

GREENHOUSE GAS INVENTORY

2024



THE UNIVERSITY OF
NEW MEXICO®



TABLE OF CONTENTS

OVERVIEW	PG. 4
SCOPE OF REPORT	PG. 5
METHODOLOGY	PG. 6
SCOPE 1 EMISSIONS	PG. 7
SCOPE 2 EMISSIONS	PG. 8
SCOPE 3 EMISSIONS	PG. 8
TOTAL EMISSIONS: FY24	PG. 9
BASELINE & COMPARISONS	PG. 10
CONCLUSION	PG. 12
GLOSSARY	PG. 13
NOTES	PG. 14

O V E R V I E W

As an institution of higher learning, the University of New Mexico (UNM) has a responsibility to exercise leadership and vision when addressing societal concerns. One of the most urgent societal concerns of our time is climate change. *Greenhouse gases (GHGs) from human activities are the most significant driver of observed climate change since the mid-20th century.* Human activities, such as burning fossil fuels, clearing land, and cutting down forests, have and continue to increase the concentration of greenhouse gases. As these emissions blanket the Earth, they trap the sun's heat, leading to global warming and climate change.

The year 2023 set a new record for the hottest year since global temperature records began in 1850, and extreme weather is increasing in intensity and frequency. New Mexico faces increased climate vulnerabilities from climate change such as water scarcity, extreme heat waves, wildfires, storms, floods, and associated public health issues. *These impacts will disproportionately affect already vulnerable populations, including historically marginalized and economically vulnerable communities.*

An important step in addressing greenhouse gas emissions for any institution is to conduct a greenhouse gas inventory, which provides a detailed picture of an organization or community's total greenhouse gas emissions. Having this baseline data allows institutions to identify the main sources of emissions, develop reduction targets and strategies, track progress toward reduction goals, and make informed decisions about climate action based on accurate data.

This UNM GHG inventory was led by the newly established Office of Sustainability in partnership with Lobo Energy, Inc. and UNM Utility Services. This is also *the first GHG inventory conducted for UNM in over a decade.*

SCOPE OF REPORT

The scope of this analysis includes the entire UNM Main Campus footprint in Albuquerque, including north campus, central campus, and south campus. This analysis excludes the UNM Hospital and its associated clinics and facilities, the UNM Branch Campuses, and any satellite university facilities that are not part of the UNM Albuquerque footprint (e.g., Sevilleta Field Station or D.H. Lawrence Ranch).

In an effort to measure emissions over which UNM has more direct influence and develop this inventory in a short time frame, this analysis is limited to Scope 1 and 2 emissions (see Table 1). UNM anticipates that future inventories will extend to aspects of Scope 3 emissions and include facilities beyond the main campus footprint.



Figure 1.
Map of UNM Greenhouse Gas Inventory area, excluding the hospital buildings and associated clinics.

Table 1.

GHG emissions scope definitions. Scope 1 and 2 are included in the UNM inventory.

SCOPE 1

Carbon emissions resulting directly from fuel combustion on campus, primarily for electricity generation (stationary emissions) and from the campus fleet (mobile emissions).

SCOPE 2

Carbon emissions associated with electricity UNM purchases from Public Service Company of New Mexico (PNM).

SCOPE 3

Carbon emissions resulting indirectly from UNM operations, either from upstream activities (such as purchasing) or downstream (e.g., students, faculty, and staff commuting or traveling for work and school). These emissions are not considered in this GHG inventory.

METHODOLOGY

This report quantifies the annual GHG emissions for UNM's Main Campus for fiscal year (FY) 2024 (July 1, 2023–June 30, 2024), then evaluates these emissions over time since the baseline year of FY2006 (July 1, 2005–June 30, 2006).

The analysis began with compiling data for historical and current emissions for Scopes 1 and 2. The inventory was conducted by Lobo Energy, Inc. using CarbonHub, a financial-grade carbon accounting software designed based on industry expertise and informed by the GHG Protocol. Total metric tons of carbon dioxide-equivalent (MTCO₂e) for each emissions category was calculated using the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) values for Global Warming Potential.

Specific emissions factors for the Scope 2 electric utility provider, PNM Resources, were input into the CarbonHub system. FY2013 data was verified against the last greenhouse gas inventory that UNM completed.

