



Greenhouse gas accounting report

American University of Sharjah

Reporting period: 1 June 2021 – 31 May 2022

Zurich, 25 May 2023



South Pole

South Pole Carbon Asset Management Ltd. · Technoparkstrasse 1 · 8005 Zurich · Switzerland
+41 43 501 35 50 · info@southpole.com · southpole.com

Details

Prepared for:

American University of Sharjah (AUS)
PO Box 26666, Sharjah, United Arab Emirates
<http://www.aus.edu>

Prepared by:

South Pole Carbon Asset Management Ltd. (South Pole)
Technoparkstrasse 1 · 8005 Zurich · Switzerland
<http://www.southpole.com>

Project Manager

Rhiannon Tomlin
Managing Consultant, Climate Strategies
r.tomlin@southpole.com

Project Leader:

Ajit Padbidri
Regional Coordinator, Climate Strategies
a.padbidri@southpole.com

Contact person

Chris Wei
Business Development Associate
z.wei@southpole.com

Disclaimer:

No warranties: all the information in this statement is provided 'as-is' with no express or implied warranties or representations of any type as to its accuracy, completeness, or any intended use of such information.

Disclaimer of liability: South Pole specifically disclaims liability for incidental or consequential damages and assumes or undertakes no responsibility or liability for any loss or damage suffered by any person as a result of the use, misuse, or reliance of any of the information or content in this statement.

Table of contents

Executive summary	5
<hr/>	
1 Introduction	8
1.1 Methodology	8
1.2 System boundaries	9
1.2.1 Organisational boundaries	9
1.2.2 Operational boundaries	9
1.3 Data inventory and assumptions	11
1.4 Global warming potentials	11
<hr/>	
2 Results	13
2.1 Overall results	13
2.2 Comparison of FY2019 and FY2022 GHG emissions	17
<hr/>	
3 Conclusions	18
<hr/>	
Annex I	19
Emission factors	19

List of tables

Table 1: Summary of key performance indicators.....	5
Table 2: Year-on-year greenhouse gas emissions by source.....	5
Table 3 Greenhouse gas reduction measures modeled in FY2019 report	7
Table 4: Company information	8
Table 5: Key figures	9
Table 6: Overview of scope 1 emission sources for 2021–2022	9
Table 7: Overview of scope 2 emission sources for 2021–2022	10
Table 8: Overview of scope 3 emission sources for FY2022	10
Table 9: Applied global warming potentials.....	12
Table 10: Key figures according to the Global Reporting Initiative	13
Table 11: Greenhouse gas emissions by scope and activity for FY2022	13
Table 12: Year-on-year change between FY2019 and FY2022 GHG emissions	17
Table 13: Emission factors	19

Table of figures

Figure 1: GHG emissions by scope (%) in FY2022	6
Figure 2: GHG emissions by source (tCO ₂ e) in FY2022.....	6
Figure 3: Greenhouse gas emissions by source for FY2022	16

Acronyms and abbreviations

AR4	'Fourth Assessment Report'
AUS	American University of Sharjah
BAU	business as usual
BEIS	Department for Business, Energy, and Industrial Strategy
BSI	British Standards Institute
CEDA	Centre for Environmental Data Analysis
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
EAC	Energy Attribute Certificate
EV	electric vehicles
GHG	greenhouse gases
GJ	gigajoule
GRI	Global Reporting Initiative
GWP	global warming potential
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
kg	kilogram
km	kilometre
LPG	liquefied petroleum gas
m ²	square metres
m ³	cubic metres
MW	megawatt
MWh	megawatt-hour
pkm	passenger-kilometre
PV	photovoltaic
SBT	science-based target
SBTi	Science-Based Target initiative
t	metric tonne
tkm	tonne-kilometre
T&D	transmission and distribution
UAE	United Arab Emirates
WBCSD	World Business Council for Sustainable Development
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 2021 to 31 May 2022 (FY2022). AUS is a private university in the United Arab Emirates (UAE). The university was founded in 1997 by His Highness Sheikh Dr Sultan bin Muhammad Al Qasimi, Supreme Council Member and Ruler of Sharjah. AUS has over 6,000 stakeholders, including staff, faculty and students. With this GHG account, AUS aims to gain insight 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 second 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).

