



Greenhouse Gas Emissions Inventory Summary

FY14-FY23

Updated March 22, 2024

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 FY23, **USC's academic facilities Scope 1 & 2 emissions are 78,384 MTCDE***, a 43.4% emissions reduction since FY14.
- In FY23, **USC's academic facilities Scopes 3 emissions are 93,790 MTCDE**, a 31.8% emissions reduction since FY14.
- The success is due in part to a 17.7% improvement in energy efficiency, as well as 48.9% drop in the electricity carbon-intensity from LADWP, and sourcing of renewable energy credits (RECs) from an LADWP program, covering about ~18.5% of USC's electrical usage.

BOUNDARIES AND PURPOSE OF INVENTORY

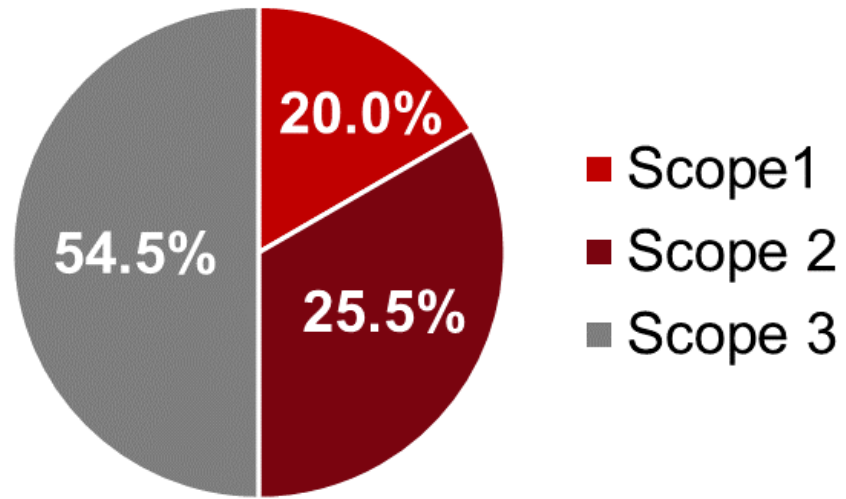
This greenhouse gas (GHG) inventory, representing FY14-23, documents the carbon footprint of USC's academic facilities, including the following campuses and locations:

- University Park Campus and off campus buildings
- 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
- Galen Center

The **organizational** boundaries have shifted over the past few years, as UCS's healthcare enterprise facilities now track their emissions separately. The **operational** boundaries have stayed essentially 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 - namely from commuting, business travel, waste disposal, and fuel and energy-related activities (FERA) – 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.

FY 23 “MARKET-BASED” OVERVIEW



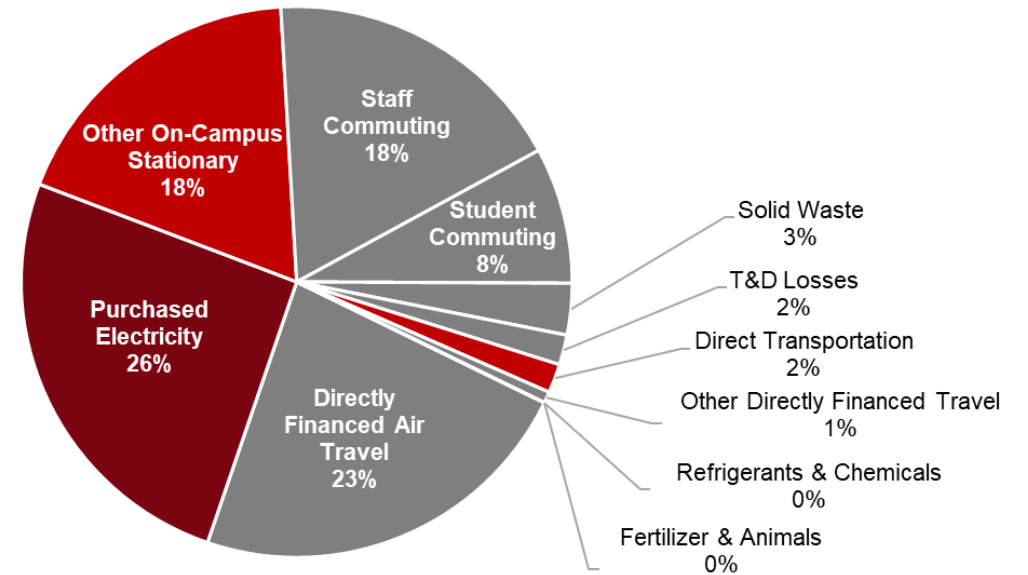
Scope	GHG MTCDE	% of Total
1	34,442	20.0%
2	43,942	25.5%
3	93,790	54.5%
Total	172,175	100.0%

In FY23, USC’s total academic facilities emitted an estimated **172,175 metric tons carbon dioxide equivalent (MTCDE)**.

