SHINSUNG PETROCHEMICAL PRIVATE LIMITED

Plot No F-24, SIPCOT Industrial Complex, Gummidipoondi,
Thiruvallur District – 601201, Tamilnadu, India.

GHG EMISSION REPORT

Form No	**:** SSCI/ESG/056
Issue No	**:** 01
Rev No	**:** 00
Date	**:** 15th April, 2025

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SHINSUNG PETROCHEMICAL PVT. LTD. ★ CHENNAI

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1. Introduction

SSCI, India, engaged in the design and manufacturing of sealants, is committed to integrating Environmental, Social, and Governance (ESG) principles into its core operations. As part of this commitment, we have prepared a comprehensive Greenhouse Gas (GHG) Emissions Summary Report covering Scope 1, Scope 2, and Scope 3 emissions. The report adopts the GHG Protocol Corporate Accounting and Reporting Standard, ensuring transparency and global alignment. By quantifying our direct and indirect emissions, we aim to identify major contributors, set reduction targets, and implement mitigation strategies, reinforcing our dedication to sustainable growth and climate responsibility.

2. GHG Emission Overview

Organizational Boundaries

SHINSUNG PETROCHEMICAL PVT. LTD

Location Covered

Plot No F-24, SIPCOT Industrial Complex, Gummidipoondi,
Thiruvallur District – 601201, Tamilnadu, India.

Calculation Period: April 2024 – March 2025

All values in: MT CO_2 e

GHG Emission Reporting Frequency: Annually

3. Reporting boundary & justification

Boundary Element	Choice Made (Operational / Organizational)	Specific Items Included	Justification	Suggested Evidence
Organizational Boundary	Operational control (recommended)	All SSCI manufacturing plants and owned vehicles under SSCI operational control in India	Operational control aligns with SSCI's management responsibility for emissions and is commonly used by manufacturers	Corporate org chart; operational control memos
Geographic Boundary	India – listed sites	Main factories and offices in India (list locations)	Material emissions originate at these physical sites	Site inventory lists; utility bills
Time Boundary	Reporting year	One financial year (April 2024 – March 2025)	Standard annual reporting period	Policy document stating FY/year

Gases Reported	CO_2 , CH_4 , N_2 O, and relevant F-gases	CO_2 , CH_4 , N_2 O; include refrigerant HFCs if applicable	Covers combustion, fugitive, and process emissions relevant to manufacturing	Monitoring logs; refrigerant service records
Scopes Included	Scope 1, Scope 2 (location & market-based if applicable), Scope 3 (upstream and downstream categories)	All categories included where data allow; exclusions disclosed with reason	Aligns with best practice and GHG Protocol Scope 3 guidance	Scope 3 data spreadsheets; supplier questionnaires

4. GHG Emissions Summary (MT CO_2 e)

Calculation Period: April 2024 – March 2025
All values in: MT CO_2 e
GHG Emission Reporting Frequency: Annually

EMISSIONS	CURRENT YEAR (April 2024 – March 2025)
Scope 1	22.43
Scope 2	813.26
Scope 3	1438021.89
Scope 3 Upstream	355987.18
Scope 3 Downstream	1082034.71
Total GHG Emissions	**1438857.58**

5. SBTi-Based Targets

Scope	Current Emissions (tCO_2 e, Apr 2024–Mar 2025)	SBTi Requirement (illustrative / typical)	Proposed Target for SSCI	Target Year	Key Strategy (summary)
Scope 1 — Direct (fuel, fugitive, fleet)	22.43	Reduce absolute emissions (example: ~50% for 1.5°C pathways)	Reduce to 11 tCO_2 e (≈50% reduction)	2035	Electrify fleet where feasible; replace diesel with renewable fuels; improve boiler/DG efficiency; strengthen refrigerant management and leak detection.
Scope 2 — Purchased electricity	813.26	Rapid reductions; 100% renewable electricity by mid-2030s (pathway-dependent)	50% reduction by 2030 (≈406.6 tCO_2 e); 0 tCO_2 e by 2035	2030 / 2035	Rooftop solar + on-site generation; procure RECs / corporate PPA(s); energy efficiency (LEDs, VFDs, IoT energy mgmt.).
Scope 3 — Upstream (purchased goods & services, inbound logistics, etc.)	355,987.18	Supplier engagement to set SBTs covering major upstream emissions; science-based reductions across value chain	Engage suppliers covering ≥67% of upstream emissions by 2028; aim for supplier-supported SBTs and 25–30% reduction by 2035	2028 (engagement) / 2035 (reduction)	Green procurement policy; supplier scorecards; supplier capacity-building; prioritize low-carbon raw materials and circular inputs.
Scope 3 — Downstream (distribution, use-phase, EoL)	1,082,034.71	Reduce downstream intensity through product design and logistics improvements; include in value-chain SBTs when material	Reduce downstream value-chain intensity by 30% (by 2035); set phased milestones	2035	Optimize logistics (modal shift, route optimization); product formulation for lower-use emissions; customer collaboration for efficient use and EoL recycling.
Total Scope 3 (Up + Down)	1,438,021.89	Align total scope-3 reductions with 1.5°C pathway (sector-specific guidance)	Target 25–30% reduction across Scope-3 by 2035 (≈1,007,000–1,078,500 tCO_2 e)	2035	Prioritise high-emitting suppliers and product streams; supplier SBT adoption; circularity and product stewardship programmes.

