

# GHG Emissions

## Data Collection Guide

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For Department Data Coordinators

A practical step-by-step guide to understanding what data to collect, where to find it, and how to enter it accurately in the GHG template.

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Based on: EPA GHG Emission Factors Hub 2022 · GHG Protocol Corporate Standard  
IPCC AR5 GWP Values · ISO 14064-1

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# How to Use This Guide

This guide is written for department staff who collect and enter greenhouse gas (GHG) data into the company template. You do not need to be an ESG expert — your job is to find the right numbers and enter them accurately. Everything else is automatic.

## Why Does This Matter?

- **Legal Requirement.** The EPA GHGRP requires U.S. facilities emitting over 25,000 MT CO<sub>2</sub>e/year to report annually. Regulations are tightening globally.
- **Investor & Customer Pressure.** CDP, TCFD, and SEC Climate Rules require verified emissions data. Customers increasingly demand supplier data.
- **Cost Savings.** Tracking energy and fuel usage reveals efficiency opportunities.
- **Your Department's Role.** Each department owns specific emission sources. Without your data, the company's total footprint cannot be accurately measured.

## Understanding the Three Scopes

<p><b>SCOPE 1 DIRECT</b></p> <p>Emissions from sources your company directly owns or controls. Includes fuel burned in boilers, vehicles, and generators, plus refrigerant leaks.</p> <p><i>Boilers · Fleet vehicles · Generators · Refrigerants</i></p>	<p><b>SCOPE 2 INDIRECT ENERGY</b></p> <p>Emissions from electricity, steam, or heat you purchase from an external supplier. You don't generate it — but your consumption drives fossil fuel burning upstream.</p> <p><i>Utility electricity · Purchased steam · District heating</i></p>	<p><b>SCOPE 3 VALUE CHAIN</b></p> <p>All other indirect emissions in your upstream and downstream value chain. Includes supplier manufacturing, employee commuting, business travel, and waste disposal.</p> <p><i>Business travel · Commuting · Suppliers · Waste</i></p>
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## The EPA Calculation Formula

All emissions use this formula from the EPA GHG Emission Factors Hub (2022). GWP values are from IPCC AR5.

$$\text{Emissions (MT CO}_2\text{e)} = [ \text{Activity} \times \text{CO}_2\text{-EF} + \text{Activity} \times \text{CH}_4\text{-EF} \times 28 + \text{Activity} \times \text{N}_2\text{O-EF} \times 265 ] / 1,000,000$$

$$\text{For refrigerant leaks: Emissions (MT CO}_2\text{e)} = \text{Refrigerant (lbs)} \times \text{GWP} / 2,204.62 / 1,000$$

**You never need to calculate this yourself.** The Excel template does it automatically when you enter activity data in the yellow cells.

## Step-by-Step: How to Use the Excel Template

1

### Open Your Department Tab

Find your tab at the bottom of the Excel file (e.g., '■ Manufacturing', '■ Office & IT'). Click it to open your department's data entry sheet.

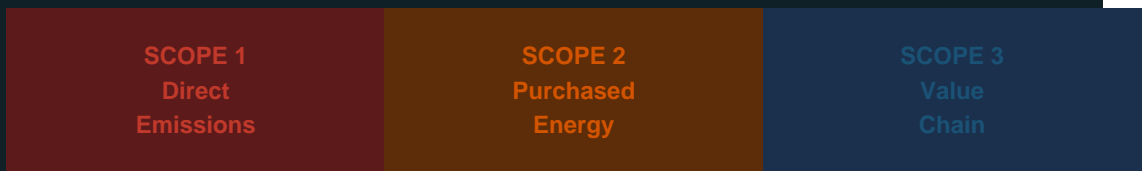
<b>2</b>	<b>Fill in Yellow Cells Only</b> Only the yellow/orange cells need your input. These are the quarterly activity amounts (Q1–Q4). All other cells (emission factors, formulas, totals) are pre-filled and calculated automatically — do NOT edit them.
<b>3</b>	<b>Enter the Number in the Correct Unit</b> Each row shows the required unit in the 'Unit' column (gallons, kWh, miles, short tons, etc.). Always check this before entering data. Wrong units are the most common mistake.
<b>4</b>	<b>Record Where the Data Came From</b> In the 'Notes / Source' column, type a short note: e.g., 'Utility bill Jan–Dec 2024' or 'Fleet card Q1–Q4 report'.
<b>5</b>	<b>Set the Data Quality Tier</b> In the 'Data Tier' column: Tier 1 = directly measured (meter), Tier 2 = from invoices/records, Tier 3 = estimated. Be honest — this affects auditor confidence.
<b>6</b>	<b>Submit by the Deadline</b> Save and send your file to the ESG team. Keep source documents (utility bills, fuel receipts, mileage logs) for at least 5 years.

