



Institutional Greenhouse Gas (GHG) Emissions Inventory

Statement of Purpose

This document has been prepared by Universidad de Las Américas (UDLA) **exclusively for the purposes of reporting to the STARS (Sustainability Tracking, Assessment & Rating System) framework**. The content herein is **entirely based on the official Greenhouse Gas (GHG) Inventory developed in accordance with the ISO 14064-1:2018 standard**, as conducted by an external consulting firm contracted by the university.

The information provided reflects the verified emissions data for the baseline year 2022 and the reporting year 2023, and serves as an institutional summary aligned with international best practices in sustainability reporting.

Universidad de Las Américas (UDLA) – GHG Inventory Report 2022 (Baseline Year) and 2023
In accordance with ISO 14064-1:2018 standard

1. General Information

Institution Name: Universidad de Las Américas (UDLA)

Location: Quito, Ecuador

Report Prepared by: Environmental Management Office

Reference Standard: ISO 14064-1:2018

Inventory Type: Institutional GHG Inventory (including Scopes 1, 2, and 3)

Evaluation Years:

- Baseline Year: 2022

- Reporting Year: 2023



2. Organizational Boundaries

The inventory covers the following operational units:

- UDLA Park
- Granados Campus
- Colón Campus

These facilities represent the main academic, administrative, and operational centers of the university. Emissions are categorized under Scopes 1, 2, and 3 according to international methodology.

3. Reported GHG Emissions

Table 1. GHG Emissions 2022 & 2023

Category	Baseline Year 2022	Reporting Year 2023
Scope 1 – Direct emissions:		
Stationary combustion (boilers, generators)	59.14 tCO ₂ e	51.44 tCO ₂ e
Mobile combustion (UDLA vehicles)	75.62 tCO ₂ e	83.79 tCO ₂ e
Scope 1 Subtotal	134.76 tCO ₂ e	135.23 tCO ₂ e
Scope 2 – Indirect emissions:		
Purchased electricity	527.29 tCO ₂ e	514.84 tCO ₂ e
Scope 2 Subtotal	527.29 tCO ₂ e	514.84 tCO ₂ e
Scope 3 – Other indirect emissions:		
Refrigerant gas leaks	4.27 tCO ₂ e	4.77 tCO ₂ e
External transport (taxis, buses)	11.85 tCO ₂ e	10.38 tCO ₂ e
Waste generation	50.75 tCO ₂ e	56.85 tCO ₂ e
Paper consumption	52.15 tCO ₂ e	55.86 tCO ₂ e
Water supply and wastewater	—	—
Scope 3 Subtotal	119.02 tCO ₂ e	127.86 tCO ₂ e
TOTAL EMISSIONS (1+2+3)	781.07 tCO ₂ e	777.93 tCO ₂ e



The university applied the ISO 14064-1:2018 standard, which sets clear principles for quantifying and reporting greenhouse gas (GHG) emissions. Using 2022 as a baseline, year-over-year performance was evaluated based on standardized emission factors and primary data from operational units. This data included electricity and fuel consumption, paper use, waste generation, and both institutional and external transport. All emissions were calculated and reported in metric tons of CO₂ equivalent (tCO₂e), allowing for consistent measurement and highlighting the benefits of emission reduction efforts across various sources.

4. Comparative Greenhouse Gas Emissions Analysis: 2022 vs 2023

This report presents a comparative analysis of Greenhouse Gas (GHG) emissions for the years 2022 and 2023, identifying key emission sources and the impact of implemented reduction initiatives.

Table 2: GHG Emissions Inventory (Including External Factors)

GHG Sources	2022 (Ton CO ₂ eq)	2023 (Ton CO ₂ eq)	Variation (Ton CO ₂ eq)	% Variation
Category 1: Direct GHG Emissions				
Diesel fuel (fixed source generators)	14.03	57.92	43.89	312.8%
Diesel fuel (organization vehicles)	48.90	60.91	12.00	24.5%
Gasoline (organization vehicles)	19.10	14.32	-4.77	-25.0%
LPG (fixed source equipment)	20.09	24.87	4.78	23.8%

Refrigerants use	261.67	75.56	-186.12	-71.1%
Domestic wastewater	19.34	19.93	0.59	3.0%
CO ₂ fire extinguishers	0.96	0.96	0.00	0.0%
CO ₂ incubator tanks	0.10	0.04	-0.06	-60.0%
Composting process	0.02	0.30	0.27	1228.4%
Category 2: Indirect GHG Emissions from Imported Energy				
Electricity consumption	417.32	397.01*	-20.30	-4.9%
Category 3: Indirect GHG Emissions from Products				
Paper consumption	0.20	0.12	-0.09	-43.1%
Recyclable & hazardous waste management	0.42	4.54	4.12	982.1%
Common solid waste management	114.68	114.68	0.00	0.0%
TOTAL	916.83	891.98	-24.86	-