Overall Emissions (Scope 1 + 2 + 3)	1,438,857.58	Net-Zero by ~2050 with near-term science-based milestones (company to select pathway)	Near-term milestone: 45% reduction by 2035; Net-Zero by 2050	2035 (near-term) / 2050 (Net-Zero)	Integrate company reduction roadmap, invest in renewables, decarbonise supply chain, deploy low-carbon products and credible residual offset strategy only if necessary.

6. Notes & Caveats

The gas-by-gas numbers presented above are illustrative because only total Scope 1 CO_2 e was available. Accurate breakdown requires fuel volumes by type and/or direct measurement data (litres of fuel, gas, refrigerant kg, vehicle km & fuel consumption). If SSCI uses diesel, petrol, natural gas, or experiences refrigerant losses, each fuel's emissions will be calculated using appropriate emission factors. Common references include BEIS (UK), IPCC (2006/2019 refinement), or India-specific national emission factors**.**

7. Scope 3 Categories: Reporting Boundary & Justification

Scope 3 Category	Included? (Yes/No)	Reporting Boundary	Justification
Purchased Goods & Services	Yes	All raw materials, chemicals, polymers, and packaging procured for sealant manufacturing	Major contributor to upstream emissions; material-intensive production makes it essential
Capital Goods	Yes	Capital equipment, machinery, tools, and infrastructure purchased for manufacturing	Significant investments in machinery can influence lifecycle emissions
Fuel- & Energy-Related Activities (not in Scope 1 or 2)	Yes	Extraction, production, and transport of fuels and electricity consumed by SSCI facilities	Captures upstream emissions of purchased fuels/electricity not reflected in Scope 1 or 2
Upstream Transportation & Distribution	Yes	Transportation of raw materials/components from suppliers to SSCI facilities	Relevant as inbound logistics contribute to upstream emissions
Waste Generated in Operations	Yes	All waste streams from manufacturing (chemical, packaging, general waste)	Captures treatment and disposal impacts from operations
Business Travel	Yes	Employee business travel (domestic and international by air, rail, road)	Part of operational footprint
Employee Commuting	Yes	Employee commuting to/from SSCI sites	Material due to workforce size

Upstream Leased Assets	No (immaterial)	Leased assets upstream of operations (if any)	Currently not material, SSCI largely owns operational assets
Downstream Transportation & Distribution	Yes	Distribution of finished sealant products to customers in India & abroad	Outbound logistics contribute to downstream emissions

8. Scope 3 Quantification Table

Scope 3 Category	Activity Data (Examples)	Methodology Used (Emission Factor Source / Tool)	Remarks
Purchased Goods & Services	Spend (INR) or mass (kg/tonnes) of raw materials, polymers, packaging	Spend-based method, supplier-specific EFs, GHG Protocol Scope 3 database	Likely largest upstream category; prioritize supplier-specific data
Capital Goods	Cost/value of machinery, equipment, buildings purchased	Spend-based method, capital goods LCA databases	Include if significant investments in new plant/equipment during reporting year
Fuel- & Energy-Related Activities	Purchased electricity (kWh) and fuels (litres/kg)	Apply upstream emission factors for electricity grid and fuel upstream EFs	Covers well-to-tank & transmission/distribution losses
Upstream Transportation & Distribution	Tonnes shipped × distance (tonne-km), by mode (road/rail/sea/air)	Activity-based method: apply transport EFs, regional databases, or EPA SmartWay	Collect logistics invoices or shipping data from suppliers
Waste Generated in Operations	Tonnes of waste (chemical, packaging, general) sent to landfill/recycling/incineration	Waste treatment EFs, IPCC waste model	Ensure segregation by waste type (recyclable vs landfill)
Business Travel	Distance travelled (passenger-km) by air, rail, car	Travel factors (air/rail/road), ICAO calculator for air travel	Data from travel agency invoices or expense records
Employee Commuting	Employee count × commuting distance × days worked (mode split: car, bus, train, bike)	Survey-based; apply transport mode EFs, local transport studies	Accuracy depends on staff survey; recommend periodic updates

