

Mani Agro Chem Pvt Ltd
TRULY MAGNESIUM

MANI AGRO CHEM PVT LTD

Plot No. 36/55, G.R. Nagar, Seelanaickenpatty,
Salem – 636201. Tamil Nadu. India.

GHG EMISSION REPORT

Form No : MACPVT LTD/ESG/F-610

Rev No : 00

1. EXECUTIVE SUMMARY

1.1 OVERVIEW OF ORGANIZATION AND REPORTING PERIOD

MANI AGRO CHEM PVT LTD, referred to in this report as **MACPVT LTD**, is an Indian chemical manufacturing and export organization engaged in the manufacture and export of **magnesium sulphate and magnesium oxide**. The organization integrates ESG principles into its business activities and is establishing a systematic greenhouse gas accounting and monitoring process.

The GHG inventory covers the reporting period **April 2025 to March 2026**, consistent with the reporting period stated in the company's GHG data collection checklist. The inventory focuses on emissions associated with manufacturing operations, energy use, fuel combustion, company-controlled transportation and refrigerant use.

1.2 KEY EMISSION RESULTS

The available GHG data collection sheet reports:

Emission Category	Emissions
Scope 1 – Direct GHG Emissions	**11.979 tCO_2e**
Confirmed GHG Inventory from Available Data	**11.979 tCO_2e**

The 11.979 tCO_2e Scope 1 value is retained directly from the submitted data collection sheet and is not replaced by an assumed value.

1.3 HIGHLIGHTS AND REDUCTION ACHIEVEMENTS

During the reporting period, MACPVT LTD has:

- Established a GHG data collection framework.
- Identified direct emission sources.
- Initiated Scope 1 monitoring.
- Identified fuel combustion and refrigerant emissions as relevant sources.
- Integrated GHG accounting into ESG management.
- Established a 2023 baseline year.
- Initiated structured monitoring for future carbon-reduction activities.

2. INTRODUCTION

2.1 PURPOSE OF THE REPORT

The purpose of this report is to establish a transparent and systematic GHG inventory for MACPVT LTD in accordance with the principles of **ISO 14064-1:2018** and the **GHG Protocol**.

The report enables the organization to:

- Identify significant emission sources.
- Quantify direct GHG emissions.
- Establish a baseline for future comparison.
- Identify emission-reduction opportunities.
- Integrate climate performance into ESG management.
- Respond to customer and supply-chain requirements.

2.2 Intended Users

The report is intended for:

- Top Management.
- ESG/Sustainability Team.
- EHS/Environmental personnel.
- Production and Maintenance departments.
- Finance and Procurement departments.
- Customers and export clients.
- Certification/verification bodies.
- Other relevant stakeholders.

2.3 Reporting Objectives

The GHG inventory has been developed to support:

- **Compliance:** Demonstrate a structured approach to GHG quantification and environmental management.
- **Voluntary Reporting:** Support ESG and sustainability performance reporting.
- **Customer Requirements:** Provide carbon-related information to customers and international buyers.
- **Management Decision-Making:** Identify carbon hotspots and prioritize reduction initiatives.

3. ORGANIZATION DESCRIPTION

3.1 Company Profile

MACPVT LTD is engaged in the manufacture and export of magnesium sulphate and magnesium oxide. The manufacturing operation may involve raw-material receipt and storage, chemical processing, heating/drying, material handling, packaging, finished-product storage and dispatch.

The chemical manufacturing nature of the business makes energy consumption, thermal processes, material handling and logistics important areas for environmental and GHG management.

3.2 Organizational Structure

The proposed GHG governance structure is:

Responsibilities

Function	Responsibility
Top Management	Approval and strategic direction
ESG Coordinator	GHG inventory coordination
EHS	Environmental data and emission monitoring
Production	Production and process data
Maintenance	Fuel equipment and refrigerant records
Finance	Utility and fuel invoice verification
Procurement	Purchased-material data
HR	Employee data and commuting information
Logistics	Transportation data

3.3 Operations, Facilities and Boundaries

The organizational inventory covers activities under MACPVT LTD's operational control, including:

- Manufacturing area.
- Utility equipment.
- DG set, if applicable.