The reporting period FY2022 showed that the majority of AUS' GHG emissions were caused by scope 2 purchased electricity. Table 1 provide an overview of key figures for AUS. Table 2 provides the year-on-year emissions for AUS from FY2019 to FY2022. According to the results, AUS' emissions increased across all scopes in FY2022 compared to FY2019.

Table 1: Summary of key performance indicators

Number of staff, faculty and students	6,082	tCO₂e/ staff, faculty and students	9.6
Premises area (m²)	363,789.27	tCO₂e/m²	0.16

(Source: South Pole, based on AUS, 2022)

Table 2: Year-on-year greenhouse gas emissions by source

Scope	Emissions (tCO ₂ e)		Percent changes (%)
	FY2022	FY2019	
Scope 1: direct GHG emissions	2,149.9	632.6	240%
Scope 2: indirect GHG emissions from purchased electricity	34,189.2	30,371.8	13%
Gross emissions without contractual instruments	34,189.2	30,371.8	13%
Avoided emissions from contractual instruments ¹	0.0	0.0	-
Scope 3: other indirect GHG emissions	22,280.3	13,122.3	70%
Total GHG emissions	58,619.4	44,126.6	33%

(Source: South Pole, based on AUS, 2022)

In Figure 1, the percentage shares of the scopes can be seen. Scope 2 was responsible for the majority of GHG emissions produced by AUS' operations in FY2022, accounting for 58.3% of total emissions. Figure 2 shows that purchased electricity contributed 34,189.2 metric tonnes of carbon dioxide equivalent (tCO₂e) to AUS' total footprint of 58,619.4 tCO₂e for this period.

¹ 'Contractual instruments' refer to renewable energy purchase instruments and contracts, such as renewable energy certificates, renewable power contracts, power purchase agreements and GoldPower offsets.

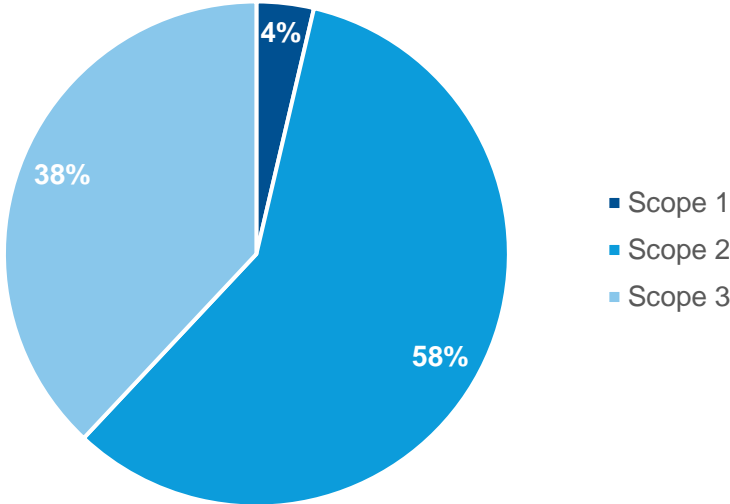


Figure 1: GHG emissions by scope (%) in FY2022

(Source: South Pole, based on AUS, 2022)

