



University
of Sadat City

CARBON Footprint

Third Report 2023



July 2024



Act now, before it is too late.

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TEAMWORK

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Abbreviations & Acronyms

CFP	Carbon Footprint
CH₄	Methane
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
EF	Emission Factors
EFDB	Emission Factor Database
ESRI	Environmental Studies and Research Institute
FCAI	Faculty of Computers and Artificial Intelligence
GEBRI	Genetic Engineering and Biotechnology Research Institute
GHGs	Greenhouse Gases
GWP	Global warming potential
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
kwh	kilowatt-hour
LPG	Liquefied petroleum gas
NG	Natural Gas
N₂O	Nitrous oxide
ODP	Ozone Depletion Potential
PFCs	Perfluorocarbons
SF₆	Sulphur hexafluoride
tCO_{2e}	tons of Carbon Dioxide Equivalent
T&D	Transmission and distribution
USC	University of Sadat City

01

INTRUDUCTION



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1. INTRODUCTION

1.1 Climate Change

Based on multiple independent analyses of measurements for multiple complementary indicators, it is virtually certain that the climate is changed since the mid-20th century; land surface air temperature increased, sea-surface, and marine air temperature increased, and hence sea level increased, summer arctic sea-ice decreased ... etc. as shown in figure (1-1). ⁽¹⁾

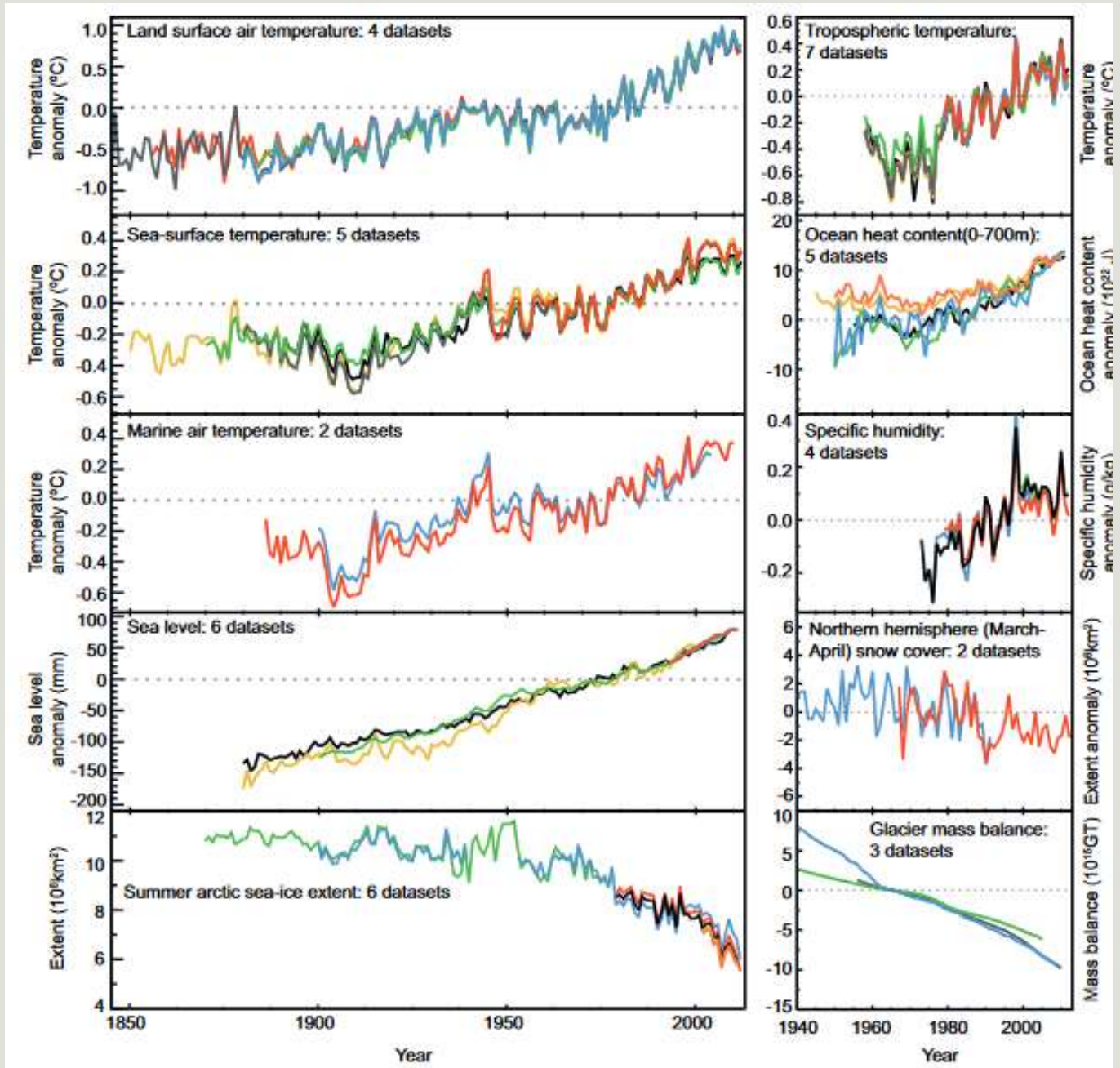


Figure 1-1 Multiple complementary indicators of a changing global climate ⁽¹⁾

According to our response, these changes in global mean temperature may be increased to a catastrophic level or it will be slowed to +1.5 °C only as shown in Figure (1-2). ⁽²⁾

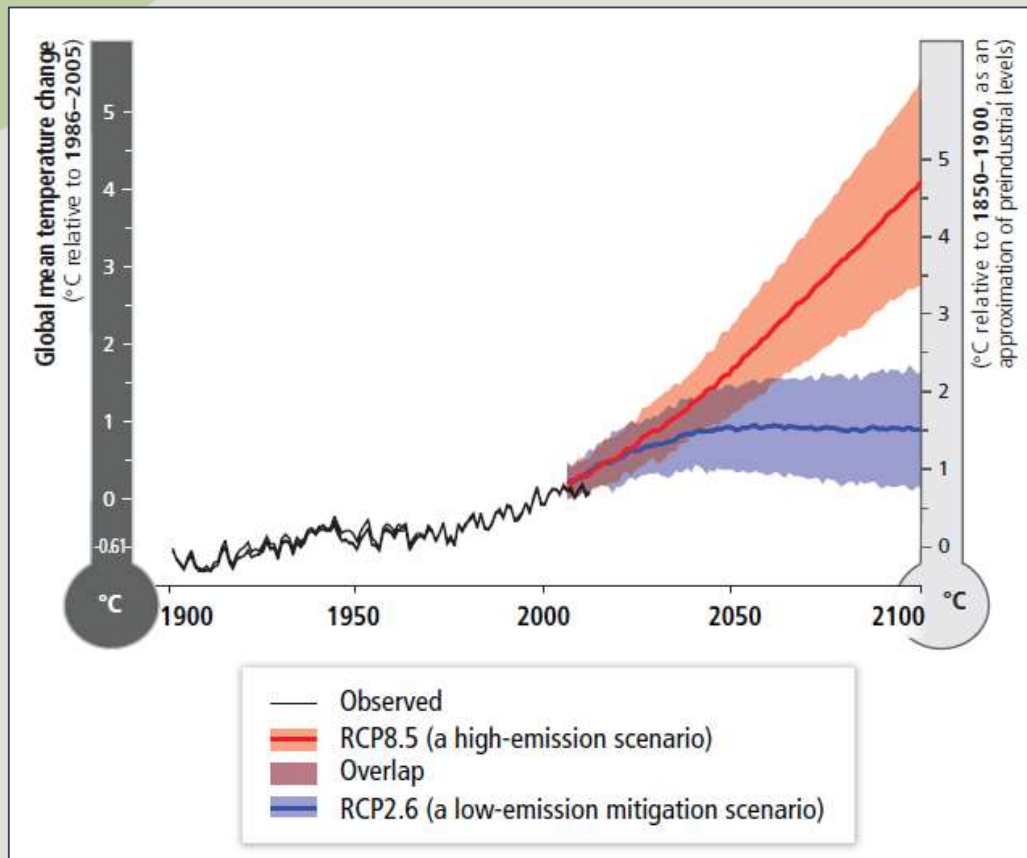


Figure 1-2 Global mean temperature change till 2100 at different scenarios ⁽²⁾

If no serious actions are taken for mitigation and adaptation; several risks would be threatening humanity and the whole ecosystem such as:

- Death, injury, and disruption to livelihoods, food supplies, and drinking water Loss of common-pool resources, sense of place, and identity, especially among indigenous populations in rural coastal zones.
- Death, injury, and disruption of human security, especially among children, elderly, and disabled persons.
- Increased mortality and morbidity during periods of extreme heat.
- Loss of agricultural productivity (Risk of food insecurity).
- Destruction of livelihoods particularly for those depending on water-intensive agriculture.
- Loss of coral cover, Arctic species, and associated ecosystems with reduction of biodiversity and potential losses of important ecosystem services.
- Risk of loss of endemic species, mixing of ecosystem types, and increased dominance of invasive organisms.
- Reduction of biodiversity and potential losses of important ecosystem services.
- Risk of loss of endemic species, mixing of ecosystem types, and increased dominance of invasive organisms. ⁽²⁾

1.2 University Overview



Figure 1-3 University of Sadat City

The University of Sadat City (USC) is an Egyptian Public University conveniently located in Sadat city, north-western of Cairo. USC was initially established as several faculties affiliated with Menofia University during the period from 1993 to 2007, then was adopted as a branch of Menofia University from 2007 to 2013. In 2013, USC's Campus was founded by the presidential decree on the 25th of March. The following data represent 2023 stats about USC. Detailed survey of faculties and scientific research institutes, staff, and students is shown in Table (2-1).



