Greenhouse Gas Emissions Inventory Report

Prepared for: Alligator Automations India Pvt. Ltd.

Inventory Year 2023-24

Site: Plot C5-7, C9-12, Gat No. 235/2, Santosh Nagar, Waki Tal-Khed, Pune 410501, Maharashtra.



Prepared by
Nirantara Ecoventures Private Limited
In association with
World Trade Centre Pune

Date of Report: 06-Feb-2025

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Executive Summary

We're excited to present Alligator Automations India Pvt. Ltd.'s first-ever Greenhouse Gas (GHG) inventory report for the financial year 2023-24. This report is a big step forward in helping Alligator understand and manage its carbon footprint. Following the GHG Protocol, the report focuses on Scope 1 emissions (direct emissions) and Scope 2 emissions (indirect emissions from purchased energy - electricity) at the assembly and fabrication site in Waki Tal-Khed, Pune. This effort reflects Alligator's dedication to sustainability and its commitment to creating a positive environmental impact.

The key findings are:

- Total Scope 1 and Scope 2 emissions for 2023-24 was 99.11 tCo2e out of which, 91.24% was attributed to Scope 1 activities.
- Scope 1 emissions are calculated to be 90,422.82 kgCO2e or 90.42 tCO2e, primarily resulting from direct fuel combustion used in DG set and on-road vehicle usage.
- Scope 2 emissions amount to 8,684.15 kgCO2e or 8.68 tCO2e, predominantly driven by electricity consumption required for assembly processes and general facility operations.

Emissions Trends:

- Transportation and operational activities are the primary drivers of emissions, with Scope 1 activities contributing nearly ten times more than Scope 2 activities.
- While electricity-related emissions are consistent, the significant share of emissions from fuel consumption and vehicle use presents a clear opportunity to prioritize emission reduction strategies in these areas.

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1. General Information

Name of reporting organization	Alligator Automations India Pvt Ltd
Description of the organization	Alligator Automations India Pvt. Ltd. is an engineering company supplying and commissioning turnkey automated solutions. Their end-of-line packaging automation solutions are used across industries including automotive, cement, chemical, FMCG, oil & gas, etc.
Website of the organization	https://www.alligatorautomations.com/
Responsible person for reporting	Suhas Barge
Contact number of responsible person	+919665553060
Email ID of the responsible person	suhas.b@alligators.in

2. Organizational Boundary

Alligator Automations India Pvt. Ltd.'s organizational boundary for GHG emissions accounting encompasses all operational activities and processes directly controlled and managed by the company. This includes:

- *Assembly and fabrication sites at* Waki Tal-Khed, Pune: All emissions associated with assembling operations, on-site fuel combustion, vehicle fleets, and other activities within the physical boundaries of the site are included in the assessment.
- *Direct operational control:* Activities within facilities, operations, and assets directly owned and operated by Alligator Automations are considered within the organizational boundary.

3. Operational Boundary

For this pilot assessment, Alligator Automations opted to focus on their Waki Tal-Khed, Pune site, where direct operational control is exercised. This includes all activities and processes directly managed and conducted by Alligator Automations within the site premises, such as manufacturing operations and fuel combustion.

4. GHG Emission Sources

Scope 1 Emission Activities:

1. Stationary Combustion
   - *Diesel Generator (DG) Set*
   - Fire Diesel Pump
   - Carbon Dioxide Gas
2. Mobile Combustion
   - Company owned cars used by employees and higher management for business travel
   - Company owned bikes and buses used for daily commute by employees
   - Company owned commercial vehicles used for material handling
3. Fugitive Emissions:
   - ABC fire extinguishers

Scope 2 Emission Activity:

- *Electricity from Grid*

These identified sources constitute the primary contributors to GHG emissions within Alligator Automations' operational boundaries.

5. GHG Emission Factors

The emission factors utilized in this assessment were sourced from three primary databases: DEFRA emission factors 2023, ecoinvent v3.10 and CEA v19. These databases provide comprehensive and up-to-date information on the environmental impacts associated with various processes and activities, including energy generation and fuel combustion. By leveraging data from these reputable sources, accuracy and reliability in greenhouse gas emissions calculations is ensured. The selection of these databases aligns with industry best practices and standards, facilitating a robust and transparent assessment of the organization's carbon footprint.

