



GHG Emissions Inventory - Comprehensive Report

For Great Lakes Institute of Management

1 April 2025 to 31 March 2026

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ACKNOWLEDGEMENT & DECLARATION

We express our sincere gratitude to Great Lakes Institute of Management (Great Lakes, Chennai) for entrusting us with the opportunity to conduct the GHG emissions inventory.

We acknowledge and greatly appreciate the support given to us, during the data collection process, from the accreditation, finance, procurement, administration, and estate management departments of Great Lakes, Chennai.

We are also thankful to the field staff of Great Lakes, Chennai for their coordination efforts with the supply chain vendors, service providers, and agencies in providing pertinent measurements and relevant data.

This report is made in good faith based on the information provided by the Great Lakes, Chennai. Diligent care has been taken while making data- and calculation-related assumptions and reasonable judgements have been made in consultation with the concerned stakeholders of Great Lakes, Chennai. All necessary professional expertise has been applied in preparing this report and the contents thereof are a true representation of the facts.

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ABBREVIATIONS

AICTE	<i>All India Council for Technical Education</i>
AMBA	<i>Association of MBAs</i>
AR6	<i>IPCC Sixth Assessment Report</i>
BEE	<i>Bureau of Energy Efficiency (India)</i>
BLDC	<i>Brushless Direct Current (motor)</i>
BOD	<i>Biochemical Oxygen Demand</i>
CEA	<i>Central Electricity Authority (India)</i>
CH ₄	<i>Methane</i>
CO ₂	<i>Carbon Dioxide</i>
CO ₂ e	<i>Carbon Dioxide Equivalent</i>
CPCB	<i>Central Pollution Control Board (India)</i>
DEFRA	<i>Department for Environment, Food and Rural Affairs (UK)</i>
DG	<i>Diesel Generator</i>
EEIO	<i>Environmentally Extended Input-Output</i>
EF	<i>Emission Factor</i>
EFTSL	<i>Equivalent Full-Time Student Load</i>
FPM	<i>Fellow Program in Management</i>
GHG	<i>Greenhouse Gas</i>
GLIM	<i>Great Lakes Institute of Management</i>
GWP	<i>Global Warming Potential</i>
HFC	<i>Hydrofluorocarbon</i>
INR	<i>Indian Rupee</i>
IPCC	<i>Intergovernmental Panel on Climate Change</i>
Km	<i>Kilometres</i>
KMPL	<i>Kilometres Per Litre</i>
LED	<i>Light Emitting Diode</i>
LEED	<i>Leadership in Energy and Environmental Design</i>
MoEFCC	<i>Ministry of Environment, Forest and Climate Change (India)</i>
N ₂ O	<i>Nitrous Oxide</i>
NBA	<i>National Board of Accreditation (India)</i>
NF ₃	<i>Nitrogen Trifluoride</i>
PFC	<i>Perfluorocarbon</i>
PGDM	<i>Post Graduate Diploma in Management</i>
PGPM-FBE	<i>Post Graduate Program in Management – For Business Executives</i>
PGXPM	<i>Post Graduate Executive Program in Management</i>
PPA	<i>Power Purchase Agreement</i>
RE	<i>Renewable Energy</i>
SAQS	<i>South Asian Quality Assurance System</i>
SBR	<i>Sequencing Batch Reactor</i>
SF ₆	<i>Sulphur Hexafluoride</i>
STP	<i>Sewage Treatment Plant</i>
T&D	<i>Transmission and Distribution</i>
tCO ₂ e	<i>Tonnes of Carbon Dioxide Equivalent</i>
US EPA	<i>United States Environmental Protection Agency</i>
WBCSD	<i>World Business Council for Sustainable Development</i>
WRI	<i>World Resources Institute</i>
WTT	<i>Well-To-Tank</i>

EXECUTIVE SUMMARY

Background

As institutions across sectors increasingly focus on climate responsibility and sustainable operations, higher education institutions have an important role to play in integrating environmental considerations into campus management and long-term planning. In this context, Great Lakes Institute of Management (GLIM) has undertaken its second annual Greenhouse Gas (GHG) emissions inventory for the Chennai campus, covering the reporting period from April 2025 to March 2026.

Building on the baseline inventory developed for FY 2024–25, the current assessment provides a year-on-year evaluation of emissions performance across Scope 1, Scope 2, and material Scope 3 categories. The inventory supports GLIM's ongoing efforts toward improving environmental performance, strengthening climate-related data management, and identifying opportunities for operational decarbonisation.

GLIM Overview

Established in 2004, GLIM is one of India's leading business schools, offering a range of management and executive education programs. The Chennai campus spans approximately 30 acres and accommodates 1,017 residential students, supported by academic, residential, and administrative infrastructure.

The campus has undertaken multiple sustainability-related initiatives across energy management, transportation, waste management, water conservation, and green infrastructure. Key initiatives include:

- Renewable electricity procurement through Power Purchase Agreements (PPA)
- On-site solar photovoltaic (PV) systems
- Electric buggies for internal campus transportation
- Biogas plant and sewage treatment systems

Methodology and Standards used for GHG Inventory

The GHG inventory has been prepared in accordance with internationally recognized GHG accounting standards and guidance, primarily based on the GHG Protocol Corporate Accounting and Reporting Standard.

The assessment methodology included:

- Operational control approach for defining organisational boundaries
- Collection of activity data from operational records, utility bills, procurement datasets, transport information, and stakeholder consultations
- Use of emission factors from recognized national and international sources including CEA, DEFRA, IPCC, and USEPA EEIO databases

The inventory includes emissions across Scope 1, Scope 2, and relevant Scope 3 categories associated with campus operations.

Organisational and Operational Boundaries

- Organisational Boundary: The inventory covers operations associated with the GLIM Chennai campus.

- Operational Boundary: Scope 1 (direct), Scope 2 (purchased electricity), and material Scope 3 emissions from the upstream/downstream value chain. The Key Scope 3 categories identified include: Purchased Goods & Services, Capital Goods, Business Travel, Employee Commuting, Waste Management.

Total GHG Emissions in FY 2025–26 by Scope for GLIM

GHG Emissions Scope	Emissions (tCO ₂ e)	Percentage
Scope 1 Emissions	592	21.9%
Scope 2 Emissions	617	22.8%
Scope 3 Emissions	1,500	55.4%
Total Emissions	2,708	100%
RE-Based Offsets (Reported Only)	2,147	-

Scope-Wise Emissions Summary

- Scope 1 – Direct Emissions: 592 tCO₂e
 - Diesel generators: 84.9 tCO₂e
 - Petrol used for Institute owned vehicles: 7.0 tCO₂e
 - Process emissions from biogas plant, composting pits, sewage treatment plant: 8.4 tCO₂e
 - Refrigerant leakage (AC units): 491 tCO₂e (83% of Scope 1)
 - CO₂ gas fire extinguishers: 0.3 tCO₂e
- Scope 2 – Indirect Electricity Emissions: 617 tCO₂e
 - Based on 868550 kWh of grid-supplied electricity
- Scope 3 – Value Chain Emissions: 1,500 tCO₂e
 - Purchased Goods & Services: 870.6 tCO₂e
 - Capital Goods: 278.2 tCO₂e
 - Fuel and Energy-Related: 41.9 tCO₂e
 - Upstream Transportation: 0.4 tCO₂e
 - Waste generated in operations: 0.6 tCO₂e
 - Business Travel: 194.5 tCO₂e
 - Employee Commuting: 113.5 tCO₂e

Emission Intensity

Emission intensity metrics provide a benchmark for tracking year-on-year improvements and aligning with peer institutions. To provide a more granular view, the total campus community has been segmented into three distinct profiles and the per capita emission intensity for each segment is presented in the following table.

Campus Community Group	Headcount in FY 2025-26	Per Capita Emission Intensity (tCO ₂ e per person)
Students only	1,017	2.66
Students + Employees (on payroll)	1,189	2.28
Students + Employees + Contract Staff	1,469	1.84

1. INTRODUCTION

As climate change continues to impact economies, communities, and ecosystems worldwide, institutions across sectors are increasingly focusing on understanding and managing their environmental impacts. Higher education institutions, in particular, have an important role to play in shaping future leaders and demonstrating responsible environmental practices through their own operations.

In this context, Great Lakes Institute of Management (GLIM) has undertaken its second annual Greenhouse Gas (GHG) emissions inventory for the Chennai campus, covering the reporting period from April 2025 to March 2026. The inventory assesses emissions across Scope 1, Scope 2, and material Scope 3 categories in line with internationally recognized GHG accounting standards. The study also provides year-on-year insights into emission trends, key contributors, and areas where further improvements in operational efficiency and decarbonisation can be pursued.

This report provides a structured assessment of GLIM's greenhouse gas emissions and is intended to support informed decision-making, operational improvements, and long-term climate action planning.

1.1. About Great Lakes Institute of Management

Established in 2004 by Padma Shri awardee Dr. Bala V. Balachandran, Professor Emeritus at the Kellogg School of Management, Great Lakes Institute of Management has grown into one of India's leading business schools. With campuses in Chennai and Gurgaon, the institute is known for its industry-oriented curriculum, academic collaborations, distinguished faculty, and management education programs.

The institute has established academic partnerships and exchange programs with reputed international institutions such as Cornell University, Chicago Booth, Skema Business School, University of Bordeaux, IESEG School of Management, and Frankfurt School of Finance & Management. GLIM is approved by AICTE and holds accreditations from AMBA, NBA, and SAQS.

The Chennai campus accommodates over 1,017 residential students and offers a range of management and executive education programs, including:

- PGPM – One-year full-time flagship management program
- PGDM – Two-year full-time management program
- PGPM-FBE – Program for family business owners and entrepreneurs
- PGXPM and PGPM-Flex – Executive programs for working professionals
- Fellow Program in Management (FPM) – Doctoral-level research program

1.1.1. Sustainability at Great Lakes

GLIM has undertaken several initiatives across campus operations aimed at improving environmental performance and promoting responsible resource management. These efforts span energy efficiency, renewable energy adoption, waste management, water conservation, green infrastructure, and biodiversity enhancement.

Some of the key sustainability initiatives undertaken at the Chennai campus include:

Campus Electrification:

Internal campus transportation has been transitioned to electric buggies, reducing dependence on fossil fuel-based mobility within the campus.

Energy Efficiency Measures:

The campus has implemented multiple energy efficiency initiatives including LED lighting, BLDC fans, BEE-rated air-conditioning systems, and smart monitoring systems to optimize electricity consumption.

Renewable Energy Adoption:

During the reporting year, GLIM continued procurement of renewable electricity through a Power Purchase Agreement (PPA), contributing approximately 65.5% of the campus electricity consumption. In addition, the on-site solar photovoltaic (PV) installation contributed an estimated 12.2% of the annual electricity demand. Together, these initiatives enabled the decarbonisation of approximately 77.7% of the campus electricity consumption during the reporting period.

GLIM is also exploring opportunities to further increase the share of renewable energy in its electricity mix in the coming years.

Waste Management Initiatives:

The campus has implemented waste segregation and responsible waste handling practices across various waste streams.

- A biogas plant commissioned in February 2025 has a processing capacity of up to 100 kg/day of food waste.
- Sewage generated on campus is treated through a Sequential Batch Reactor (SBR)-based Sewage Treatment Plant (STP), with treated water reused for gardening purposes.
- Recyclable waste streams such as paper, plastic, metal, and e-waste are periodically handed over to authorized recyclers.

Water Conservation Practices:

The campus has an operational rainwater harvesting system and continues to explore additional measures such as low-flow fixtures, water reuse systems, and leak monitoring practices to improve water efficiency.

Green Building Infrastructure:

The Chennai campus is reportedly the first LEED Platinum-certified green campus in South Asia, reflecting GLIM's focus on sustainable infrastructure and resource-efficient campus design.

Green Cover and Biodiversity:

Spread across approximately 30 acres, the campus includes significant green cover comprising trees, shrubs, grasslands, medicinal plants, and indigenous species. Tree plantation initiatives and biodiversity conservation efforts contribute positively toward the campus environment and carbon sequestration potential.

The development of a structured GHG inventory further supports GLIM in understanding its carbon footprint and identifying opportunities for continuous environmental improvement.

1.2. Objective and Importance of the GHG Inventory

The objective of this GHG inventory is to establish a comprehensive and credible assessment of emissions associated with GLIM Chennai campus operations across Scope 1, Scope 2, and material Scope 3 categories.

The inventory has been developed to:

- Quantify greenhouse gas emissions associated with campus operations
- Identify significant emission sources and operational hotspots
- Track year-on-year changes in emissions performance
- Support data-driven sustainability planning and operational improvements
- Strengthen institutional climate accountability and transparency
- Enable informed decision-making related to energy, infrastructure, mobility, procurement, and waste management

As educational institutions increasingly integrate sustainability into governance and operations, systematic GHG accounting provides an important foundation for evaluating environmental performance and identifying long-term decarbonisation opportunities.

This inventory also supports GLIM’s ongoing efforts to integrate sustainability considerations into campus management and institutional planning processes.

1.3. Reporting Period and Base Year

This GHG inventory covers the reporting period from April 2025 to March 2026 (FY 2025–26) for the Chennai campus of Great Lakes Institute of Management.

FY 2024–25 has been considered as the baseline year for tracking and comparing greenhouse gas emissions performance across subsequent reporting years. The baseline inventory established the initial emissions profile of the campus across Scope 1, Scope 2, and material Scope 3 categories.

The current reporting year inventory has been developed using a consistent methodological approach, wherever feasible, to enable meaningful year-on-year comparison and trend analysis. In cases where improvements in data availability, estimation methodologies, or operational coverage were identified, appropriate refinements have been incorporated and transparently disclosed within the report.