9 Faculties



2 Research Institutes



1013
Academic Staff



39,055 Students
(Undergraduate
& Postgraduate)



1,270
Non-academic Staff

Table 1-1 Survey of academic, non academic staff, and students of USC (2023)

Faculty/Institute/Organization	Academic Staff	Students	Non-academic Staff
Faculty of Pharmacy	65	433	44
Faculty of Veterinary Medicine	142	1211	102
Faculty of Computers and Artificial Intelligence (FCAI)	22	620	25
Genetic Engineering and Biotechnology Research Institute (GEBRI)	130	701	101
Environmental Studies and Research Institute (ESRI)	59	1,442	50
Faculty of Commerce	28	8,492	81
Faculty of Education	22	4,806	64
Faculty of Physical Education	219	3,920	55
Faculty of Education for Early Childhood	21	2000	27
Faculty of Law	56	11287	59
Faculty of Tourism & Hotels	67	1,046	103
University Administration	603
University Housing	247	3530	...
Total (2023)	1,013	39,055	1,270

02

METHODOLOGY



image: Freepik.com

2. METHODOLOGY

2.1 Carbon Footprint (CFP)

The six regulated greenhouse gases (GHGs) are Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF₆). The total set of greenhouse gases emissions caused directly and indirectly by an individual, organization, event, or product is commonly called their **Carbon Footprint (CFP)**. Establishing CFP of an organization can be the 1st step in a program to reduce the emissions it causes. ⁽³⁾

Greenhouse gas emissions can be classified into three main types (Figure 2-1), and can be calculated using the following equation:

$$\text{GHG emissions (CO}_2\text{e)} = \text{activity data (unit)} \times \text{emissions factor (CO}_2\text{e/ unit)}$$

Calculating an organization's carbon footprint can be an effective tool for ongoing energy and environmental management. Having quantified the emissions, opportunities for reduction can be identified and prioritized, focusing on the areas of greatest savings potential ⁽³⁾.

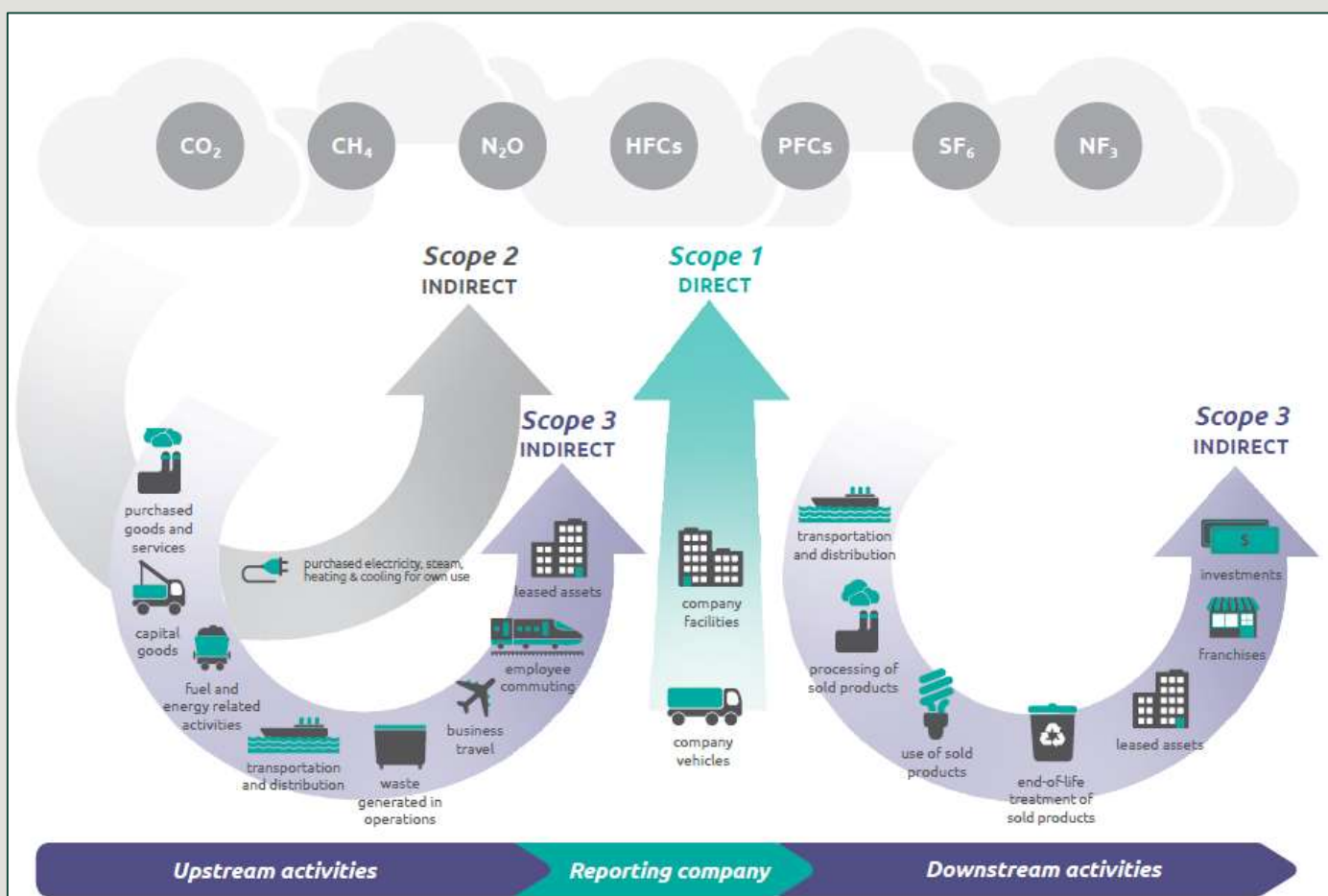


Figure 2-1 Overview of GHG Protocol scopes and emissions across the value chain ⁽⁴⁾

2.2 Reporting Period & Operational Boundaries

Calculations of the CFP for USC included the calendar year from 01-01-2023 to 31-12-2023 for the GHGs sources shown in Table (2-1).

Table 2-1 GHGs sources included in CFP calculations for USC and used emission factors

Scopes	Included GHGs sources	Emission Factors
Scope I	Owned Vehicles	2.626 kg CO ₂ e/ liter of diesel ⁽⁵⁾
		2.331 kg CO ₂ e/ liter of Petrol ⁽⁵⁾
	Generator	2.626 kg CO ₂ e/ liter of diesel ⁽⁵⁾
		1.555 kg CO ₂ e/ liter of LPG ⁽⁵⁾
	Cookers	2.016 kg CO ₂ e/ m ³ of NG ⁽⁵⁾
		2.626 kg CO ₂ e/ liter of diesel ⁽⁵⁾
	Agricultural tractors	2,088 kg CO ₂ e/ kg of R-410a ⁽⁵⁾
		1,760 ^(*) kg CO ₂ e/ kg of R-22 ⁽⁵⁾
	Fertilizers	0.01 kg N ₂ O/kg N ⁽⁶⁾
		Livestock
	55 kg CH ₄ /head/year ⁽⁷⁾	
32 kg CH ₄ /head/year ⁽⁷⁾		
8 kg CH ₄ /head/year ⁽⁷⁾		
5 kg CH ₄ /head/year ⁽⁷⁾		
Scope II	Electricity Consumption	0.518 kg CO ₂ e/ kwh ^(**)
Scope III	Purchased goods (Paper)	910.48 kg CO ₂ e/ ton ⁽⁵⁾
	Transmission and distribution (T&D) losses	10.00% ^(***)

(*) Although the global warming potential (GWP) of R22 is less than R410a, it is not the environmentally preferred option as R22 is a hydrochlorofluorocarbon (HCFC) which reach the stratosphere where they deplete the stratospheric ozone layer, while R410 is a hydrofluorocarbon (HFC) and have zero Ozone Depletion Potential (ODP) because they do not contain chlorine ^{(9), (10)}.

