

Final report

Greenhouse gas (GHG) accounting report

American University of Sharjah

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Details

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List of acronyms

AED	United Arab Emirates Dirham	IEA	International Energy Agency
AR4	Fourth Assessment Report	IPCC	Intergovernmental Panel on Climate Change
AR5	Fifth Assessment Report	kg	kilogram
AUS	American University of Sharjah	km	kilometre
BEIS	Department for Business, Energy, and Industrial Strategy	kWh	kilowatt-hour
CEDA	Centre for Environmental Data Analysis	L	litre
CH ₄	methane	LPG	liquefied petroleum gas
CHSB	Cornell Hotel Sustainability Benchmarking	m ²	square metres
CO ₂	carbon dioxide	m ³	cubic metres
CO ₂ e	carbon dioxide equivalent	pkm	passenger-kilometre
g/sheet	gram/sheet	SBTi	Science Based Targets initiative
GHG	greenhouse gas	tCO ₂ e	tonnes of carbon dioxide equivalent
GJ	gigajoule	tkm	tonne-kilometre
GRI	Global Reporting Initiative	UAE	United Arab Emirates
gsm	gram per square metre	WBCSD	World Business Council for Sustainable Development
GWP	global warming potential	WRI	World Resources Institute

Executive summary

This report provides a summary of the greenhouse gas (GHG) emissions produced by American University of Sharjah (AUS) operations from 1 June 2022 to 31 May 2023 (FY2023). AUS is a private university in the United Arab Emirates (UAE), founded in 1997 by His Highness Sheikh Dr Sultan bin Muhammad Al-Qasimi, Supreme Council Member and Ruler of Sharjah. The university has over 6,000 stakeholders, including teaching staff, faculty and students. With this GHG accounting report, AUS aims to gain insights into the quantity of GHG emissions caused by its operations, identify emission hotspots and understand where emission reduction strategies should be focused. This is the third time AUS has reported its emissions profile; a baseline report was released in 2022, which calculated the GHG emissions for AUS operations from 1 June 2018 to 31 May 2019 (FY2019).

A summary of key performance indicators is presented in Table 1. The results show that with 6,312 employees and students, emissions per employee and student are 9.57 tCO₂e in FY2023. While the number of employees and students is increasing, the premises area has remained relatively stable compared to FY2022.

Table 1: Summary of key performance indicators

	FY2023	FY2022	FY2019		FY2023	FY2022	FY2019
Number of stakeholders	6,312	6,082	6,161	tCO₂e/ stakeholders	9.57	9.64	7.16
Premises area (m²)	363,728.27	363,789.27	363,789.27	tCO₂e/m²	0.17	0.16	0.12

(Source: South Pole, based on AUS, 2023)

Table 2 shows the year-on-year GHG emissions by source from FY2019 to FY2023. According to the results, AUS emissions increased across scope 1 and scope 3 from FY2019 to FY2023, whereas scope 2 slightly decreased from FY2022 to FY2023.

Table 2: Year-on-year GHG emissions by source

Scope	FY2023 (tCO ₂ e)	Year-on-year change	FY2022 (tCO ₂ e)	Year-on-year change	Base year FY2019 (tCO ₂ e)
Scope 1: direct GHG emissions	2,357.49	9.66%	2,149.90	239.85%	632.60
Scope 2: indirect GHG emissions from purchased electricity	34,081.68	-0.31%	34,189.20	12.57%	30,371.80
Gross emissions without contractual instruments	34,081.68	-0.31%	34,189.20	12.57%	30,371.80
Avoided emissions from contractual instruments	0.00		0.00		0.00
Scope 3: other indirect GHG emissions	23,986.30	7.66%	22,280.30	69.79%	13,122.30
Total GHG emissions	60,425.46	3.08%	58,619.40	32.84%	44,126.64

(Source: South Pole, based on AUS, 2023)

In Figure 1, the percentage shares of the scopes can be seen. Scope 2 contributed the majority of GHG emissions from AUS operations in FY2023, accounting for 56.4%. Figure 2 shows that purchased electricity contributed 34,081.68 tCO₂e to AUS total footprint of 60,425.46 tCO₂e for this period.

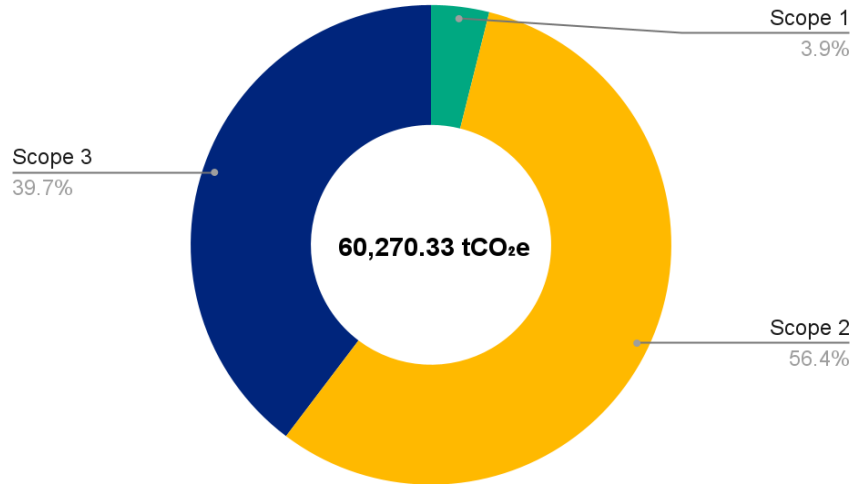


Figure 1: Scope 1, 2 and 3 emissions by percentage of total emissions in FY2023

(Source: South Pole, based on AUS, 2023)

