



CARBON EMISSIONS SUMMARY

2024

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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.

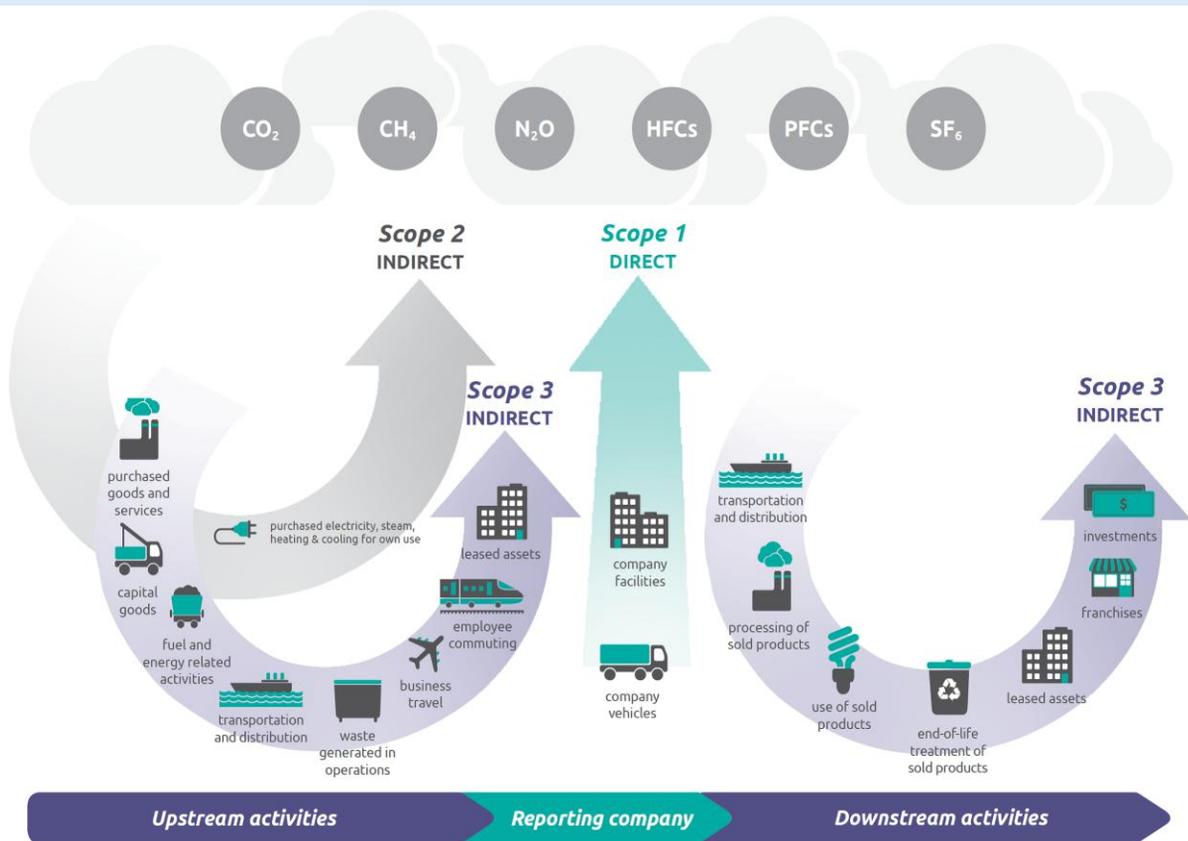
Scope of Emissions

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 2024. 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.

