



THE METAL POWDER COMPANY

GHG Inventory Report

FY 2024-25



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Executive Summary

The Metal Powder Company Limited (MEPCO) has prepared this Greenhouse Gas (GHG) Inventory Report for the financial year FY 2024–25 to quantify and report its greenhouse gas emissions in line with the GHG Protocol Corporate Accounting and Reporting Standard, the GHG Protocol Value Chain (Scope 3) Standard, and ISO 14064-1. The report reflects MEPCO’s commitment to transparency, environmental responsibility, and continuous improvement in sustainability performance.

The GHG inventory covers five operational facilities under MEPCO’s operational control, including Maravankulam, Kappalur, Kalligudi, and Nilakottai in Tamil Nadu, and Pithampur in Madhya Pradesh. Emissions have been calculated using a consumption-based approach and composite CO₂e emission factors, ensuring consistency and accuracy in reporting.

For the reporting period, MEPCO’s total consolidated GHG emissions amount to **314280.47 t-CO₂e** across all locations. **Scope 3** emissions dominate the emissions profile, contributing **95.52%** of the total footprint, largely driven by purchased goods and services within the upstream supply chain. **Scope 1** emissions, arising from direct fuel combustion and process-related activities, account for **1.19%**, while **Scope 2** emissions, associated with purchased electricity on a location-based basis, contribute **3.29%** of total emissions.

MEPCO meets its electricity requirements primarily through **on-site renewable** energy generation systems operating under net metering arrangements, thereby minimizing dependence on conventional grid power, with approximately **60%** of its total electricity consumption met through its owned wind and solar power plants across different locations. The combined Scope 1 and Scope 2 emissions represent 4.48% of total emissions, indicating that MEPCO’s greenhouse gas impact is primarily driven by value chain activities rather than direct operations.

An uncertainty assessment was conducted, and the overall uncertainty associated with the reported emissions is considered reasonable and within **±5%**, in line with accepted practices for organizational-level GHG reporting.

This GHG Inventory establishes a robust emissions baseline for MEPCO and provides a strong foundation for future emissions monitoring, sustainability disclosures, and the development of targeted emission reduction and decarbonisation initiatives.

Abbreviations

GHG:	Greenhouse Gas
GWP:	Global Warming Potential
IPCC:	Intergovernmental Panel on Climate Change
ISO:	International Organization for Standardization
kWh:	Kilowatt hour
UOM:	Unit of Measurement
T CO₂e:	Tons of Carbon dioxide equivalent
Kg CO₂e:	Kilograms of Carbon dioxide equivalent
WBCSD:	World business council for sustainable development
WRI:	World Resource Institute
DEFRA:	Department for Environment, Food and Rural Affairs.
USEPA:	United States Environmental Protection Agency
NAICS:	North American Industry Classification System
MEPCO:	The Metal Powder Company Limited



1. About MEPCO

The Metal Powder Company Limited (MEPCO) is a pioneering Indian manufacturer of metal powders, with a legacy spanning several decades. MEPCO is recognized as one of the earliest and most established producers of metal powders in India, supplying to a wide range of domestic and international customers across diverse industrial sectors.

The company specializes in the production of non-ferrous metal powders, including aluminium, copper powders, and customized powder grades, which are used in applications such as defense, aerospace, pyrotechnics, plastics & refractories, powder metallurgy components, welding consumables, friction materials, surface coatings, and soft magnetic products. MEPCO's products play a critical role in downstream industries such as automotive, engineering, electrical, electronics, infrastructure, and general manufacturing.

MEPCO operates integrated manufacturing facilities that encompass raw material processing, melting, atomization (air & gas), electrolysis, chemical reduction, heat treatment, pulverizing, blending, and finishing operations, supported by in-house research and development, quality control, and testing capabilities. The company places strong emphasis on process reliability, product consistency, and adherence to customer and regulatory specifications.

Energy and resource utilization form an important part of MEPCO's operations due to the nature of metal powder manufacturing processes. Recognizing this, MEPCO is committed to responsible environmental management, continuous improvement in operational efficiency, and alignment with evolving sustainability expectations.

As part of its sustainability and environmental stewardship initiatives, MEPCO has undertaken the preparation of a Green House Gas (GHG) Inventory to systematically identify, quantify, and report emissions arising from its operations and relevant value chain activities. This initiative reflects MEPCO's intent to enhance transparency, regulatory preparedness, and informed decision-making, while laying a foundation for future energy efficiency, emission reduction, and decarbonization strategies.

1.1. Purpose and Objective of Report

The Metal Powder Company Limited (MEPCO) has prepared this Greenhouse Gas (GHG) Inventory Report as part of its commitment to responsible environmental management, transparency, and continual improvement in sustainability performance. The report presents a systematic quantification and reporting of GHG emissions associated with MEPCO's operations for the financial year FY 2024–25.

The key purposes and objectives of this report are outlined below:

- **Understanding MEPCO's GHG Emissions Profile**
To identify and quantify greenhouse gas emissions arising from MEPCO's operational activities and relevant value chain processes, categorized under Scope 1 (direct emissions), Scope 2 (indirect emissions from purchased electricity), and selected Scope 3 (other indirect emissions), in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Value Chain (Scope 3) Standard.
- **Establishing a Robust Emissions Baseline**
To establish a reliable and transparent emissions baseline for MEPCO, this will serve as a reference point for: Monitoring year-on-year emissions performance, tracking the effectiveness of operational improvements, and supporting future target setting and decarbonisation planning.
- **Supporting Regulatory and Voluntary Disclosures**
To enable accurate, consistent, and credible disclosure of GHG emissions data for: Customer and stakeholder information requirements, Sustainability ratings and assessments (e.g., EcoVadis, CDP), and Alignment with evolving national and international climate-related reporting expectations.
- **Identifying Emission Hotspots and Reduction Opportunities**
To identify key emission-intensive activities within MEPCO's operations and value chain, thereby supporting: Energy efficiency initiatives, Optimization of fuel and electricity usage, increased adoption of cleaner energy sources, and Data-driven decision-making for emissions reduction.
- **Enhancing Transparency and Accountability**
To demonstrate MEPCO's commitment to environmental responsibility through transparent, data-driven reporting, thereby strengthening stakeholder confidence and supporting informed engagement with customers, partners, and regulators.
- **Alignment with Sustainability and Climate Strategy**
To provide a structured foundation for integrating GHG management into MEPCO's broader sustainability and business strategy, including long-term climate risk management and transition planning.

1.2. Reporting Period

The reporting period is from **1st April 2024 to 31st March 2025**. This is the first year of reporting by the company for its controlled facility and all greenhouse gas emissions quantified and reported in this document are based on activity data collected during this defined reporting period.

1.3. Frequency of Reporting

MEPCO has chosen to adhere to GHG Protocol standards for reporting their GHG Inventory. The reporting frequency for the GHG Inventory will be consistent and occur on an annual basis. This frequency is determined based on the unique needs and requirements of the reporting organization and the customers.

1.4. Key Information's

Table 1: Key Information's for GHG Emission Inventory

Company name	The Metal Powder Company Limited (MEPCO)
Description of the company	An Indian manufacturer of non-ferrous metal powders, operating a total of five facilities, with four locations in Tamil Nadu and one facility in Madhya Pradesh.
Report Title	GHG Emission Inventory, 2024-25
Date	20 th February 2026
Physical Location	<p>Address:</p> <ol style="list-style-type: none"> 1. – Head Office and manufacturing facility Maravankulam, Thirumangalam- 625 706. Madurai Dt., Tamil Nadu, India 2. Manufacturing Facilities The Metal Powder Company Limited Unit - (III) Kappalur , Thirumangalam- 625008. Madurai Dt., Tamil Nadu, India 3. Mepco Speciality Products Survey No.308-312, National Highways, No, 7, K.Vellakulam, Kalligudi-625 701, Madurai Dist. Tamil Nadu, India 4. NALCO Metal Products Limited S/331, Batlagundu Road, Nilakottai – 624208. Dindigul District, Tamil Nadu State 5. Madhya Pradhesh Metal Powder Plot No.102, Sector II, Industrial area, Pithampur-454775, Madhya Pradesh
Reporting Period	1 st April 2024 to 31 st March 2025
GHG Emissions Sources Covered	<p>Scope 1 Activities:</p> <ul style="list-style-type: none"> • Direct emissions from Stationary combustion.

	<ul style="list-style-type: none"> • Direct emissions from Mobile Combustion. • Direct emissions from fugitive sources. <p>Scope 2 Activities:</p> <ul style="list-style-type: none"> • Indirect GHG emissions from Purchased electricity. (Market & Location based) <p>Scope 3 Activities:</p> <ul style="list-style-type: none"> • Category-1: Purchased goods and Services • Category-2: Capital Goods • Category-3: Fuel & Energy Related • Category-4: Upstream Transportation and Distribution • Category-5: Waste Generation in Operations • Category-6: Business Travel • Category-7: Employee Commuting • Category-9: Downstream Transportation and Distribution
Base Year	FY 2024-25
Prepared By	EKI Energy Services Limited. EKI Embassy, A35, Scheme 78 Part 1 Phase 2, Indore, Madhya Pradesh (452010)

2. Operational Boundary

The organizational boundary for the Greenhouse Gas (GHG) Inventory defines the facilities and operations for which MEPCO accounts for and reports its greenhouse gas emissions.