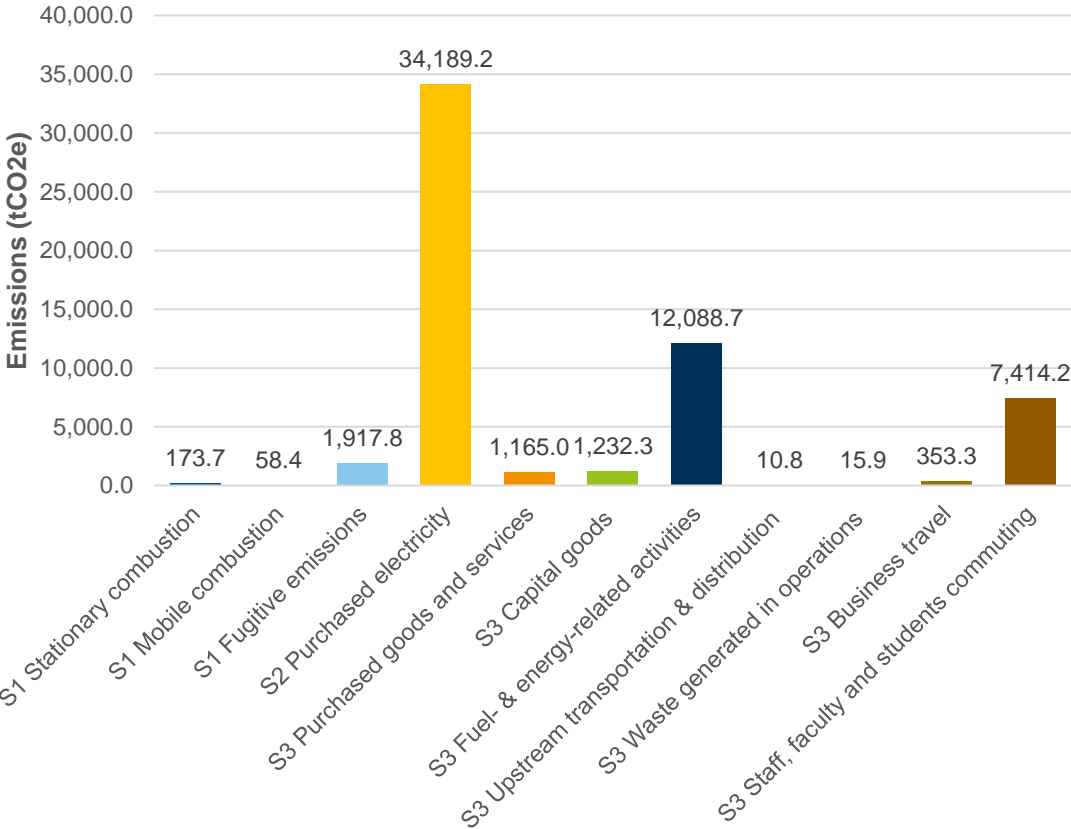


Figure 2: GHG emissions by source (tCO₂e) in FY2022

(Source: South Pole, based on AUS, 2022)

Greenhouse gas (GHG) accounting report

In the previous FY2019 report, AUS modelled scope 1 and 2 emission reduction targets in line with the Science Based Targets Initiative (SBTi). The increased emissions in FY2022 indicate that more action needs to be taken to reduce emissions across all scopes. Electricity usage for example has increased by 13% and is the largest contributor at 58.3% of the total footprint. It is recommended AUS work to implement the reduction interventions identified in the FY2019 GHG report, shown in Table 3 below, to reduce its emissions in order for it to meet their emission reduction target by the selected target year of 2030.

Table 3 Greenhouse gas reduction measures modeled in FY2019 report

GHG scope	Measure	Emission reductions (tCO ₂ e)
Scope 1		
Mobile combustion	Switching 35% of vehicles to electric vehicles (EVs)	108
Scope 2		
Electricity	Existing energy efficiency upgrades, e.g. chiller and LED lighting upgrades	6,074
Electricity	Further energy efficiency upgrades, including thermal insulation, pump upgrades and improved sensing and monitoring	5,913
Electricity	Installing a 7 MW on-site solar photovoltaic (PV) system	7,483
Electricity (option a)	Installing a 50 MW solar PV system	53,450 ²
Electricity (option b)	Renewable energy procurement, e.g. acquiring EACs	31,398
Total		50,976

² It should be noted that the estimated system size is not confirmed. As shown, a 50MW system exceeds AUS's requirements based on South Pole's electricity consumption estimated. A detailed feasibility study should be undertaken to confirm the final system size to meet AUS' current and future demands.

1 Introduction

This report provides a summary of the GHG emissions produced by AUS' operations from 1 June 2021 to 31 May 2022.