## Department Guide

# Manufacturing / Production

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The Manufacturing department typically has the **highest Scope 1 emissions**. You burn fuel in boilers, generators, and forklifts; refrigeration systems can leak potent greenhouse gases. Production-line electricity drives Scope 2. Raw material purchases dominate Scope 3.



Excel Tab: ■ Manufacturing

# Manufacturing / Production

## SCOPE 1

### Direct Emissions — Fuel, Process & Refrigerant

Fuel you burn in boilers, generators, forklifts, and any chemical process on-site.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Boiler – Natural Gas	scf	Gas utility bill → 'Gas Usage' in Therms × 100, or CCF × 100
Emergency Generator – Diesel	gallons	Fuel purchase receipts / fuel tank refill logs
Forklift – LPG	gallons	LPG cylinder purchase records or propane invoices
Refrigerant Leak – HFC-32 / R-410A	lbs	HVAC service records → 'refrigerant added' quantity
Process Chemical Reaction	MT CO <sub>2</sub> e	Process engineer estimate or EPA Subpart method

#### ✓ TIP

If your gas bill shows Therms, multiply × 100 to get scf. If it shows CCF (hundred cubic feet), that IS scf already.

#### ! NOTE

Refrigerant leaks are often missed. Ask your HVAC contractor for annual service reports showing how much refrigerant was added to each unit.

## SCOPE 2

### Indirect Energy — Purchased Electricity & Steam

Electricity and steam your facility buys to run production lines.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Electricity – Production Lines	kWh	Monthly electricity bill → annual total 'kWh Usage'
Purchased Steam from Utility	MMBtu	Steam utility invoice → 'MMBtu delivered' (or Mlbs × 1.194)

#### ✓ TIP

If your facility has sub-meters, enter each separately to identify which production line uses the most energy.

### SCOPE 3

## Value Chain — Upstream & Downstream (Scope 3)

Emissions embedded in the raw materials and components you purchase.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.1 – Purchased Steel	short tons	ERP or procurement system → annual steel purchase tonnage
Cat.1 – Purchased Plastics	short tons	Purchase orders for resin/plastic pellets
Cat.1 – Purchased Chemicals	short tons	Chemical inventory or purchase orders
Cat.2 – Capital Equipment	\$1,000 spent	Finance: total capex on new equipment this year
Cat.5 – Industrial Waste to Landfill	short tons	Waste hauler manifests or annual disposal invoices



**TIP**

For purchased materials, use the annual total weight received. Your procurement team can export tonnage from the ERP system.

### Step-by-Step: Entering Data in the Template

**1**

#### Open Your Department Tab

In the Excel file, click the tab labelled **Manufacturing**.

**2**

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

**3**

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

**4**

#### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO<sub>2</sub>e using the EPA formula. Do NOT edit these columns.

**5**

#### Document Your Source

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

**6**

#### Set Data Quality Tier

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## Frequently Asked Questions

**Q I don't know how much gas each boiler uses separately.**

A That's OK — enter the total gas for all boilers combined in one row.

**Q What if we didn't use a particular fuel this year?**

A Leave the activity cells blank or enter 0. The formula will show 0 MT CO<sub>2</sub>e.

**Q Our refrigeration system was serviced twice. How do I enter that?**

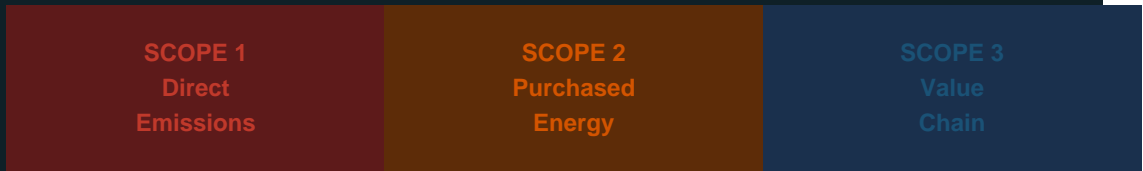
A Add up all refrigerant added across both service visits and enter the annual total.

## Department Guide

# Logistics & Transport

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Logistics is primarily a **Scope 1 and Scope 3** department. Every gallon burned by company-owned trucks, vans, and cars is Scope 1. Third-party carriers (3PL) are Scope 3. Warehouse electricity is Scope 2.



Excel Tab: ■ **Logistics & Transport**

# Logistics & Transport

## SCOPE 1

### Direct Emissions — Company-Owned Vehicles & Equipment

Fuel burned in vehicles and equipment your company owns or leases.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Fleet Trucks – Diesel	gallons	Fleet fuel card portal (WEX/Fleetcor) → annual diesel gallons
Company Cars – Gasoline	gallons	Fleet fuel card → total gasoline gallons for the year
Forklifts (Warehouse) – Diesel	gallons	Fuel log at warehouse or fuel card for forklifts
Refrigerant Leak – R-410A	lbs	Cold storage HVAC service records → annual top-up quantity

#### ✓ TIP

Log into your fleet card portal and run an annual fuel consumption report grouped by fuel type. This is the fastest data source.

