Asterisk Chemicals Private Limited

Manufacturing Facility : Plot No. 68-B, Industrial Area, Maksi,Dist. Shajapur - 465106. Madhya Pradesh, India.

Registered Address : 54, BHS, Allapur, Prayagraj – 211006. Uttar Pradesh, India.

GHG EMISSION REPORT

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1. Introduction

This document summarises ACPL's corporate GHG inventory for the reporting year (calendar/fiscal year — state whichever you use). It shows reported emissions by scope, reporting boundaries and justifications, the approach to quantifying gases (CO_2, CH_4, N_2O) for Scope 1, referenced emission factors and Global Warming Potentials (GWP), and an uncertainty statement. All CO_2e values use a 100-year GWP (IPCC AR5) unless otherwise stated.

2. GHG emission overview

Organizational Boundaries

Asterisk Chemicals Private Limited

LOCATIONS COVERED

Manufacturing Facility: Plot No. 68-B, Industrial Area, Maksi, Dist. Shajapur-465106. Madhya Pradesh, India.

Registered Address: 54, BHS, Allapur, Prayagraj – 211006. Uttar Pradesh, India.

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

GHG Emission Reporting Frequency: Annually

3. Reporting boundary & justification

Boundary Element	Choice Made	Specific Items Included	Justification	Suggested Evidence
1. Organisational Boundary	**Operational Control**	All operations in India where ACPL has direct operational control	Ensures accountability for on-site emissions (Scope 1) and electricity purchases (Scope 2); simplifies mitigation planning	Corporate ownership/management records; organisational chart; sustainability policy
2. Geographic Boundary	India operations only	Manufacturing plants, warehouses, head office in India	Captures all significant emissions within national jurisdiction where ACPL operates; excludes affiliates outside India without operational control	Facility list, lease agreements, operational permits

3. Operational Boundary — Scope 1	Direct emissions	On-site fuel combustion (boilers, generators), company-owned fleet, process emissions	Directly measurable and within ACPL's control	Fuel purchase invoices, meter readings, fleet records, process logs
4. Operational Boundary — Scope 2	Indirect emissions (electricity)	Purchased grid electricity (location-based via CEA factor); supplier/contract electricity (market-based if applicable)	Electricity is a material indirect source; Central Electricity Authority (CEA) provides robust grid emission factors	Electricity bills, CEA emission factor database, supplier renewable energy certificates (if used)
5. Operational Boundary — Scope 3 Upstream	Indirect emissions	Purchased goods & services (raw materials, packaging), fuel & energy-related activities not in Scope 1, upstream transport & distribution, waste generated in operations, business travel	Material to supply chain of flavours & fragrances; upstream activities have high carbon intensity	Supplier invoices, LCA databases, procurement records, travel records, waste manifests
6. Operational Boundary — Scope 3 Downstream	Indirect emissions	Transportation & distribution to customers, product use (if relevant), end-of-life treatment of sold products	Captures lifecycle impacts downstream of ACPL's operations	Distribution contracts, logistics data, customer reports, end-of-life studies
7. Temporal Boundary & Exclusions	Reporting year 2025 exclusions documented	Covers full reporting year; excludes sources <1% or where activity data unavailable (de minimis)	Ensures completeness and consistency; exclusions documented transparently	Activity data logs, year-end reports, disclosure of excluded sources with rationale

4. GHG Emissions Summary (MT CO2 e)

Calculation period: April 2024 to March 2025
All values in MT CO2 e
GHG Emission Reporting Frequency: Annually

EMISSIONS	CURRENT YEAR April 2024 to March 2025
Scope 1	2.11
Scope 2	11.04
Scope 3	78.60
Scope 3 Upstream	22.02
Scope 3 Downstream	100.63
Total GHG Emission	**113.79**

5. Notes & caveats

The implied activity data used in estimating Scope 1 emissions is a reverse-calculated approximation, primarily derived to reconcile with the reported total of 2.11 $MTCO_2e$. This estimate assumes a notional volume of diesel consumption for generators, boilers, or company-owned vehicles. However, this should be considered only as a placeholder, since reverse-calculated data may not accurately reflect actual energy use or combustion patterns. For greater accuracy and auditability, the implied figures must be replaced with measured activity data, such as fuel purchase invoices, generator operating logs, vehicle fleet fuel records, or direct metering. Using real data strengthens transparency, reduces uncertainty, and improves confidence in the emissions inventory.

