

THE UNIVERSITY OF CHICAGO

Greenhouse Gas Emissions Inventory Report

FY2012–FY2021

December 2021



THE UNIVERSITY OF
CHICAGO

Office of
Sustainability

Contents

Executive Summary	3
Reporting and Methodology	4
Results	7
Appendix A: Greenhouse Gas Emissions Inventory Analysis FY2012-FY2021	12
Appendix B: Greenhouse Gas Emissions Inventory Organizational Boundary FY2012-FY2021	13
Appendix C: Additional Resources	19
Appendix D: Assumptions	20
Acknowledgments	21

Executive Summary

The University of Chicago Greenhouse Gas Emissions Inventory Report 2012–2021 includes the University’s current greenhouse gas emissions inventory. This inventory has been updated from the 2015, 2016, 2018, 2019, and 2020 releases. For additional information, please refer to prior [reporting](#).

Scopes 1 and 2 absolute greenhouse gas emissions declined 10% from the target base year to fiscal year 2021.

The COVID-19 global pandemic, electricity emissions factors, and offsets had the most significant impact on the reduction of greenhouse gas emissions from the target base year to fiscal year 2021. Refer to [Appendix A](#) for the full inventory.



Reporting and Methodology

TARGET BASE YEAR

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

2030 GOAL

The University has a goal to reduce its absolute greenhouse gas emissions by 50% by 2030. The 2030 goal is based on scope 1 and scope 2 absolute greenhouse gas emissions and is analyzed by comparing 2030 greenhouse gas emissions to the target base year greenhouse gas emissions.

TEMPORAL BOUNDARY

The temporal boundary is fiscal years 2012 through 2021.

ORGANIZATIONAL BOUNDARY

The greenhouse gas emissions inventory includes the University of Chicago Hyde Park campus, excluding the medical campus. The operational control approach was used to define the organizational boundary. 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. Refer to [Appendix B](#).

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 1.1. The following greenhouse gases are tracked and reported: CO₂ (carbon dioxide), CH₄ (methane), and N₂O

(nitrous oxide). 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: SF₆ (sulfur hexafluoride) and (NF₃)³ (nitrogen trifluoride).

SCOPE 3 EMISSIONS

Emissions from scope 3, as applicable to the University of Chicago, are tracked and reported, although they are not part of the 2030 goal. Scope 3 emissions are optional reporting.

GLOBAL WARMING POTENTIALS

The global warming potentials from the Intergovernmental Panel on Climate Change were updated to the Sixth Assessment Report and were applied to this inventory for fiscal years 2012 through 2021. Refer to Table 1.2.

EMISSIONS FACTORS

Emissions factors are provided by the U.S. EPA. Emissions factors for electricity are U.S. EPA regional eGRID emissions factors. Table 1.3 contains a summary of absolute greenhouse gas emissions, global warming potentials, and U.S. EPA regional eGRID emissions factors versions 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 emissions factors are updated, they are applied retroactively, where applicable, making the greenhouse gas emissions inventory dynamic. To demonstrate this point, Table 1.3 summarizes the emissions factors used for scope 2 electricity for the most recent six reporting periods.

CALCULATION TOOL

The greenhouse gas emissions were quantified using an internally developed calculation tool that connects with University systems of record and automates the calculation and visualization of greenhouse gas emissions.

REFERENCED STANDARDS

The inventory was completed according to widely accepted referenced standards, including *The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* (2004), *The GHG Protocol Scope 2 Guidance*, *The Climate Registry General Reporting Protocol, Version 2.0* (2013), and *The Climate Registry General Reporting Protocol, Version 3.0* (2019).

UNITS OF MEASURE

Absolute greenhouse gas emissions are reported in units of metric tons equivalent carbon dioxide per fiscal year [MT eCO₂/FY]

Where:

eCO₂ = equivalent carbon dioxide

FY = fiscal year

MT = 1 metric ton = 1,000 kilograms

Reporting and Methodology

APPROACH

The operational control approach from the *The World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* (2004) was used to define the organizational boundary.

The location-based method of calculation outlined in *The GHG Protocol Scope 2 Guidance* was used to calculate emissions from scope 2 electricity.

Emissions from carbon dioxide, methane, and nitrous oxide are calculated by taking the amount of 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 eCO₂]. By converting all emissions into the same unit, MT eCO₂, the contribution of emissions sources can be more easily aggregated and compared. This also enables comparison between organizations.

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 (CH₄) has the same impact on climate change as emitting 29.8 metric tons of carbon dioxide (CO₂).

