KRR ENGINEERING PRIVATE LIMITED

UNIT 1: L - 17 & 18 Ambattur Industrial Estate, Chennai - 600 058. Tamilnadu, India.
UNIT 2: No 6, Vanagaram Road, Ayanambakkam, Chennai - 600095. Tamilnadu, India.
UNIT 3: 18/2A Poonamallee Bypass Road, Senneerkuppam, Chennai - 600056. Tamilnadu, India.

GHG EMISSION REPORT

APRIL 2024 TO MARCH 2025

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1. Introduction

KRR integrates ESG principles across its operations, focusing on minimizing the carbon footprint of its design, manufacturing, and erection activities for pressure vessels, autoclaves, heat exchangers, and boiler components. This report provides a comprehensive GHG inventory for 2024, covering Scope 1 (direct emissions from fuel combustion, vehicles, and fugitive gases), Scope 2 (purchased electricity), and Scope 3 (upstream and downstream value chain). It defines organizational, geographic, and temporal boundaries, justifies inclusion criteria, and outlines quantification methodologies, emission factors, and GWPs. A statement of uncertainty ensures transparency, supporting auditability, baseline tracking, and informed strategies for continuous GHG reduction.

2. GHG emission overview

Organizational Boundary

KRR Engineering Private Limited

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GHG Emission Reporting Frequency: Annually

3. Reporting Boundaries & Justification

Boundary Type	Description	Inclusion / Scope	Justification	Suggested Evidence
Organizational Boundary	All KRR India operations under operational control (manufacturing, warehouses, erection sites)	Included	Operational control best reflects direct management and corporate energy/fuel use	Organization chart, asset registers, operational policy
Geographic Boundary	All facilities in India	Included	Ensures completeness of GHG inventory	Facility addresses, site maps, utility bills

Temporal Boundary	Reporting period 1st April 2024 – 31st March 2025	Included	Provides comparability and auditability	Financial calendar, internal reporting schedule
Scope 1	On-site fuel combustion, company-owned vehicles, fugitive emissions	Included	Direct emissions under company control	Fuel invoices, meter readings, vehicle logs, refrigerant records
Scope 2	Purchased electricity	Included	Accounts for indirect emissions from electricity	Electricity bills, CEA grid EF, supplier data
Scope 3 Upstream	Purchased goods & services, inbound transport, fuel & energy-related upstream, business travel, employee commuting, waste	Included	Major contributor due to heavy industrial supply chain	Procurement records, transport bills, HR records, waste disposal receipts
Scope 3 Downstream	Transportation of finished products, end-of-life of products	Included	Completeness of lifecycle emissions	Customer delivery records, product lifecycle studies

4. GHG Emissions Summary (MT CO2e)

Calculation period: April 2024 to March 2025
All values in MT CO2 e

GHG Emission Reporting Frequency: Annually

EMISSION	CURRENT YEAR 2024 -2025
Scope 1	2.668
Scope 2	523.81
Scope 3 Upstream	31054.24
Scope3 Downstream	230.249
Total Scope 3	31284.49
Total GHG Emission	**31,810.968**

5. SBTi based Targets

Scope	Baseline (2024–25)	SBTi Requirement	Target (Near-Term: 2030)	Target (Long-Term: 2050)	Key Levers
Scope 1 – Direct emissions	2.668 tCO_2e	Reduce absolute Scope 1 & 2 emissions by 42% by 2030 from base year	1.55 tCO_2e	Net-zero operational emissions (0 tCO_2e)	Electrification of welding & fabrication machinery; transition from diesel to LPG/biofuels; preventive maintenance for combustion systems
Scope 2 – Purchased electricity	523.81 tCO_2e	Reduce market-based Scope 2 emissions by 42% by 2030	303.81 tCO_2e	100% renewable electricity (0 tCO_2e)	Solar rooftop installation; RE purchase agreements; LED & energy-efficient equipment upgrades

Scope 3 – Upstream (Purchased goods, logistics, business travel, etc.)	31,054.24 tCO_2e	Engage suppliers covering 67% of upstream emissions to set SBTs by 2028	24,000 tCO_2e (approx. 23% reduction)	Net-zero supply chain by 2050	Green procurement policy; supplier decarbonization support; use of low-carbon steel & materials; optimized inbound logistics
Scope 3 – Downstream (Transport, end-of-life)	230.25 tCO_2e	Reduce value-chain emissions consistent with a 1.5°C pathway	180 tCO_2e (22% reduction)	Near-zero through circular economy & recycling practices	Optimized delivery routes; collaboration with recyclers for equipment end-of-life recovery
Total (Scope 1 + 2 + 3)	31,810.97 tCO_2e	Near-term SBT: 42% reduction in Scopes 1+2 by 2030; Supplier engagement for Scope 3	25,485 tCO_2e (overall 20% reduction by 2030)	Net-zero across all scopes by 2050	Renewable energy transition, low-carbon manufacturing, supplier engagement, logistics optimization, and waste circularity

6. Notes & caveats

Scope 1 CH_4 and N_2O emissions are estimated from fuel combustion and operational activity, converted to CO_2e using IPCC AR5 GWPs; actual measurements may replace estimates if available. F-gases like R134a and R404A are converted using their specific GWP values. Scope 3 emissions, including upstream procurement and transport, are calculated using spend-based, supplier-specific, or default emission factors when supplier data is lacking. Variability in activity data, temporal and geographic differences, and emission factor limitations introduce uncertainty. KRR India continuously improves data collection, monitoring, and supplier verification to enhance the accuracy and transparency of its GHG inventory.