(**) There is no official emission factor for electricity consumption from Egyptian grid, and this emission factor used by different organization in CFP reporting.

(***) Specific for electricity grid in Egypt ⁽⁸⁾

03

RESULTS



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3. RESULTS

3.1 Scope I

3.1.1 University Fleet

The USC fleet consumed 180,174 liters of diesel and 214,233 liters of petrol (gasoline) as shown in table (3-1) causing GHGs emissions reached to **972.471 tCO₂e** which represented **50.9%** of scope I emissions in 2023. In comparison with 2022 report, GHGs emissions from USC fleet in 2023 increased as shown in figure (3-1).

Table 3-1 GHGs Emissions (tCO₂e) from university fleet | USC | 2023

Faculty/ Institute	Vehicles	No.	Consumption	GHGs Emissions
F. of Pharmacy	Private Car (Petrol)	1	6,350	499.334 tCO₂e
F. of Veterinary Medicine	Private Car (Petrol)	1	6,730	
FCAI	Private Car (Petrol)	1	6,000	
GEBRI	Private Car (Petrol)	1	2,500	
ESRI	Private Car (Petrol)	2	7,200	
F. of Commerce	Private Car (Petrol)	1	3,078	
F. of Education	Private Car (Petrol)	1	5,695	
F. of Physical Education	Private Car (Petrol)	1	6,000	
F. of Early Childhood Education	Private Car (Petrol)	13	12,0000	
F. of Law	Private Car (Petrol)	1	3,080	
F. of Tourism & Hotels	Private Car (Petrol)	1	6,000	
University administration	Private Car (Petrol)	13	6,350	
	Buses 52 (Diesel)	8		
	Buses 28 (Diesel)	19		
	Minibus 14 (Diesel)	10	180174	
	Trucks (Diesel)	10		
University Housing	Ambulances (Diesel)	2		
	Truck (Diesel)	1	1,500	

Note: Only private cars were added to each faculty/institute, but other vehicles added only to university administration to prevent duplicate account.

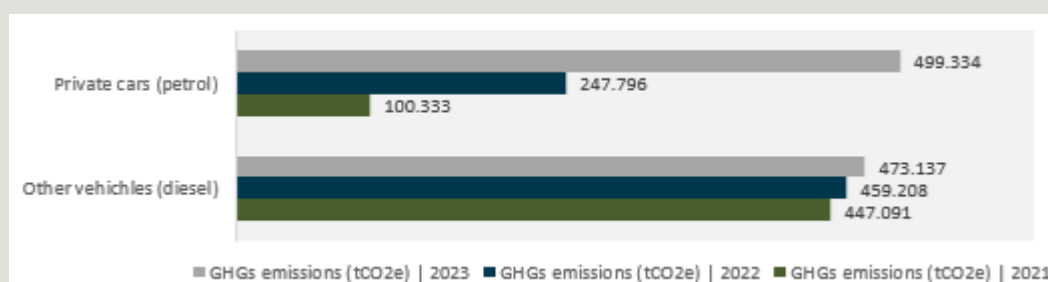


Figure 3-1 GHGs Emissions (tCO₂e) from university fleet | USC | 2021, 2022, and 2023

3.1.2 Generators

During 2023, generators consumed 8,794 liters of diesel as shown in table (3-2) causing GHGs emissions that didn't exceed **23.093 tCO₂e** (represent **1.22%** only of scope I emissions in 2023). In comparison with 2022, reported GHGs emissions from generator increased as shown in figure (3-2).

Table 3-2 GHGs Emissions (tCO₂e) from generators | USC | 2023

Faculty/ Institute	Diesel consumption	GHGs Emissions
F. of Pharmacy	Not reported	
F. of Veterinary Medicine	Not reported	
FCAI	144	
GEBRI	650	
ESRI	Not reported	
F. of Commerce	2,000	
F. of Education	Not reported	23.093 tCO₂e
F. of Physical Education	Not reported	
F. of Early Childhood Education	Not reported	
F. of Law	3,600	
F. of Tourism & Hotels	300	
University administration	1,100	
University Housing	1,000	

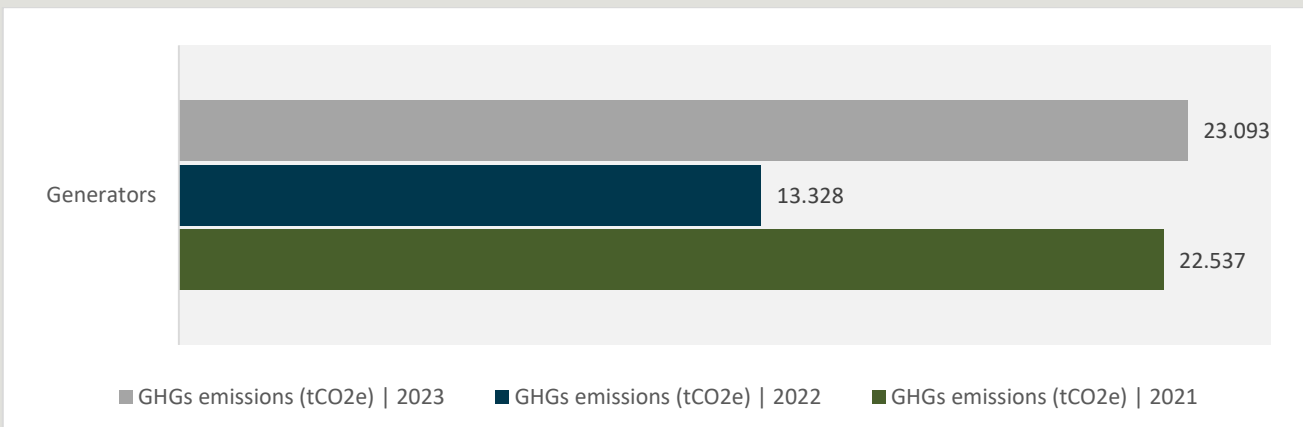


Figure 3-2 GHGs Emissions (tCO₂e) from generators / USC | 2021, 2022, and 2023

3.1.3 Cookers

During 2023, 6,735 liters of LPG and 10,000 liters of NG were consumed by cookers as shown in table (3-3) causing GHGs emissions of **527.374 tCO₂e** (represent **27.85 %** of scope 1 emissions in 2023). GHGs emissions from cookers in 2023 decreased in comparison to 2022 report as shown in figure (3-3).

Table 3-3 GHGs Emissions (tCO₂e) from cookers | USC | 2023

Faculty/ Institute	Fuel type	Consumption	GHGs Emissions
F. of Pharmacy	LPG	150	
F. of Veterinary Medicine	LPG	Not reported	
FCAI	LPG	180	
GEBRI	LPG	1,440	
ESRI	LPG	360	
F. of Commerce	LPG	500	
F. of Education	LPG	1,440	10.473 tCO₂e
F. of Physical Education	LPG	360	
F. of Early Childhood Education	LPG	240	
F. of Law	LPG	90	
F. of Tourism & Hotels	LPG	330	
University administration	LPG	1,645	
University Housing	LPG	180	
	NG	10000	20.160 tCO₂e