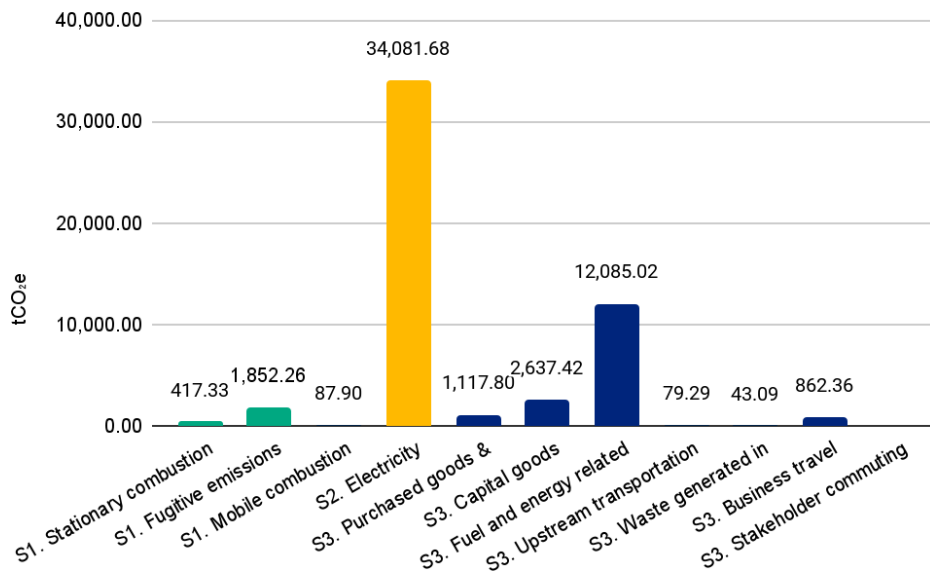


Figure 2: Scope 1, 2 and 3 emissions by category in FY2023

(Source: South Pole, based on AUS, 2023)

Introduction

This report provides a summary of the greenhouse gas (GHG) emissions produced by American University of Sharjah (AUS) operations from 1 June 2022 to 31 May 2023.

AUS was founded in 1997 by His Highness Sheikh Dr Sultan Bin Muhammad Al Qasimi, member of the Supreme Council of the United Arab Emirates (UAE) and Ruler of Sharjah. Sheikh Sultan articulated his vision of a distinctive institution against the backdrop of Islamic history and in the context of the aspirations and needs of contemporary society in the UAE and the Gulf region (AUS, 2023). The university has over 6,000 stakeholders, including teaching staff, faculty and students. With this GHG accounting report, AUS aims to gain insights into the quantity of GHG emissions caused by its operations. This is the third report of GHG calculations, following the previous reports for FY2022 and FY2019.

Company information and the reporting period are presented in Table 3.

Table 3: Company information

Company information	
Website	www.aus.edu
Business area	Private University, Education
Reporting period	01/06/2022 - 31/05/2023

(Source: South Pole, based on AUS, 2023)

Methodology

The GHG accounting and reporting procedure is based on the 'The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard – Revised Edition' (the GHG Protocol) and the complementary 'Corporate Value Chain (Scope 3) Accounting and Reporting Standard', which are the most widely used international accounting tools for government and business leaders to understand, quantify and manage GHG emissions. The standards were developed in a partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

The accounting was based on the following principles of the GHG Protocol:

- **Relevance:** establishing an appropriate inventory boundary that reflects the GHG emissions of the company and serves the decision-making needs of users.
- **Completeness:** implementing accounting that includes all emission sources within the chosen inventory boundary. Any specific exclusion is disclosed and specified.
- **Consistency:** ensuring the meaningful comparison of information over time and transparently documenting any changes to the data.
- **Transparency:** guaranteeing data inventory sufficiency and clarity, whereby relevant issues are addressed in a coherent manner.
- **Accuracy:** minimising uncertainty and avoiding the systematic over- or under-quantification of GHG emissions.

System boundaries

Organisational boundaries

The system boundaries for the GHG accounting procedure were defined by the control approach, i.e. covering all entities where AUS has operational control. Table 4 shows the key figures relevant for the performance indicator of AUS.

Table 4: Key figures

Region	Number of facilities	Status	Area (m ²)	Headcount
UAE	1	owned	363,728.27	6,312
Total			363,728.27	6,312

(Source: South Pole, based on AUS, 2023)

Operational boundaries

Under the GHG Protocol, emissions are divided into direct and indirect emissions. Direct emissions originate from sources either owned or controlled by the reporting entity, while indirect emissions are generated by the reporting entity's activities, but which occur at sources owned or controlled by another entity. Each emission type is divided into three scopes, as found below.

Scope 1

Scope 1 includes all carbon emissions that can be directly managed by the organisation (i.e. direct GHG emissions). This includes emissions from the combustion of fossil fuels in mobile and stationary sources (e.g. owned or controlled boilers, power generators, and vehicles), carbon emissions generated by chemical and physical processes, and fugitive emissions from the use of cooling and air conditioning equipment. Table 5 gives an overview of the emission sources considered in scope 1, based on the information provided by AUS.

Table 5: Overview of scope 1 emission sources for FY2023

Category	Emission sources	Boundary
Stationary combustion	Generation of electricity and heat	Included
Mobile combustion	Company-owned or leased vehicles	Included
Physical or chemical processing	Manufacture or processing of chemicals and materials	Not applicable
Fugitive emissions	Emissions from the use of cooling systems and air conditioning equipment, leakage from CO ₂ tanks or methane (CH ₄) tubes	Included

(Source: South Pole, based on AUS, 2023)

Scope 2

Scope 2 includes indirect GHG emissions from the generation of electricity, steam, heat or cooling purchased by the organisation from external energy providers. Table 6 gives an overview of the emission sources considered in scope 2.

Table 6: Overview of scope 2 emission sources for FY2023

Category	Emission sources	Boundary
Electricity	Purchased electricity	Included
Steam	Purchased steam	Not applicable
District heating	Purchased district heating	Not applicable
District cooling	Purchased district cooling	Not applicable

(Source: South Pole, based on AUS, 2023)

Scope 3

Scope 3 includes other indirect emissions, such as emissions from the extraction and production of purchased materials and services, vehicles not owned or controlled by the reporting entity, outsourced activities, and waste disposal, among others.

