جامعة الشارقة
UNIVERSITY OF SHARJAH

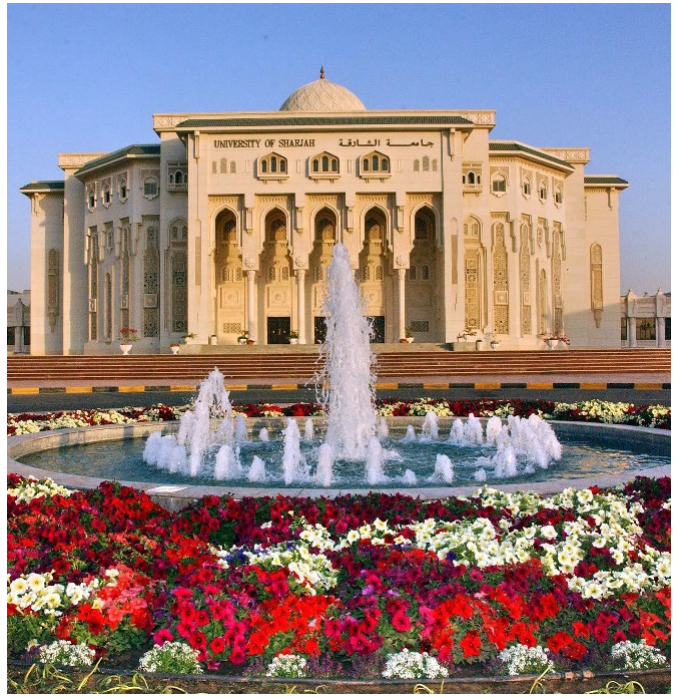
مكتب الاستدامة
SUSTAINABILITY OFFICE

Race to Zero Action Plan

(Together we can make an impact)

The University of Sharjah

- The University of Sharjah (UOS) was established in 1997 by its Founder, President, and Chairman, the Ruler of Sharjah, His Highness Sheikh Dr. Sultan Bin Muhammad Al-Qasimi, to meet the Emirate of Sharjah's aim of educational needs. One of the University's goals is to become a leading academic institution in the Middle East and worldwide.
- The University of Sharjah is working to embody the directives of His Highness Sheikh Dr. Sultan bin Muhammad Al-Qasimi, by making a concerted effort to reduce the effects of global warming, support sustainability projects and stimulate many different aspects of sustainability in education and research-related fields, as well as physically implementing the concept throughout the campus.



- The vision of the university of Sharjah is to become a regional and global benchmark for sustainability excellence in higher education, which is aligned with the UAE's commitment to achieving (net) Zero by 2050.

Recent International Achievements

1st university in the Arab World to earn a Sustainability Tracking, Assessment, and Rating System (STARS) Gold rating in the year June 2022 in recognition of its sustainability achievements from the Association for the Advancement of Sustainability in Higher Education (AASHE) in Florida, United States

1st place in UAE for six consecutive years (2017-2022) in the UI Green Metric World University Rankings (UI GWUR) 2022, 81st globally in the overall rank, 7th in Setting and Infrastructure, 22nd in Water, 73rd in Waste, and the 85th in Education & Research category

1st place in UAE for three years in a row based on the UN Sustainable Development Goals in the year 2022

Pledge

- **The University of Sharjah pledges** to reach (net) zero GHGs as soon as possible and by mid-century at the latest, in line with global efforts to limit warming to 1.5C. This aligns with the UAE's commitment to achieving (net) zero by 2050 at the latest.
- We set an interim target to achieve in the next decade, which reflects maximum effort towards or beyond a fair share of the 50% global reduction in CO2 by 2030 identified in the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5C.