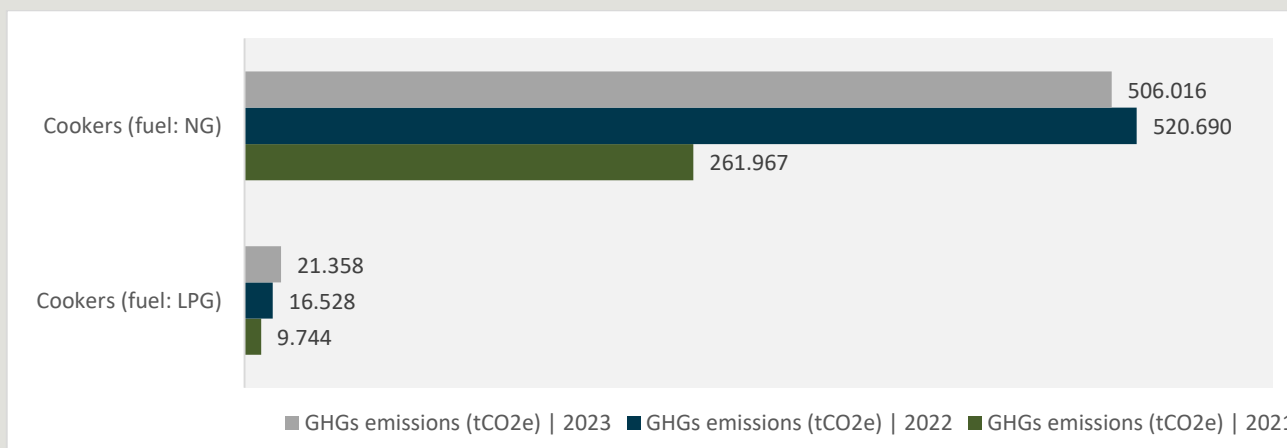


Figure 3-3 GHGs Emissions (tCO₂e) from cookers | USC | 2021, 2022, and 2023

3.1.4 Air Conditioners

In 2023, 131.82 kg of R22 and 28 kg of R410a leaked from air conditioners as shown in table (3-4) and increased carbon footprint of USC by **290.467 tCO₂e** (represent **15.34%** of scope 1 emissions in 2023). GHGs leakage from AC in 2023 decreased in comparison to 2022 report as shown in figure (3-4).

Table 3-4 GHGs leakage from ACs (tCO₂e) | USC | 2023

Faculty/ Institute	Freon type	Consumption	GHGs Emissions
F. of Pharmacy	R22	Not reported	290.467 tCO₂e
F. of Veterinary Medicine	R22	Not reported	
FCAI	R22	Not reported	
GEBRI	R22	15	
ESRI	R22	76	
F. of Commerce	R22	28.2	
	R410a	65.8	
F. of Education	R22	4.5	
F. of Physical Education	R22	4.32	
F. of Early Childhood Education	R22	Not reported	
F. of Law	R22	1	
F. of Tourism & Hotels	R22	3.6	
University administration	R22	3	
University Housing	R22	Not reported	

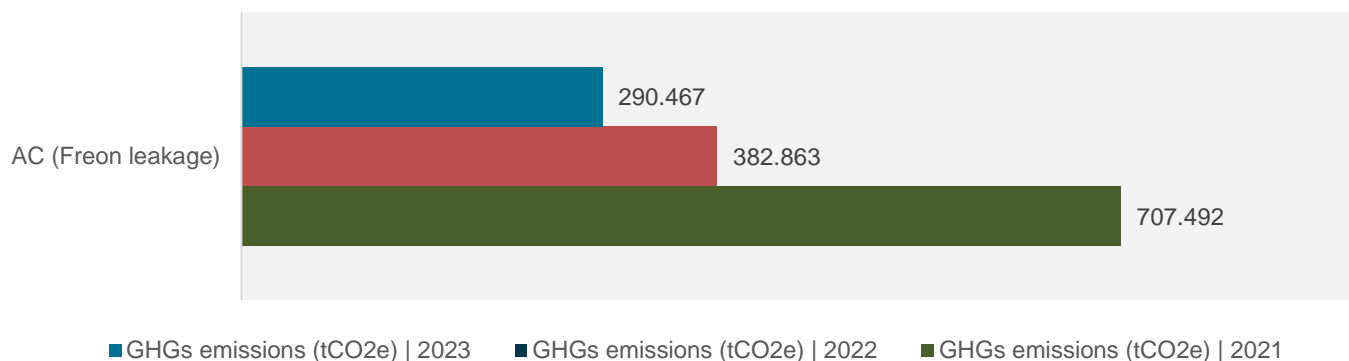


Figure 3-4 GHGs leakage from ACs (tCO₂e) | USC | 2021, 2022, and 2023

3.1.5 Agricultural tractors

In 2023, 4045 liters of diesel were consumed by agricultural tractors as shown in table (3-5) and increased carbon footprint of USC by **12.342 tCO₂e** (represent **0.65 %** of scope I emissions in 2023). GHGs emissions from tractors in 2023 decreased in comparison to 2022 report as shown in figure (3-5).

Table 3-5 GHGs Emissions (tCO₂e) from agricultural tractors | USC | 2023

Faculty/ Institute	Diesel Consumption	GHGs Emissions
F. of Pharmacy	--	
F. of Veterinary Medicine	2600	
FCAI	--	
GEBRI	500	
ESRI	1150	
F. of Commerce	--	
F. of Education	--	12.342 tCO₂e
F. of Physical Education	--	
F. of Early Childhood Education	--	
F. of Law	--	
F. of Tourism & Hotels	--	
University administration	400	
University Housing	--	

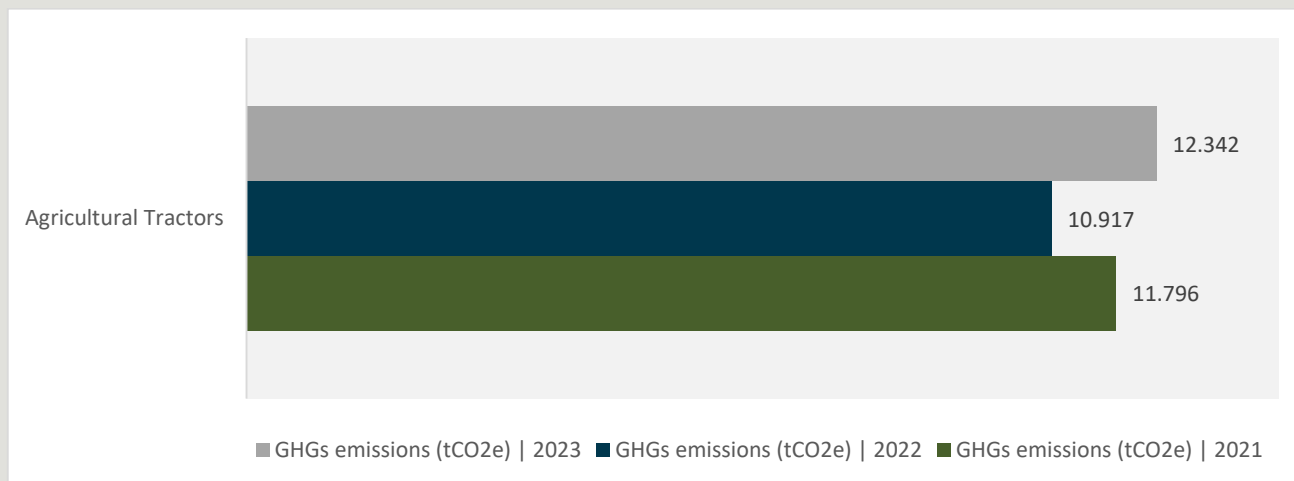


Figure 3-5 GHGs emissions from agricultural tractors (tCO₂e) | USC | 2021, 2022, and 2023

3.1.6 Synthetic fertilizers

In 2023, 18812 kg of fertilizers were consumed in the USC farms as shown in table (3-6) and caused emissions of N₂O equivalent to **12.79 tCO₂e** (*) (represent **0.68 %** of scope I emissions in 2023). GHGs emissions from fertilizers in 2023 increased in comparison to those reported in the 2022 as shown in figure (3-6).

(*) In this report, Global Warming Potential (GWP) of N₂O = 273 (according to AR6 of IPCC) ⁽¹¹⁾.