For this GHG Inventory Report, The Metal Powder Company Limited (MEPCO) has defined its organizational boundary based on the Operational Control approach, in line with the GHG Protocol Corporate Accounting and Reporting Standard. Under this approach, MEPCO accounts for 100% of the GHG emissions from operations over which it has full authority to introduce and implement operating policies, environmental management practices, and sustainability initiatives.

MEPCO maintains full operational control over all the facilities included within this reporting boundary. Accordingly, the GHG Inventory includes emissions from all five MEPCO facilities, as listed below:

Facilities Included in the Organizational Boundary

1. **The Metal Powder Company Limited – Head Office**
Maravankulam, Thirumangalam- 625 706. Madurai Dt., Tamil Nadu, India
2. **The Metal Powder Company Limited Unit-III Manufacturing Facility**
Kappalur , Thirumangalam- 625008. Madurai Dt., Tamil Nadu, India
3. **Mepco Speciality Products Manufacturing Facility**
Survey No.308-312, National Highways, No, 7, K.Vellakulam, Kalligudi-625 701, Madurai Dist. Tamil Nadu, India
4. **NALCO Metal Products Limited Manufacturing Facility**
S/331, Batlagundu Road, Nilakottai – 624208. Dindigul District, Tamil Nadu State.
5. **Madhya Pradesh Metal Powder Manufacturing Facility**
Plot No.102, Sector II, Industrial area, Pithampur- 454775, Madhya Pradesh

All emission sources arising from activities conducted within these facilities—covering administrative operations, manufacturing processes, utilities, and on-site energy use—are included in the GHG Inventory for the reporting period, unless specifically stated otherwise in the exclusions section of this report.

Table 2: Organizational Boundary Approach

<p>Which consolidation approach was chosen (check each consolidation approach for which your company is reporting emissions) If your company is reporting according to more than one consolidation approach, please complete and attach an additional completed reporting template that provides your company’s emissions data following the other consolidation approach(es).</p>		
Equity Share <input type="checkbox"/>	Financial Control <input type="checkbox"/>	Operational Control <input checked="" type="checkbox"/>

3. Reporting Boundary

The reporting boundary defines the scope of greenhouse gas (GHG) emissions included in The Metal Powder Company Limited's (MEPCO) GHG Inventory. This boundary establishes which emission sources are accounted for under Scope 1, Scope 2, and Scope 3, in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard.

MEPCO's GHG Inventory covers emissions arising from activities conducted within the organizational boundary defined in Chapter 2, including its five operational facilities located in Tamil Nadu and Madhya Pradesh.

GHG emissions are categorized as follows:

3.1. Scope 1: Direct GHG Emissions

Scope 1 emissions include **direct greenhouse gas emissions** from sources that are owned or controlled by MEPCO. These emissions arise from activities occurring within MEPCO's operational facilities.

For the reporting period, the following Scope 1 emission sources are included within the reporting boundary:

Included Scope 1 Emission Sources

- **Stationary Combustion:**
Emissions from the combustion of fuels in stationary equipment such as furnaces, generators, heaters, and other process-related combustion units used in metal powder manufacturing operations.
- **Mobile Combustion:**
Emissions from fuel consumption in company-owned or company-controlled vehicles used for operational, logistics, and administrative purposes.
- **Fugitive Emissions:**
Emissions resulting from the leakage or release of refrigerants used in cooling systems, air-conditioning units, and fire suppression equipment installed within MEPCO's facilities.
- **Process Emissions:**
Emissions arising from acetylene consumption used during metallurgical and thermal processes within MEPCO's manufacturing operations. Acetylene is utilized as part of the maintenance process, and the associated emissions are considered direct emissions as they occur from sources under MEPCO's operational control.

All relevant Scope 1 emission sources under MEPCO's operational control have been identified and included in this GHG Inventory.

3.2. Scope 2: Indirect GHG Emissions from Purchased Energy

Scope 2 emissions include indirect greenhouse gas emissions associated with the generation of purchased energy consumed by MEPCO.

For this reporting period, MEPCO's Scope 2 emissions include:

- **Purchased Electricity:**
Electricity procured from state and regional electricity distribution companies and consumed across MEPCO's manufacturing facilities and head office.

Scope 2 emissions have been quantified using both:

- **Location-based methodology**, reflecting the average emissions intensity of the regional electricity grids supplying MEPCO's facilities, and
- **Market-based methodology**, where applicable, based on contractual instruments or specific energy procurement arrangements.

This dual reporting approach enables a comprehensive assessment of MEPCO's electricity-related emissions and supports informed decision-making on renewable energy management.

3.3. Scope 3: Other Indirect GHG Emissions

Scope 3 emissions include other indirect greenhouse gas emissions that occur in MEPCO's value chain but are not owned or directly controlled by the company.

In line with the GHG Protocol Value Chain Standard, MEPCO has identified and reported on relevant Scope 3 categories based on data availability, relevance, and materiality for the reporting period.

Included Scope 3 Categories

The following Scope 3 categories are included in this GHG Inventory:

- **Category 1:** Purchased Goods and Services
- **Category 2:** Capital Goods
- **Category 3:** Fuel- and Energy-Related Activities
- **Category 4:** Upstream Transportation and Distribution
- **Category 5:** Waste Generated in Operations
- **Category 6:** Business Travel
- **Category 7:** Employee Commuting
- **Category 9:** Downstream Transportation and Distribution



Excluded Scope 3 Categories

Certain Scope 3 categories have been excluded from the current reporting boundary due to limitations such as **lack of operational influence, or immaterial contribution**. These exclusions are transparently documented in the **Exclusions of GHG Emissions** chapter of this report.

4. Quantified GHG Inventory of Emissions

The Metal Powder Company Limited (MEPCO) has quantified its greenhouse gas (GHG) emissions in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and ISO 14064-1. The quantification covers emissions arising from activities within the defined organizational and reporting boundaries as described in the previous chapters.

The GHG inventory has been developed using a consumption-based approach, wherein emissions are calculated based on actual activity data collected from MEPCO’s operational facilities and relevant value chain activities.

GHG emissions in this report are quantified and reported in terms of tonnes of carbon dioxide equivalent (tCO₂e). The emission factors applied for calculation are composite CO₂e emission factors, which already incorporate the combined climate impact of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) based on 100-year Global Warming Potentials.

All emissions have therefore been directly calculated using:

$$\text{GHG Emissions (tCO}_2\text{e)} = \text{Activity Data} \times \text{CO}_2\text{e Emission Factor}$$

4.1. Direct GHG Emissions (Scope 1)

This section presents the quantified greenhouse gas emissions under Scope 1 for The Metal Powder Company Limited (MEPCO) for the reporting period. The detailed category-wise results are presented in both consolidated form and facility-wise form in the Annexure, to provide a clear understanding of emission contributions across MEPCO’s operations.

Table 3: Overall Scope 1 emissions breakdown

Scope 1 emissions (t-CO ₂ eq)					
Source	Mepco Unit-III Kappalur	MPMP Pithampur	NALCO Nilakottai	MSP Kalligudi	Mepco Maravankulam
Stationary Combustion	745.448	521.995	904.695	77.853	1318.318
Mobile Combustion	0.000	8.547	32.780	0.111	122.599
Fugitive emissions	0.000	0.013	3.385	0.000	0.000
Process Emission	0.000	0.000	0.034	0.000	0.863
Total	745.448	530.555	940.894	77.963	1441.780

The Scope 1 emissions results indicate that stationary combustion is the dominant contributor to direct greenhouse gas emissions across all MEPCO facilities. Maravankulam, being the Head Office, records the highest Scope 1 emissions, followed by NALCO and Mepco Unit-III, primarily due to higher fuel consumption for operational and process requirements. MPMP Pithampur shows comparatively moderate emissions, while MSP Kalligudi has the lowest Scope 1 emissions among the facilities. Contributions from mobile combustion, fugitive emissions, and process emissions (acetylene usage) are minimal in comparison to stationary combustion, indicating that fuel-based stationary sources are the key drivers of Scope 1 emissions for MEPCO.

