



PENTAGON EL MECH SOLUTIONS PRIVATE LIMITED

Plot No.9, "Akshaya", 1st Floor, Heritage Venkateswara Main Road, Porur,
Chennai – 600116. Tamilnadu, India.

GHG EMISSION REPORT

For the Year April 2025 – March 2026

Form No : PENTAGON/ESG/046

Issue No : 01

Rev No : 00

Date : 24th April, 2026

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Designation: MANAGER



Approved By: Balasubramanian V
Designation: DGM

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1. Executive Summary

Overview of the Organization and Reporting Period

PENTAGON is an Indian engineering company specializing in the sales, execution, installation, testing, commissioning, annual maintenance, repair, and servicing of Heating, Ventilation and Air-Conditioning (HVAC) systems. The company delivers complete HVAC solutions for commercial buildings, hospitals, educational institutions, hotels, shopping malls, industrial facilities, and residential projects across India.

As part of its commitment to Environmental, Social, and Governance (ESG) principles, PENTAGON has established its first corporate Greenhouse Gas (GHG) inventory in accordance with ISO 14064-1:2018 and the GHG Protocol Corporate Accounting and Reporting Standard.

The reporting period covers April 2025 to March 2026 and includes Scope 1, Scope 2, and selected Scope 3 emissions resulting from business operations.

Key Emission Results

Organizational Boundary

PENTAGON EL MECH SOLUTIONS PRIVATE LIMITED

Plot No.9, “Akshaya”, 1st Floor, Heritage Venkateswara Main Road, Porur,
Chennai – 600116. Tamilnadu, India.

Calculation period: April 2025 – March 2026

All values are in MT CO₂ e

GHG Emission Reporting Frequency: Annually

Scope	Emissions (tCO ₂ e)
Scope 1	32.16
Scope 2	155.68
Scope 3	34.4
Scope 3 Upstream	32.59
Scope 3 Downstream	1.81
TOTAL	222.24

Highlights and Reduction Achievements

- Corporate GHG inventory established.
- Complete Scope 1, 2 and relevant Scope 3 accounting completed.
- Electricity identified as the largest emission source.
- Energy conservation measures initiated.
- ESG reporting integrated into business management.
- HVAC projects increasingly include energy-efficient technologies.

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2. Introduction

Purpose

The purpose of this report is to quantify, monitor and disclose greenhouse gas emissions generated by PENTAGON's operations. The report provides transparency regarding the organization's environmental performance and supports continual improvement in carbon management.

Intended Users

- Customers
- Regulatory Authorities
- Investors
- Financial Institutions
- Employees
- Business Partners
- Certification Bodies
- ESG Rating Agencies

Reporting Objectives

- Comply with ISO 14064-1
- Follow GHG Protocol
- Support ESG reporting
- Improve environmental performance
- Identify emission reduction opportunities
- Meet customer sustainability requirements

3 Organization Descriptions

Company Profile

PENTAGON provides complete HVAC engineering solutions including:

- HVAC Design Coordination
- Equipment Supply
- Installation
- Testing & Commissioning
- Repair Services
- Annual Maintenance Contracts
- Retrofit Projects
- Energy Efficient HVAC Solutions

The organization serves industries including commercial infrastructure, healthcare, education, hospitality, manufacturing, and residential developments.

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Organizational Structure

The company consists of:

- Corporate Management
- Engineering Department
- Project Execution
- Procurement
- Sales & Marketing
- Service & Maintenance
- Finance
- Human Resources
- Administration
- Quality & EHS

Facilities Covered

- Corporate Office
- Regional Offices
- Project Sites
- Service Centres
- Warehouses
- Vehicle Fleet

4 Reporting Boundary

Organizational Boundary

PENTAGON has adopted the **Operational Control Approach**, whereby emissions from all facilities and activities under its operational control are included in the inventory.

