



Greenhouse Gas Emissions Inventory Summary

FY14-FY22

Updated December 2022

EXECUTIVE SUMMARY

- USC is committed to achieving **climate neutrality** for annual **Scopes 1 & 2** emissions by **FY25** and for annual **Scope 3** emissions by **FY35** (with a 50% reduction in Scope 3 emissions by 2028, using FY14 as the baseline).
- In FY22, **USC's academic facilities Scopes 1 & 2 emissions are 94,799 MTCDE**, a 31.6% emissions reduction since FY14.
- In FY22, **USC's academic facilities Scopes 3 emissions are 70,286 MTCDE**, a 48.9% emissions reduction since FY14.
- Achievements are due in part to a 15.4% improvement in energy efficiency, as well as 45% less carbon-intensive electricity from LADWP. COVID-19 caused a significant dip in FY21, and emissions have rebounded in FY22 as the campuses reopened.

BOUNDARIES AND PURPOSE OF INVENTORY

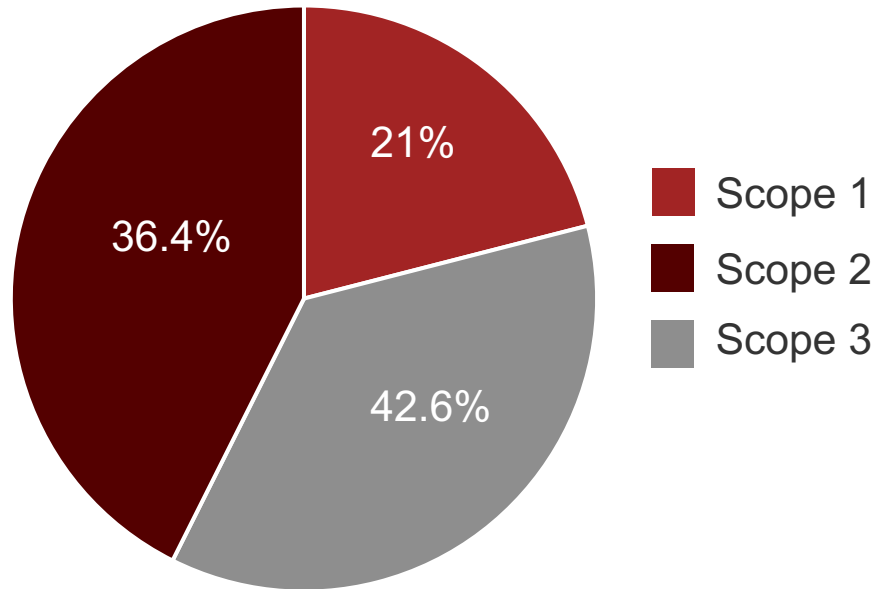
This FY14-22 greenhouse gas (GHG) inventory documents the carbon footprint of USC's academic facilities, including the following campuses and locations:

- University Park Campus
- University Park North Housing
- USC Health Sciences Campus (*excluding HC2, HC3, HC4, NOR, NTT, SST*)
- USC Wrigley Institute for Environmental Studies in Catalina
- USC Pacific Asian Museum
- USC Hotel
- Several off-campus buildings

The **organizational** boundaries have shifted from those in previous years' reports, as USC's healthcare enterprise facilities now track their emissions separately. The **operational** boundaries have stayed the same: USC tracks its scope 1 and Scope 2 emissions (i.e., power, ventilation, heating and cooling buildings; fleet fuels; refrigerant and fertilizer use.) Scope 3 emissions from select sources (i.e., commuting, business travel, and waste disposal) are also reported.

This report has been created by Unlimited Carbon Assistance Network, an independent consultant that analyzes clients' GHG emissions management efforts. It is a tool for assessing USC's progress toward its climate and sustainability goals.