6. GHG Quantification Methodology

The GHG accounting methodology adopted for Alligator Automations India Pvt. Ltd.'s inventory involved a systematic and collaborative approach to ensure accuracy and reliability in the assessment process. This methodology comprised several key steps:

- *Opening Meeting:* An initial meeting was conducted between Nirantara Ecoventures Private Limited and Alligator Automations India Pvt. Ltd. through on-site meeting to delineate the scope of work and requirements, ensuring clarity and alignment with organizational objectives.
- *Checklist Preparation and Data Collection:* A comprehensive checklist and data collection sheet were prepared and sent to Alligator Automations, facilitating the gathering of relevant information and emission data.
- *Site Visit:* A site visit was conducted to observe company activities firsthand and address any queries or uncertainties regarding the data collection process, ensuring completeness and accuracy.

- *Data Verification and Validation:* Alligator Automations provided the duly filled data collection sheet along with supporting evidence, which underwent thorough verification and validation to ensure data integrity and reliability.
- *GHG Accounting Calculation:* Utilizing the verified data, GHG emissions were calculated using standard laid out by GHG Protocol and emission factors from reputable sources, such as DEFRA emission factors 2023, ecoinvent v3.10 and CEA v19.
- *Report Preparation:* The final step involved synthesizing the findings into a comprehensive GHG inventory report, documenting the emissions sources, calculations, and key insights to facilitate informed decision-making and future emissions management strategies.

7. GHG Data Aggregation and Reporting Period

The reporting period for Alligator Automations India Pvt. Ltd.'s inaugural GHG inventory covers the fiscal year 2023-24. Data aggregation methods were tailored to each emission source as follows:

- ***Diesel Generator (DG) Set***: Emissions were calculated based on diesel consumption data sourced from monthly petro-card reports.
- ***Fire Diesel Pump:*** Verifiable evidence for fire diesel pump was not available. Back-calculation methodology was applied by Alligator to arrive at the diesel consumed in fire diesel pump by taking into consideration the quantity of diesel purchased compared with the quantity of diesel remaining in the diesel purchase container.

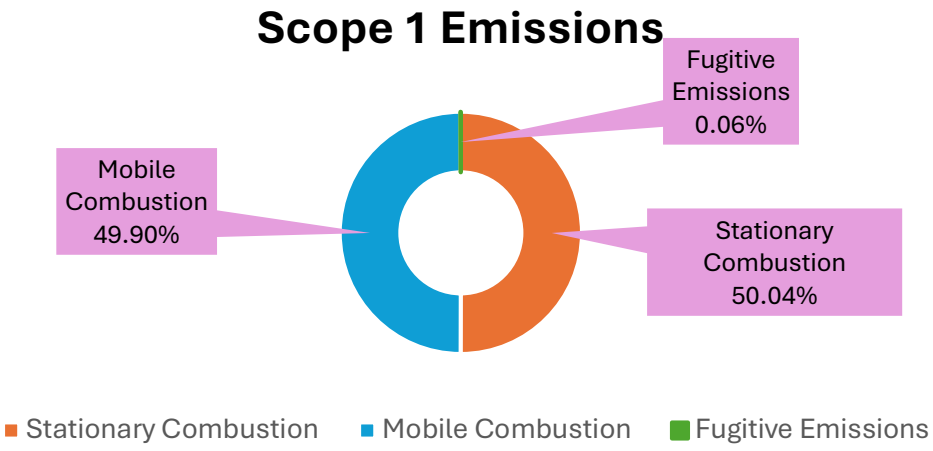
- ***Carbon Dioxide Gas:*** Emissions from the use of CO2 gas were calculated using consumption data recorded in purchase order records.
- ***Mobile Combustion:*** Emissions from vehicles, including cars, bikes, buses, and commercial vehicles (used for material handling), were determined using petro-card records provided by service providers.
- ***Fire Extinguisher Refilling:*** Emissions from fire extinguisher refilling were tracked through refilling reports obtained from the service provider – Surya Fire Safety Enterprises.
- ***Electricity Consumption:*** Emissions from grid electricity were calculated based on the units consumed, as documented in electricity bills received from the utility provider - Mahavitaran. Electricity from solar produced inhouse sold to Mahavitaran every month was not considered as part of scope 2.