The inventory includes emissions associated with campus operations that fall within the defined organisational and operational boundaries during the reporting period.

1.4. About the Reporting Standard

The GHG inventory has been prepared in accordance with internationally recognized greenhouse gas accounting standards and guidance developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

The assessment methodology aligns with the following frameworks and guidance documents:

- GHG Protocol – Corporate Accounting and Reporting Standard (Revised Edition)
- GHG Protocol – Corporate Value Chain (Scope 3) Accounting and Reporting Standard
- GHG Protocol – Technical Guidance for Calculating Scope 3 Emissions
- GHG Protocol – Scope 2 Guidance

The inventory covers greenhouse gas emissions associated with campus activities for the reporting period April 2025 to March 2026.

Activity data used for the assessment was obtained through internal stakeholder consultations, administrative records, utility bills, procurement information, operational datasets, and surveys, wherever applicable. Appropriate emission factors from recognized national and international sources were used, including:

- Central Electricity Authority (CEA), India
- DEFRA emission factor databases
- USEPA Environmentally Extended Input-Output (EEIO) datasets
- Other internationally recognized secondary databases, where relevant

Where primary data was not available, reasonable assumptions and estimation methodologies were applied in line with GHG Protocol guidance.

2. ORGANISATIONAL AND OPERATIONAL BOUNDARIES

Establishing clear boundaries is a critical first step in preparing a comprehensive GHG emissions inventory. It ensures that the inventory is accurate, consistent, and aligned with global standards. This section outlines the organisational boundary, operational boundary, and the approach to emissions classification and attribution used in the GHG inventory for GLIM, Chennai campus.

2.1. Organisational Boundary and Control Approach

2.1.1. Organisational Boundary: GLIM Chennai Campus

GLIM operates across two campuses: Chennai and Gurgaon. This GHG inventory is focused exclusively on the 30-acre Chennai campus, which includes academic buildings, administrative facilities, student hostels, dining areas, sports and recreation infrastructure, and various operational utilities. This campus accommodates approximately 1,017 full-time residential students and a range of full-time and part-time faculty and staff.

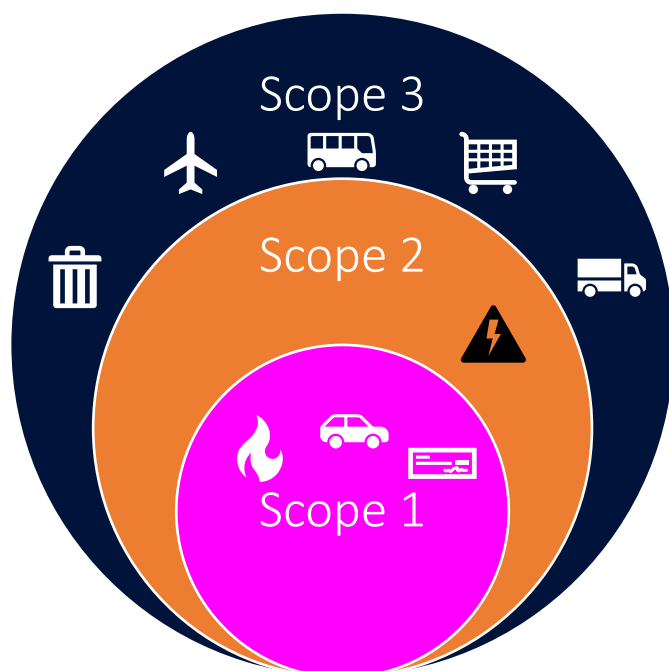
2.1.2. Consolidation Approach: Operational Control

As per the GHG Protocol, three approaches are available to set organisational boundaries: Equity Share Approach, Financial Control Approach and Operational Control Approach.

For this inventory, the Operational Control Approach is adopted. Under this method, the institute accounts for 100% of GHG emissions from operations over which it has full operational control. This approach is particularly suitable for academic institutions like GLIM, where day-to-day campus operations are directly managed and controlled by the institute.

2.2. Operational Boundary

The GHG Protocol classifies emissions into three scopes:



Scope 3: Other indirect GHG emissions- Emissions that occur in the value chain of the institution, both upstream and downstream.

Scope 2: Indirect GHG emissions from purchased electricity- Emissions from the generation of electricity, heating, or cooling consumed by the institution but generated off-site.

Scope 1: Direct GHG emissions- Emissions from sources that are owned or controlled by the institution.

The operational boundary for GLIM includes all activities, facilities, and operations located within the GLIM Chennai campus. It covers direct emissions from sources owned or controlled by the institution, such as diesel generators, institute-owned vehicles, refrigerant usage for air conditioning, and relevant process emissions from the biogas plant and STP. It also encompasses indirect emissions from purchased electricity, along with selected material Scope 3 categories pertinent to campus operations. These include purchased goods and services, capital goods, business travel, employee and student commuting, and waste generation. This boundary has been defined in alignment with the GHG Protocol to ensure accurate, transparent, and consistent emission inventorisation—enabling GLIM to effectively monitor, manage, and reduce its carbon footprint.

2.3. Green House Gases included in the Inventory

The GHG inventory for GLIM includes GHGs relevant to its operations, in line with international reporting standards. The GHG Protocol recommends accounting for the following seven greenhouse gases covered under the Kyoto Protocol: Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF₆), and Nitrogen Trifluoride (NF₃). For the purpose of this inventory, the GHGs that are relevant to GLIM's operations have been considered.

All emissions are reported as CO₂-equivalents (CO₂e) to provide a standardized measure that reflects the relative global warming impact of each GHG. This is done by multiplying the mass of each gas emitted by its Global Warming Potential (GWP).

2.3.1. Global Warming Potentials (GWP)

GHGs differ in both their residence time in the atmosphere and their radiative efficiency—that is, their ability to trap heat in the Earth's atmosphere. Some gases, such as methane (CH₄) and nitrous oxide (N₂O), are more effective at trapping heat than carbon dioxide (CO₂), while others like hydrofluorocarbons (HFCs) can have thousands of times more warming impact per molecule. Because of these differences, the Global Warming Potential (GWP) metric was developed to provide a standardized way to compare the climate impact of different gases over a given time horizon. GWPs convert emissions of various GHGs into a common unit—carbon dioxide equivalent (CO₂e)—to enable consistent reporting and aggregation.

This inventory uses 100-year GWP values from the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), reflecting the most recent scientific consensus at the time of reporting. This approach is consistent with the recommendations of the GHG Protocol and is widely adopted in corporate and institutional carbon accounting.

3. METHODOLOGY, DATA SOURCES & ASSUMPTIONS

This section outlines the methodology, data sources, emission factors, estimation approaches, and key assumptions considered for the GHG emissions inventory of the Chennai campus of Great Lakes Institute of Management. The assessment covers Scope 1, Scope 2, and material Scope 3 emissions associated with campus operations during the reporting period.

3.1. Methodology and Calculation Approach

The GHG inventory has been developed in accordance with the principles and guidance provided under the GHG Protocol Corporate Accounting and Reporting Standard. Relevant supplementary guidance from the Intergovernmental Panel on Climate Change (IPCC), Central Electricity Authority (CEA), and other recognized sources has also been referred to during the assessment.

The inventory includes emissions across the following categories:

- Scope 1: Direct emissions from sources owned or controlled by GLIM, such as diesel consumption for DG sets and fugitive emissions, wherever applicable.
- Scope 2: Indirect emissions associated with purchased electricity consumed within campus operations.
- Scope 3: Other indirect emissions associated with institutional activities, including purchased goods and services, employee commuting, waste management, business travel, and other relevant categories.

The assessment was carried out using a combination of activity-based and spend-based methodologies, depending on the nature and availability of data for each emission category. Wherever feasible, actual activity data was used to improve the accuracy and relevance of the inventory.

The following approach was adopted during the assessment process:

1. A detailed data request sheet was shared with the GLIM administration and facility management teams covering potential GHG emission sources across campus operations.
2. Relevant activity data related to fuel consumption, electricity usage, procurement, transportation, waste generation, and travel activities was collected from respective departments and stakeholders.
3. The collected data was reviewed for completeness, consistency, and applicability for emissions estimation.
4. Clarifications and additional inputs were sought wherever data gaps or inconsistencies were identified.
5. Appropriate methodologies and emission factors were applied to estimate emissions across identified scopes and categories.
6. Emissions were calculated and consolidated in line with the GHG Protocol guidance and reporting principles.

While the data provided by GLIM is considered complete and sufficient for calculation of emissions, the data has not been audited or independently verified.

3.2. Activity Data Collection

The GHG inventory has been developed using a combination of primary data obtained from GLIM and secondary data from recognized national and international sources. Primary data was collected

through stakeholder consultations, institutional records, utility documents, procurement information, and operational datasets. The following key data sources were used during the assessment:

1. Primary Data Collection

- *Campus Utility Records: Electricity consumption records, diesel purchase logs, and sewage treatment plant operational data.*
- *Administrative and Operational Data: Information related to employee and student commuting patterns, institutional transportation, and travel-related activities.*
- *Procurement Records: Expenditure data for purchased goods, services, and capital goods used for Scope 3 estimation.*
- *Waste Management Data: Information related to solid waste generation, treatment, recycling, and disposal practices obtained from campus facility teams and vendors.*

2. Secondary Data Sources

- *Secondary data sources were used primarily for emission factors, global warming potentials, and methodological references. These included: Central Electricity Authority (CEA), India, IPCC Guidelines, GHG Protocol tools and databases, DEFRA emission factor databases, USEPA Environmentally Extended Input-Output (EEIO) datasets, CPCB and MoEFCC guidance, wherever applicable, etc.*
- Global Warming Potentials (GWPs) considered in the inventory are based on the IPCC Sixth Assessment Report (AR6), wherever applicable.

3.3. Assumptions and Limitations

The following assumptions and limitations were considered during the GHG emissions inventorisation for the GLIM Chennai campus. These help clarify the scope, methodology, and potential uncertainties in the data and calculations:

- **Combustion Emissions Methodology:** Stationary combustion emissions were calculated using a fuel-based approach, i.e., volume of diesel consumed (in litres) multiplied by appropriate emission factors (EF).
- **Electricity Consumption:** Grid electricity consumption was based on actual utility bills for the reporting year. Any discrepancies due to unmetered areas or billing delays are not accounted for.
- **Grid Emission Factor:** The latest available grid emission factor from the Central Electricity Authority was applied.
- **EEIO Emission Factors:** The EEIO emission factors used in this assessment have been selected based on data availability, applicability, and the consultant's professional judgement and opinion.
- **For waste items reported only in numbers, unit weights have been considered based on literature review and industry references.**
- **Commuting Frequency Assumption:** Weekly commuting was assumed to occur 5 days per week for approximately 40 weeks per year, accounting for academic schedules and holidays.
- **Procurement Emissions Methodology:** A spend-based approach was used for estimating emissions from purchased goods and services. Annual expenditure in various categories was multiplied by emission factors from the USEPA EEIO database.
- **Currency Adjustments:** Procurement data in Indian Rupees was adjusted and converted to USD, using 2022 average exchange rates as the latest supply chain emission factors are available for 2022.

- Employee Commuting by buses: It is assumed that institute out-sourced buses run for an average of 22 working days per month, based on a standard academic schedule excluding weekends and holidays. Additionally, for the purpose of fuel consumption estimation, the average mileage of the buses is assumed to be 8 km per litre (kmpl). These assumptions are used to calculate fuel-based emissions from staff commuting via institutional transport.

4. EMISSION INVENTORY FY 2025-26

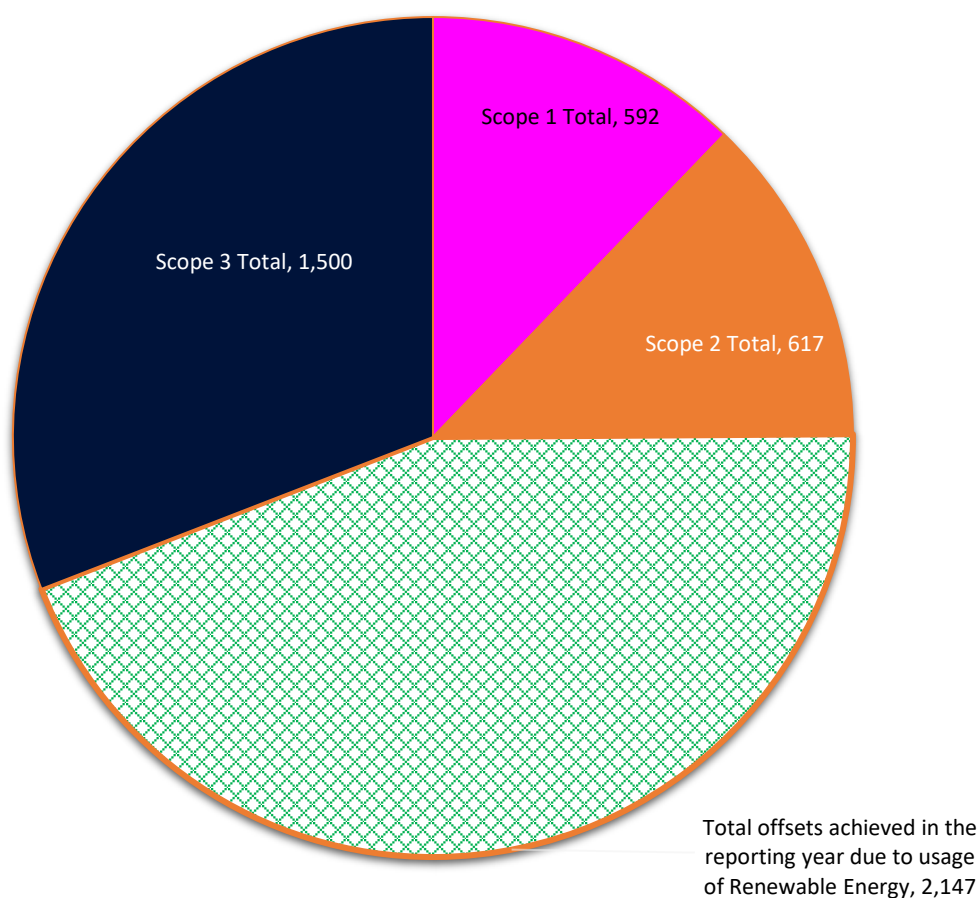
The total GHG emissions for the GLIM for the reporting year April 2025 to March 2026 are estimated at 2,708 tCO₂e. These emissions have been categorized under Scope 1, Scope 2, and Scope 3 as per the GHG Protocol standards.