Aim of the report

The aim of this report is to:

- ✓ Report inventories of relevant annu greenhouse gas (GHG) emissions (Scop 1, 2, and 3) shown in Figure 1.
- ✓ Set a plan to quantify other sources ar activities that produce GHG (Scope 3)
- ✓ Set a plan to reduce the GHG and reac net zero by 2050
- ✓ Contribute to the most critical SDGs:

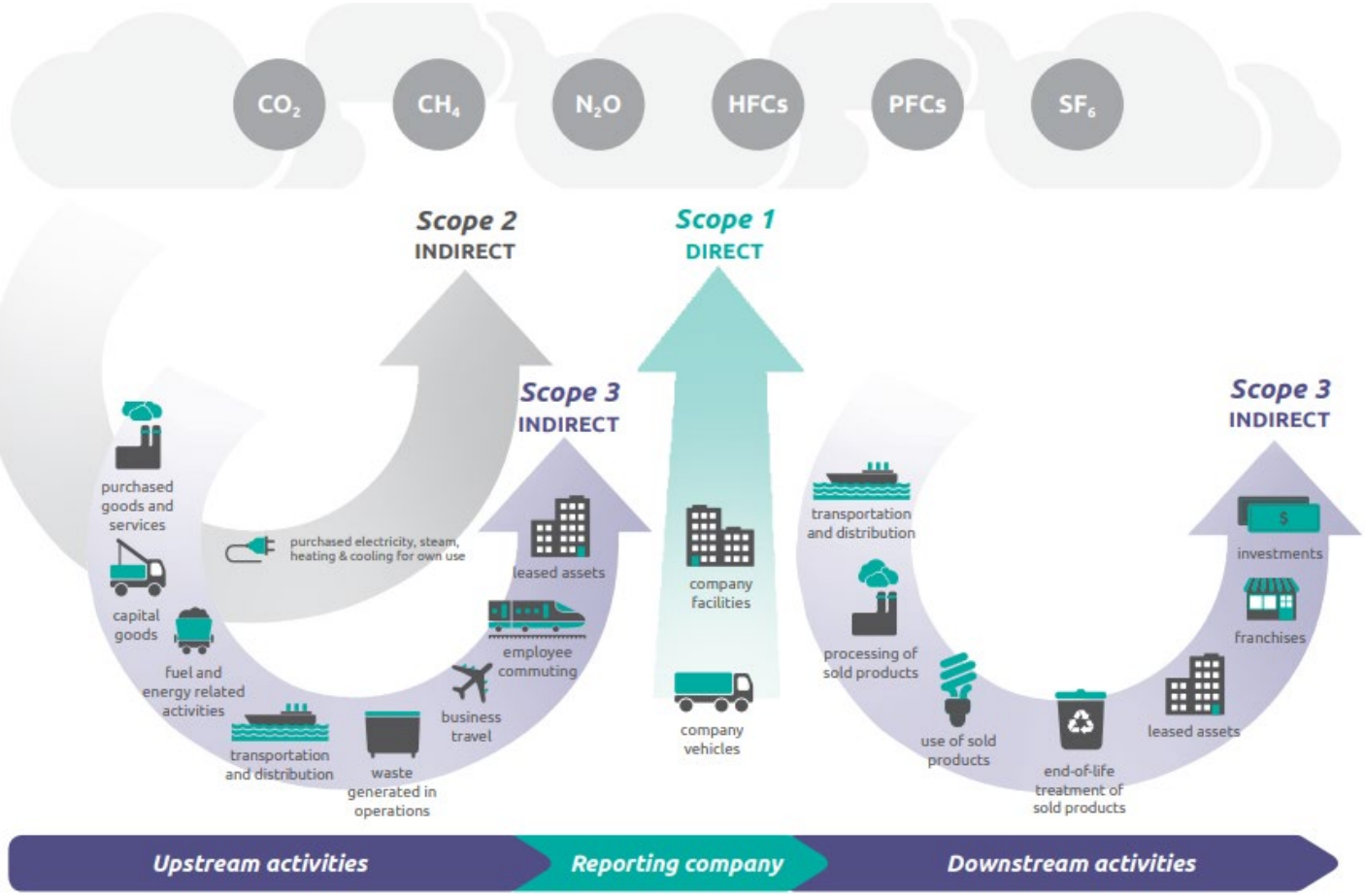


Figure 1. Overview of GHG Protocol Scopes and emissions cross the value chain (Source: Standardized Carbon Emissions Reporting Framework – Version 3.0 – December 2022)

Emissions inventory

In this report we are considering **the academic year 2021/2022** as a baseline year. Only the CO2 emissions will be considered. Other activities in scope 3 will be included in the future.

