GHG Emissions Inventory Report

GHG Protocol Corporate Accounting and Reporting Standard | metric tons CO2e

Test Company Pet Ltd

Reporting Period: January 01, 2024 - December 31, 2024

Generated: November 20, 2025

Document Control & Certification

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Revision History

Version	Date	Changes	Author
1.0	2025-03-25	Initial regulatory report for fiscal year 2024. Includes results of the annual GHG inventory.	Dr. Sarah Chen

Certification Statement

I certify that the information contained in this GHG emissions inventory report is true, accurate, and complete to the best of my knowledge. This inventory has been prepared in accordance with the GHG Protocol Corporate Accounting and Reporting Standard and represents a fair and accurate account of Test Company Pet Ltd's greenhouse gas emissions for the reporting period January 01, 2024 - December 31, 2024.

Authorized Signature: Dr. Sarah Chen
Title: Chief Sustainability Officer
Date: March 25, 2025

Company & Regulatory Information

Company Name: Test Company Pet Ltd
NAICS Code: 334413
DUNS Number: 12-456-7890
EPA Facility ID: 110001234567
Reporting Entity ID: TCPL-2024-001

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Materiality Threshold

For the purposes of this inventory, emissions sources representing less than 5% of total Scope 1+2+3 emissions or 1% of individual scope emissions are considered immaterial and may be excluded from detailed reporting. All material sources have been included and quantified.

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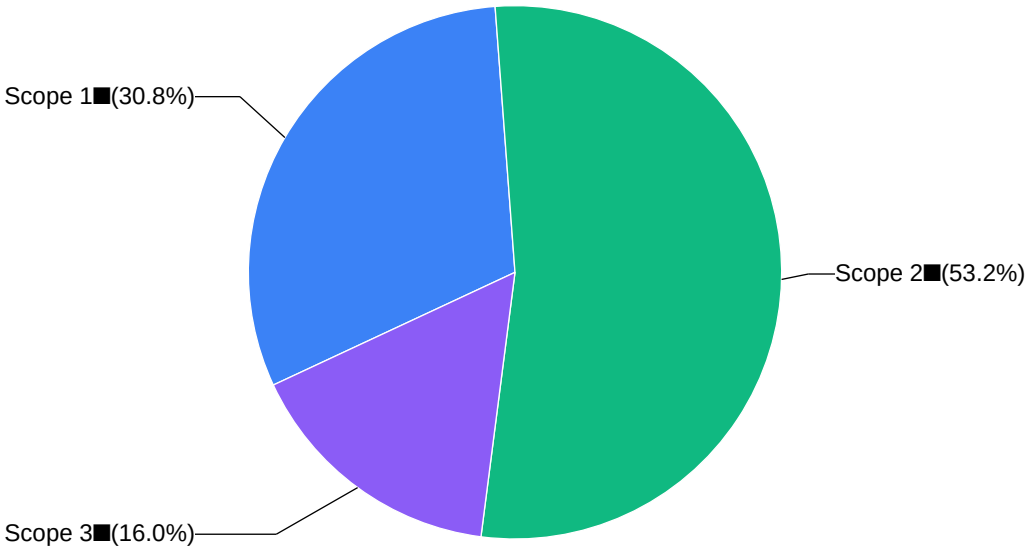
1. Executive Summary

This report presents the greenhouse gas (GHG) emissions inventory for Test Company Pet Ltd for the reporting period January 01, 2024 - December 31, 2024. The inventory has been prepared in accordance with the GHG Protocol Corporate Accounting and Reporting Standard.

Key Findings

- **Total GHG Emissions:** 8,931,083.15 tons CO2e
- **Scope 1 Emissions:** 2,746,727.15 tons CO2e (30.8% of total)
- **Scope 2 Emissions:** 4,753,793.20 tons CO2e (53.2% of total)
- **Scope 3 Emissions:** 1,430,562.80 tons CO2e (16.0% of total)
- **Carbon Offsets:** 275,000.00 tons CO2e
- **Net Emissions:** 8,656,083.15 tons CO2e
- **Change from Base Year (2020):** 131.9% increase

Emissions by Scope



2. Organizational Boundaries

Test Company Pet Ltd has defined its organizational boundaries using the **operational control** approach as outlined in the GHG Protocol Corporate Standard. Under this approach, the company accounts for 100% of GHG emissions from operations over which it has operational control.