2024 Emissions Summary

MMU produced 468.04 tCO₂e Scope 1 and 16,842.11 tCO₂e Scope 2 emissions throughout 2024, summing to a total carbon footprint of 17,310.15 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)	468.04
Scope 2 (tCO ₂ e)	16,842.11
Total tCO₂e	17,310.15
Per Capita	0.91
Per m ²	0.05
Gross Usable Area	368,707.66

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



Emissions Over Time (2019-2024)

Figure 1 and Table 2 presents MMU’s year-over-year breakdown of total carbon emissions for Scope 1 and Scope 2. Carbon emission in 2021 was low due to the COVID-19 pandemic, as on-campus activities were reduced under the Movement Control Order (MCO) enforced by the government, along with physical distancing guidelines and the shift to online 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 2024. However, in 2024 there is a slight increase of total emission compared to 2023. This increase can be attributed to several factors, such as hosting events for the community, sports, and competitions for schools, government agencies, etc.; providing lodging and hospitality services for visitors and students from abroad, campus refurbishment works; and ancillary activities associated with events, such as increased use of campus shuttle/bus services and increased demand for campus utilities.

Year	2019	2020	2021	2022	2023	2024
Scope 1 (tCO ₂ e)	338.44	169.93	112.58	349.09	454.76	468.04
Scope 2 (tCO ₂ e)	16,276.88	10,557.30	8,958.11	13,780.11	15,895.05	16,842.11
Total tCO₂e	16,615.32	10,727.23	9,070.69	14,129.20	16,349.81	17,310.15
Per Capita	1.19	0.79	0.62	0.88	0.90	0.91
Per m ²	0.05	0.03	0.02	0.04	0.04	0.05
Gross Usable Area	368,707.66	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 (2019-2024)



Emissions Over Time (2019-2024)