A breakdown of emissions by scope is presented in Table 4.1, along with their respective contributions by each scope to the total GHG footprint. A graphical representation is provided in Figure 4.1 to illustrate the relative share of each scope.

Table 4.1: Total GHG Emissions in FY 2025-26 by scope for GLIM

GHG Emissions Scope	Emissions (tCO ₂ e)	Percentage
Scope 1 Emissions	592	21.9%
Scope 2 Emissions	617	22.8%
Scope 3 Emissions	1,500	55.4%
Total Emissions	2,708	100%
RE-Based Offsets (Reported Only)	2,147	-

Figure 4.1: Total GHG Emissions in FY 2025-26 by Scope for GLIM



4.1. Scope 1 Emissions

Scope 1 GHG emissions are direct emissions from sources that are owned or controlled by the institution. For GLIM, these emissions arise from the combustion of fuels in generators and vehicles, biological and waste treatment processes, and fugitive refrigerant releases from air-conditioning systems.

The total Scope 1 emissions for the reporting year are estimated at 592 tCO₂e. The breakdown of emission sources is presented in Figure 4.2 and summarized in Table 4.2.

Figure 4.2: Scope 1 Emissions Breakdown by Activity (in tCO₂e)

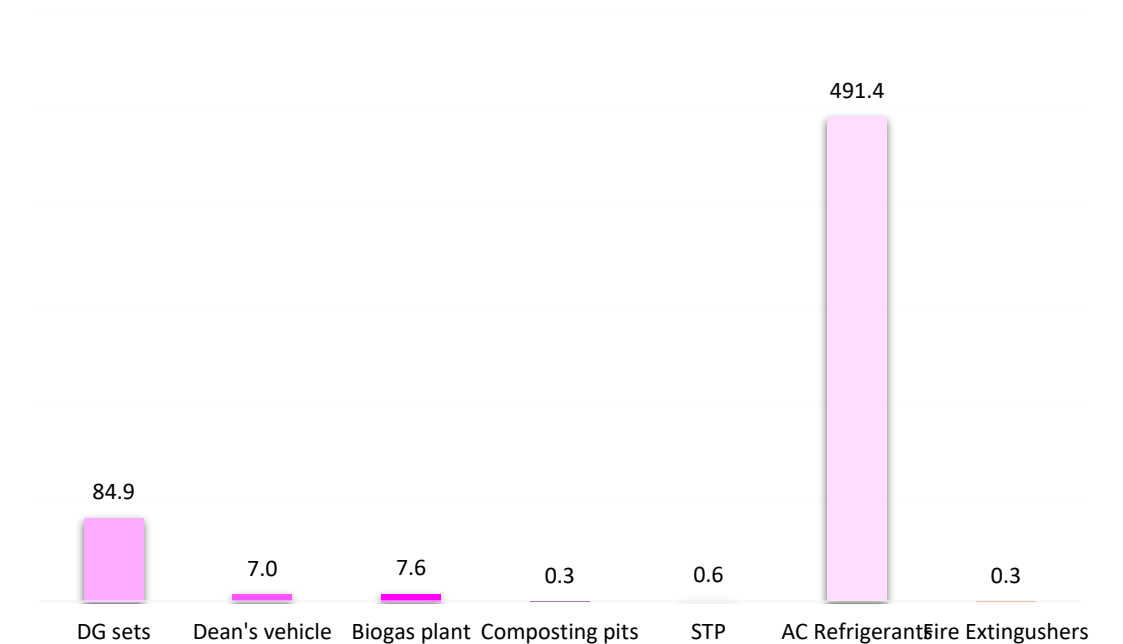


Table 4.2: Scope 1 Emissions Summary

Scope 1 Activity	Activity data	Emissions (tCO ₂ e)	Percentage
Stationary Emissions			
Diesel Generators	31,464 litres of diesel consumed	84.9	14.4%
Mobile Emissions			
Dean's vehicle	2,683 litres of petrol consumed	6.6	1.1%
Procurement Manager's 2-wheeler	173 litres of petrol consumed	0.4	0.1%
Process Emissions			
Biogas Plant (Food Waste)	360 kg of biogas generated	7.6	1.3%
Conventional Composting	14,786 kg of food waste and 15,000 kg of landscape waste composted	0.3	0.1%
Sewage Treatment Plant (STP)	43,106 kilolitres of sewage treated	0.6	0.1%
Fugitive Emissions			
Air Conditioning Systems (Split, Ductable, VRF)	Refrigerant leakage from various AC units	491	83.0%
CO ₂ Fire extinguishers	331 kg of CO ₂ gas refilled	0.3	0.1%
Total Scope 1 Emissions	-	592	100%

The data for diesel consumption used in the campus diesel generators, as well as petrol consumption associated with the Dean’s vehicle and the Procurement Manager’s two-wheeler, was provided by GLIM and reportedly sourced from maintained logbooks.

Process emissions from the biogas plant were estimated using the total volume of gas generated and its composition, as provided by GLIM. Emissions from conventional composting activities were calculated based on the quantity of food waste processed on campus.

For the Sewage Treatment Plant (STP), emissions were estimated based on the total volume of sewage treated and the level of Biological Oxygen Demand (BOD) reduction achieved. The STP reportedly operates using aerobic treatment through eco-SBR (Sequential Batch Reactor) technology.

4.2. Scope 2 Emissions

Scope 2 GHG emissions are indirect emissions resulting from the consumption of purchased electricity, which is generated off-site but consumed within the institution. These emissions form a significant portion of the carbon footprint for educational campuses due to the substantial energy demand from academic blocks, administrative offices, residential hostels, and other facilities.

During the reporting period April 2025 to March 2026, GLIM consumed a total of 38,92,303 kWh of electricity. Of this:

- a) 868,550 kWh (22.3%) was sourced from the conventional grid, contributing to Scope 2 emissions.
- b) 3,023,753 kWh (77.7%) was sourced from renewable energy (RE) — comprising onsite solar generation (12.2%) and purchased renewable electricity via Power Purchase Agreements (PPAs) (65.5%).

Note: Only grid-sourced electricity is accounted for under Scope 2 emissions. Electricity generated from or purchased as renewable energy is excluded from Scope 2 calculations. However, in this report, the emissions avoided due to renewable energy use are reported separately as "offsets" to highlight GLIM’s transition toward cleaner energy. These offsets are reported separately and should not be used to calculate net emissions.

The total Scope 2 emissions attributable to grid electricity consumption are estimated at 617 tCO₂e. The offsets achieved due to renewable energy usage are estimated at 2,147 tCO₂e. A visual representation is provided in Figure 4.3, and a summary of Scope 2 emissions and RE offsets is presented in Table 4.3.

Figure 4.3: Scope 2 Emissions & RE Offsets (in tCO₂e)

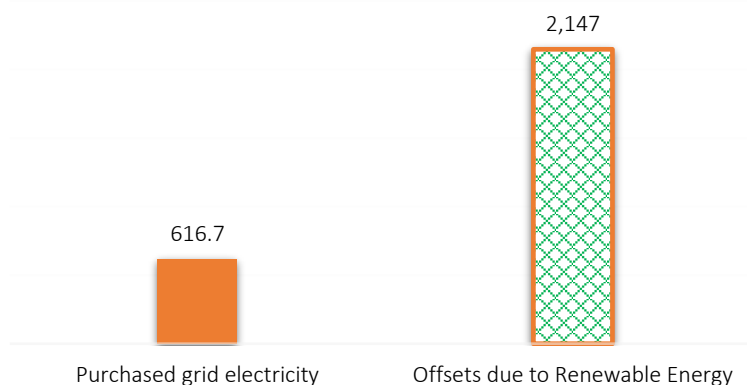


Table 4.3: Scope 2 Emissions Summary

Scope 2 Activity	Activity data	Emissions (tCO ₂ e)	Percentage
Purchased Electricity from grid	868,550 kWh of grid electricity consumed	617	100%
Total Scope 2 Emissions	-	617	100%
RE-Based Offsets (Reported Only)	3,023,753 kWh from both onsite solar + renewable PPAs	2147 (offset)	-

The electricity consumption data used in the analysis was provided by GLIM and reportedly sourced from monthly utility bills for the reporting period.

4.3. Scope 3 Emissions

Scope 3 GHG emissions are indirect emissions that occur outside the boundaries of the institution, arising from upstream and downstream activities associated with GLIM’s operations. These emissions occur at various points in the value chain, including procurement, outsourced services, commuting, and waste management.

For the reporting year April 2025 to March 2026, the total Scope 3 emissions for GLIM are estimated at 1,500 tCO₂e. A breakdown of these emissions by category is illustrated in Figure 4.4 and presented in Table 4.4, with detailed explanations provided in the following subsections.

Figure 4.4: Scope 3 Emissions Breakdown by Category (in tCO₂e)

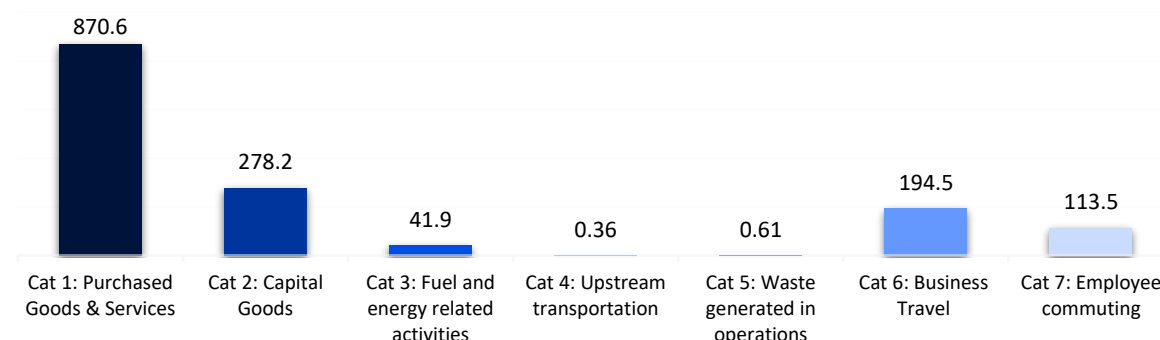


Table 4.4: Scope 3 Emissions Summary

Scope 3 Category	Activity data	Emissions (tCO ₂ e)	Percentage
Category 1: Purchased Goods & Services	32,48,81,451 INR spent on various purchased goods and services during the reporting year	870.6	58.1%
Category 2: Capital Goods	10,17,25,000 INR spent on various capital goods during the reporting year	278.2	18.6%
Category 3: Fuel and energy related activities	The same fuel and electricity consumption data used for Scope 1 and 2 GHG emissions estimation is used for this category	41.9	2.8%
Category 4: Upstream transportation	50,000 INR spent on transportation of kitchen consumables during the reporting period	0.36	0.02%

Category 5: Waste generated in operations	Waste generation and disposal data was considered for the estimations	0.61	0.04%
Category 6: Business Travel	A total of 62 air travel instances (9 international and 53 domestic), 4 train journeys, and 3 bus journeys were considered based on the business travel data shared by GLIM	194.5	13.0%
Category 7: Employee commuting	Employee commuting includes approximately 577 km/day through buses and tempo travellers combined, 25 km/day through two-wheelers, and an estimated 21,230 km of cab travel per month. In addition, approximately 2,870 km of cab travel per month has been decarbonised through the adoption of electric vehicles for planned trips.	113.5	7.6%
Total Scope 3 Emissions	-	1,500	100%

4.3.1. Scope 3 Category 1: Purchased Goods & Services

Category 1 of Scope 3 covers emissions resulting from the procurement of goods and services, such as stationery, IT equipment, facility management, food services, consulting, etc. These emissions occur during the production, processing, and delivery stages of the goods and services that GLIM purchases, even though they occur outside the campus premises.

Emissions under this category were estimated using the spend-based method, where annual procurement expenditure were multiplied by corresponding emission factors from the USEPA EEIO database.

For the reporting period, Scope 3 Category 1 emissions are estimated at 870.6 tCO₂e, accounting for approximately 58.1% of GLIM's total Scope 3 emissions. The activity-wise summary is presented in Table 4.4a.