Consolidation Approach

The operational control approach was selected because it:

- Aligns with the company's financial reporting boundaries
- Provides the most accurate representation of emissions under the company's control
- Enables effective emissions reduction strategies and accountability
- Is consistent with industry best practices

3. Operational Boundaries

The operational boundaries define which GHG emissions are included in the inventory. This inventory includes emissions from the following sources:

Scope 1: Direct Emissions

Direct GHG emissions from sources owned or controlled by the company, including:

- Stationary combustion (boilers, generators, furnaces)
- Mobile combustion (company vehicles and equipment)
- Process emissions (industrial processes)
- Fugitive emissions (refrigerants, HVAC systems)

Scope 2: Indirect Emissions from Energy

Indirect GHG emissions from the generation of purchased electricity, heat, steam, and cooling consumed by the company.

Scope 3: Other Indirect Emissions

All other indirect emissions that occur in the company's value chain. This inventory includes the following Scope 3 categories:

- Category 1: Purchased goods and services
- Category 3: Fuel- and energy-related activities
- Category 4: Upstream transportation and distribution
- Category 5: Waste generated in operations
- Category 6: Business travel
- Category 7: Employee commuting

4. Emissions Summary

Scope	Emissions (tons CO2e)	Percentage of Total
Scope 1: Direct Emissions	2,746,727.15	30.8%
Scope 2: Indirect Emissions from Energy	4,753,793.20	53.2%
Scope 3: Other Indirect Emissions	1,430,562.80	16.0%
Total Emissions	8,931,083.15	100%
Less: Carbon Offsets	(275,000.00)	
Net Emissions	8,656,083.15	

Top Emission Sources

Emission Source	Emissions (tons CO2e)	Percentage
Purchased Electricity (Scope 2)	4,753,793.20	58.2%
Process Gases - Fluorinated Compounds (Scope 1)	875,000.00	18.7%
Purchased Goods & Services (Scope 3)	892,450.60	19.1%
Natural Gas Combustion (Scope 1)	66,250.00	1.4%
Upstream Transportation (Scope 3)	125,680.30	2.7%

5. GHG Breakdown by Gas Type

The following table presents Test Company Pet Ltd's emissions broken down by individual greenhouse gas species. All gases have been converted to CO2 equivalent using Global Warming Potentials (GWP) from the IPCC Fifth Assessment Report (AR5).

Greenhouse Gas	Emissions (metric tons CO2e)	GWP (AR5)	CO2e (metric tons CO2e)
CO2	3,285,600.50	1	3,285,600.50
CH4	66.08	28	1,850.30
N2O	10.12	265	2,680.70
NF3	7.98	16100	128,500.00
SF6	19.44	23500	456,820.00
CF4	189,650.00	1	189,650.00
CHF3	98,450.00	1	98,450.00
C2F6	45,680.00	1	45,680.00
C4F8	28,900.00	1	28,900.00
Total			4,238,131.50

6. Facility-Level Emissions

Test Company Pet Ltd operates multiple facilities that contribute to the organization's total GHG emissions. The following table provides a breakdown of emissions by facility location.