Scope 1 & Scope 2 Carbon Emission

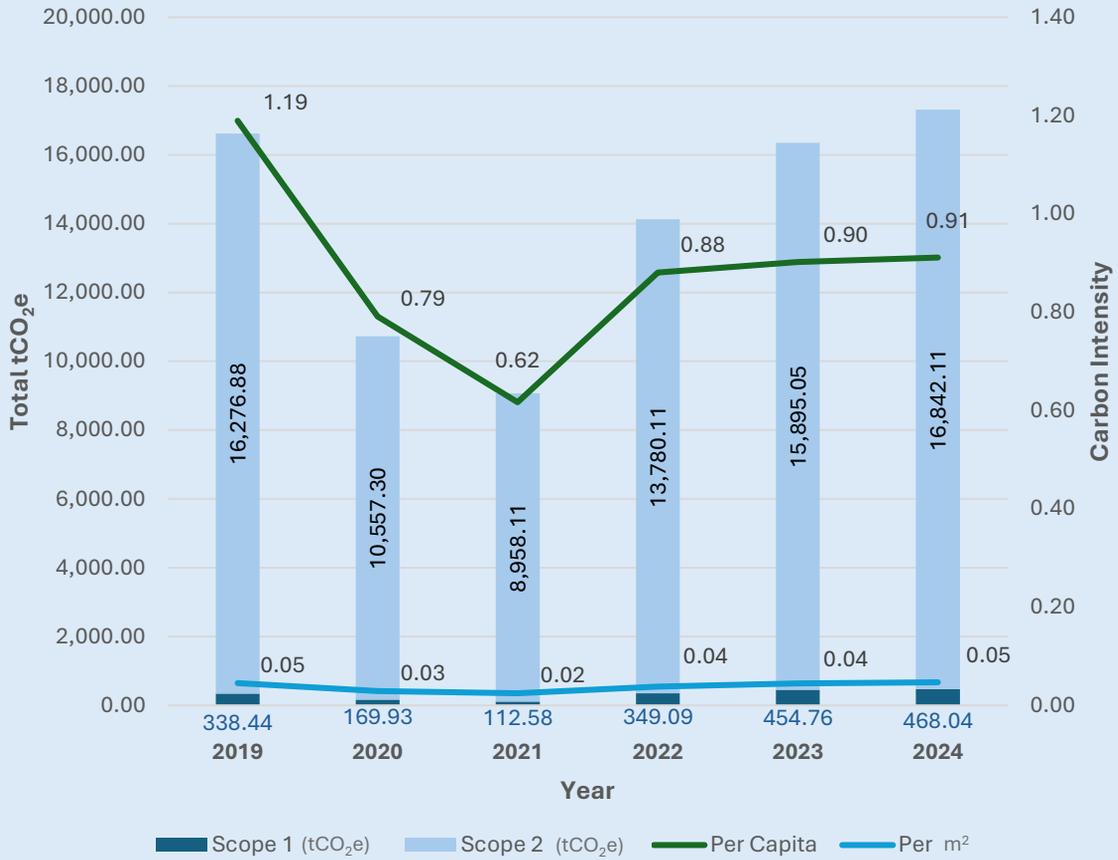


Figure 1: MMU’s total carbon emissions for Scope 1 and Scope 2 (2019-2024)



Emissions by Scope (2019-2024)

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 2024 as shown in Table 3 and Figure 2.

Year	2019	2020	2021	2022	2023	2024
Scope 1 (Total tCO ₂ e)	338.44	169.93	112.58	349.09	454.76	468.04
Diesel (Scope 1)	8.65	38.29	15.53	106.05	183.42	208.52
Petrol (Scope 1)	329.79	131.64	97.05	243.04	271.34	259.52

Table 3: Summary of carbon emissions for Scope 1 in MMU (2019-2024)

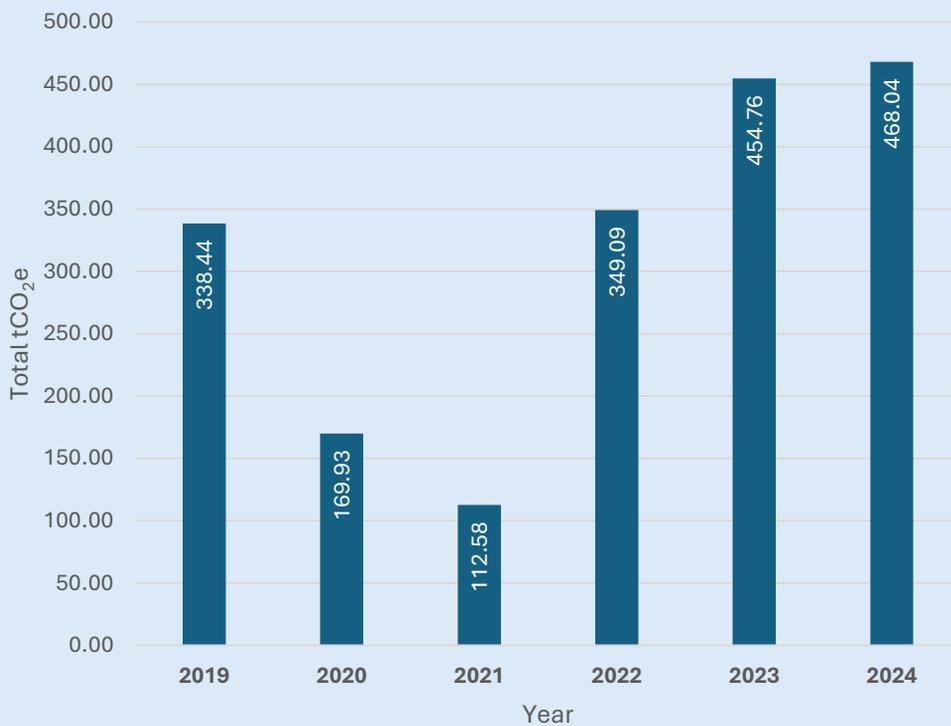


Figure 2: MMU’s total carbon emissions for Scope 1 (2019-2024)



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 2024. Figure 3 shows the Scope 2 emissions in MMU over time.

