



CARBON EMISSIONS SUMMARY

2023

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Net Zero Emissions Target

MMU is dedicated towards attaining carbon neutrality by 2050 with a holistic set of sustainability strategies and initiatives that encompasses campus operations, energy consumption, supply chain, education and awareness that will realise MMU's bold net zero target by 2050.

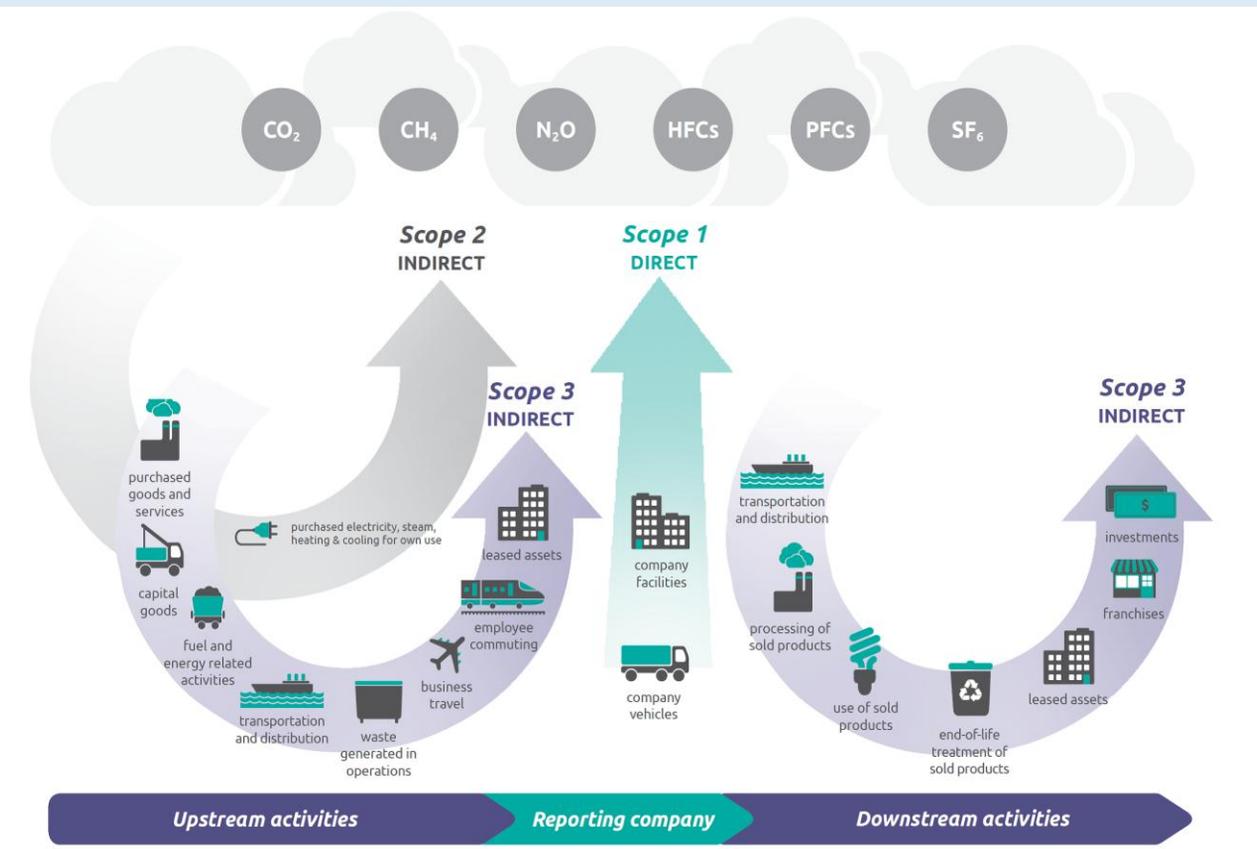
Scope of Emissions

Scope 1 emissions are direct emission of greenhouse gases from sources controlled or owned by MMU.

