

Carbon Footprint Report

Reporting Period
April 2022 – March 2023



Marwadi University

Rajkot – Morbi Highway
At Gauridad, Rajkot – 360003
Gujarat, India

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1.0 Terms Used

| Abbreviations | Full Form |
|----------------------|--------------------------------------|
| CFP | Carbon Footprint |
| CO ₂ | Carbon dioxide |
| CO ₂ e | Carbon dioxide equivalent |
| GHG | Greenhouse Gases |
| Kg | Kilograms |
| tCO ₂ e | Tonnes of CO ₂ Equivalent |
| LPG | Liquefied Petroleum Gas |
| PNG | Piped Natural Gas |
| MU | Marwadi University |

2.0 Sustainability Now: Acting with Purpose and Urgency



"The world has seen more extreme climate events in recent years, with hitherto unheard-of environmental effects. Deadly heatwaves, widespread wildfires, snow avalanches, severe flooding in major cities worldwide, record-breaking rainfall, and devastating landslides are all examples of the profound environmental degradation brought on by unbridled human intervention and exploitation of nature.

A growing number of people throughout the world are realizing how urgent action is required due to the severity of our current environmental disaster. This is demonstrated by the numerous organized programs that governments around the world are putting into place. A dedication to addressing climate change is demonstrated by initiatives like the COP conferences and the legislative actions made by national and international leaders. However, only a concerted and persistent effort—one that includes not only governments and institutions but also the active participation of every global citizen—can undo the enormous harm caused over decades.

3.0 About Marwadi University

Marwadi University is established under Gujarat Private Universities act no. 9 of 2016. The University has carved its niche presence in technical education at the heart of Saurashtra region with 12,000 + students from across the country along with more than 11% International students hailing from 52 countries, enrolled in UG, PG and Doctoral studies. The University is supported by 450+ faculties from 22 states of the country with around 150 PhD qualified faculty members.

The Education Department, Govt. of Gujarat has awarded University with a status of “Centre of Excellence”. This status has elevated the Institute as one among the top seven Institutes of Gujarat and has added a golden feather in the cap. This distinction bestowed upon the University showcases that Quality Education, Excellent Research, Innovative Teaching Methodologies, Quality of Extension Services, High Employability and Entrepreneurship are being imparted.

3.0 Sustainability Commitment at Marwadi University

As a leading academic institution, Marwadi University understands its critical role as a leader and inspiration to the academic community. The University's dedication to sustainability goes well beyond creating a green campus; it also aims to raise a new generation of sustainability advocates—people who will continue the principles and behaviors they were taught in university to make a significant contribution to society.

The vibrant atmosphere at Marwadi University inspires staff, instructors, and students to get involved in a variety of projects that address sustainability from all angles. These include social inclusion, environmental care, and adherence to strong governance systems that guarantee accountability and ongoing progress. Additionally, the University extends an invitation to the local and global community to participate in and gain from its numerous sustainability projects.

Structured approach and initiatives:

The University's leadership actively supports these initiatives to demonstrate its sincere dedication to sustainability. Under the direction of the Provost, a cross-functional Core Committee made up of representatives from various stakeholders guides an all-encompassing sustainability plan that consists of:

- **Academic integration** is the process of integrating sustainability concepts into all subject areas and coordinating educational initiatives with the Sustainable Development Goals (SDGs) of the UN.
- **Research for a Greener Future:** Assisting academics and students in conducting research on sustainable practices, technology, and solutions.
- **Operational Efficiency:** Reducing the negative effects on the environment by implementing strategic measures including waste management, energy saving, carbon footprint reduction, and sustainable resource usage.
- **Campus engagement** is the process of fostering a sustainable culture among students, professors, and staff through events, awareness campaigns, and participation projects.
- **Community Outreach:** Working together with nearby groups and communities to take sustainability initiatives outside of the campus.

Sustainability is a fundamental principle that defines Marwadi University's identity, not only an environmental duty. Because of this dedication, a dynamic and meaningful learning environment is produced that draws in like-minded people and equips students to become responsible global citizens who are prepared to take the lead in building a more just and sustainable future.