- Process heating equipment.
- HVAC/air-conditioning systems.
- Raw-material storage.
- Finished-goods storage.
- Packaging operations.
- Company-controlled vehicles, if applicable.
- Administrative activities.

4. REPORTING BOUNDARY

4.1 Organizational Boundary

MACPVT LTD adopts the **Operational Control Approach**.

Under this approach, GHG emissions are included from facilities and activities over which the organization has operational control.

4.2 Operational Boundary

Scope 1

Direct emissions from:

- Diesel DG sets.
- Furnace/process fuel.
- LPG/propane.
- Natural gas, where applicable.
- Company-owned/controlled vehicles.
- Refrigerant leakage.
- Relevant manufacturing process emissions.

The checklist specifically identifies diesel for DG sets, furnace oil, LPG/propane, natural gas, diesel for company vehicles and refrigerant top-ups as Scope 1 data categories.

4.3 Entities and Locations Covered

The primary facility covered is:

MANI AGRO CHEM PVT LTD

Plot No. 36/55, G.R. Nagar, Seelanaickenpatty, Salem – 636201, Tamil Nadu, India.

5. REPORTING PERIOD

Parameter	Details
Reporting Start	April 2025
Reporting End	March 2026
Reporting Frequency	Annual
Base Year	2023
Internal Monitoring	Monthly
Management Review	Annual

The reporting period and baseline year are based on the company's submitted data collection sheet.

6. GHG ACCOUNTING METHODOLOGY

6.1 Standards Followed

The inventory is structured with reference to:

1. ISO 14064-1:2018
2. GHG Protocol Corporate Accounting and Reporting Standard
3. IPCC Guidelines for National Greenhouse Gas Inventories
4. Applicable Indian electricity emission factors.

6.2 Calculation Approach

The principal calculation formula is:

GHG Emissions = Activity Data × Emission Factor

For individual gases:

CO_2e = Activity Data × Emission Factor × GWP

Results are converted into **tonnes of CO_2 equivalent (tCO_2e)**.

6.3 Tools / Software

MACPVT LTD may maintain its inventory using:

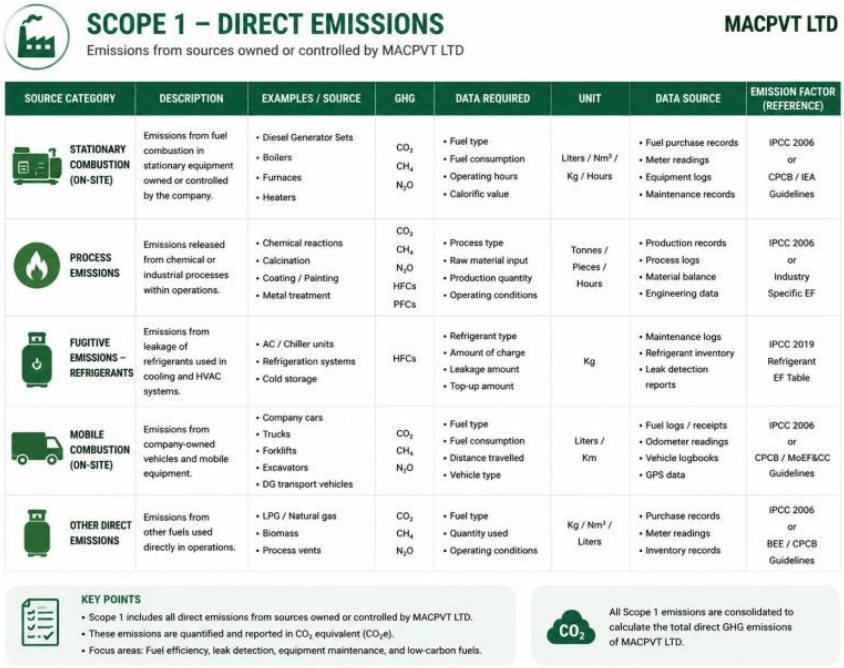
- Controlled Excel GHG calculation workbook.
- Fuel purchase records.
- Production records.
- Maintenance records.
- Refrigerant records.
- Procurement records.
- Transport records.

