KUDUMA PRECISIONS

No. 252, BM Shankrappa Industrial Estate, Srigandadakavalu, Sukadakatte,
Vishwaneedam Post, Banglore - 560091, Karnataka, India.

GHG EMISSION REPORT

(APRIL 2024 TO MARCH 2025)

Form No : **KP/ESG/310**

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Date : **10th April, 2025**

KUDUMA PRECISIONS ★ BANGALORE-79 ★

Prepared By: P. Indhu
Designation: Manager

Approved By: R.Kantharaju
Designation: Proprietor

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1. Introduction

KP, based in India, manufactures injection moulds, jigs & fixtures, mould bases, precision engineering components, injection-moulded plastic parts, and sub-assemblies for industrial applications. Integrating ESG principles, KP is committed to minimizing its environmental footprint through responsible energy and resource management. This Greenhouse Gas (GHG) Emissions Report quantifies and discloses emissions from Scope 1 (direct), Scope 2 (purchased electricity), and Scope 3 (other indirect) sources in accordance with the GHG Protocol. Using IPCC AR5 Global Warming Potentials and national emission factors, the report establishes a transparent baseline to track progress, identify reduction opportunities, and support KP's sustainable manufacturing and climate-action objectives.

2. GHG emission overview

Organizational Boundary

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GHG Emission Reporting Frequency: Annually

3. Reporting boundary & justification

Boundary Type	Description	Inclusion / Scope	Justification	Suggested Evidence
Organisational Boundary (Operational Control)	Includes all KP facilities and operations where KP has direct operational control over energy use and emissions, including manufacturing plants, warehouses, and owned/leased vehicles.	Scope 1, Scope 2, and applicable Scope 3 activities under operational control.	The operational control approach is consistent with the GHG Protocol Corporate Standard, ensuring accountability where KP can influence energy use and emission reduction.	List of owned/leased facilities and vehicles; organization chart; operational control declaration.
Operational Boundary	Defines emission sources categorized as Scope 1 (direct), Scope 2 (indirect from purchased energy), and Scope 3 (other indirect).	Scope 1: Stationary combustion, mobile combustion, refrigerant leaks. Scope 2: Purchased electricity (location- and market-based).	These sources represent material emission activities relevant to a precision manufacturing organization and align with the GHG Protocol	Energy bills, fuel consumption records, refrigerant logs, supplier data, transport invoices.

		Scope 3: Upstream (purchased goods & services, transport, waste, business travel) and Downstream (distribution, product use, end-of-life).	Scope 3 Standard.	
Geographical Boundary	Physical locations within India where KP operates and exerts operational control.	All Indian manufacturing facilities, warehouses, and vehicles. Subsidiaries/JVs included or excluded based on control.	Focused on Indian operations to maintain data integrity and availability; aligned with the operational control approach.	Facility addresses; control and ownership documents; site inventory.
Temporal Boundary	Defines the period covered by the emissions inventory.	One full fiscal/reporting year (e.g., April 1, 2024 – March 31, 2025).	Consistency with corporate reporting cycles ensures accurate year-on-year comparison and verification.	Annual report, audited financial calendar, meter readings, and fuel/electricity bills covering the period.
Materiality Approach (Scope 3)	Identifies significant Scope 3 categories based on materiality and influence.	Categories contributing >5% of total emissions or with significant influence — primarily purchased goods & services, inbound transport, use-phase, and waste.	Focuses on emission hotspots to ensure efficient data collection and reporting transparency as per the GHG Protocol Scope 3 Guidance.	Supplier questionnaires, spend analysis, life-cycle emission factors, procurement data.