According to the GHG Protocol, companies shall separately account for and report on emissions from scopes 1 and 2. Scope 3 is an optional reporting category, but as it is often the most important scope for many organisations, companies are expected to at least assess the relevant categories.

Table 7 gives an overview of the emission sources considered in scope 3.

Table 7: Overview of scope 3 emission sources for FY2023

Category	Emission sources	Boundary
Purchased goods and services	Purchased goods (raw materials) and services	Included
Capital goods	Production of capital goods (e.g. machinery and IT equipment)	Included
Fuel- and energy-related activities	Upstream life cycle emissions from fuel and electricity generation, including transmission and distribution losses	Included
Upstream transportation and distribution	Transportation and distribution of goods and services to the company	Included
Waste generated in operations	Waste management of operational waste (landfilling, recycling, etc.)	Included
Business travel	Travel and accommodation of employees	Included
Stakeholder commuting	Stakeholders travel between home and work	Included

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Category	Emission sources	Boundary
Upstream leased assets	Operation of assets leased by the organisation (lessee) in the reporting year and not included in scopes 1 or 2	Not applicable
Downstream transportation and distribution	Transportation and distribution of products sold by the organisation	Not applicable
Processing of sold products	Processing of intermediate products sold by the organisation	Not applicable
Use of sold products	Use of sold goods that require energy to operate	Not applicable
End-of-life treatment of sold products	Waste disposal and treatment of sold products	Not applicable
Downstream leased assets	Operation of assets owned by the company (lessor), leased to other entities, and not included in scopes 1 or 2	Not applicable
Franchises	Operation of franchises not included in scopes 1 or 2	Not applicable
Investments	Operation of investments not included in scopes 1 or 2	Not applicable

(Source: South Pole, based on AUS, 2023)

Data inventory and assumptions

Overall, the data inventory, emission factors and assumptions are based on the GHG Protocol. The assumptions and emission factors were selected using a conservative approach. Unless otherwise specified, all emission values in this report are given in tCO₂e.

AUS has provided activity data for the following:

- Stationary combustion
- Mobile combustion
- Fugitive emissions
- Electricity
- Purchased goods and services (such as water supply, paper, IT services and consumables)
- Capital goods (IT devices)
- Freight activities
- Waste generated in operations
- Business travel and accommodation
- Stakeholder commuting

A complete overview of activity data, extrapolations and estimations are summarised in Annex II, while emission factors used are detailed in Annex I.

Global warming potential

Global warming potential (GWP) is a measure of the climate impact of a GHG compared to carbon dioxide over a time horizon. GHG emissions have different GWP values depending on their efficiency of absorbing long-wave radiation and the atmospheric lifetime of the gas. The GWP

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values used in GHG accounting include the six GHGs covered by the United Nations Framework Convention on Climate Change and Kyoto Protocol, and blends from these, as presented in Table 8.

These are the GWP values used by the Department for Business, Energy and Industrial Strategy (BEIS) of the United Kingdom, and are based on the Intergovernmental Panel on Climate Change's (IPCC's) 'Fourth Assessment Report (AR4)' and 'Fifth Assessment Report (AR5)'.

The GHG Protocol recommends the use of AR5 but does not prohibit the use of previous assessment reports. Furthermore, the GHG Protocol requires the use of a single assessment report for any inventory where possible but does not prohibit the use of multiple assessment reports provided this is disclosed. AR5 emissions factors have been primarily used; if unavailable, an AR4 factor has been converted to AR5. However, in cases where an AR5 factor could not be sourced or if a conversion was not possible, an AR4 factor was used.

Table 8: Applied global warming potentials

Category	AR4 GWP (100 years)	AR5 GWP (100 years)
Carbon dioxide (CO ₂)	1	1
Methane (CH ₄)	25	28
Nitrous oxide (N ₂ O)	298	265
Hydrofluorocarbons (HFCs)	See GHG Protocol GWPs (p. 2-3)	See GHG Protocol GWPs (p. 2-3)
Perfluorocarbons (PFCs)	See GHG Protocol GWPs (p. 2-3)	See GHG Protocol GWPs (p. 2-3)
Sulphur hexafluoride (SF ₆)	22,800	23,500

(Source: GHG Protocol, 2013)

Results

Overall results

Total emissions in this report refers to the emissions sources covered, as described in the system boundaries section. Please note that due to rounding of numbers, the figures may not add up exactly to the total provided.

Based on the results, total GHG emissions for the reporting period are estimated at 60,425.46 tCO₂e. Table 9 illustrates the key figures in terms of GHG emissions (in tCO₂e) and energy intensity (in GJ) relevant to corporate sustainability reporting, in accordance with the GHG Protocol.

Table 9: Key figures according to the Global Reporting Initiative

GRI G4	GRI Standard	Topic	Quantity	Unit
		Direct energy consumption by primary source:		
G4-EN3	302-1	Propane (stationary combustion)	7,002.45	GJ
		Diesel (mobile combustion)	37.45	GJ
		Petrol (mobile combustion)	1,271.86	GJ
		Indirect energy consumption by primary source		
G4-EN3	302-1	Grid electricity	232,158.89	GJ
		Direct GHG emissions (Scope 1)	2,357.49	tCO ₂ e
G4-EN16	305-2	Energy indirect GHG emissions (Scope 2)	34,081.68	tCO ₂ e
G4-EN17	305-3	Other indirect GHG emissions (scope 3)	23,986.30	tCO ₂ e
G4-EN18	305-4	GHG emission per employee & student	9.57	tCO ₂ e per employee

(Source: South Pole, based on AUS, 2023)

Table 10 provides a breakdown of GHG emissions by scope and source. It describes the consumption and emissions in FY2023.