#### ! NOTE

Only enter fuel for company-owned or leased vehicles. Employee-owned vehicles used for business go in Scope 3.

## SCOPE 2

### Indirect Energy — Warehouse & Charging Electricity

Electricity purchased to run warehouses, cold storage, and EV charging.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Electricity – Warehouse/Cold Storage	kWh	Monthly electricity bill for each warehouse location
Electricity – EV Fleet Charging	kWh	EV charging system report (ChargePoint etc.) or sub-meter

#### ✓ TIP

If you have multiple warehouse locations, sum all location utility bills to get a single annual kWh total.

### SCOPE 3

## Value Chain — Third-Party Freight & Distribution

Emissions from freight carriers, forwarders, and last-mile delivery you hire.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.4 – 3PL Road Freight (inbound)	ton-miles	TMS report: freight weight (short tons) × distance (miles)
Cat.4 – Air Cargo (upstream)	ton-miles	Freight forwarder invoice: air cargo weight × distance
Cat.4 – Ocean Freight (upstream)	ton-miles	Freight forwarder: metric tons × nautical miles
Cat.9 – Downstream Road Distribution	ton-miles	Sales delivery records: goods weight × delivery distance
Cat.9 – Last-Mile Parcel Delivery	ton-miles	Courier portal (UPS/FedEx) → annual ton-mile report



TIP

Your TMS (Transportation Management System) or freight broker can generate a freight activity report showing total ton-miles by mode.

### Step-by-Step: Entering Data in the Template

1

#### Open Your Department Tab

In the Excel file, click the tab labelled **Logistics & Transport**.

2

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

4

#### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO2e using the EPA formula. Do NOT edit these columns.

5

#### Document Your Source

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

6

#### Set Data Quality Tier

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## Frequently Asked Questions

**Q We have 200+ vehicles. Do I enter each one?**

A No — group by fuel type. One row for all diesel trucks (total gallons), one row for all gasoline cars (total gallons).

**Q Inbound vs. outbound shipments — which Scope 3 category?**

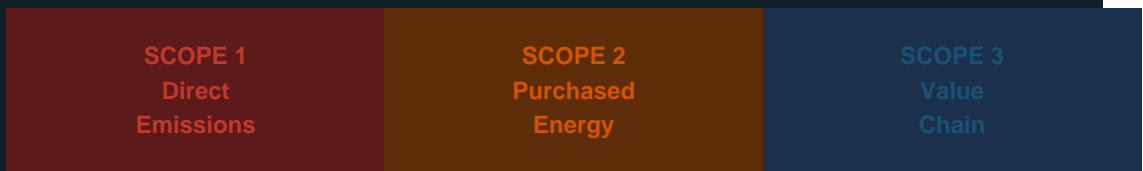
A Inbound (goods arriving at your facility) = Cat.4. Outbound (goods leaving to customers) = Cat.9.

## Department Guide

# Office & IT

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Office and IT departments are dominated by **Scope 2 and Scope 3**. Electricity for offices and data centers is Scope 2. Business travel and employee commuting are the largest Scope 3 sources. Scope 1 is usually small (gas heating, company cars).



Excel Tab: ■ Office & IT

# Office & IT

## SCOPE 1

### Direct Emissions — Heating & Company Vehicles

Natural gas for office heating and any company-owned vehicles.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Office Gas Boiler / Furnace – Natural Gas	scf	Office building gas bill (or Facilities allocation). 1 Therm = 100 scf.
Company Vehicles – Motor Gasoline	gallons	Fleet fuel card report or petty cash receipts for small fleets

#### ✓ TIP

If your office is in a multi-tenant building, ask Facilities Management for the natural gas allocation for your tenant space.

## SCOPE 2

### Indirect Energy — Office & Data Center Electricity

Electricity for offices, on-site data centers, and cloud/co-location infrastructure.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Office Building Electricity	kWh	Monthly electricity bill → annual total kWh
On-Site Data Center Electricity	kWh	Data center sub-meter or PDU reports → annual kWh
Co-Location / Cloud (market-based)	kWh	AWS/Azure/GCP carbon dashboard, or co-lo monthly kWh invoice

#### ✓ TIP

AWS, Azure, and Google Cloud all provide carbon dashboards. AWS: Customer Carbon Footprint Tool. Azure: Emissions Impact Dashboard. Ask your cloud admin or FinOps team to pull the annual kWh report.

#### ! NOTE

If your cloud provider uses 100% renewable energy with certified RECs, enter emission factor as 0. Check your service contract or provider's sustainability report to confirm.