AUS was founded in 1997 by His Highness Sheikh Dr Sultan Bin Muhammad Al Qasimi, Member of the Supreme Council of the 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.³ The university has over 6,000 stakeholders, including staff, faculty and students. With this GHG accounting report, AUS would like to gain insights into the quantity of GHG emissions caused by its operations during the FY2022 reporting period. This analysis and report is the second time The University of Sharjah has calculated its GHG emissions and follows an earlier report released in 2022 which calculated the universities emissions for the first time in 2019.

Company information and the reporting period are presented in Table 4.

Table 4: Company information

Company information	
Website	www.aus.edu
Business area	Private University, Education
Reporting period	01/06/2021–31/05/2022

(Source: South Pole, based on AUS, 2022)

1.1 Methodology

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

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 which 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; and
- **Accuracy:** minimising uncertainty and avoiding the systematic over- or under-quantification of GHG emissions.

³ American University of Sharjah, 2022.

1.2 System boundaries

1.2.1 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 5 shows the key figures for AUS.

Table 5: Key figures

Region	No. of facilities	Status	Area (m ²)	Headcount
UAE	1	Owned	363,789.27	6,082
Total			363,789.27	6,082

(Source: South Pole, based on AUS, 2022)

1.2.2 Operational boundaries

Under the GHG Protocol, emissions are divided into direct and indirect emissions. Direct emissions are those originating from sources either owned or controlled by the reporting entity, while indirect emissions are those 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 6 gives an overview of the emission sources considered in scope 1, based on the information provided by AUS.

Table 6: Overview of scope 1 emission sources for 2021–2022

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, 2022)

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 7 gives an overview of the emission sources considered in scope 2.

Table 7: Overview of scope 2 emission sources for 2021–2022

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, 2022)

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

Table 8: Overview of scope 3 emission sources for FY2022

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 (T&D) losses	Included
Upstream T&D	T&D 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 staff and faculty	Included
Staff, faculty and student commuting	Travel between home and work	Included
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 T&D	T&D 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

Category	Emission sources	Boundary
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, 2022)

1.3 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 provided primary data on fuel for: stationary combustion; distances for mobile combustion; refrigerants; electricity consumption for the university campus; flight-related business travel; purchased goods and services (such as paper, furniture, and other materials); water supply; capital goods (such as IT devices); freight; and waste generated in operations.

Where activity data of the inventory was lacking, extrapolations and estimations were made for the following categories:

- mobile combustion (land transport):** AUS was able to provide distances covered, fuel type and vehicle model. An estimation of fuel consumption was made based on fuel efficiencies of the vehicle models.
- freight:** AUS provided origin and destination of freights occurred in the reporting period. Except the location of AUS campus, the origin and destination information was limited to the name of the origin and destination city. South Pole assumed the origins and destinations to be the centre of the city.
- accommodation:** AUS was unable to provide information regarding accommodation. To obtain an estimate, an assumption was made using the data for flight-related business travel. It was assumed that short-haul and medium-haul flights required an overnight stay and long-haul flights required an accommodation stay of three nights. A three-star accommodation rating was also assumed.
- staff faculty and student commuting:** AUS conducted a commuting survey in 2022. The total number of respondents was 669. Out of these respondents, 231 commuted to AUS campus. The survey provided mode of transportation and total distance for commuting. South Pole extrapolated this data to represent all student, faculty and staff who were commuting in FY2022.

1.4 Global warming potentials

Global warming potential (GWP) is a measure of the climate impact of a GHG compared to CO₂ over a time horizon. GHG emissions have different GWP values depending on their efficiency in absorbing longwave radiation and the atmospheric lifetime of the gas. The GWP values used in GHG accounting include the six GHGs covered by the United Nations Framework Convention on Climate Change and the Kyoto Protocol and combinations of these, as outlined in Table 9. These are also the GWP values used by the UK's Department for Business, Energy and Industrial Strategy (BEIS) and based on the Intergovernmental Panel on Climate Change's (IPCC) 'Fourth Assessment Report' (AR4). Although the 'Fifth Assessment Report' is more recent, it has not been accepted internationally by all stakeholders.