4. GHG Emissions Summary (MT CO2e)

Calculation period: April 2024 to March 2025
All values in MT CO2e

GHG Emission Reporting Frequency: Annually

EMISSIONS	CURRENT YEAR April 2024 to March 2025
Scope 1	2.17
Scope 2	152.728
Scope 3	1043.841
Scope 3 Upstream	575.098
Scope 3 Downstream	468.743
Total GHG Emission	**1,198.739**

5. SBTi based Targets

In-Scope Category	Baseline (FY 2024–25)	SBTi Requirement	Target (Near-Term: 2030)	Target (Long-Term: 2050)	Key Levers / Actions
Scope 1 (Direct Emissions)	2.17 tCO_2e	Minimum 42% absolute reduction by 2030 from base year (aligned to 1.5°C pathway).	Reduce Scope 1 emissions by ≥42% (to ~1.26 tCO_2e) by FY 2030.	Achieve net-zero direct emissions through full transition to renewable fuels and electrification by FY 2050.	Replace diesel gensets with solar/biogas hybrids, switch to electric or hybrid vehicles, adopt energy-efficient air compressors, leak detection for refrigerants.
Scope 2 (Indirect from Purchased Electricity)	152.728 tCO_2e	Minimum 42% absolute reduction by 2030 from base year (1.5°C pathway).	Reduce Scope 2 emissions by ≥42% (to ~88.58 tCO_2e) by FY 2030.	100% renewable electricity (RE100 alignment); zero Scope 2 emissions by FY 2050.	On-site solar PV installation, green power purchase agreements, RECs, LED and VFD upgrades.

Scope 3 Upstream (Purchased Goods & Services, Transport, Waste, Business Travel)	575.098 tCO_2e	At least 25% of suppliers (by emissions) to set science-based targets by 2028; achieve 30% absolute reduction in key categories by 2030.	Reduce Scope 3 Upstream emissions by ≥30% (to ~328.12 tCO_2e) by FY 2030.	Achieve 90–100% supplier alignment with SBTi and net-zero upstream emissions by 2050.	Engage suppliers on low-carbon materials, green logistics, local sourcing, circular design, supplier SBTi training.
Scope 3 Downstream (Distribution, Use of Sold Products, End-of-Life)	468.743 tCO_2e	Reduce product-related emissions intensity (per unit sold) by ≥25% by 2030 and target net-zero by 2050.	Reduce downstream emissions by ≥25% (to ~431.32 tCO_2e) by FY 2030.	Achieve net-zero product lifecycle emissions by 2050 through circularity and material efficiency.	Design for recyclability, lightweighting, customer partnerships for take-back and reuse, digital lifecycle tracking.
Total Scope 3	1,043.841 tCO_2e	SBTi recommends ≥30% absolute reduction by 2030 and net-zero by 2050.	Reduce Scope 3 by ≥30% (to ~730.69 tCO_2e) by FY 2030.	Net-zero value chain by FY 2050.	Supplier decarbonization programs, product redesign, logistics optimization.
Overall Corporate Emissions (Scope 1+2+3)	1,198.739 tCO_2e	Combined reduction consistent with 1.5°C (≥42% Scope 1+2; ≥30% Scope 3 by 2030).	Achieve ~35% overall reduction (to ~779 tCO_2e) by FY 2030.	Achieve Net-Zero across all scopes by FY 2050.	Energy transformation, renewable sourcing, supplier collaboration, carbon offsetting for residuals.

6. Notes & Caveats

The GHG emissions and targets presented for KP are based on the FY 2024–25 verified inventory and align with the SBTi 1.5°C pathway. Scope 1 and 2 emissions rely on measured fuel use, electricity consumption, and refrigerant records, while Scope 3 uses a combination of supplier data, spend-based estimates, and emission factors. Uncertainties exist due to incomplete supplier data, assumptions in refrigerant leaks, and variability in emission factors. Targets assume continued operational growth and technological feasibility of low-carbon solutions. Achieving long-term net-zero depends on supplier engagement, renewable energy adoption, circular product design, and residual emissions offsetting using certified removals.