Table 1.1: Data Compiled for the Greenhouse Gas Emissions Inventory	
Institutional	Unit of Measure
Student, Faculty, and Staff Population	[count/FY]
FICM Gross Area	[sqft/FY]
Scope 1: Direct Emissions (mandatory reporting)	Unit of Measure
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*	[pounds/FY]
Fertilizer, Nitrogen	[pounds N/FY]
Scope 2: Indirect Emissions (mandatory reporting)	Unit of Measure
Electricity	[kWh/FY]
Scope 3: Other Indirect Emissions (optional reporting)	Unit of Measure
Business Travel (Air, Automobile)	[miles/FY]
Study Abroad Travel (Air)	[miles/FY]
Landfilled Waste	[short tons [†] /FY]
*Omitted from reporting. Expected to be a very small amount of overall University emissions. Reporting is anticipated when verifiable and reliable data is available.	
[†] 1 short ton = 2,000 pounds	

Table 1.2: 100-Year Global Warming Potentials		
Common Name	Chemical Formula	GWP
Carbon dioxide	CO ₂	1
Methane fossil	CH ₄	29.8
Methane non-fossil	CH ₄	27.2
Nitrous oxide	N ₂ O	273

Source: IPCC Sixth Assessment Report

Reporting and Methodology

Table 1.3: Absolute Greenhouse Gas Emissions in [MT eCO₂], Global Warming Potentials, and U.S. EPA Regional eGRID Emissions Factor Versions for Scope 2 Electricity by Reporting Period and Fiscal Year *Location-Based Method*

Fiscal Year	Reporting Period 6	Reporting Period 5	Reporting Period 4	Reporting Period 3	Reporting Period 2	Reporting Period 1*
	FY2012-FY2021 Inventory Report December 2021	FY2012-FY2020 Inventory Report July 2021	FY2012-FY2019 Inventory Report January 2021	FY2012-FY2018 Inventory Report October 2019	FY2012-FY2017 Inventory Report May 2018	FY2012-FY2015 Sustainability Plan November 2016
	GWP AR6	GWP AR5	GWP AR5	GWP AR4	GWP AR4	GWP AR4
	Scopes 1 and 2 [MT eCO ₂]	Scopes 1 and 2 [MT eCO ₂]	Scopes 1 and 2 [MT eCO ₂]	Scopes 1 and 2 [MT eCO ₂]	Scopes 1 and 2 [MT eCO ₂]	Scopes 1, 2, and 3 [MT eCO ₂]
2012	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.
2013	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.	rel. 2015, eGRID2012, 10th ed.
2014	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	eGRID2014
2015	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	rel. 2017, eGRID2014, 11th ed.	eGRID2014
2016	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2017, eGRID2014, 11th ed.	NA
2017	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2018, eGRID2016, 12th ed.	rel. 2017, eGRID2014, 11th ed.	NA
2018	rel. 2020, eGRID2018, 13th ed.	rel. 2020, eGRID2018, 13th ed.	rel. 2020, eGRID2018, 13th ed.	rel. 2018, eGRID2016, 12th ed.	NA	NA
2019	rel. 2021, eGRID2019, 14th ed.§	rel. 2021, eGRID2019, 14th ed.§	rel. 2020, eGRID2018, 13th ed.	NA	NA	NA
2020	rel. 2021, eGRID2019, 14th ed.§	rel. 2021, eGRID2019, 14th ed.§	NA	NA	NA	NA
2021	rel. 2021, eGRID2019, 14th ed.§	NA	NA	NA	NA	NA

Global Warming Potential source:

[IPCC Fourth Assessment Report](#)
[IPCC Fifth Assessment Report](#)
 IPCC Sixth 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 regional eGRID emissions factors were released on 23 February 2021, are called eGRID2019, are from 2019 data, and are the fourteenth edition.

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

U.S. EPA emissions factors can change for two reasons:

- Lag time in data sets being released. It usually takes one to two years for data sets to be released. For example, for electricity, eGRID2019, which includes 2019 data, was released on February 23, 2021. Regional emissions and generation resource integrated database (eGRID) release dates are available in the [U.S. EPA eGRID Questions and Answers/ What years are available for eGRID?](#) For a summary of what is new in eGRID2019, refer to the [United States Environmental Protection Agency](#). The [U.S. EPA eGRID Technical Guide](#) contains more detailed information.
- Updates to methodology. U.S. EPA factors can and do change due to methodology updates. For example, emissions factors for solid landfilled waste declined significantly from the 2019 reporting period to present. This is due to the availability of new and updated information. Refer to the [U.S. EPA Versions of the Waste Reduction Model \(WARM\)](#) for additional information. Version 15 is used in the current reporting period.

Results

Below is a discussion of the greenhouse gas emissions inventory shown in [Appendix A](#) and Figures 2.1, 2.2, 2.3, and 2.4.

OVERVIEW

Scopes 1 and 2 absolute greenhouse gas emissions declined 10% from the target base year to fiscal year 2021.

Greenhouse gas emissions from the target base year to fiscal year 2021 declined significantly due to several factors, including the COVID-19 global pandemic, electricity emissions factors, and Climate Vault offsets.

THE COVID-19 GLOBAL PANDEMIC

The pandemic had a significant impact on reducing University greenhouse gas emissions from the target base year to fiscal year 2021. Therefore, fiscal year 2021 emissions do not represent a typical year in the University's greenhouse gas emissions inventory.

Various factors impacted energy usage in campus buildings during fiscal year 2021. For example, during all 12 months of fiscal year 2021, internal loads in campus buildings, such as occupants, lighting, and plug loads, decreased from a typical year because the campus population decreased significantly as many employees were working from home and several classes were held remotely. Temperature and occupancy

setbacks continued in campus buildings where possible, for approximately two months of the fiscal year. Reduced internal loads and setbacks reduce the energy required to heat and cool spaces. However, as part of the COVID-19 mitigation strategies, outside air was increased for 10 months of the fiscal year, increasing the demand for energy required to heat and cool spaces.