Table 9: Applied global warming potentials

GHG	GWP (100 years)
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	25
Nitrous oxide (N ₂ O)	298
Hydrofluorocarbons (HFCs)	<u>See IPCC AR4 – Table 2.14</u>
Perfluorocarbons (PFCs)	<u>See IPCC AR4 – Table 2.14</u>
Sulphur hexafluoride (SF ₆)	22,800

(Source: IPCC AR4, 2007)

2 Results

2.1 Overall results

Based on the data provided by AUS, the total GHG reported emissions for the reporting period are estimated at 58,619.4 tCO_{2e}. Table 10 below illustrates the key figures in terms of GHG emissions (in tCO_{2e}) and energy intensity (in gigajoules [GJ]) relevant to corporate sustainability reporting, in accordance with the GHG Protocol.

'Total emissions' in this report refers to the emission sources covered, as described in section 1.2. Please note that due to the rounding of numbers the figures may not add up exactly to the total provided, as seen in Table 10. Table 11 provides the breakdown of GHG emissions by source.

Table 10: Key figures according to the Global Reporting Initiative

GRI G4	GRI standards	Topic	Quantity	Unit
G4-EN3	302-1	Direct energy consumption by primary source:		
		diesel	49.7	GJ
		petrol	895.9	GJ
		propane or liquefied petroleum gas (LPG)	2,890.7	GJ
G4-EN3	302-1	Indirect energy consumption by primary source: grid electricity	232,891.5	GJ
G4-EN15	305-1	Direct GHG emissions (scope 1)	2,149.9	tCO _{2e}
G4-EN16	305-2	Energy indirect GHG emissions (scope 2)	34,189.2	tCO _{2e}
G4-EN17	305-3	Other indirect GHG emissions (scope 3)	22,280.3	tCO _{2e}
G4-EN18	305-4	GHG emissions per staff, faculty and students	9.6	tCO _{2e} per staff, faculty and students

(Source: Global Reporting Initiative [GRI], G4 to pkm Standard, 2017)

Table 11: Greenhouse gas emissions by scope and activity for FY2022

Activity	Consumption	Unit	Emissions (tCO _{2e})	Percentage of total (%)
Scope 1: direct GHG emissions			2,149.9	3.67%
Stationary combustion			173.7	0.30%
Propane or LPG	110.6	m ³	172.2	0.29%
Diesel/heating oil	560.0	Litres	1.4	0.00%
Mobile combustion			58.4	0.10%
Diesel	740.5	Litres	1.9	0.00%
Petrol	26,154.1	Litres	56.5	0.10%

Greenhouse gas (GHG) accounting report

Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Refrigerant leakage			1,917.8	3.27%
R-134a	20.0	Kg	28.6	0.05%
R-22	873.0	Kg	1,580.1	2.70%
R-407c	1.5	Kg	3.2	0.01%
R-410a	146.5	kg	305.9	0.52%
Scope 2: indirect GHG emissions from purchased electricity, heating and cooling			34,189.2	58.32%
Electricity			34,189.2	58.32%
Grid	64,692,078.0	kWh	34,189.2	58.32%
Scope 3: other indirect GHG emissions			22,280.3	38.01%
Business travel			353.3	0.60%
Flights	1,298,292.7	pkm	277.9	0.47%
<463 km	13,334.0	pkm	3.6	0.01%
463–3,700 km	128,665.6	pkm	23.4	0.04%
>3,700 km	1,156,293.0	pkm	250.9	0.43%
Rented vehicles	317,725.0	AED	58.6	0.10%
Accommodation	365.0	guest-nights	16.8	0.03%
Purchased goods and services			1,165.0	1.99%
Water	69,608,871.5	m ³	39.5	0.07%
Supply	69,608,871.5	gallons	39.5	0.07%
Paper	86.2	t	64.9	0.11%
Unspecified	6.5	t	6.0	0.01%
Recycled	79.7	t	59.0	0.10%
Cloud services	227,000.0	users	356.6	0.61%
Books	503,572.0	AED	62.0	0.11%
Catering	400,293.0	AED	37.6	0.06%
Electrical appliances	547,967.0	AED	93.1	0.16%
Furniture	2,058,304.0	AED	359.6	0.61%
Printing	467,936.0	AED	73.3	0.13%
Water heaters	306,650.0	AED	78.4	0.13%
Capital goods			1,232.3	2.10%
Construction	3,943,309.0	AED	808.5	1.38%