Table 3-6 GHGs emissions from used fertilizers (tCO₂e) | USC | 2023

Faculty/ Institute	Fertilizer type	Consumption	GHGs Emissions
F. of Pharmacy	---	---	3.49 tCO₂e
F. of Veterinary Medicine	Urea (46.5% N)	1000	
	Granul Super Phosphate (0% N)	1000	
FCAI	---	---	
GEBRI	Ammonium Nitrate (33% N)	500	
	Urea (46.5% N)	250	
	Calcium Nitrate (12% N)	100	
	Magnesium sulphate (20% N)	125	
	Phosphoric acid (85% N)	200	
	Nitric acid (50% N)	125	
ESRI	Compound fertilizers (33% N)	5000	
	Ammonia nitrate (19% N)	10000	
F. of Commerce	---	---	
F. of Education	---	---	
F. of Physical Education	---	---	
F. of Early Childhood Education	---	---	
F. of Law	---	---	
F. of Tourism & Hotels	---	---	
University administration	Humic Acid (0% N)	3	
	Agricultural sulfur (0% N)	5	

	Urea (46% N)	250
	Granual Super Phosphate (0% N)	250
	N.P.K (5% N)	1
	N.P.K (18% N)	1
	N.P.K (19% N)	1
	N.P.K (20% N)	1
University Housing	---	---

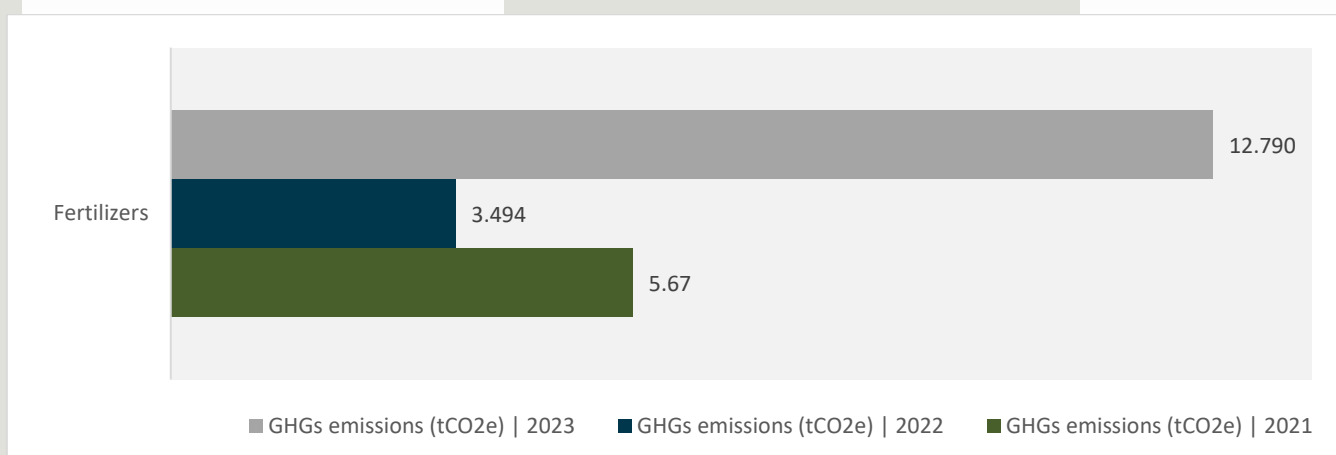


Figure 3-6 GHGs emissions from used fertilizers (tCO_{2e}) | USC | 2021, 2022, and 2023

3.1.7 Livestock

Methane (CH₄) is emitted as a by-product of the normal livestock digestive process. In 2023, **73.66 tCO_{2e}** (represent **3.89 %** of scope I emissions in 2023) were emitted from livestock in the farm of faculty of veterinary medicine as shown in table (3-7). GHGs emissions from Livestock in 2023 increased in comparison to those reported in the 2022 as shown in figure (3-7).

Table 3-7 GHGs emissions related to livestock (tCO_{2e}) | USC | 2023

Faculty/ Institute	Livestock	Number	GHGs Emissions
F. of Veterinary Medicine	Camels	1	2728 kg CH ₄ = 73.66 tCO_{2e} (*)
	Buffaloes	18	
	Cows	41	
	Sheep	35	
	Goats	20	

(*) In this report, Global Warming Potential (GWP) of CH₄ for in 100 years = 27 (according to AR6 of IPCC) ⁽¹¹⁾.

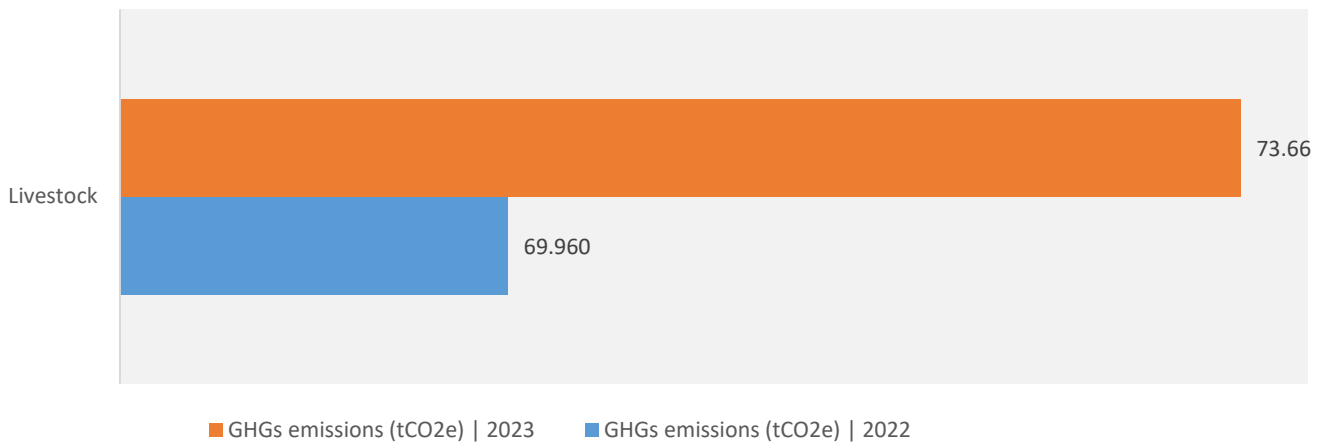


Figure 3-7 GHGs emissions from Livestock (tCO_{2e}) | USC | 2022, and 2023

3.2 Scope II

3.2.1 Electricity Consumption

In 2023, total electricity consumption in USC reach to 2,437,382.99 kwh which represented about **1,262.564 tCO_{2e}**. Contribution of each faculty/ institute in scope II is shown in table (3-8). GHGs emissions from electricity consumption in 2023 Decreased in comparison to those reported in the 2022 as shown in figure (3-8).

Table 3-8 GHGs Emissions (tCO_{2e}) from electricity consumption | USC | 2023

Faculty/ Institute	Consumption (kwh)	GHGs Emissions
F. of Pharmacy	75,000.00	1,262.564 tCO_{2e}
F. of Veterinary Medicine	44,000.00	
FCAI	143,525.33	
GEBRI	144,725.33	
ESRI	68,508.00	
F. of Commerce	178,268.00	
F. of Education	82,350.00	
F. of Physical Education	126,796.20	
F. of Early Childhood Education	104,502.50	
F. of Law	178,268.00	
F. of Tourism & Hotels	143,525.33	
University administration	347,914.29	
University Housing	800,000.00	

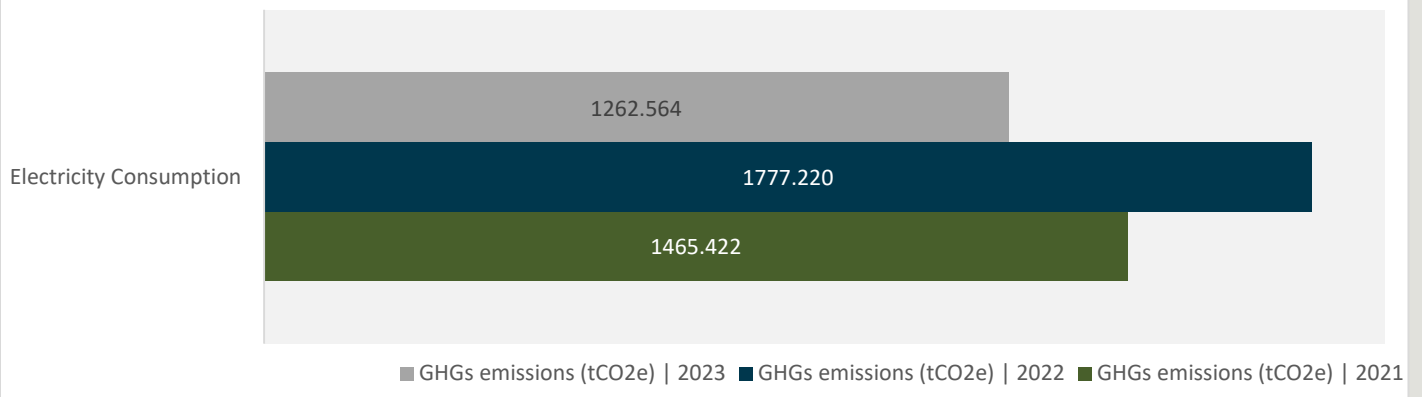


Figure 3-8 GHGs emissions from electricity consumption (tCO_{2e}) | USC | 2021, 2022, and 2023

3.3 Scope III

Scope 3 includes indirect emissions from activities related to the university. Its categories are shown in table (3-9). In 2023, scope III is calculated only for paper production and T&D loss.