Further, fuel usage for scope 1 University-owned fleet and UGo shuttles declined, causing scope 1 direct transportation emissions to decline by 5%.

The University's COVID-19 travel and financial policies for staff limited domestic and international air travel for business needs and for study abroad programs. Therefore emissions from scope 3 business air travel declined by 97%, ground transport emissions declined by 8%, and study abroad air travel emissions declined by 92%. With the increased use of technology, business air travel emissions have a potential to remain lower than pre-pandemic levels, as some employees may opt to attend virtual conferences and events.

In fact, scope 3 emissions decreased in all areas except solid waste. Solid landfilled waste absolute emissions increased by 1%, likely attributed to the increase of disposables required in campus dining halls to be in compliance with COVID-19 safety protocols.

ELECTRICITY EMISSIONS FACTORS

Electricity usage increased 16% from the target base year to fiscal year 2021 but electricity emissions decreased 11%. An increase in electricity usage can be explained by a 15% increase in the organizational boundary FICM gross area in

the same time period. Emissions decreased while usage increased due to U.S. EPA regional eGRID emissions factors as a result of the electrical grid transition to lower and zero carbon emissions.

CLIMATE VAULT OFFSETS

The University of Chicago offset 10,000 MT eCO₂ through a partnership with [Climate Vault](#). These 10,000 metric tons of carbon allowance permits were acquired and vaulted on the RGGI cap-and-trade market. Climate Vault's award-winning solution provides immediate, affordable, verifiable, and quantifiable carbon reductions, as well as fostering innovation in carbon removal technologies. Climate Vault purchases carbon permits from multiple cap-and-trade compliance markets and vaults them so emitters cannot use them. Because the number of permits is capped, this decreases the amount of global carbon dioxide pollution allowed by government regulators. As shown in [Appendix A](#), without these offsets, scopes 1 and 2 absolute greenhouse gas emissions would have declined by 2% (instead of 10%) from the target base year to fiscal year 2021.

Results

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 Figure 2.4, on-campus stationary sources were the second largest contributor to overall campus greenhouse gas emissions at 37% in fiscal year 2021. Distillate fuel oil #2 emissions are negligible when compared to natural gas emissions in fiscal year 2021.

Natural gas usage increased by 12% and emissions by 13% from the target base year to fiscal year 2021. This is attributed to an increase in the organizational boundary FICM gross area of 15% as mentioned previously. Despite this increase, overall scope 1 and 2 emissions still decreased due to the factors discussed above.

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, and agriculture (nitrogen in fertilizer) at less than 1% of overall campus greenhouse gas emissions. Refer to Figure 2.4 for additional information.

SCOPE 2 ELECTRICITY

As indicated in Figures 2.2, 2.3, and 2.4, electricity is the largest contributor to campus greenhouse gas emissions and was 55% of overall campus emissions in fiscal year 2021.

From the target base year to fiscal year 2021, emissions due to scope 2 electricity declined by 11% while electricity usage increased by 16%. Usage increased due to the increase in FICM gross area in the organizational boundary as previously discussed. Emissions declined while usage went up because of U.S. EPA the regional eGRID emissions factors as noted above.

SCOPE 3

While scope 3 is not part of the 2030 goal, it is important to note the third largest contributor to overall campus greenhouse gas emissions is typically business air travel. However, due to COVID-19 as discussed above, fiscal year 2021 is not a typical year. Business air travel only contributed to less than 1% of campus emissions in fiscal year 2021 while it is typically 20%.

The third largest contributor to greenhouse gas emissions in fiscal year 2021 was transmission and distribution losses from scope 2 electricity at 3%. When added with scope 2 electricity emissions, emissions from electricity are 58% of campus emissions.

Other sources of scope 3 emissions in fiscal year 2021 included solid landfilled waste (2%), study abroad travel (almost zero), and business automobile travel (1%).

Total scope 3 emissions were 7% of overall campus greenhouse gas emissions in fiscal year 2021. In a typical year, scope 3 emissions are 30% of campus emissions. This decline is expected due to the COVID-19 pandemic as previously discussed. Refer to Figures 2.3 and 2.4 for additional information.

Results

Figure 2.1: Results Overview for Scopes 1, 2, and 3 Absolute Greenhouse Gas Emissions by Source, Scope, and Fiscal Year [MT eCO₂]

Location-Based Method

	Scope 1 [MTCDE]			Scope 2 [MTCDE]	Scope 3 [MTCDE]				
	Other On-Campus Stationary	Direct Transportation	Agriculture	Electricity	Directly Financed Outsourced Travel Air	Other Directly Financed Travel	Study Abroad Travel Air	Solid waste	T&D losses
2012	41,875.7	1,685.9	22.8	84,360.6	22,918.8	1,170.4	2,380.0	3,276.4	8,517.2
2013	44,982.1	1,820.9	6.8	83,797.5	25,911.2	1,332.6	2,430.4	3,160.8	8,460.3
2014	49,005.0	1,974.0	7.0	84,595.2	29,513.5	1,536.1	2,246.9	3,067.8	4,424.3
2015	45,769.8	1,962.7	9.9	81,477.5	30,389.6	1,597.2	2,476.7	3,227.7	4,261.2
2016	47,355.0	1,745.4	6.5	88,077.1	29,936.0	1,028.2	2,040.0	2,573.3	4,140.6
2017	62,161.8	1,944.2	6.4	91,365.0	29,347.5	1,066.6	2,249.5	2,603.8	4,295.1
2018	51,954.4	2,307.2	8.6	86,637.2	31,000.8	1,459.6	2,426.0	2,691.7	4,446.7
2019	52,866.7	2,109.2	8.5	82,350.2	36,072.7	2,241.4	2,466.6	2,809.7	4,226.7
2020	51,726.9	1,919.0	7.1	78,249.5	29,134.9	1,270.1	2,177.2	2,986.7	4,016.2
2021	51,232.7	1,744.3	2.0	75,428.5	872.6	1,234.8	181.6	3,205.9	3,871.4