8. GHG Reporting

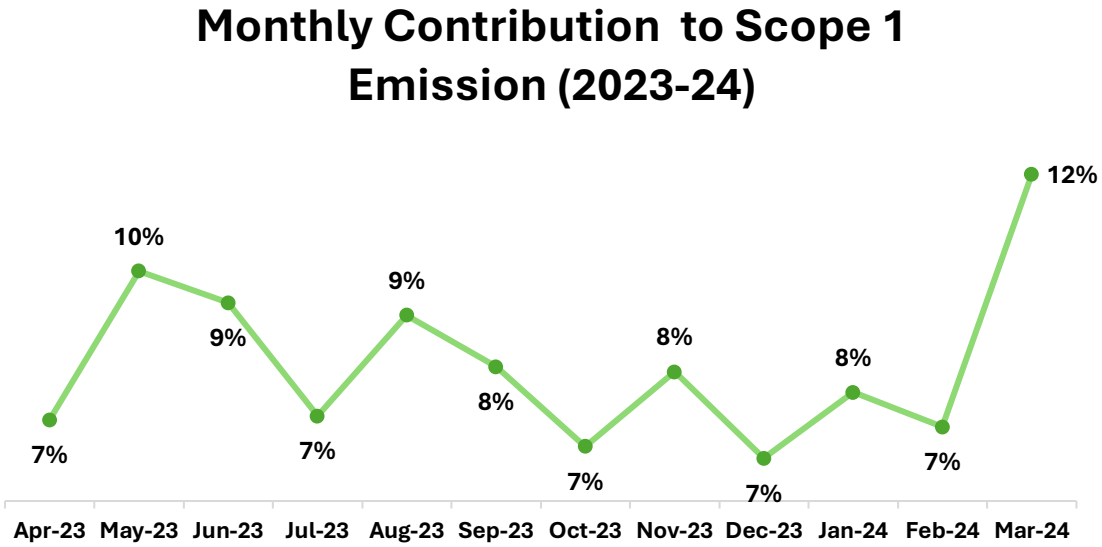
Scope 1 Emission:

Emission Activity	Emission	Unit
Stationary Combustion		
DG Set	23,252.86	kgCO2e
Fire Diesel Pump	45.21	kgCO2e
CO2 Gas	21,945.19	kgCO2e
Mobile Combustion		
Employee commute (company owned buses)	28,838.97	kgCO2e
Cars used by management (company owned)	6,034.32	kgCO2e
Bikes used by employee	1,014.62	kgCO2e

Ashok Leyland Dost	5,573.08	kgCO2e
Mahindra Bolero Maxi	3,659.81	kgCO2e
Fugitive Emissions		
ABC Fire extinguishers	58.76	kgCO2e