Table 4.4a: Scope 3 Category 1: Purchased Goods & Services Emissions Summary

Scope 3 Activity	Spend (INR)	Emissions (tCO ₂ e)	Percentage
Category 1 Purchased Goods & Services			
Marketing Services (Advertising, etc.)	8,09,16,000	77.0	8.84%
Food Services	7,79,74,000	125.5	14.42%
Facility Management Services	5,96,00,000	420.1	48.25%
Stationery Items (Pens, Markers, Paper, etc.)	3,22,80,000	104.3	11.98%
Security Services	1,88,60,000	29.2	3.35%
Furniture	1,09,17,000	32.8	3.76%
Solar Panels for On-site Electricity Generation	77,56,000	20.3	2.34%
Landscaping Services	66,52,000	8.4	0.96%
IT Items (Laptops, etc.)	58,67,000	10.2	1.18%
Software Services (Web Hosting, etc.)	53,47,122	6.1	0.70%
Air Conditioner Maintenance	44,82,000	4.2	0.48%
Maintenance Consumables	34,59,000	10.5	1.20%

Healthcare Services (Medical, etc.)	33,89,000	6.0	0.69%
Dean’s New Vehicle	23,96,329	7.0	0.81%
Hospitality Services (Outstation Stay, etc.)	22,52,000	4.0	0.46%
BLDC Ceiling Fans	10,73,000	2.3	0.26%
Consulting Services	6,31,000	0.6	0.07%
DG Maintenance	2,92,000	0.5	0.06%
Lift Maintenance	2,36,000	0.2	0.03%
STP Maintenance	1,55,000	1.1	0.13%
Electrical Switchgear Maintenance	1,44,000	0.1	0.02%
Procurement Manager’s Bike	1,04,000	0.3	0.03%
Transformer Maintenance	99,000	0.1	0.01%
Total Category 1 Emissions	32,48,81,451	870.6	100%

The procurement spend data used for this analysis was provided by GLIM and sourced from the Finance Department for the reporting period.

4.3.2. Scope 3 Category 2: Capital Goods

Category 2 of Scope 3 includes GHG emissions associated with the procurement of capital goods, such as construction of buildings, infrastructure development, machinery, and vehicles. These emissions are attributed to the manufacturing, processing, and transportation of capital goods, even though the emissions occur off-site.

For this assessment, emissions under this category were calculated using the spend-based method, where annual capital expenditure was multiplied by relevant emission factors from the USEPA EEIO database.

For the reporting year April 2025 to March 2026, Scope 3 Category 2 emissions are estimated at 278.2 tCO₂e, accounting for approximately 18.6% of GLIM’s total Scope 3 emissions. The activity-wise breakdown is provided in Table 4.4b.

Table 4.4b: Scope 3 Category 2: Capital Goods Emissions Summary

Scope 3 Activity	Spend (INR)	Emissions (tCO ₂ e)	Percentage
Category 2 Capital Goods			
New Hostel	7,80,00,000	213.1	76.6%
Building Maintenance (Consumables, Civil Works, STP Blowers, Shed Works, Dining Hall Creation, Faculty Cabin Creation, etc.)	53,21,000	16.1	5.8%
Kitchen Equipment	50,00,000	13.6	4.9%
Air Conditioning Units	44,44,000	9.3	3.4%
Construction of Laundromat	37,74,000	11.0	4.0%
STP Rectification Works	20,98,000	6.1	2.2%
Construction of Metal Staircase	16,67,000	4.9	1.7%
Construction of Food Waste Dumping Yard	7,44,000	2.2	0.8%
Driver’s Resting Cabin	6,77,000	2.0	0.7%
Total Category 2 Emissions	10,17,25,000	278.2	100%

The capital expenditure data used for this analysis was provided by GLIM’s Finance Department for the reporting period.

4.3.3. Scope 3 Category 3: Fuel- and Energy-Related Activities

Category 3 of Scope 3 emissions covers upstream emissions associated with the production and delivery of purchased fuels and purchased electricity, which are not included in Scope 1 or Scope 2. This includes:

- Well-to-Tank (WTT) emissions from the extraction, refining, and transportation of fuels used in diesel generators and vehicles.
- Transmission and Distribution (T&D) losses during the delivery of grid electricity to the campus.

Emissions in this category were estimated using DEFRA-published emission factors for both WTT and T&D losses.

For the reporting year April 2025 to March 2026, Scope 3 Category 3 emissions are estimated at 41.9 tCO₂e, accounting for approximately 2.8% of GLIM’s total Scope 3 emissions. The detailed breakdown by activity is presented in Table 4.4c.

Table 4.4c: Scope 3 Category 3: Fuel- and Energy-Related Activities Emissions Summary

Scope 3 Activity	Activity data	Emissions (tCO ₂ e)	Percentage
Category 3 Fuel and Energy related activities			
Purchased electricity from grid	8,68,550 kWh consumed	20.47	48.9%
Purchased fuel for Diesel Generators	31,464 litres of diesel consumed	19.64	46.9%
Purchased fuel for Dean’s vehicle	2,856 litres of petrol consumed	1.78	4.3%
Total Category 3 Emissions	-	41.9	100%

The data used for estimating Scope 1 and Scope 2 emissions (i.e., fuel and electricity consumption) was also used as the basis for estimating upstream emissions under this category.

4.3.4. Scope 3 Category 4: Upstream Transportation

Category 4 of Scope 3 covers upstream transportation emissions, which are associated with the transportation of goods and services purchased by GLIM prior to reaching the campus. These emissions typically occur during the logistics and distribution phase and are not included in other Scope 1 or 2 categories.

For this assessment, emissions were estimated using a spend-based method, wherein expenditure related to transportation activities were multiplied by relevant emission factors from the USEPA EEIO database.

For the reporting year April 2025 to March 2026, Scope 3 Category 4 emissions are estimated at 0.36 tCO₂e, accounting for approximately 0.02% of GLIM’s total Scope 3 emissions. The detailed breakdown is presented in Table 4.4d.

Table 4.4d: Scope 3 Category 4: Upstream Transportation Emissions Summary

Scope 3 Activity	Spend (INR)	Emissions (tCO ₂ e)	Percentage
Category 4 Upstream Transportation			

Transportation of consumables	50,000 INR spent on transportation of kitchen consumables during the reporting period	0.36	100%
Total Category 4 Emissions	-	0.36	100%

The expenditure data for transportation-related activities used in this analysis was sourced from GLIM's Finance Department for the reporting period.

4.3.5. Scope 3 Category 5: Waste Generated in Operations

Category 5 of Scope 3 accounts for GHG emissions resulting from the treatment and disposal of waste generated during the regular operations of GLIM. These emissions typically occur off-site, during waste processing activities such as recycling, composting, land application, or landfill disposal.

For this assessment, emissions were estimated using emission factors published by DEFRA, which account for both the type and treatment method of waste.

For the reporting year April 2025 to March 2026, Scope 3 Category 5 emissions are estimated at 0.61 tCO₂e, accounting for approximately 0.04% of GLIM's total Scope 3 emissions. The detailed breakdown by waste stream is presented in Table 4.4e.

Table 4.4e: Scope 3 Category 5: Waste Generated in Operations Emissions Summary

Scope 3 Activity (Type of waste)	Activity data (Waste generated in Kg)	Emissions (tCO ₂ e)	Percentage
Category 5 Waste Generated in Operations			
Food Waste (Composting)	34,500	0.307	50.7%
Scrap Iron (Recycling)	4,098.5	0.087	14.4%
Ceiling Fans (Recycling)	1,915	0.041	6.7%
Plastic Waste (Recycling)	1,463	0.031	5.1%
Stainless Steel Scrap (Recycling)	1,090.5	0.023	3.8%
Tyres (Recycling)	830	0.018	2.9%
Old Mattresses – 6' x 3' (Recycling)	825	0.018	2.9%
Aluminium Cables (Recycling)	687	0.015	2.4%
Brass Scrap (Recycling)	480	0.010	1.7%
Scrap Aluminium (Recycling)	422	0.009	1.5%
Washing Machines (Recycling)	400	0.009	1.4%
STP Sludge (Combustion)	280	0.006	1.0%
Tin Scrap (Recycling)	259	0.006	0.9%
Air Conditioning Units (Recycling)	220	0.005	0.8%
Oil Barrels – 200 Litre (Recycling)	220	0.005	0.8%
Scrap Metal Components (Recycling)	198	0.004	0.7%
Water Coolers (Recycling)	180	0.004	0.6%
Motor Scrap (Recycling)	162	0.003	0.6%
Plastic Cans (Recycling)	114	0.002	0.4%
Electrical Switchgears / Breakers (Recycling)	70	0.001	0.2%
Pressure Pumps (Recycling)	60	0.001	0.2%
Electrical Bus Duct (Recycling)	50	0.001	0.2%
Scrap Wire (Recycling)	29	0.001	0.1%
Total Category 5 Emissions	-	0.61	100%

The waste generation and disposal data used in this analysis was provided by GLIM’s Facility Management Department for the designated reporting period.

4.3.6. Scope 3 Category 6: Business Travel

Category 6 of Scope 3 GHG emissions includes business travel-related emissions, from air/road/rail travel undertaken by GLIM staff or representatives for institutional purposes. These emissions occur off-site, and are attributed to the institution due to their operational necessity.

For the reporting period April 2025 to March 2026, Scope 3 Category 6 emissions are estimated at 194.5 tCO₂e, accounting for approximately 13% of GLIM’s total Scope 3 emissions. The summary is presented in Table 4.4f.

Table 4.4f: Scope 3 Category 6: Business Travel Emissions Summary

Scope 3 Activity-Travel Category	Description	Emissions (tCO ₂ e)	Percentage
Category 6 Business Travel			
Air Travel – Domestic	Domestic air travel undertaken during the reporting period	182.92	94.05%
Air Travel – International	International air travel undertaken during the reporting period	11.30	5.81%
Bus Travel	Intercity business travel by bus	0.23	0.12%
Train Travel	Business travel undertaken by train	0.04	0.02%
Cab Travel	Business travel through cabs	0	0.00%
Total Category 6 Emissions	-	194.5	100%

The expenditure data used for this analysis was provided by GLIM’s Finance Department for the reporting period.

4.3.7. Scope 3 Category 7: Employee commuting

Category 7 of Scope 3 GHG emissions includes emissions from employee commuting, which occur off-site but are attributable to institutional operations. These emissions arise from the use of various transport modes by staff traveling between their residences and the campus.

At GLIM, employee commuting is partially outsourced and is facilitated through a fleet of four dedicated buses operating from key city locations: Parrys, KK Nagar, Porur, and Pallikaranai. In addition, some employees commute using two-wheelers (primarily local staff) and cabs, particularly during off-hours or weekends.

For this assessment, emissions were estimated based on travel distance, mode of transport, fuel type, and trip frequency. Assumptions include:

- Institute out sourced buses are assumed to operate 26 working days per month.
- Bus mileage is assumed to be 8 km per litre (kmpl).

For the reporting year April 2025 to March 2026, Scope 3 Category 7 emissions are estimated at 113.5 tCO₂e, accounting for approximately 7.6% of GLIM’s total Scope 3 emissions. A breakdown of commuting activities is provided in Table 4.4g.

Table 4.4g: Scope 3 Category 7: Employee Commuting Emissions Summary

Scope 3 Activity	Activity data	Emissions (tCO ₂ e)	Percentage
Category 7 Employee Commuting			
Employee cabs (off-hours / weekends)	120 km per trip; 177 trips per month	52.0	45.8%
Bus – Parrys to Manamai	154 km round-trip per working day	16.2	14.3%
Bus – KK Nagar to Manamai	154 km round-trip per working day	16.2	14.3%
Bus – Porur to Manamai	154 km round-trip per working day	16.2	14.3%
Tempo traveller – Pallikaranai to Manamai	115 km round-trip per working day	12.1	10.7%
Local employees – 2-wheelers	25 km per day; 35 trips per month	0.9	0.8%
Total Category 7 Emissions	-	113.5	100%
Cab Travel (E-Vehicles)	Business travel through cabs – emissions avoided through the adoption of electric vehicles for planned trips	7	-

The data used for this analysis was provided by GLIM’s Administration and Logistics Department for the reporting period.

4.4. Emission Intensity

GHG performance is typically assessed using two key metrics:

- Absolute emissions, which represent the total greenhouse gas emissions generated during the reporting period; and
- Emission intensity metrics, which normalize emissions against a relevant operational parameter to support performance evaluation and benchmarking.

Absolute emissions provide an overall view of the institute’s carbon footprint and serve as an important basis for tracking year-on-year performance and identifying major emission sources. However, absolute emissions alone may not provide meaningful comparisons across institutions due to differences in campus size, operational boundaries, infrastructure, occupancy levels, and academic activities.

For FY 2025–26, the total absolute emissions for Great Lakes Institute of Management Chennai campus were estimated at 2,708 tCO₂e, compared to the baseline year emissions of 4,013 tCO₂e reported for FY 2024–25. The reduction in emissions is primarily attributable to increased renewable electricity procurement, on-site solar energy generation, and changes in operational activities during the reporting period.

For this assessment, per capita emission intensity has been considered the most relevant indicator, as campus emissions are closely linked to occupancy levels and day-to-day institutional activities. The campus population has been categorized into different groups, and the corresponding per capita emission intensity values are presented below.

Campus Community Group	Headcount in FY 2025-26	Per Capita Emission Intensity (tCO ₂ e per person)
Students only	1,017	2.66
Students + Employees (on payroll)	1,189	2.28
Students + Employees + Contract Staff	1,469	1.84

While emission intensity metrics provide useful insights for internal tracking and performance evaluation, comparisons with other institutions should be interpreted with caution. Differences in organisational boundaries, Scope 3 coverage, operational scale, accounting methodologies, emission factors, and data quality can significantly influence reported intensity values.

Nevertheless, emission intensity remains a useful indicator for understanding operational trends, identifying emission hotspots, and supporting future reduction planning and sustainability initiatives.