NOTES

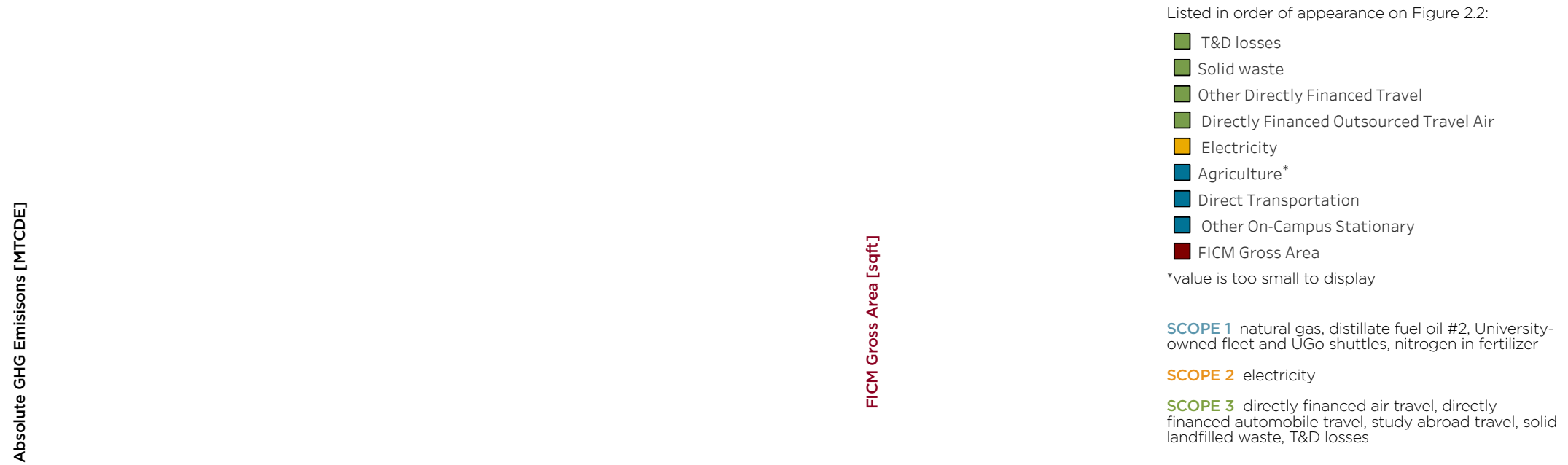
- Verifiable and reliable data is used to the best of its availability during the current reporting period. Decisions are made with the best information available during the reporting period, and on the side of over reporting. Greenhouse gas emissions inventories are dynamic. When new data, information, 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 World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)* (2004), *The GHG Protocol Scope 2 Guidance*, *The Climate Registry General Reporting Protocol, Version 2.0* (2013), and *The Climate Registry General Reporting Protocol, Version 3.0* (2019).
- The greenhouse gas emissions are calculated using the operational control approach and the location-based method and an internal tool.
- The greenhouse gas emissions inventory includes the University of Chicago Hyde Park campus, excluding the medical campus.
- Goal: Reduce absolute greenhouse gas emissions by 50% by 2030 for scopes 1 and 2.
- Target base year: the average of emissions from fiscal years 2012, 2013, and 2014.

Appendix A contains a full inventory.

Results

Figure 2.2: Scopes 1, 2, and 3 Absolute Greenhouse Gas Emissions by Source, Scope, and Fiscal Year [MT eCO₂]