Table 10: GHG emissions by scope and activity for FY2023

Activity	Consumption	Unit	Emission (tCO ₂ e)
Scope 1: direct GHG emissions			2,357.49
Stationary combustion			417.33
Propane/LPG	270,365.00	L	417.33

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Activity	Consumption	Unit	Emission (tCO2e)
Diesel/heating oil	-		-
Mobile combustion			87.90
Diesel	975.16	L	2.63
Petrol	36,443.08	L	85.27
Fugitive emissions			1,852.26
Refrigerant	1,040.90	kg	1,852.26
Scope 2: Indirect GHG emissions from purchased electricity, heating and cooling			34,081.68
Electricity			34,081.68
Grid	64,488,580.30	kWh	34,081.68
Scope 3: Other indirect GHG emissions			23,986.30
Category 1: Purchased Goods & Services			1,117.80
Water	360,066.54	m ³	54.01
<i>Supply</i>	360,066.54	m ³	54.01
Paper	31.20	tonnes	28.68
<i>Unspecified</i>	31.20	tonnes	28.68
<i>Recycled</i>	-		-
Food and beverages	1,450,773.99	AED	101.35
Cloud services	153,009.00	user	220.35
Videoconferencing	5,814,000.00	hour	370.35
Online advertising	160,000.00	AED	16.55
Furniture	1,197,593.94	AED	162.61
Books	815,725.64	AED	76.27
Electrical appliances	244,772.83	AED	43.64
Printing	338,095.96	AED	42.21
Water heaters	-	-	-
Repair of rented vehicle	17,866.10	AED	1.78
Category 2: Capital goods			2,637.42
Construction	14,396,027.15	AED	2,109.16
CPU/workstation	145.00	Number of devices	250.77
Desktop	2.00	Number of devices	0.73
Digital camera	3.00	Number of devices	0.04
External power supply	11.00	Number of devices	0.09
Gaming	2.00	Number of devices	0.64
IoT devices	1.00	Number of devices	0.03
Laptop	485.00	Number of devices	128.33
Microphone	34.00	Number of devices	0.78
Mobile phone	20.00	Number of devices	0.77
Monitor or computer screen	240.00	Number of devices	108.39
Office telephone	45.00	Number of devices	3.10
Printer	27.00	Number of devices	4.64
Projector	10.00	Number of devices	0.35

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Activity	Consumption	Unit	Emission (tCO2e)
Speaker	14.00	Number of devices	22.40
Storage units/mini servers	23.00	Number of devices	4.93
Tablet	19.00	Number of devices	1.23
Television	2.00	Number of devices	0.07
VR	53.00	Number of devices	0.19
Other electrical equipment	0.19	tonnes	0.78
Category 3: Fuel and energy related activities			12,085.02
Well-to-tank			12,085.02
<i>Propane or LPG (stationary)</i>	270,365.00	L	48.79
<i>Diesel (stationary)</i>	-	L	-
<i>Diesel (mobile)</i>	975.16	L	0.61
<i>Petrol or gasoline (mobile)</i>	36,443.08	L	21.97
<i>Electricity</i>	64,488,580.30	kWh	12,013.65
Category 4: Upstream transportation and distribution			79.29
Freight	422,455.48	tkm	79.29
<i>Air</i>	61,653.54	tkm	73.31
<i>Road</i>	205.75	tkm	0.15
<i>Sea</i>	360,596.19	tkm	5.84
Category 5: Waste generated in operations			43.09
Batteries	0.07	tonnes	0.00
Bulbs and lamps	-	-	-
Cardboard	18.34	tonnes	0.39
Construction waste	3.00	kg	0.00
Electrical items	0.40	tonnes	0.01
Glass	0.11	tonnes	0.00
Hazardous waste	0.56	tonnes	0.12
Metal waste	0.09	tonnes	0.00
Office waste	1,864.69	tonnes	39.68
Paper	10.90	tonnes	0.23
Plastic	0.25	tonnes	0.01
Plastic - PET bottles	117.00	kg	0.12
Recyclable waste	118.63	tonnes	2.52
Textile	14.00	kg	0.00
Category 6: Business travel			862.36
Flights	3,273,868.04	pkm	581.24
<i>Short haul <463</i>	38,585.10	pkm	10.52
<i>Medium haul 463-3700</i>	483,167.73	pkm	80.92
<i>Long haul >3700</i>	2,752,115.21	pkm	489.80
Rented vehicles	1,937,702.72	AED	277.98
Accommodation	87.00	Number of guest nights	3.13

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Activity	Consumption	Unit	Emission (tCO ₂ e)
Category 7: Stakeholder commuting			7,161.32
Car (petrol or diesel)	30,196,211.72	km	6,511.78
Car (hybrid vehicle)	230,547.15	km	34.87
Car (electric vehicle)	34,155.13	km	2.24
Taxi	227,075.06	pkm	41.99
Taxi (shared)	52,038.87	pkm	9.62
Bicycle/Scooter (electric)	8,599.81	km	1.25
Motorcycle	0.00	km	0.00
Dubai Metro	411,191.06	pkm	14.82
AUS Dubai Metro Shuttle	3,207,276.00	pkm	437.32
University City Transportation Services	745,311.80	pkm	101.63
Local bus	42,399.08	pkm	5.78
Total			60,425.46

(Source: South Pole, based on AUS, 2023)

Figure 3 shows that AUS major emission sources are scope 2 purchased electricity (34,081.68 tCO₂e), scope 3 fuel- and energy-related activities (12,085.02 tCO₂e), and scope 3 stakeholder commuting (7,161.32 tCO₂e).

