FY2019	NA	9.42%	15.51%	-30.58%	-10.49%	38.34%	66.57%	5.01%	-10.40%	-45.83%	9.65%	-10.49%	15.63%	-3.23%	1.61%
Fiscal Year															
2012	7,984,412	41,574.0	1,685.1	22.1	83,437.3	22,916.3	1,169.9	2,379.7	8,105.1	8,424.0	43,281.3	83,437.3	42,994.9	126,718.5	169,713.5
2013	7,857,616	44,460.3	1,820.1	6.6	82,435.5	25,908.3	1,331.9	2,430.1	7,819.2	8,322.8	46,287.1	82,435.5	45,812.4	128,722.6	174,534.9
2014	7,674,162	48,363.7	1,973.1	6.8	82,431.3	29,510.2	1,535.2	2,246.7	7,708.6	4,311.1	50,343.6	82,431.3	45,311.8	132,774.9	178,086.7
2015	7,947,480	45,894.4	1,885.2	9.6	82,065.3	30,386.2	1,596.5	2,476.4	8,110.3	4,292.0	47,789.2	82,065.3	46,861.4	129,854.4	176,715.9
2016	8,383,298	45,270.8	1,744.6	6.3	78,145.9	29,391.7	1,027.8	2,002.9	6,464.9	3,673.7	47,021.7	78,145.9	42,561.0	125,167.6	167,728.6
2017	8,631,963	44,053.2	1,943.6	6.2	79,342.9	29,266.6	1,066.2	2,243.3	6,541.2	3,730.0	46,003.0	79,342.9	42,847.3	125,345.8	168,193.1
2018	8,684,797	48,841.4	2,306.6	8.3	71,964.4	31,044.1	1,459.0	2,429.4	6,763.5	3,693.6	51,156.3	71,964.4	45,389.6	123,120.8	168,510.3
2019	8,685,190	49,020.0	2,109.4	8.2	74,085.5	36,123.1	2,241.5	2,470.1	7,058.6	3,802.5	51,137.7	74,085.5	51,695.7	125,223.2	176,918.9
target base year emissions	NA	44,799.4	1,826.1	11.8	82,768.0	26,111.6	1,345.7	2,352.2	7,877.6	7,019.3	46,637.3	82,768.0	44,706.4	129,405.3	174,111.7
FY2019 % of total	NA	27.71%	1.19%	0.00%	41.88%	20.42%	1.27%	1.40%	3.99%	2.15%	28.90%	41.88%	29.22%	70.78%	100.00%
FY2019 rank	NA	2	8	9	1	3	7	6	4	5					

CARBON INTENSITY (EMISSIONS/SQFT)	INSTITUTIONAL	SCOPE 1			SCOPE 2	SCOPE 3					SCOPE 1	SCOPE 2	SCOPE 3	SCOPES 1+2	SCOPES 1+2+3
	Area	Other On-Campus Stationary <sup>1</sup>	Direct Transportation <sup>2</sup>	Agriculture <sup>3</sup>	Electricity	Directly Financed Air Travel	Other Directly Financed Travel <sup>4</sup>	Study Abroad Air Travel	Solid Waste	Scope 2 T&D Losses <sup>5</sup>	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	[sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]	[kg eCO <sub>2</sub> / sqft]
% Change Target Base Year to FY2019	NA	-1.37%	4.12%	-36.86%	-19.23%	24.62%	50.02%	-5.21%	-19.13%	-50.92%	-1.16%	-19.23%	4.30%	-12.71%	-8.34%
Fiscal Year															
2012	7,984,412	5.2	0.2	0.003	10.5	2.9	0.1	0.3	1.0	1.1	5.4	10.5	5.4	15.9	21.3
2013	7,857,616	5.7	0.2	0.001	10.5	3.3	0.2	0.3	1.0	1.1	5.9	10.5	5.8	16.4	22.2
2014	7,674,162	6.3	0.3	0.001	10.7	3.8	0.2	0.3	1.0	0.6	6.6	10.7	5.9	17.3	23.2
2015	7,947,480	5.8	0.2	0.001	10.3	3.8	0.2	0.3	1.0	0.5	6.0	10.3	5.9	16.3	22.2
2016	8,383,298	5.4	0.2	0.001	9.3	3.5	0.1	0.2	0.8	0.4	5.6	9.3	5.1	14.9	20.0
2017	8,631,963	5.1	0.2	0.001	9.2	3.4	0.1	0.3	0.8	0.4	5.3	9.2	5.0	14.5	19.5
2018	8,684,797	5.6	0.3	0.001	8.3	3.6	0.2	0.3	0.8	0.4	5.9	8.3	5.2	14.2	19.4
2019	8,685,190	5.6	0.2	0.001	8.5	4.2	0.3	0.3	0.8	0.4	5.9	8.5	6.0	14.4	20.4
target base year emissions	NA	5.7	0.2	0.001	10.6	3.3	0.2	0.3	1.0	0.9	6.0	10.6	5.7	16.5	22.2
FY2019 % of total	NA	27.71%	1.19%	0.00%	41.88%	20.42%	1.27%	1.40%	3.99%	2.15%	28.90%	41.88%	29.22%	70.78%	100.00%
FY2019 rank	NA	2	8	9	1	3	7	6	4	5					