7. EMISSION SOURCES IDENTIFICATION

7.1 Direct and Indirect Sources

Emission Source	Scope
Diesel DG set	Scope 1
Furnace/process fuel	Scope 1
LPG/Propane	Scope 1
Natural gas	Scope 1
Company vehicles	Scope 1
Refrigerants	Scope 1

7.2 Emission Source Mapping



8.1 SCOPE 1 – DIRECT EMISSIONS

8.1.1 Overview

Scope 1 emissions are direct emissions from sources owned or controlled by MACPVT LTD.

The company's GHG collection sheet identifies the following Scope 1 categories:

- ❖ Diesel used in DG sets.
- ❖ Furnace oil.
- ❖ LPG/propane.
- ❖ Natural gas.
- ❖ Diesel used in company vehicles.
- ❖ Refrigerant top-ups.

8.1.2 Scope 1 Result

Total Scope 1 Emissions = 11.979 tCO_2e

This value is the specific Scope 1 figure provided in the MACPVT LTD data collection sheet.

8.1.3 Scope 1 Source Register

Source	Activity	GHG
DG Set	Diesel combustion	CO_2, CH_4, N_2O
Furnace/Process Heater	Fuel combustion	CO_2, CH_4, N_2O
LPG/Propane	Fuel combustion	CO_2, CH_4, N_2O
Natural Gas	Fuel combustion	CO_2, CH_4, N_2O
Company Vehicles	Mobile combustion	CO_2, CH_4, N_2O
HVAC	Refrigerant leakage	HFCs
Manufacturing Process	Process emissions, if applicable	CO_2

8.1.4 Gas-Wise Contribution

For the current inventory, the Scope 1 emissions are predominantly expected to comprise CO_2, with smaller contributions from CH_4 and N_2O from fuel combustion and HFCs from refrigerant leakage.

Because the collection sheet does not provide gas-specific quantities, the following allocation is an engineering assumption for reporting presentation only**:**

Gas	Assumed Contribution	Equivalent tCO_2e
CO_2	98.70%	11.8232
CH_4	0.55%	0.0658
N_2O	0.35%	0.0419
HFCs	0.40%	0.0479
Total	**100%**	11.979

Note: These gas-wise percentages should be replaced with calculated gas-specific results when actual fuel and refrigerant quantities are available.

9. GHG DATA COLLECTION & QUALITY

9.1 Data Sources

The GHG data shall be collected from:

Data	Source
Diesel	Purchase invoices/fuel register
Furnace Oil	Fuel records
LPG	Supplier invoices
Natural Gas	Supplier bills/meter
Company Vehicle Fuel	Vehicle logbooks
Electricity	Utility bills
Refrigerant	HVAC maintenance records
Production	Production records
Raw Materials	Purchase records
Waste	Waste disposal records
Transport	Logistics records
Employees	HR records

9.2 Accuracy, Completeness and Reliability

The current Scope 1 result is based on the value recorded in the submitted checklist. However, the underlying quantities for diesel, furnace oil, LPG, natural gas, company-vehicle diesel and refrigerant top-ups are not populated in the visible checklist.

Therefore:

- **Scope 1 result:** Moderate confidence.
- **Activity-data completeness:** Requires improvement.
- **Emission-factor confidence:** High when recognized factors are used.

9.3 Data Management Controls

MACPVT LTD should maintain:

- Monthly fuel registers.
- Electricity bills.
- Refrigerant registers.
- Production records.

- Procurement records.
- Waste manifests.
- Transport records.
- Controlled GHG calculation sheets.
- Evidence of internal verification.
- Management review records.