Location-Based Method

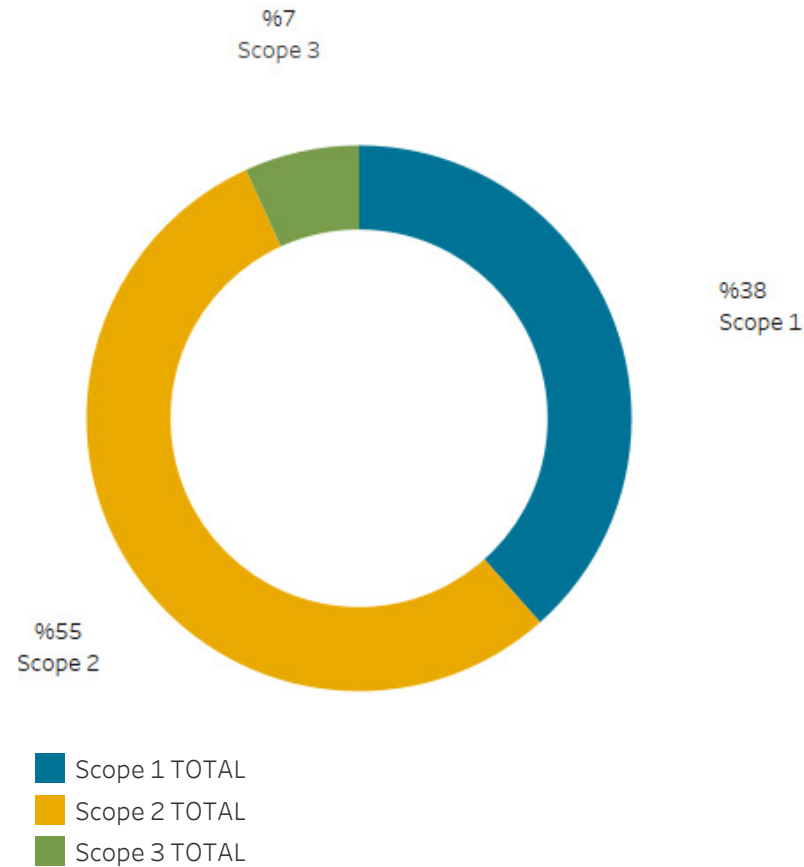


Results

FY2021 Scopes 1, 2, and 3 Absolute Greenhouse Gas Emissions by Source, Scope, and Fiscal Year [Percent]

Location-Based Method

Figure 2.3

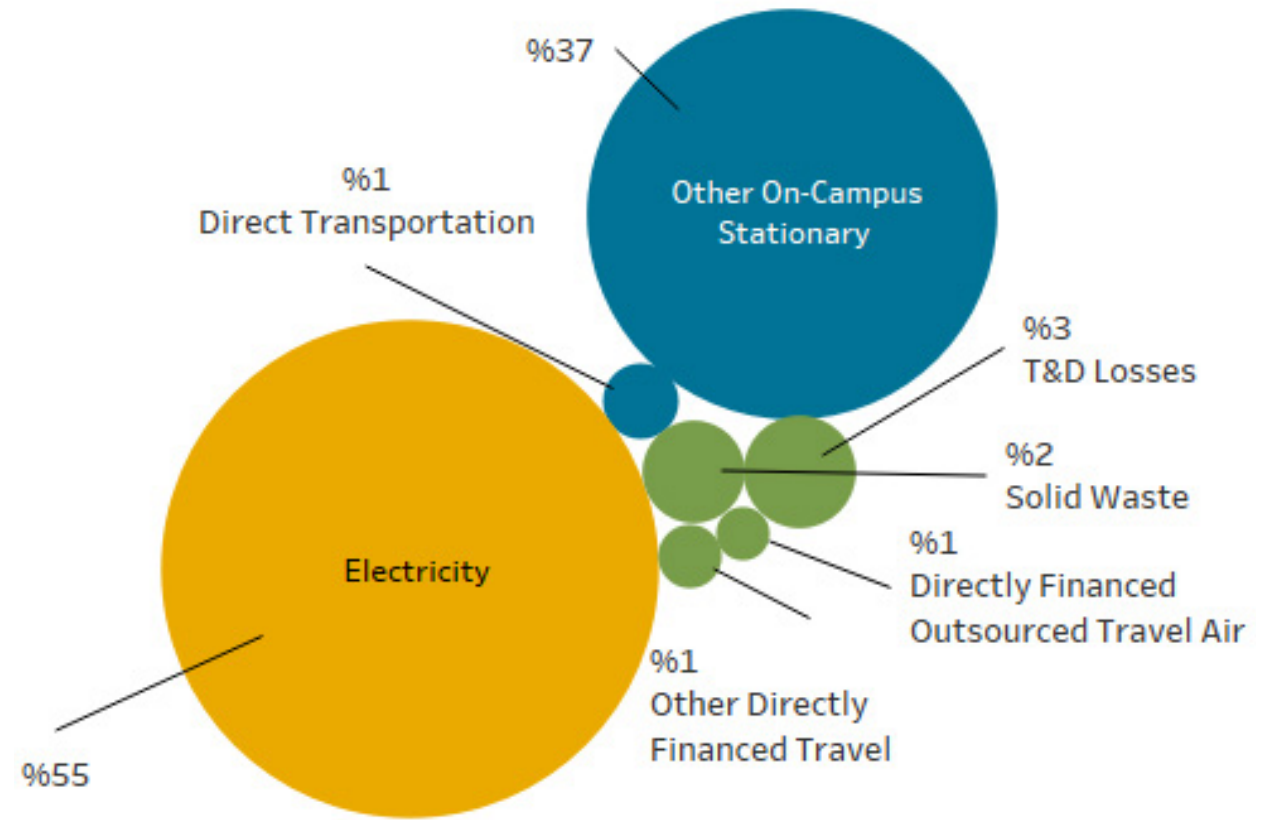


SCOPE 1 natural gas, distillate fuel oil #2, University-owned fleet and UGo shuttles, nitrogen in fertilizer

SCOPE 2 electricity

SCOPE 3 directly financed air travel, directly financed automobile travel, study abroad travel, solid landfilled waste, T&D losses

Figure 2.4



- T&D losses
- Solid waste
- Other Directly Financed Travel
- Directly Financed Outsourced Travel Air
- Electricity
- Agriculture
- Direct Transportation
- Other On-Campus Stationary