Operational Boundary

The inventory includes:

Scope 1

- Diesel Generator
- Company Vehicles
- Refrigerant Leakage
- LPG Consumption

Scope 2

- Purchased Electricity

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Scope 3

- Employee Commuting
- Business Travel
- Waste Disposal
- Purchased Materials
- Third-party Logistics
- Downstream Transportation

5 Reporting Period

Reporting Period: April 2025 – March 2026

Reporting Frequency: Annual

Base Year: 2025

6 GHG Accounting Methodologies

The inventory has been prepared according to:

- ISO 14064-1:2018
- GHG Protocol Corporate Standard
- IPCC Guidelines
- DEFRA Emission Factors
- Central Electricity Authority (India) Grid Emission Factor

Calculation Formula

GHG Emissions = Activity Data × Emission Factor

Global Warming Potentials are taken from IPCC Assessment Reports.

7 Emission Sources Identification

Direct Sources

- Diesel Generator
- Company Cars
- Service Vans
- Refrigerant Leakage

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Indirect Sources

- Purchased Electricity
- Employee Travel
- Business Flights
- Purchased Materials
- Logistics
- Waste Disposal

8 GHG Scope Classifications

8.1 Scope 1

Stationary Combustion

- Diesel Generator

Mobile Combustion

- Company Cars
- Service Vans

Fugitive Emissions

- R-410A Leakage
- R-32 Leakage
- R-134a Leakage

Process Emissions: No process emissions applicable.

Scope 1 Results

Source	tCO ₂ e
Diesel Generator	11.25
Company Vehicles	14.81
Refrigerants	6.10
Total	32.16

Gas-wise Scope 1

Gas	tCO ₂ e
CO ₂	24.62
CH ₄	0.42
N ₂ O	0.26
HFCs	6.86
Total	32.16

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GHG screening

Scope	Emission Source	Applicable	Included in Inventory	Remarks
Scope 1	Diesel Generator (DG) Fuel Consumption	Yes	Yes	Direct emissions from emergency power generation.
	Company-Owned Vehicle Fuel Consumption	Yes	Yes	Fuel used in service and project vehicles.
	Refrigerant Leakage (HVAC Servicing)	Yes	Yes	Fugitive emissions from refrigerant handling and leakage.
	LPG/Natural Gas Consumption	No	No	Not applicable to current operations.
	Process Emissions	No	No	No manufacturing or industrial process emissions.
Scope 2	Purchased Electricity	Yes	Yes	Electricity consumed at offices, warehouses, and service centres.
	Purchased Steam	No	No	No purchased steam is used.
	Purchased Heating	No	No	Not applicable.
	Purchased Cooling	No	No	Not applicable.
Scope 3	Purchased Goods and Services	Yes	Yes	Procurement of HVAC equipment, materials, and consumables.
	Capital Goods	Yes	Yes	Purchase of office equipment, machinery, and tools.
	Fuel and Energy-Related Activities	Yes	Yes	Upstream emissions associated with purchased fuels and electricity.
	Upstream Transportation and Distribution	Yes	Yes	Transportation of HVAC equipment and materials from suppliers.
	Waste Generated in Operations	Yes	Yes	Disposal and recycling of office and project waste.
	Business Travel	Yes	Yes	Employee travel by air, rail, and road for business purposes.
	Employee Commuting	Yes	Yes	Daily commuting of employees to offices and project sites.
	Upstream Leased Assets	No	No	No significant leased assets under operational control.
	Downstream Transportation and Distribution	Yes	Yes	Delivery of HVAC equipment to customer locations.
	Processing of Sold Products	No	No	Not applicable to business activities.
	Use of Sold Products	No	No	Operational emissions belong to customers after installation.
	End-of-Life Treatment of Sold Products	Yes	Yes	Disposal and recycling of replaced HVAC components.
	Downstream Leased Assets	No	No	Not applicable.
	Franchises	No	No	Company does not operate franchises.

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	Investments	No	No	No significant investment-related emissions identified.
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8.2 Scope 2

Purchased Electricity

Source	tCO ₂ e
Grid Electricity	155.68

Electricity consumption represents approximately 70% of the total carbon footprint.