5.0 Report Objective

This initiative's goal is to establish a baseline for the carbon footprint of all activities conducted on the university campus, including those conducted in the academic, research, and non-academic buildings (such as the campus residence hall, dining hall, and recreational areas). This study's objective is to calculate the Scope 1 and Scope 2 carbon footprints for 2023. This will serve as a baseline for evaluating the advancements made in the years that follow.

Key objectives to achieve from this study included:

- Calculate the Scope 1 and Scope 2 carbon footprint for all operations conducted on the Marwadi University campus for the year 2022-23.
- Break down and analyze the individual components contributing to emissions within each category.
- Identify improvement opportunities to further strengthen Marwadi University's performance and progress in its sustainability journey.

6.0 Reporting Period

"The period from April 1, 2022, to March 31, 2023, has been designated as the reporting period and will serve as the baseline year for all future assessments in this domain. Performance across various sub-parameters under Scope 1 and Scope 2 emissions will be systematically analyzed to identify areas for improvement and to inform sustainability initiatives aligned with the strategic vision of the University."

7.0 Scope and Reporting Boundary

"At MU, we report our emissions in accordance with the two categories (or 'scopes') defined by the Greenhouse Gas (GHG) Protocol—the most widely recognized global standard for carbon accounting. This framework is adopted across various sectors worldwide, including the higher education sector. For the purposes of this document, the terms 'emissions' and 'carbon emissions' refer to carbon dioxide equivalents (tCO₂e), expressed in metric tonnes."

Marwadi University has installed 612 kW rooftop solar panels at the terrace of every building to compensate the carbon footprints created by the campus activities. Details of the offset impact is tabulated below.

a) Physical boundary: All activities including teaching and non-teaching activities based out of the MU Campus located at Marwadi University Campus, Rajkot-Morbi Highway, At Gauridad, Rajkot – 360003, Gujarat, India.

b) Operational boundary

Scope 1 – Direct Emissions

Scope 1 covers direct greenhouse gas emissions resulting from fuel combustion and energy use in sources owned or controlled by the organization. At Marwadi University, the primary sources of Scope 1 emissions include:

1. Gas (LPG/PNG) used for heating purposes
2. Petrol and Diesel consumed by university-owned vehicles, including fleet cars and buses
3. Fugitive Emissions from fluorinated gases typically associated with air conditioning, refrigeration, and cooling systems

Scope 2 – Indirect Emissions

Scope 2 refers to indirect emissions generated from the purchase and consumption of electricity or energy produced outside the University's operational control. For Marwadi University, Scope 2 emissions primarily arise from:

1. Grid-Supplied Electricity, including electricity used for power supply as well as electrical heating and cooling, where applicable.

8.0 Methodology

Aligned with the MU leadership’s commitment to Educate, Empower, and Engage all stakeholders, the Carbon Footprint (CFP) computation methodology was intentionally designed to involve a cross-functional team throughout the entire process of carbon footprint assessment.

A diverse team comprising representatives from both academic and support departments was actively engaged to offer subject-matter expertise, guidance, and collaborative input across each phase of the initiative. This included strategic planning, capability building, format and tool development, data collection and validation, and the final CFP computation.

The methodology drew upon several nationally and internationally recognized standards and global frameworks to ensure accuracy, credibility, and alignment with best practices.

As the University’s first formal carbon footprint assessment, this report establishes the baseline values that will serve as reference points for all future measurements and will enable meaningful year-over-year performance comparisons in the institution’s sustainability journey. Figure 1 shows the flowchart for the estimation of carbon footprint.



Figure 1: Flow for Estimating Carbon Footprint

9.0 CFP Estimation

Computed values of the CFP for Scope 1 & Scope 2 for the base year
 (1 April 2022 – 31 March 2023)