SCOPE 1 natural gas, distillate fuel oil #2, University-owned fleet and UGo shuttles, nitrogen in fertilizer*

SCOPE 2 electricity

SCOPE 3 directly financed air travel, directly financed automobile travel, study abroad travel*, solid landfilled waste, T&D losses

*these values are too small to visualize on the chart for FY2021

ABSOLUTE EMISSIONS	INSTITUTIONAL	SCOPE 1			SCOPE 2	SCOPE 3					Offsets	SCOPE 1	SCOPE 2	SCOPE 3	SCOPES 1+2	SCOPES 1+2 LESS OFFSETS	SCOPES 1+2+3
	Area	Other On-Campus Stationary ¹	Direct Transportation ²	Agriculture ³	Electricity	Directly Financed Air Travel	Other Directly Financed Travel ⁴	Study Abroad Air Travel	Solid Waste	Scope 2 T&D Losses ⁵		TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	[sqft]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]		[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]	[MT eCO ₂]
Fiscal Year																	
2012	8,090,775	41,875.7	1,685.9	22.8	84,360.6	22,918.8	1,170.4	2,380.0	3,276.4	8,517.2	0.0	43,584.3	84,360.6	38,262.7	127,944.9	127,944.9	166,207.6
2013	7,963,980	44,982.1	1,820.9	6.8	83,797.5	25,911.2	1,332.6	2,430.4	3,160.8	8,460.3	0.0	46,809.9	83,797.5	41,295.3	130,607.4	130,607.4	171,902.7
2014	7,789,702	49,005.0	1,974.0	7.0	84,595.2	29,513.5	1,536.1	2,246.9	3,067.8	4,424.3	0.0	50,986.0	84,595.2	40,788.6	135,581.2	135,581.2	176,369.7
2015	8,063,020	45,769.8	1,962.7	9.9	81,477.5	30,389.6	1,597.2	2,476.7	3,227.7	4,261.2	0.0	47,742.4	81,477.5	41,952.4	129,219.9	129,219.9	171,172.2
2016	8,498,838	47,355.0	1,745.4	6.5	88,077.1	29,936.0	1,028.2	2,040.0	2,573.3	4,140.6	0.0	49,106.9	88,077.1	39,718.2	137,184.0	137,184.0	176,902.2
2017	8,747,503	62,161.8	1,944.2	6.4	91,365.0	29,347.5	1,066.6	2,249.5	2,603.8	4,295.1	0.0	64,112.4	91,365.0	39,562.6	155,477.4	155,477.4	195,040.0
2018	8,800,337	51,954.4	2,307.2	8.6	86,637.2	31,000.8	1,459.6	2,426.0	2,691.7	4,446.7	0.0	54,270.1	86,637.2	42,024.7	140,907.4	140,907.4	182,932.1
2019	8,807,078	52,866.7	2,109.2	8.5	82,350.2	36,072.7	2,241.4	2,466.6	2,809.7	4,226.7	0.0	54,984.4	82,350.2	47,817.1	137,334.6	137,334.6	185,151.7
2020	9,031,821	51,726.9	1,919.0	7.1	78,249.5	29,134.9	1,270.1	2,177.2	2,986.7	4,016.2	0.0	53,653.0	78,249.5	39,585.2	131,902.5	131,902.5	171,487.7
2021	9,128,250	51,232.7	1,744.3	2.0	75,428.5	872.6	1,234.8	181.6	3,205.9	3,871.4	10,000.8	52,978.9	75,428.5	9,366.3	128,407.5	118,406.7	137,773.8
target base year	7,948,152.4	45,287.6	1,826.9	12.2	84,251.1	26,114.5	1,346.3	2,352.4	3,168.3	7,133.9	NA	47,126.7	84,251.1	40,115.5	131,377.8	131,377.8	171,493.4
FY2021 % of total based on 1+2+3 w/o offsets	NA	37.2%	1.3%	0.0015%	54.7%	0.6%	0.9%	0.1%	2.3%	2.8%	NA	38.5%	54.7%	6.8%	93.2%	85.9%	100.0%
FY2021 rank	NA	2	5	9	1	7	6	8	4	3	NA	NA	NA	NA	NA	NA	NA
TBY TO FY2021	14.8%	13.1%	-4.5%	-83.5%	-10.5%	-96.7%	-8.3%	-92.3%	1.2%	-45.7%	NA	12.4%	-10.5%	-76.7%	-2.3%	-9.9%	-19.7%
FY2020 TO FY2021	1.1%	-1.0%	-9.1%	-71.7%	-3.6%	-97.0%	-2.8%	-91.7%	7.3%	-3.6%	NA	-1.3%	-3.6%	-76.3%	-2.6%	-10.2%	-19.7%

FOOTNOTES

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

RANK

1. Electricity	1	
2. Other on-campus stationary ¹	2	top 3
3. Scope 2 transmission & distribution losses ⁵	3	
4. Solid Waste	4	middle
5. Direct Transportation ²	5	
6. Other Directly Financed Travel ⁴	6	
7. Directly Financed Air Travel	7	<1%
8. Study Abroad Air Travel	8	
9. Agriculture ³	9	

TARGET BASE YEAR CALCULATION

To obtain the target base year, calculate the average greenhouse gas emissions from FY2012 through FY2014.