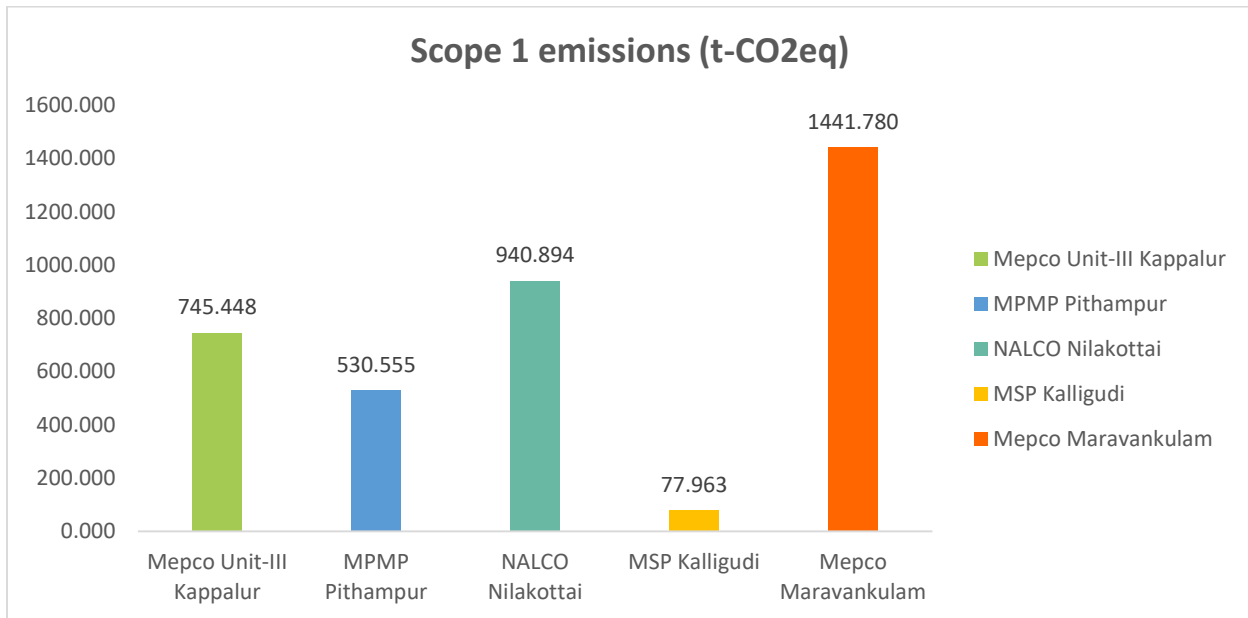


Figure 1: Facility wise Scope 1 Emissions

4.2. Indirect GHG Emissions from Purchased Electricity (Scope 2)

This section presents the quantified greenhouse gas emissions under Scope 2 for The Metal Powder Company Limited (MEPCO) for the reporting period. The detailed category-wise results are presented in both consolidated form and facility-wise form in the Annexure, to provide a clear understanding of emissions associated with purchased electricity consumption across MEPCO’s operations.

Table 4: Overall Scope 2 emissions breakdown

Scope 2 emissions (t-CO ₂ eq)					
Source	Mepco Unit-III Kappalur	MPMP Pithampur	NALCO Nilakottai	MSP Kalligudi	Mepco Maravankulam
Purchased Electricity (Grid)	774.749	3370.154	2189.912	529.690	3522.190

Purchased Electricity (RE)	0.000	0.000	0.000	0.000	0.000
Total	774.749	3370.154	1675.439	991.640	3522.190

The Scope 2 emissions results indicate that purchased grid electricity is the primary contributor to indirect greenhouse gas emissions across MEPCO facilities during the reporting period. Maravankulam records the highest Scope 2 emissions, followed by Pithampur and NALCO, reflecting higher electricity consumption at these locations. Kalligudi and Kappalur show comparatively lower Scope 2 emissions. MEPCO also operates on-site renewable energy generation systems integrated through a net metering mechanism, which contribute to meeting a portion of the electricity demand. While these systems support emissions mitigation, residual electricity requirements are met through grid procurement, resulting in the reported Scope 2 emissions.

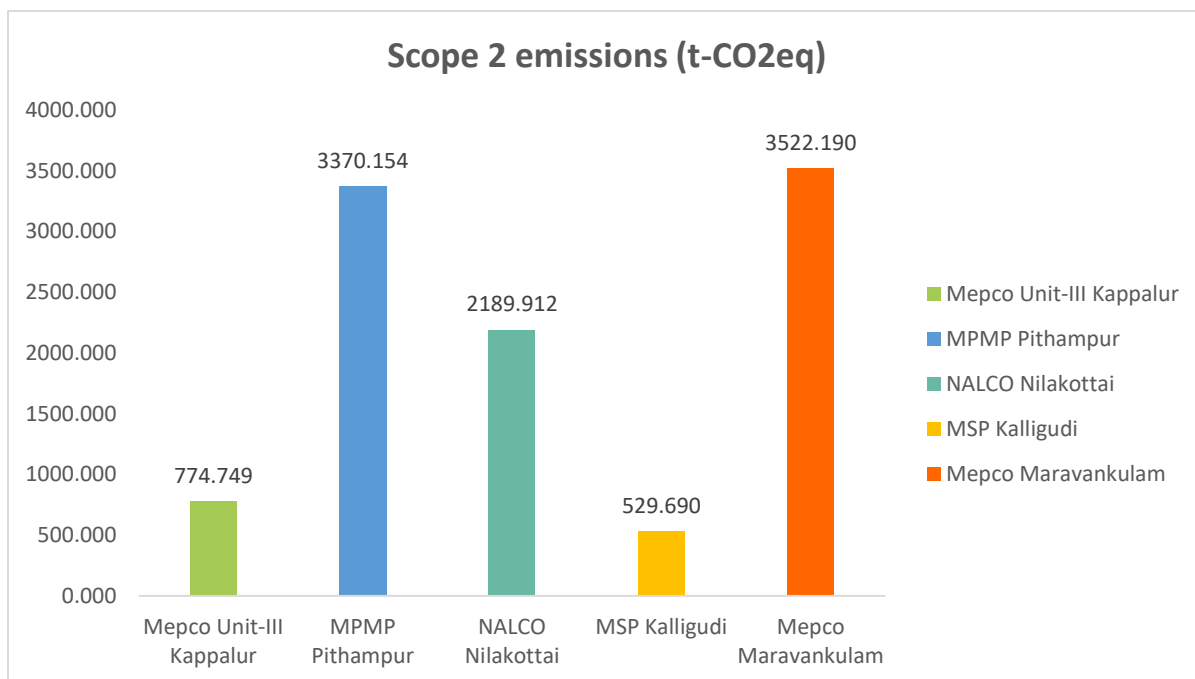


Figure 2: Facility wise Scope 2 Emissions

4.3. Other Indirect GHG Emissions (Scope 3)

This section presents the quantified greenhouse gas emissions under Scope 3 for The Metal Powder Company Limited (MEPCO) for the reporting period. The detailed category-wise results are presented in consolidated and category-wise form in the Annexure, to provide a clear understanding of emission contributions arising from MEPCO’s value chain activities.

Table 5: Overall Scope 3 Emissions breakdown

Scope 3 emissions (t-CO2eq)					
Source	Mepco Unit-III Kappalur	MPMP Pithampur	NALCO Nilakottai	MSP Kalligudi	Mepco Maravankulam
Category 1: Purchase goods & services	26927.53	34278.93	52838.39	7417.21	172366.10
Category 2: Capital Goods	0.000	0.000	58.465	0.000	343.309
Category 3: Fuel & Energy Related	384.497	1067.198	823.86	154.23	1308.172
Category 4: Upstream T&D	0.000	50.281	980.589	26.860	400.37
Category 5: Waste Generation	0.000	0.023	0.061	0.000	2.160
Category 6: Business Travel	0.000	0.000	0.000	0.000	48.717
Category 7: Employee Commute	14.334	15.485	29.664	16.365	352.757
Category 9: Downstream T&D	0.000	0.041	10.509	8.877	299.481
Total	27326.36	35411.96	54741.54	7623.54	175121.066

The Scope 3 emissions assessment shows that Purchased Goods and Services (Category 1) are the largest contributors to MEPCO’s value chain emissions across all locations. Among the facilities, Mepco reports the highest Scope 3 emissions, followed by NALCO, MPMP, Mepco Unit-III, and MSP, with procurement activities being the primary driver in each case. Other Scope 3 categories, including fuel- and energy-related activities, upstream transportation and distribution, employee commuting, business travel, waste generation, and downstream transportation, contribute comparatively smaller shares to the overall Scope 3 emissions. The results highlight the significance of upstream supply chain activities as key emission drivers and underscore the importance of supplier engagement and sustainable procurement practices for future emissions reduction.

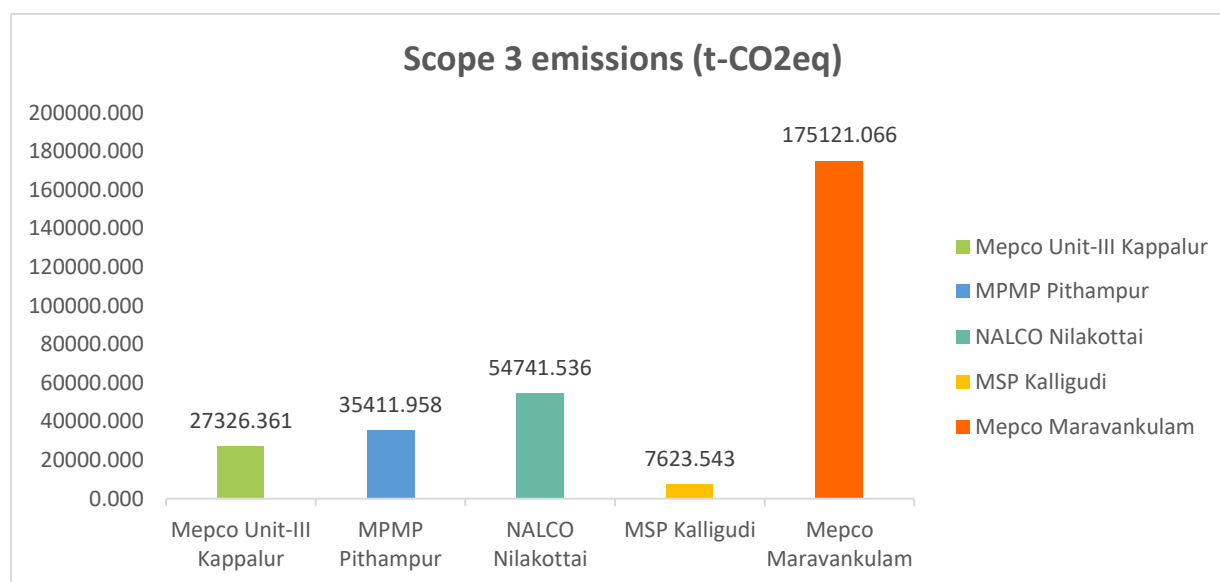


Figure 3: Facility wise Scope 3 Emissions

4.4. Overall Result Summary

Table 6: Emission Summary

Source	Emission (t-CO ₂ eq)	Contribution (%)
Scope 1	3736.641	1.19%
Scope 2 (Location Based)	10386.70	3.30%
Scope 2 (Market Based)	10386.70	
Scope 3	300224.47	95.51%
Scope 1+2	14123.34	4.49%
Scope 1+2+3	314347.81	100%

The consolidated greenhouse gas emissions for The Metal Powder Company Limited (MEPCO) across all operational locations indicate a total footprint of 314347.81 t-CO₂e for the reporting period. Scope 3 emissions overwhelmingly dominate the overall emissions profile, contributing 95.51% of total emissions, primarily driven by upstream value chain activities, particularly purchased goods and services.