The total GHG emissions in 2023 show a net decrease of 24.86 Ton CO₂ eq compared to 2022. This reduction is primarily due to a 71.1% drop in refrigerant emissions, attributed to improvements in the air conditioning systems. Despite this, increases were recorded in areas influenced by external conditions—particularly the use of diesel generators (+43.89 Ton CO₂ eq) due to the national energy crisis and a rise in hazardous waste emissions (+4.12 Ton CO₂ eq) stemming from the change of waste manager, who now reports carbon emissions. Additionally, composting emissions rose as the zero-waste initiative was fully



implemented. While external factors caused temporary spikes, internal mitigation efforts still resulted in a favorable overall balance.

Table 3: GHG Emissions Inventory (Excluding External Operational Factors)

GHG Sources	2022 (Ton CO ₂ eq)	2023 (Ton CO ₂ eq)	Variation (Ton CO ₂ eq)	% Variation
Category 1: Direct GHG Emissions				
Diesel fuel (fixed source generators)	14.03	14.03*	0.00	0.0%
Diesel fuel (organization vehicles)	48.90	60.91	12.00	24.5%
Gasoline (organization vehicles)	19.10	14.32	-4.77	-25.0%
LPG (fixed source equipment)	20.09	24.87	4.78	23.8%
Refrigerants use	261.67	75.56	-186.12	-71.1%
Domestic wastewater	19.34	19.93	0.59	3.0%
CO ₂ fire extinguishers	0.96	0.96	0.00	0.0%
CO ₂ incubator tanks	0.10	0.04	-0.06	-60.0%
Composting process	0.02	0.30	0.27	1228.4%
Category 2: Indirect GHG Emissions from Imported Energy				
Electricity consumption	417.32	397.01*	-20.30	-4.9%
Category 4: Indirect GHG Emissions from Products				
Paper consumption	0.20	0.12	-0.09	-43.1%
Recyclable & hazardous waste management	0.42	4.54	4.12	982.1%
Common solid waste management	114.68	114.68	0.00	0.0%
TOTAL	916.83	727.26*	-189.58	-20.7%



When emissions linked to external, uncontrollable variables (e.g., energy crisis, emission factor changes) are excluded, the total GHG emissions show a more accurate and substantial reduction of 189.58 Ton CO₂ eq, representing a 20.7% decrease. The most significant benefit stems from the drastic drop in refrigerant emissions, confirming the positive impact of the organization's intervention in cooling systems. Moreover, electricity consumption decreased despite operational consistency. This adjusted analysis demonstrates that, under normal operational conditions, the organization's emission reduction initiatives were highly effective, confirming the environmental benefit of the implemented sustainability projects.

5. Mitigation Actions and Impact

During 2023, UDLA implemented several actions that contributed to a net reduction in emissions:

On-site renewable energy generation: 258.24 MWh produced by photovoltaic systems at UDLA Park and Granados.

Optimization of the refrigeration systems on several campuses, reducing losses and refrigerant gas leaks.

Reduction in paper use through administrative process digitalization.

Environmental awareness campaigns targeting the university community.

Donation and reuse of furniture, preventing indirect emissions from improper waste disposal.

These actions resulted in the avoidance of 197.38 tCO₂e in 2023.



6. Performance Indicator – Per Capita GHG Emissions

Table 4: GHG Emissions Per Capita (2022–2023)

Year	Population (persons)	Emissions (Ton CO ₂ eq)	Emissions (kg CO ₂ eq/person)
2022	14,969	916.83	61.25
2023	15,214	727.26	47.80
Change	+1.6%	-20.7%	-22%

The university population (students, staff, and faculty) is a critical indicator for assessing institutional performance, as it directly influences resource consumption and GHG emissions.

These results reflect a significant improvement in the university's environmental efficiency. As the campus community grew, the carbon footprint per individual dropped notably—demonstrating the positive impact of the sustainability strategies implemented and the institution's commitment to reducing its environmental impact.

7. Conclusion

Universidad de Las Américas has developed a comprehensive GHG emissions inventory aligned with ISO 14064-1, covering Scopes 1, 2, and 3, marking a key step in its climate commitment. Between 2022 and 2023, the university achieved a 20.7% reduction in total emissions and a 22% decrease in per capita emissions, despite a growing population. These results reflect improved environmental efficiency and highlight the positive impact of implemented sustainability strategies, laying a solid foundation for future emission reduction targets and informed climate action.