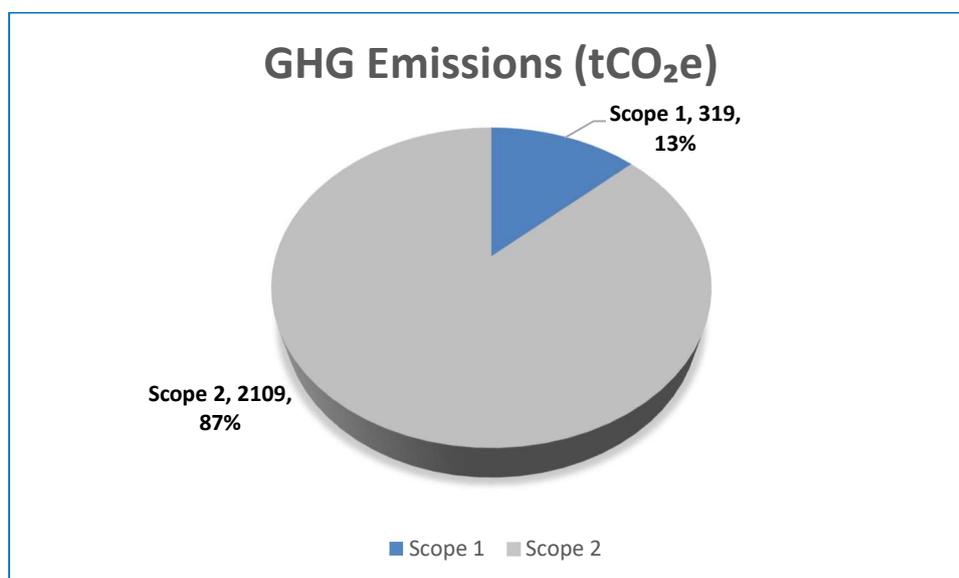
| Sr. No. | GHG Emissions | tCO ₂ e | | |
|---------------------|------------------------|--------------------|-------------|-----|
| 1 | Scope 1 | Energy | 144 | 319 |
| | | Travel | 64 | |
| | | HVAC | 111 | |
| 2 | Scope 2 | | 2835 | |
| | On Campus Solar Offset | | 726 | |
| | Net Scope 2 | | 2109 | |
| Total GHG Emissions | | | 2428 | |

The computed value is arrived at considering the Emission Factors in Indian Context as obtained from the India GHG Protocol and the published methodologies by various Protocol. The computation of the carbon footprint is undertaken using global defined protocols and International ISO 14064 standards.

10.0 Analysis of Estimated Carbon Footprint

10.1 Total Carbon Footprint

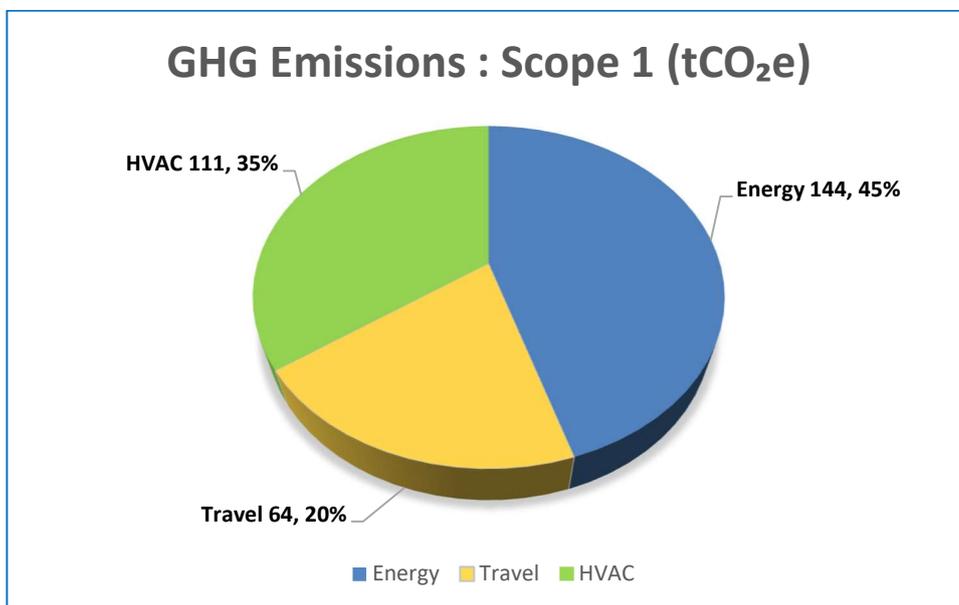
Based on the overall Carbon footprint computation, it is established that the Scope 1 emission is only 13% of the total Scope 1 +2 emissions computed for the reporting period.