Greenhouse gas (GHG) accounting report

Activity	Consumption	Unit	Emissions (tCO _{2e})	Percentage of total (%)
IT equipment	1,413.0	No. of devices	423.8	0.72%
Laptops	703.0	No. of devices	182.0	0.31%
Monitor or computer screen	710.0	No. of devices	241.8	0.41%
Staff, faculty and student commuting			7,414.2	12.65%
Car (petrol or diesel)	30,753,142.0	km	6,862.9	11.71%
Car (hybrid vehicle)	270,669.0	km	26.4	0.05%
Car (electric vehicle)	40,099.0	km	0.6	0.00%
Taxi	569,107.0	pkm	105.3	0.18%
Taxi (shared)	130,422.0	pkm	24.1	0.04%
Walk	847,095.0	km	0.0	0.00%
Bicycle	165,409.0	km	0.0	0.00%
Scooter electric	21,553.0	km	3.1	0.01%
Dubai Metro	1,029,546.0	pkm	33.8	0.06%
AUS Dubai Metro Shuttle	1,387,932.0	pkm	45.5	0.08%
University City Transportation Services	2,028,215.0	pkm	297.0	0.51%
Local Bus to and from Sharjah	106,263.0	pkm	15.6	0.03%
Upstream transportation and distribution			10.8	0.02%
Freight	63,406.4	tkm	10.8	0.02%
Air	8,764.9	tkm	9.9	0.02%
Sea	54,641.4	tkm	0.9	0.00%
Waste generated in operations			15.9	0.03%
Incineration	743,800.0	t	15.8	0.03%
General waste	743,800.0	kg	15.8	0.03%
Recycling	60,597.0	kg	0.1	0.00%
Batteries	31.0	kg	0.0	0.00%
Bulb and lamps	53.0	kg	0.0	0.00%
Cardboard	15,697.0	kg	0.0	0.00%
Electrical items	168.0	kg	0.0	0.00%
Glass	308.0	kg	0.0	0.00%
Metal	94.0	kg	0.0	0.00%

Greenhouse gas (GHG) accounting report

Activity	Consumption	Unit	Emissions (tCO ₂ e)	Percentage of total (%)
Paper	10,994.0	kg	0.0	0.00%
Plastic	672.0	kg	0.0	0.00%
Other	32,580.0	kg	0.0	0.00%
Fuel- and energy-related activities			12,088.7	20.62%
Well-to-tank			12,088.7	20.62%
Propane or LPG (stationary)	110.6	m ³	20.3	0.03%
Diesel (stationary)	560.0	litres	0.3	0.00%
Diesel (mobile)	740.5	litres	0.5	0.00%
Petrol or gasoline (mobile)	26,154.1	litres	16.0	0.03%
Electricity	64,692,078.0	kWh	12,051.6	20.56%
Total GHG emissions			58,619.4	100.00%

(Source: South Pole, based on AUS, 2022)

Figure 3 shows that AUS' major emission sources are scope 2 purchased electricity (58.32%), scope 3 fuel- and energy-related activities (20.62%) and scope 3 staff, faculty and student commuting (12.65%).