Scope 1 emissions, arising from direct fuel combustion and process-related activities across MEPCO's facilities, account for 3736.641 t-CO₂e, representing 1.19% of the total emissions. Scope 2 emissions, associated with purchased electricity on a location-based basis, contribute 10386.70 t-CO₂e, accounting for 3.30% of the overall footprint.

The combined Scope 1 and Scope 2 emissions amount to 14123.34 t-CO₂e, representing 4.49% of total emissions, while the inclusion of Scope 3 emissions significantly increases the total footprint. These results clearly indicate that MEPCO's greenhouse gas impact is largely influenced by value chain-related activities rather than direct operational emissions, highlighting the importance of supplier engagement, sustainable procurement, and upstream decarbonization initiatives, alongside continued efforts to improve energy efficiency and renewable energy integration within operations.

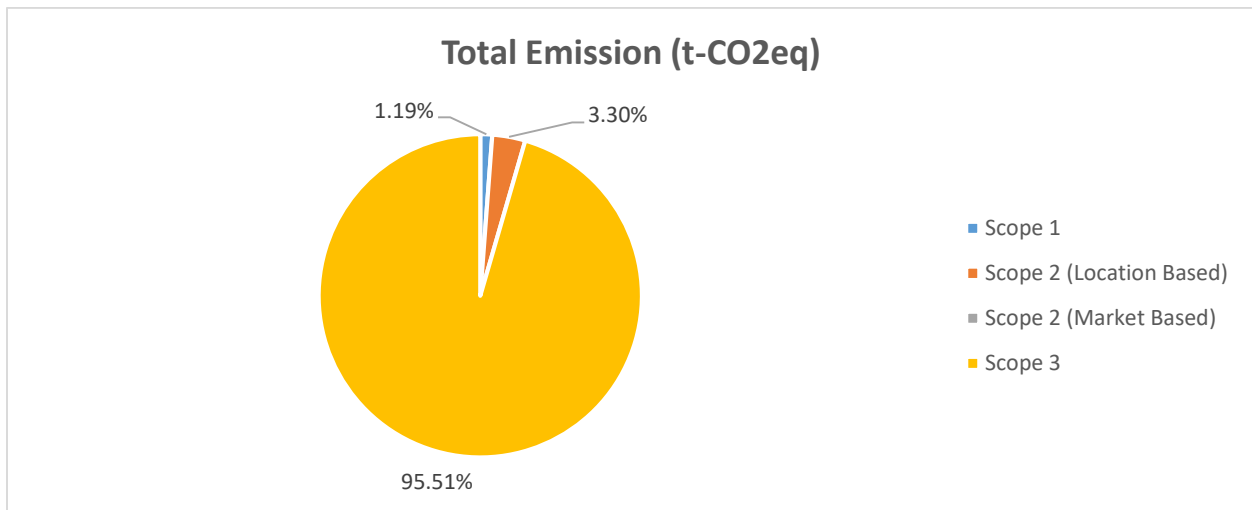


Figure 4: Overall GHG Emissions (Scope-wise)

5. Exclusion of GHG Emissions

The Metal Powder Company Limited (MEPCO) has prepared this Greenhouse Gas (GHG) Inventory in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and the GHG Protocol Value Chain (Scope 3) Accounting and Reporting Standard. The objective of this inventory is to ensure comprehensive and transparent reporting of material greenhouse gas emissions within the defined organizational and reporting boundaries.

While all relevant and material emission sources have been considered, certain emission categories have been excluded from the current inventory due to non-applicability, data unavailability, or lack of relevance to MEPCO’s business model and operational structure. All exclusions are documented below to maintain transparency and reporting integrity.

5.1. Exclusion of GHG Emissions from Scope 3

MEPCO recognizes the importance of Scope 3 emissions in understanding value chain impacts. However, consistent with the GHG Protocol’s relevance and materiality principles, MEPCO has excluded certain Scope 3 categories that are not applicable to its operations or for which emissions do not occur in a meaningful manner.

Excluded Scope 3 Categories

Table 7: Excluded Categories from Scope 3

Scope 3 Category	Status	Justification for Exclusion
Category 8: Upstream Leased Assets	Excluded	MEPCO does not operate or rely on upstream leased assets as part of its business operations during the reporting period.
Category 10: Processing of Sold Products	Excluded	MEPCO manufactures and sells metal powders as finished products, which are not intended for further energy-intensive processing by downstream entities that would be attributable to MEPCO. As such, emissions under this category are not relevant to MEPCO’s value chain.
Category 11: Use of Sold Products	Excluded	MEPCO does not have operational control or visibility over how customers use the metal powders after sale, and the products themselves do not generate direct emissions during use.
Category 12: End-of-Life Treatment of Sold Products	Excluded	Metal powders are intermediate industrial materials that become embedded in downstream products. End-of-life treatment pathways are outside MEPCO’s control and cannot be reliably attributed.
Category 13: Downstream Leased Assets	Excluded	MEPCO does not lease products or assets to downstream customers.
Category 14: Franchises	Excluded	MEPCO does not operate under a franchise business model.

Category 15: Investments	Excluded	Emissions associated with financial investments are outside MEPCO's operational boundary and reliable data is not currently available.
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6. Annexure

6.1. Uncertainty Assessment

An uncertainty assessment was conducted for all material emission sources included in MEPCO's GHG inventory to evaluate the reliability and accuracy of the reported emissions. The assessment covers Scope 1, Scope 2 and Scope 3 emissions and follows the principles of the IPCC Good Practice Guidance (2000) and aligned to ISO 14064-1:2018 (Clause 9.3.2).

Scope 1 & Scope 2

Quantitative Assessment

For Scope 1 and Scope 2 emissions, a structured **Excel-based uncertainty model** was applied using IPCC-recommended **error propagation methods**. For each emission source, uncertainties associated with activity data and emission factors were combined using:

$$U_{source} = \sqrt{(U_{AD})^2 + (U_{EF})^2}$$

Overall organizational uncertainty was calculated using weighted aggregation:

$$\pm u = \frac{\sqrt{\sum(H_i \times I_i)^2}}{M}$$

Where,

H_i represents emissions from source i

I_i the respective uncertainty,

M the total emissions.

Key assumptions applied:

Source	Activity Data Uncertainty	Emission Factor Uncertainty	Basis
Fuel combustion	± 3%	± 5%	Metered data and IPCC default factors
Refrigerants	± 3%	± 20%	Estimated leakage, IPCC EFDB
Purchased electricity	± 1%	± 5%	Utility bills and CEA grid factors

Results:

- Total emissions (Scope 1 & 2): **14070.813 tCO₂e**
- Overall uncertainty: **± 4.0%**
- Certainty ranking: **High**

Qualitative Assessment

In addition to quantitative analysis, a qualitative review was performed to assess data quality and methodological robustness:

- Activity data is sourced from **verified fuel records, calibrated meters, and utility invoices**, ensuring high traceability.
- Emission factors were obtained from **CEA (India) and DEFRA**, representing conservative and internationally accepted values.
- Composite CO₂e emission factors were used, reducing uncertainty from separate GWP conversions.
- Minor uncertainty arises from manual data aggregation and estimation for refrigerant leakage.

Scope 3

Quantitative Assessment

For Scope 3 emissions, a quantitative uncertainty assessment was performed at the category and sub-category level, considering the specific calculation methodologies applied (supplier data, distance-based, spend-based and database factors).

Source-wise uncertainties were assigned based on data type and calculation approach, and uncertainty propagation was applied using the same IPCC statistical method. This avoided the use of a single average uncertainty value across all Scope 3 categories and ensured more accurate representation of category-specific risks.

Due to the diverse nature of Scope 3 emission sources, uncertainty levels vary across categories, with higher uncertainty observed for spend-based and estimation-driven categories compared to supplier-specific data.