SCOPE 1 EMISSIONS

The University of New Mexico directly generates GHG emissions. The primary sources of these emissions are stationary emissions from the natural gas combusted for campus utilities and mobile emissions from gasoline, diesel, and compressed natural gas (CNG) used to power campus fleet vehicles. The largest source of Scope 1 emissions on Main Campus are the boilers and cogeneration units at the Ford Utilities Center.

Table 2.

UNM Scope 1 emissions in FY24.

Scope 1 Emission Source	MTCO _{2e}
Stationary Combustion: Natural Gas	73,046
Mobile Combustion: UNM Fleet	246
Total Scope 1 Emissions	73,292



SCOPE 2 EMISSIONS

UNM generates Scope 2 emissions through purchased electricity from PNM and the utility's operation of coal and gas-fired power plants. After the passage of the 2019 New Mexico Energy Transition Act, PNM made a commitment to reduce its greenhouse gas emissions and transition to a carbon-free energy portfolio five years before the legislated target, or by 2040. This has already started with the retirement of coal units and additions of large-scale solar and wind projects, and these emissions reductions will continue to be reflected in future UNM GHG inventories.

Table 3.
UNM Scope 2 emissions in FY24.

Scope 2 Emission Source	MTCO ₂ e
Purchased Electricity	16,011

SCOPE 3 EMISSIONS

Scope 3 emissions are not considered in this inventory due to the complexity of data collection associated with components such as commuter travel. However, UNM anticipates that they will be considered to some extent in future inventories. Lobo Energy Inc. is currently tracking some Scope 3 emissions, such as emissions associated with UNM-related air travel.

TOTAL EMISSIONS: FY24

Total UNM Main Campus Scope 1 and 2 emissions in FY24 were 89,302 MTCO_{2e} (see Table 4). This is equivalent to **21,254 gasoline-powered passenger vehicles driven for one year^L**.

Table 4.

Summary of GHG Emissions Totals from Scope 1 and 2 in FY24.

Scope 1 Emission Source	MTCO _{2e}
Stationary Combustion: Natural Gas	73,046
Mobile Combustion: UNM Fleet	246
Scope 2 Emission Source	
Purchased Electricity	16,011
Total Scope 1 & Scope 2 Emissions	89,302



BASELINE & COMPARISONS

UNM is reporting GHG emissions on its fiscal year; the baseline year of FY2006 was chosen to align most closely with 2005, the baseline year for state greenhouse gas reduction targets set forth in *New Mexico Executive Order 2019-003: Addressing Climate Change and Energy Waste Prevention*. EO 2019-003 states: “New Mexico’s objective is to achieve a statewide reduction in greenhouse gas emissions of at least 45% by 2030 as compared to 2005 levels.” This baseline year also aligns with the 2015 Paris Agreement baseline.

Table 5 and Figure 2 compare the GHG emissions generated by scope between FY2006 and FY2024. Total Scope 1 and 2 emissions decreased 11% during this time, mostly reflecting the substantial reduction of emissions from UNM’s electric utility provider, PNM. The 2019 New Mexico Energy Transition Act sets a goal for New Mexico investor-owned utilities to achieve net zero carbon resources by 2045, and this has motivated PNM to move away from coal-fired and gas-fired generation and toward an increasingly low-carbon portfolio.

Table 5.
GHG emissions comparisons (MTCO_{2e}).

Category	FY2006 (MTCO _{2e})	FY2024 (MTCO _{2e})	% Change
Scope 1			
Natural gas	32,682	73,046	+124%
UNM Fleet	300	246	-18%
Scope 2			
Purchased Electricity	67,207	16,011	-76%
Total Scope 1 & 2	100,189	89,302	-11%

¹Based on a weighted average combined 2021 fuel economy of cars and light trucks of 22.9 miles per gallon and average 2021 vehicle miles traveled (VMT) of 10,746 miles per year. See <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.