5. YEAR-ON-YEAR PERFORMANCE ANALYSIS

This section presents a comparison of the GHG emissions inventory for FY 2025–26 against the baseline year FY 2024–25. The analysis highlights changes in overall emissions, scope-wise trends, operational drivers influencing emissions performance, and improvements made in data collection and reporting practices during the reporting period. The year-on-year comparison provides useful insights into how operational activities, renewable energy adoption, procurement patterns, travel activities, and data quality improvements have influenced the campus carbon footprint over time.

The table below shows the performance summary:

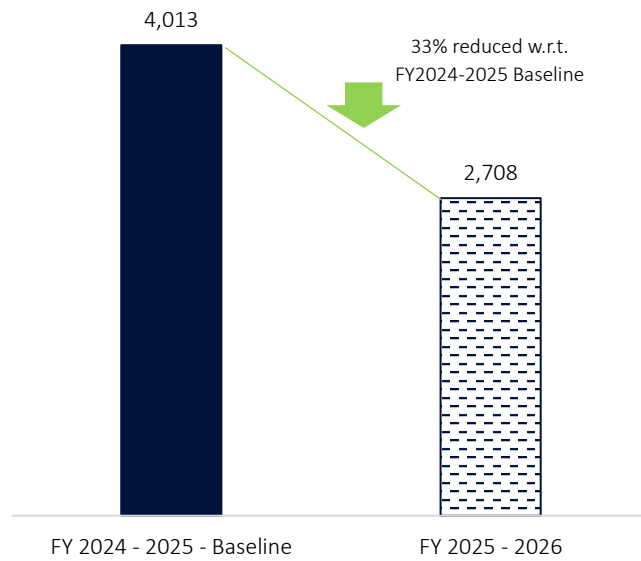
Emission Sources	FY 2024-25 Baseline (tCO ₂ e)	FY 2025-26 Current (tCO ₂ e)
Stationary combustion – Diesel generators	96.1	84.9 ↓
Mobile combustion – Institute owned vehicles	2.9	7.0 ↑
Process emissions – On-campus biogas plant	3.7	7.6 ↑
Process emissions – On-campus composting pits	0.26	0.27 ↑
Process emissions – On-campus STP	0.5	0.6 ↑
Fugitive emissions – Refrigerant gases	142	491 ↑
Fugitive emissions – Fire extinguishers	0.0	0.3 ↑
Scope 1 Emissions	246	592 ↑
Purchased electricity – Grid	2,120	617 ↓
Scope 2 Emissions	2,120	617 ↓
Category 1 – Purchased goods and services	752.0	870.6 ↑
Category 2 – Capital goods	512.7	278.2 ↓
Category 3 – Fuel and energy related activities	91.7	41.9 ↓
Category 4 – Upstream transportation	0.7	0.4 ↓
Category 5 – Waste generated in operations	0.1	0.6 ↑
Category 6 – Business travel	146	194.5 ↑
Category 7 – Employee commuting	144.0	113.5 ↓
Scope 3 Emissions	1,647	1,500 ↓
Total Emissions	4,013	2,708 ↓
Total offsets achieved from renewable energy	877	2,147 ↑

5.1. Comparison with FY 2024–25 Baseline

FY 2024–25 represented the first comprehensive GHG inventory developed for the Chennai campus of Great Lakes Institute of Management and established the baseline emissions profile across Scope 1, Scope 2, and material Scope 3 categories.

For FY 2025–26, the total GHG emissions of the campus were estimated at 2,708 tCO₂e, compared to 4,013 tCO₂e reported in the baseline year, representing an overall reduction of approximately 33% in total emissions.

Figure 5.1: Total Emissions (in tCO₂e)



The reduction in emissions during the reporting year is primarily attributable to:

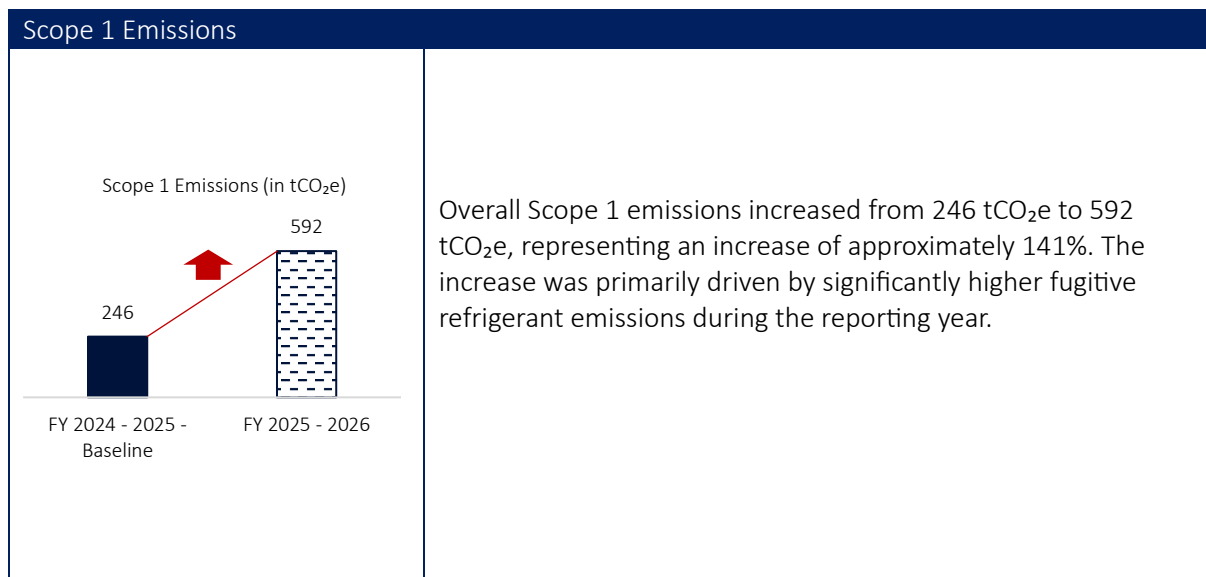
- Increased renewable electricity procurement through Power Purchase Agreements (PPAs)
- Continued contribution from on-site solar photovoltaic generation

At the same time, some emission categories showed increases due to changes in campus activities, infrastructure additions, procurement patterns, and business travel requirements during the reporting period.

As this represents only the second year of inventory development, the comparison should also be viewed in the context of evolving data maturity, improved operational visibility, and refinements in calculation methodologies.

Figure 5.2 to Figure 5.4 summarizes the source/category-wise comparison of emissions across each scope for the reporting years FY 2024–25 and FY 2025–26.

Figure 5.2: Source/category-wise comparison of Scope 1 emissions (in tCO₂e)



1. Stationary Combustion – Diesel Used for DG Sets	
<p>FY 2024 - 2025 - Baseline: 96.1 FY 2025 - 2026: 84.9</p>	<p>Emissions from diesel consumption in DG sets reduced by approximately 12%. The reduction is likely attributable to lower diesel consumption during the reporting year, potentially supported by improved electricity reliability, operational optimization, and increased use of renewable electricity sources.</p>
2. Mobile Combustion – Company-owned Vehicles	
<p>FY 2024 - 2025 - Baseline: 2.9 FY 2025 - 2026: 7.0</p>	<p>Emissions from fuel consumption associated with company-owned vehicles increased from 2.9 tCO₂e to 7.0 tCO₂e, representing an increase of approximately 138%. The increase is primarily attributable to improved accounting and tracking of fuel consumption during the reporting year. In addition to the Dean’s vehicle, emissions from a company-owned two-wheeler used by the Procurement Manager were also included in the current year inventory, contributing to the overall increase in emissions.</p>
3. Process Emissions – Biogas Plant	
<p>FY 2024 - 2025 - Baseline: 3.7 FY 2025 - 2026: 7.6</p>	<p>Emissions associated with the biogas plant increased from 3.7 tCO₂e to 7.6 tCO₂e, reflecting an increase of approximately 106%. This increase is likely attributable to improved utilization of the biogas plant through higher food waste processing volumes and increased operational usage of the system during the reporting year.</p>
4. Process Emissions – Conventional Composting	
<p>FY 2024 - 2025 - Baseline: 0.26 FY 2025 - 2026: 0.27</p>	<p>Emissions from conventional composting activities remained relatively stable during the reporting year, increasing marginally from 0.26 tCO₂e to 0.27 tCO₂e. The slight increase is operationally insignificant and indicates relatively consistent composting activity levels across both reporting years.</p>
5. Process Emissions – Sewage Treatment Plant (STP)	
<p>FY 2024 - 2025 - Baseline: 0.5 FY 2025 - 2026: 0.6</p>	<p>STP-related emissions increased slightly from 0.5 tCO₂e to 0.6 tCO₂e, representing an increase of approximately 3%. The increase may be associated with marginally higher sewage treatment volumes or changes in campus occupancy and operational activities</p>

6. Fugitive Emissions – Refrigerants	
<p>FY 2024 - 2025 - Baseline: 142</p> <p>FY 2025 - 2026: 491</p>	<p>Fugitive emissions from refrigerant leakage increased significantly from 142 tCO₂e to 491 tCO₂e, representing an increase of approximately 245%. This was one of the most significant contributors to the increase in Scope 1 emissions during the reporting year. The increase may be attributable to: Higher refrigerant refilling or leakage incidents during maintenance activities or Replacement or servicing of air-conditioning systems.</p>
7. Fugitive Emissions – CO ₂ Gas Fire Extinguishers	
<p>FY 2024 - 2025 - Baseline: 0.0</p> <p>FY 2025 - 2026: 0.3</p>	<p>A small quantity of emissions (0.3 tCO₂e) was reported from CO₂ gas fire extinguishers during FY 2025–26, whereas no emissions were reported in the baseline year.</p>

Figure 5.3: Source/category-wise comparison of Scope 2 emissions (in tCO₂e)

Scope 2 Emissions	
<p>Scope 2 Emissions (in tCO₂e)</p> <p>FY 2024 - 2025 - Baseline: 2,120</p> <p>FY 2025 - 2026: 617</p>	<p>Scope 2 emissions associated with purchased electricity reduced substantially from 2,120 tCO₂e to 617 tCO₂e, reflecting a reduction of approximately 71%. This significant reduction was primarily driven by:</p> <ul style="list-style-type: none"> • Increased renewable electricity procurement through the Power Purchase Agreement (PPA), • Continued contribution from on-site solar photovoltaic generation. <p>The reduction in Scope 2 emissions represents the most significant positive change observed during the reporting year and demonstrates the effectiveness of renewable energy adoption initiatives undertaken by GLIM.</p>
Renewable Energy Offsets / Decarbonised Electricity Impact	
<p>Renewable Energy Offsets (in tCO₂e)</p> <p>FY 2024 - 2025 - Baseline: 877</p> <p>FY 2025 - 2026: 2,147</p>	<p>The total emissions offsets achieved through renewable energy usage increased from 877 tCO₂e in FY 2024–25 to 2,147 tCO₂e in FY 2025–26, representing an increase of approximately 145%.</p>

Figure 5.4: Source/category-wise comparison of Scope 3 emissions (in tCO₂e)

Scope 3 Emissions	
<p>1,647 FY 2024 - 2025 - Baseline 1,500 FY 2025 - 2026</p>	<p>Overall Scope 3 emissions reduced marginally from 1,647 tCO₂e to 1,500 tCO₂e, representing a reduction of approximately 9%. While reductions were observed in categories such as capital goods, fuel- and energy-related activities, and employee commuting, these reductions were partially offset by increases in emissions from purchased goods and services and business travel during the reporting year.</p>
Category 1 – Purchased Goods and Services	
<p>752.0 FY 2024 - 2025 - Baseline 870.6 FY 2025 - 2026</p>	<p>Emissions from purchased goods and services increased from 752.0 tCO₂e to 870.6 tCO₂e, representing an increase of approximately 16%. The increase is likely attributable to higher procurement volumes, higher expenditure on goods and services, etc. Facility management services and food services continued to remain major contributors within this category.</p>
Category 2 – Capital Goods	
<p>512.7 FY 2024 - 2025 - Baseline 278.2 FY 2025 - 2026</p>	<p>Capital goods emissions reduced from 512.7 tCO₂e to 278.2 tCO₂e, representing a reduction of approximately 46%. The reduction may be linked to: Reduced procurement of major capital equipment, and Completion of certain infrastructure-related works in the previous reporting year.</p>
Category 3 – Fuel- and Energy-Related Activities	
<p>91.7 FY 2024 - 2025 - Baseline 41.9 FY 2025 - 2026</p>	<p>Emissions from fuel- and energy-related activities reduced from 91.7 tCO₂e to 41.9 tCO₂e, representing a reduction of approximately 54%. The reduction is primarily attributable to lower grid electricity dependence and increased renewable energy usage during the reporting year.</p>
Category 4 – Upstream Transportation	
<p>0.7 FY 2024 - 2025 - Baseline 0.4 FY 2025 - 2026</p>	<p>Upstream transportation emissions reduced from 0.7 tCO₂e to 0.4 tCO₂e, reflecting a reduction of approximately 50%. The variation is relatively small in absolute terms and may be associated with changes in transportation requirements.</p>

Category 5 – Waste Generated in Operations	
<p>FY 2024 - 2025 - Baseline: 0.1 FY 2025 - 2026: 0.6</p>	<p>Emissions from waste generated in operations increased significantly from 0.1 tCO₂e to 0.6 tCO₂e. Although this reflects a large percentage increase, the overall emissions contribution from this category remains relatively small in absolute terms. The increase is likely due to: Improved waste data availability or better quantification of landscape waste disposal.</p>
Category 6 – Business Travel	
<p>FY 2024 - 2025 - Baseline: 146.0 FY 2025 - 2026: 194.5</p>	<p>Business travel emissions increased from 146.0 tCO₂e to 194.5 tCO₂e, representing an increase of approximately 33%. The increase was primarily attributable to improved data availability and better quantification of travel-related emissions during the reporting year. Unlike the baseline year, where emissions were estimated using proxy assumptions due to the unavailability of detailed travel data, the current year assessment was carried out using actual business travel records.</p>
Category 7 – Employee Commuting	
<p>FY 2024 - 2025 - Baseline: 144.0 FY 2025 - 2026: 113.5</p>	<p>Employee commuting emissions reduced from 144.0 tCO₂e to 113.5 tCO₂e, reflecting a reduction of approximately 21%. The reduction may be attributable to improved employee commuting data availability and partly due to the adoption of e-mobility solutions for planned trips during the reporting year.</p>

6. CONCLUSION

The GHG emissions profile of Great Lakes Institute of Management continues to reflect the typical emissions characteristics of higher education institutions with integrated academic, administrative, and residential infrastructure. For the reporting year FY 2025–26, the total emissions estimated for the Chennai campus are 2,708 tCO₂e, representing an overall reduction of approximately 33% compared to the baseline year FY 2024–25.