### SCOPE 3

## Value Chain — Business Travel & Employee Commuting

Business travel (all modes) and commuting — the largest categories for most office depts.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.6 – Air Travel Short Haul (<300 mi)	pass-miles	Corporate travel system (Concur/Egencia) → air mileage report
Cat.6 – Air Travel Medium Haul (300–2300 mi)	pass-miles	Travel system → filter by haul range
Cat.6 – Air Travel Long Haul (>2300 mi)	pass-miles	Travel system → international/long-haul flights
Cat.6 – Rail Travel (Amtrak avg)	pass-miles	Travel system or employee expense reports for train tickets
Cat.6 – Hotel / Lodging	room-nights	Travel system or expense system → total hotel nights
Cat.7 – Commute: Personal Car	vehicle-miles	Commute survey: employees × avg round-trip miles × working days
Cat.7 – Commute: Transit Rail	pass-miles	Commute survey: transit users × avg miles × working days
Cat.7 – Commute: Bus	pass-miles	Commute survey: bus users × avg miles × working days

#### ✓ TIP

Run a simple 5-question commute survey annually via Microsoft Forms or Google Forms. Ask: (1) transport mode, (2) one-way miles, (3) days/week in office. 70%+ response rate is sufficient.

### Step-by-Step: Entering Data in the Template

1

#### Open Your Department Tab

In the Excel file, click the tab labelled **Office & IT**.

2

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

**4**

#### **Annual Total & Emissions Calculate Automatically**

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO2e using the EPA formula. Do NOT edit these columns.

**5**

#### **Document Your Source**

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

**6**

#### **Set Data Quality Tier**

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## **Frequently Asked Questions**

### **Q We use AWS/Azure. How do I get kWh data?**

A AWS: Cost Explorer → Customer Carbon Footprint Tool. Azure: Emissions Impact Dashboard. Google Cloud: Carbon Footprint Report. All show kWh or CO2e by service and region.

### **Q How do I estimate commuting without a survey?**

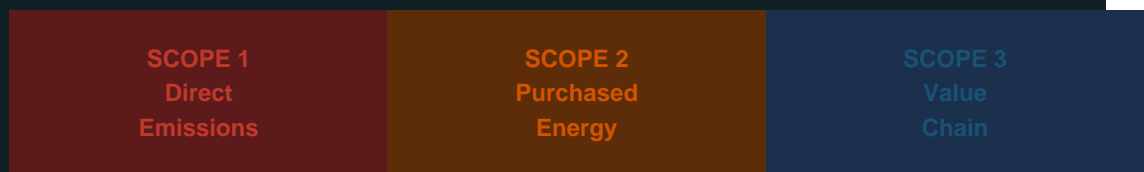
A Use: total employees × avg commute ~15 miles × 2 (round trip) × 235 working days. Mark as Tier 3 (estimate) in the Data Quality column.

## Department Guide

# Facilities & Building Management

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Facilities Management owns **Scope 1 and Scope 2** as the primary data custodian. You manage central boilers, HVAC systems, refrigerant charges, and building electricity. You likely have the most detailed energy records of any department.



Excel Tab: ■ **Facilities & Building**

# Facilities & Building Management

## SCOPE 1

### Direct Emissions — Building Systems & Refrigerants

Fuel and refrigerant gases from building systems you operate.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Central Boiler – Natural Gas	scf	Gas utility bill for the building → Therms × 100
HVAC Heating – Natural Gas	scf	Separate HVAC gas meter if different from boiler
Refrigerant Leak – R-22 (GWP=1,810)	lbs	HVAC contractor service report → 'refrigerant charged'
Refrigerant Leak – R-410A (GWP=2,088)	lbs	Service report → refrigerant type per unit and qty added
Diesel Backup Generator	gallons	Generator fuel log or fuel tank delivery records

#### ✓ TIP

Keep a 'Refrigerant Log' recording every service call: date, equipment ID, refrigerant type, quantity added, and technician name. Required for EPA Section 608 compliance, and makes GHG reporting straightforward.

#### ! NOTE

Even small refrigerant leaks create large CO<sub>2</sub>e values. 10 lbs of R-410A leaked = over 9 MT CO<sub>2</sub>e. Always report accurately.

## SCOPE 2

### Indirect Energy — Building Electricity & District Heating

Electricity and district heating/cooling purchased for building operations.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Common Area / Lobby Electricity	kWh	Building electricity utility account → common area sub-meter
Tenant Space Electricity	kWh	Tenant sub-meters or master meter minus common area
District Heating / Steam Purchased	MMBtu	District energy invoice → 'MMBtu delivered' (or Mlbs × 1.194)

#### ✓ TIP

Install sub-meters by floor or system type (HVAC, lighting, elevators). Sub-metering makes it easier to track trends and find savings.