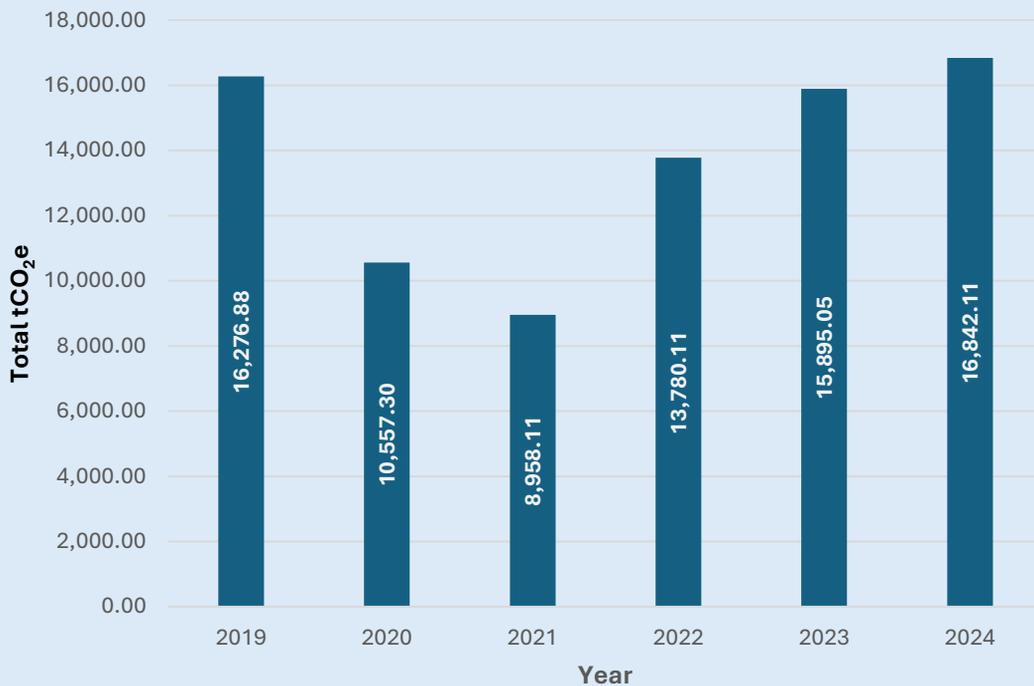


Figure 3: MMU's total carbon emissions for Scope 2 (2019-2024)



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. Refurbishment

Refurbishment in MMU (Melaka Block B, Faculty offices, Classrooms, etc.), such as improving the insulation of rooms and replacing the aging air conditioners with energy-efficient air conditioners, can reduce MMU’s carbon footprint and decrease energy consumption.

ii. Awareness on SDG and ESG

Create awareness in the MMU community in the areas covered by Sustainable Development Goals (SDG) and Environment, Social, and Governance (ESG) through education, research, community, and operations. For example, transforming energy usage patterns among staff and students. The following are possible initiatives:

- a) Promote energy efficiency/conservation on campus through university courses such as students’ clubs and society programs.
- b) Provide information to staff and students occasionally through e-mail.
- c) Acknowledge and reward individual, department, and faculty-wide successes in energy-saving.

iii. Alternative Energy Sources and Water Management

MMU shall work on the following to enhance air quality, conserve resources, and reduce carbon emissions:

- a) Rainwater harvesting
- b) Investing in renewable energy sources, such as solar power



iv. Recycling and Reducing Waste Streams

MMU shall embrace the following to reduce carbon emissions:

- a) Encourage responsible consumption practices and the five Rs (reuse, reduce, reuse, repurpose/repair, recycling) to staff and students via campaign and education.
- b) Implement green purchasing policies and procedures at the university.
- c) Promote sustainability in the office by encouraging the reduction and reuse of resources while minimizing the production of waste and hazardous materials.

v. Climate Action-Related Research and Teaching

MMU recognizes the significance of advancing research and education related to climate change and sustainability as follows:

- a) Engaging students and staff in research on climate action
- b) Incorporating and embedding sustainability into academic courses and programmes.