A significant reduction was observed in Scope 2 emissions, which decreased from 2,119.8 tCO₂e in the baseline year to 617 tCO₂e during the reporting period. This reduction was primarily driven by increased renewable electricity procurement through the Power Purchase Agreement (PPA) and continued contribution from the on-site solar photovoltaic (PV) system. Together, these initiatives have substantially reduced the emissions associated with campus electricity consumption and demonstrate the effectiveness of renewable energy adoption as a key decarbonisation lever for GLIM.

Scope 3 emissions represent a major share of the institute's overall emissions profile, accounting for approximately 1,500 tCO₂e during FY 2025–26. The primary contributors within Scope 3 include purchased goods and services, capital goods, business travel, and employee commuting. The increase in emissions from purchased goods and services reflects the operational dependence on outsourced services and procurement-related activities, while the reduction in capital goods emissions indicates comparatively lower infrastructure-related activities during the reporting year.

Business travel emissions increased during FY 2025–26 primarily due to improved data availability and the use of actual travel records instead of proxy assumptions used in the baseline year. This reflects an improvement in the quality and granularity of activity data available for the assessment.

Scope 1 emissions increased during the reporting year, primarily due to fugitive refrigerant emissions associated with air-conditioning systems. Refrigerant leakage and servicing activities emerged as one of the major direct emission sources for the campus and represent an important area for future emissions management and reduction efforts. Strengthening refrigerant monitoring practices, and transitioning toward lower Global Warming Potential (GWP) refrigerants may help reduce these emissions over time.

The reporting year also demonstrated improvements in institutional data management and emissions accounting practices. Better availability of operational records, procurement information, travel data, and waste-related datasets enabled improved quantification of several emission categories compared to the baseline year assessment.

While the current inventory represents an important step toward understanding and managing the campus carbon footprint, there remains significant opportunity to further strengthen emissions management practices. Potential focus areas for future years include:

- Expanding renewable energy usage,
- Further electrification of transportation systems,
- Transitioning toward more activity-based Scope 3 estimation methodologies, and
- Enhancing sustainable procurement practices,
- Increasing supplier engagement for low-carbon products and services.

APPENDIX A- CALCULATION TABLES

Scope 1: Stationary Emissions

S.No.	Source ID	Fuel Type	Total Consumption (l)	Emission factors (kg/l)			Emission factor source	Emissions (kg)			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
				CO ₂ factor	CH ₄ factor	N ₂ O factor		CO ₂ emission	CH ₄ emissions	N ₂ O emissions		
1	Diesel Generators (DG) Sets	Diesel	31464	2.689	0.000109	0.0000218	IPCC	84600.9858	3.4251	0.6850	84883.6	84.9

Scope 1: Mobile Emissions

S.No.	Source ID	Fuel Type	Total Consumption (l)	Emission factors (kg/l)			Emission factor source	Emissions (kg)			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
				CO ₂ factor	CH ₄ factor	N ₂ O factor		CO ₂ emission	CH ₄ emissions	N ₂ O emissions		
1	Dean's vehicle	Petrol	2683	2.395	0.000864	0.0001106	IPCC	6424.3077	2.3176	0.2966	6570.0	6.6
2	Procurement manager's 2-wheeler	Petrol	173	2.395	0.000864	0.0001106	IPCC	414.2645	0.1494	0.0191	423.7	0.4

Scope 1: Process Emissions (Biogas Plant)

S.No.	Source ID	Type of GHG emitting from the process	Total Gas Generation (kg)	Emission factors (kg/kg)			Emission factor source	Emissions (kg)			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
				CO ₂ factor	CH ₄ factor	N ₂ O factor		CO ₂ emission	CH ₄ emissions	N ₂ O emissions		
1	Biogas plant (1/12 months)	Methane - 75% CO ₂ - 20% Nitrogen - 5 %	360	0.20	0.75	0.00	Site specific design data	72.00	270.00	0.00	7605.0	7.6

Scope 1: Process Emissions (Conventional Composting)

S.No.	Source ID	Type of waste	Quantity Generated	Units	Waste disposal method	Waste disposal emission factors as per UK DEFRA			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
						Waste type as per DEFRA	Assumed activity as per DEFRA	Emission factor (kg CO ₂ e/Ton)		
2	Conventional Composting	Food Waste	14786	Kgs	Conventional Composting	Organic: food and drink waste	Composting	8.912	131.8	0.132
3	Conventional Composting	Landscape Waste	15000	Kgs	Conventional Composting	Organic: garden waste	Composting	8.912	133.7	0.134

Scope 1: Process Emissions (STP)

S.No.	Source ID	Emission factors	Emissions (kg)	Total Emissions (tCO ₂ e)
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		Average BOD inlet concentration (mg/l)	Total Sewage Treated (kl)	CO ₂ factor	CH ₄ factor (kg/kgof BOD)	N ₂ O factor (Kg N ₂ O-N/Kg N)	Emission factor source	CO ₂ emission	CH ₄ emissions	N ₂ O emissions	Total Emissions (kgCO ₂ e)	
3	STP	400	43106	0	0.018	0.016	IPCC	0.00	6.92	1.35	560.6	0.5606

Scope 1: Fugitive Emissions - Refrigeration

S.No.	Source ID	Type of Refrigerant used	Total Refrigerant capacity (kg)	GWP	Total CO ₂ emission (kgCO ₂ e)	Total Emissions (tCO ₂ e)
1	Split Acs, Ductable AC units & VRF Units	R22	104.25	1760	5504.40	5.50
2	Split Acs, Ductable AC units & VRF Units	R32	102.75	677	2086.85	2.09
3	Split Acs, Ductable AC units & VRF Units	R407	25.5	1923.4	1471.40	1.47
4	Split Acs, Ductable AC units & VRF Units	R410	2610	1923.5	150610.05	150.61
5	Fridges discarded	-	0		0	0
6	Cold Room discarded	-	0		0	0
7	Deep freezers discarded	-	0		0	0
8	Discarded ACs	R32	490	677	331730.00	331.73
	Total				491403	491.4

Scope 1: Fugitive Emissions - CO₂ gas Fire Extinguishers

S.No.	Source ID	Quantity of gas refill	Unit of Measurement	Total CO ₂ emission (kgCO ₂ e)	Total Emissions (tCO ₂ e)
1	CO ₂ gas fire extinguishers	331	kgs	331	0.331
	Total	331		331	0.331

Scope 2: Electricity related emissions

S.No.	Activity	Type of electricity	Measurement Unit	Total Electricity Consumption	CO ₂ emission factor (T/Mwh) from CEA	Emission factor source	Total Emissions (tCO ₂ e)
1	All operations	Grid	KWh	868550	0.71	CEA	616.7

Emissions offset due to usage of RE

S.No.	Activity	Type of electricity	Measurement Unit	Total Electricity Consumption	CO ₂ emission factor (T/Mwh) from CEA	Emission factor source	Total Emissions (tCO ₂ e)
1	All operations	Renewable through PPA	KWh	2549565	0.71	CEA	1810.2
2	All operations	Onsite solar panel	KWh	474188	0.71	CEA	336.7
	Total			1205705			2146.9

Scope 3 Cat-1: Purchased Goods & Services

S.No.	Category	Purchased Item Description	Amount spent	Unit of currency	Amount spent in USD (ref 2022)	Supply chain emission factors as per USEPA								Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)	
						Purchase type	Group	Sector	Sub sector	Industry Group	NAICS Code	NAICS Industry	Units			Emission Factor
1	Purchased good	Stationery items- Pen, Markers, Paper, etc.,	32280000	INR	393659	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Miscellaneous Manufacturing (NAICS 339)	Other Miscellaneous Manufacturing: NAICS 3399	339940	Office Supplies (except Paper) Manufacturing	kg CO ₂ e/2022 USD, purchaser price	0.265	104319.5	104.3
2	Purchased good	IT items- Laptops, Meraki Wifi AP & Switches, CCTV Perimeter, OAT, ARR CLD & Nalanda Classroom AV equipments, New hostel networking, Fiber replacement,	5867000	INR	71549	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Computer and Electronic Product Manufacturing (NAICS 334)	Computer and Peripheral Equipment Manufacturing: NAICS 3341	334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing	kg CO ₂ e/2022 USD, purchaser price	0.143	10231.5	10.2
3	Purchased good	Furnitures	10917000	INR	133134	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Furniture and Related Product Manufacturing (NAICS 337)	Household and Institutional Furniture and Kitchen Cabinet Manufacturing: NAICS 3371	337127	Institutional Furniture Manufacturing	kg CO ₂ e/2022 USD, purchaser price	0.246	32751.0	32.8
4	Purchased good	Maintenance consumables	3459000	INR	42183	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Fabricated Metal Product Manufacturing (NAICS 332)	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing: NAICS 3327	332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	kg CO ₂ e/2022 USD, purchaser price	0.248	10461.4	10.5
5	Purchased good	Gifts	0	INR	0	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Miscellaneous Manufacturing (NAICS 339)	Other Miscellaneous Manufacturing: NAICS 3399	339999	All Other Miscellaneous Manufacturing	kg CO ₂ e/2022 USD, purchaser price	0.182	0.0	0.0
6	Purchased Service	Sodexo- Facility management services	59600000	INR	726829	Service-Providing Industries	Trade, Transportation, and Utilities	Utilities (NAICS 22)	Utilities (NAICS 221)	Water, Sewage and Other Systems: NAICS 2213	221320	Sewage Treatment Facilities	kg CO ₂ e/2022 USD, purchaser price	0.578	420107.3	420.1
7	Purchased Service	Compass- Food services	77974000	INR	950902	Service-Providing Industries	Leisure and Hospitality	Accommodation and Food Services (NAICS 72)	Food Services and Drinking Places (NAICS 722)	Special Food Services: NAICS 7223	722310	Food Service Contractors	kg CO ₂ e/2022 USD, purchaser price	0.132	125519.1	125.5
8	Purchased Service	Security services	18860000	INR	230000	Service-Providing Industries	Professional and Business Services	Administrative and Waste Management and Remediation Services (NAICS 56)	Administrative and Support Services (NAICS 561)	Other Support Services: NAICS 5619	561990	All Other Support Services	kg CO ₂ e/2022 USD, purchaser price	0.127	29210.0	29.2

9	Purchased Service	AC maintenance	4482000	INR	54659	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Electronic and Precision Equipment Repair and Maintenance: NAICS 8112	811211	Consumer Electronics Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.076	4154.0	4.2
10	Purchased Service	STP maintenance	155000	INR	1890	Service-Providing Industries	Trade, Transportation, and Utilities	Utilities (NAICS 22)	Utilities (NAICS 221)	Water, Sewage and Other Systems: NAICS 2213	221320	Sewage Treatment Facilities	kg CO2e/2022 USD, purchaser price	0.578	1092.6	1.1
11	Purchased Service	Transformer maintenance	99000	INR	1207	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Electronic and Precision Equipment Repair and Maintenance: NAICS 8112	811219	Other Electronic and Precision Equipment Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.076	91.8	0.1
12	Purchased Service	DG maintenance	292000	INR	3561	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance: NAICS 8113	811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.136	484.3	0.5
13	Purchased Service	Electrical switch gears maintenance	144000	INR	1756	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Electronic and Precision Equipment Repair and Maintenance: NAICS 8112	811219	Other Electronic and Precision Equipment Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.076	133.5	0.1
14	Purchased Service	Lift maintenance	236000	INR	2878	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Electronic and Precision Equipment Repair and Maintenance: NAICS 8112	811219	Other Electronic and Precision Equipment Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.076	218.7	0.2
15	Purchased Service	Marketing services (advertising etc.)	80916000	INR	986780	Service-Providing Industries	Professional and Business Services	Professional, Scientific, and Technical Services (NAICS 54)	Professional, Scientific, and Technical Services (NAICS 541)	Management, Scientific, and Technical Consulting Services: NAICS 5416	541613	Marketing Consulting Services	kg CO2e/2022 USD, purchaser price	0.078	76968.9	77.0
16	Purchased Service	Software services (webhosting, etc.)	5347122	INR	65209	Service-Providing Industries	Information	Information (NAICS 51)	Data Processing, Hosting, and Related Services (NAICS 518)	Data Processing, Hosting, and Related Services: NAICS 5182	518210	Data Processing, Hosting, and Related Services	kg CO2e/2022 USD, purchaser price	0.093	6064.4	6.1
17	Purchased Service	Hospitality services (stay etc.)- Outstation	2252000	INR	27463	Service-Providing Industries	Leisure and Hospitality	Accommodation and Food Services (NAICS 72)	Accommodation (NAICS 721)	Rooming and Boarding Houses: NAICS 7213	721310	Rooming and Boarding Houses, Dormitories, and Workers' Camps	kg CO2e/2022 USD, purchaser price	0.145	3982.2	4.0
18	Purchased Service	Healthcare services (medical etc.)	3389000	INR	41329	Service-Providing Industries	Education and Health Services	Health Care and Social Assistance (NAICS 62)	Hospitals (NAICS 622)	General Medical and Surgical Hospitals: NAICS 6221	622110	General Medical and Surgical Hospitals	kg CO2e/2022 USD, purchaser price	0.145	5992.7	6.0
19	Purchased Service	Consulting services	631000	INR	7695	Service-Providing Industries	Professional and Business Services	Professional, Scientific, and Technical Services (NAICS 54)	Professional, Scientific, and Technical Services (NAICS 541)	Management, Scientific, and Technical Consulting Services: NAICS 5416	541618	Other Management Consulting Services	kg CO2e/2022 USD, purchaser price	0.078	600.2	0.6
20	Purchased Service	R&D services	0	INR	0	Service-Providing Industries	Professional and Business Services	Professional, Scientific, and Technical Services (NAICS 54)	Professional, Scientific, and Technical Services (NAICS 541)	Scientific Research and Development Services: NAICS 5417	541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	kg CO2e/2022 USD, purchaser price	0.156	0.0	0.0
21	Purchased Service	Legal services	0	INR	0	Service-Providing Industries	Professional and Business Services	Professional, Scientific, and Technical Services (NAICS 54)	Professional, Scientific, and Technical Services (NAICS 541)	Legal Services: NAICS 5411	541199	All Other Legal Services	kg CO2e/2022 USD, purchaser price	0.041	0.0	0.0