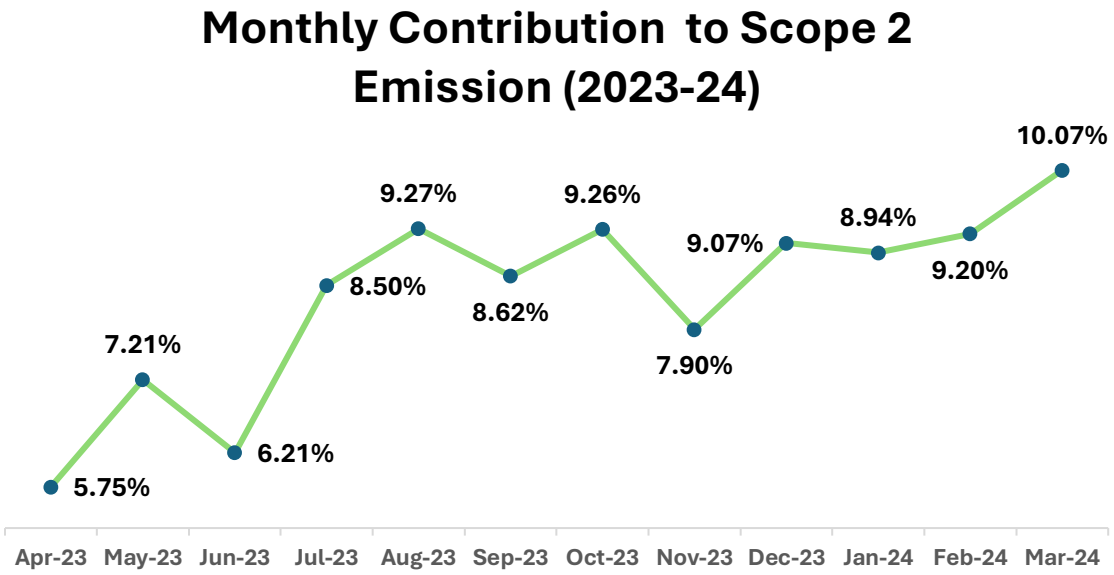


Total Emission in Scope 1: 90,422.82 kgCO2e or 90.42 tCO2e

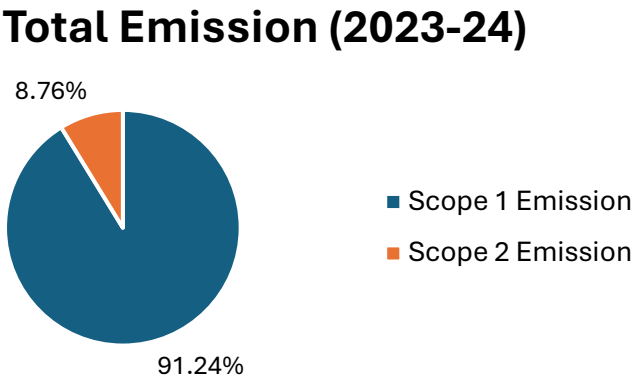


Scope 2 Emission:

Emission Activity	Emission	Unit
Electricity from Grid	8,684.15	kgCO2e



Total Emission in Scope 2: 8,684.15 kgCO2e or 8.68 tCO2e



Total Emission Scope 1 + Scope 2: 99,106.97 kgCO2e or 99.11 tCO2e

For the assessment process the following were taken into consideration:

a. Assumptions:

- CNG: For the months of April 2023 to January 2024 it assumed that CNG price per kg is Rs. 86 and for February 2024 price was Rs. 88. This assumption is based on pdf historical CNG data document by Maharashtra Natural Gas Limited (MNGL).
- *Fire Extinguisher:* ABC fire extinguisher comprises of ammonium phosphate and ammonium sulphate. The ratio of these is assumed as 40% and 60% respectively.
- *Argon +CO2 mix:* Relative density of CO2 with respect to air is 1.52 kg/m3. This assumption is considered due to unavailability of density of the CO2 in the mixed gas.

b. Limitations:

- Fire Diesel Pump: Direct evidence for diesel usage in the fire pump was not accessible. Diesel consumption was estimated using a back-calculation approach, comparing the purchased amount with the remaining diesel in storage.

9. Verification and Validation

Key aspects of the verification and validation processes included:

- Data Accuracy: Verification involved confirming the accuracy and completeness of data collected from various sources, including monthly electricity bills, petro-card expense records, purchase order records and fire extinguisher refilling reports. This process ensured that all relevant emissions data were

appropriately accounted for and accurately represented in the inventory.

- Calculation Methodologies: The methodology used for calculating emissions, included the application of emission factors from reputable databases such as DEFRA emission factors 2023, ecoinvent v3.10 and CEA v19. This step ensured consistency and reliability in the estimation of greenhouse gas emissions across different emission sources.
- Documentation Review: The verification process included a thorough review of documentation, including data collection sheets, supporting evidence, and emission calculations. This ensured transparency and traceability of the inventory process, enhancing the credibility of the reported emissions data.