Greenhouse Gas Emissions Inventory Organizational Boundary RP6 FY2012-FY2021

Property Code	Property Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Boundary Status	
A06	John Crerar Library	Included in boundary											Included in boundary
A07	Kersten Physics Teaching Center	Included in boundary											
A08	Hinds Laboratory	Included in boundary											Excluded from boundary
A12	Ingleside Hall	Included in boundary		Demolished									
A13	Bookstore	Included in boundary											
B01	Michelson Center for Physics	Included in boundary				Renovation			Included in boundary				
B02	High Energy Physics	Included in boundary											
B03	Accelerator Building	Included in boundary											
B04	Astronomy and Astrophysics Center	Included in boundary	Demolished										
B06	Low Temperature Laboratory	Demolished											
B07	Research Institutes	Included in boundary	Demolished										
B08	Biopsychological Research Building	Included in boundary											
B34	Stagg Field Building	Included in boundary											
B65	William Eckhardt Research Center	Excluded from boundary				New Construction							
B78	Ratner Athletics Center	Included in boundary											
B113	West Campus Combined Utility Plant	Included in boundary											
C01	Pierce Hall	Included in boundary		Demolished									
C02	Henry Crown Field House	Included in boundary											
C03	Regenstein Library	Included in boundary											
C04	Bartlett Commons	Included in boundary											
C05	Young Memorial Building	Included in boundary											
C13	Smart Museum of Art	Included in boundary											
C14	Cochrane-Woods Art Center	Included in boundary											
C15	Court Theatre	Included in boundary											
C25	Joe and Rika Mansueto Library	New Construction											
C26	Campus North Residential Commons	Excluded from boundary					New Construction						
C32	Max Palevsky Commons A/West	Included in boundary											
C33	Max Palevsky Commons B/Center	Included in boundary											
C34	Max Palevsky Commons C/East	Included in boundary											

Greenhouse Gas Emissions Inventory Organizational Boundary RP6 FY2012-FY2021

Property Code	Property Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Boundary Status
D01	Quadrangle Club											Included in boundary
D02	Mitchell Tower											Excluded from boundary
D03	Reynolds Clubhouse											Excluded from boundary
D04	Hutchinson Commons											Excluded from boundary
D05	Zoology Building											Excluded from boundary
D06	Anatomy Building											Excluded from boundary
D07	Hitchcock Hall											Excluded from boundary
D08	Snell Hall											Excluded from boundary
D09	Searle Chemistry Laboratory											Excluded from boundary
D10	Culver Hall											Excluded from boundary
D11	Erman Biology Center											Excluded from boundary
D12	Mandel Hall											Excluded from boundary
D13	5727 South University Avenue											Excluded from boundary
D14	5733 South University Avenue											Excluded from boundary
D16	Eckhart Hall											Excluded from boundary
D17	Ryerson Laboratory											Excluded from boundary
D18	Kent Chemical Laboratory											Excluded from boundary
D19	Jones Laboratory											Excluded from boundary
D20	Edward H. Levi Hall											Excluded from boundary
D21	Cobb Lecture Hall											Excluded from boundary
D22	Bond Chapel											Excluded from boundary
D23	Swift Hall											Excluded from boundary
D24	Rosenwald Hall											Excluded from boundary
D25	Walker Museum											Excluded from boundary
D26	Oriental Institute											Excluded from boundary
D29	Rockefeller Chapel											Excluded from boundary
D31	5855 South University Avenue											Excluded from boundary
D32	Beecher Hall											Excluded from boundary
D33	Green Hall											Excluded from boundary

Greenhouse Gas Emissions Inventory Organizational Boundary

RP6 FY2012-FY2021

Property Code	Property Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Boundary Status	
D34	Kelly Hall	Included in boundary											<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="display: flex; align-items: center; margin-bottom: 5px;"> Included in boundary </div> <div style="display: flex; align-items: center;"> Excluded from boundary </div> </div>
D35	Foster Hall	Included in boundary											
D36	Social Science Research Building	Included in boundary											
D37	Stuart Hall	Included in boundary											
D38	Harper Memorial Library	Included in boundary											
D39	Haskell Hall	Included in boundary											
D40	Wieboldt Hall	Included in boundary											
D41	Classics Building	Included in boundary											
D42	Goodspeed Hall	Included in boundary											
D43	Gates Hall	Included in boundary											
D44	Blake Hall	Included in boundary											
D48	5737 South University Avenue	Included in boundary					Renovation		Included in boundary				
D53	Pick Hall	Included in boundary											
E05	Lillie House	Included in boundary											
E06	Sunny Gymnasium	Included in boundary											
E07	Belfield Hall	Included in boundary											
E09	Ida Noyes Hall	Included in boundary											
E10	Judd Hall	Included in boundary											
E11	University High School	Included in boundary											
E12	Blaine Hall	Included in boundary											
E13	International House	Included in boundary											
E20	Wilder House	Included in boundary											
E21	Breckinridge House	Included in boundary											
E29	Middle School	Included in boundary											
E30	Gordon Parks Arts Hall	Excluded from boundary					New Construction						
E41	Kovler Gymnasium	Included in boundary											
E44	Charles M. Harper Center	Included in boundary											
E55	Earl Shapiro Hall	Excluded from boundary				New Construction							
F02	South Steam Plant	Included in boundary											

