# Carbon Footprint Calculation

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## 1 Introduction

This document outlines the process of calculating the carbon footprint for **Company**, including the formulas used and the data collection process.

## 2 Scope 1 Emissions

### 2.1 Formula

$$\text{Emissions}_{\text{Scope 1}} = \sum(\text{Activity} \times \text{Emission Factor})$$

### 2.2 Explanation

Scope 1 emissions refer to direct emissions from sources owned or controlled by the company, such as fuel combustion in boilers or vehicles. The formula calculates the total Scope 1 emissions by multiplying each business activity by its corresponding emission factor and summing them up.

#### Data Collection

For Scope 1 emissions, companies need to provide data on their fuel consumption or expenditure on fuel. This can include the number of liters of fuel used or the amount spent on fuel.

1. **Company Type:** [Drop-down options: Manufacturing, Transportation, Agriculture, Retail, Hospitality, Services, Other]
2. **Location:** [Drop-down options: Country/Region]
3. **Fuel Consumption:** What is your annual fuel consumption? [Unit: Liters]

# 3 Scope 2 Emissions

## 3.1 Formula

$$\text{Emissions}_{\text{Scope 2}} = \sum(\text{Activity} \times \text{Emission Factor})$$

## 3.2 Explanation

Scope 2 emissions represent indirect emissions from purchased electricity, heat, or steam. The formula calculates the total Scope 2 emissions by multiplying each activity by its corresponding emission factor and summing them up.

### Data Collection

Companies should provide data on their energy consumption or expenditure on electricity and heating. This includes the amount of energy consumed or the money spent on energy.

1. **Energy Consumption:** What is your annual energy consumption? [Unit: kWh]
2. **Transportation:** What is your annual mileage for each type of vehicle? [Unit: Miles]

# 4 Scope 3 Emissions

## 4.1 Formula

$$\text{Emissions}_{\text{Scope 3}} = \sum(\text{Expenditure} \times \text{Emission Factor})$$

## 4.2 Explanation

Scope 3 emissions include indirect emissions from sources not owned or controlled by the company, such as supply chain activities, employee commuting, and waste generation. The formula calculates the total Scope 3 emissions based on expenditure data and emission factors per unit of expenditure.

### Data Collection

For Scope 3 emissions, companies need to provide expenditure data on various categories such as transportation, waste management, and employee commuting.

1. **Waste Generation:** What is your annual waste generation? [Unit: Tons]
2. **Water Usage:** What is your annual water usage? [Unit: Gallons]

## 5 Final Carbon Footprint

The final carbon footprint of **Company** is calculated using the following formula:

$$\begin{aligned}\text{Total Carbon Footprint} = &(Electricity \times 0.4) + (NaturalGas \times 0.2) + (Diesel/Petrol \times 2.68) \\ &+ (HeatingOil \times 2.93) + (SolidWaste \times 0.6) + (LiquidWaste \times 0.5) \\ &+ (HazardousWaste \times 1.0) + (MileageperVehicle \times \text{Num vehicles} \times 0.4)\end{aligned}$$

The emission factors used in the calculation are as follows:

- Electricity: 0.4 kg $CO_2$e/kWh
- Natural Gas: 0.2 kg $CO_2$e/$m^3$
- Diesel/Petrol: 2.68 kg $CO_2$e/liter
- Heating Oil: 2.93 kg $CO_2$e/liter
- Solid Waste: 0.6 kg $CO_2$e/kg
- Liquid Waste: 0.5 kg $CO_2$e/liter
- Hazardous Waste: 1.0 kg $CO_2$e/kg
- Mileage per Vehicle: 0.4 kg $CO_2$e/mile

## 6 Conclusion

By following the outlined process and providing accurate data, **Company** can calculate their carbon footprint and take steps towards reducing their environmental impact.