“MARKET-BASED” OVERVIEW



Scope	MTCDE	% of Total
1	34,682	21%
2	60,117	36.4%
3	70,286	42.6%
TOTAL	165,085	100%

In FY22, USC’s total academic facilities GHG emissions are **165,085 metric tons carbon dioxide equivalent (MTCDE)**.

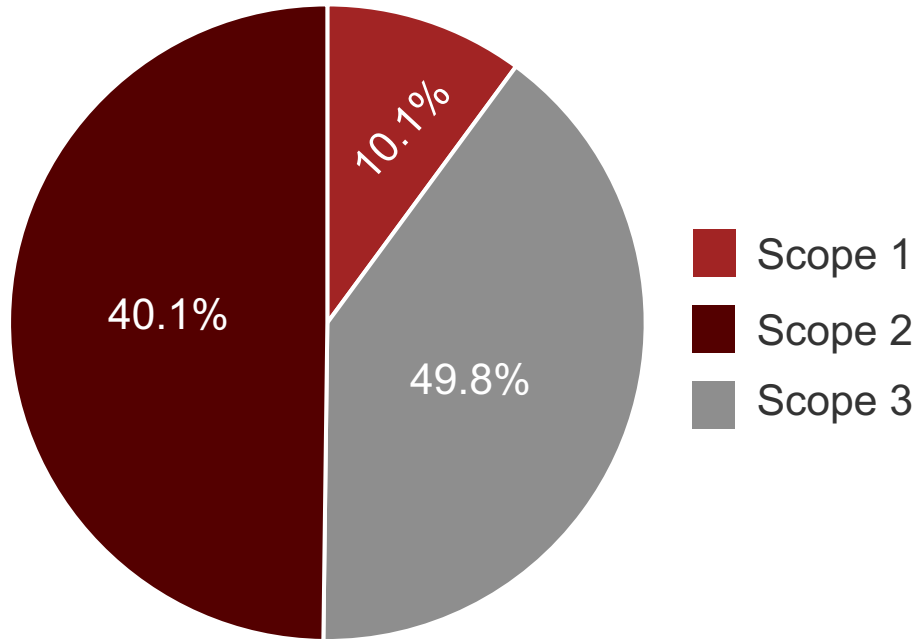
Scopes 1 & 2 GHG emissions are **94,799 MTCDE** (31.6% lower than the FY14 baseline), and **Scopes 3** GHG emissions are **70,286 MTCDE** (48.9% lower than the FY14 baseline).

DETAILED “MARKET-BASED” OVERVIEW

Scopes	Source	MTCDE	% of Total
1	Other On-Campus Stationary	31,449.39	19%
1	Direct Transportation	2,870.41	2%
1	Refrigerants & Chemicals	353.85	0%
1	Fertilizer & Animals	7.92	0%
2	Purchased Electricity	60,117.05	36%
1 and 2	TOTAL	94,798.62	57%
3	Staff Commuting	34,866.24	21%
3	Student Commuting	11,214.72	7%
3	Directly Financed Air Travel	14,733.44	9%
3	Other Directly Financed Travel	878.95	1%
3	Solid Waste	5,228.56	3%
3	T&D Losses	3,364.52	2%
1, 2 and 3	TOTAL	165,085.05	100%

Purchased electricity remains the largest source of USC’s greenhouse gas footprint (36%). Indirect commuting emissions from employees and students are the next-largest contributor to USC’s footprint (28%). Emissions from natural gas and other non-transportation fuels are significant sources as well (19%). Emissions from air travel were estimated at 9% of the total footprint. Campus waste disposal, other business travel, fleet vehicles and refrigerant use were minor contributors.