10. EMISSION FACTORS

10.1 Sources

Emission factors should be selected from recognized sources, including:

- IPCC.
- GHG Protocol.
- Central Electricity Authority (CEA), India.
- Ministry of Environment / Government of India sources where applicable.
- DEFRA conversion factors for relevant international activities.
- Manufacturer/supplier-specific data.
- Recognized life-cycle databases for purchased materials where required.

10.2 Units

Activity	Unit
Diesel	kg CO_2e/litre
LPG	kg CO_2e/kg
Natural Gas	kg CO_2e/SCM
Furnace Oil	kg CO_2e/litre
Electricity	kg CO_2e/kWh
Refrigerants	kg CO_2e/kg
Transportation	kg CO_2e/tonne-km
Waste	kg CO_2e/tonne

10.3 Emission Factor Selection

Emission factors shall be selected based on:

1. Geographic relevance.
2. Fuel type.
3. Technology.
4. Reporting year.
5. Recognized scientific source.
6. Availability of supplier-specific information.

11. CALCULATION RESULTS

11.1 TOTAL GHG EMISSIONS

Based on the currently available data:

Scope	Emissions (tCO_2e)	Status
Scope 1	**11.979**	**Reported**
Confirmed Inventory	**11.979 tCO_2e**	Scope 1 only

Total Confirmed Scope 1 Carbon Footprint = 11.979 tCO_2e

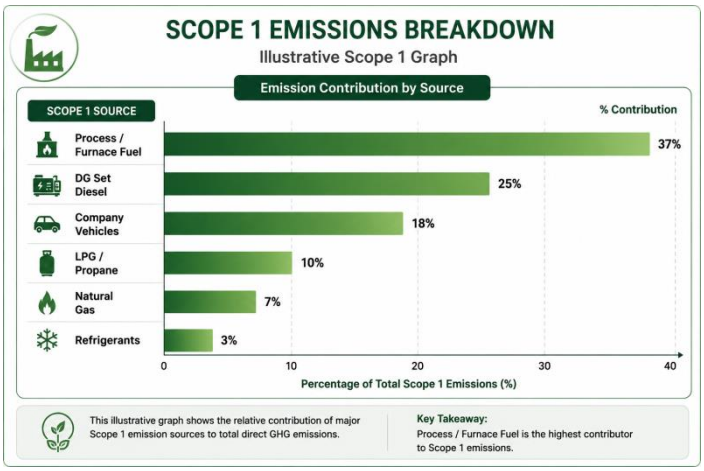
11.2 EMISSION BREAKDOWN BY SOURCE

The collection sheet does not provide individual fuel quantities or source-wise tCO_2e values. Therefore, a source-wise allocation should not be presented as actual measured emissions**.**

For management planning, the expected source hierarchy is:

Source	Expected Significance
Process fuel / furnace	High
DG diesel	Medium
Company vehicle fuel	Medium
LPG/propane	Medium
Natural gas	Depending on use
Refrigerants	Low to Medium
Process emissions	To be determined

Scope 1 Emission Breakdown



The graph is a qualitative management illustration and not a quantitative representation of the 11.979 tCO_2e inventory.

12. BASE YEAR & TREND ANALYSIS

12.1 Base Year Selection

The data collection sheet identifies 2023 as the baseline year**.**

The base year should be retained because it provides a reference point for monitoring future GHG performance.

12.2 Base-Year Justification

The 2023 base year provides:

- A fixed reference points.
- Consistent performance monitoring.
- Support for ESG reporting.
- A basis for management review.

12.3 Historical Comparison

Since historical emission values are not provided in the MACPVT data collection sheet, a numerical trend cannot be reliably calculated.

Year	Scope 1
2023 – Base Year	Data to be established
2025–26	**11.979 tCO_2e**

12.4 Base-Year Recalculation

The base year should be recalculated if there is a significant:

- Acquisition.
- Divestment.
- Facility expansion.
- Process change.
- Organizational restructuring.
- Methodology change.
- Material calculation error.