- **Scope1:**

➢ Vehicles owned by University of Sharjah (UOS): University fleet
➢ Diesel generators at UOS

- **Scope2:**

➢ Electricity purchased by UOS

- **Scope3:**
  - **Upstream operations**
    - ➢ Stationary purchased by UOS
    - ➢ Transportation: employees and students commuting
  - **Downstream operations**
    - ➢ Waste generated by UOS

Emissions inventory: Scope1 Source1

- **Source1: Vehicles owned by the University of Sharjah (UOS): University fleet**
- **Baseline**: **CO2 Emissions from university busses and vehicles: 44.928 (Bus/Shuttle)+ 28.954(Cars) = 73.882 metric tons**

Table 1. Scope1, source1, CO2 emissions (2022-2030)

	2022 Baseline	2024	2026	2028	2030
Actions to be taken to reduce CO2 emissions.	None – baseline	Convert 10% of the university-owned vehicles to Zero-Emission Vehicles	Convert 15% of the university-owned vehicles to Zero-Emission Vehicles	Convert 20% of the university-owned vehicles to Zero-Emission Vehicles	Convert 20% of the university-owned vehicles to Zero-Emission Vehicles
Metric tons CO2 University Fleet (busses and Cars)	73.882	66.49	56.52	45.22	36.17

Emissions inventory: Scope1
Source1

- **Numbers used for the calculation:** University fleet (scope1, source1):

Bus/Shuttle	
Number of shuttles operating in the university	60
Total trips of each shuttle service each day	9
Approximate travel distance of a vehicle each day inside campus only (in kilometers)	4
Number of working days per year (4 working days a week)	208
Coefficient to calculate the emission in metric tons per 100 km for a bus (source: GreenMetric)	0.01
Tons CO2	**44.928**

University Cars	
Number of cars operating in the university	87
Total trips of each vehicle each day	2
Approximate travel distance of a vehicle each day inside campus only (in kilometers)	4
Number of working days per year (4 working days a week)	208
Coefficient to calculate the emission in metric tons per 100 km for a car (source: GreenMetric)	0.02
Tons CO2	**28.954**

Emissions inventory: Scope1
Source2

- **Source2: Diesel generators at UOS – 20 generators**
- **Total CO2 (baseline) = (34230 kWh/year)/(12.69 kWh/gal)*3.78 L/gallon* 3 kgCO2/L**

  = 30589 kg CO2/year = 30.59 Metric tons

Table 2. Scope1, source2, CO2 emissions (2022-2030)

	2022 – Baseline	2024	2026	2028	2030
Actions to be taken to reduce CO2 emissions.	None – baseline	Reduce the Operation time of the backup generator By 10%	Reduce the Operation time of the backup generator By 15%	Reduce the Operation time of the backup generator By 20%	Reduce the Operation time of the backup generator By 20%
Metric tons CO2	30.59	27.53	23.4	18.72	14.98

Emissions inventory: Scope1 Source2

Numbers used for the calculation: Back up generator (scope1, source2):

20 generators. Characteristics shown in Table3

- Average Running Time = 0.5 hrs/month
- Energy (kWh) consumed by the generator: E = P (kVA or kW) x time (hr)
- Average Fuel consumption of Diesel generator: 12.69 kWh/gallon
- Conversion factor: 1 gallon = 3.78 L
- Emission factor: 3 kg C02/Liter
- Total energy from all the Diesel Generators: 34230 kWh/year