7. Scope 3 Categories: Reporting Boundary & Justification

Scope 3 Category	Included? (Yes/No)	Reporting Boundary	Justification
Purchased goods & services	Yes	All raw materials, components, and outsourced manufacturing inputs procured by KP in India.	Represents the largest upstream emissions contributor for manufacturing; material and within influence of KP's supplier engagement program.
Capital goods	No	Excludes machinery and equipment emissions outside operational control.	Emissions considered low relative to total footprint; data collection challenges.
Fuel- and energy-related activities (not in Scope 1 or 2)	Yes	Upstream extraction, production, and transportation of fuels and electricity consumed on-site.	Necessary to capture full life-cycle impact of energy use; relevant per GHG Protocol.
Upstream transportation & distribution	Yes	Emissions from inbound logistics of raw materials and components.	KP can influence through transport mode selection, consolidation, and supplier contracts.
Waste generated in operations	Yes	Emissions from treatment and disposal of operational waste (hazardous, non-hazardous).	Operationally material and under KP's control via waste reduction and recycling initiatives.
Business travel	Yes	Employee air, rail, and road travel for business purposes.	Contributes to indirect emissions and is measurable via expense and travel records; actionable reduction potential.
Employee commuting	No	Not included	Emissions considered immaterial for current reporting boundary; data collection limited.
Upstream leased assets	No	Excluded	KP does not lease material assets with significant emissions upstream.
Downstream transportation & distribution	Yes	Emissions from delivery of finished products to customers and distribution centers.	Material to product lifecycle and manageable through logistics optimization.
Processing of sold products	No	Excluded	KP's products are industrial components; processing emissions occur at customer sites beyond KP control.

Use of sold products	Yes	Emissions from energy consumption of products during use phase where applicable.	Material for some injection-molded parts; KP can reduce via design for efficiency.
End-of-life treatment of sold products	Yes	Emissions from recycling, disposal, or incineration of products after customer use.	Supports circular economy initiatives; relevant for full Scope 3 assessment.
Downstream leased assets	No	Excluded	KP does not lease out significant assets to customers.
Franchises	No	Excluded	KP has no franchise operations.
Investments	No	Excluded	Not applicable; KP does not hold material investment portfolios affecting emissions.

8. Scope 3 Quantification Table

Scope 3 Category	Activity Data (Examples)	Methodology Used (Emission Factor Source / Tool)	Remarks
Purchased goods & services	Quantity of raw materials, components, plastics (kg or tonnes), purchased parts, outsourced machining volumes	DEFRA 2024 emission factors, supplier-specific carbon data, GHG Protocol Scope 3 Standard	Largest contributor to Scope 3; emission factor choice depends on material type (plastic, steel, aluminum).
Fuel- and energy-related activities	Upstream emissions for diesel, natural gas, electricity	DEFRA 2024 fuel lifecycle EF, IPCC AR6 GWPs	Included to capture cradle-to-gate energy emissions not in Scope 1/2.
Upstream transportation & distribution	Inbound transport (km × tonnage by truck/rail/ship)	DEFRA 2024 or GHG Protocol logistics EF ($kgCO_2e$/t-km)	Focus on suppliers' logistics; mode of transport impacts emission factor.
Waste generated in operations	Tonnes of hazardous & non-hazardous waste sent to landfill, incineration, recycling	DEFRA 2024 Waste EF, WARM Tool, GHG Protocol Scope 3	Includes both disposal and treatment; reduction possible through recycling.
Business travel	Air, rail, road travel distances	DEFRA 2024 travel EF,	Travel data collected from

	(km), flight class, vehicle fuel consumption	ICAO carbon emissions calculator	employee expense reports; small fraction of total emissions.
Downstream transportation & distribution	Delivery of finished products (km × tonnes by truck/rail/ship)	DEFRA 2024 logistics EF, GHG Protocol Scope 3	Emissions influenced by transport mode, route optimization, consolidation.
Use of sold products	Electricity consumed by industrial parts during customer operations	Product life-cycle analysis, supplier data, DEFRA 2024 EF for electricity	Relevant for energy-intensive plastic or electronic components.
End-of-life treatment of sold products	Tonnes of products disposed, recycled, or incinerated at customer end-of-life	DEFRA 2024 waste treatment EF, GHG Protocol Scope 3	Supports circular economy assessment; KP can encourage take-back or recycling programs.

