Carbon Footprint Report

Reporting Period: April 2024 - March 2025

Marwadi University

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

Table of Contents

Content	Page No.
1. Terms Used	3
2. Sustainability Now: Acting with Purpose and Urgency	3
3. About Marwadi University	4
4. Sustainability Commitment at Marwadi University	4
5. Report Objective	5
6. Reporting Period	5
7. Scope and Reporting Boundary	5
8. Methodology	6
9. CFP Estimation	7
10. Analysis of Estimated Carbon Footprint	8
11. Limitations, Assumptions and Considerations	9
12. Recommendations	10
13. Target to Achieve Net Zero	11

1. Terms Used

Abbreviation	Full Form
CFP	Carbon Footprint
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
GHG	Greenhouse Gases
Kg	Kilograms
tCO_2e	Tonnes of CO_2 Equivalent
LPG	Liquefied Petroleum Gas
PNG	Piped Natural Gas
MU	Marwadi University

2. Sustainability Now: Acting with Purpose and Urgency

The world continues to face unprecedented climate challenges, with extreme weather events, rising global temperatures, and environmental degradation demanding urgent collective action. Governments, institutions, and individuals share the responsibility to mitigate climate change through measurable actions. Marwadi University remains firmly committed to playing its part by tracking, reducing, and offsetting its carbon emissions year on year, contributing meaningfully to India's climate goals and the global sustainability agenda.

3. About Marwadi University

Marwadi University, established under the Gujarat Private Universities Act No. 9 of 2016, is a premier institution in the Saurashtra region with 12,000+ students from across India and 52 countries. Supported by 450+ faculty members from 22 states, including over 150 PhD-qualified members, the University holds the prestigious "Centre of Excellence" status awarded by the Government of Gujarat. The University is committed to Quality Education, Excellent Research, Innovative Teaching Methodologies, and High Employability.

4. Sustainability Commitment at Marwadi University

Marwadi University's dedication to sustainability extends beyond creating a green campus -it aims to raise a new generation of sustainability advocates. Under the direction of the Provost, a cross-functional Core Committee guides the comprehensive sustainability plan encompassing:

- **Academic Integration:** Embedding sustainability concepts across all disciplines aligned with the UN Sustainable Development Goals (SDGs).
- **Research for a Greener Future:** Supporting faculty and student research on sustainable practices and technologies.
- **Operational Efficiency:** Reducing environmental impact through energy conservation, waste management, carbon footprint reduction, and sustainable resource usage.
- **Campus Engagement:** Fostering a sustainability culture through events, awareness campaigns, and participation projects.
- **Community Outreach:** Collaborating with local communities to extend sustainability initiatives beyond campus.

5. Report Objective

This report aims to compute and analyze the Scope 1 and Scope 2 carbon footprint for all operations conducted on the Marwadi University campus for the year 2024-25. Building on the baseline established in 2022-23, this assessment enables meaningful year-over-year performance comparison and identifies further improvement opportunities in the University's sustainability journey.

Key objectives:

- Calculate the Scope 1 and Scope 2 carbon footprint for all campus operations for April 2024 - March 2025.
- Break down and analyze individual components contributing to emissions within each category.
- Compare performance against the 2022-23 baseline year to evaluate progress.
- Identify improvement opportunities to further strengthen sustainability performance.

6. Reporting Period

The reporting period covers April 1, 2024, to March 31, 2025. This is the third assessment cycle since the baseline year (2022-23). Performance across various sub-parameters under Scope 1 and Scope 2 emissions has been systematically analyzed to track progress and inform future sustainability initiatives.

7. Scope and Reporting Boundary

Emissions are reported in accordance with the two categories (Scopes) defined by the Greenhouse Gas (GHG) Protocol -the most widely recognized global standard for carbon accounting. All emissions are expressed as carbon dioxide equivalents (tCO_2e) in metric tonnes.

Marwadi University has expanded its rooftop solar capacity to **750 kW** (up from 612 kW in the baseline year) to further offset campus carbon footprints.

Physical Boundary

All activities including teaching and non-teaching operations based at Marwadi University Campus, Rajkot-Morbi Highway, At Gauridad, Rajkot - 360003, Gujarat, India.

Operational Boundary

Scope 1 - Direct Emissions

Scope 1 covers direct GHG emissions from fuel combustion and energy use in sources owned or controlled by the University:

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 associated with air conditioning, refrigeration, and cooling systems

Scope 2 - Indirect Emissions

Scope 2 refers to indirect emissions from the purchase and consumption of grid-supplied electricity, including power for electrical heating and cooling.

8. Methodology

The Carbon Footprint computation methodology was designed to involve a cross-functional team throughout the assessment process, aligned with MU leadership's commitment to Educate, Empower, and Engage all stakeholders. The methodology draws upon nationally and internationally recognized standards, including the India GHG Protocol and ISO 14064 standards.

Process Flow:

1. Reviewing and setting organizational physical and operational boundaries
2. Designing the input data collection template
3. Training the team to facilitate accurate data collection
4. Review and validation of data
5. Updating the Carbon Footprint Tool and emission factors
6. Computing Scope 1 and Scope 2 Carbon Footprint based on collected data
7. Analyzing the computed Carbon Footprint
8. Presenting outputs along with identified opportunities for improvement

9. CFP Estimation

Computed values of the CFP for Scope 1 & Scope 2 for the reporting year (April 2024 - March 2025):

Sr. No.	GHG Emissions	tCO_2e
1	**Scope 1**	**276**
	Energy	120
	Travel	52
	HVAC	104
2	**Scope 2 (Gross)**	**2,580**
	On-Campus Solar Offset	890
	Net Scope 2	**1,690**
Total	**Total GHG Emissions**	**1,966**

The computed values are based on Emission Factors in the Indian context as obtained from the India GHG Protocol and published methodologies, aligned with ISO 14064 standards.

