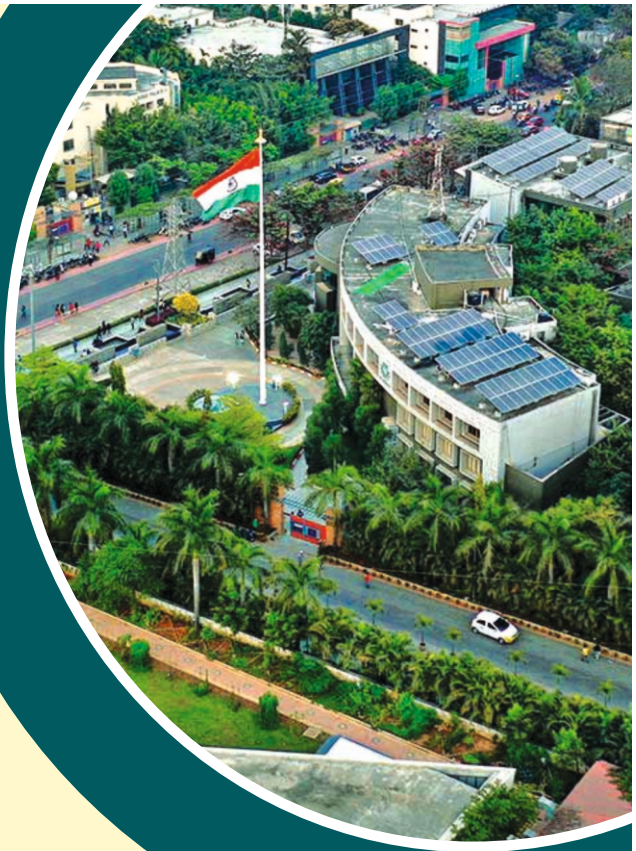

Carbon Emissions Report

(As per the GHG Protocol Corporate Standard)

Kalinga Institute of Industrial Technology (KIIT)
Deemed to be University, Bhubaneswar

Carbon Emissions Report in Line with GHG Protocol Corporate Standard 2024-2025

Sustainability Summary:

This report offers a comprehensive assessment of KIIT Deemed to be University (KIIT DU) carbon emissions in compliance with the GHG Protocol Corporate Standard, which is widely recognized and often used for calculating and reporting greenhouse gas (GHG) emissions. The evaluation includes a summary of the methodology, sources of emissions identified, and significant findings regarding KIIT DU's carbon footprint.

Overview:

KIIT DU is dedicated to methodically assessing and lowering its carbon footprint since it recognizes the importance of environmental sustainability. This evaluation is based on the GHG Protocol, which provides a strong and generally recognized methodology for measuring and reporting greenhouse gas (GHG) emissions.

The University defines its organizational boundaries using the operational control model, which includes all campuses, residence halls, academic and administrative buildings, healthcare facilities, and associated infrastructure that are directly under its control.

Carbon Neutrality Pathway of KIIT Deemed to be University (2018–2050)

The figure below illustrates KIIT's strategic transition from its 2018 carbon baseline toward achieving net-zero emissions by 2050. The pathway highlights a steady reduction in both direct (Scope 1) and indirect (Scope 2) emissions, primarily driven by improved energy efficiency and reduced dependence on grid electricity.

From 2025 onward, advanced measures such as electricity-efficient new buildings, carbon offset initiatives, and adoption of negative emission technologies play a significant role in accelerating emission reductions. A key milestone is the 50% mitigation target by 2035, after which deeper cuts are achieved through carbon removal and offset strategies.

The roadmap reflects a balanced approach combining efficiency, renewable integration, and carbon neutralization to achieve long-term sustainability goals.