### SCOPE 3

## Value Chain — Waste & Capital Expenditures

Waste disposal and capital expenditure on building renovations.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.2 – Building Renovation	\$1,000 spent	Finance: total capex on renovation/construction this year
Cat.5 – Landfill: Mixed MSW	short tons	Waste hauler invoice → 'tons disposed' or 'tons landfilled'
Cat.5 – Recycling: Cardboard (credit)	short tons	Recycling vendor report or building recycling log
Cat.5 – Food Waste: Composting (credit)	short tons	Composting contractor weight tickets or annual summary

#### ✓ TIP

Recycling and composting show as **negative numbers (emission credits)** in the template. This is correct — always enter these values to reflect the benefit of diverting waste.

### Step-by-Step: Entering Data in the Template

1

#### Open Your Department Tab

In the Excel file, click the tab labelled ■ **Facilities & Building**.

2

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

4

#### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO<sub>2</sub>e using the EPA formula. Do NOT edit these columns.

5

#### Document Your Source

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

## 6

### Set Data Quality Tier

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## Frequently Asked Questions

### Q Our building has 50+ HVAC units with different refrigerants.

A Group by refrigerant type. Total all R-22 units in one row, all R-410A units in another. No need for a row per unit.

### Q What if I only have waste cost, not tonnage?

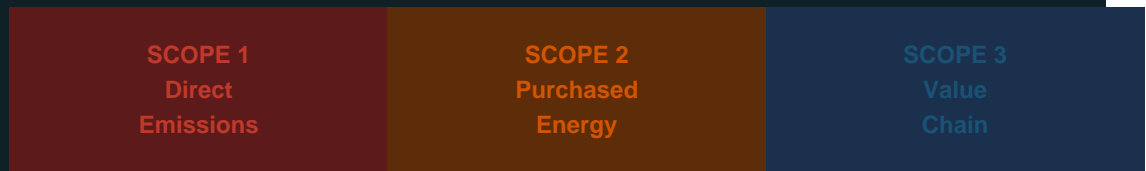
A Contact your hauler (Waste Management, Republic Services) and request annual tonnage reports — available in most customer portals. If unavailable, use \$200/ton as a rough estimate and mark as Tier 3.

## Department Guide

# Procurement & Supply Chain

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Procurement is the **Scope 3 champion**. Purchased goods and services (Category 1) often represent 50–80% of a company's total footprint. Your supplier data quality is central to the company's GHG inventory accuracy.



Excel Tab: ■ Procurement & Supply Chain

# Procurement & Supply Chain

## SCOPE 1

### Direct Emissions — Procurement Team Vehicles

Minimal Scope 1 — only fuel in procurement team vehicles.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Procurement Team Vehicles – Gasoline	gallons	Fleet fuel card or expense reports for procurement staff cars



Scope 1 is usually very small for Procurement. Focus your effort on Scope 3 Category 1 — it has the biggest impact.

## SCOPE 2

### Indirect Energy — Office Electricity

Electricity for the procurement team's work area.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Procurement Office Electricity	kWh	Facilities Management allocation based on floor area or headcount



Ask Facilities to provide your department's proportional electricity allocation if you don't have a dedicated sub-meter.

## SCOPE 3

### Value Chain — Upstream Supply Chain (Categories 1–4)

This is where Procurement's real impact lies — upstream emissions.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.1 – Tier 1 Suppliers (spend-based)	\$1,000 spent	ERP system: total annual spend with Tier 1 suppliers by category
Cat.1 – Purchased Steel (upstream)	short tons	ERP / procurement: annual steel purchase tonnage (PO data)
Cat.1 – Purchased Packaging	short tons	Procurement records: annual corrugated/cardboard purchased

Source in Template	Unit	Where to Find the Data
Cat.1 – Purchased Chemicals	short tons	Chemical management system or ERP purchase orders
Cat.2 – Capital Goods (spend-based)	\$1,000 spent	Finance: total capex spend on purchased equipment
Cat.3 – Upstream Fuel (Well-to-Tank)	gallons diesel	Same diesel gallons as Scope 1 fleet — also report upstream lifecycle
Cat.4 – Upstream Road Transport (3PL)	ton-miles	Freight / logistics: weight x distance for all inbound shipments
Cat.4 – Upstream Air Freight	ton-miles	Freight forwarder or TMS report for air cargo inbound

✓ TIP

Fastest start: export total annual spend by supplier category from your ERP (SAP/Oracle/Coupa). Enter total spend in '\$1,000 units'. This gives a reasonable Tier 3 estimate while you develop more precise activity data.

! NOTE

Category 1 data is typically the hardest to collect. Start with spend-based estimates and improve accuracy year-over-year as suppliers share their own emissions data.

## Step-by-Step: Entering Data in the Template

1

### Open Your Department Tab

In the Excel file, click the tab labelled **Procurement & Supply Chain**.

2

### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

4

### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO2e using the EPA formula. Do NOT edit these columns.