Greenhouse Gas Emissions Inventory Organizational Boundary RP6 FY2012-FY2021

Property Code	Property Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Boundary Status	
F08	Laboratory Service Building	Included in boundary											Included in boundary
F12	1427 East 60th Street	Included in boundary											
F15	South Campus Chiller Plant	Included in boundary											Excluded from boundary
F16	Chicago Theological Seminary	Leased								Excluded from boundary			
G01	1365 East 60th Street	Included in boundary				Inactive							Excluded from boundary
G02	Chapin Hall	Included in boundary											
G03	Keller Center	Included in boundary						Renovation		Excluded from boundary		Included in boundary	
G04	Mott Building	Included in boundary						Demolished					Excluded from boundary
G30	6045 Kenwood Building	Included in boundary											
H01	1155 East 60th Street	Included in boundary											
H02	Laird Bell Law Quadrangle	Included in boundary											
H03	Burton-Judson Courts	Included in boundary											
H09	Renee Granville-Grossman Residential Commons	Included in boundary											
H10	Arley D. Cathey Dining Commons	Included in boundary											
I01	Edith Abbott Hall	Included in boundary											
I02	Midway Studios	Included in boundary											
I03	6011-27 South Ingleside Avenue	Included in boundary											
I04	Edelstone Center	Included in boundary											
I10	6022-24 South Drexel Avenue	Included in boundary											
I13	Woodlawn Social Service Center	Included in boundary											
I29	6054 South Drexel Avenue	Included in boundary											
I30	Reva and David Logan Center for the Arts	Excluded from boundary	New Construction										
I32	Lorado Taft House	Included in boundary											
I33	Kiln	Excluded from boundary							New Construction				
L29	Facilities Services	Excluded from boundary				New Construction							
M68	1340 East 55th Street	Excluded from boundary								New Construction			
N11	5608 South Stony Island Blvd	Included in boundary									Demolished		
N12	Alumni House	Included in boundary											
O11	Neubauer Collegium for Culture and Society	Excluded from boundary				New Construction							

Greenhouse Gas Emissions Inventory Organizational Boundary

RP6 FY2012-FY2021

Property Code	Property Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Boundary Status		
013	Institute of Politics			New Construction									Included in boundary	
015	5711 South Woodlawn Avenue								occupancy change					Included in boundary
016	5710 South Woodlawn Avenue												Included in boundary	
020	5720 South Woodlawn Avenue												Included in boundary	
024	5730 South Woodlawn Avenue												Included in boundary	
028	5736 South Woodlawn Avenue												Included in boundary	
030	5740 South Woodlawn Avenue			Renovation									Included in boundary	
031	McGiffert House			Renovation									Included in boundary	
032	5750 South Woodlawn Avenue			Renovation									Included in boundary	
033	Robie House	Leased											Excluded from boundary	
036	Saieh Hall for Economics		Renovation										Included in boundary	

Acronyms and Chemical Formulas

Maroon text indicates UChicago-specific acronyms

BTU	British thermal unit
CH ₄	methane
CBECS	Commercial Buildings Energy Consumption Survey
CO ₂	carbon dioxide
CR	The Climate Registry
eCO ₂	equivalent CO ₂
EF	emissions factor
eGRID	emissions and generation resource integrated database
FICM	Facilities Inventory and Classification Manual
FS	Facilities Services
(FS) ²	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 ⁶ Btu
MT	1 metric ton = 1,000 kg
(NF ₃) ³	nitrogen trifluoride
N ₂ O	nitrous oxide
OS	Office of Sustainability
PFC	perfluorocarbons
SF ₆	sulfur hexafluoride
SP	Sustainability Plan

Links

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

Facilities Services
facilities.uchicago.edu

Office of Sustainability
sustainability.uchicago.edu

Sustainability Plan
sustainability.uchicago.edu/sp

Facilities Services Facility Standards (FS)²
facilities.uchicago.edu/about/partners/facilitiesstandards

Sources

Referenced Standards

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

The GHG Protocol Scope 2 Guidance

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

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

Global Warming Potentials
 IPCC Sixth Assessment Report

Emissions Factors

United States Environmental Protection Agency Emissions and Generation Resource Integrated Database (eGRID)

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

Calculation Tool

Internally developed tool

Area (square footage)

Facilities Inventory and Classification Manual (FICM)

Climate Zone

Chicago is in CBECS climate zone 2.

United States Climate Zones for 2003 CBECS

- 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 absolute greenhouse gas emissions by 50% by 2030 for scopes 1 and 2.
- 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 (≥ 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 Sixth 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 usage 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 partial data as it reflects only what is booked through the University's official travel booking system. Travel not booked through the University's system is excluded.
- The rental car data is partial data as it reflects only what is booked through the University's preferred contracts.
- 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](#). Airlines for America is 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 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.
- If a building is leased out less than 100%, it is included. If a building is leased out 100% it is included if University personnel frequently occupy it, otherwise it is excluded.

THE UNIVERSITY OF CHICAGO

Greenhouse Gas Emissions Inventory Report 2012–2021

December 2021

sustainability.uchicago.edu

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