9. Emission factors, GWPs and references used

Primary GWP source (100-year time horizon): IPCC AR6 GWPs (the recommended/latest). Examples used above: CH_4 non-fossil = 27.0, N_2O = 273, HFC-134a = 1530, CO_2 = 1. GHG Protocol

Conversion / emission factors guidance (for fuels, electricity, refrigerants, scope 3 lifecycle factors): use the GHG Protocol standards and the Government conversion factors (DEFRA 2024) or country-specific factors (India Central Electricity Authority / Ministry of Power) where appropriate. Examples and methodology: GHG Protocol corporate standards & HFC calculation guidance; DEFRA conversion factors (2024 condensed set). Practical sources you should use when calculating / evidencing numbers:

- IPCC / GWP table (AR6) — for GWP100 values. GHG Protocol
- GHG Protocol Corporate Standard and HFC guidance (for scope definitions and fugitive HFC calculations). GHG Protocol+1
- DEFRA 2024 conversion factors (good default for electricity/fuels/waste life-cycle factors) and methodology PDF.

10. Statement of Uncertainty

An uncertainty assessment was conducted following GHG Protocol guidance. Scope 1 combustion emissions, based on metered fuel and invoices, are estimated within ±5–15%, while refrigerant fugitive emissions carry higher uncertainty (±30–100%) due to limited leak measurement. Scope 2 uncertainty depends on electricity supplier data; location-based grid factors may vary annually, whereas market-based factors are more precise. Scope 3 emissions exhibit larger uncertainty (±20–50%) as they rely on spend-based estimates, secondary data, and supplier variability. Where feasible, primary supplier data were requested to improve accuracy. All uncertainties combine measurement errors and emission factor variability to provide a transparent emission inventory.

11. Conclusion

KP's GHG emissions assessment demonstrates a clear understanding of the company's carbon footprint across Scope 1, Scope 2, and Scope 3 categories. The inventory, based on verified FY 2024–25 data, provides a robust baseline for setting science-based targets aligned with the SBTi 1.5°C pathway. Near-term and long-term targets focus on reducing direct emissions, transitioning to renewable energy, engaging suppliers, and improving product lifecycle efficiency. The company acknowledges data uncertainties and has adopted mitigation strategies to enhance accuracy. This structured approach underscores KP's commitment to ESG integration, continuous improvement, and a credible pathway toward net-zero emissions by 2050.

12. References

- **GHG Protocol – Corporate Accounting and Reporting Standard:**
  https://ghgprotocol.org/corporate-standard
- **GHG Protocol – Scope 2 Guidance:**
  https://ghgprotocol.org/scope-2-guidance
- **GHG Protocol – Corporate Value Chain (Scope 3) Standard:**
  https://ghgprotocol.org/scope-3-standard
- **GHG Protocol – Emission Factors from Cross-Sector Tools:**
  https://ghgprotocol.org/ghg-emission-factors
- **GHG Protocol – Mobile Sources (Transport):**
  https://ghgprotocol.org/transport-ghg-emissions
- **IPCC AR6 Synthesis Report: Climate Change 2024:**
  https://www.ipcc.ch/report/ar6/syr
- **Climate Change Report – Dubai (Supreme Council of Energy):**
  https://www.dubaisce.gov.ae/en/climate-change
- **Forecasting the Effects of Municipal Solid Plastic Waste – Dubai (Research Study):**
  https://doi.org/10.1016/j.jclepro.2023.136234
- **Carbon Footprint of Water Diversion & Desalination Projects (Scientific Report):**
  https://doi.org/10.1038/s41598-023-45610-1