5

### Document Your Source

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

6

### Set Data Quality Tier

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## Frequently Asked Questions

### **Q We buy from 500+ suppliers. Do I need data from all of them?**

A No — focus on top 20 suppliers by spend (likely 80% of Cat.1 footprint). Use spend-based estimates for the rest.

### **Q What is Cat.3 upstream fuel and why enter diesel twice?**

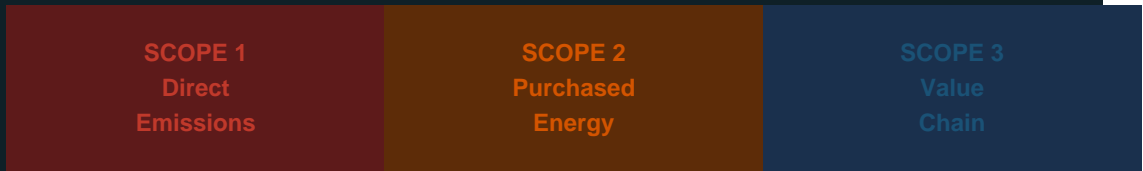
A Category 3 captures emissions from extracting and refining fuel before you burn it (well-to-tank). Scope 1 captures burning the fuel (tank-to-wheel). Both are required.

## Department Guide

# Sales & Marketing

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Sales and Marketing has Scope 1 (fleet), Scope 2 (retail stores), and significant Scope 3 from **product use phase and end-of-life emissions**. If your company sells energy-consuming products, Cat.11 may be your largest category.



Excel Tab: ■ Sales & Marketing

# Sales & Marketing

## SCOPE 1

### Direct Emissions — Sales Fleet Vehicles

Fuel burned in sales fleet vehicles.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Sales Fleet – Motor Gasoline	gallons	Fleet fuel card → filter for gasoline, sales team vehicles
Sales Fleet – Diesel (heavier vehicles)	gallons	Fleet fuel card → filter for diesel, sales team vehicles



**TIP**

Run the fleet card report grouped by fuel type to get separate totals for gasoline and diesel.

## SCOPE 2

### Indirect Energy — Sales Offices & Retail Locations

Electricity for sales offices, showrooms, and retail locations.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Sales Office Electricity	kWh	Office electricity bill or Facilities allocation
Retail Stores / Showrooms Electricity	kWh	Utility bills for each retail location → sum all annual kWh



**TIP**

If you have many retail locations, build a simple spreadsheet listing each location's annual kWh, then enter the grand total in the template.

### SCOPE 3

## Value Chain — Travel, Distribution & Product Lifecycle

Business travel, product distribution, customer product use, and end-of-life.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.6 – Business Travel by Air	pass-miles	Corporate travel system → sales team air mileage report
Cat.9 – Downstream Distribution	ton-miles	Logistics / ERP: weight of goods shipped × delivery distance
Cat.11 – Use-Phase Energy (sold products)	kWh	Product energy spec (watts) × units sold × avg hours used × yrs
Cat.12 – End-of-Life: Landfill	short tons	Units sold × avg product weight × % estimated to landfill
Cat.13 – Leased Assets Electricity	kWh	Tenant/lessee utility reports or lease energy allowances

#### ✓ TIP

For Cat.11 (product use phase), work with R&D to get energy specs (watts). Formula: Annual kWh/unit = Watts / 1,000 × hours/day × 365 × product life (yrs). Multiply by total units sold.

#### ! NOTE

Cat.11 and Cat.12 can be very large for companies selling appliances or electronics. Even rough Tier 3 estimates must be reported — omitting material categories violates GHG Protocol.

### Step-by-Step: Entering Data in the Template

1

#### Open Your Department Tab

In the Excel file, click the tab labelled **Sales & Marketing**.

2

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

4

#### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO2e using the EPA formula. Do NOT edit these columns.

**5**

**Document Your Source**

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

**6**

**Set Data Quality Tier**

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

**Frequently Asked Questions**

**Q We sell services, not products. What do I enter for Cat.11?**

A Cat.11 (product use phase) is not applicable for service businesses. Mark those rows N/A in the notes column.

**Q How do I estimate what fraction of products go to landfill (Cat.12)?**

A Use industry averages: electronics ~50%, furniture ~80%, packaging ~65%. Multiply units sold × avg product weight × landfill fraction.

## Department Guide

# Research & Development

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R&D departments have **concentrated energy use in labs and cleanrooms**. Specialized equipment consumes significant electricity. Chemical processes and prototype testing generate direct emissions. International conference travel can also be a significant Scope 3 source.