FOOTNOTES  
<sup>1</sup>natural gas; distillate fuel oil #2  
<sup>2</sup>University-owned fleet; UGo shuttles  
<sup>3</sup>Nitrogen in fertilizer  
<sup>4</sup>Rental car; personal mileage reimbursement  
<sup>5</sup>T&D = transmission & distribution

RANK		
1. Electricity	41.88%	
2. Other on-campus stationary <sup>1</sup>	27.71%	top 3
3. Directly financed air travel	20.42%	
4. Solid Waste	3.99%	middle
5. Scope 2 transmission & distribution losses <sup>5</sup>	2.15%	
6. Study abroad air travel	1.40%	
7. Other directly financed travel <sup>4</sup>	1.27%	<2%
8. Direct transportation <sup>2</sup>	1.19%	
9. Agriculture <sup>3</sup>	0.00%	

$$target\ base\ year = \frac{\left(\frac{FY2012\ emissions}{sqft}\right) + \left(\frac{FY2013\ emissions}{sqft}\right) + \left(\frac{FY2014\ emissions}{sqft}\right)}{3}$$

# Appendix C

# Greenhouse Gas Emissions Inventory Organizational Boundary FY2012–FY2019

Property Code	Property Name	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
A06	John Crerar Library								
A07	Kersten Physics Teaching Center								
A08	Hinds Laboratory								
A12	Ingleside Hall			demolished					
A13	Bookstore								
A86	Gordon Center for Integrative Science <sup>1</sup>								
B01	Michelson Center for Physics					renovation	renovation		
B02	High Energy Physics								
B03	Accelerator Building								
B04	Astronomy and Astrophysics Center		demolished						
B06	Low Temperature Laboratory	demolished							
B07	Research Institutes		demolished						
B08	Biopsychological Research Building								
B34	Stagg Field Building								
B65	William Eckhardt Research Center					new const.			
B78	Ratner Athletics Center								
B113	West Campus Combined Utility Plant								
C01	Pierce Hall			demolished					
C02	Henry Crown Field House								
C03	Regenstein Library								
C04	Bartlett Commons								
C05	Young Memorial Building								
C13	Smart Museum of Art								
C14	Cochrane-Woods Art Center								
C15	Court Theatre								
C25	Joe and Rika Mansueto Library	new const.							
C26	Campus North Residential Commons						new const.		
C32	Max Palevsky Commons A/West								
C33	Max Palevsky Commons B/Center								
C34	Max Palevsky Commons C/East								
D01	Quadrangle Club								
D02	Mitchell Tower								
D03	Reynolds Clubhouse								
D04	Hutchinson Commons								
D05	Zoology Building								
D06	Anatomy Building								
D07	Hitchcock Hall								
D08	Snell Hall								
D09	Searle Chemistry Laboratory								
D10	Culver Hall								
D11	Erman Biology Center								

<sup>1</sup>Utilities and area (square footage) are adjusted to include portion of the building included in the organizational boundary (since the other portion of the property is occupied by the Medical Center).