Table 3-9 Included categories of Scope III in 2023 report

No.	Category	Status	2023 Report
1	Purchased goods and services	partially calculated	Paper production
2	Capital goods	not included	
3	Fuel-and-energy-related activities (Not included in Scope 1 or 2)	partially calculated	T&D loss
4	Upstream transportation and distribution	not included	
5	Waste generated in operations	not included	
6	Business travel	not included	
7	Employee commuting	not included	
8	Upstream leased assets	not relevant	
9	Downstream transportation and distribution	not relevant	
10	Processing of sold products	not relevant	
11	Use of sold products	not relevant	
12	End of life treatment of sold products	not relevant	
13	Downstream leased assets	not relevant	
14	Franchises	not relevant	
15	Investments	not relevant	

3.3.1 Paper Consumption

In 2023, 103.36 ton of paper were consumed according to reported data as shown in table (3-10). Production of that amount of paper emitted GHGs emissions up to **94.106 tCO_{2e}**. In addition, Yield of pulp/ pine tree assumed to be 530 kg, and hence **195 trees** were cut down in 2023 to produce this amount of paper.

Table 3-10 GHGs Emissions (tCO_{2e}) from paper consumption | USC | 2023

Faculty/ Institute	Consumption	GHGs Emissions
F. of Pharmacy	200000 (A4 sheets)	94.106 tCO_{2e}
	12500 (A3 sheets)	
	2500 (Exam booklets)	
F. of Veterinary Medicine	125000 (A4 sheets)	
	2500 (A3 sheets)	
	75000 (Exam booklets)	
FCAI	50000 (A4 sheets)	
	6000 (A3 sheets)	
	80000 (Exam booklets)	
GEBRI	110000 (A4 sheets)	
	6000 (A3 sheets)	
	20000 (Exam booklets)	
ESRI	55000 (A4 sheets)	
	5000 (A3 sheets)	
	37000 (Exam booklets)	
F. of Commerce	700000 (A4 sheets)	
	50000 (A3 sheets)	
	375000 (Exam booklets)	
F. of Education	400000 (A4 sheets)	
	57500 (A3 sheets)	
	145000 (Exam booklets)	
F. of Physical Education	400000 (A4 sheets)	

	111589 (Exam booklets)
	200000 (A4 sheets)
F. of Early Childhood Education	25000 (A3 sheets)
	30000 (Exam booklets)
	500000 (A4 sheets)
F. of Law	26000 (A3 sheets)
	13000 (Exam booklets)
	125000 (A4 sheets)
F. of Tourism & Hotels	5000 (A3 sheets)
	105000 (Exam booklets)
	2500000 (A4 sheets)
University administration	50000 (A3 sheets)
	100000 (A4 sheets)
University Housing	5000 (A3 sheets)
	5000 (Exam booklets)

Note: Weight of A4 sheet assumed to be ≈ 5 g, A3 ≈ 10 g, and exam booklet ≈ 75 g.

3.3.2 T&D loss

Transmission, and distribution (T&D) loss in Egyptian electricity grid reach to 10.0% according to world bank. And hence, T&D related to electricity consumption in USC was **122.371 tCO_{2e}**.

04

SUMMARY



4. SUMMARY

Carbon footprint of University of Sadat City was calculated for 2023. Scope I included university fleet, generators, cookers, air conditioners, agricultural tractors, synthetic fertilizers, and livestock. Scope II included electricity consumption only. Scope I & II was **3155.986 tCO₂e** (\approx 81 kg/ student). Detailed contribution of each source is shown in figure (4-1). Compared to 2022 CFP (scope I & II) decreased by 346.014 tCO₂e as shown in figure (4-2).