Improvement Opportunities

Key areas identified for improvement include:

- Enhanced refrigerant tracking and leak monitoring
- Digital data logging for fuel
- Increased engagement with suppliers to improve Scope 3 primary data availability
- Periodic review of emission factors for alignment with national guidelines

6.2. Emission Factors

6.2.1. Scope 1 and 2

Table 8: Emission factors and sources (Scope 1 and 2)

Categories	UOM	Emission Factor				Emission Factor Source
		kg-CO2	kg-CH4	kg-N2O	kg-CO2e	
Scope 1						
Stationery combustion						
Diesel consumption in DG Sets	litres	2.62818	0.00029	0.03308	2.66155	DEFRA 2024
Diesel in production (Furnace)	litres	2.62818	0.00029	0.03308	2.66155	DEFRA 2024
LPG consumption	Tonnes	2935.18	2.5536	1.62735	2939.36 1	DEFRA 2024
Fuel used in Furnace (Furnace Oil)	litres	3.16262	0.0053	0.00701	3.17493	DEFRA 2024
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	2.62818	0.00029	0.03308	2.66155	DEFRA 2024
Diesel consumption in Forklifts	litres	2.62818	0.00029	0.03308	2.66155	DEFRA 2024
Petrol consumption in company owned Bike	litres	2.33955	0.0082	0.00597	2.35372	DEFRA 2024
Diesel consumption in company owned Car	litres	2.62818	0.00029	0.03308	2.66155	DEFRA 2024
Petrol consumption in company owned Car	litres	2.33955	0.0082	0.00597	2.35372	DEFRA 2024
Fugitive emissions						
R-32	kgs	-	-	-	677	DEFRA 2024
CO2 type fire extinguishers refilling	kgs	-	-	-	1	DEFRA 2024
Process emissions						
Acetylene Consumption	Tonnes	3384.6	0	0	3384.6	IPCC
Scope 2						
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	-	-	-	0.727	CEA Version 20.0
Purchased Renewable power consumption	kWh	-	-	-	0.727	CEA Version 20.0
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	-	-	-	0.727	CEA Version 20.0
Purchased Renewable power consumption	kWh	-	-	-	0	CEA Version 20.0

6.2.2. Scope 3

Table 9: Emission factors and sources (Scope 3)

Categories	UOM	Emission Factor: kg-CO ₂ e	Emission Factor Source
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminium ingots	Kg	17.148	Supplier Specific (NALCO)
2. Chemicals	Kg	1.85	Ecoinvent V3.11
3. Mineral Turpentine Oil	Tonnes	843	Ecoinvent V3.11
5. Stearic Acid	Kg	0.539	Ecoinvent V3.11
6. Xylene	kg	1.75	Ecoinvent V3.11
7. Castor oil	Kg	8.14	Castor Oil Supply Chain: A Case Study
8. Nitric Acid	Kg	2	Ecoinvent V3.11
9. Sulfuric Acid	kg	0.175	Ecoinvent V3.11
10. Naphtha	kg	0.816	Ecoinvent V3.11
11. Diethylene Glycol (DEG)	kg	2.31	Ecoinvent V3.11
12. White Phosphorus	kg	13	Ecoinvent V3.11
13. Copper	kg	6.83	Ecoinvent V3.11
14. Silicon	kg	8.25	Ecoinvent V3.11
15. Magnesium ingots	kg	27.9	Ecoinvent V3.11
16. Zinc	kg	2.66	Ecoinvent V3.11
17. Tin	kg	10.3	Ecoinvent V3.11
18. Nickel	kg	17.4	Ecoinvent V3.11
19. Sodium chloride	kg	0.27	Ecoinvent V3.11
20. Sodium Hydroxide	kg	1.29	Ecoinvent V3.11
21. Metals	Tonnes	3815.78473	DEFRA 2024
22. Aluminium Alloy ingot	kg	19.4	Ecoinvent V3.11
23. Toluene	kg	1.61	Ecoinvent V3.11
24. Mineral Oil	kg	1401	DEFRA 2024
Packaging Materials			
1. MS Drum	Kg	1.98	Ecoinvent V3.11
2. Polythene bags	Kg	3.1	Ecoinvent V3.11
3. Paper bag	Kg	0.983	Ecoinvent V3.11
4. Corrugated Box	Kg	1.17	Ecoinvent V3.11
5. Tin Container	Kg	10.3	Ecoinvent V3.11
6. HDPE Bag	Kg	2.32	Ecoinvent V3.11
7. Jute	Kg	0.783	Ecoinvent V3.11

Categories	UOM	Emission Factor: kg-CO2e	Emission Factor Source
8. Fabric	Tonnes	22310	DEFRA 2024
9. Other packaging material	Tonnes	3164.78049	DEFRA 2024
Quantity of food ,snacks and drinks	USD	0.372	USEPA (NAICS Code-311919)
Consumables (For eg. Machines spares parts, nuts, bolts and other material consumed)	USD	0.115	USEPA (NAICS Code-423840)
Packaging Materials	USD	0.544	USEPA (NAICS Code-326112)
Printing Paper	USD	0.236	USEPA (NAICS Code-323111)
Stationary and Other materials	USD	0.296	USEPA (NAICS Code-322230)
Stationary and Other materials	Kg	3164.78049	DEFRA 2024
Coconut Oil	Kgs	1.56	DEFRA 2024
Chemicals (Soap,cleaning agents,air freshners etc)	USD	0.355	USEPA (NAICS Code-325611)
Chemicals (Soap,cleaning agents,air freshners etc)	Kg	1.86	Ecoinvent V3.11
Quantity of other services (like AC servicing, plumbing, building maintenance, cleaning supplies, security, consulting, etc)	USD	0.221	USEPA (NAICS Code-238220)
Internet, Telephone, Mobile recharges	USD	0.096	USEPA (NAICS Code-517312)
Category 2: Capital Goods			
Electronic and Electrical Items	USD	0.098	USEPA (NAICS Code-334419)
Vehicle	USD	0.268	USEPA (NAICS Code-336112)
Equipment & Machinery	USD	0.185	USEPA (NAICS Code-333249)
Furniture	USD	0.24	USEPA (NAICS Code-337211)
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	0.62409	DEFRA 2024
Upstream emission from Petrol	Litre	0.60664	DEFRA 2024
Upstream emission from Furnace Oil	Litre	0.69539	DEFRA 2024
Upstream emission from LPG	Tonnes	349.29282	DEFRA 2024
Upstream Electricity	kWh	0.167482489	DEFRA 21
Electricity T&D Losses	kWh	0.037633706	DEFRA 21
Category 4: Upstream T&D			
Truck	ton.km	0.02359	DEFRA 2024
Ship	ton.km	0.003	DEFRA 2024

Categories	UOM	Emission Factor: kg-CO2e	Emission Factor Source
Air	ton.km	0.13516	DEFRA 2024
Category 5: Waste Generation			
Plastic Waste	ton	8.88386	DEFRA 2024
Oil Waste	ton	6.41061	DEFRA 2024
Chemical Sludge	ton	520.3342	DEFRA 2024
Paper Waste	ton	1164.39015	DEFRA 2024
Metal Waste	ton	1.26435	DEFRA 2024
E Waste	ton	8.88386	DEFRA 2024
Food waste	ton	700.20961	DEFRA 2024
Category 6: Business Travel			
Business Travel: Rail	pax-km	0.00446	DEFRA 2024
Business Travel: Air	pax-km	0.1758	DEFRA 2024
Bus	pax-km	0.10846	DEFRA 2024
Category 7: Employee Commute			
2 Wheeler - Petrol	km	0.11367	DEFRA 2024
2 Wheeler - EV	km	0.0217	ICCT Fuel consumption standards for the new two-wheeler fleet in India
Car-Petrol	km	0.1645	DEFRA 2024
Car-Diesel	km	0.16984	DEFRA 2024
Bus	pax-km	0.12999	DEFRA 2024
Auto	km	0.1322	India-specific road transport EF (Page 26)
Category 9: Downstream T&D			
Truck	Tonn.kms	0.02359	DEFRA 2024
Ship	Tonn.kms	0.003	DEFRA 2024

6.3. Category-wise Scope 1 Emissions

6.3.1. Consolidated emissions of all locations for Scope 1

Table 10: Category-wise emission breakdown for Scope 1 (Consolidated)

Scope 1	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	24255.00	63.75	0.01	0.80	64.56
Diesel in production (Furnace)	litres	61650.00	162.03	0.02	2.04	164.08
LPG consumption	Tonnes	12.30	36.09	0.03	0.02	36.15
Fuel used in Furnace (Furnace Oil)	litres	1040502.82	3290.72	5.51	7.29	3303.52
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	10539.28	27.70	0.00	0.35	28.05
Diesel consumption in Forklifts	litres	13765.00	36.18	0.00	0.46	36.64
Petrol consumption in company owned Bike	litres	299.26	0.70	0.00	0.00	0.70
Diesel consumption in company owned Car	litres	35687.00	93.79	0.01	1.18	94.98
Petrol consumption in company owned Car	litres	1556.00	3.64	0.01	0.01	3.66
Fugitive emissions						
R-32	kgs	5.0	-	-	-	3.39
CO ₂ type fire extinguishers refilling	kgs	13.0	-	-	-	0.01
Process emissions						
Acetylene Consumption	Tonnes	0.3	0.90	0.00	0.00	0.90
Total Scope-1			3715.49	5.60	12.15	3736.64

6.3.2. Unit-Wise emissions for Scope 1

The Metal Powder Company Limited Unit-III, Kappalur

Table 11: Category-wise emission breakdown for Scope 1 (Mepco Unit-III)

Scope 1	UOM	Activity Data	Total Emission From Kappalur			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	1745	4.58617	0.0005	0.0577	4.64440
Diesel in production (Furnace)	litres	61650	162.027	0.017	2.039	164.084