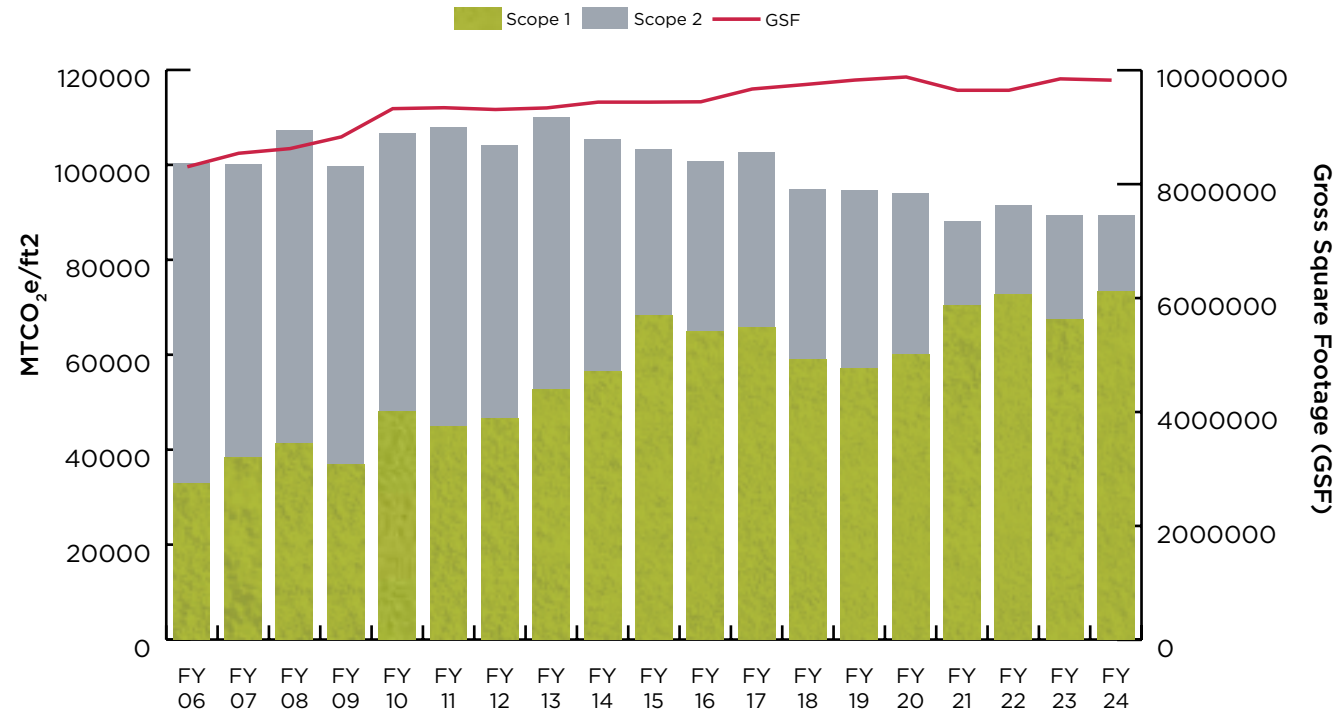


Figure 2. UNM Scope 1 and 2 emissions FY06–FY24. During this time, total emissions decreased 11%, while gross square footage (GSF) of the area included in this GHG inventory grew 19%.

Between FY06 and FY24, UNM Main Campus square footage grew 19%, or by 1,520,000 square feet. When total emissions are compared to square footage, we can derive the UNM campus building greenhouse gas intensity, which decreased 25% between FY06 and FY24 (Figure 3). This was a result of a focus on increasing efficiencies in existing buildings and ensuring that new buildings were efficient as possible.



