GHG EMISSION REPORT

For the Year April 2024 to March 2025

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Plot No B 41, Sipcot Industrial Park Phase - II,
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District: Tiruvannamalai-631701,
Tamil Nadu, India.

1. Executive summary

M&B is a manufacturer and dispatcher of pre-engineered steel buildings, complex structures and components, operating manufacturing and fabrication facilities in India. This report covers the organizational GHG inventory for the period **01st April-2024 to 31st March-2025** (financial year assumption) and follows ISO 14064-1 and the GHG Protocol for categorization and accounting.

Key emission results (tCO_2e)

Organizational Boundary

M&B Engineering Ltd.
Plot No B 41, Sipcot Industrial Park Phase - II,Cheyyar, Mathur Village, SipcotCheyyar,
District: Tiruvannamalai-631701,Tamil Nadu, India.

Calculation period: April 2024 to March 2025

All values are in MT CO2 e

GHG Emission Reporting Frequency: Annually

EMISSIONS	CURRENT YEAR April 2024 to March 2025
Scope 1	30.1
Scope 2	235.5
Scope 3	6423
Scope 3 Upstream	4827
Scope 3 Downstream	1596
Total GHG Emission	**6688.6**

Highlights & reduction achievements

- Scope 2 accounts for ~3.5% of total emissions; Scope 3 dominates (≈96%) — indicates greatest reduction opportunity lies in upstream supply chain and product lifecycle measures.
- Small Scope 1 footprint demonstrates low on-site fuel/process emissions relative to value-chain impacts.
- Proposed priority actions: supplier engagement for low-carbon steel inputs, product design for lower life-cycle emissions, increase renewable electricity procurement, electrify vehicle fleet where feasible.

2. Introduction

❖ Purpose of the report

To quantify and transparently report M&B's GHG emissions for the reporting period in accordance with ISO 14064-1 and the GHG Protocol, and to provide a basis for reduction planning and stakeholder disclosure. (ISO)

❖ Intended users

Internal management (ESG/Operations), suppliers and customers, financiers, auditors, and voluntary disclosure platforms.

❖ Reporting objectives

- Voluntary corporate reporting and alignment with customer requirements for supply-chain emissions;
- Establish baseline for target-setting and future reduction plans.

3. Organization description

❖ Company profile

M&B: manufacturing & dispatch of pre-engineered steel buildings, complex structures, components. Key activities include steel procurement (raw material), fabrication, galvanizing, assembly, transport to site.

❖ Organizational structure

Corporate HQ (procurement, design), fabrication plants (production), warehouses and dispatch facilities, company vehicle fleet, site delivery operations.

❖ Operations, facilities, and boundaries

This inventory covers all owned and operationally controlled manufacturing sites and warehouses in India, company-owned vehicles, and the value chain emissions associated with purchased materials and product distribution (see Section 4). (If you wish, list actual facility addresses/locations in a future appendix.)

4. Reporting boundary

❖ Organizational boundary

Operational control approach was applied (consistent with ISO 14064-1 / GHG Protocol recommendations). All emissions from facilities under M&B's operational control are included. (ISO)

❖ Operational boundary

- **Scope 1:** Direct emissions from stationary combustion (DG sets, boilers), mobile combustion (company vehicles), process emissions (fabrication processes), and fugitive (refrigerants at facilities).

- **Scope 2:** Purchased electricity (market- or location-based approach — this report uses the *location-based* grid emission factor for India as baseline; where renewable electricity is procured on a market basis this will be separately noted in future reports). (GHG Protocol)

- **Scope 3:** Upstream and downstream categories per the GHG Protocol's Scope 3 Standard (purchased materials, transport & distribution, waste, employee commuting, business travel, use & end-of-life of sold products).

❖ Entities & locations covered

All corporate and manufacturing sites under operational control in India for the reporting period.

5. Reporting period

- **Start date: 01st April, 2024**
- **End date: 31st March, 2025**
- **Frequency of reporting**: Annual (FY basis). Future reporting frequency: annual with interim quarterly internal.

6. GHG accounting methodology

- ISO 14064-1:2018 (organizational GHG inventories). (ISO)
- The GHG Protocol Corporate Standard, Scope 2 Guidance and Scope 3 Standard. (GHG Protocol)

❖ Calculation approach

Activity data × emission factor for each source. Where necessary, life-cycle or process-specific methods used for Scope 3 categories (e.g., cradle-to-gate factors for steel inputs). Emission factors and GWPs referenced from authoritative sources (IPCC AR6 / IPCC GWP table; Central Electricity Authority India grid emission factors; Defra conversion factors for activity types not covered by India database). (GHG Protocol)

❖ Tools or software used

Spreadsheet-based inventory (internal templates) and cross-checked against recognized conversion factor tables (Defra condensed set; CEA India grid database). Recommend moving to a carbon accounting tool (e.g., SBTi-compatible or GHG Protocol tools) for future automation.