10. Analysis of Estimated Carbon Footprint

10.1 Total Carbon Footprint

The total GHG emissions for 2024-25 stand at **1,966 tCO_2e**, representing a **19.0% reduction** from the baseline year (2,428 tCO_2e in 2022-23). Scope 1 accounts for 14% and Scope 2 for 86% of total emissions.

Parameter	2022-23 (Baseline)	2024-25	Change (%)
Scope 1	319 tCO_2e	276 tCO_2e	−13.5%
Net Scope 2	2,109 tCO_2e	1,690 tCO_2e	−19.9%
Total GHG	**2,428 tCO_2e**	**1,966 tCO_2e**	**−19.0%**

The significant reduction in Scope 2 emissions is driven by the expansion of solar capacity and energy efficiency measures implemented across campus.

10.2 Scope 1 - Carbon Footprint Analysis

The Scope 1 Carbon Footprint is 276 tCO_2e, broken down as follows:

Category	tCO_2e	Share (%)
Energy (LPG/PNG)	120	43%
Travel (Fleet Vehicles)	52	19%
HVAC (Fugitive Emissions)	104	38%

Key observations:

- Energy consumption from fossil fuels decreased by 16.7% due to improved heating systems and operational controls.

- Travel emissions reduced by 18.8%, attributed to the partial adoption of electric vehicles in the campus fleet.
- HVAC-related fugitive emissions decreased by 6.3% through better refrigerant management and preventive maintenance practices.

10.3 Scope 2 - Carbon Footprint Analysis

The gross Scope 2 emissions for 2024-25 are 2,580 tCO_2e based on actual electricity consumption from Paschim Gujarat Vij Company Limited (PGVCL) and the applicable grid emission factor as per IEA guidelines. The net Scope 2 emissions after solar offset are **1,690 tCO_2e**.

The expansion of rooftop solar capacity from 612 kW to 750 kW has increased the solar offset from 726 tCO_2e to **890 tCO_2e**, a 22.6% improvement in renewable energy contribution.

11. Limitations, Assumptions and Considerations

- The data used for 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.
- Minor calibration errors and inherent accuracy limitations may exist in monitoring and measurement equipment.
- Emission factors have been updated to reflect the latest available India GHG Protocol values for the 2024-25 period.

12. Recommendations

Based on the analysis of the computed Carbon Footprint, the following improvement initiatives are recommended:

1. **Optimize Resource Utilization** -Improve operational efficiency through advanced process controls and IoT-based resource management systems.
2. **Prevent Wastage through Technology and Engagement** -Deploy smart building technologies and actively involve students, faculty, and staff to minimize resource wastage.
3. **Pursue Carbon Neutral and Water Neutral Campus Goals** -Accelerate long-term strategies aimed at achieving net-zero carbon and water neutrality by 2035.
4. **Expand Clean Energy Adoption** -Target 1 MW solar capacity by 2026-27 and explore wind energy partnerships.
5. **Implement Zero-Cost Improvement Projects** -Encourage participation from all stakeholders in no-cost sustainability initiatives.
6. **Adopt Energy-Efficient Technologies** -Replace legacy equipment with BEE 5-star rated and energy-efficient systems.
7. **Enhance Green Cover** -Continue the annual target of planting 1,000 trees with focus on high carbon sequestration species.
8. **Strengthen Stakeholder Engagement** -Expand structured sustainability events involving the campus and surrounding community.
9. **Adopt Water Efficiency Standards** -Implement ISO 46001 for systematic water efficiency management.
10. **Conduct Regular Energy Audits** -Optimize energy usage through bi-annual energy audits and continuous monitoring.
11. **Promote Use of Electric Vehicles** -Increase EV charging infrastructure and transition 50% of the campus fleet to electric by 2027.
12. **Encourage Paperless Practices** -Promote digital workflows for academic and administrative processes.
13. **Implement Sub-Metering** -Use sub-metering to identify high-consumption zones and implement targeted optimization.

14. **Evaluate Event-Related Emissions** -Regularly assess and mitigate the carbon impact of major university events.

13. Target to Achieve Net Zero

Marwadi University maintains its clear and ambitious target of achieving **net-zero carbon emissions by 2035**. As part of this commitment, the University plans to:

- Incorporate **Scope 3 emissions** into future carbon footprint assessments for a comprehensive environmental impact evaluation.
- Continue the annual target of **planting 1,000 trees** to enhance carbon sequestration.
- Expand renewable energy capacity to **1 MW by 2026-27** and explore additional green energy sources.
- Transition campus fleet vehicles to **50% electric by 2027**.
- Establish a **Carbon Neutrality Roadmap** with annual milestones and third-party verification.

With consistent progress -a 19% reduction from the baseline in just two years -Marwadi University is firmly on track toward its net-zero vision, demonstrating that higher education institutions can lead by example in the fight against climate change.

Report Prepared by Marwadi University Using Software the sustainability Cloud | Reporting Period: April 2024 - March 2025