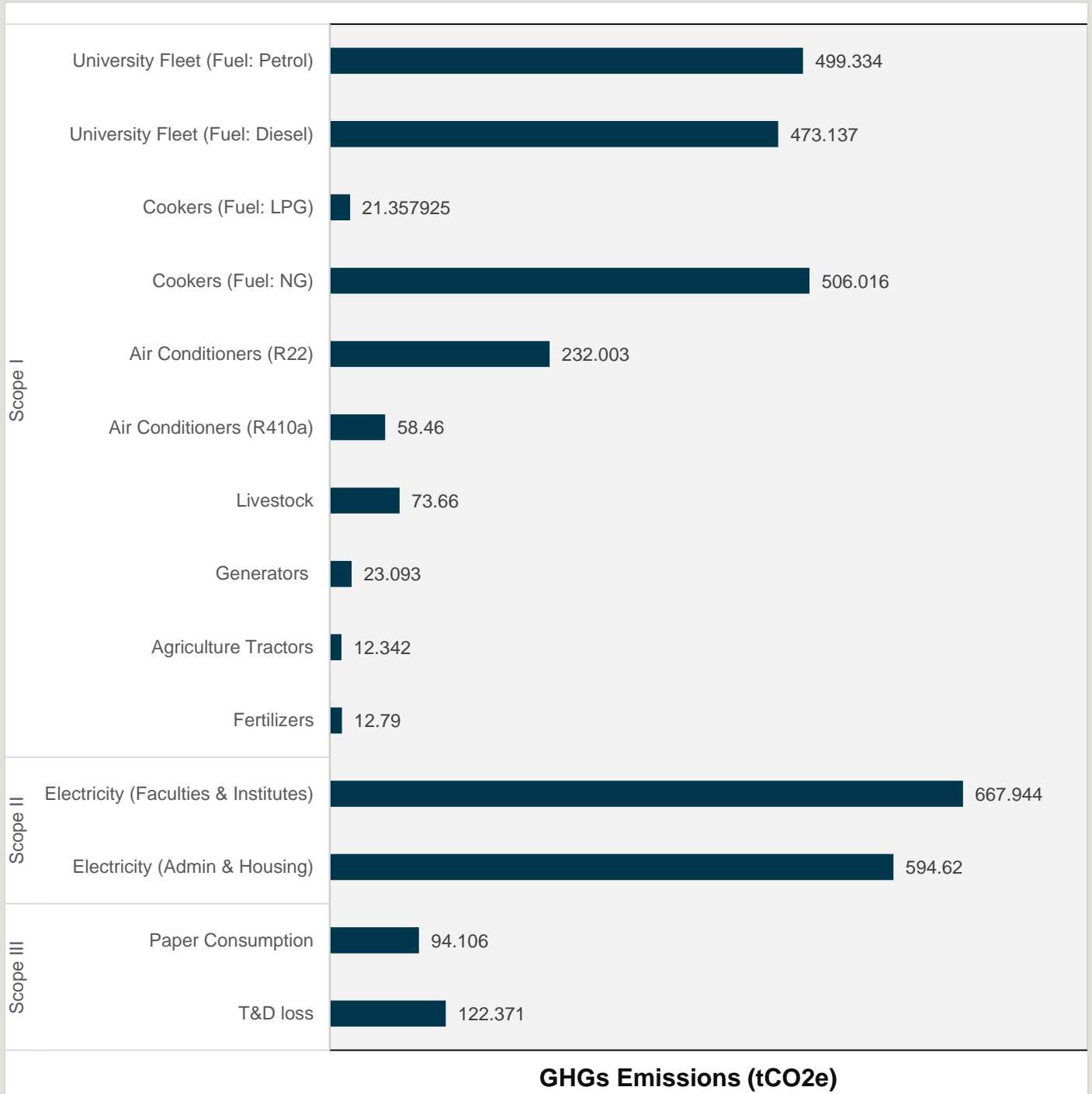


Figure 4-1 GHGs emissions from different sources (tCO₂e) | USC | 2023

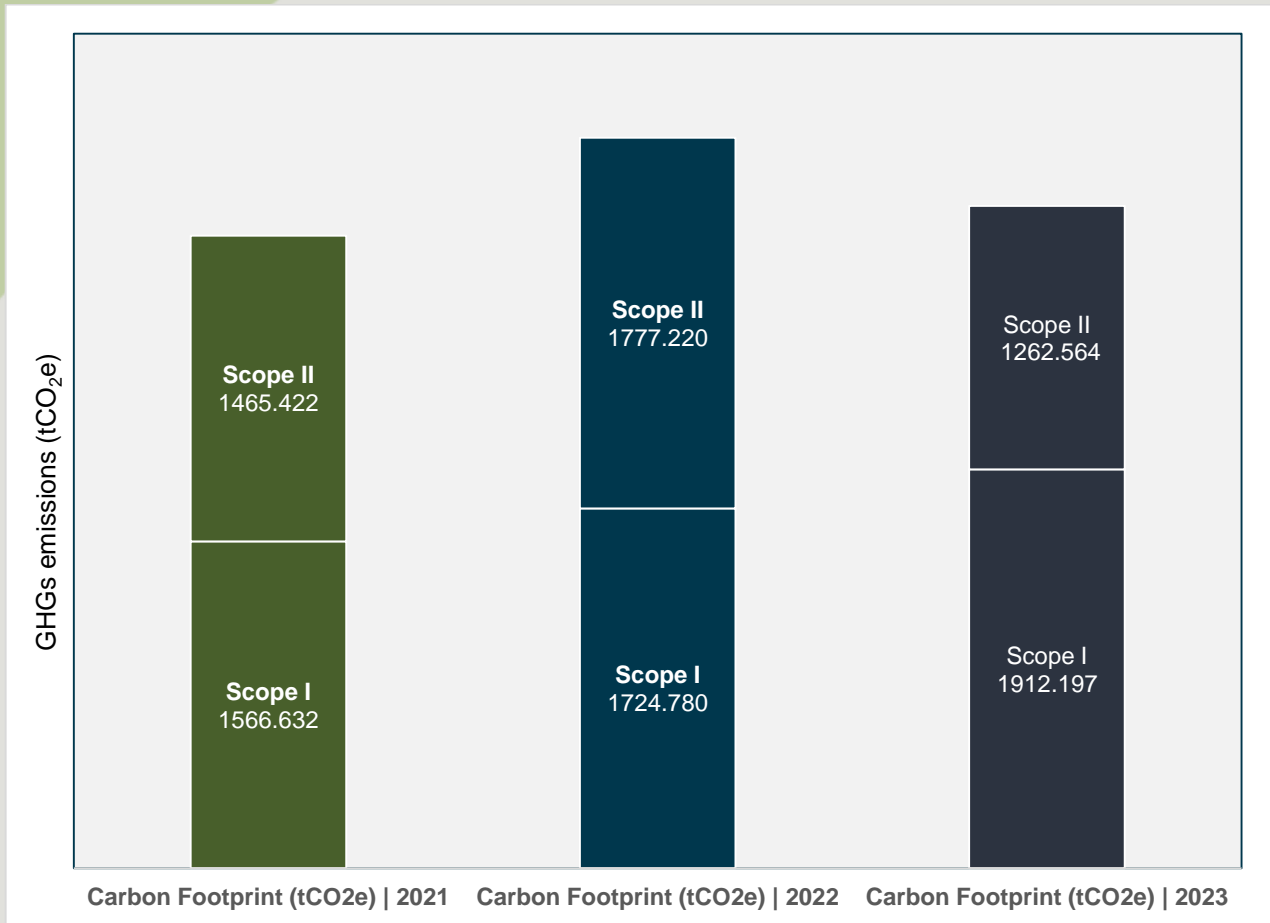


Figure 4-2 Carbon Footprint of USC(tCO₂e) in 2021, 2022, and 2023

To determine the contribution of each faculty/institute in the overall carbon footprint of USC, results were recollected for each college separately as shown in table (4-1), and figure (4-3). The results showed that **university housing** had the highest carbon footprint in the university in 2023 (representing **32.46 %** of the carbon footprint of the university), while **faculty of pharmacy** had the lowest carbon footprint in 2023 (represent **2.12 %** of the USC carbon footprint) according to the reported data.

Table 4-1 Carbon footprint of each faculty/ institute | USC | 2023

Faculty/ Institute	CFP (Scope I & II) tCO ₂ e	Percentage (%)
F. of Pharmacy	61.03	2.12%
F. of Veterinary Medicine	139.16	4.83%
FCAI	88.99	3.09%
GEBRI	98.26	3.41%
ESRI	205.56	7.13%
F. of Commerce	202.85	7.04%
F. of Education	66.09	2.29%

F. of Physical Education	87.83	3.05%
F. of Early Childhood Education	334.20	11.60%
F. of Law	110.88	3.85%
F. of Tourism & Hotels	97.33	3.38%
University administration	454.19	15.76%
University Housing	935.43	32.46%

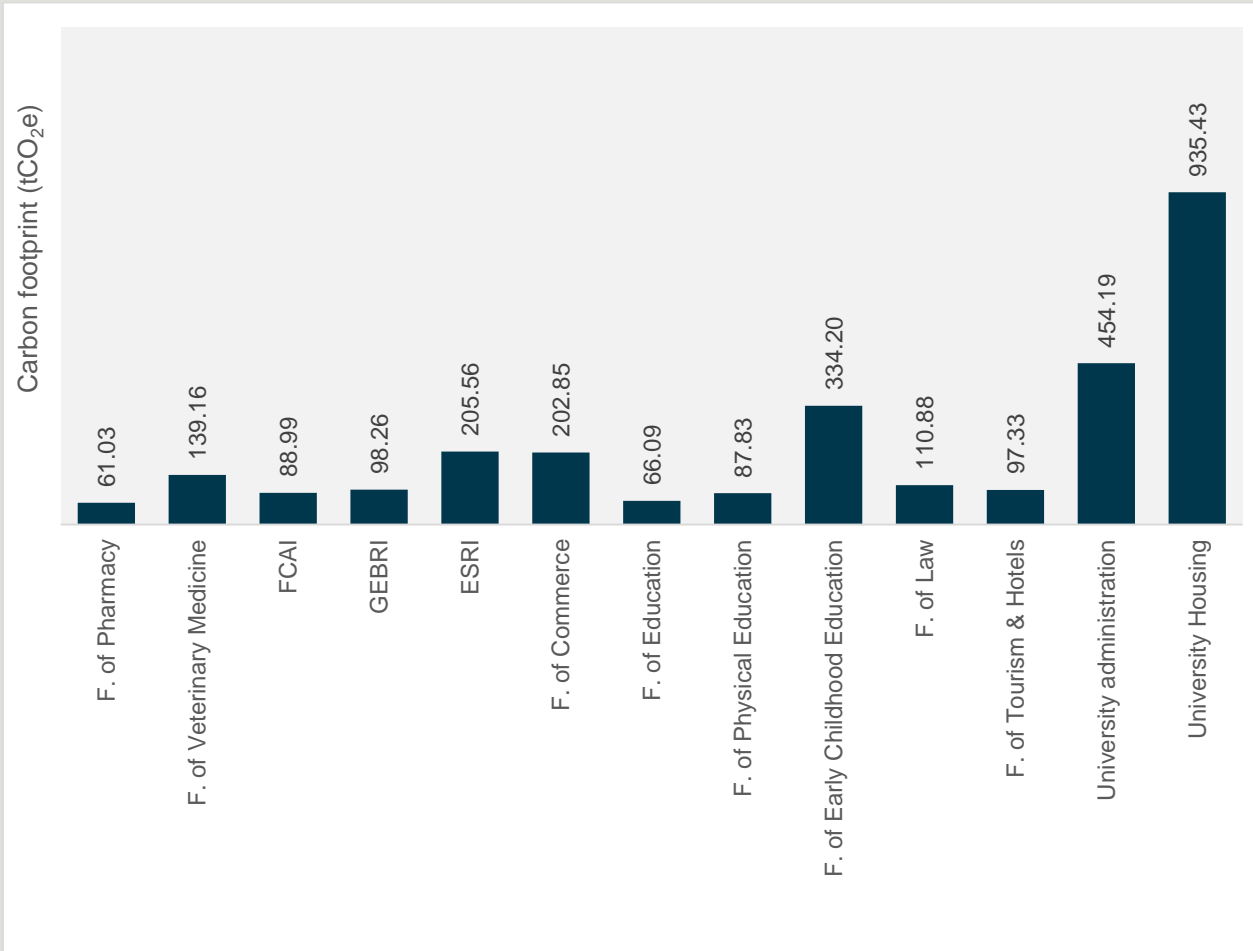


Figure 4-3 Carbon Footprint of each faculty/ institute | USC | 2023

05

MITIGATION PLAN



image: Freepik.com

5. MITIGATION PLAN

5.1 Carbon Reduction Projects & Strategies

5.1.1 Fuel Consumption

Achieved Targets:

- The university administration received **3** new private cars that run on natural gas instead of petrol.

Reported Targets:

- F. of Pharmacy will change one private car that will run on natural gas instead of petrol.

5.1.2 Freon Leakage

Reported Targets:

- 800 AC that operate with R22 freon will be replaced within 5 years (2024-2028).
- Cost: 9,410,000 Egyptian pounds
- Benefit: avoiding freon leaks resulting from old AC (= 382.9 tCO_{2e} in 2023).
- F. of Commerce will replace 4 air conditioners operating on R22 with others that use R410 or other refrigerants that do not harm the ozone layer, and will replace 12 old air conditioners with new ones.
- F. of Education will Try to replace 10 air conditioners that operate at R22 with ones that operate at R410
- F. of Education is taking measures to install solar cells as soon as the college moves to the new university building at the beginning of the next academic year.
- The university administration will replace 10 air conditioners operating on R22 with others that use R410 or other refrigerants that do not harm the ozone layer.