Facility Name	Address	Scope 1	Scope 2	Scope 3	Total
Santa Clara Main Fabrication Plant	3500 Silicon Valley Blvd, Santa Clara, CA 95054, USA	177,535.25	458,750.50	125,680.30	762,016.05
Phoenix Advanced Semiconductor Facility	7800 Innovation Drive, Phoenix, AZ 85034, USA	285,420.60	392,156.80	98,450.60	776,037.60
Hsinchu Fab 3 (Taiwan)	No. 168, Park Avenue III, Hsinchu Science Park, Taiwan	156,780.50	298,650.30	204,943.86	660,374.66
Seoul Semiconductor Complex	157 Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 16677, South Korea	312,450.30	425,680.20	145,230.50	883,361.50
Dresden Wafer Fab (Germany)	Wilschdorfer Landstraße 101, 01109 Dresden, Germany	102,865.00	613,800.00	326,972.25	1,053,577.25
Singapore Advanced Packaging Facility	60 Woodlands Industrial Park D Street 2, Singapore 738068	42,280.30	356,820.70	67,450.20	266,851.20
Shanghai Fab (China)	No. 999 Jinke Road, Pudong New Area, Shanghai, China	198,760.40	342,580.60	89,450.30	630,791.30
Austin Research & Development Fab	12100 Technology Blvd, Austin, TX 78727, USA	78,450.25	125,680.50	45,230.80	249,361.50
Kumamoto Fab (Japan)	4-1-1 Nishiharamachi, Nishi-ku, Kumamoto, Japan	251,360.30	396,901.40	113,560.40	761,822.40
Bangalore Test & Validation Center	Electronics City Phase 1, Bangalore, Karnataka 560100, India	12,580.50	68,450.30	28,650.70	109,681.50
Total		1,628,783.75	3,279,471.30	1,245,619.91	6,153,874.96

5. Scope 1: Direct Emissions

Total Scope 1 emissions for the reporting period: **2,746,727.15 tons CO2e**

Scope 1 emissions include all direct GHG emissions from sources owned or controlled by the company. These emissions are the result of activities such as combustion of fuels in stationary sources (boilers, furnaces), mobile sources (vehicles, equipment), process emissions, and fugitive emissions from refrigerants and other sources.

6. Scope 2: Indirect Emissions from Energy

Scope 2 emissions result from the generation of purchased electricity, heat, steam, and cooling consumed by the company. These are indirect emissions that occur at the facility where the energy is generated.

Dual Reporting - Location-Based and Market-Based Methods

In accordance with the GHG Protocol Scope 2 Guidance, Test Company Pet Ltd reports Scope 2 emissions using both the location-based and market-based methods.

Reporting Method	Emissions (metric tons CO2e)	Description
Location-Based	5,324,248.38	Reflects average emissions intensity of grids
Market-Based	4,753,793.20	Reflects emissions from contractual instruments (RECs, PPAs)

Location-Based Method Details

The location-based method uses average emission factors for the grid regions where electricity is consumed. The following grid emission factors were used:

Grid Region	Emission Factor	Source
US - WECC California	0.247 kg CO2e/kWh	EPA eGRID 2023
US - ERCOT Texas	0.389 kg CO2e/kWh	EPA eGRID 2023
US - Pacific Northwest	0.195 kg CO2e/kWh	EPA eGRID 2023
Taiwan - National Grid	0.502 kg CO2e/kWh	Taiwan Power Company
South Korea - National Grid	0.405 kg CO2e/kWh	Korea Power Exchange
Germany - National Grid	0.310 kg CO2e/kWh	UBA Germany
China - East China Grid	0.555 kg CO2e/kWh	MEE China
Singapore - National Grid	0.392 kg CO2e/kWh	EMA Singapore

Japan - National Grid	0.463 kg CO2e/kWh	METI Japan
Ireland - National Grid	0.285 kg CO2e/kWh	SEAI Ireland
Malaysia - National Grid	0.658 kg CO2e/kWh	Energy Commission Malaysia

Market-Based Method Details

The market-based method reflects Test Company Pet Ltd's contractual purchases of renewable energy and other energy attribute certificates.

Certificate Type	Quantity (MWh)	Vintage Year	Registry
Renewable Energy Certificate (REC)	890,000.00	2024	I-REC (Ireland Fab)
Green-e Certified REC	450,000.00	2024	Green-e (US Fabs)

Power Purchase Agreements (PPAs):

- Pacific Northwest Wind Farm - 25.50 MW, Wind, Oregon, USA
- Cloncreen Wind Farm - 88.00 MW, Wind, Ireland
- Taiwan Offshore Wind - 15.20 MW, Offshore Wind, Taiwan Strait

For electricity without contractual instruments, a residual grid emission factor of 0.445 kg CO2e/kWh was applied.