22	Purchased Service	Landscaping services	6652000	INR	81122	Service-Providing Industries	Professional and Business Services	Professional, Scientific, and Technical Services (NAICS 54)	Professional, Scientific, and Technical Services (NAICS 541)	Architectural, Engineering, and Related Services: NAICS 5413	541320	Landscape Architectural Services	kg CO2e/2022 USD, purchaser price	0.103	8355.6	8.4
23	Purchased good	Solar panels for on-site electricity generation	7756000	INR	94585	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Computer and Electronic Product Manufacturing (NAICS 334)	Semiconductor and Other Electronic Component Manufacturing: NAICS 3344	334413	Semiconductor and Related Device Manufacturing	kg CO2e/2022 USD, purchaser price	0.215	20335.9	20.3
24	Purchased Service	Installation of solar panels for on-site electricity generation	0	INR	0	Service-Providing Industries	Other Services (except Public Administration)	Other Services (except Public Administration) (NAICS 81)	Repair and Maintenance (NAICS 811)	Electronic and Precision Equipment Repair and Maintenance: NAICS 8112	811219	Other Electronic and Precision Equipment Repair and Maintenance	kg CO2e/2022 USD, purchaser price	0.076	0.0	0.0
25	Purchased good	Dean's new vehicle	2396329	INR	29224	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Transportation Equipment Manufacturing (NAICS 336)	Motor Vehicle Manufacturing: NAICS 3361	336111	Automobile Manufacturing	kg CO2e/2022 USD, purchaser price	0.24	7013.6	7.0
26	Purchased good	Procurement manager's bike	104000	INR	1268	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Transportation Equipment Manufacturing (NAICS 336)	Motor Vehicle Manufacturing: NAICS 3361	336111	Automobile Manufacturing	kg CO2e/2022 USD, purchaser price	0.24	304.4	0.3
27	Purchased good	BLDC ceiling fans	1073000	INR	13085	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Electrical Equipment, Appliance, and Component Manufacturing (NAICS 335)	Household Appliance Manufacturing: NAICS 3352	335220	Major Household Appliance Manufacturing	kg CO2e/2022 USD, purchaser price	0.172	2250.7	2.3
1	Purchased good	Stationery items- Pen, Markers, Paper, etc.,	32280000	INR	393659	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Miscellaneous Manufacturing (NAICS 339)	Other Miscellaneous Manufacturing: NAICS 3399	339940	Office Supplies (except Paper) Manufacturing	kg CO2e/2022 USD, purchaser price	0.265	104319.5	104.3
	Total														870643.2	870.6

Scope 3 Cat-2: Capital Goods

S.No	Category	Purchased Item Description	Amount spent	Unit of currency	Amount spent in USD (ref 2022)	Supply chain emission factors as per USEPA								Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)	
						Purchase type	Group	Sector	Sub sector	Industry Group	NAICS Code	NAICS Industry	Units			Emission Factor
1	Capital good	New Hostel	78000000	INR	951220	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236220	Commercial and Institutional Building Construction	kg CO2e/2022 USD, purchaser price	0.224	213073.2	213.1
2	Capital good	Kitchen equipment	5000000	INR	60976	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Fabricated Metal Product Manufacturing (NAICS 332)	Cutlery and Handtool Manufacturing: NAICS 3322	332215	Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (except Precious) Manufacturing	kg CO2e/2022 USD, purchaser price	0.223	13597.6	13.6
3	Capital good	Buggies	0	INR	0	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Transportation Equipment Manufacturing (NAICS 336)	Motor Vehicle Manufacturing: NAICS 3361	336111	Automobile Manufacturing	kg CO2e/2022 USD, purchaser price	0.24	0.0	0.0
4	Capital good	Building maintenance- Consumables, Building maintenance like Civil works, STP blowers, Shed works, Dining hall creation, Faculty cabin creations, etc.,	5321000	INR	64890	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Fabricated Metal Product Manufacturing (NAICS 332)	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing: NAICS 3327	332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	kg CO2e/2022 USD, purchaser price	0.248	16092.8	16.1

5	Capital good	Driver's resting cabin	677000	INR	8256	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236210	Industrial Building Construction	kg CO2e/2022 USD, purchaser price	0.239	1973.2	2.0
6	Capital good	AC units	4444000	INR	54195	Goods-Producing Industries	Manufacturing	Manufacturing (NAICS 31-33)	Electrical Equipment, Appliance, and Component Manufacturing (NAICS 335)	Household Appliance Manufacturing: NAICS 3352	335220	Major Household Appliance Manufacturing	kg CO2e/2022 USD, purchaser price	0.172	9321.6	9.3
7	Capital good	STP rectification	2098000	INR	25585	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236210	Industrial Building Construction	kg CO2e/2022 USD, purchaser price	0.239	6114.9	6.1
8	Capital good	Construction of metal staircase	1667000	INR	20329	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236210	Industrial Building Construction	kg CO2e/2022 USD, purchaser price	0.239	4858.7	4.9
9	Capital good	Construction of Laundromat	3774000	INR	46024	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236210	Industrial Building Construction	kg CO2e/2022 USD, purchaser price	0.239	10999.8	11.0
10	Capital good	Construction of Food waster dumping yard	744000	INR	9073	Goods-Producing Industries	Construction	Construction (NAICS 23)	Construction of Buildings (NAICS 236)	Nonresidential Building Construction: NAICS 2362	236210	Industrial Building Construction	kg CO2e/2022 USD, purchaser price	0.239	2168.5	2.2
Total															278200.2	278.2

Scope 3 Cat-3: Fuel & Energy related activities (not included in Scope 1 and 2)

S.No.	Source ID	Type of Fuel/ Energy	Units of Measurement	Total Consumption	Emissions related to	WTT Emission Factors - DEFRA	WTT Emission Factors units	Total CO ₂ emission (kgCO ₂ e)	Total Emissions (tCO ₂ e)
1	Diesel Generators (DG) Sets	Diesel	liters	31464	WTT fuels	0.62409	kg CO2e/l	19636.4	19.64
2	Dean's vehicle	Petrol	liters	2855.84	WTT fuels	0.62409	kg CO2e/l	1782.3	1.78
3	All operations	Grid	KWh	868550	T&D losses	0.02357	kgCO2e/kWh	20469.8	20.47
Total								41888.47	41.89

Scope 3 Cat-4: Upstream Transportation

S.No.	Transportation details	Mode of transport	Amount Spent	Unit of currency	Amount spent in USD (ref 2022)	Supply chain emission factors as per USEPA					Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)				
						Purchase type	Group	Sector	Sub sector	Industry Group			NAICS Code	NAICS Industry	Units	Emission Factors
1	Consumables	Road	50,000	INR	610	Service-Providing Industries	Trade, Transportation, and Utilities	Transportation and Warehousing (NAICS 48-49)	Truck Transportation (NAICS 484)	General Freight Trucking: NAICS 4841	484110	General Freight Trucking, Local	kg CO2e/2022 USD, purchaser price	0.595	362.8	0.3628

Scope 3 Cat-5: Waste generated in operations

S.No.	Waste description	Type of waste	Quantity Generated	Units	Approx. unit weight	Total weight in Kg	Waste disposal method	Waste disposal emission factors as per UK DEFRA			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
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					(for Items reporte d in Nos.)			Waste type as per DEFRA	Assumed activity as per DEFRA	Emission factor (Kg CO ₂ e/Ton)		
1	Scrap	Old mattress- 6'x 3'	55	Nos	15	825	Recycling	Clothing	Closed loop recycling	21.281	17.6	0.018
2	Scrap	Tyres	83	Nos	10	830	Recycling	Tyres	Closed loop recycling	21.281	17.7	0.018
3	Scrap	Plastic cans	228	Nos	0.5	114	Recycling	Plastics: average plastics	Open loop recycling	21.281	48.5	0.049
4	Scrap	Wire	29	KG	-	29	Recycling	Metal: scrap metal	Open loop recycling	21.281	0.6	0.001
5	Scrap	Iron	4098.5	KG	-	4,099	Recycling	Metal: aluminium cans and foil (excl. forming)	Open loop recycling	21.281	87.2	0.087
6	Scrap	Aluminium	422	KG	-	422	Recycling	Metal: scrap metal	Open loop recycling	21.281	9.0	0.009
7	Scrap	Plastic	1463	KG	-	1,463	Recycling	Plastics: average plastics	Open loop recycling	21.281	31.1	0.031
8	Scrap	Metal Udappu	198	KG	-	198	Recycling	WEEE- small	Open loop recycling	21.281	4.2	0.004
9	Scrap	Thagaram	259	KG	-	259	Recycling	WEEE- mixed	Open loop recycling	21.281	11.0	0.011
10	Scrap	Water cooler	9	No	20	180	Recycling	Metal: steel cans	Open loop recycling	21.281	3.8	0.004
11	Scrap	SS	1090.5	KG	-	1,091	Recycling	Metal: steel cans	Open loop recycling	21.281	232.1	0.232
12	Scrap	Washing Machine	8	No	50	400	Recycling	WEEE- large	Open loop recycling	21.281	212.8	0.213
13	Scrap	Prisher pump	2	No	30	60	Recycling	WEEE- large	Open loop recycling	21.281	31.9	0.032
14	Scrap	AC unit	4	No	55	220	Recycling	Commercial and industrial waste	Landfill	520.335	34.3	0.034
15	Scrap	Motor scrap	162	kg	-	162	Recycling	WEEE- mixed	Open loop recycling	21.281	1.0	0.001
16	Scrap	Aluminium cable	687	KG	-	687	Recycling	Metal: aluminium cans and foil (excl. forming)	Open loop recycling	21.281	4.4	0.004
17	Scrap	Brass	480	KG	-	480	Recycling	Metal: scrap metal	Open loop recycling	21.281	3.1	0.003
18	Scrap	Electrical bus duct	1	No	50	50	Recycling	Metal: scrap metal	Open loop recycling	21.281	0.3	0.000
19	Scrap	Oil Barrel- 200 Litre	11	No	20	220	Recycling	Mineral oil	Closed loop recycling	21.281	1.4	0.001
20	Scrap	Ceiling fans	383	No	5	1915	Recycling	WEEE- small	Open loop recycling	21.281	12.2	0.012
21	Scrap	Electrical switchgears (Breakers)	7	Nos	10	70	Recycling	WEEE- small	Open loop recycling	21.281	0.4	0.000
22	Food waste	Food waste	34500	KG	-	34500	Composting	Organic: food and drink waste	Composting	8.912	307.5	0.307
23	STP Sludge	STP Sludge	280	KL	-	280	Combustion	Commercial and industrial waste	Combustion	21.281	6.0	0.006
	Total										606.5	0.607

Scope 3 Cat-6: Business Travel - Outstation

S.No.	Travel Description	Mode of travel	Origin	Destination	Expenses (INR)	Distance in passenger.km	Emission factors (kg CO ₂ e/passenger km)	Emission factor source	Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
1	Business travel - Air	Flight	Ahmedabad	Bombay	30,512	444	0.273	Business travel - domestic emission factors as per UK DEFRA	121.0	0.12