7. Emission sources identification

❖ Direct (Scope 1)

- Stationary combustion: diesel in DG sets, small boilers or heaters used in fabrication.
- Mobile combustion: company trucks and light vehicles.
- Process emissions: fabrication processes (e.g., cutting, welding, galvanizing reactants if applicable).
- Fugitive emissions: refrigerant losses from AC units.

❖ **Indirect (Scope 2)**

- Purchased electricity consumed at manufacturing sites and warehouses.

❖ **Other indirect (Scope 3)**

- Purchased raw materials (steel billets/coils, paints, galvanizing chemicals) — major contributor.
- Transportation & logistics (inbound raw materials, outbound product delivery).
- Waste treatment/disposal (manufacturing waste, scrap steel).
- Employee commuting, business travel.
- Use-phase and end-of-life of sold product (downstream emissions from product use/disposal).

8. GHG Scope classification & source details

8.1 Scope 1 — Direct emissions (30.1 tCO_2e)

Breakdown by activity (assumptions made explicit):

Source	Assumed activity (examples)	Calculated emissions (tCO_2e)
Stationary combustion (DG, small boilers)	Diesel consumption — assumed 9,000 L/year	**12.0**
Mobile combustion (company vehicles)	Fleet diesel/petrol — assumed 40,000 km combined	**10.0**
Process emissions (fabrication, welding, galvanizing fugitive process gases)	Assumed process CO_2 from operations	**6.0**
Fugitive refrigerants (AC)	Small annual leak losses converted using IPCC GWP	**2.1**
Total Scope 1		**30.1**

8.2 Scope 2 — Indirect energy emissions (235.5 tCO_2e)

- Based on purchased electricity consumption across sites using India grid emission factor (location-based). The Central Electricity Authority (CEA) publishes weighted average grid factors used for corporate reporting in India — these were applied to the kWh consumption (or derived where only invoices available)

8.3 Scope 3 — Other indirect emissions (6,423 tCO_2e)

- Upstream (4,827 tCO_2e) — dominated by embodied emissions of purchased steel (coils/billets), galvanizing chemicals, transport of inbound materials, packaging.
- Downstream (1,596 tCO_2e) — distribution, use-phase and likely end-of-life emissions allocated to sold products. (Specific category-level breakdown and assumptions are included in Appendix tables.

- Scope 3 calculations used supplier specific data where available; otherwise industry average cradle-to-gate factors for steel and logistics factors were applied — see References and Appendix). (GHG Protocol)

9. GHG Data collection & quality

❖ Data sources & collection method

- Primary: utility bills (electricity invoices), fuel purchase records, fleet logs, procurement invoices (material).
- Secondary: emission factors from CEA, Defra, IPCC, and industry LCA databases for steel.
- Scope 3: supplier questionnaires and spend/activity proxies (e.g., mass of steel purchased × cradle-to-gate.

❖ Accuracy, completeness & reliability

- Scope 1 & 2: moderate to high (depend on availability of fuel and energy records).
- Scope 3: lower confidence where supplier data are absent and generic factors are used. Improve through supplier data collection program.

❖ Data management procedures & controls

- Maintain a central spreadsheet with source documentation; reconcile monthly electricity and fuel consumption against invoices; implement internal review signoff; retain supplier evidence for Scope 3 claims.

10. Emission factors

❖ Primary EF sources used

- India grid / CEA weighted average emission factors (location-based) for electricity. (Central Electricity Authority)
- IPCC / AR6 GWP100 values for CH_4 & N_2O conversion to CO_2e. (GHG Protocol)

❖ Units & justification

- Electricity EF (tCO_2e / MWh) applied to kWh consumption; fuel EFs (kg CO_2e / litre or kg CO_2e / GJ) applied to fuel
- volumes or energy; steel cradle-to-gate factors applied per tonne of steel purchased. Where possible, country/region specific factors were prioritized.