What it covers: Fuel consumption directly generated by university-owned fleet of vehicles and transportation. The data is provided by Facilities Management Division (FMD) in MMU. The fuel combustion (petrol and diesel fuel) has been determined from the invoice records.

Scope 2 emissions are indirect emissions associated with energy that the university purchases.

What it covers: The amount of electricity consumed in both the MMU Cyberjaya and Melaka campuses. The electricity used is converted into carbon emissions based on the Malaysia Energy Information Hub (MEIH) Grid Emissions Factor for Peninsular Malaysia.



Source: WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard, p. 5.



Method of Calculation

The quantification methods used to calculate greenhouse gases emissions for MMU are based on the World Resources Institute(WRI) and the World Business Council for Sustainable Development (WBCSD) GHG Protocol. All fuel combustion and electricity consumption has been determined from invoices and financial records. Using emission factors, which are unique to each emission source, the raw data has been converted to metric tonnes of CO₂ equivalent emissions (tCO₂e). This was done to allow for normalized comparison between different types of emissions sources.

The emission factors used in the calculations are based on national industry standards i.e. Malaysia Energy Information Hub (MEIH) Grid Emissions Factor for Peninsular Malaysia and the Department for Environment Food and Rural Affairs (DEFRA) Emissions Factors 2023. The data provided in this report were prepared by the MMU Facilities Management Division. Any questions regarding the methods used to collect and calculate these values can be directed to sqa@mmu.edu.my.

2023 Emissions Summary

MMU produced 454.76 tCO₂e Scope 1 and 15,895.05 tCO₂e Scope 2 emissions throughout 2023, summing to a total carbon footprint of 16,349.81 tCO₂e. A summary of MMU’s emissions is shown below in Table 1, including emissions normalized by the campus population i.e. per capita and by gross usable area i.e., per m².

	MMU’s emissions (tCO ₂ e)
Scope 1 (tCO ₂ e)	454.76
Scope 2 (tCO ₂ e)	15,895.05
Total tCO₂e	16,349.81
Per Capita	0.90
Per m ²	0.04
Gross Usable Area	368,707.66

Table 1: Summary of MMU’s Scope 1 and Scope 2 carbon emissions



Emissions Over Time (2019-2023)

From 2019 to 2023, MMU has reduced its total carbon emissions from 16,615.32 tCO₂e to 16,349.81 tCO₂e. Figure 1 and Table 2 presents MMU’s year-over-year breakdown of total carbon emissions for Scope 1 and Scope 2. Carbon emissions in the year 2021 was low due to the COVID-19 pandemic with reduced on-campus teaching activities due to the Movement Control Order (MCO) enforced by the government and physical distancing guidelines as well as online delivery of teaching as required by the Ministry of Higher Education. Whereas in 2022, an increase in total emissions is observed, as the students and staff return to campuses for their classes and work as the COVID-19 pandemic came under control. It must be noted that even with significant student growth, overall emissions per capita are below 1.0 tCO₂e compared to 1.19 tCO₂e recorded in the year 2019 just before COVID-19 pandemic and overall emissions per gross usable area are between 0.02 tCO₂e to 0.05 tCO₂e from 2019 to 2023.

Year	2019	2020	2021	2022	2023
Scope 1 (tCO ₂ e)	338.44	169.93	112.58	349.09	454.76
Scope 2 (tCO ₂ e)	16,276.88	10,557.30	8,958.11	13,780.11	15,895.05
Total tCO₂e	16,615.32	10,727.03	9,070.69	14,129.20	16,349.81
Per Capita	1.19	0.79	0.62	0.88	0.90
Per m ²	0.05	0.03	0.02	0.04	0.04
Gross Usable Area	368,707.66	368,707.66	368,707.66	368,707.66	368,707.66

Table 2: Summary of carbon emissions for Scope 1 and Scope 2 in MMU (2019-2023)



Emissions Over Time (2019-2023)