BASELINE “MARKET-BASED” OVERVIEW

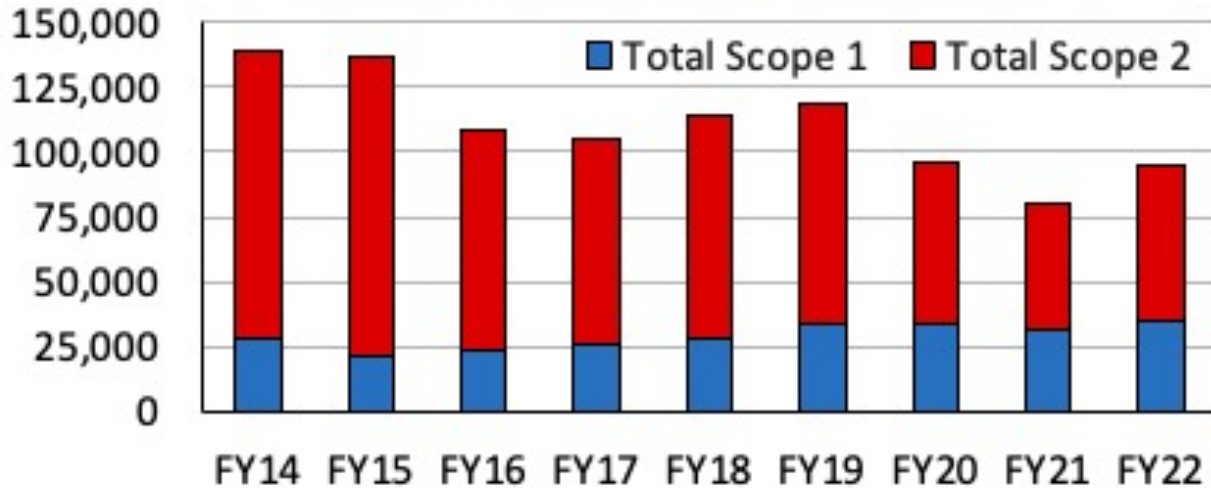


Scope	MTCDE	% of Total
1	27,866	10.1%
2	110,735	40.1%
3	137,556	49.8%
TOTAL	276,157	100%

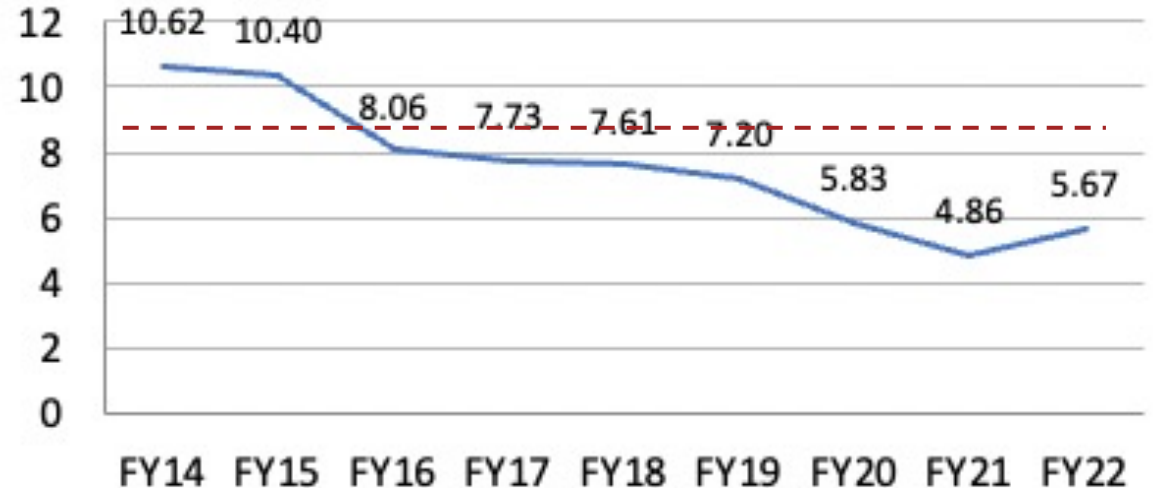
In the FY14 baseline year, USC’s academic facilities emitted an estimated 276,157 metric tons carbon dioxide equivalent. 10% of those emissions were Scope 1 emissions, which means they occur directly as a result of burning fuels or using chemicals on the USC campus. Another 40% were Scope 2 emissions; these result from the purchased electricity used on campus. The largest emissions category —50% of the USC footprint—were the “Scope 3” emissions that are the indirect result of campus operations; for example, the emissions resulting from student and employee commuting, and from business travel.