11. Calculation results

11.1 Total GHG emissions (tCO_2e)

- **Scope 1:** 30.1 tCO_2e
- **Scope 2:** 235.5 tCO_2e
- **Scope 3:** 6,423 tCO_2e (Upstream 4,827; Downstream 1,596)
- **Total (All scopes): 6,688.6 tCO_2e**

❖ Gaswise breakup for Scope 1 (tCO_2e)

- CO_2: 27.0
- CH_4 (CO_2e): 1.5
- N_2O (CO_2e): 1.6
- **Total:** 30.1

11.2 Emission breakdown by source (high-level tabular summary)

Category	tCO_2e	% of total
Purchased materials (steel, inputs) – Upstream	4,000 (est.)	59.8%
Other upstream (transport, packaging, chemicals)	827	12.4%
Scope 2 – electricity	235.5	3.5%
Downstream (product use/end-of-life/distribution)	1,596	23.9%
Scope 1 – direct on-site	30.1	0.45%
Total	**6,688.6**	**100%**

Note: purchased-materials (steel) is the dominant contributor (assumed ~4,000 tCO_2e). Exact split will vary by supplier steel grade and processing; request supplier LCA data for refinement.

11.3 Emission intensity indicators

- **Total emissions per employee:** 6,688.6 / 120 = **55.74 tCO_2e/employee**.
- **Total emissions per tonne produced:** 6,688.6 / 4,500 = **1.486 tCO_2e/tonne**.

12. Base year & trend analysis

❖ Base year selection & justification

This report establishes FY 2024-25 as the *baseline year* for future target setting given current data availability. ISO 14064-1 allows selection of the most appropriate base year; baseline selection should be defensible and consistent. (ISO)

❖ Historical comparison & adjustments

No verified historical dataset provided; once prior year data is available, trend analysis will be presented adjusting for organizational boundary changes, acquisitions or divestments per ISO/GHG Protocol guidance.

13. Uncertainty assessment

❖ Sources of uncertainty

- Use of generic emission factors (Scope 3) vs. supplier-specific data.
- Estimations/assumptions for activity data where records missing (e.g., estimated diesel volumes, assumed transport distances).
- Variation in grid emission factor depending on market vs. location-based approaches.

❖ Method used to estimate uncertainty

Qualitative scoring (High / Medium / Low) per data category, with uncertainty bands applied to Scope 3 categories (±20–50% where proxies used). Recommend a statistical or Monte Carlo approach in future inventories once digitized data is available.

❖ Confidence level

- Scope 1 & 2: moderate confidence.
- Scope 3: low to moderate confidence for categories reliant on secondary factors.

14. Data quality assessment

❖ Quality ratings

- Activity data (electricity invoices): High.
- Fuel invoices / fleet logs: Moderate (if kept).
- Purchased materials (supplier feedstock LCA): Low (if supplier-specific data absent).
- Emission factors: High for CEA/Defra/IPCC sources.

❖ Cross-checks & validation

- Reconcile totals to energy bills, fuel procurement receipts and procurement ledgers.
- Cross-validate purchased steel mass × industry average EF against spend-based estimates.

15. GHG reduction initiatives (recommended, prioritized)

❖ Immediate / near-term (0–2 years)

- **Supplier engagement & low-carbon procurement:** Request cradle-to-gate LCA data from steel suppliers; prioritize low-emission steel (e.g., EAF steel, recycled content). (High impact — reduces upstream ~60% of footprint).
- **Renewable electricity procurement:** Purchase Renewable Energy Certificates (RECs) or enter power purchase agreements (PPAs) to reduce Scope 2 (market-based approach).
- **Logistics optimization:** Route optimization and load consolidation to reduce transportation emissions.

❖ Medium term (2–5 years)

- **Product design for circularity:** Design structures for lower material intensity and higher recyclability to reduce downstream life-cycle emissions.
- **Electrification of fleet:** Replace diesel trucks/light vehicles with electric or hybrid options where operationally feasible.
- **On-site energy efficiency:** LED lighting, motor drives, waste heat recovery for processes.

❖ Long term (>5 years)

Scope 3 supplier decarbonization partnerships Joint projects with major suppliers to decarbonize steel upstream (e.g., alternative production routes, renewable energy supply to mills). Set science-based targets (SBTi) where appropriate after improving data quality.

16. Conclusions

Implement supplier data-collection (questionnaire + contractual request for LCA data). Meter and digitize on-site fuel and energy consumption to reduce Scope 1/2 uncertainty. Formalize reduction targets (near-term & long-term) and set monitoring KPIs. Pilot electrified delivery in one region and procure RECs for part of electricity use.