# Appendix C

# Greenhouse Gas Emissions Inventory Organizational Boundary FY2012–FY2019

Property Code	Property Name	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
D12	Mandel Hall								
D13	5727 South University Avenue								
D14	5733 South University Avenue								
D16	Eckhart Hall								
D17	Ryerson Laboratory								
D18	Kent Chemical Laboratory								
D19	Jones Laboratory								
D20	Edward H. Levi Hall								
D21	Cobb Lecture Hall								
D22	Bond Chapel								
D23	Swift Hall								
D24	Rosenwald Hall								
D25	Walker Museum								
D26	Oriental Institute								
D29	Rockefeller Chapel								
D31	5855 South University Avenue								
D32	Beecher Hall								
D33	Green Hall								
D34	Kelly Hall								
D35	Foster Hall								
D36	Social Science Research Building								
D37	Stuart Hall								
D38	Harper Memorial Library								
D39	Haskell Hall								
D40	Wieboldt Hall								
D41	Classics Building								
D42	Goodspeed Hall								
D43	Gates Hall								
D44	Blake Hall								
D48	5737 South University Avenue						renovation		
D53	Pick Hall								
E05	Lillie House								
E06	Sunny Gymnasium								
E07	Belfield Hall								
E09	Ida Noyes Hall								
E10	Judd Hall								
E11	University High School								
E12	Blaine Hall								
E13	International House								
E20	Wilder House								
E21	Breckinridge House								

# Appendix C

# Greenhouse Gas Emissions Inventory Organizational Boundary FY2012–FY2019

**online** **offline** A building is online (area and utility data included in the greenhouse gas emissions calculations) if utility data is available for six months or more of the fiscal year.

Property Code	Property Name	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
E29	Middle School								
E30	Gordon Parks Arts Hall					new const.			
E41	Kovler Gymnasium								
E44	Charles M. Harper Center								
E55	Earl Shapiro Hall				new const.				
F02	Steam Plant Power Plant								
F08	Laboratory Service Building								
F12	1427 East 60th Street								
F15	South Campus Chiller Plant								
F16	Chicago Theological Seminary	new const.							
G01	1365 East 60th Street				inactive				
G02	Chapin Hall								
G03	Keller Center						renovation	renovation	renovation
G04	Mott Building						demolished		
H01	1155 East 60th Street								
H02	Laird Bell Law Quadrangle								
H03	Burton-Judson Courts								
H09	Renee Granville-Grossman Residential Commons								
H10	Arley D. Cathey Dining Commons								
I01	Social Service Administration								
I02	Midway Studios								
I03	6011-27 South Ingleside Avenue								
I04	Edelstone Center								
I10	6022-24 South Drexel Avenue								
I13	950 East 61st Street								
I29	6054 South Drexel Avenue								
I30	Reva and David Logan Center for the Arts		new const.						
I33	Kiln								new const.
L29	Facilities Services					new const.			
N11	5608 South Stony Island Blvd								
N12	Alumni House								
O11	Neubauer Collegium for Culture and Society					new const. <sup>2</sup>			
O16/D54	5710 South Woodlawn Avenue								
O20/D45	5720 South Woodlawn Avenue								
O24/D46	5730 South Woodlawn Avenue								
O28/D47	5736 South Woodlawn Avenue								
O30/D15	5740 South Woodlawn Avenue			renovation					
O31/E52	McGiffert Hall			renovation					
O32/D49	5750 South Woodlawn Avenue			renovation					
O33/E01	Robie House								
O36/D69	Saieh Hall for Economics		renovation	renovation					

<sup>2</sup>Adaptive reuse

## Acronyms and Chemical Formulas

Maroon text indicates UChicago-specific acronyms

BTU	British thermal unit
CH <sub>4</sub>	methane
CBECS	Commercial Buildings Energy Consumption Survey
CO <sub>2</sub>	carbon dioxide
CR	The Climate Registry
eCO <sub>2</sub>	equivalent CO <sub>2</sub>
EF	emissions factor
eGRID	emissions and generation resource integrated database
FICM	Facilities Inventory and Classification Manual
FS	Facilities Services
(FS) <sup>2</sup>	Facilities Services Facility Standards
FY	fiscal year
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt hour
MMBtu	1 MMBtu = 1x10 <sup>6</sup> Btu
MT	1 metric ton = 1,000 kg
(NF <sub>3</sub> ) <sup>3</sup>	nitrogen trifluoride
N <sub>2</sub> O	nitrous oxide
OS	Office of Sustainability
PFC	perfluorocarbons
SF <sub>6</sub>	sulfur hexafluoride
SP	Sustainability Plan

## Links

The University of Chicago  
[uchicago.edu](http://uchicago.edu)

Facilities Services  
[facilities.uchicago.edu](http://facilities.uchicago.edu)

Office of Sustainability  
[sustainability.uchicago.edu](http://sustainability.uchicago.edu)

Sustainability Plan  
[sustainability.uchicago.edu/sp](http://sustainability.uchicago.edu/sp)