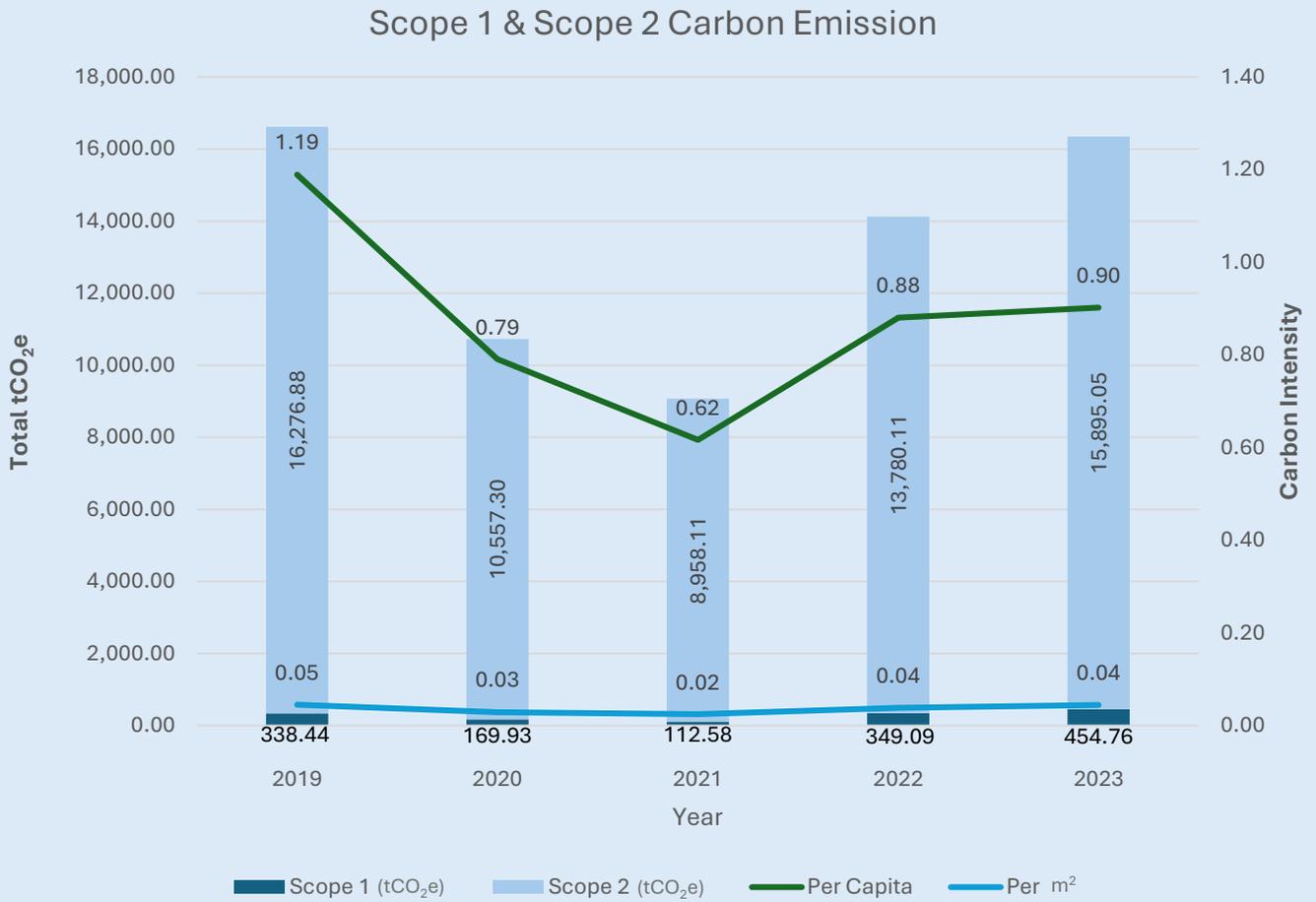


Figure 1: MMU’s total carbon emissions for Scope 1 and Scope 2 (2019-2023)



Emissions by Scope (2019-2023)

Scope 1: Direct Emissions From Fuel Consumption

What it covers: Fuel consumption directly generated by university-owned vehicles. The data is provided by Facilities Management Division (FMD) in MMU. The fuel combustion (petrol and diesel fuel) has been determined from the invoice records.