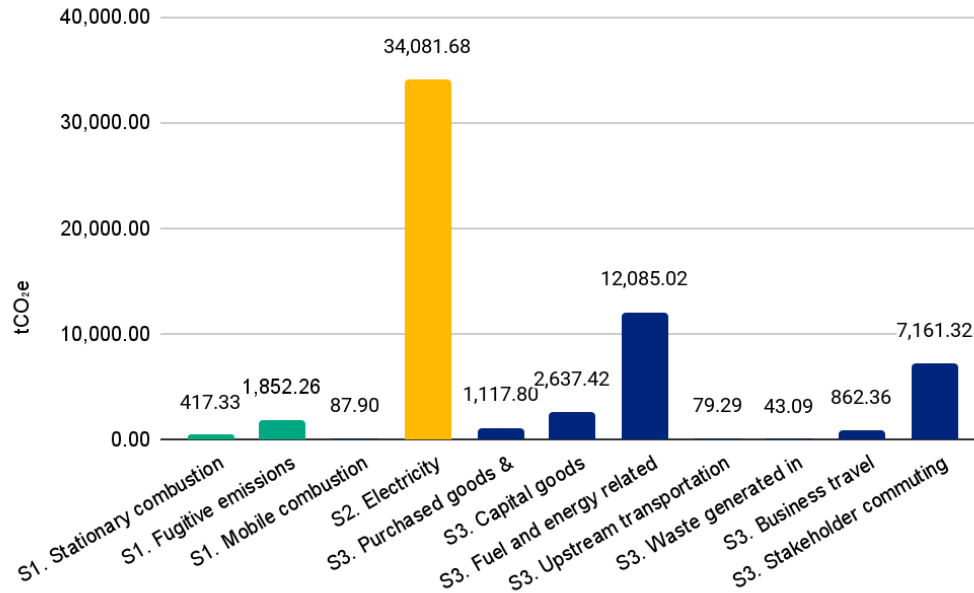


Figure 3: Scope 1, 2 and 3 emissions by category (tCO₂e) in FY2023

(Source: South Pole, based on AUS, 2023)

Comparison of FY2019, FY2022 and FY2023 GHG emissions

Table 11 shows the year-on-year change of AUS GHG emissions per activity for the FY2019, FY2022 and FY2023 inventories. Overall, AUS GHG emissions increased slightly between FY2022 and FY2023, by 3.08% from 58,619.40 tCO₂e to 60,425.46 tCO₂e.

The three most significant changes in emissions between FY2022 and FY2023 are as follows:

- A 634.19% increase in upstream transportation and distribution. The activity data for upstream transportation and distribution by road, sea and air has increased significantly compared to FY2022 which is leading to this increase in emissions.
- A 171% increase in waste generated in operations, which was caused by an increase in activity data.
- A 1114.02% increase in capital goods. The primary cause of this increase is the growth in renovation or construction expenses. For improvement of future reports, it is suggested to separate the construction expenditure related to repair and maintenance with major renovation or new construction. According to the GHG protocol, companies can follow their own financial accounting procedures to classify the emissions. Major renovation or new construction are often classified as capital goods as they extend or add the useful life of the building assets, while repair and maintenance are considered to be one time expense (purchased goods and services category).

Table 11: Year-on-year change in GHG emissions between FY2019, FY2022 and FY2023

Activity	FY2023 (tCO ₂ e)	Year-on-year change	FY2022 (tCO ₂ e)	Year-on-year change	Base year FY2019 (tCO ₂ e)
Scope 1					
Stationary combustion	417.33	140.26%	173.70	308.29%	42.54
Mobile combustion	87.90	50.51%	58.40	-80.91%	305.86
Fugitive emissions	1,852.26	<0.1%	1,917.80	574.88%	284.17
Scope 1 total	2,357.49	9.66%	2,149.90	239.87%	632.57
Scope 2					
Electricity	34,081.68	-0.31%	34,189.20	12.57%	30,371.77
Scope 2 total	34,081.68	-0.31%	34,189.20	12.57%	30,371.77
Scope 1 and 2 total	36,439.17	0.28%	36,339.10	17.21%	31,004.34
Scope 3					
Purchased Goods & Services	1,117.80	-4.05%	1,165.00	-55.46%	2,615.80
Capital goods	2,637.42	114.02%	1,232.30	4245.36%	28.36
Fuel and energy related activities	12,085.02	-0.03%	12,088.70	55.71%	7,763.54
Upstream transportation and distribution	79.29	634.19%	10.80	-93.00%	154.22

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Activity	FY2023 (tCO ₂ e)	Year-on-year change	FY2022 (tCO ₂ e)	Year-on-year change	Base year FY2019 (tCO ₂ e)
Waste generated in operations	43.09	171.00%	15.90	-8.44%	17.37
Business travel	862.36	144.09%	353.30	-85.98%	2,520.69
Stakeholder commuting	7,161.32	-3.41%	7,414.20	33110.30%	22.33
Scope 3 total	23,986.30	7.66%	22,280.20	69.79%	13,122.30
Scope 1 + Scope 2 + Scope 3	60,425.46	3.08%	58,619.40	32.84%	44,126.64

(Source: South Pole, based on AUS, 2023)

Based on Table 11 above, the high level explanations for the emissions variance from FY2022 to FY2022 are described in Table 12.

Table 12: Explanation of emissions variance from FY2022

Scope	Category	Explanations
	Stationary combustion	Increment is mainly due to the increase in the consumption of Propane/LPG by 144.45%.
Scope 1	Mobile combustion	Increment is mainly due to the increase in the consumption of Diesel (31.69%) and Petrol (39.34%).
	Fugitive emissions	No significant variance noted, which is inline with the consumption of refrigerants.
Scope 2	Electricity	No significant variance noted, which is inline with the purchased electricity consumption variance of -0.31%
	Purchased goods & services	Decrement is mainly due to the decrease in video conferencing activity, furniture purchase and printing, netted off with the increase in books and food/beverage purchase.
	Capital goods	Increment is mainly due to the increase in construction activity by 265.07%.
	Fuel- and energy-related activities	No significant variance noted, which is inline with the variance of purchased electricity consumption (-0.31%) as the main contributor of this category.
Scope 3	Upstream transportation and distribution	Increment is mainly due to the increase in the air freight transport (603.41%) and sea freight transport activity (559.53%) in the current fiscal year.
	Waste generated in operations	Increment is mainly due to the increase in office waste generation by 150.67% and also improvement of data quality with more detailed waste type.
	Business travel	Increment is mainly due to the increase in flight business travel by 152.17%.
	Stakeholder commuting	Decrement is mainly due to the decrease in car (diesel and petrol) commuting activity by 1.81% and the related emission factor by 6.88%.