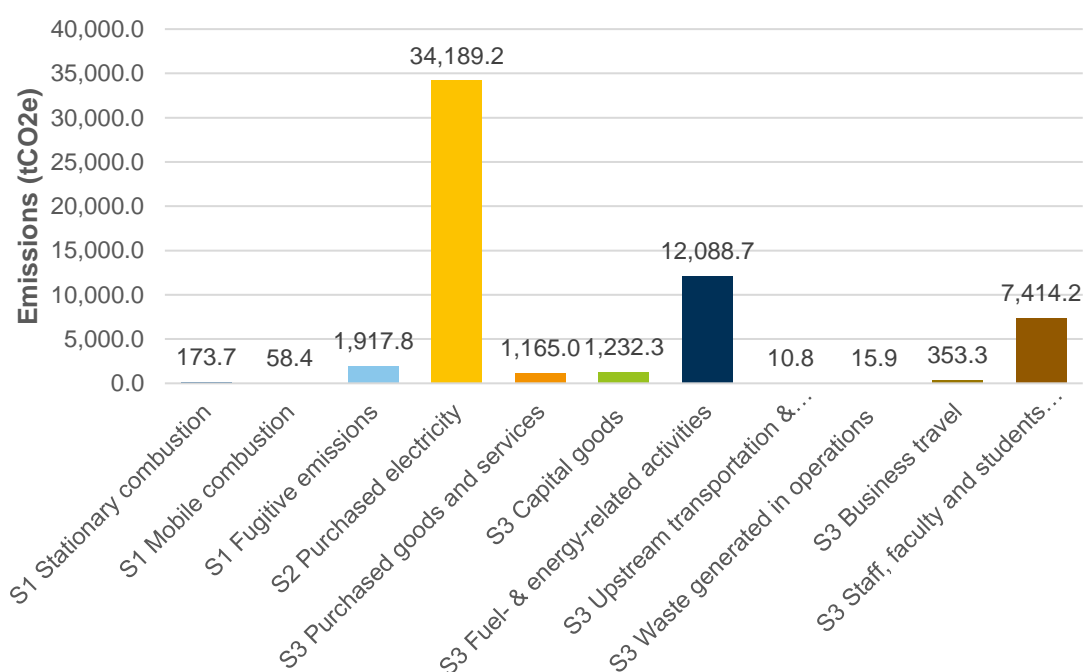


Figure 3: Greenhouse gas emissions by source for FY2022

(Source: American University of Sharjah, 2022)

2.2 Comparison of FY2019 and FY2022 GHG emissions

Table 12 shows the year-on-year change of AUS' GHG emissions per activity from FY2019 inventory to FY2022 inventory. Overall, AUS' GHG emissions increased by 33% from FY2019 to FY2022. The three highest emissions changes between FY2019 and FY2022 are from staff, faculty and student commuting, capital goods and fugitive emissions.

For staff, faculty and student commuting, there was a methodology change to account the emissions. In FY2019, there was very minimal visibility on the commuting habits of AUS staff, faculty and students. The commuting activities were accounted for using 2017 surveys where it provided the mode of transportation and the commuting distance in ranges. In FY2022, AUS provided the commuting data from the 2022 survey where it detailed the mode of transport used and the distance each transportation mode covers. The 2022 survey provided more granular data compared to 2017. From the 2022 survey, it was found that the distance for commuter groups (staff, faculty and students who were commuting) that use cars (petrol or diesel) is much higher than what was previously assumed. This resulted in a significant increase in commuting emissions.

For capital goods, the emissions came from construction and IT device purchase. In FY2019, there was no reported construction, while there was construction in FY2022. The amount of IT devices purchased in FY2022 was significantly higher than in FY2019. The increase in fugitive emissions, was a result of more granular data being available for FY2022.

Table 12: Year-on-year change between FY2019 and FY2022 GHG emissions

Scope	Activity	FY2022 (tCO ₂ e)	FY2019 (tCO ₂ e)	Year-on-year change (%)
Scope 1	Stationary combustion	173.7	42.5	308%
	Mobile combustion	58.4	305.9	-81%
	Fugitive emissions	1,917.8	284.2	575%
Scope 2	Purchased electricity	34,189.2	30,371.8	13%
Scope 3	Purchased goods and services	1,165.0	2,615.8	-55%
	Capital goods	1,232.3	28.4	4246%
	Fuel- and energy-related activities	12,088.7	7,763.5	56%
	Upstream transportation & distribution	10.8	154.2	-93%
	Waste generated in operations	15.9	17.4	-8%
	Business travel	353.3	2,520.7	-86%
	Staff, faculty and student commuting	7,414.2	22.3	33110%
Total		58,619.4	44,126.6	33%

(Source: South Pole, 2023)

3 Conclusions

The total GHG emissions for AUS in FY2022 was 58,619.4 tCO₂e. Emissions from purchased electricity, fuel- and energy-related activities and staff, faculty and student commuting make up the majority of the footprint, accounting for 34,189.2 tCO₂e (58.32%), 12,088.7 tCO₂e (20.62%) and 7,414.2 (12.65%), respectively.