**SCOPE 1**  
Direct  
Emissions

**SCOPE 2**  
Purchased  
Energy

**SCOPE 3**  
Value  
Chain

Excel Tab: ■ Research & Development

# Research & Development

## SCOPE 1

### Direct Emissions — Lab Gas, Test Vehicles & Processes

Gas used in lab equipment, test vehicles, and any chemical processes.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Laboratory Gas – Natural Gas	scf	Lab gas meter or Facilities allocation for your lab area
R&D; Test Vehicles – Motor Gasoline	gallons	Fuel receipts or fleet fuel card for test vehicles
Chemical Process Emissions (direct CO <sub>2</sub> )	MT CO <sub>2</sub> e	Process/chemical engineer calculation or EPA methodology

#### ✓ TIP

If your lab uses gas for burners or specialized equipment, ask Facilities for the gas sub-meter reading for your lab area. Even small amounts should be reported.

## SCOPE 2

### Indirect Energy — Lab & Cleanroom Electricity

Electricity for lab equipment, cleanrooms, and general R&D; facilities.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Lab / General R&D; Electricity	kWh	Lab electricity sub-meter or Facilities allocation for R&D; area
Cleanroom / Semiconductor Lab	kWh	Cleanroom-specific sub-meter (cleanrooms use 50–100x more energy/sqft)

#### ✓ TIP

Cleanrooms and electron microscopy labs are often the largest energy consumers in R&D. Ensure Facilities provides separate kWh data for cleanrooms — do not pool them with general office space.

### SCOPE 3

## Value Chain — Materials, Equipment & Research Travel

Purchased research materials, lab equipment, conference travel, and lab waste.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.1 – Research Materials / Chemicals	short tons	Lab supplies purchasing records → total chemical weight purchased
Cat.2 – Research Equipment	\$1,000 spent	Finance/capex: spending on new lab instruments and equipment
Cat.6 – International Conference Travel	pass-miles	Travel system → R&D; team air mileage report
Cat.5 – Lab Waste to Landfill	short tons	Waste manifests → non-hazardous lab waste landfill portion

#### ✓ TIP

Conference travel for R&D teams is often significant due to international travel frequency. Ask HR to pull all flights for employees in the R&D cost center from the travel management system.

### Step-by-Step: Entering Data in the Template

1

#### Open Your Department Tab

In the Excel file, click the tab labelled **Research & Development**.

2

#### Read the Row Description & Unit

Each row shows an emission source and a required unit. Check both carefully.

3

#### Enter Quarterly Totals in Yellow Cells

Click a yellow cell under Q1/Q2/Q3/Q4 and type the activity total for that quarter. Example: 3,000 gallons of diesel in Q1 → type 3000.

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#### Annual Total & Emissions Calculate Automatically

Column K (Annual Activity) sums Q1–Q4. Column L (Annual Emissions) calculates MT CO2e using the EPA formula. Do NOT edit these columns.

5

#### Document Your Source

In the 'Notes / Source' column, note where the data came from. Example: 'Gas utility bill Jan–Dec 2024'.

## 6

### Set Data Quality Tier

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

## Frequently Asked Questions

### Q How do I estimate electricity for specialized equipment without a sub-meter?

A Check the equipment nameplate (kW rating). Annual kWh = Nameplate kW × hours/day × operating days/year × utilization (0.3–0.8).

### Q Some of our chemicals are hazardous waste — do they count?

A Only non-hazardous waste going to landfill uses the standard EPA WARM factor. For hazardous waste, ask the ESG team for the correct EPA factor.

## Department Guide

# HR & Administration

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HR and Administration holds key data on **employee commuting and workforce size**, which drives Scope 3 Category 7 (employee commuting). You also manage cafeteria operations (Scope 1 gas, Scope 3 food purchases) and shuttle bus programs (Scope 1).

**SCOPE 1**  
Direct  
Emissions

**SCOPE 2**  
Purchased  
Energy

**SCOPE 3**  
Value  
Chain

Excel Tab: ■ **HR & Administration**

# HR & Administration

## SCOPE 1

### Direct Emissions — Cafeteria Gas & Shuttle Buses

Gas for the cafeteria and fuel for company-run shuttle buses.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cafeteria Gas Cooking – Natural Gas	scf	Cafeteria gas sub-meter or Facilities allocation for kitchen
Employee Shuttle Bus – Diesel	gallons	Shuttle bus fuel log or fuel card report for shuttle buses

#### ✓ TIP

If cafeteria operations are outsourced, ask the contract catering company for the annual gas consumption report for your location.

## SCOPE 2

### Indirect Energy — Cafeteria & Corporate Housing

Electricity for the cafeteria and any corporate dormitories.

#### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cafeteria / Break Room Electricity	kWh	Cafeteria sub-meter or Facilities allocation for cafeteria area
Corporate Housing / Dormitory Electricity	kWh	Utility bill for corporate dormitory or company-owned housing

#### ✓ TIP

Cafeterias are energy-intensive. If there's no sub-meter, Facilities can estimate based on the cafeteria's proportional floor area.

### SCOPE 3

## Value Chain — Commuting, Travel & Cafeteria Purchasing

Employee commuting (the most significant HR emission category), travel, and food purchasing.