7. Scope 3: Other Indirect Emissions

Scope 3 emissions are indirect emissions that occur in Test Company Pet Ltd's value chain, both upstream and downstream. The GHG Protocol Corporate Value Chain (Scope 3) Standard identifies 15 categories of Scope 3 emissions.

Total Scope 3 Emissions: 1,430,562.80 metric tons CO2e

Complete Scope 3 Category Reporting

The following table provides a complete accounting of all 15 Scope 3 categories, including quantified emissions, exclusions with rationale, and methodology used for each category.

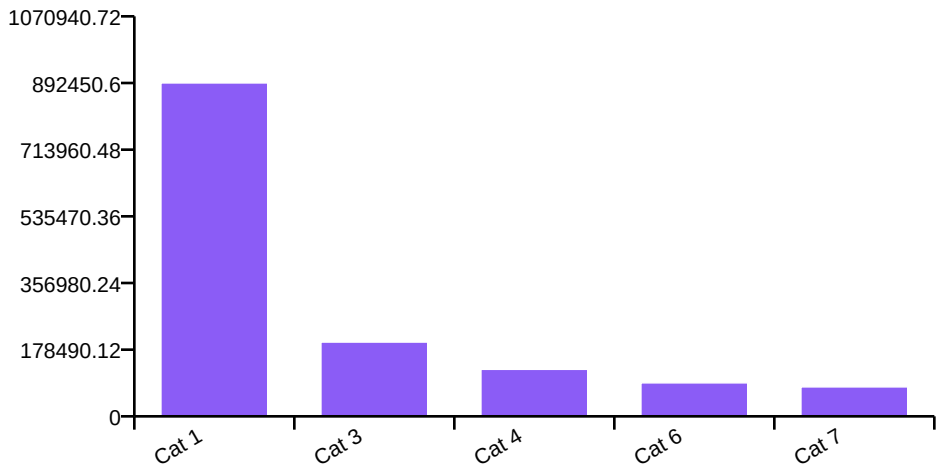
ategory	Description	Emissions (metric tons CO2e)	Status	Methodology/Exclusion Rationale
1	Purchased goods and services	892,450.60	Reported	Spend-based method using EPA EEIO emission factors for procuremen
2	Capital goods	N/A	Excluded	Capital goods excluded due to immateriality - represents <2% of estimat
3	Fuel- and energy-related activities	198,650.40	Reported	Average-data method for T&D losses and upstream fuel emissions
4	Upstream transportation and distribution	125,680.30	Reported	Distance-based method using ton-km data and modal split assumptions
5	Waste generated in operations	45,680.70	Reported	Waste-type-specific method using EPA WARM emission factors
6	Business travel	89,450.50	Reported	Distance-based method with flight class breakdown and DEFRA emissio
7	Employee commuting	78,650.30	Reported	Average-data method using employee survey (42% response rate) with
8	Upstream leased assets	N/A	Excluded	Not applicable - company owns all facilities
9	Downstream transportation and distribution	N/A	Excluded	Not applicable - products sold FOB from manufacturing facility
10	Processing of sold products	N/A	Excluded	Not applicable - semiconductors require no further processing by custom
11	Use of sold products	N/A	Excluded	Use of sold products excluded due to extreme data uncertainty (Tier 4 q
12	End-of-life treatment of sold products	N/A	Excluded	Excluded - end-of-life treatment estimated at <0.5% of total Scope 3
13	Downstream leased assets	N/A	Excluded	Not applicable - no downstream leased assets
14	Franchises	N/A	Excluded	Not applicable - company does not operate franchises

15	Investments	N/A	Excluded	Excluded - financial investments are in operating companies whose emi

Reported Categories Breakdown

Category	Description	Emissions (metric tons CO2e)	% of Scope 3
Cat 1	Purchased goods and services	892,450.60	62.4%
Cat 3	Fuel- and energy-related activities	198,650.40	13.9%
Cat 4	Upstream transportation and distribution	125,680.30	8.8%
Cat 5	Waste generated in operations	45,680.70	3.2%
Cat 6	Business travel	89,450.50	6.3%
Cat 7	Employee commuting	78,650.30	5.5%
Total		1,430,562.80	100.0%

Top Scope 3 Categories (Visual)