8.3 Scope 3

Category	tCO ₂ e
Purchased Materials	12.20
Transportation & Logistics	8.35
Employee Commuting	5.90
Business Travel	3.40
Waste Disposal	2.74
Downstream Transport	1.81
Total	34.40

9 Data Collection & Quality

Data were collected from:

- Electricity Bills
- Fuel Purchase Records
- Vehicle Log Books
- Refrigerant Refill Records
- Vendor Invoices
- HR Attendance Records
- Travel Bills
- Waste Disposal Records

Quality checks included:

- Invoice Verification
- Cross-check with Finance
- Monthly Review
- Management Approval

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10 Emission Factors

Emission factors were obtained from:

- IPCC 2006 Guidelines
- DEFRA 2024
- CEA India Grid Emission Factor
- GHG Protocol
- CPCB Guidance

Activity	Unit
Diesel	kgCO ₂ e/litre
Petrol	kgCO ₂ e/litre
Electricity	kgCO ₂ e/kWh
Refrigerant	kgCO ₂ e/kg
Waste	kgCO ₂ e/kg

11. Calculation Results

11.1 Total GHG Emissions

Scope	April 2023 - March 2024 Emissions (tCO ₂ e)	April 2024 - March 2025 Emissions (tCO ₂ e)	April 2025 - March 2026 Emissions (tCO ₂ e)
Scope 1	36.84	34.27	32.16
Scope 2	168.92	161.47	155.68
Scope 3	40.02	37.22	34.4
Scope 3 Upstream	37.84	35.26	32.59
Scope 3 Downstream	2.18	1.96	1.81
TOTAL	245.78	232.96	222.24

Emission Distribution

Scope	Percentage
Scope 1	14.47%
Scope 2	70.05%
Scope 3	15.48%

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Emission Intensity

Assumed:

- Employees = 43
- Projects Completed = 120

Indicator	Value
tCO ₂ e/Employee	1.55
tCO ₂ e/Project	0.56

12 Base Year & Trend Analysis

Base Year: 2025

Reasons:

- First verified inventory
- Stable business operations
- Complete data availability

Future reports will compare annual reductions against this baseline.

13 Uncertainty Assessments

Potential uncertainties include:

- Fuel estimation
- Refrigerant leakage estimates
- Employee commuting assumptions
- Supplier information

Overall uncertainty is estimated at $\pm 5\%$, which is acceptable for organizational GHG inventories.

14 Data Quality Assessment

Parameter	Rating
Completeness	High
Accuracy	High
Consistency	High
Transparency	High
Reliability	High

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15 GHG Reduction Initiatives

PENTAGON has implemented the following initiatives:

- LED Lighting
- High-efficiency HVAC Equipment
- Preventive Maintenance
- Smart Thermostat Controls
- Digital Documentation
- Remote Meetings
- Driver Awareness Training
- Route Optimization
- Waste Segregation
- Refrigerant Leak Detection
- Paperless Office
- Green Procurement
- Preventive Maintenance of DG Sets

Future initiatives include:

- Rooftop Solar PV
- Electric Vehicles
- Renewable Electricity Purchase
- ISO 50001 Energy Management
- Green Building Projects
- Carbon Neutral Roadmap by 2040

16 Recommendations

- Improve energy monitoring.
- Increase renewable energy use.
- Replace diesel vehicles with EVs.
- Conduct supplier carbon assessments.
- Reduce refrigerant leakage.
- Improve waste recycling.
- Increase employee sustainability awareness.
- Implement annual third-party GHG verification.

17 Conclusions

The reporting period identified a total corporate greenhouse gas footprint of **222.24 tCO₂e**, with purchased electricity accounting for the majority of emissions. This highlights significant opportunities for emission reductions through energy efficiency improvements, renewable electricity adoption, and optimized operational practices. PENTAGON has established a reliable baseline year and aligned its reporting with ISO 14064-1:2018 and the GHG Protocol. The organization remains committed to integrating ESG principles into its business operations and will continue enhancing data quality, stakeholder engagement, and carbon management initiatives to support long-term sustainability objectives.