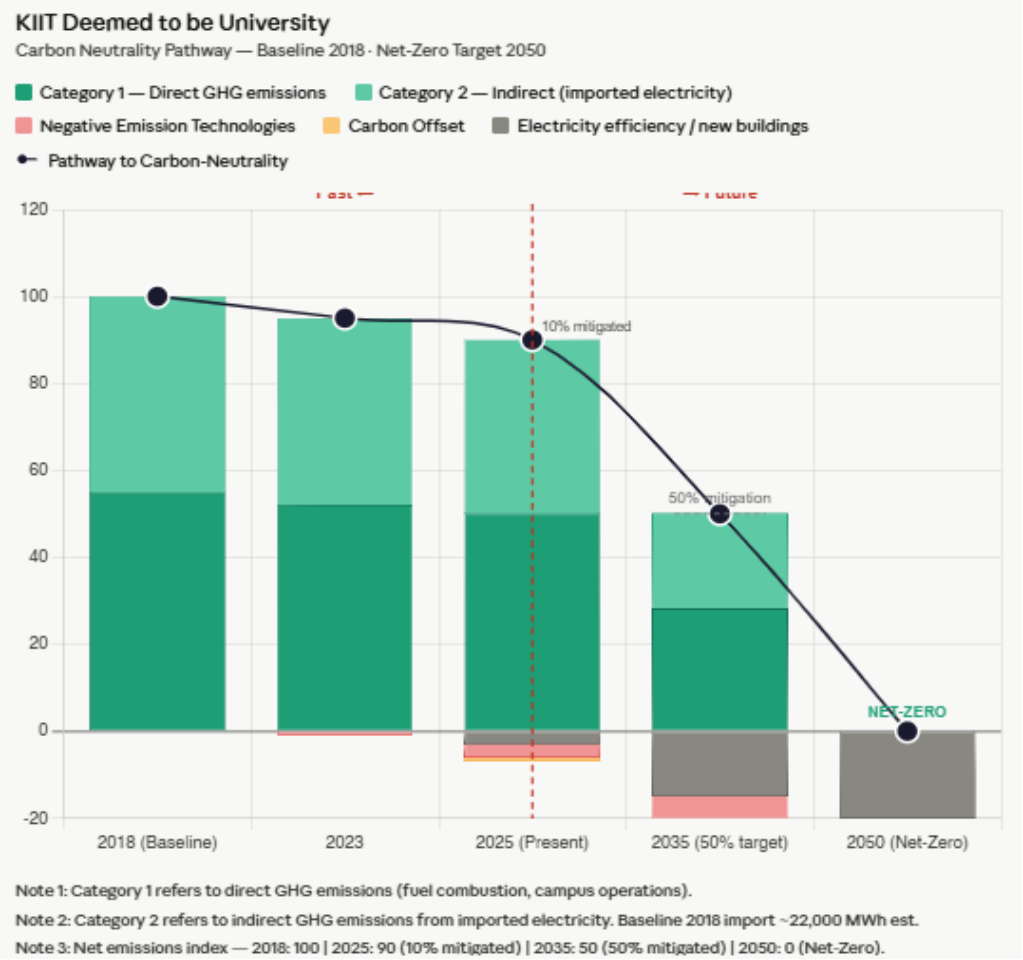

Fig: Carbon Neutrality Pathway

Methodology:

The following steps were undertaken to calculate KIIT DU's carbon emissions:

a. Scope Definition: The assessment's parameters were set, which included direct emissions (Scope 1), indirect emissions from energy purchases (Scope 2), and additional indirect emissions related to the university's operations (Scope 3).

b. Data Collection: Data on energy consumption, transportation, waste generation, and other relevant activities were collected from various sources within the university, including utility bills, financial records, and transportation logs. Where primary data was unavailable, reasonable assumptions and proxy data were used in the terms of miscellaneous factor.

c. Conversion Factors: Standardized conversion factors were applied to convert

the collected data into CO2 equivalent (CO2e) emissions. These factors were sourced from recognized industry databases and emission factors recommended by the GHG Protocol.

d. Calculation: The total CO2e emissions for each emission source and scope were determined by multiplying the gathered data by the respective emission factors.

e. Reporting: To give a thorough picture of KIIT DU's carbon emissions, the emissions data were combined and grouped by emission source and scope.