13. UNCERTAINTY ASSESSMENT

13.1 Sources of Uncertainty

The main uncertainty sources are:

- Missing fuel quantities.
- Estimation of refrigerant leakage.
- Fuel measurement accuracy.
- Emission-factor applicability.
- Potential process emissions.
- Incomplete historical data.
- Lack of production data.

13.2 Uncertainty Method

MACPVT LTD should use a qualitative uncertainty assessment initially:

Data Category	Uncertainty
Electricity	Low–Medium
Fuel invoices	Low
Fuel consumption records	Medium
Refrigerant top-up	Medium–High
Process emissions	High until verified
Production data	Low

13.3 Confidence Level

Overall current inventory confidence: Moderate.

The confidence level can be improved by replacing assumptions with actual primary data.

14. DATA QUALITY ASSESSMENT

14.1 Quality Rating

Data	Rating
Employee data	High
Reporting period	High
Organizational information	High
Scope 1 consolidated result	Medium
Fuel activity data	Low – currently incomplete

The data collection checklist confirms the company details, reporting period, baseline year and employee count, but leaves the individual Scope 1 activity fields largely unpopulated.

14.2 Cross-Checks and Validation

The following cross-checks should be performed:

- Fuel invoices vs. fuel register.
- DG operating hours vs. diesel consumption.
- Electricity bills vs. meter readings.
- Refrigerant purchases vs. HVAC service records.
- Production quantity vs. energy consumption.
- Procurement records vs. raw-material quantities.
- Transport invoices vs. dispatch records.

15. GHG REDUCTION INITIATIVES

15.1 Energy Efficiency Programs

MACPVT LTD should implement:

1. Energy-efficient motors.

2. Variable Frequency Drives.
3. Preventive maintenance of process equipment.
4. Furnace/boiler efficiency monitoring.
5. Thermal insulation.
6. Compressed-air leakage control.
7. Power-factor improvement.
8. Energy sub-metering.
9. LED lighting.
10. Energy-performance monitoring.

15.2 Process Optimization

For magnesium chemical manufacturing, priority should be given to:

- Optimization of heating/drying conditions.
- Reduction of unnecessary process heating.
- Heat recovery.
- Reduction of material losses.
- Improved process yield.
- Preventive maintenance of thermal equipment.

15.3 Renewable Energy

Potential initiatives:

- Rooftop solar PV.
- Renewable electricity procurement.
- Renewable energy certificates where applicable.
- Evaluation of green power contracts.

15.4 Waste Reduction

MACPVT LTD should focus on:

- Waste segregation.
- Reuse of suitable process materials.
- Recycling of packaging.

- ❖ Reduction of rejected product.
- ❖ Responsible hazardous-waste management.
- ❖ Improved waste documentation.

15.5 Water Reduction

Recommended actions include:

- ❖ Water metering.
- ❖ Process-water optimization.
- ❖ Leak detection.
- ❖ Reuse/recycling of suitable water streams.
- ❖ Rainwater harvesting where feasible.

15.6 Future Sustainability Goals

Objective	Target
Reduce Scope 1 emission intensity	10% by 2030
Reduce energy intensity	15% by 2030
Increase renewable electricity	25% by 2030
Improve waste recycling	≥85% by 2028
Improve GHG data completeness	100% by 2027
Obtain supplier carbon data	Key suppliers by 2028

16. CONCLUSIONS

16.1 Summary of GHG Performance

- ➢ MACPVT LTD has initiated its GHG accounting system and identified relevant direct emission sources associated with its manufacturing activities.
- ➢ For the current reporting period **April 2025–March 2026**, the submitted GHG collection sheet reports Scope 1 = 11.979 tCO_2e

16.2 Successes

Key achievements include:

- GHG inventory framework established.
- 2023 baseline identified.
- Scope 1 sources identified.
- ESG integration initiated.
- GHG data collection process established.
- Direct emissions quantified.