(Source: South Pole, based on AUS, 2023)

Figure 4 and 5 illustrates AUS emissions categorised by scope and activity from FY2019 to FY2023. There was a substantial increase from FY2019 to FY2022 and a modest increase from FY2022 to FY2023.

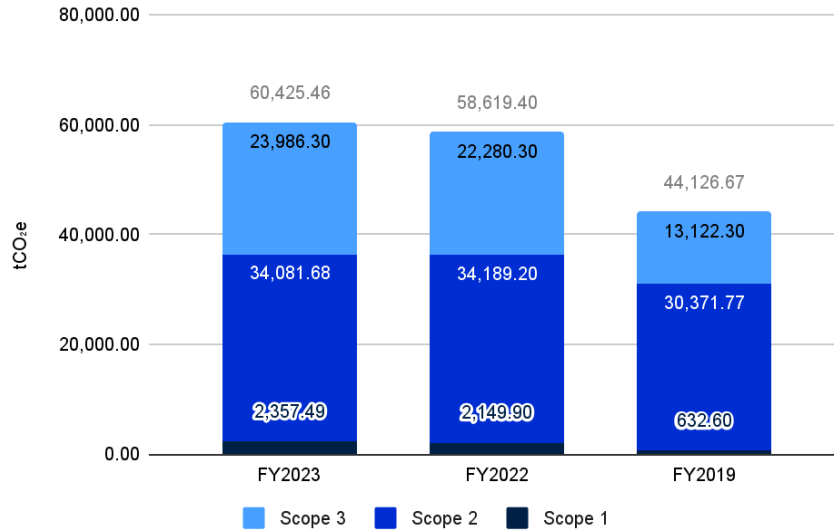


Figure 4: Emissions by scope from FY2019 to FY2023

(Source: South Pole, based on AUS, 2023)

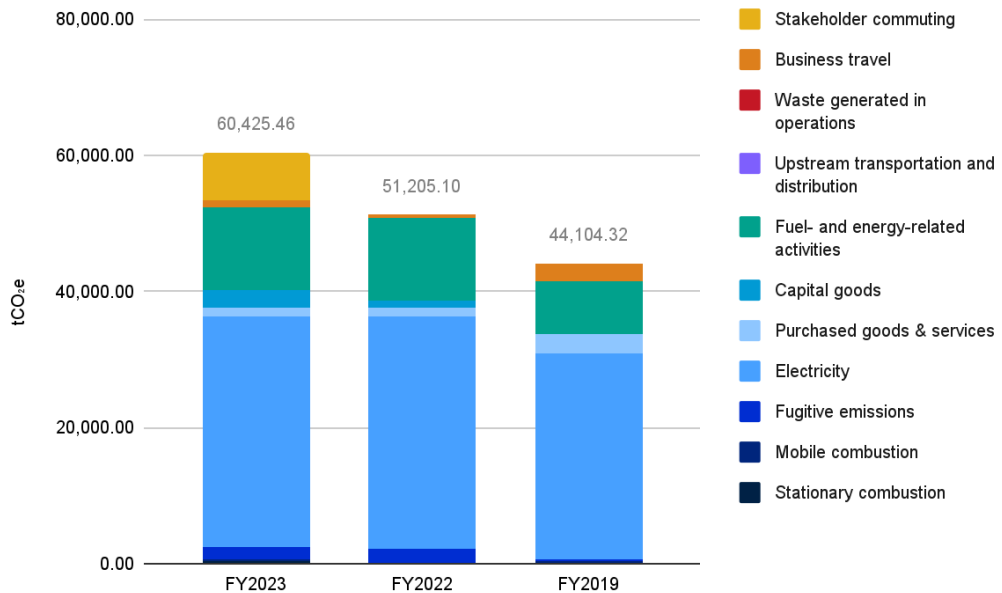


Figure 5: Emissions by categories from FY2019 to FY2023

(Source: South Pole, based on AUS, 2023)

Conclusion and recommendations

The total GHG emissions for AUS in FY2023 were 60,425.46 tCO₂e. Emissions from purchased electricity, fuel- and energy-related activities, and stakeholder commuting account for 34,081.68 tCO₂e (56.4%), 12,085.02 tCO₂e (20%) and 7,161.32 tCO₂e (11.85%), respectively.

For purchased electricity, the emissions were generated through electricity consumption in campus facilities, housing, dormitories, academic buildings and electric vehicles, totalling 64,488,580 kWh. This consumption is slightly lower than the recorded consumption for FY 2022 (64,692,078 kWh). However, in terms of electricity usage efficiency, there is improvement from 10,217 kWh/number of stakeholders to 10,637 kWh/number of stakeholders (4% more efficient). It is recommended that AUS starts looking for renewable energy options, such as energy attribute certificates, corporate power purchase agreements and on-site renewable energy plants, to reduce its emissions from this category. This will also help to reduce the scope 3 fuel- and energy-related activities emissions, which currently represent 20% of total emissions.

For stakeholder commuting, there is improvement in terms of data quality received from only using a projected commuting data based on stakeholder survey conducted by AUS in FY2022 to using a combination of actual data (for car and shuttle bus commuting) and the stakeholder survey results in FY2023. A detailed explanation of the methodology and the survey can be read in Annex II. The FY2023 results revealed that employees and students predominantly chose to commute to the campus by car, resulting in a total travel distance of 30,460,914 km by car, 279,113.93 pkm by taxi, 8,599.81 km by bicycle/scooter electric, 3,207,276 pkm by AUS Dubai metro shuttle, 411,191.06 pkm by Dubai metro, 745,311.80 pkm by university city transportation services, and 42,399.08 pkm by local bus. Therefore, it is recommended that AUS looks for options to reduce these emissions. Considering future data collection efforts, it is suggested to enhance the survey samples by extending the survey period in order to increase the number of respondents. Furthermore, AUS could explore options such as promoting awareness on commuting emissions, introducing the usage of car pooling, and also providing shuttles or other mass transport options to reduce the dependency on private cars.