SCOPE 1 + 2 EMISSIONS TRENDS FY14-FY22

**Absolute Scope 1+2 Emissions
(Metric Tons eCO₂)**



**Scope 1+2 Emissions/1000 GSF
(Metric Tons eCO₂)**



----- 2020 reduction target (20%)

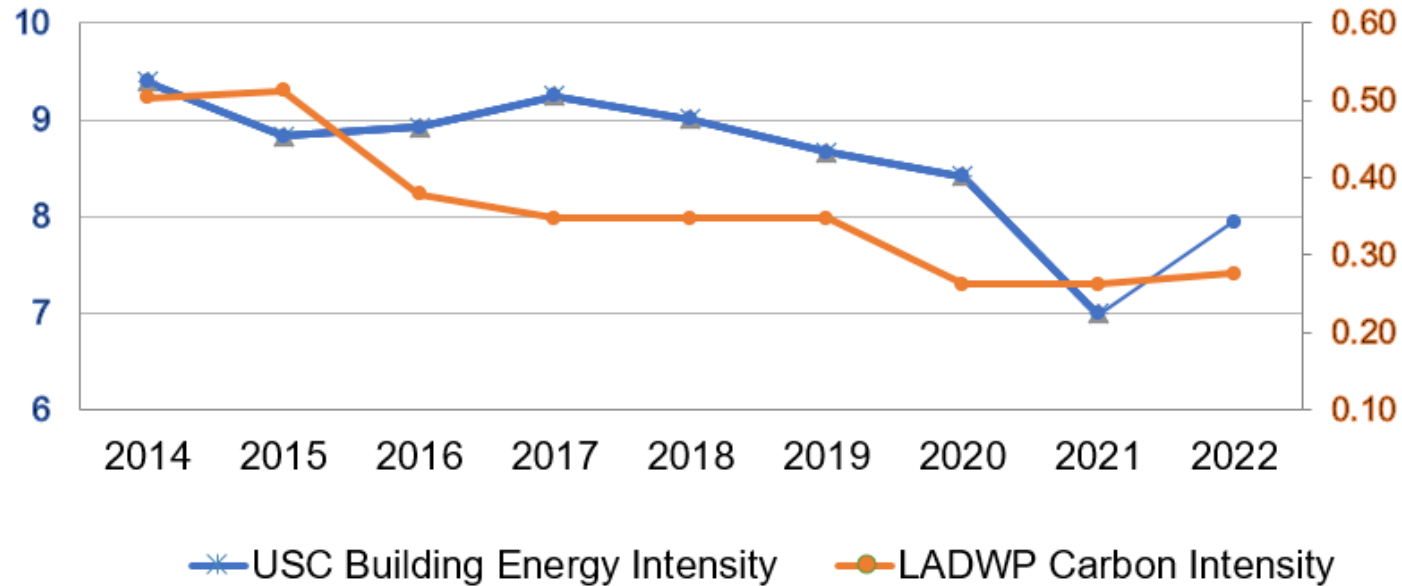
In FY22, absolute Scope 1 and 2 emissions were 31.6% lower than the FY14 baseline levels.

Scope 1 emissions have increased 24.5%, as natural gas consumption has risen to support a 28% increase in campus square footage. This increase was offset by a 45.7% decrease in Scope 2 emissions, due in part to the “greening” of USC’s power supply and in part to decreased electric consumption in university buildings.

When normalized to account for campus growth, the Scope 1 and 2 emissions reduction is even greater:

USC FY22 S1+2 emissions-per-square-foot (i.e., emissions intensity) levels were 46.6% lower than FY14.