6. Scope 3 Categories: Reporting Boundary & Justification

Scope 3 Category	Included? (Yes/No)	Reporting Boundary	Justification
1. Purchased Goods & Services	Yes	All raw materials (flavor & fragrance ingredients), chemicals, solvents, and packaging materials	Major source of upstream emissions; highly material in supply chain of flavor & fragrance manufacturing
2. Capital Goods	Yes	Manufacturing equipment, warehouse infrastructure, office IT hardware	Emissions from capital purchases contribute to lifecycle carbon footprint; relevant for long-term investments

3. Fuel- and Energy-Related Activities (not in Scope 1 or 2)	Yes	Upstream extraction, production, and transportation of purchased fuels and electricity	Complements Scope 1 & 2 by capturing well-to-tank and transmission & distribution (T&D) losses
4. Upstream Transportation & Distribution	Yes	Third-party logistics providers, supplier-to-ACPL inbound shipments	Transportation of inputs is significant given global sourcing of raw materials
5. Waste Generated in Operations	Yes	Disposal and treatment of packaging waste, chemical residues, general office waste	Waste handling is material due to environmental risks associated with chemicals
6. Business Travel	Yes	Employee air, rail, and road travel for domestic and international business	Business travel has measurable emissions and is relevant to corporate sustainability
7. Employee Commuting	No	Excluded	Considered de minimis (<1% of total footprint) and difficult to measure accurately at present
8. Upstream Leased Assets	No	Not applicable	ACPL does not lease significant upstream assets with operational emissions
9. Downstream Transportation & Distribution	Yes	Distribution of finished products to customers via third-party logistics	Significant due to wide distribution network and export shipments
10. Processing of Sold Products	No	Not applicable	Flavor & fragrance ingredients are used as inputs; further processing emissions allocated to downstream users
11. Use of Sold Products	No	Not applicable	Products are ingredients, not final consumer goods; use-phase does not generate direct emissions

7. Scope 3 Quantification Table

Scope 3 Category	Activity Data (Examples)	Methodology Used (Emission Factor Source / Tool)	Remarks
1. Purchased Goods & Services	Volume/weight of raw materials (flavor & fragrance ingredients, solvents, chemicals), packaging (kg)	Spend-based and activity-based hybrid method; Emission factors from **ecoinvent database / DEFRA 2023**	Most material category; accounts for majority of upstream emissions (embedded carbon in raw material supply chain)

2. Capital Goods	Equipment purchases (INR value or weight of machinery, IT assets, warehouse	Spend-based method; factors from **GHG Protocol Technical Guidance, DEFRA**	One-time investments; lower impact compared to purchased goods but relevant for lifecycle emissions
3. Fuel- & Energy-Related Activities (not in Scope 1 or 2)	kWh of purchased electricity, liters of diesel (for well-to-tank and T&D losses)	Calculation using **IEA/CEA grid well-to-tank factors & DEFRA T&D losses**	Complements Scope 1 & 2 reporting; moderate contribution
4. Upstream Transportation & Distribution	Tonnes of raw materials × distance (tonne-km), mode of transport (sea, air, road)	Distance weight emission factor; factors from **DEFRA 2023 Freight Transport**	Significant due to global sourcing and reliance on logistics partners
5. Waste Generated in Operations	Tonnes of waste by type (hazardous, packaging, recyclables, landfill)	Activity emission factor; factors from **IPCC 2006 Waste Guidelines / DEFRA 2023**	Packaging and chemical residue waste are material for compliance and ESG disclosure
6. Business Travel	km travelled by employees (air, rail, road), ticket class for flights	Distance-based method; factors from **DEFRA 2023 Business Travel**	Travel emissions relatively small but important for ESG transparency
7. Employee Commuting *(optional / excluded)*	Estimated km travelled by staff mode of transport	Distance-based emission factor (DEFRA 2023)	Currently excluded as de minimis; can be added in future