Scopes 1 & 2 GHG emissions are **78,384 MTCDE (43.4% lower than the FY14 baseline)**, and **Scopes 3** GHG emissions are **93,790 MTCDE (31.8% lower than the FY14 baseline)**.

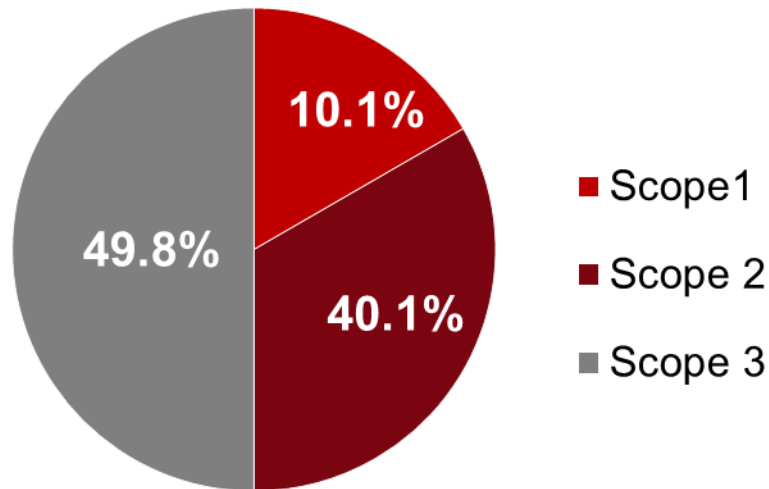
DETAILED FY23 “MARKET-BASED” OVERVIEW

Scopes	Source	MTCDE	% of Total
1	Other On-Campus Stationary	31,505	18.3%
1	Direct Transportation	2,927	1.7%
1	Refrigerants & Chemicals	0	0.0%
1	Fertilizer & Animals	9	0.0%
2	Purchased Electricity	43,942	25.5%
1 and 2	TOTAL	78,384	45.5%
3	Staff Commuting	30,983	18.0%
3	Student Commuting	13,783	8.0%
3	Directly Financed Air Travel	39,655	23.0%
3	Other Directly Financed Travel	1,137	0.7%
3	Solid Waste	5,207	3.0%
3	T&D Losses	3,026	1.8%
3	TOTAL	93,790	54.5%
1, 2 and 3	TOTAL	172,175	100.0%



Due to renewable energy sourcing, emissions from purchased electricity was dramatically reduced and now has a smaller footprint (25.5%). Indirect commuting emissions from employees and students (26.0%) are now the largest emissions source for USC. Emissions from financed travel has climbed to pre-pandemic levels and are once again a sizable portion (23.7%). Emissions from natural gas and other non-transportation fuels are also meaningful drivers (20.0%). Campus waste disposal, other business travel, fleet vehicles and refrigerant use were minor contributors.