These emissions are calculated using the Department for Environment Food and Rural Affairs (DEFRA) Emissions Factors. We have calculated our Scope 1 emission from the year 2019 to year 2023 as shown in Table 3 and Figure 2.

Year	2019	2020	2021	2022	2023
Scope 1 (Total tCO₂e)	338.44	169.93	112.58	349.09	454.76
Diesel (Scope 1)	8.65	38.29	15.53	106.05	183.42
Petrol (Scope 1)	329.79	131.64	97.05	243.04	271.34

Table 3: Summary of carbon emissions for Scope 1 in MMU (2019-2023)

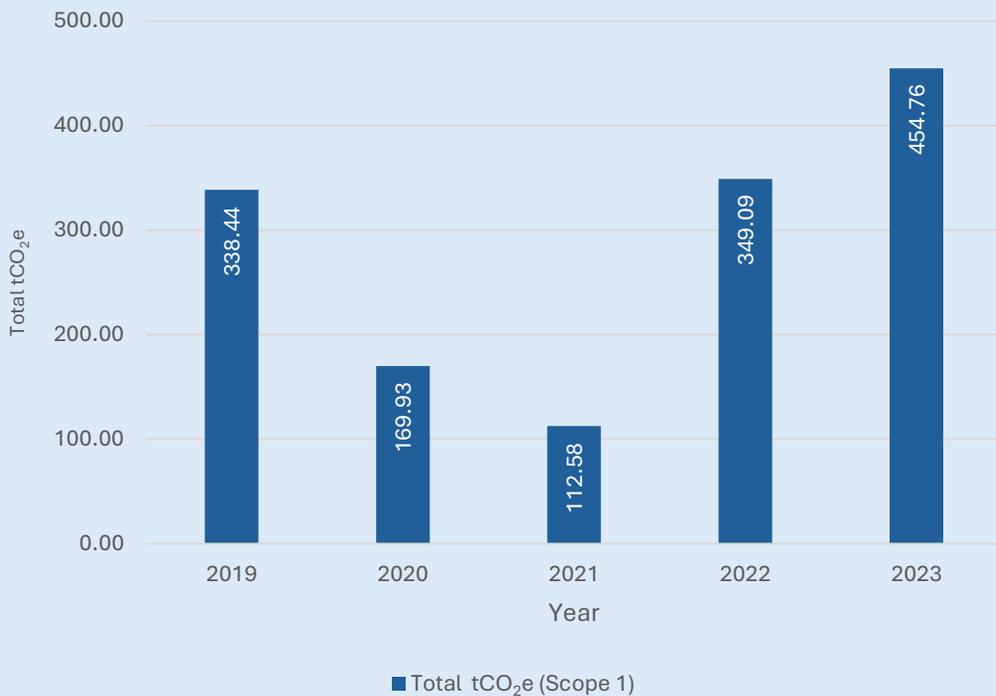


Figure 2: MMU's total carbon emissions for Scope 1 (2019-2023)



Scope 2: Indirect Emissions From Purchased Electricity

What it covers: Scope 2 covers the amount of electricity consumed by both the MMU Cyberjaya and Melaka campuses. The electricity consumed is converted into carbon emissions based on the Malaysia Energy Information Hub (MEIH) Grid Emissions Factor for Peninsular Malaysia.

The data on electricity consumption is mainly collected from utility bills provided by the energy supplier, which is Tenaga Nasional Berhad (TNB). The Facilities Management Division (FMD) recorded these bills which detail monthly electricity consumption.

The Scope 2 emissions were calculated using data obtained from 2019 to 2023. Figure 3 shows the Scope 2 emissions in MMU over time.