ENERGY VS. CARBON INTENSITY: FY14-FY22



USC’s building energy intensity (the amount of natural gas, propane and electricity used per square foot) for buildings was 15.4% lower in FY22 than FY14. FY21 shows an anomalous dip, due to shutdowns from the COVID-19 pandemic. Energy intensity rebounded in FY22, but nevertheless continues an overall downward trend.

USC’s carbon reductions are also significantly due to the “greening of the grid.” The University gets most of its power from LADWP, which has cut its carbon intensity (the amount of eCO2 emitted per kWh of electricity it produces) by 45% since FY14.

METHODOLOGY

The data for this inventory was provided from utility bills (LADWP/SCE for electricity, SoCalGas for Natural Gas), data from other Facilities staff outside of the Energy office (for propane, fertilizer applied on campus, and municipal solid waste), and reports run on square footage during fall and winter of 2022. Fleet fuel usage was estimated to be the same as in FY21, due to a lack of available data for FY22. Given that fleet emissions are a de minimis source for USC (historically <3%), we have confidence that this is a reasonable placeholder. In 2022, USC had an additional estimated 307 MTCDE of biogenic emissions from biodiesel and ethanol as transport fuels.

For the years 2015, 2016, 2017 and 2018, emissions for commuting were estimated/projected based on the rate of change in (Full-Time Equivalent) student enrollment from the 2014 baseline year (for student commuting). For 2020, a 30% across-the-board reduction from 2019 commuting vehicle miles traveled was assumed, due to changes induced by the COVID-19 pandemic. For 2021, a further 50% across the board reduction was applied. For this 2022 update, we have changed methodologies to incorporate AQMD commuter survey data, allowing for much greater confidence in the mode share and distance numbers. While the survey breaks commuters down by subtype (e.g. undergrad versus grad students, faculty vs staff), the total commuting emissions were aggregated into the two categories (employee and student) to allow for continuity between historic reporting and this new method for gathering and analyzing activity data.

For air travel, a portion of miles traveled was provided directly by the travel agencies that service campus travel needs; in addition, the dollars spent on airfare were converted to air passenger miles using conversion factors from the Bureau of Transportation Statistics (BTS).

All calculations were done using the [Sustainability Indicator Management and Analysis Platform \(SIMAP\)](#), EF version 2021 (the most up to date available at time of calculation). Global Warming Potential (GWP) values are from the [IPCC Fifth Assessment Report \(AR5\)](#). The selected radiative forcing factor was 2.7 and the air travel cost version was “BTS.”

For Market Based Scope 2 emissions calculations, an LADWP supplier-specific emission factor was applied to the UPC, UPC North, HSC campus and the USC Hotel. These supplier specific emissions factors were published by LADWP (for which the last available update was October 2021) and reflect the municipal utility’s generation mix for properties that use LADWP. The other facilities in Catalina and Pasadena used the residual mix for E-Grid region CAMX.

FTE figures used for benchmarking were drawn from IPEDS data, accessed from the USC Institutional Research site (<http://oir.usc.edu/ipeds/>); specifically, the “12-Month Enrollment” and “Human Resources” reports. Gross Square Footage is tracked by USC Facilities.

DEFINITIONS

FTE - Full-time Employee

FY - Fiscal Year (July to June)

GHG - Greenhouse Gas

LADWP - Los Angeles Department of Water and Power

Market Based - GHG calculation method using supplier-specific emissions factors, rather than a “Location Based” method that uses emissions factors for the entire grid region.

MTCDE - Metric Tons Carbon Dioxide Equivalent

Scope 1 - Emissions from sources owned or controlled by an organization (e.g. on-site combustion for building heating, refrigerants, owned or leased vehicles)

Scope 2 - Emissions from purchased energy from utilities (e.g. the electricity supplied by LADWP)

Scope 3 - Emissions from sources not owned or directly controlled by an organization but resulting from the organization’s activities or value chain (e.g. waste processing, business travel, employee and student commuting)