2	Business travel - Air	Flight	Ahmedabad	Chennai	6,718	1374	0.273	Business travel - domestic emission factors as per UK DEFRA	374.5	0.37
3	Business travel - Air	Flight	Bengaluru	Hyderabad	10,797	912	0.273	Business travel - domestic emission factors as per UK DEFRA	248.6	0.25
4	Business travel - Air	Flight	Bengaluru	Chennai	1,96,978	12549	0.273	Business travel - domestic emission factors as per UK DEFRA	3420.6	3.42
5	Business travel - Air	Flight	Bengaluru	Pune	8,473	1444	0.273	Business travel - domestic emission factors as per UK DEFRA	393.6	0.39
6	Business travel - Air	Flight	Bombay	Delhi	76,873	12507	0.273	Business travel - domestic emission factors as per UK DEFRA	3409.1	3.41
7	Business travel - Air	Flight	Bombay	Chennai	4,52,212	54749	0.273	Business travel - domestic emission factors as per UK DEFRA	14923.3	14.92
8	Business travel - Air	Flight	Calicut	Chennai	19,681	1004	0.273	Business travel - domestic emission factors as per UK DEFRA	273.7	0.27
9	Business travel - Air	Flight	Kolkata	Chennai	1,07,766	2008	0.273	Business travel - domestic emission factors as per UK DEFRA	547.3	0.55
10	Business travel - Air	Flight	Paris	Zurich	18,375	477	0.135	Business travel - International emission factors as per UK DEFRA	64.4	0.06
11	Business travel - Air	Flight	Coimbatore	Chennai	15,233	808	0.273	Business travel - domestic emission factors as per UK DEFRA	220.2	0.22
12	Business travel - Air	Flight	Cochin	Pune	16,760	1948	0.273	Business travel - domestic emission factors as per UK DEFRA	531.0	0.53
13	Business travel - Air	Flight	Dehradun	Chennai	10,038	1922	0.273	Business travel - domestic emission factors as per UK DEFRA	523.9	0.52
14	Business travel - Air	Flight	Delhi	Ahmedabad	10,166	755	0.273	Business travel - domestic emission factors as per UK DEFRA	205.8	0.21
15	Business travel - Air	Flight	Delhi	Bengaluru	1,36,612	29036	0.273	Business travel - domestic emission factors as per UK DEFRA	7914.5	7.91
16	Business travel - Air	Flight	Delhi	Bombay	1,11,872	17055	0.273	Business travel - domestic emission factors as per UK DEFRA	4648.8	4.65
17	Business travel - Air	Flight	Delhi	Kolkata	97,774	15744	0.273	Business travel - domestic emission factors as per UK DEFRA	4291.4	4.29
18	Business travel - Air	Flight	Delhi	Hyderabad	50,403	8855	0.273	Business travel - domestic emission factors as per UK DEFRA	2413.7	2.41
19	Business travel - Air	Flight	Delhi	Chennai	5,22,010	130166	0.273	Business travel - domestic emission factors as per UK DEFRA	35480.2	35.48
20	Business travel - Air	Flight	Delhi	Pune	6,306	1155	0.273	Business travel - domestic emission factors as per UK DEFRA	314.8	0.31
21	Business travel - Air	Flight	Hyderabad	Bengaluru	12,596	912	0.273	Business travel - domestic emission factors as per UK DEFRA	248.6	0.25
22	Business travel - Air	Flight	Hyderabad	Bombay	37,479	3732	0.273	Business travel - domestic emission factors as per UK DEFRA	1017.3	1.02
23	Business travel - Air	Flight	Hyderabad	Delhi	45,641	8855	0.273	Business travel - domestic emission factors as per UK DEFRA	2413.7	2.41
24	Business travel - Air	Flight	Hyderabad	Chennai	1,92,223	17238	0.273	Business travel - domestic emission factors as per UK DEFRA	4698.7	4.70
25	Business travel - Air	Flight	Indore	Chennai	10,406	2352	0.273	Business travel - domestic emission factors as per UK DEFRA	641.1	0.64
26	Business travel - Air	Flight	Punjab	Bombay	16,245	1347	0.273	Business travel - domestic emission factors as per UK DEFRA	367.2	0.37
27	Business travel - Air	Flight	Punjab	Chennai	28,649	3992	0.273	Business travel - domestic emission factors as per UK DEFRA	1088.1	1.09
28	Business travel - Air	Flight	Mangaluru	Bengaluru	12,323	306	0.273	Business travel - domestic emission factors as per UK DEFRA	83.4	0.08
29	Business travel - Air	Flight	Jammu	Chennai	35,078	6768	0.273	Business travel - domestic emission factors as per UK DEFRA	1844.8	1.84
30	Business travel - Air	Flight	Madurai	Jammu	16,464	2563	0.273	Business travel - domestic emission factors as per UK DEFRA	698.6	0.70
31	Business travel - Air	Flight	Jaipur	Bombay	32,833	911	0.273	Business travel - domestic emission factors as per UK DEFRA	248.3	0.25
32	Business travel - Air	Flight	Los Angeles	Seattle	61,775	1537	0.135	Business travel - International emission factors as per UK DEFRA	207.5	0.21
33	Business travel - Air	Flight	Lucknow	Delhi	4,132	423	0.273	Business travel - domestic emission factors as per UK DEFRA	115.3	0.12
34	Business travel - Air	Flight	Lucknow	Chennai	9,237	1532	0.273	Business travel - domestic emission factors as per UK DEFRA	417.6	0.42
35	Business travel - Air	Flight	Chennai	Ahmedabad	5,537	1374	0.273	Business travel - domestic emission factors as per UK DEFRA	374.5	0.37
36	Business travel - Air	Flight	Chennai	Bengaluru	1,14,220	7476	0.273	Business travel - domestic emission factors as per UK DEFRA	2037.8	2.04
37	Business travel - Air	Flight	Chennai	Bombay	2,67,380	46485	0.273	Business travel - domestic emission factors as per UK DEFRA	12670.7	12.67
38	Business travel - Air	Flight	Chennai	Kolkata	95,561	16620	0.273	Business travel - domestic emission factors as per UK DEFRA	4530.2	4.53
39	Business travel - Air	Flight	Chennai	Paris	84,823	8021	0.135	Business travel - International emission factors as per UK DEFRA	1082.8	1.08
40	Business travel - Air	Flight	Chennai	Coimbatore	11,260	808	0.273	Business travel - domestic emission factors as per UK DEFRA	220.2	0.22
41	Business travel - Air	Flight	Chennai	Delhi	6,83,976	161828	0.273	Business travel - domestic emission factors as per UK DEFRA	44110.6	44.11
42	Business travel - Air	Flight	Chennai	Hong Kong	34,409	7426	0.135	Business travel - International emission factors as per UK DEFRA	1002.5	1.00

43	Business travel - Air	Flight	Chennai	Hyderabad	3,88,182	30927	0.273	Business travel - domestic emission factors as per UK DEFRA	8430.0	8.43
44	Business travel - Air	Flight	Chennai	Jammu	12,831	2256	0.273	Business travel - domestic emission factors as per UK DEFRA	614.9	0.61
45	Business travel - Air	Flight	Chennai	Los angels	2,47,146	28874	0.135	Business travel - International emission factors as per UK DEFRA	3898.0	3.90
46	Business travel - Air	Flight	Chennai	Lucknow	10,870	1532	0.273	Business travel - domestic emission factors as per UK DEFRA	417.6	0.42
47	Business travel - Air	Flight	Chennai	Madrid	43,880	8549	0.135	Business travel - International emission factors as per UK DEFRA	1154.1	1.15
48	Business travel - Air	Flight	Chennai	Pune	2,38,466	33744	0.273	Business travel - domestic emission factors as per UK DEFRA	9197.8	9.20
49	Business travel - Air	Flight	Chennai	Srinagar	19,008	4794	0.273	Business travel - domestic emission factors as per UK DEFRA	1306.7	1.31
50	Business travel - Air	Flight	Chennai	Thiruvananthapuram	9,997	614	0.273	Business travel - domestic emission factors as per UK DEFRA	167.4	0.17
51	Business travel - Air	Flight	Madrid	Bombay	29,197	7517	0.135	Business travel - International emission factors as per UK DEFRA	1014.8	1.01
52	Business travel - Air	Flight	Milan	Chennai	44,194	7503	0.135	Business travel - International emission factors as per UK DEFRA	1012.9	1.01
53	Business travel - Air	Flight	Navi Mumbai	Chennai	17,055	3030	0.273	Business travel - domestic emission factors as per UK DEFRA	825.9	0.83
54	Business travel - Air	Flight	Pune	Bengaluru	6,477	722	0.273	Business travel - domestic emission factors as per UK DEFRA	196.8	0.20
55	Business travel - Air	Flight	Pune	Delhi	8,951	1155	0.273	Business travel - domestic emission factors as per UK DEFRA	314.8	0.31
56	Business travel - Air	Flight	Pune	Hyderabad	4,836	499	0.273	Business travel - domestic emission factors as per UK DEFRA	136.0	0.14
57	Business travel - Air	Flight	Pune	Chennai	77,260	10032	0.273	Business travel - domestic emission factors as per UK DEFRA	2734.5	2.73
58	Business travel - Air	Flight	Puducherry	Bengaluru	5,064	266	0.273	Business travel - domestic emission factors as per UK DEFRA	72.5	0.07
59	Business travel - Air	Flight	Raipur	Pune	4,898	866	0.273	Business travel - domestic emission factors as per UK DEFRA	236.1	0.24
60	Business travel - Air	Flight	Seattle	Chennai	50,107	12932	0.135	Business travel - International emission factors as per UK DEFRA	1745.8	1.75
61	Business travel - Air	Flight	Trichy	Chennai	11,638	588	0.273	Business travel - domestic emission factors as per UK DEFRA	160.3	0.16
62	Business travel - Air	Flight	Visakhapatnam	Hyderabad	11,111	511	0.273	Business travel - domestic emission factors as per UK DEFRA	139.3	0.14
63	Business travel - Bus	Bus	Hyderabad	Chennai	11,916	1250	0.118	Local bus (not London)	147.5	0.15
64	Business travel - Bus	Bus	Bengaluru	Chennai	1,638	330	0.118	Local bus (not London)	38.9	0.04
65	Business travel - Bus	Bus	Chennai	Bengaluru	1,205	330	0.118	Local bus (not London)	38.9	0.04
66	Business travel - Cab	Cab	-	-	NA	0	0.208	Regular taxi	0.0	0.00
67	Business travel - Train	Train	Chennai	Bengaluru	5,807	358	0.035	National rail	12.7	0.01
68	Business travel - Train	Train	Bengaluru	Chennai	8,166	358	0.035	National rail	12.7	0.01
69	Business travel - Train	Train	Mumbai	Pune	660	158	0.035	National rail	5.6	0.01
70	Business travel - Train	Train	Pune	Palghar	560	234	0.035	National rail	8.3	0.01
	Total								194480.9	194.48

Scope 3 Cat-7: Employee Commuting

S.No	Travel Description	Origin	Destination	Fuel type	Distance of Travel (km)	No. of trips in month	Total Distance traveled in a year (km)	Average Mileage (km/l)	Estimated fuel consumption (l)	Emission factors (kg/l)			Emission factor source	Emissions (kg)			Total Emissions (kgCO ₂ e)	Total Emissions (tCO ₂ e)
										CO ₂ factor	CH ₄ factor	N ₂ O factor		CO ₂ emission	CH ₄ emissions	N ₂ O emissions		
1	Bus-1	Parrys	Manamai	Diesel	154	26	48000	8	6000	2.689	0.000109	0.0000218	IPCC	16132.9111	0.6532	0.1306	16186.8	16.2
2	Bus-2	KK Nagar	Manamai	Diesel	154	26	48000	8	6000	2.689	0.000109	0.0000218	IPCC	16132.9111	0.6532	0.1306	16186.8	16.2
3	Bus-3	Porur	Manamai	Diesel	154	26	48000	8	6000	2.689	0.000109	0.0000218	IPCC	16132.9111	0.6532	0.1306	16186.8	16.2

4	Tempo traveller	Pallikaranai	Manamai	Diesel	115	26	36000	8	4500	2.689	0.000109	0.0000218	IPCC	12099.6833	0.4899	0.0980	12140.1	12.1
5	Local employees	Anupuram	Manamai	Petrol	25	35	10500	30	350	2.395	0.000864	0.0001106	IPCC	838.1073	0.3023	0.0387	857.1	0.9
6	Cabs for employees coming early / leaving late / working on weekends	Chennai	Manamai	Diesel	120	177	254760	12	21230	2.395	0.000864	0.0001106	IPCC	50837.1924	18.3395	2.3475	51989.7	52.0
7	Cabs for employees coming early / leaving late / working on weekends	Chennai	Manamai	Electric Vehicle	120	24	34440	-	-	-	-	-	-	-	-	-	-	-
Total																	120575.6	113.5

APPENDIX B- EMISSION FACTORS

Accurate and reliable GHG accounting and reporting depend heavily on the quality of emission factors used. These standardized values convert activity data (e.g., fuel use, electricity consumption) into emissions, ensuring consistent and comparable calculations across sectors and regions. The selection of emission factor sources is influenced by an organization's operations, geographic location, and reporting requirements.

1. Global Standards

- a. GHG Protocol Cross-Sector Tools- Provides standardized emission factors aligned with international GHG accounting frameworks. Used for calculating Scope 1 (mobile and stationary) emissions for GLIM. ([Link](#))
- b. Intergovernmental Panel on Climate Change (IPCC)- Offers detailed guidelines and default emission factors for fuels, processes, and fugitive emissions. - IPCC AR6 Global Warming Potentials (GWPs) used for fugitive emissions. ([Link](#))

2. Region-Specific Sources

- a. Department for Environment, Food & Rural Affairs (DEFRA) (UK)- UK-specific factors for fuels, transport, and energy use. ([Link](#))
- b. Environmental Protection Agency (EPA) (US)- Emission factors for various US-based activities including energy, transportation, and waste. ([Link](#))
- c. Central Electricity Authority (CEA) (India)- Provides Indian grid emission factors, essential for Scope 2 calculations. ([Link](#))

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