Facilities Services Facility Standards (FS)<sup>2</sup>  
[facilities.uchicago.edu/about/partners/facilitiesstandards](http://facilities.uchicago.edu/about/partners/facilitiesstandards)

## Sources

Referenced Standards

*The Climate Registry General Reporting Protocol, Version 2.0 (2013)*  
*The Climate Registry General Reporting Protocol, Version 3.0 (2019)*

*The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) (2004)*

Global Warming Potentials  
[IPCC Fifth Assessment Report](http://www.ipcc.ch/publications_and_products/assessment/ipcc_wg1_tech_dr/AR4/WG1_Tech_Dr_Chapter_2.pdf)

Emissions Factors

[United States Environmental Protection Agency Emissions and Generation Resource Integrated Database \(eGRID\)](http://www.epa.gov/eGRID)

- The eGRID sub-region symbol is RFCW.
- The eGRID region name is RFC West.

Calculation Tool

[Sustainability Indicator Management and Analysis Platform \(SIMAP™\)](http://www.simap.com)

Area (square footage)

[Facilities Inventory and Classification Manual \(FICM\)](http://www.ficm.org)

Climate Zone

Chicago is in CBECS climate zone 2.

[United States Climate Zones for 2003 CBECS](http://www.epa.gov/eGRID)

- Verifiable and reliable data is used to the best of its availability during the current reporting period. Decisions are made with the best information available during the reporting period, and on the side of over reporting. Greenhouse gas emissions inventories are dynamic. When new data, information, emissions factors, and/or global warming potentials become available that were not available during the reporting period, they are incorporated in the next reporting period, as appropriate.
- Referenced standards: *The Climate Registry General Reporting Protocol, Version 2.0 (2013)*, *The Climate Registry General Reporting Protocol, Version 3.0 (2019)*, and *The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) (2004)*.
- The greenhouse gas emissions inventory includes the University of Chicago Hyde Park campus, excluding the Medical Campus.
- The greenhouse gas emissions are calculated using the operational control approach and the location-based method.
- Goal: Reduce greenhouse gas emissions by 20% by 2025 for scopes 1 and 2 carbon intensity.
- Target base year: 2012–2014 average emissions.
- Scopes; Scope 1: Natural Gas, Distillate Fuel Oil #2, Unleaded Fuel (University-Owned Fleet and UGo Shuttles), Diesel Fuel (University-Owned Fleet and UGo Shuttles), Fertilizer, Nitrogen; Scope 2: Purchased Electricity; Scope 3 (included in reporting, not included in 2025 goal): Business Travel (Air, Automobile), Study Abroad Travel (Air), Landfilled Waste, Transmission and Distribution Losses from Scope 2 Electricity.
- Population includes students, faculty, staff, and the University of Chicago Laboratory School students.
- Each fiscal year's Autumn Quarter demographic data is used as the data point (i.e. for FY2017, Autumn Quarter 2016 data is used).
- Harper Court staff population is included, even though Harper Court (building) is not within the greenhouse gas emissions organizational boundary. The Harper Court staff population is included because occupants of Harper Court also inhabit campus, contribute to the waste, use the shuttles, water, and other resources on campus. Additionally, they participate in commuting to/from campus, and business travel. The Harper Court building is not included because it is not University owned and is not within the University's operational control.
- Guests and visitors are excluded from the population data.
- Biological Sciences Division population is excluded since BSD is also excluded from the physical campus scope of the inventory.
- Biological Sciences Division properties are excluded except where under Facilities Services operational control.
- Building areas are measured in gross square feet using Facilities Inventory and Classification Manual (FICM) areas.
- For new construction or demolished buildings: if a building is "online" (utility data is available for it) for 6 months or more ( $\geq 6$  mo) of the fiscal year, its area and utility data are included in the greenhouse gas emissions calculations.
- E44 Charles M. Harper Center is not within the operational control of Facilities Services but it is included in the greenhouse gas emissions inventory because it is contiguous to the rest of campus, a high profile professional school, and a campus partner.
- 100-year global warming potentials IPCC Fifth Assessment Report. United States Environmental Protection Agency Emissions and Generation Resource Integrated Database (eGRID) eGRID sub-region symbol RFCW, eGRID region name RFC West.
- Utility data is from utility billing.
- Steam data is adjusted to include the portion of steam serving the buildings in the organizational boundary.
- A86 Gordon Center for Integrative Science: utilities and area (sqft) are adjusted to include the portion of the building included in the organizational boundary since the other portion of the building is occupied by the medical campus. 100% of fuel oil is included in the inventory as it is used for required testing of the emergency generators and the generators are operated by Facilities Services.
- Fuel oil for buildings on the medical campus is excluded from the inventory.
- Fuel oil is zero for some fiscal years.
- University-owned fleet data tracked and reported is only what is included in the IT Services database (fuel that was filled up on campus at the Fuel Depot). If fuel was filled up off campus, it is not tracked and reported.
- Data includes fuel used for all University-owned fleet such as Facilities Services, the Library, IT Services, the Press Building, the University of Chicago Booth School of Business, UCPD (starting in FY2017), etcetera. It excludes the medical center fleet.
- The UCPD fleet does not have any vehicles that use diesel fuel. The UCPD fleet is University owned.
- UGo Daytime and UGo Nightride shuttles: Since the lease between UChicago and the shuttle vendor is an operating lease, and the consolidation method is operational control, the gallons of fuel usage from the UGo Shuttles are included in scope 1 of the greenhouse gas emissions inventory calculations.
- This report excludes fugitive emissions from refrigerants and other chemicals.
- The air travel data is all employee (anyone on the University payroll) air travel from expense reporting.
- A portion of the faculty/staff air travel data contains student air travel. This occurs when the employee (anyone on University payroll) purchases the travel on behalf of the student.
- Conversion factors for USD (\$) to miles of international and domestic air travel were used from [Airlines for America](#), except for fiscal year 2015, which was extrapolated from previous years since Airlines for America did not have any 2015 conversion rates listed. Note: Airlines for America no longer reporting on the passenger yield data point that is necessary to convert air travel dollars to miles. In the absence of this data, the last available year's data (FY2017) is used for FY2018.
- The rental car data is partial data as it reflects only what is booked through the University's preferred contracts.
- For personal mileage reimbursement, the data is only for employees (anyone on University payroll).
- Assumed all study abroad travel originated from Chicago O'Hare International Airport per student participating in the program.
- Landfilled waste: Data includes all buildings included in the greenhouse gas emissions organizational boundary, as well as many residential properties not within the organizational boundary (which contribute a small portion of the total data). Data excludes Harper Court, Gleacher Center, or any leased space. Data excludes construction waste. New waste hauler arrived on campus in 2016.