Carbon Emission Sources:

The major emission sources considered in this report include, but are not limited to:

a. Scope 1:

- Direct emissions from combustion of fossil fuels in university owned generators, and vehicles.
- Refrigerant leaks from cooling systems.

b. Scope 2:

- Indirect emissions from purchased electricity consumed by the university.

c. Scope 3:

- Indirect emissions from commuting and business travel by staff, faculty, and students.
- Indirect emissions from waste generated by the university.
- Indirect emissions from procurement activities and other upstream and downstream activities.

Key Findings:

The assessment of KIIT DU's carbon emissions for the year **2024–2025**, based on the **GHG Protocol Corporate Standard**, reveals the following key insights:

a. Scope 1 Emissions (3.50%)

These emissions remain relatively low, primarily arising from **diesel consumption in generators (0.61%)** and **fuel used in university vehicles (2.20%)**. This indicates that direct emissions from institutional operations are well controlled but still offer scope for transition toward cleaner fuels.

b. Scope 2 Emissions (67.36%)

c. Scope 2 emissions constitute the largest share of the carbon footprint, primarily driven by purchased electricity consumption. However, this also reflects the transitional phase of the university's energy strategy, as **KIIT DU is steadily expanding its renewable energy capacity year on year**. With ongoing investments in **solar energy and biogas-based solutions**, the institution is progressively reducing its dependence on grid electricity and moving towards a more sustainable and self-reliant energy ecosystem.

d. Scope 3 Emissions (29.14%)

Indirect emissions constitute a significant portion of the total carbon footprint, with major contributions arising from the use of electronic devices (22.12%), followed by miscellaneous activities (4.10%) and food waste (1.85%). Additional smaller sources include LPG usage, waste treatment processes, and paper consumption, all of which collectively add to the overall emissions profile.

This highlights KIIT DU's proactive approach in managing emissions associated with lifestyle, digital infrastructure, and consumption patterns. Through continuous awareness initiatives, adoption of energy-efficient technologies, and promotion of sustainable practices, the university is actively working towards optimizing resource use and further reducing its overall carbon footprint.

Table: Details of Carbon Emissions by KIIT DU in 2024 – 2025

Sl. No.	Factors	Carbon Emission per Annum (in kg)	% contribution in total emission	Scope
1	Imported Electricity (in kWhs)	98,48,874.31	67.37	2
2	Mobile Phones & Computers (in hours)	32,34,422.40	22.12	3
3	Diesel Fuel for Generators (in litres)	89,910.00	0.61	1
4	Fuel for University Vehicles (in litres)	3,21,975.00	2.20	1
5	Food Wastage (in kgs)	2,70,000.00	1.85	3
6	LPG (in kgs)	98,000.00	0.67	1
7	Waste Treatment Plants (in litres)	1,27,650.00	0.87	3
8	Paper Waste & Notebooks (in kgs)	24,024.00	0.16	3
9	Consumables in Labs and Workshops (includes chemicals, refrigerants, lubricants, etc.)	4,800.00	0.03	3
10	Miscellaneous	6,00,000.00	4.10	3

Total CO2 Emissions	14619655.71 kgs

Scope 1	0.509885 kt	3.49%
Scope 2	9.84887431 kt	67.37%
Scope 3	4.2608964 kt	29.14%

Total Scope 1 & 2 emissions:	10358.75931 tCO2e
Total Scope 3 emissions :	4260.8964 tCO2e

Year-on-Year Emission Comparison (2023–24 vs 2024–25)

- **Total Emissions (2023–24):** 14,954.59 tCO_2e
- **Total Emissions (2024–25):** 14,619.66 tCO_2e

Change in Emissions:

- **Absolute Reduction:** 334.94 tCO_2e
- **Percentage Change:** ↓ **2.24% reduction**

Indicates a **moderate but positive decline in overall carbon emissions** in the reporting year 2024–25.

Emission Intensity Metrics (2024–25)

Emissions per Student

- **2024–25:**≈ 0.727 tCO_2e per student

- **2023–24:**≈ 0.729 tCO_2e per student

Improvement observed in per-student emissions, indicating better efficiency.