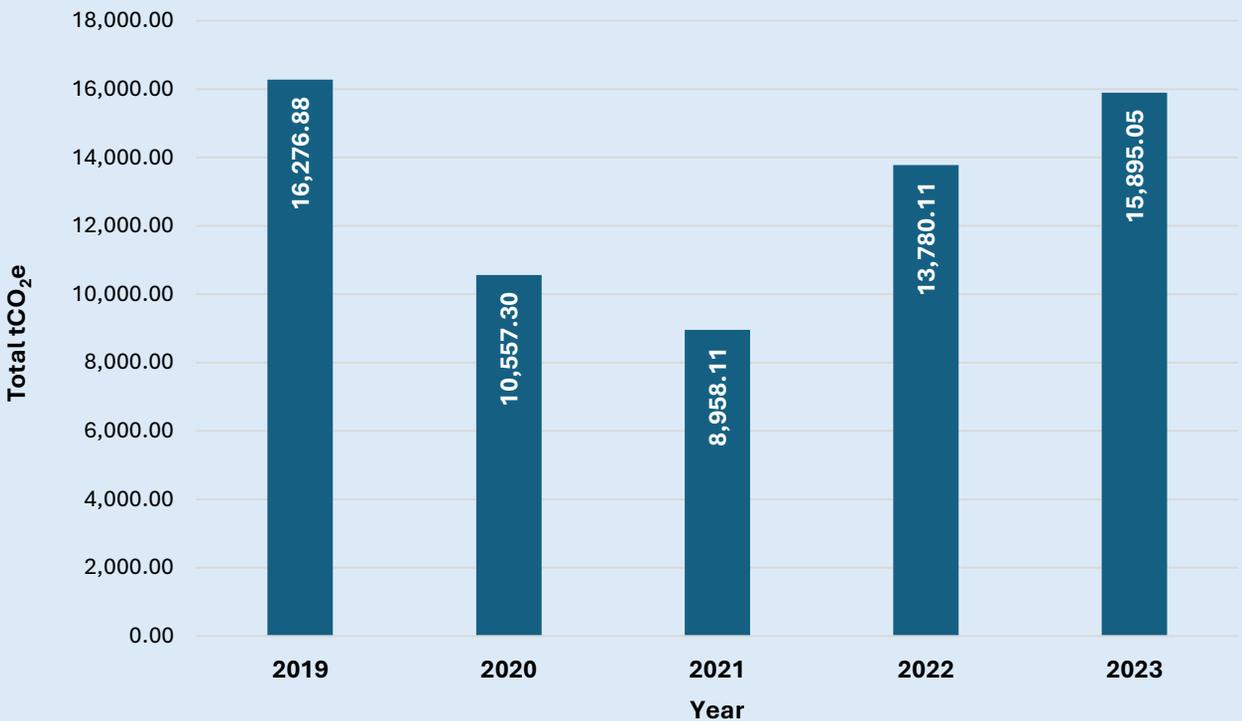


Figure 3: MMU's total carbon emissions for Scope 2 (2019-2023)



Moving Forward

MMU is committed to promoting a sustainable and environmentally friendly campus. The strategies listed below to ensures that MMU will achieve net zero emissions by 2050 with the support of students and staff through education, research, community engagement, and operations.

i. Insulation efficiency

Refurbishment in MMU to improve the insulation of rooms will be undertaken this year to reduce MMU's carbon footprint and decrease energy consumption.

ii. Replacement of air-conditioning systems

Campus-wide efforts will be taken to assess and replace air conditioners and HVAC systems with energy-efficient air conditioners to reduce energy consumption.

iii. ESG literacy assessment

In an effort to ensure an effective ESG programme in the university, it is exigent that the current levels of ESG awareness and literacy amongst students and staff is ascertained with a robust ESG literacy assessment tool in MMU.

iv. Greener lighting options

MMU shall work on the following to conserve energy and reduce carbon emissions:

- a) Replacement of environmental outdoor lighting systems with energy-efficient solutions.
- b) Replacement of indoor lighting systems in study, research and work areas with energy-efficient solutions.