Scope 1	UOM	Activity Data	Total Emission From Kappalur			
LPG consumption	Tonnes	0	0	0	0	0
Fuel used in Furnace (Furnace Oil)	litres	181647.9	574.483	0.9627	1.2733	576.719
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	0	0	0	0	0
Diesel consumption in Forklifts	litres	0	0	0	0	0
Petrol consumption in company owned Bike	litres	0	0	0	0	0
Diesel consumption in company owned Car	litres	0	0	0	0	0
Petrol consumption in company owned Car	litres	0	0	0	0	0
Fugitive emissions						
R-32	kgs	0	0	0	0	0
CO ₂ type fire extinguishers refilling	kgs	0	0	0	0	0
Process emissions						
Acetylene Consumption	Tonnes	0	0	0	0	0
Total Scope-1			741.096	0.9811	3.3704	745.448

Madhya Pradesh Metal Powder Unit, Pithampur

Table 12: Category-wise emission breakdown for Scope 1 (MPMP Unit)

Scope 1	UOM	Activity Data	Total Emission From Pithampur			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	360	0.94614	0.0001	0.0119	0.95815
Diesel in production (Furnace)	litres	0	0	0	0	0
LPG consumption	Tonnes	0.057	0.16730	0.0001	0.0001	0.16754
Fuel used in Furnace (Furnace Oil)	litres	164057	518.849	0.8695	1.1500	520.869
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	0	0	0	0	0
Diesel consumption in Forklifts	litres	3065	8.05537	0.0008	0.1013	8.15765
Petrol consumption in company owned Bike	litres	165.24	0.38658	0.0013	0.0009	0.38892
Diesel consumption in company owned Car	litres	0	0	0	0	0
Petrol consumption in company owned Car	litres	0	0	0	0	0

Scope 1	UOM	Activity Data	Total Emission From Pithampur			
Fugitive emissions						
R-32	kgs	0	0	0	0	0
CO ₂ type fire extinguishers refilling	kgs	13	-	-	-	0.013
Process emissions						
Acetylene Consumption	Tonnes	0	0	0	0	0
Total Scope-1			528.405	0.8719	1.2644	530.554

Nalco Metal Products Limited Unit, Nilakottai

Table 13: Category-wise emission breakdown for Scope 1 (NALCO Unit)

Scope 1	UOM	Activity Data	Total Emission From NALCO			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	3700	9.72426 6	0.0010 73	0.1223 96	9.84773 5
Diesel in production (Furnace)	litres	0	0	0	0	0
LPG consumption	Tonnes	0	0	0	0	0
Fuel used in Furnace (Furnace Oil)	litres	281847.9	891.377	1.4937	1.9757	894.84
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	10539.28	27.6991	0.0030	0.3486	28.0508
Diesel consumption in Forklifts	litres	1700	4.46790	0.0004	0.0562	4.52463
Petrol consumption in company owned Bike	litres	87	0.20354	0.0007	0.0005	0.20477
Diesel consumption in company owned Car	litres	0	0	0	0	0
Petrol consumption in company owned Car	litres	0	0	0	0	0
Fugitive emissions						
R-32	kgs	5	-	-	-	3.385
CO ₂ type fire extinguishers refilling	kgs	0	0	0	0	0
Process emissions						
Acetylene Consumption	Tonnes	0.01	0.03384	0	0	0.03384
Total Scope-1			933.506	1.4991	2.5035	940.894

Mepco Speciality Products Unit, Kalligudi

Table 14: Category-wise emission breakdown for Scope 1 (MSP Unit)

Scope 1	UOM	Activity Data	Total Emission from Kalligudi			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	7600	19.9741	0.0022	0.2514	20.2277
Diesel in production (Furnace)	litres	0	0	0	0	0
LPG consumption	Tonnes	0	0	0	0	0
Fuel used in Furnace (Furnace Oil)	litres	18150	57.401	0.096	0.127	57.624
Mobile combustion (Company owned vehicles)						
Diesel consumption in company owned Trucks	litres	0	0	0	0	0
Diesel consumption in Forklifts	litres	0	0	0	0	0
Petrol consumption in company owned Bike	litres	47.02	0.11000	0.0003	0.0002	0.11067
Diesel consumption in company owned Car	litres	0	0	0	0	0
Petrol consumption in company owned Car	litres	0	0	0	0	0
Fugitive emissions						
R-32	kgs	0	0	0	0	0
CO ₂ type fire extinguishers refilling	kgs	0	0	0	0	0
Process emissions						
Acetylene Consumption	Tonnes	0	0	0	0	0
Total Scope-1			77.4857	0.0987	0.3789	77.9634

The Metal Powder Company Limited Unit, Maravankulam

Table 15: Category-wise emission breakdown for Scope 1 (Mepco Unit)

Scope 1	UOM	Activity Data	Total Emission from Maravankulam			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Stationery combustion						
Diesel consumption in DG Sets	litres	10850	28.51575	0.0031	0.3589	28.8778
Diesel in production (Furnace)	litres	0	0	0	0	0
LPG consumption	Tonnes	12.24	35.9266	0.0312	0.0199	35.9777
Fuel used in Furnace (Furnace Oil)	litres	394800	1248.602	2.0924	2.7675	1253.46
Mobile combustion (Company owned vehicles)						

Scope 1	UOM	Activity Data	Total Emission from Maravankulam			
Diesel consumption in company owned Trucks	litres	0	0	0	0	0
Diesel consumption in Forklifts	litres	9000	23.65362	0.0026	0.2977	23.9539
Petrol consumption in company owned Bike	litres	0	0	0	0	0
Diesel consumption in company owned Car	litres	35687	93.79186	0.0103	1.1805	94.9827
Petrol consumption in company owned Car	litres	1556	3.64034	0.0127	0.0092	3.66238
Fugitive emissions						
R-32	kgs	0	0	0	0	0
CO ₂ type fire extinguishers refilling	kgs	0	0	0	0	0
Process emissions						
Acetylene Consumption	Tonnes	0.255	0.863073	0	0	0.86307
Total Scope-1			1434.99	2.1525	4.6339	1441.78

6.4. Category-wise Scope 2 Emissions

6.4.1. Consolidated emissions of all locations for Scope 2

Table 16: Category-wise emission breakdown for Scope 2 (Consolidated)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	14214817	-	-	-	10334.17
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	10334.17
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	14214817	-	-	-	10334.17
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	10334.17

6.4.2. Unit-Wise emissions for Scope 2

The Metal Powder Company Limited Unit-III, Kappalur

Table 17: Category-wise emission breakdown for Scope 2 (Mepco Unit-III)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	1065680	-	-	-	774.7493
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	774.7493
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	1065680	-	-	-	774.7493
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	774.7493

Madhya Pradesh Metal Powder Unit, Pithampur

Table 18: Category-wise emission breakdown for Scope 2 (MPMP Unit)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	4635700	-	-	-	3370.153
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	3370.153
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	4635700	-	-	-	3370.153
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	3370.153

Nalco Metal Products Limited Unit, Nilakottai

Table 19: Category-wise emission breakdown for Scope 2 (NALCO Unit)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	2304593	-	-	-	1675.439
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	1675.439
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	2304593	-	-	-	1675.439
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	1675.439

Mepco Speciality Products Unit, Kalligudi

Table 20: Category-wise emission breakdown for Scope 2 (MSP Unit)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	1364016	-	-	-	991.639
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	991.639
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	1364016	-	-	-	991.639
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	991.639

The Metal Powder Company Limited Unit, Maravankulam

Table 21: Category-wise emission breakdown for Scope 2 (Mepco Unit)

Scope 2 emissions	UOM	Activity Data	Total Emissions			
			t-CO ₂	t-CH ₄	t-N ₂ O	t-CO ₂ eq
Scope 2 emissions Location Based						
Purchased Electricity from Grid	kWh	4844828	-	-	-	3522.189
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Location Based			-	-	-	3522.189
Scope 2 emissions Market Based						
Purchased Electricity from Grid	kWh	4844828	-	-	-	3522.189
Purchased Renewable power consumption (Wind)	kWh	0	0	0	0	0.00
Total Scope-2 Market Based			-	-	-	3522.189

6.5. Category-wise Scope 3 Emissions

6.5.1. Consolidated emissions of all locations for Scope 3

Table 22: Category-wise emission breakdown for Scope 3 (Consolidated)

Scope 3	UOM	Activity Data	Total Emissions (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminum ingots	Kg	13590429.000	233048.68
2. Chemicals	Kg	129350.900	239.30
3. Mineral Turpentine Oil	Litre	796.417	671.38
5. Stearic Acid	Kg	257669.350	138.88
6. Xylene	kg	10692.000	18.71
7. Castor oil	Kg	1098.355	8.94
8. Nitric Acid	Kg	489.850	0.98
9. Sulfuric Acid	kg	8500.000	1.49
10. Naphtha	kg	27918.320	22.78
11. Diethylene Glycol	kg	274265.000	633.55
12. White Phosphorus	kg	358158.000	4656.05
13. Brass Powder	kg	729926.000	4985.39
14. Copper ingots	kg	278948.000	2301.32
15. Magnesium ingots	kg	143166.000	3994.33
16. Zinc ingots	kg	190733.000	507.35