Table 3. Characteristics of the 20 generators

Sl.No#	Descriptions	Quantity
1	Generator at M11-B 016, P200, 250KVA	01 No.
2	Generator at M2 GR, GE150 ,150 KVA	01 No.
3	Generator at W2 042, GE 150 - CATER PILLER 150KVA	01 No.
4	Generator at M23-028,150KVA - CUMMINS	01 No.
5	Generator at M24, 150KVA - CUMMINS	01 No.
6	Generator at M26, 150KVA - VOLA PENTA	01 No.
7	Generator at M27, 150KVA - CUMMINS	01 No.
8	Generator at M28 , 90 KVA - CUMMINS	01 No.
9	Generator at M29, 120KVA - CUMMINS	01 No.
10	Generator at M16, 320KVA - CAT	01 No.
11	Generator at W16, 320KVA - CAT	01 No.
12	Generator at Lab -W12, 100KVA - PERKINS	01 No.
13	Generator at Lab -M12, 60KVA - PERKINS	01 No.
14	Generator at Institute of Medical Research-M32,1500KVA PERKINS Gen1	01 No.
15	Generator at Institute of Medical Research–M32,1500KVA, PERKINS Gen2	01 No.
16	Generator at M31, 250KVA - PERKINS	01 No.
17	Generator at Planetarium, 420KVA - PERKINS	01 No.
18	Generator at UDHS,1675KVA - CUMMINS	01 No.
19	Generator at M3A, 400KVA - PERKINS	01 No.
20	Generator at M1A, 500KVA - PERKINS	01 No.

Total emissions inventory from Scope1 (source1+source2)= 104.47 Metric tons of CO2

→ 51.15 Metric tons of CO2 expected in 2030 (51% reduction)

Emissions inventory: Scope2 Source1

- **Source1: Electricity purchased by UOS**

Total CO2 emission from electricity (baseline)= (68318668/1000)*0.709 = 48,44 metric tons

Table 4. Scope2, source1, CO2 emissions (2022-2030)

	2022 Baseline Million kWh	2024 Million kWh	2026 Million kWh	2028 Million kWh	2030 Million kWh
Fossil fuel electricity purchased from Sharjah Electricity and Water Authority	68.32	58.76	49.35	40.96	34.00
Action to be taken to reduce CO2 emissions. Energy Conservation Energy Efficiency Renewable Energy	None: baseline	Energy Conservation: reduce waste of energy: 6% Energy Efficiency: use more efficient energy system (HVAC, Lighting and Equipment): 7% Renewable energy - solar PV: 1 % of the total energy consumption from solar PV	Energy Conservation: reduce waste of energy: 7% Energy Efficiency: use more efficient energy system (HVAC, Lighting and Equipment): 8% Renewable energy - solar PV: 1 % of the total energy consumption from solar PV	Energy Efficiency: use more efficient energy system (HVAC, Lighting and Equipment): 12% Renewable energy - solar PV: 5% of the total energy consumption from solar PV	Energy Efficiency: use more efficient energy system (HVAC, Lighting and Equipment): 12% Renewable energy - solar PV: 5% of the total energy consumption from solar PV
Metric tons CO2	48437.94	41656.62	34991.56	29043.00	24105.69

Emissions inventory: Scope2
Source1

Numbers used for the calculation:

Electricity Usage (baseline)= 68318668 kWh

Emission Factor: https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

Total emissions inventory from Scope2 (source1)= 48.44 Metric tons of CO2 in 2022

→ 24.11 Metric tons of CO2 expected in 2030 (50.2% reduction)

Emissions inventory: Scope3 Source1

- **Upstream Operations, Source1: Stationary purchased by the UOS**

- **Baseline:**

Paper,white,A3,Paper One= 50*4 (kg)*1.5= 200(kg)*1.5 = 0.3 metric tons

PaperA4,COPY PAPER 80GM WHITE 80 gms,210x297,500 S = 1100*12.8(kg)*1.5= 14,080(kg)*1.5 = 21.12 metric tons

Table 5. Scope3, source1, CO2 emissions (2022-2030)

	2022 – Baseline	2024	2026	2028	2030
Actions to be taken to reduce CO2 emissions.	None – baseline	Reduce 20% of the use of papers by university stakeholders by implementing various paperless strategies	Reduce 15% of the use of papers by university stakeholders by implementing various paperless strategies	Reduce 15% of the use of papers by university stakeholders by implementing various paperless strategies	Reduce 15% of the use of papers by university stakeholders by implementing various paperless strategies
Metric tons CO2	21.42	17.14	14.57	12.38	10.52

Here are the numbers used for the calculations (scope3, source1):

We approximated that the production of one ton of paper generates approximately 1.5 tons of CO2 emissions.