5.1.3 Electricity Consumption

Adopted strategies:

- Increase reliance on natural light.
- Power off all light sources and instruments after official working hours.

Reported Targets:

- Use LED bulbs instead of incandescent bulb as shown in figure (5-1).

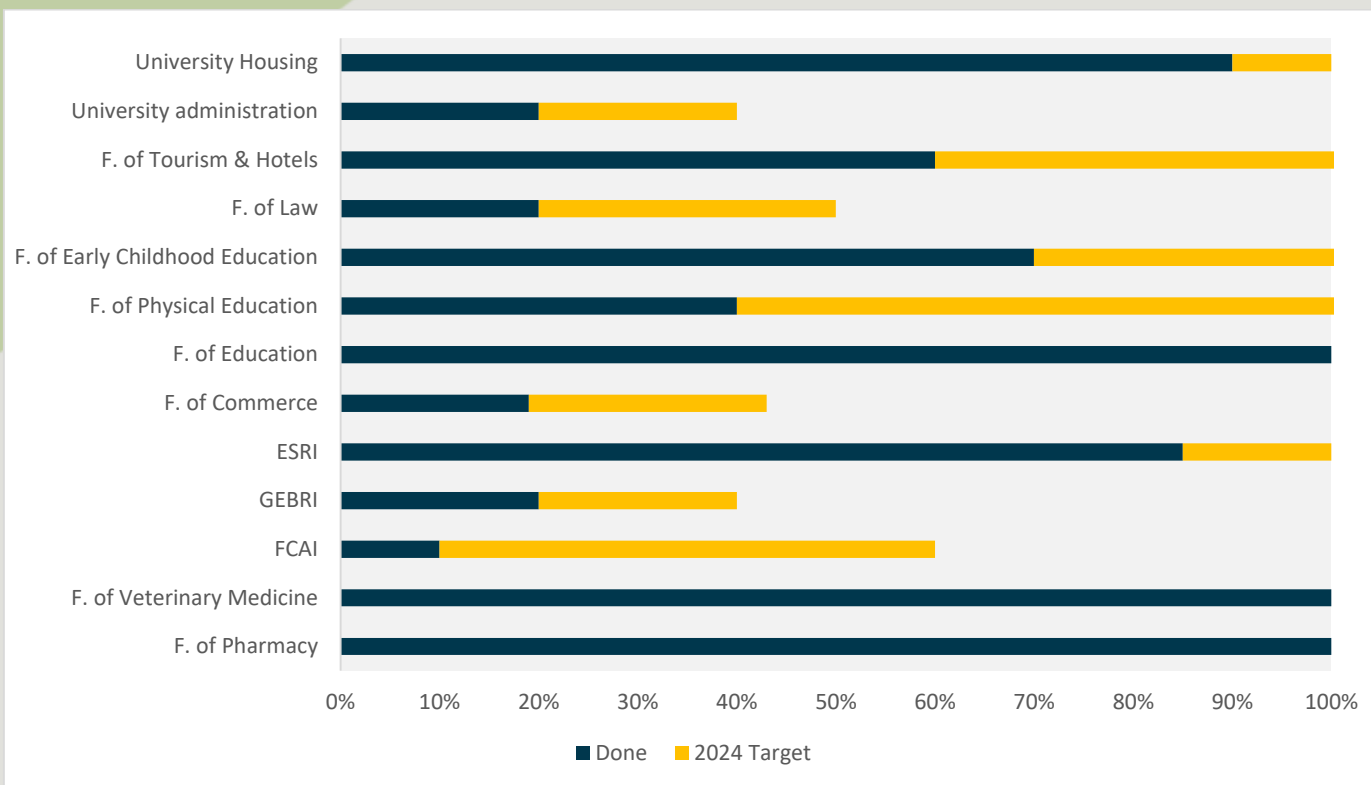


Figure 5-1 achieved and reported targets for bulb replacement| USC | 2023

- By the end of 2025, 3,000 LED bulbs will have been purchased instead of normal bulbs.
- Cost: 320,000 Egyptian pounds
- Benefits: These 3000 LED bulbs consumption assumed to be reaches 35,100 kw annually instead of 295,500 kw annually (for normal bulbs), which means reducing GHGs emissions by **134.9 tCO₂e annually**.

5.1.4 Paper Consumption

Adopted strategy (Digital transformation):

- Electronic communication instead of printed letters.
- Electronic archiving of meetings on university website.
- Gradual shift towards electronic tests.

Reported Targets:

- Faculty of Commerce: **16%** reduction ▼
- Faculty of Veterinary Medicine: **50%** reduction ▼
- Faculty of Computer and Artificial Intelligence: **50%** reduction ▼
- Faculty of Education: **70%** reduction ▼
- Faculty of Law: **20%** reduction ▼
- Faculty of Tourism and Hotels: **80%** reduction ▼
- Faculty of Pharmacy: **90%** reduction ▼

5.2 Carbon Avoidance Projects

Achieved Targets:

- Two solar energy stations have been established, one of them is 75 kW and the other 1 kW in the 100 feddan area of the university at a cost of 1,000,000 Egyptian pounds.
- This solar station generates 100,000 kWh per year (**51.8 tCO₂e avoided annually**).



Figure 5-2 installed solar panels

Reported Targets:

- Faculty of Pharmacy will install new 10 solar panels.
- Faculty of Education will install new 10 solar panels.

5.3 Carbon Removal Projects

Over one year a mature tree will take up about 22 kilograms of carbon dioxide from the atmosphere ⁽¹²⁾. There are already **4,282 trees** in USC faculties and institutes that absorb **94.204 tCO₂** of air annually, and USC aims by the end of 2024 to plant **1,025 trees**, bringing the total GHGs removed from the air to **116.754 tCO₂** annually. The following table shows the achieved and reported targets for each faculty/institute.

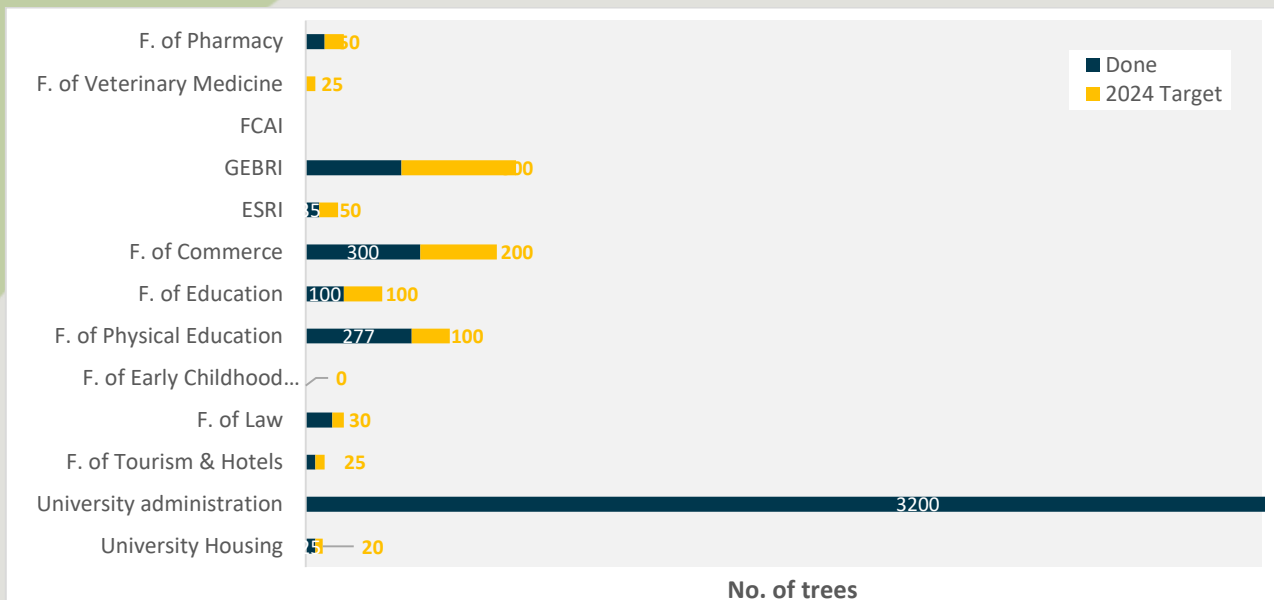


Figure 5-3 Achieved (2023) and reported targets (2024) for trees planting | USC

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(*) All used icons and photos from <https://www.flaticon.com> and <https://www.freepik.com>



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