Scope 3	UOM	Activity Data	Total Emissions (t-CO ₂ e)
17. Tin ingots	kg	13053.000	134.45
18. Nickel	kg	1008.000	17.54
19. Sodium chloride	kg	20100.000	5.43
20. Sodium Hydroxide	kg	10322.700	13.32
21. Metals	tons	101.500	387.30
22. Aluminium Alloy ingot	kg	17773.000	344.80
23. Toluene	kg	10214.000	16.44
24. Mineral Oil	kg	23280.000	32615.28
Packaging Materials			
1. MS Drum	Kg	1421436.200	2814.44
2. Polythene bags	Kg	1774018.875	5499.46
3. Paper bag	Kg	7010.250	6.89
4. Corrugated Box	Kg	43558.100	50.96
5. Tin Container	Kg	35592.010	366.60
6. HDPE Bag	Kg	1743.000	4.04
7. Jute	Kg	120.000	0.09
8. Fabric	Tonnes	0.013	0.29
9. Other packaging material	Tonnes	47.318	149.75
Quantity of food ,snacks and drinks	USD	77447.916	28.81
Consumables (For e.g. Machines spares parts, nuts, bolts and other material consumed)	USD	152909.288	17.58
Packaging Materials	USD	19647.000	10.69
Printing Paper	USD	3658.893	0.86
Stationary and Other materials	USD	2703.172	0.80
Stationary and Other materials	Kg	31.640	100.13
Coconut Oil	Kgs	46.000	0.07
Chemicals (Soap, cleaning agents, air fresheners etc.)	USD	1699.982	0.60
Chemicals (Soap, cleaning agents, air fresheners etc.)	Kg	5180.560	9.64
Quantity of other services (like AC servicing, plumbing, building maintenance, cleaning supplies, security, consulting, etc.)	USD	3090.616	0.68
Internet, Telephone, Mobile recharges	USD	21514.400	2.07
Total Emission Category -1			293828.17
Category 2: Capital Goods			
Electronic and Electrical Items	USD	143048.7751	14.01877996
Vehicle	USD	33586.45944	9.00117113
Equipment & Machinery	USD	2043223.837	377.9964099
Furniture	USD	3158.4	0.758016
Total Emission Category -2			401.774377

Scope 3	UOM	Activity Data	Total Emissions (t-CO2e)
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	145896.28	91.0524
Upstream emission from Petrol	Litre	1902.28	1.1540
Upstream emission from Furnace Oil	Litre	1022370.967	710.9465
Upstream emission from LPG	Tonnes	12.297	4.2953
Upstream Electricity	kWh	14214817	2380.7329
Electricity T&D Losses	kWh	14214817	534.9562
Total Emission Category -3			3723.13738
Category 4: Upstream T&D			
Truck	ton.km	61471357.8	1450.109
Ship	ton.km	2645808.00	7.937
Air	ton.km	414.06	0.056
Total Emission Category -4			1458.10
Category 5: Waste Generation			
Plastic Waste	ton	0.22	0.001954449
Oil Waste	ton	0.4	0.002564244
Chemical Sludge	ton	0.11	0.057236762
Paper Waste	ton	0.07	0.081507311
Metal Waste	ton	0.16	0.000202296
E Waste	ton	0.075	0.00066629
Food waste	ton	3	2.10062883
Total Emission Category -5			2.244760181
Category 6: Business Travel			
Business Travel: Rail	pax-km	13146	0.05863116
Business Travel: Air	pax-km	179154	31.4952732
Bus	pax-km	158248	17.16357808
Total Emission Category -6			48.71748244
Category 7: Employee Commute			
2 Wheeler - Petrol	km	2330248	264.8792902
2 Wheeler - EV	km	11988	0.2601396
Car-Petrol	km	61462	10.110499
Car-Diesel	km	33112	5.62374208
Bus	pax-km	1127100	146.511729
Auto	km	9216	1.2183552
Total Emission Category -7			428.603755
Category 9: Downstream T&D			
Truck	Tonn.kms	6968983.462	164.3983199
Ship	Tonn.kms	51502825.07	154.508
Total Emission Category -9			318.91

Scope 3	UOM	Activity Data	Total Emissions (t-CO ₂ e)
Total Scope 3 emissions			300209.65

6.5.2. Unit-Wise emissions for Scope 3

The Metal Powder Company Limited Unit-III, Kappalur

Table 23: Category-wise emission breakdown for Scope 3 (Mepco Unit-III)

Scope 3	UOM	Activity Data	Emission From Kappalur (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminium ingots	Kg	1570000.000	26922.360
2. Stearic Acid	kg	423.075	0.228
3. Castor oil	Kg	123.355	1.004
Consumables (For e.g. Machines spares parts, nuts, bolts and other material consumed)	USD	30961.50192	3.560572721
Stationary and Other materials	USD	144.42912	0.04275102
Chemicals (Soap, cleaning agents, air fresheners etc.)	USD	954.0624	0.338692152
Total Emission Category -1			26927.53
Category 2: Capital Goods			
Electronic and Electrical Items	USD	0	0
Vehicle	USD	0	0
Equipment & Machinery	USD	0	0
Furniture	USD	0	0
Total Emission Category -2			0
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	63395	39.56418555
Upstream emission from Petrol	Litre	47.02	0.028524213
Upstream emission from Furnace Oil	Litre	181647.9	126.3161332
Upstream Electricity	kWh	1065680	178.4827389
Electricity T&D Losses	kWh	1065680	40.10548776
Total Emission Category -3			384.4970696
Category 4: Upstream T&D			
Truck	ton.km	0	0
Ship	ton.km	0	0
Air	ton.km	0	0
Total Emission Category -4			0

Scope 3	UOM	Activity Data	Emission From Kappalur (t-CO ₂ e)
Category 5: Waste Generation			
Plastic Waste	ton	0	0
Oil Waste	ton	0	0
Chemical Sludge	ton	0	0
Paper Waste	ton	0	0
Metal Waste	ton	0	0
E Waste	ton	0	0
Food waste	ton	0	0
Total Emission Category -5			0
Category 6: Business Travel			
Business Travel: Rail	pax-km	0	0
Business Travel: Air	pax-km	0	0
Bus	pax-km	0	0
Total Emission Category -6			0
Category 7: Employee Commute			
2 Wheeler - Petrol	km	66816	7.59497472
Bus	pax-km	51840	6.7386816
Total Emission Category -7			14.33365632
Category 9: Downstream T&D			
Truck	Tonn.kms	0	0
Total Emission Category -9			0
Total Scope 3 emissions			27326.36

Madhya Pradesh Metal Powder Unit, Pithampur

Table 24: Category-wise emission breakdown for Scope 3 (MPMP Unit)

Scope 3	UOM	Activity Data	Emission From Pithampur (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminum ingots	Kg	1977235	33905.62578
2. Chemicals	Kg	5500.000	10.18
3. Mineral Turpentine Oil	Tonnes	380.023	320.36
4. Stearic Acid Kg	Kg	59000.000	31.80
Packaging Materials	USD	19647	10.687968
Printing Paper	USD	26.3984	0.006230022
Stationary and Other materials	USD	47.376	0.014023296

Scope 3	UOM	Activity Data	Emission From Pithampur (t-CO ₂ e)
Chemicals (Soap, cleaning agents, air fresheners etc.)	USD	745.92	0.2648016
Total Emission Category -1			34278.93
Category 2: Capital Goods			
Electronic and Electrical Items	USD	0	0
Vehicle	USD	0	0
Equipment & Machinery	USD	0	0
Furniture	USD	0	0
Total Emission Category -2			0
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	3425	2.138
Upstream emission from Petrol	Litre	165.24	0.100
Upstream emission from Furnace Oil	Litre	164057	114.084
Upstream emission from LPG	Tonnes	0.057	0.020
Upstream Electricity	kWh	4635700	776.399
Electricity T&D Losses	kWh	4635700	174.459
Total Emission Category -3			1067.09816
Category 4: Upstream T&D			
Truck	ton.km	2131465.079	50.28126121
Total Emission Category -4			50.28126121
Category 5: Waste Generation			
Plastic Waste	ton	0.02	0.000177677
Paper Waste	ton	0.02	0.023287803
Metal Waste	ton	0.05	6.32175E-05
Total Emission Category -5			0.023528698
Category 6: Business Travel			
Business Travel: Rail	pax-km	0	0
Business Travel: Air	pax-km	0	0
Bus	pax-km	0	0
Total Emission Category -6			0
Category 7: Employee Commute			
2 Wheeler - Petrol	km	136224	15.48458208
Total Emission Category -7			15.48458208
Category 9: Downstream T&D			
Truck	Tonn.kms	1741.39	0.04107939
Total Emission Category -9			0.04107939
Total Scope 3 emissions			35411.96

Nalco Metal Products Limited Unit , Nilakottai

Table 25: Category-wise emission breakdown for Scope 3 (NALCO Unit)

Scope 3	UOM	Activity Data	Emission From NALCO (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminum ingots	Kg	3054915	52385.68242
2. Chemicals	Kg	2973	5.50005
3. Stearic Acid	Kg	41351	22.288189
Packaging Materials			
1. MS Drum	Kg	200687.8	397.361844
2. Polythene bags	Kg	1956.91	6.066421
3. Paper bag	Kg	680	0.66844
4. Corrugated Box	Kg	8316	9.72972
5. Tin Container	Kg	2	0.0206
6. HDPE Bag	Kg	1743	4.04376
Quantity of food ,snacks and drinks	Tonnes	345.53	1278.945982
Consumables (For e.g. Machines spares parts, nuts, bolts and other material consumed)	USD	32948.58559	3.789087343
Printing Paper	USD	376.4949288	0.088852803
Stationary and Other materials	USD	1419.017796	0.420029268
Chemicals (Soap, cleaning agents, air fresheners etc.)	Kg	305	0.5673
Quantity of other services (like AC servicing, plumbing, building maintenance, cleaning supplies, security, consulting, etc.)	USD	3090.61566	0.683026061
Internet, Telephone, Mobile recharges	USD	355.91784	0.034168113
Total Emission Category -1			52838.39
Category 2: Capital Goods			
Electronic and Electrical Items	USD	119495.3455	11.71054386
Vehicle	USD	18341.28	4.91546304
Equipment & Machinery	USD	226157.2658	41.83909418
Total Emission Category -2			58.46510108
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	15939.28	9.948
Upstream emission from Petrol	Litre	87	0.053
Upstream emission from Furnace Oil	Litre	281847.9167	195.994
Upstream Electricity	kWh	2304593	385.979
Electricity T&D Losses	kWh	2304593	86.730