16.3 Opportunities

The main opportunities are:

- Improve fuel data accuracy.
- Introduce electricity monitoring.
- Establish production-based carbon intensity.
- Improve refrigerant tracking.
- Assess process emissions.
- Introduce renewable energy.
- Improve process energy efficiency.

16.4 Plan for Next Reporting Period

Action	Responsible	Frequency
Collect fuel data	Production/EHS	Monthly
Collect electricity data	Finance/EHS	Monthly
Monitor refrigerants	Maintenance	As required
Record production quantity	Production	Monthly
Review emission factors	ESG Team	Annual
Calculate GHG inventory	ESG Team	Annual
Internal verification	Internal Audit	Annual
Monitor reduction targets	Management	Quarterly
Management review	Top Management	Annual

17. APPENDICES

Appendix A – Activity Data Table

Activity	Unit	Reporting Period	Status
Diesel – DG Set	Litres	Apr 2025–Mar 2026	To be populated
Furnace Oil	Litres	Apr 2025–Mar 2026	To be populated
LPG/Propane	kg/cylinders	Apr 2025–Mar 2026	To be populated
Natural Gas	m^3	Apr 2025–Mar 2026	To be populated
Company Vehicle Diesel	Litres	Apr 2025–Mar 2026	To be populated
Refrigerant Top-up	kg	Apr 2025–Mar 2026	To be populated
Purchased Electricity	kWh	Apr 2025–Mar 2026	To be collected
Production	tonnes	Apr 2025–Mar 2026	To be collected
Raw Materials	tonnes	Apr 2025–Mar 2026	To be collected
Waste	tonnes	Apr 2025–Mar 2026	To be collected
Transportation	tonne-km	Apr 2025–Mar 2026	To be collected
Employee Commuting	passenger-km	Apr 2025–Mar 2026	To be collected

The underlying checklist specifically includes DG diesel, furnace oil, LPG/propane, natural gas, company-vehicle diesel and refrigerant top-ups as Scope 1 collection parameters.

Appendix B – Emission Factor Reference Framework

Source	Application
IPCC Guidelines	Fuel combustion
GHG Protocol	Corporate GHG accounting
CEA India	Purchased electricity
DEFRA	Relevant transport/business travel
Supplier-specific factors	Raw materials
Refrigerant manufacturer data	Fugitive emissions
Waste-specific factors	Waste treatment

Appendix C – Definitions & Abbreviations

Abbreviation	Definition
GHG	Greenhouse Gas
CO_2	Carbon Dioxide
CH_4	Methane
N_2O	Nitrous Oxide
HFC	Hydrofluorocarbon
CO_2e	Carbon Dioxide Equivalent
ESG	Environmental, Social and Governance
GWP	Global Warming Potential
DG	Diesel Generator
EHS	Environment, Health & Safety
ISO	International Organization for Standardization
IPCC	Intergovernmental Panel on Climate Change
CEA	Central Electricity Authority
KPI	Key Performance Indicator

Appendix D – Reference Standards Used

ISO 14064-1:2018 – Greenhouse gases — Part 1: ISO 14064-1:2018 – Official ISO Page

GHG Protocol Corporate Accounting and Reporting Standard: GHG Protocol – Standards

GHG Protocol Scope 2 Guidance: GHG Protocol – Standards & Guidance

IPCC Guidelines for National Greenhouse Gas Inventories

Official source: IPCC – Guidelines for National Greenhouse Gas Inventories

Central Electricity Authority (CEA), India – Grid Emission Factor Official CEA website: Central Electricity Authority (CEA), India GHG Program – Standards & Guidance / Emission Accounting Resources:

India GHG Program – Standards & Guidance.

ACKNOWLEDGEMENT OF RECEIPT

I confirm that I have received and reviewed this GHG Emission Report and understand my responsibility to comply with applicable requirements.

Name : **J. Siva kumar**

Designation : **Production Manager**

Signature :



Date : **13th April, 2026**