Emissions per Campus Area

- Total campus area: **721,402 m^2**
- **2024–25:**≈ 0.0203 tCO_2e/m^2

- **2023–24:**≈ 0.0207 tCO_2e/m^2

Result shows **reduced carbon intensity per unit area**, reflecting improved infrastructure efficiency.

Renewable Energy Progress (Key Highlight)

KIIT DU has demonstrated consistent progress in renewable energy adoption, with the share of renewables in total energy consumption increasing from **8.73% to 9.53%.**

Major Environmental Sustainability Initiatives – 2025

KIIT Deemed to be University has undertaken several impactful initiatives in 2025 to strengthen its commitment towards environmental sustainability:

- **Energy-Efficient Infrastructure Upgrade:** Approximately 25% of conventional induction motor ceiling fans have been replaced with energy-efficient BLDC motors, resulting in nearly 30% reduction in electricity consumption.
- **Green Campus Development:** Large-scale plantation drives were conducted across and around the campus, with the planting of over 3,500 saplings, enhancing green cover and biodiversity.
- **Waste-to-Energy Initiative:** Agricultural waste generated in and around the campus is being effectively utilized for biogas generation, promoting circular resource use and reducing organic waste.
- **Promotion of Electric Mobility:** The University has significantly increased the adoption of electric vehicles (EVs), which now constitute approximately 15% of the campus vehicle fleet, contributing to reduced fossil fuel dependency.
- **Paper Reduction Practices:** KIIT DU has actively promoted a "Reduce Paper Use" policy, encouraging digital workflows and minimizing paper consumption across academic and administrative activities.
- **Solar Energy Adoption:** Continued expansion of solar photovoltaic (PV) installations has contributed to increasing the share of renewable energy in total energy consumption.

Recommendations:

Recommendations for 2025–26

Based on the emission trends and sustainability progress, the following measures are recommended to further reduce the carbon footprint of KIIT DU:

1. Energy Efficiency & Renewable Energy Expansion

- Scale up solar photovoltaic (PV) installations to significantly increase the share of renewable energy beyond current levels.
- Target replacement of remaining conventional electrical appliances (fans, lighting, HVAC) with high-efficiency systems such as BLDC motors and smart HVAC controls.

- Implement AI-enabled smart energy monitoring systems for real-time tracking and optimization of energy consumption across campus.
- Explore green power procurement (off-site renewable energy sourcing) to reduce grid dependency.

2. Sustainable & Low-Carbon Mobility

- Increase the share of electric vehicles (EVs) beyond 15% with a phased transition plan for campus transport.
- Establish additional EV charging infrastructure across strategic campus locations.
- Promote shared mobility solutions, including carpooling platforms and campus shuttle optimization.
- Encourage cycling and pedestrian-friendly infrastructure within the campus.

3. Integrated Waste Management & Circular Practices

- Expand biogas generation capacity using agricultural and food waste to enhance waste-to-energy conversion.
- Strengthen segregation, recycling, and e-waste management systems across all departments and hostels.
- Introduce zero-waste campus initiatives, focusing on reducing landfill dependency.

4. Resource Efficiency & Digital Transformation

- Intensify the "Reduce Paper Use" campaign by adopting fully digital administrative and academic processes.
- Encourage paperless classrooms, e-submissions, and digital documentation systems.
- Monitor and reduce water and material consumption through smart campus solutions.

5. Awareness, Engagement & Capacity Building

- Conduct regular sustainability awareness programs, workshops, and green audits for students, faculty, and staff.
- Introduce student-led sustainability initiatives and green clubs to drive behavioral change.

- Integrate sustainability concepts into curriculum and research projects, especially in engineering and management disciplines.

Conclusion:

This assessment, conducted using the GHG Protocol Corporate Standard, highlights KIIT DU's carbon footprint for 2023 - 2024. The necessity of using renewable energy is required. Addressing Scope 3 emissions through waste management and digital sustainability can further enhance KIIT DU's commitment to environmental responsibility. Implementing these recommendations will help the university in future to achieve its carbon reduction goals and contribute to global climate action.