Scope 3	UOM	Activity Data	Emission From NALCO (t-CO ₂ e)
Total Emission Category -3			678.70
Category 4: Upstream T&D			
Truck	ton.km	41567974.62	980.5885214
Total Emission Category -4			980.5885214
Category 5: Waste Generation			
Plastic Waste	ton	0.150	0.001
Oil Waste	ton	0.400	0.003
Chemical Sludge	ton	0.110	0.057
Total Emission Category -5			0.061133585
Category 6: Business Travel			
Business Travel: Rail	pax-km	0	0
Business Travel: Air	pax-km	0	0
Bus	pax-km	0	0
Total Emission Category -6			0
Category 7: Employee Commute			
2 Wheeler - Petrol	km	160198	18.20970666
2 Wheeler - EV	km	468	0.0101556
Car-Petrol	km	26038	4.283251
Car-Diesel	km	20440	3.4715296
Bus	pax-km	28380	3.6891162
Total Emission Category -7			29.66375906
Category 9: Downstream T&D			
Truck	Tonn.kms	445466.45	10.50855356
Total Emission Category -9			10.50855356
Total Scope 3 emissions			54596.38

Mepco Speciality Products Unit, Kalligudi

Table 26: Category-wise emission breakdown for Scope 3 (MSP Unit)

Scope 3	UOM	Activity Data	Emission from MSP unit (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminum ingots	Kg	412266.000	7069.54
2. Chemicals	Kg	953.500	1.76
3. Mineral Turpentine Oil	Litre	177.162	149.35
4. Stearic Acid	Kg	13301.500	7.17

Scope 3	UOM	Activity Data	Emission from MSP unit (t-CO ₂ e)
5. Xylene	kg	2151.000	3.76
6. Naphtha	kg	10040.320	8.19
Packaging Materials			
1. MS Drum	Kg	13250	26.235
2. Polythene bags	Kg	12203	37.8293
3. Corrugated Box	Kg	9475	11.08575
Printing Paper	USD	147.4	0.0347864
Stationary and Other materials	Kg	31.64	100.1336547
Chemicals (Soap, cleaning agents, air fresheners etc.)	Kg	1091.3	2.029818
Internet, Telephone, Mobile recharges	USD	854.48256	0.082030326
Total Emission Category -1			7417.21
Category 2: Capital Goods			
Electronic and Electrical Items	USD	0	0
Vehicle	USD	0	0
Equipment & Machinery	USD	0	0
Furniture	USD	0	0
Total Emission Category -2			0
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	7600	4.743084
Upstream emission from Petrol	Litre	47.02	0.028524213
Upstream emission from Furnace Oil	Litre	18.15	0.012621329
Upstream Electricity	kWh	1364016	228.4487947
Electricity T&D Losses	kWh	1364016	51.33297706
Total Emission Category -3			284.5660013
Category 4: Upstream T&D			
Truck	ton.km	1138629.524	26.86027047
Ship	ton.km	0	0
Air	ton.km	0	0
Total Emission Category -4			26.86027047
Category 5: Waste Generation			
Plastic Waste	ton	0	0
Oil Waste	ton	0	0
Chemical Sludge	ton	0	0
Paper Waste	ton	0	0
Metal Waste	ton	0	0
E Waste	ton	0	0
Food waste	ton	0	0

Scope 3	UOM	Activity Data	Emission from MSP unit (t-CO ₂ e)
Total Emission Category -5			0
Category 6: Business Travel			
Business Travel: Rail	pax-km	0	0
Business Travel: Air	pax-km	0	0
Bus	pax-km	0	0
Total Emission Category -6			0
Category 7: Employee Commute			
2 Wheeler - Petrol	km	143970	16.3650699
2 Wheeler - EV	km	0	0
Car-Petrol	km	0	0
Car-Diesel	km	0	0
Bus	pax-km	0	0
Auto	km	0	0
Total Emission Category -7			16.3650699
Category 9: Downstream T&D			
Truck	Tonn.kms	376287.075	8.876612099
Total Emission Category -9			8.876612099
Total Scope 3 emissions			7753.87

The Metal Powder Company Limited Unit, Maravankulam

Table 27: Category-wise emission breakdown for Scope 3 (Mepco Unit)

Scope 3	UOM	Activity Data	Emission from Mepco Unit (t-CO ₂ e)
Category 1: Purchase goods & services			
Raw Materials			
1. Aluminium ingots	Kg	6576013.000	112765.471
2. Chemicals	Kg	119924.400	221.860
3. Mineral Turpentine Oil	Tonnes	239.231	201.672
5. Stearic Acid	Kg	143593.775	77.397
6. Xylene	kg	8541.000	14.947
7. Castor oil	Kg	975.000	7.937
8. Nitric Acid	Kg	489.850	0.980
9. Sulfuric Acid	kg	8500.000	1.488
10. Naphtha	kg	17878.000	14.588
11. Diethylene Glycol	kg	274265.000	633.552
12. White Phosphorus	kg	358158.000	4656.054

Scope 3	UOM	Activity Data	Emission from Mepco Unit (t-CO2e)
13. Brass Powder	kg	729926.000	4985.395
14. Copper	kg	278948.000	2301.321
15. Magnesium ingots	kg	143166.000	3994.331
16. Zinc	kg	190733.000	507.350
17. Tin	kg	13053.000	134.446
18. Nickel	kg	1008.000	17.539
19. Sodium chloride	kg	20100.000	5.427
20. Sodium Hydroxide	kg	10322.700	13.316
21. Metals	Tonnes	101.500	387.302
22. Aluminium Alloy ingot	kg	17773.000	344.796
23. Toluene	kg	10214.000	16.445
24. Mineral Oil	kg	23280.000	32615.280
Packaging Materials			
1. MS Drum	Kg	1207498.4	2390.846832
2. Polythene bags	Kg	1759858.965	5455.562792
3. Paper bag	Kg	6330.25	6.22263575
4. Corrugated Box	Kg	25767.1	30.147507
5. Tin Container	Kg	35590.01	366.577103
6. Jute	Kg	120	0.09396
7. Fabric	Tonnes	0.012987	0.28973997
8. Other packaging material	Tonnes	47.3183325	149.7521355
Quantity of food, snacks and drinks	USD	455.9376	0.169608787
Consumables (For eg. Machines spares parts, nuts, bolts and other material consumed)	USD	88999.200	10.235
Printing Paper	USD	3108.6	0.7336296
Stationary and Other materials	USD	1092.349278	0.323335386
Coconut Oil	Kgs	46	0.07176
Chemicals (Soap, cleaning agents, air fresheners etc.)	Kg	3784.26	7.0387236
Internet, Telephone, Mobile recharges	USD	20304	1.949184
Total Emission Category -1			172366.10
Category 2: Capital Goods			
Electronic and Electrical Items	USD	23553.4296	2.308236101
Vehicle	USD	15245.17944	4.08570809
Equipment & Machinery	USD	1817066.571	336.1573157
Furniture	USD	3158.4	0.758016
Total Emission Category -2			343.3092759
Category 3: Fuel & Energy Related			
Upstream emission from Diesel	Litre	55537	34.66008633

Scope 3	UOM	Activity Data	Emission from Mepco Unit (t-CO2e)
Upstream emission from Petrol	Litre	1556	0.94393184
Upstream emission from Furnace Oil	Litre	394800	274.539972
Upstream emission from LPG	Tonnes	12.24	4.275344117
Upstream Electricity	kWh	4844828	811.4238522
Electricity T&D Losses	kWh	4844828	182.3288323
Total Emission Category -3			1308.172019
Category 4: Upstream T&D			
Truck	ton.km	16633288.579	392.379
Ship	ton.km	2645808.000	7.937
Air	ton.km	414.060	0.056
Total Emission Category -4			400.37
Category 5: Waste Generation			
Plastic Waste	ton	0.05	0.000444193
Paper Waste	ton	0.05	0.058219508
Metal Waste	ton	0.11	0.000139079
E Waste	ton	0.075	0.00066629
Food waste	ton	3	2.10062883
Total Emission Category -5			2.160097899
Category 6: Business Travel			
Business Travel: Rail	pax-km	13146	0.05863116
Business Travel: Air	pax-km	179154	31.4952732
Bus	pax-km	158248	17.16357808
Total Emission Category -6			48.71748244
Category 7: Employee Commute			
2-Wheeler - Petrol	km	1823040	207.2249568
2-Wheeler - EV	km	11520	0.249984
Car-Petrol	km	35424	5.827248
Car-Diesel	km	12672	2.15221248
Bus	pax-km	1046880	136.0839312
Auto	km	9216	1.2183552
Total Emission Category -7			352.7566877
Category 9: Downstream T&D			
Truck	Tonn.kms	6145488.547	144.9720748
Ship	Tonn.kms	51502825.070	154.508
Total Emission Category -9			299.48
Total Scope 3 emissions			175121.07

7. References

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