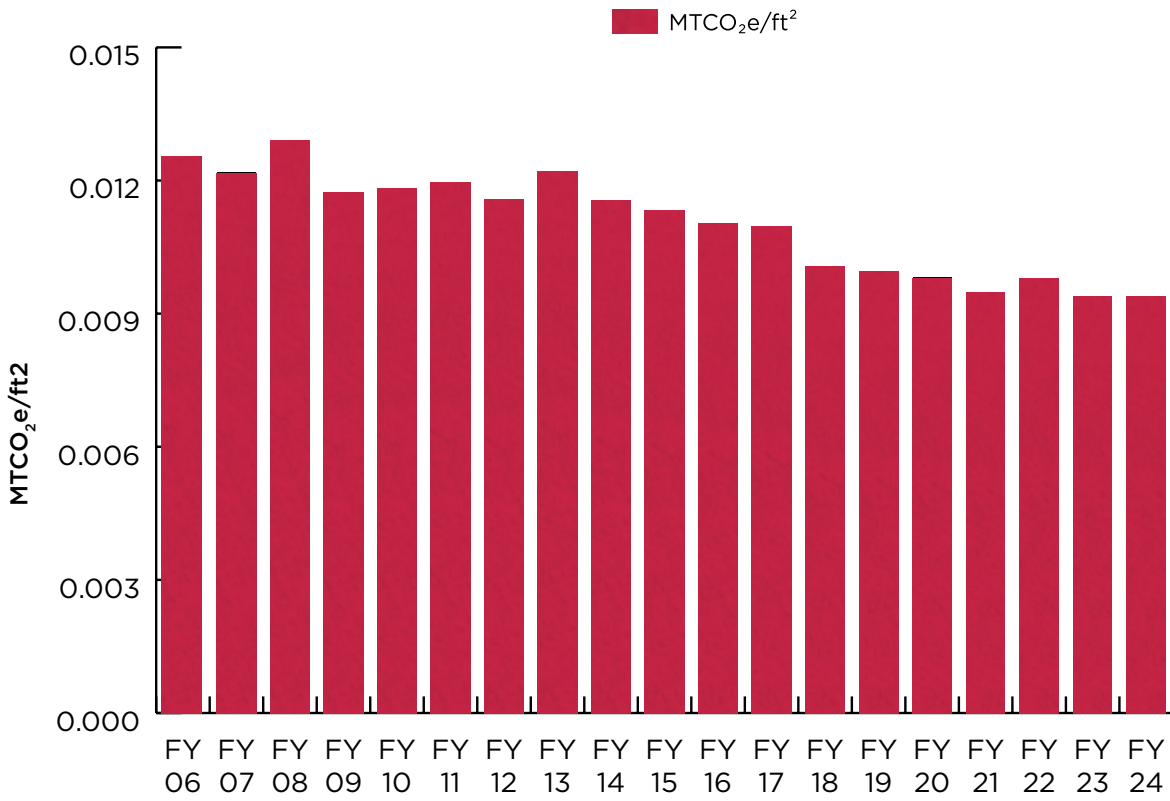


Figure 3. UNM Main Campus greenhouse gas intensity FY06-FY24.

C ONCLUSION

This baseline GHG inventory will be an important tool as the UNM Office of Sustainability engages in developing a five-year strategic plan for UNM’s environmental sustainability efforts. While UNM overall has slightly reduced its GHG emissions over time, accelerating the rate of decarbonization will be required for meaningful cuts to be made. The higher education sector in New Mexico—particularly the state’s flagship higher education institution—is well positioned to research and implement climate solutions that reduce carbon emissions.

GLOSSARY

Metric tonnes CO₂ equivalent (MTCO₂e):

A measure used to compare the emissions from various greenhouse gases on the basis of their global warming potential (GWP). It allows for the expression of emissions and reductions of different gases in a common CO₂ unit. For instance, if a gas is 25 times more effective than CO₂ at trapping heat in the atmosphere, then one metric ton of that gas would be equivalent to 25 metric tons of CO₂, hence its CO₂ equivalent (CO₂e) would be 25. This concept provides a unified framework to account for different gases in terms of their impact on global warming.

Ford Utilities Center:

UNM campus central utility, which has two natural-gas cogeneration units and has the capacity to produce 219,000 pounds of steam per hour, 4,000 tons of chilled water, 14 megawatts of electricity, and compressed air.

Scope 1 emissions:

Carbon emissions resulting directly from fuel sources owned or controlled by an organization.

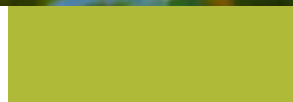
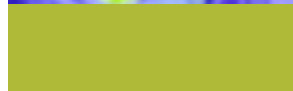
Scope 2 emissions:

Indirect greenhouse gas emissions that result from the generation of energy that an organization purchases and uses.

Stationary emissions sources:

Stationary emissions sources are large, fixed sources of air emissions and include power plants, refineries, and factories. For the purposes of this inventory, they include the two co-generation turbines at the Ford Utilities Center and associated boilers.

NOTES







GREENHOUSE GAS
INVENTORY
2024