### What Data Do You Need & Where to Find It?

Source in Template	Unit	Where to Find the Data
Cat.6 – HR Recruiting Travel (air)	pass-miles	Travel system → filter by HR cost center, all flights
Cat.7 – Commute: Personal Car	vehicle-miles	Commute survey: employees x avg round-trip miles x days in office
Cat.7 – Commute: Transit Rail	pass-miles	Commute survey: transit users x avg miles x days in office
Cat.1 – Cafeteria Food Purchases	short tons	Food purchasing records or catering invoice → total food weight
Cat.5 – Food Waste: Composting (credit)	short tons	Composting contractor weight tickets or annual summary

#### ✓ TIP

Keep the commute survey to 5 questions max: (1) primary transport mode, (2) one-way distance in miles, (3) days per week in the office, (4) vehicle type if driving, (5) any secondary mode. Aim for 70%+ response rate.

#### ! NOTE

Commuting emissions change significantly with work-from-home policy. If your policy changed mid-year (e.g., return-to-office mandate), adjust calculations quarterly — not a flat annual rate.

### Step-by-Step: Entering Data in the Template

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**6**

**Set Data Quality Tier**

Tier 1 = directly measured · Tier 2 = from invoices · Tier 3 = estimated.

**Frequently Asked Questions**

**Q We don't have a commute survey. Where do I start?**

A Create one in Microsoft Forms or Google Forms. Ask: (1) How do you commute? (2) How far is your one-way commute in miles? (3) How many days per week are you in the office? That's enough for Cat.7.

**Q Our employees work from multiple city offices. How do I calculate commuting?**

A Run the survey per office location, or use location as a survey filter. Different cities have very different commuting patterns (e.g., NYC vs. suburban Texas).

# Quick Reference Card

Keep this page accessible when filling in the GHG template.

## Key Emission Factors (EPA GHG Emission Factors Hub 2022)

Fuel / Source	Unit	CO2e Emission Factor	Source
Natural Gas	per scf	0.0544 kg CO2e	EPA EF Hub 2022
Diesel Fuel (No.2)	per gallon	10.21 kg CO2e	EPA EF Hub 2022
Motor Gasoline	per gallon	8.78 kg CO2e	EPA EF Hub 2022
LPG (Propane)	per gallon	5.68 kg CO2e	EPA EF Hub 2022
Kerosene-Type Jet Fuel	per gallon	9.75 kg CO2e	EPA EF Hub 2022
U.S. Grid Electricity	per kWh	0.000386 MT CO2e	EPA eGRID 2021 avg
Refrigerant R-410A	per lb leaked	GWP 2,088 × lb / 2,204.62	IPCC AR5
Refrigerant R-22	per lb leaked	GWP 1,810 × lb / 2,204.62	IPCC AR5
Air Travel – Long Haul	per pass-mile	0.170 kg CO2e	EPA EF Hub 2022
Personal Car – Gasoline	per vehicle-mile	0.332 kg CO2e	EPA EF Hub 2022
Mixed MSW – Landfill	per short ton	522 kg CO2e	EPA WARM 2022

## Unit Conversion Cheat Sheet

If Your Data Shows...	Convert To	Formula	Example
Gas bill in Therms	scf	Therms × 100	500 therms = 50,000 scf
Gas bill in CCF	scf	CCF × 100	50 CCF = 5,000 scf
Gas in MMBtu	scf (gas)	MMBtu × 1,020	10 MMBtu = 10,200 scf
Steam in Mlbs	MMBtu	Mlbs × 1.194	100 Mlbs = 119.4 MMBtu
Metric tons (weight)	Short tons	Metric tons × 1.1023	100 MT = 110.2 short tons
kWh electricity	kWh	No conversion needed	1,000 kWh = 1 MWh
Passenger-miles	pass-miles	People × miles traveled	5 people × 200 mi = 1,000
Vehicle-miles	vehicle-miles	No conversion needed	1 car × 15 mi = 15

## Data Quality Tier Definitions

<b>TIER 1</b>	<b>TIER 2</b>	<b>TIER 3</b>
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<p><b>Directly Measured</b> From meters, sensors, or on-site measurement equipment.</p>	<p><b>Calculated from Records</b> Derived from utility bills, fuel receipts, purchase orders, or financial records.</p>	<p><b>Estimated / Approximated</b> Based on averages, benchmarks, or engineering estimates.</p>
<p>Examples: smart meter readings, fuel flow meters, EV charger data.</p>	<p>Examples: utility bill kWh, fuel card gallons, fleet mileage logs.</p>	<p>Examples: commute survey estimates, spend-based Cat.1 calculations.</p>

**Questions?** Contact the ESG / Sustainability Team  
 Submit your data file with subject line: **[Department] GHG Data Submission**  
 Keep all source documents (utility bills, fuel receipts, mileage logs) for a minimum of **5 years**.