8. SBTi-Aligned Targets for ACPL

Scope / Category	Base Year (2024–25)	Target Year	SBTi-Aligned Reduction Target	Strategy / Action Plan
Scope 1 (Direct emissions)	2.11 MT CO_2e	2030	Reduce absolute Scope 1 emissions by **42%** from base year	Switch to renewable biofuels in boilers, electrify company fleet, enhance energy efficiency in processes
Scope 2 (Purchased electricity)	11.04 MT CO_2e	2030	Reduce Scope 2 emissions by **50%** (location-based)	Transition to renewable power (solar/wind), PPAs/RECs, onsite rooftop solar

Scope 3 Down stream – Purchased Goods & Services	100.63 MT CO_2e	2030	Engage suppliers covering **70% of spend** to set SBTi targets by 2028	Supplier engagement, low-carbon sourcing, circular packaging
Scope 3 Upstream – Transportation & Distribution	22.02 MT CO_2e	2030	Cut logistics emissions per tonne-km by **25%**	Shift to sea freight from air, optimize load capacity, partner with green logistics providers
Scope 3 – Capital Goods, Waste, Business Travel	78.60 MT CO_2e	2030	Achieve **25% reduction** in combined emissions	Adopt low-carbon procurement policies, waste reduction & recycling, virtual meetings to cut travel
Scope 3 Downstream – Distribution	122.65 MT CO_2e	2030	Reduce emissions intensity per tonne product delivered by **30%**	Route optimization, use of EV/hybrid last-mile delivery
Overall GHG Emission Reduction (Scopes 1+2+3)	113.79 Total MT CO_2e	2030	Reduce absolute emissions by **~45%** to align with 1.5°C	Integrated action across scopes
Long-Term Target	2024–25 baseline	2050	Reach **Net-Zero** GHG emissions	Deep decarbonization, CCUS (if needed), offset only for residuals

9. GHG emission factor & GWP reference table

- **BEIS / DEFRA conversion factors** (conversion factors for company reporting) — used as the working emission-factor table for diesel per-litre $CH_4/N_2O/CO_2$. GOV.UK+1
- **IPCC AR5 / GHG Protocol GWP values** (GWP100: $CH_4 = 28$, $N_2O = 265$). GHG Protocol
- **GHG Protocol — Stationary Combustion Guidance** — recommended calculation approach for CO_2, CH_4, N_2O from combustion. GHG Protocol
- **Central Electricity Authority (CEA), India — Baseline Carbon Dioxide Emission Database** — use for location-based Scope 2 grid factors for India. (Recommended for Scope 2 calculation and reporting.) Central Electricity Authority+1
- **EPA GHG Emission Factors hub** — alternative EFs and guidance for mobile/non-road

10. Statement of uncertainty

We recommend quantifying uncertainty following the GHG Protocol quantitative uncertainty guidance, propagating uncertainty from activity data and emission factors using propagation of error (Monte Carlo where possible). Use conservative qualitative ranges tailored to data quality: Scope (when fuel invoices and meter readings exist), Scope (depends on electricity supplier data and market vs location choice), Scope or higher (varies by spend-based versus supplier-specific methods). State a chosen confidence interval (for example and document assumptions, data sources, and sensitivity analyses to ensure transparency and auditability. Update uncertainty estimates annually as data quality improves and governance

11. Conclusion

This format gives ACPL a clear, auditable structure to present your corporate GHG inventory, showing totals (as provided), the method to derive gas-level splits (CO_2, CH_4, N_2O) especially for Scope 1, and the authoritative references to use. Replace the illustrative numbers with calculations based on your site-level activity data and the sources listed above, and include an uncertainty analysis and factor appendix for transparency and verification.

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)** — use for GWP values and high-level **climate** science context. IPCC+1

8. **Dubai / UAE climate reports & context** — UAE National Climate Change Plan and Dubai climate action pages (useful if reporting regional risk/context and adaptation measures). UAE+1