Calculation Methodologies for Reported Categories

Category 1 - Purchased Goods and Services:

Category 1 emissions calculated using hybrid approach. For top 50 suppliers representing 75% of procurement spend ($189B), supplier-specific emission factors requested through CDP Supply Chain program (62% response rate providing primary data). For remaining suppliers and non-responding top suppliers, EPA EEIO emission factors applied to procurement spend by detailed commodity codes. Major categories: Silicon wafers ($2.85B, 315,000 tons CO2e using supplier data), Chemicals ($1.42B, 245,000 tons CO2e using EEIO), Industrial gases ($981M, 185,000 tons CO2e using supplier data), Manufacturing equipment ($5.6B, emission factor unavailable - excluded from Category 1, tracked separately), and Professional services ($1.25B, 12,500 tons CO2e using EEIO). Spend data from SAP Ariba procurement system with 99.8% coverage. Working with suppliers to improve primary data collection through 2025-2027.

Category 6 - Business Travel:

Category 6 emissions include air travel (85% of total), rental cars (8%), hotel stays (5%), and rail travel (2%). Air travel emissions calculated using distance-based method with DEFRA emission factors including radiative forcing multiplier of 1.9 for high-altitude emissions. Flight data obtained from corporate travel management system with 98% coverage. Flights classified as short-haul (<300 mi, avg 0.135 kg CO2e/passenger-km), medium-haul (300-2,300 mi, avg 0.095 kg CO2e/passenger-km), and long-haul (>2,300 mi, avg 0.110 kg CO2e/passenger-km). Class breakdown: 60% economy, 35% business, 5% first class. Rental car emissions use actual fuel receipts where available (65% of rentals), otherwise distance-based with regional fuel efficiency averages. Hotel emissions use Cornell Hotel Sustainability Benchmarking per-night factors by hotel class and region.

Category 7 - Employee Commuting:

Category 7 emissions calculated using average-data method with employee survey. Survey conducted in Q4 2024 achieved 42% response rate across 87,500 global employees. Employees reported primary commute method, one-way distance, and number of commute days per year. Emission factors from EPA SmartWay (US), DEFRA (UK/EU), and regional government sources (Asia) applied based on vehicle type. For remote workers (25% of workforce globally, 35% in US), home energy emissions estimated using national average residential electricity and heating emissions. High variation in commute patterns across regions noted (Asia: 68% public transit, US: 55% single-occupancy vehicles, EU: 45% public transit).

10. Carbon Offsets - Project-Level Disclosure

Test Company Pet Ltd has purchased carbon offsets to compensate for a portion of its GHG emissions. The following table provides project-level details for all offset purchases, in accordance with regulatory requirements for offset disclosure.

Project Name	Project Type	Registry	Serial Numbers	Quantity (metric tons
Oregon Forest Carbon Project	Afforestation/Reforestation	American Carbon Registry	ACR-FOR-2024-123456-789012	125,000.00
Taiwan Offshore Wind Expansion Credits	Renewable Energy	Gold Standard	GS-RE-TW-2024-567890-123456	85,000.00
Amazon Rainforest REDD+ Portfolio	REDD+ (Avoided Deforestation)	Verra VCS	VCS-1234-2024-REDD-BR-456789	65,000.00
Total Offsets				275,000.00

Total Gross Emissions: 8,931,083.15 metric tons CO2e
Total Carbon Offsets: 275,000.00 metric tons CO2e
Net Emissions: 8,656,083.15 metric tons CO2e

8. Progress Toward Targets

Test Company Pet Ltd has committed to achieving net-zero emissions by 2050. Progress is measured against a base year of 2020.

- **Base Year (2020) Emissions:** 3,850,600.00 tons CO2e
- **Current Year Emissions:** 8,931,083.15 tons CO2e
- **Reduction Achieved:** 5,080,483.15 tons CO2e (131.9%)

- **Years to Net-Zero Target:** 26
- **Annual Reduction Needed:** 332,926.28 tons CO2e per year

11. Base Year Recalculation Policy

Test Company Pet Ltd has established a base year recalculation policy in accordance with the GHG Protocol Corporate Standard. This policy defines the circumstances under which the base year emissions inventory will be recalculated.