According to the results, AUS emissions have shown a slight increase (3.08%) in FY2023 compared to FY2022. In FY2019, AUS modelled scope 1 and 2 emission reduction targets in line with the SBTi and identified opportunities for reducing emissions. The upturn in emissions in FY2023 suggests that further progress is needed to meet these targets. Based on the FY2023 inventory, AUS will need to reduce its current scope 1 and 2 emissions by 54.22% to achieve the target of 16,681 tCO₂e by 2030.

In both FY2023 and FY2022, emissions from purchased electricity and stakeholder commuting remained the dominant contributors to AUS emissions. AUS should focus more resources on implementing interventions to reduce its emissions, particularly focusing on the largest hotspot, purchased electricity. Making a switch to renewable energy in the next few years would allow AUS to significantly reduce its emissions and meet its reduction target.

Additionally, in FY2023, scope 3 emissions accounted for 39.7% of the total emissions. A specific target for scope 3 emissions becomes mandatory when they reach or exceed the 40% limit (SBTi, 2023). It is clear that AUS scope 3 emissions are approaching this threshold. Therefore, it is strongly advisable for AUS to demonstrate a strong commitment to reduce emissions across its value chain or to consider establishing a scope 3 emissions target in the coming year.

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Annex I

Emission factors

Table 13: Emission factors

Activity	Emission factor reference	GWP	Public/licensed
Stationary combustion	BEIS, 2022	AR5	Public
Mobile combustion	BEIS, 2022	AR5	Public
Fugitive emissions	BEIS, 2022	AR5	Public
Purchased electricity	IEA, 2022	AR5	Licensed
Purchased goods and services	<ul style="list-style-type: none"> ● Amazon, 2021 ● BEIS, 2022 ● CEDA 6 ● Ecoinvent, 2021 ● Google, 2012 ● Google, 2021 ● IPCC, 2014 ● Microsoft, 2021 	AR4, AR5	<ul style="list-style-type: none"> ● Public ● Public ● Licensed ● Licensed ● Public ● Public ● Public ● Public
Capital goods	<ul style="list-style-type: none"> ● Apple, 2016-2022 ● BEIS, 2022 ● CarbonCatalogue, 2016 ● Dell, 2018-2022 ● Samsung, 2020 	AR5	<ul style="list-style-type: none"> ● Public ● Public ● Public ● Public ● Public
Fuel- and energy-related activities	<ul style="list-style-type: none"> ● BEIS, 2022 ● Ecoinvent, 2022 ● IEA, 2022 	AR5	<ul style="list-style-type: none"> ● Public ● Licensed ● Licensed
Freight activities	BEIS, 2022	AR5	Public
Waste	<ul style="list-style-type: none"> ● BEIS, 2022 ● Ecoinvent, 2022 	AR4, AR5	<ul style="list-style-type: none"> ● Public ● Licensed
Business travel	BEIS, 2022	AR5	Public
Accommodation	CHSB, 2021	AR5	Public
Stakeholder commuting	BEIS, 2022	AR4, AR5	Public

(Source: GHG Protocol, 2013)

Annex II

Data assumptions and extrapolations

Stationary combustion

Data on fuel (propane) consumption was provided by AUS; there was no diesel consumption in FY2023. Emissions were calculated using emission factors for propane published by BEIS (2022).

Mobile combustion

AUS provided data relating to distance covered and fuel type. An estimation of fuel consumption was made based on the efficiency of the fuel type. Data for electric vehicles was ignored to prevent double counting, as the electricity used by these vehicles is accounted for in electricity bills.

Purchased electricity

AUS provided data on purchased electricity, totalling 64,488,580.3 kWh. Emissions were calculated using emission factors for grid electricity, both market-based and location-based, from IEA (2022).

Fugitive emissions

AUS provided fugitive emissions for R22 and R410A refrigerant data in kg. Emissions were calculated using emission factors for each type of refrigerant published by BEIS (2022).

Purchased goods and services

Water

Data on water supply was provided, totalling 95,119,517.3 US liquid gallons. Unit conversion to m³ was conducted to calculate emissions using emission factors for water supply published by BEIS (2022).

Paper

Data on paper consumption was provided in terms of the number of reams, paper weights and paper size. Additional assumptions were applied, assuming 5 g/sheet for A4 80 gsm, 10 g/sheet for A3 80 gsm and 80 g/sheet for A0 80 gsm. Emissions were calculated using emission factors for unspecified paper and recycled paper published by BEIS (2022).

IT services

AUS provided data on types of IT services in terms of the number of users and online advertising in the amount spent. IT services are divided into two categories: cloud services, encompassing both cloud services and datacentre, and videoconferencing. An assumption was made that videoconferencing lasted for an average of 1 hour. Emissions were calculated using emission factors for cloud services published by Amazon (2021), Google (2012), Microsoft (2021) and IPCC (2014). Also, emission factors for videoconferencing published by Ecoinvent (2021) and advertising published by CEDA 6 (2022) were used.

Final report

Other consumables

Data for office expenditure, such as books and periodicals, furniture, electrical appliances, and repair of vehicles, was given as total spend during the reporting period. Emissions were calculated using emission factors published by CEDA 6 (2022).

Construction

AUS provided construction data in terms of total spend during the reporting period. Emissions were calculated using emission factors published by CEDA 6 (2022).