In fiscal year 2019, the University completed six preventative maintenance and commissioning (PM + Cx) projects and started seven new PM + Cx projects to develop energy conservation measures (ECM) for completion in fiscal year 2020. The University completed an LED lighting retrofit of over 800 Poulsen lights throughout the campus landscape and kicked off LED lighting retrofits in three buildings. In total, the University implemented over 50 ECMs in fiscal year 2019.

## Projects completed in Fiscal Year 2019

- Central plant cooling tower optimization
- Central plant free cooling optimization
- Laird Bell Law Quadrangle (Phase 1)
- Pick Hall (Phase 1)
- Joe and Rika Mansueto Library (Phase 1)
- Ratner Athletics Center (Phase 1)
- Reva and David Logan Center for the Arts (Phase 1)
- Kent air handling unit 3
- Searle Chemistry Laboratory (Phase 1)
- Poulsen LED retrofits

## Projects started in Fiscal Year 2019

- Anatomy Building (Phase 1)
- Gordon Center for Integrative Science (Phase 1)
- Hinds Laboratory (Phase 1)
- Chapin Hall (Phase 1)
- 1427 East 60th Street (Phase 1)
- Saieh Hall for Economics (Phase 1)
- Max Palevsky Commons (Phase 1)
- Bartlett Commons LED Lighting Upgrades
- Ratner Athletics Center LED Lighting Upgrades
- Hinds Laboratory LED Lighting Upgrades

THE UNIVERSITY OF CHICAGO

# Greenhouse Gas Emissions Inventory Report 2012–2019

January 2021

[sustainability.uchicago.edu](https://sustainability.uchicago.edu)

## ACKNOWLEDGMENTS

Collecting the data required for the University of Chicago greenhouse gas emissions inventory for fiscal years 2009 through 2019 was a collaborative effort, involving contributions from many University departments and individuals. The Office of Sustainability offers a sincere thank you to everyone who contributed.

## PROJECT TEAM

**Sara Popenhagen, sustainability manager**  
Brian Bozell, energy and utilities manager  
James Cook, space information manager  
James Novack, data analyst  
Nathan Bartlett, graphic artist (pp. 12–13)

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