For purchased electricity, AUS procured its electricity from the grid, totalling 64,692,078 kWh during the FY2022. It is recommended that AUS start looking for renewable energy options, such as energy attribute certificates (EACs), corporate power purchase agreements (PPAs) and on-site renewable energy plant to reduce its emissions from this category. This will also help to reduce the scope 3 fuel- and energy-related activities emissions which are currently responsible for 21% of AUS total emissions.

For staff, faculty and student commuting, AUS has improved its data by providing the 2022 commuting survey. The total respondents were 669 (11% response rate), which is a valid sample size for a population of 6,082. The improvement of the methodology impacted AUS emissions quite significantly. This is due to new findings that many of AUS's commuter groups (staff, faculty and students) use cars (petrol or diesel) to commute at long distances (>100 km) to the campus. Commuter emissions account for 13% of AUS's total emissions and are the third highest emission source, therefore it is recommended that AUS look for options to reduce these emissions. It is recognised that public transport to and from the university is limited, therefore, AUS could explore the option of providing shuttles and other mass transport options to reduce the reliance on private cars.

According to the results, AUS' emissions increased across all scopes in FY2022 compared to FY2019. In FY2019, AUS has modelled scope 1 and 2 emission reduction targets in line with the Science Based Targets Initiative (SBTi) as well as identifying emission reduction opportunities. The increased emissions in FY2022 indicates that progress towards meeting the target still needs to be achieved. AUS should focus more resources on implementing interventions to reduce its emissions, particularly regarding 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, setting a scope 3 target is not mandatory while scope 3 emissions remain under the 40% as set out by the SBTi target setting guidelines⁴, however it is strongly encouraged and would show a strong commitment to reducing emissions across the university's value chain.

⁴ SBTi Criteria and Recommendations, version 5.0 October 2021

Annex I

Emission factors

Table 13: Emission factors

Activity	Emission factor reference ⁵
Fuel and electricity	<ul style="list-style-type: none"> • BEIS, 2022⁶ (Global emissions factor used for stationary and mobile fuel activity). • International Energy Agency (IEA) electricity emission factors 2022. • Ecoinvent v3.9.1
Business travel	<ul style="list-style-type: none"> • BEIS, 2022 (emissions factors for short, medium, and long-haul flights were used for business air travel). • CEDA⁷, 2019 (UAE emissions factor applied for rental car).
Accommodation	CHSB Index 2019 ⁸ , Cornell Hotel Sustainability Benchmarking 2019 (country mean value emissions factor applied Per Occupied Room).
Purchased goods and services	<ul style="list-style-type: none"> • BEIS, 2022 (Global emissions factor for recycled and primary material used for paper purchases, global emissions factor used for water supply) • CEDA, 2019 (UAE emissions factor used for catering, books, furniture, printing, water heaters and electrical appliances) • Technology-specific Cost and Performance Parameters, 2014 (used to determine the user emissions factor for cloud services)
Capital goods	<ul style="list-style-type: none"> • CEDA, 2019 (UAE emissions factor used for construction); • Dell, 2021; • Apple, 2021; • Microsoft, 2019
Staff, faculty and student commuting	BEIS, 2022 (Global emissions factor for average motorbike, car and buses were used.)
Freight	BEIS, 2022 (emissions factor for average cargo container ship and air freight)
Waste	BEIS 2022 (average waste emissions factor for cardboard, paper, glass, metal, batteries, and electrical items used)

(Source: South Pole, 2023)

⁵ South Pole derives its emission factors from reliable and credible sources. South Pole is not responsible for inaccuracies in emission factors provided by third parties.

⁶BEIS Emission Factors, 2022

⁷ CEDA Country specific emission factor, Purchaser Price, 2019

⁸ CHSB Index, 2019