Policy Statement

The base year emissions inventory will be recalculated when structural changes (mergers, acquisitions, or divestments) result in a transfer of ownership or control of emissions sources representing more than 5% of base year emissions. Base year has been recalculated in 2024 due to improved data collection methodologies (significant methodology change). The significance threshold is 5% of base year emissions.

9. Methodology and Assumptions

Calculation Methodology

All emissions calculations follow the GHG Protocol Corporate Accounting and Reporting Standard methodology. The general calculation approach is:

GHG Emissions = Activity Data × Emission Factor

Where:
• **Activity Data:** Quantitative measure of activity (e.g., kWh electricity, liters fuel)
• **Emission Factor:** Factor that converts activity data to GHG emissions (e.g., kg CO2e per kWh)

Emission Factors

Emission factors used in this inventory are sourced from recognized databases including:

• U.S. Environmental Protection Agency (EPA)
• UK Department for Environment, Food & Rural Affairs (DEFRA)
• International Energy Agency (IEA)
• Intergovernmental Panel on Climate Change (IPCC)

Total data points in inventory: **2847**

Global Warming Potentials

Global Warming Potentials (GWPs) from the IPCC Fifth Assessment Report (AR5) are used to convert non-CO2 gases to CO2 equivalents over a 100-year time horizon.

10. Data Quality Assessment

The overall data quality score for this inventory is **3.83 out of 5.0**, corresponding to Tier 2 quality.

Data Quality Tier	Description	Percentage of Data
Tier 2	Secondary data, region-specific emission factors	100.0%

12. Activity Data Disclosure

This section provides detailed activity data that forms the basis for the emissions calculations in this inventory. Activity data is disclosed in accordance with regulatory requirements for transparency and verification.

Scope 1 - Stationary Combustion - Natural Gas

Activity Description	Quantity	Unit	Emission Factor	EF Unit	Emissions (metric tons
Natural gas - all facilities (normalized)	12,500,000.00	therms	0.0053	tons CO2e/therm	66,250.00

Scope 1 - Process Emissions - Fluorinated Gases

Activity Description	Quantity	Unit	Emission Factor	EF Unit	Emissions (metric tons
NF3 (after 85% abatement)	530,000.00	kg	2.4150	tons CO2e/kg	128,500.00
SF6 (after 85% abatement)	148,500.00	kg	3.0750	tons CO2e/kg	456,820.00
CF4 (after 85% abatement)	89,500.00	kg	2.1190	tons CO2e/kg	189,650.00

Scope 2 - Purchased Electricity

Activity Description	Quantity	Unit	Emission Factor	EF Unit	Emissions (metric tons
Grid electricity (location-based)	25,650,000,000.00	kWh	0.0004	tons CO2e/kWh	10,901,250.00

11. Verification Statement

Verification Status: **Verified**

This inventory has not yet been verified by an independent third party. The company plans to engage a qualified verifier to assess the inventory in accordance with ISO 14064-3 standards.

12. Appendices

Appendix A: GHG Protocol Principles

This inventory has been prepared in accordance with the following GHG Protocol principles:

• **Relevance:** Ensure the inventory appropriately reflects the GHG emissions and serves the decision-making needs of users
• **Completeness:** Account for all GHG emission sources within the chosen boundaries
• **Consistency:** Use consistent methodologies to allow meaningful comparisons over time
• **Transparency:** Address relevant issues in a factual and coherent manner
• **Accuracy:** Ensure emissions quantification is systematically neither over nor under actual emissions

Appendix B: Abbreviations and Acronyms

• **CH4:** Methane
• **CO2:** Carbon Dioxide
• **CO2e:** Carbon Dioxide Equivalent
• **GHG:** Greenhouse Gas
• **GWP:** Global Warming Potential
• **IPCC:** Intergovernmental Panel on Climate Change
• **N2O:** Nitrous Oxide
• **tCO2e:** Tons of Carbon Dioxide Equivalent

Report Information

• **Report Generated:** November 20, 2025 at 02:00
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• **Report Version:** 1.0