7. Scope 3 Categories: Reporting Boundary & Justification

Scope 3 Category	Included? (Yes/No)	Reporting Boundary	Justification
1. Purchased goods and services	Yes	All purchased raw materials, consumables, packaging, and auxiliary materials used in production	Material upstream emissions; key driver of KRR India's supply chain footprint
2. Capital goods	Yes	Machinery, plant equipment, and office equipment purchased during reporting year	Significant embodied emissions in purchased assets affecting lifecycle emissions
3. Fuel- and energy-related activities (not included in Scope 1 or 2)	Yes	Emissions from extraction, production, and transportation of purchased fuels and electricity	Accounts for upstream emissions associated with purchased energy
4. Upstream transportation and distribution	Yes	Transportation of raw materials from suppliers to KRR facilities	Covers logistics emissions not controlled by KRR but part of upstream activities
5. Waste generated in operations	Yes	All waste streams from manufacturing, office operations, and packaging	Captures emissions from waste disposal and treatment
6. Business travel	Yes	Employee travel by air, rail, road for business purposes	Directly linked to operational activities
7. Employee commuting	Yes	Employee travel from home to workplace	Captures commuting-related emissions
8. Upstream leased assets	No	Leased properties or equipment not under operational control	Excluded due to immateriality
9. Downstream transportation and distribution	Yes	Transport of finished products to customers and warehouses	Completes lifecycle assessment of emissions
10. Processing of sold products	No	Not applicable for KRR's industrial equipment	Minimal operational influence; excluded

11. Use of sold products	No	Industrial equipment use-phase emissions negligible	Excluded due to outside company control
12. End-of-life treatment of sold products	Yes	Disposal, recycling, or incineration of sold equipment	Ensures lifecycle completeness
13. Downstream leased assets	No	Leased assets not under operational control	Excluded due to immateriality
14. Franchises	No	Not applicable	KRR does not operate franchises
15. Investments	No	Financial investments outside operational control	Excluded based on materiality

8. Scope 3 Quantification Table

Scope 3 Category	Activity Data	Methodology / Emission Factor	Remarks
Purchased goods & services	Quantity of raw materials, packaging	GHG Protocol Scope 3 Standard, EcoInvent, supplier-specific EF	Major contributor to Scope 3; use supplier-specific EF where possible
Capital goods	Cost/value of machinery	DEFRA 2023 spend-based EF	Lifecycle emissions included
Fuel- & energy-related upstream	Fuel L, electricity kWh	IPCC 2006 / CEA EF	Covers upstream emissions
Upstream transport & distribution	Distance (km), weight (t)	DEFRA 2023 ton-km EF	Supplier to KRR transport emissions
Waste generated in operations	Quantity & type	GHG Protocol Waste, IPCC 2006	Include all operational sites
Business travel	Flights, rail, vehicle km	DEFRA / ICAO EF	Mode and class-specific
Employee commuting	Distance & transport mode	DEFRA 2023 EF	HR survey-based

Downstream transportation	Distance & product weight	DEFRA 2023 / EcoTransIT	Minor but included for lifecycle completeness
End-of-life treatment	Quantity sold, disposal type	GHG Protocol Product Lifecycle, IPCC 2006	Completeness of emissions

9. GHG emission factor & GWP reference table

- **Global Warming Potentials (GWP100, AR5):** CO_2=1, CH_4=28, N_2O=265
- **Fuel & Combustion EF:** IPCC 2006 Guidelines, Tier 1/Tier 2 defaults
- **Electricity EF (India):** CEA Grid Emission Factor
- **Scope 3 EF:** GHG Protocol Scope 3 Standard, DEFRA 2023, EcoInvent
- **F-gas EF:** IPCC AR5 / GHG Protocol cross-sector tools

10. Statement of uncertainty

The GHG emissions data for KRR India (Scope 1, 2, and 3) follow GHG Protocol standards using recognized emission factors. Uncertainties arise from variability in emission factors, accuracy of fuel, electricity, and logistics data, estimations for upstream and downstream Scope 3 emissions, and limitations in supplier-reported information. Scope 1 and 2 uncertainties are estimated at ±5–10%, while Scope 3 ranges from ±15–25% due to broader data variability. KRR India continuously enhances data quality through improved measurement, monitoring systems, and supplier verification to increase transparency, accuracy, and reliability of its carbon footprint reporting.

11. Conclusion

The 2024–25 GHG emissions inventory for KRR India offers a clear and comprehensive account of Scope 1, Scope 2, and Scope 3 emissions across all operational sites. By detailing organizational and geographic boundaries, data collection methodologies, and emission factors, the report ensures transparency, auditability, and alignment with ESG commitments. This inventory establishes a reliable baseline for continuous emissions monitoring, supporting informed decision-making and the implementation of targeted reduction strategies. It enables KRR to systematically reduce its carbon footprint, drive sustainable operational practices, and demonstrate accountability to stakeholders while advancing its long-term environmental objectives.

12. Reference

- **GHG Protocol Corporate Standard**
  https://ghgprotocol.org/corporate-standard
- **GHG Protocol Scope 3 Standard**
  https://ghgprotocol.org/scope-3-standard
- **ISO 14064-1:2018**
  https://www.iso.org/standard/66453.html
- **ISO 14064-3:2019**
  https://www.iso.org/standard/66454.html
- **ISO 14067:2018**
  https://www.iso.org/standard/71206.html
- **IPCC Guidelines for National Greenhouse Gas Inventories**
  https://www.ipcc-nggip.iges.or.jp/public/2006gl/
- **Carbon Trust – Carbon Footprint Guidance**
  https://www.carbontrust.com
- **GHG Protocol Calculation Tools**
  https://ghgprotocol.org/calculation-tools
- **WRI Climate Data**
  https://www.wri.org