Capital goods

AUS provided data on capital goods, which included various types of IT devices measured in units. Unlike the previous reporting period, AUS provided a broader range of IT devices. Emissions were calculated using emission factors published by Apple (2016–2021), BEIS (2022), CarbonCatalogue (2016), Dell (2018–2022) and Samsung (2020). However, additional assumptions were made for certain IT devices, where emissions were estimated based on the device's weight. For these devices, emissions were calculated using emission factors published by BEIS (2022).

Fuel- and energy-related activities

Data for fuel- and energy-related activities was based on purchased fuels and electricity. It considered the upstream or well-to-tank emissions of both activities. Emissions were calculated using emission factors published by BEIS (2022), IEA (2022) and Ecoinvent (2022).

Upstream transportation and distribution

Data was provided in terms of freight activity, including road, sea and air transportation, measured by the weight of cargo and the origin and destination of the cargo. Emissions were calculated by estimating the distance (in kilometres) between the origin and destination of cargo to determine the weight of cargo per kilometre. Additionally, emission factors for each form of freight transportation were used, from BEIS (2022).

Waste generated in operations

AUS provided data for many types of waste generated, including plastics, paper, textiles, construction, glass, electronics and hazardous waste, which were measured in units or weight. Furniture was also mentioned in waste data, but it was excluded from the calculation because it was donated to charity and reused by others. Assumptions were made for certain waste types measured in units, by estimating the weight of the waste. Emissions were determined using emission factors for each type of waste published by BEIS (2022) and Ecoinvent (2022).

Business travel

Rented vehicles

Data for rented vehicles was provided in terms of total spend. Emissions were calculated using emission factors for automotive equipment rental and leasing published by CEDA 6 (2022).

Final report

Flight

Data was provided for commercial flights. Data on the origin, destination and flight class was available for all recorded flights. This information was used to estimate the passenger-kilometres (pkm) travelled on each route, which proved to be sufficient to calculate the emissions from air travel. Emissions from flights were calculated using factors from BEIS (2022).

Accommodation

Data on accommodation was provided, totalling 48 nights at international hotels. The hotels' star ratings were not provided and so average star hotels were assumed. Emissions for accommodation were calculated using accommodation emission factors published by CHSB (2021).

Stakeholder commuting

AUS provided data for stakeholder commuting from actual commuting data and commuting survey results. Actual data was collected for 2,511 stakeholders who commute by car and those who use AUS Dubai metro shuttle. In addition, AUS also identified 2,849 stakeholders who lived in the university area in FY2023 where they are assumed to use modes of commuting with no emission (walking or bicycle). The modes of commuting for the remaining stakeholders (2,152 head) are projected based on the commuting survey conducted by AUS. The total number of respondents of the survey was 231 with 1 excluded respondent due to unclear responses. The survey provided questions related to mode of transportation and total distance for commuting. Extrapolation was conducted to represent stakeholders who were commuting by taxi, bicycle/scooter (electric), and local bus. Emissions were calculated using emission factors published by BEIS (2022).

Annex III

Year-on-year emissions compared to target emissions

In the previous FY2019 report, AUS modelled scope 1 and 2 emission reduction targets in line with the Science Based Targets initiative (SBTi) with FY2019 as the base year totalling 31,004.34 tCO₂e for scope 1 and scope 2 emissions.

Figure 6 illustrates year-on-year scope 1 and scope 2 emissions compared to target emissions. There was 5,334.76 tCO₂e or 17.21% increase from FY2019 to FY2022, and a 100.07 tCO₂e or 0.28% increased in FY2023 compared to FY2022. With total scope 1 and scope 2 inventory in FY2023 amounting to 36,439.17 tCO₂e, there is still an emissions gap of **19,758.17 tCO₂e** to achieve the target of 16,681 tCO₂e in 2030, as mentioned in the FY2019 report. This implies that AUS still needs to reduce its current scope 1 and 2 emissions by at least **54.22%**.

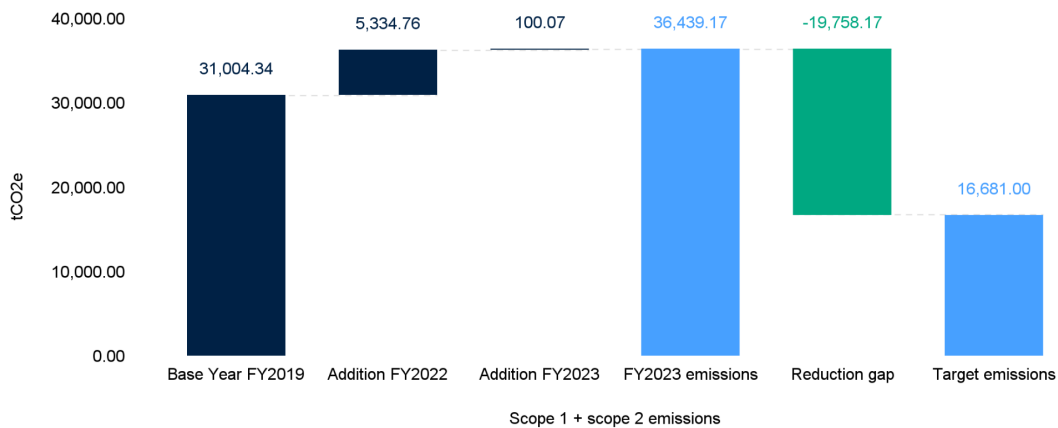


Figure 6: Year-on-year scope 1 and scope 2 emissions compared to target emissions

(Source: South Pole, based on AUS, 2023)

Implementation of the reduction interventions outlined in the FY2019 GHG report is essential for reducing emissions. Furthermore, careful consideration should be given to the establishment of a scope 3 target, especially in light of the fact that scope 3 emissions are approaching a critical threshold of 40% of total emissions in FY2023 (currently 39.7%). The SBTi Criteria for near-term targets (criterion C4) states that if a company's scope 3 emissions are 40% or more of total scope 1, 2, and 3 emissions, a scope 3 target is required.