10.2 Scope 1 - Carbon Footprint Analysis

The Scope 1 Carbon Footprint is computed as 319 MT of CO₂ Equivalent and it could be divided into three main categories:

- Gas used for heating purposes
- Petrol and Diesel consumed by university-owned vehicles, including fleet cars and buses
- Fugitive Emissions from fluorinated gases typically associated with air conditioning, refrigeration, and cooling systems



As evident, the HVAC contributes to about 30% of the total Scope 1 Carbon Footprint emissions for the reporting period. While the contribution from the use of Fossil fuel for energy at campus was 50% and for the vehicular emission by company controlled and owned vehicles contributed 20% of the overall Scope 1 Emissions.

10.3 Scope 2 Carbon Footprint Analysis

Indirect greenhouse gas (GHG) emissions related to the production of electricity that the University purchases and uses are referred to as scope 2 emissions.

The Scope 2 carbon footprint for the reporting period is 2,109 metric tons of CO₂ equivalent (tCO₂e). According to the International Energy Agency's (IEA) rules for the reporting year, this figure is based on the actual energy consumption sourced from Paschim Gujarat Vij Company Limited (PGVCL) and the relevant grid emission factor.

There isn't any previous data for comparison at this time because this reporting period is the baseline year. However, in all subsequent carbon footprint assessments, this number will be used as the standard for assessing and monitoring Scope 2 emissions performance.

11.0 Limitations, Assumptions and Considerations:

- The data used for the carbon footprint computation has been provided by Marwadi University and is assumed to be accurate and reliable.
- Electricity consumption figures are based on actual meter readings as reflected in official electricity bills, and are considered to be accurate.
- It is acknowledged that minor calibration errors and inherent accuracy limitations may exist in the monitoring and measurement equipment used by the University during data collection.

12.0 Recommendations

Based on the analysis of the computed Carbon Footprint, the following improvement initiatives are recommended to enhance sustainability and reduce environmental impact at Marwadi University:

1. Optimize Resource Utilization

Improve operational efficiency through better process controls and resource management.

2. Prevent Wastage through Technology and Engagement

Leverage smart technologies and actively involve students, faculty, and staff to minimize resource wastage across campus.

3. Pursue Carbon Neutral and Water Neutral Campus Goals

Develop long-term strategies aimed at achieving net-zero carbon and water neutrality.

4. Expand Clean Energy Adoption

Gradually transition to renewable energy sources with a target of achieving 100% green power usage.

5. Implement Zero-Cost Improvement Projects

Encourage participation from students, faculty, non-teaching staff, and the local community in no-cost sustainability initiatives.

6. Adopt Energy-Efficient Technologies

Introduce modern, energy-efficient equipment and systems to reduce overall energy consumption.

7. Enhance Green Cover

Increase tree plantation efforts, focusing on species with high carbon sequestration potential.

8. Strengthen Stakeholder Engagement

Promote structured, participatory events to involve the entire campus and surrounding community in sustainability efforts.

9. Adopt Water Efficiency Standards

Implement ISO 46001 for water efficiency to manage and reduce water consumption effectively.

10. Conduct Regular Energy Audits

Optimize energy usage through periodic energy audits and continuous monitoring.

11. Promote Use of Electric Vehicles (EVs)

Facilitate and encourage the use of e-vehicles on campus to reduce fossil fuel consumption.

12. Encourage Paperless Practices

Promote digital workflows for official communication and academic processes, including online assignments and resource sharing.

13. Implement Sub-Metering for Electricity Monitoring

Use sub-metering to identify high-consumption areas and implement targeted energy optimization strategies.

14. Evaluate Event-Related Emissions

Regularly assess the carbon impact of key university events and develop mitigation plans where necessary.

13. Target to Achieve Net Zero

Achieving net zero carbon emissions by 2035 is a clear and ambitious aim established by Marwadi University. The University also intends to add Scope 3 emissions to its carbon footprint assessment as part of this long-term commitment, allowing for a more thorough understanding of its environmental impact. With a specific goal of planting 1,000 trees a year, the University will implement targeted initiatives in all important areas, guided by the recommendations presented in this report, furthering its aim to promote a more sustainable and greener future.