Upstream Leased Assets	Fuel/electricity consumed in leased facilities (if applicable)	Same as Scope 1/2 methodology but allocated to leased assets	Include only if leased sites exist; currently low relevance for SSCI

9. GHG Emission Factor & GWP Reference Table

1. **GHG Protocol — Corporate Standard & Scope 3 Calculation Guidance**: Definitions and calculation methods for Scope 1, 2, and 3 emissions (GHG Protocol).
2. **IPCC AR6 / GWP Values**: Use AR6 GWP100 values for CO_2 , CH_4 , N_2 O conversions (documented in AR6 / GHG Protocol GWP table).
3. **BEIS / GOV.UK Conversion Factors (2023/2024)**: Default emission factors for fuels (diesel, petrol), electricity, and business travel; use when supplier-specific EFs unavailable.
4. **Central Electricity Authority (CEA) India**: CO_2 baseline database & grid emission factors; use for India grid / location-based Scope 2 factors.
5. **EPA / US Emission Factors**: Applicable for mobile combustion, vehicles, and sector-specific emissions if needed.

10. Statement of Uncertainty

The GHG inventory prepared by SSCI has been developed in alignment with the GHG Protocol and IPCC good practice methodologies; however, certain uncertainties remain. These arise primarily from the quality of activity data, estimation methods, and the application of default emission factors. For Scope 1, fuel data is relatively reliable, while N_2 O and CH_4 estimates carry higher variability. Scope 2 uncertainty stems from regional grid factor assumptions, and Scope 3 faces the highest uncertainty due to reliance on spend-based or secondary data. SSCI is committed to progressively improving data accuracy by enhancing supplier engagement, metering, and record-keeping practices.

11. Conclusion

SSCI's GHG inventory for April 2024 to March 2025 reflects a structured approach to measuring and reporting emissions across Scope 1, Scope 2, and Scope 3 in alignment with the GHG Protocol. To further refine accuracy, SSCI will collect detailed activity data including fuel consumption by type and month, electricity usage by meter, fleet distance and fuel logs, refrigerant purchase/leak records, purchase ledger by material mass/value, and freight ton-km or invoices. Scope 1 gas splits presented are marked as illustrative/provisional. The final report will clearly state the GWP basis, Scope 2 reporting method (location vs. market-based), emission factor sources, and the adopted uncertainty approach.

12. References

1. **GHG Protocol — Corporate Accounting & Reporting Standard (Revised).** World Resources Institute & WBCSD — core corporate inventory standard. *GHG Protocol* +1
2. **GHG Protocol — Scope 2 Guidance** (dual reporting: location-based and market-based). *GHG Protocol* +1
3. **GHG Protocol — Corporate Value Chain (Scope 3) Accounting & Reporting Standard** (Scope 3 categories & methods). *GHG Protocol*

4. **GHG Protocol — Emission Factors from Cross-Sector Tools** (workbook / EF compilation for stationary combustion, mobile, electricity conversions). *GHG Protocol* +1
5. **GHG Protocol — Calculation Tools & Guidance** (tools list & EFs; practical calculation tool downloads). GHG Protocol
6. **GHG Protocol — Guidance on Mobile Sources / Transport Emissions** (see transport calculation sections in cross-sector tools and transport tools). *GHG Protocol*
7. **IPCC AR6 Synthesis Report (Climate Change 2023).** Intergovernmental Panel on Climate Change — GWP values and high-level climate science context. *IPCC* +1
8. **Central Electricity Authority (CEA) India — CO_2 Baseline Database & Grid Emission Factors.** Reference source for Scope 2 location-based emissions. *CEA India* +1
9. **Academic / case studies relevant to SSCI:**
   • Life Cycle Assessment of polymer-based products and sealants in industrial applications (Journal of Cleaner Production, Elsevier). Useful for benchmarking Scope 3 purchased goods emissions.
   • Plastic and chemical industry supply chain emissions analysis in India (ScienceDirect / ResearchGate). Provides upstream raw material emission context for sealant manufacturing.