BASELINE: “MARKET-BASED” OVERVIEW

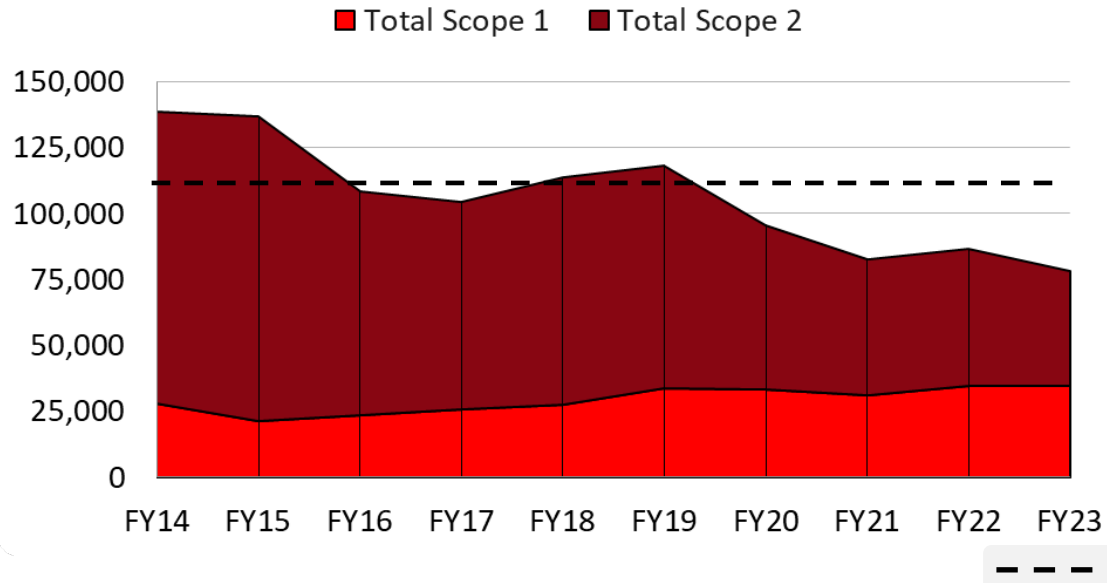


Scope	GHG MTCDE	% of Total
1	27,866	10.1%
2	110,735	40.1%
3	137,523	49.8%
Total	276,124	100.0%

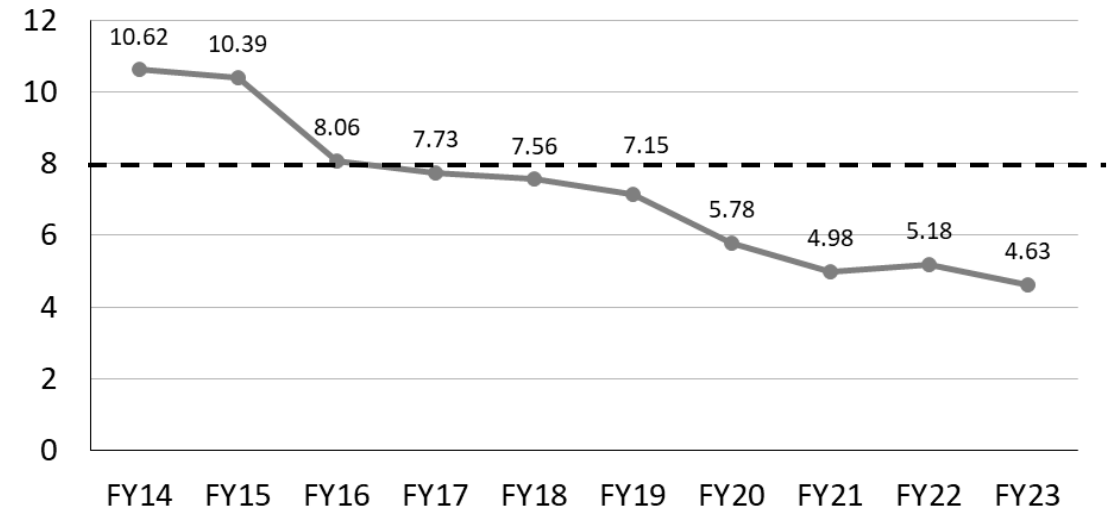
In the FY14 baseline year, USC’s academic facilities emitted an estimated 276,124 metric tons carbon dioxide equivalent. 10.1% of those emissions were Scope 1 emissions, which means they occur directly as a result of burning fuels or using chemicals on the USC campus. Another 40.1% were Scope 2 emissions; these result from the purchased electricity used on campus. The largest emissions category —49.8% 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-FY23

Absolute Scope 1+2 Emissions (Metric Tons eCO₂)



Scope 1+2 Emissions/1000 GSF¹ (Metric Tons eCO₂)