Outcome: Following the verification and validation processes, Alligator Automations' GHG inventory received validation from ISO 14064:2018 certified auditors of Nirantara Ecoventures Private Limited, confirming the accuracy and reliability of the reported emissions data.

10. Conclusion and Future Actions

In conclusion, the GHG inventory conducted for Alligator Automations India Pvt. Ltd. represents a pivotal step towards understanding and mitigating the organization's carbon footprint. The results highlight a total Scope 1 and Scope 2 emission of 99.10 tCO2e, with significant contributions from stationary and mobile combustion, and electricity consumption from the grid. This comprehensive assessment provides valuable insights, setting the stage for strategic action in reducing emissions and fostering sustainability.

Looking ahead, Alligator Automations can leverage these findings to implement effective sustainability measures. We recommend the following future actions:

- **Enhance Energy Efficiency:**
  Explore initiatives to improve energy efficiency within operations, particularly by optimizing the use of the DG set. Conduct regular maintenance and explore energy-saving technologies to reduce overall consumption.
- **Conduct annual energy audits:** Conduct annual energy audits to identify inefficiencies, reduce energy consumption, and lower GHG emissions. These audits will uncover opportunities for energy savings and support the company's efforts to optimize operations. Additionally, pursuing ISO 50001 certification will enhance energy management and showcase Alligator's commitment to sustainability.
- **Expand Renewable Energy Integration:** Building on the existing 100 KW solar panel capacity, consider expanding the renewable energy infrastructure. This could involve additional solar panel installations to increase in-house energy production and further decrease reliance on the electricity grid, enhancing the company's overall sustainability profile.
- **Sustainable Transport Initiatives:** Given the emissions from company-owned vehicles and employee commute, explore the adoption of electric or hybrid vehicles for company use.
- **Continuous Improvement and Monitoring:** Establish a robust system for the ongoing monitoring and reporting of GHG emissions. This will enable tracking of progress, identification of new opportunities for emission reduction, and continuous improvement in sustainability practices.

Nirantara Ecoventures Private Limited remains committed to supporting Alligator Automations on this sustainability journey, offering expertise and guidance to help the organization achieve its environmental goals. Together, we can drive impactful change, reduce emissions, and build a sustainable future for all.

Appendix A

GHG Activities:

GHG source	GHG activity data	Data source	Frequency of collection
Diesel Generator (DG) Set	Consumption of diesel	Petro-Card monthly expense record	Monthly
Fire Diesel Pump	Consumption of diesel	Petro-Card monthly expense record	Monthly
Carbon Dioxide Gas	Consumption of CO2 gas	Purchase order monthly expense record	Monthly
Company owned cars used by employees and higher management for business travel	Consumption of Diesel, Petrol and CNG	Petro-Card monthly expense record	Monthly
Personal bikes used for daily commute by employees	Consumption of petrol	Petro-Card monthly expense record	Monthly
Company owned commercial vehicles used for material handling	Consumption of diesel	Petro-Card monthly expense record	Monthly
ABC fire extinguishers	Refilling of fire extinguisher	Vendor invoice	Yearly
Electricity	Electricity Consumption	Monthly electricity bill	Monthly

Appendix B

Emission factor sources:

Scope	GHG Activity	Emission factor source
Scope 1	Diesel Generator (DG) Set	DEFRA Emission Factor 2023
Scope 1	Fire Diesel Pump	DEFRA Emission Factor 2023
Scope 1	Company owned cars used by employees and higher management for business travel	DEFRA Emission Factor 2023
Scope 1	Personal bikes used for daily commute by employees	DEFRA Emission Factor 2023
Scope 1	Company owned commercial vehicles used for material handling	DEFRA Emission Factor 2023
Scope 1	ABC fire extinguishers	ecoinvent v3.10
Scope 2	Electricity	Central Electricity Authority (CEA) - CO2 Baseline Database for Indian Power Sector, CEA v19

Disclaimer: GHG Inventory Report 2023-24

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