Emissions inventory: Scope3 Source2

- **Upstream operations, Source2: employee and students commuting (UOS):**

CO2 Emissions from commuting cars/motorcycles (baseline): 1347.840 (cars) + 10.220 (motorcycles) = 1358.060 metric tons

Table 6. Scope3, source2, CO2 emissions (2022-2030)

	2022 – Baseline	2024	2026	2028	2030
Actions to be taken to reduce CO2 emissions.	None – baseline	Convert 10% of the commuting vehicles to Zero-Emission Vehicles	Convert 15% of the commuting vehicles to Zero-Emission Vehicles	Convert 17% of the commuting vehicles to Zero-Emission Vehicles	Convert 20% of the commuting vehicles to Zero-Emission Vehicles
Metric tons CO2	1358.06	1222.25	1038.92	862.30	689.84

Emissions inventory: Scope3 Source2

- **Numbers used for the calculation: Commuting Vehicles** (scope3, source2):

Commuting Cars	
Number of vehicles commuting to the university	16200
Total trips of each vehicle each day	2
Approximate travel distance of a vehicle each day inside campus only (in kilometers)	1
Number of working days per year (4 working days a week)	208
Coefficient to calculate the emission in metric tons per 100 km for a car (source: GreenMetric)	0.02
Tons CO2	**1347.840**

Delivery Motorcycles	
Number of motorcycles operating in the university	140
Total trips of each vehicle each day	2
Approximate travel distance of a vehicle each day inside campus only (in kilometers)	1
Number of working days per year	365
Coefficient to calculate the emission in metric tons per 100 km for a motorcycle (source: GreenMetric)	0.01
Tons CO2	**10.220**

Emissions inventory: Scope3
Source3

- **Downstream operations, Source 3:** Waste generated by UOS

Table 8. Scope3, source3, CO_2 emissions (2022-2030)

	2022 – Baseline	2024	2026	2028	2030
Actions to be taken to reduce CO_2 emissions	None – baseline	Reduce the amount of organic waste disposed of in landfills by 12%*	Reduce the amount of organic waste disposed of in landfills by 15%*	Reduce the amount of organic waste disposed of in landfills by 16%*	Reduce the amount of organic waste disposed of in landfills by 20%*
Tons CO_2	3305.00	2908.40	2472.14	2076.60	1661.28

This can be achieved by processing the collected waste in material and energy recovery facilities, such as composting facilities, incinerators, and anaerobic digesters.

The methane gas emissions of organic waste disposed of in landfill were calculated based on the methodology of tier 1 of the Intergovernmental Panel on Climate Change (IPCC) guidelines. Tier 1 states that CH4 emissions in a landfill are calculated using the generated amounts of waste and default emission factors.

Emissions inventory: Scope3
Source3

Assumptions and numbers used for the calculations (scope3, source3):

- Biogenic carbon emissions are excluded.
- Global warming potential for methane = 28
- Methane fraction in landfill gas = 50%
- Amount of organic waste disposed of in landfills (municipal) = 997 tons
- Amount of organic waste disposed of in landfills (non-municipal) = 1558 tons
- Total amount of organic waste disposed of in landfills = 2555 tons
- Methane emissions from organic waste disposed of in landfills = 118 tons CH4
- Equivalent carbon emissions from organic waste disposed of in landfills = 3305 tons CO2

Total emissions inventory from Scope2 (source1)=4684.48 Metric tons of CO2 in 2022

→ 2361.64 Metric tons of CO2 expected in 2030 (49.6% reduction)

Summary of CO2 Emission

Scope	Source	Baseline CO2 Emission (Metric tons)	Interim CO2 (Metric tons)	% Reduction
Scope 1	Source 1	73.88	36.17	51.04
	Source 2	30.59	14.98	51.03
Scope 2	Source 1	48437.94	24105.69	50.23
Scope 3	**Upstream:**			
	Source 1	21.42	10.52	50.89
	Source 2	1358.06	689.84	49.20
	Downstream			
	Source 3	3305.00	1661.28	49.73
Total		**53226.89**	**26518.48**	**50.18**

Needed information

1. **Net-Zero Target:** 2050

2. **Interim Target:** 2030

3. **URL to the Net-Zero Plan** and **4. URL to the annual progress report against the Net-Zero Target:**
https://www.sharjah.ac.ae/en/Administration/Sustainability/Pages/rz.aspx