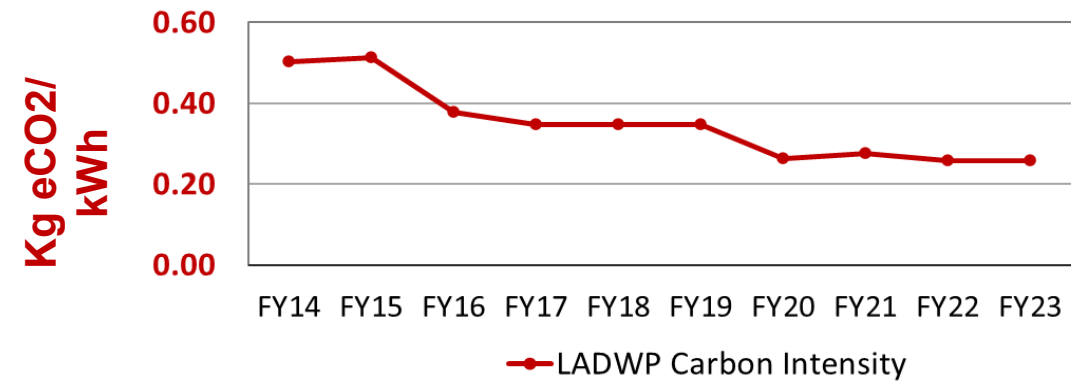
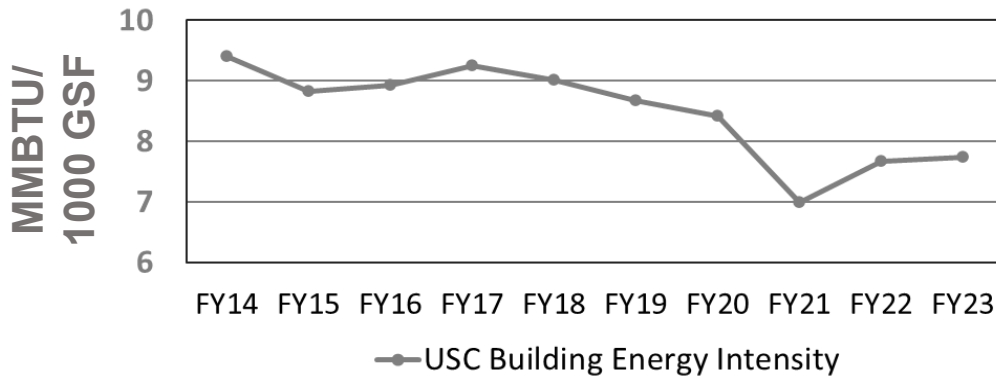
In FY23, absolute Scope 1 and 2 emissions were 43.4% lower than the FY14 baseline levels. Scope 1 emissions have increased 23.6%, as natural gas consumption has risen to support a 29.8% increase in campus square footage. This increase was offset by a 60.3% decrease in Scope 2 emissions, due mainly to the “greening” of USC’s power supply, an 17.7% increase in energy efficiency, and the purchasing of RECs.

When normalized to account for campus growth, the Scope 1 and 2 emissions reduction is even greater. **USC FY23 S1+2 emissions-per-square-foot (i.e., emissions intensity) levels were 56.4% lower than FY14.**



1- Emission totals are subject to retroactive adjustments. Emission factors for the most current years are estimated using published placeholder values, which often are updated later by LADWP. Once updated data becomes available emission factors are applied retroactively.

ENERGY VS CARBON INTENSITY: FY14-FY23



Leading factors to carbon reduction

- **USC’s building energy intensity (the amount of natural gas, propane and electricity used per square foot) for buildings was 17.7% lower in FY23 than FY14.** FY21 shows an anomalous dip, due to shutdowns from the COVID-19 pandemic. Energy intensity rebounded in FY22 and FY23, 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 48.9% since 2014.
- **USC also procures renewable energy credits (RECs) through an agreement with LADWP.** The RECs further reduce the carbon footprint on ~18.5% of the University’s electrical usage in FY 23.



METHODOLOGY

The data for this inventory was provided from utility bills (LADWP and 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 winter of 2023. Fleet fuel usage was estimated to be the same as in FY21, due to a lack of available data for FY22 and FY23. Given that fleet emissions are a de minimis source for USC (historically <3%), we have confidence that this is a reasonable placeholder. USC had an additional estimated 308 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 the FY22 and FY23 updates, methodologies were changed 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). Spending on ground transportation for which mileage was not available was paired with EPA EEIO factors to calculate associated emissions.

All calculations were done using the [Sustainability Indicator Management and Analysis Platform \(SIMAP\)](#), EF version 2022 (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 properties that use LADWP (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 the 2022 version) and reflect the municipal utility’s generation mix. The other facilities in Catalina and Pasadena used the residual mix for E-Grid region CAMX (v2022).

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)