

How to Calculate a Basic Carbon Footprint for Your Business

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A WORKED EXAMPLE FOR
SME - A COFFEE OUTLET

In the previous article, we looked at the **basics of carbon calculation** — why carbon matters, how emissions are calculated using **activity data × emission factor**, and why businesses should start with a practical understanding of **Scope 1, Scope 2, and Scope 3**.

The next step is to make that more real.

For many SMEs and larger enterprises carbon only starts to make sense when it is applied to an actual business.

That is why it is useful to **move from theory into a simple example**.

A small coffee shop is a good place to start because the main carbon sources are usually visible and familiar:

- a business vehicle,
- electricity bills,
- waste, and
- possibly employee commuting.

The important point is this: before calculating anything, the business owner should first separate emissions **by asking three practical questions**:

- **What do I own or directly control?**
- **What electricity or energy do I purchase?**
- **What other indirect activities are linked to the business?**



That is where **Scope 1, Scope 2, and Scope 3** become useful

FIRST STEP: SEPARATE THE EMISSIONS BY SCOPE

For a small coffee shop, this may look something like this:

Scope 1 – Direct emissions

These come from sources the business owns or controls. For example:

- fuel used in a business-owned delivery van or small truck
- diesel used in a generator, if any

Scope 2 – Indirect electricity emissions

These come from purchased electricity. For most coffee shops, that means electricity bought from TNB for:

- lighting
- air-conditioning
- refrigeration
- coffee machines
- kitchen equipment

Scope 3 – Other indirect emissions

The GHG Protocol identifies **15 categories of Scope 3 emissions** across the value chain. Businesses do not need to calculate all 15 at once. They should first decide which are **relevant** and reasonably measurable for their business.

For a small coffee shop, relevant early categories may include:

- employee commuting
- waste generated in operations
- business travel, if any
- purchased goods and services, later if the business is ready to go further

Basic formula

$$\text{Activity Data} \times \text{Emission Factor} = \text{CO}_2\text{e}$$

Convert all baseline data to tonne CO₂ equivalent or **tCO₂e**

Activity Data For Example Scope 1

Fuel used in a business-owned van (**liters used per year**)- activity data

Scope 2

Electricity purchased from TNB- (**KWh used for year**) – activity data

Emission Factor :

is to enable the conversion of the activity data to a Carbon Dioxide equivalent or CO₂e.

These factors can be found in the **IPCC website** and be used as **proxy** if you can't find one in your country. For Peninsular Malaysia, the Energy Commission's provisional 2024 grid emission factor is **0.740 tCO₂e/MWh**.

SECOND STEP: CALCULATE SCOPE 1

Let us assume the coffee shop owns a small petrol van used to collect supplies and make occasional deliveries.

A Malaysian SME carbon calculator published by MGTC uses a petrol emission factor of 2.3228 kgCO₂e per litre.
If the van used 1,200 litres of petrol over the year:

$$\begin{aligned}\text{Scope 1 emissions} &= 1,200 \text{ litres} \times 2.3228 \text{ kgCO}_2\text{e/litre} \\ &= 2,787.36 \text{ kgCO}_2\text{e} \\ &= 2.79 \text{ tCO}_2\text{e}\end{aligned}$$

That is the business's basic annual Scope 1 estimate for vehicle fuel.

THIRD STEP: CALCULATE SCOPE 2

The coffee shop is in Peninsular Malaysia and bought 24,000 kWh of electricity from TNB during the year.

The Energy Commission's latest provisional grid emission factor for Peninsular Malaysia for 2024 is 0.740 tCO₂e/MWh, which is the same as 0.000740 tCO₂e/kWh. (convert to tonnes per kWh)

So:

$$\begin{aligned}\text{Scope 2 emissions} &= 24,000 \text{ kWh} \times 0.000740 \text{ tCO}_2\text{e/kWh} \\ &= 17.76 \text{ tCO}_2\text{e}\end{aligned}$$

For many small businesses, Scope 2 is often the biggest number at the start, especially if air-conditioning, refrigeration, and equipment use are significant.

FOURTH STEP : LOOK AT SCOPE 3, BUT KEEP IT PROPORTIONATE

Scope 3 often feels complicated because there are 15 categories under the GHG Protocol.

But that should not stop a business from starting. The better question is:

Which Scope 3 categories are relevant to my business, and can I measure them fairly?

For a coffee shop, a practical starting point may be:

- employee commuting, if the business has a small team and can estimate travel
- waste generated in operations, if disposal records or reasonable estimates exist
- business travel, if the owner or staff travel for business purposes

At this stage, Scope 3 does not need to be perfect. It just needs to be practical and transparent.

A worked example: small coffee shop

Here is a simple illustration of a basic annual carbon footprint for a small coffee shop in Peninsular Malaysia.

H I G H L I G H T S

Scope	Activity	Sample annual activity data	Emission factor used	Sample emissions
Scope 1	Petrol used in business-owned van	1,200 litres	2.3228 kgCO ₂ e/litre	2,787.36 kgCO ₂ e = 2.79 tCO₂e
Scope 2	Purchased electricity from TNB	24,000 kWh	0.000740 tCO ₂ e/kWh	17.76 tCO₂e
Scope 3	Employee commuting	Estimate only at first	Depends on method used	Track later if reasonably measurable
Scope 3	Waste generated in operations	Estimate only at first	It depends on waste data and method	Track later if reasonably measurable

Basic footprint total for Scope 1 + Scope 2

2.79 tCO₂e + 17.76 tCO₂e = 20.55 tCO₂e per year

This is not a complete footprint yet, because selected Scope 3 items may still be added later. But it already gives the business something valuable: baseline.

What does this tell the business owner?

Our customer base expanded by 10%, with a notable increase in repeat customers.

It shows that:

- electricity may be the biggest emissions source
- the delivery van also contributes, but less than electricity in this example
- the business now has a first carbon number it can track over time

Scope 3 should be considered, but not allowed to overwhelm the starting point

That is where **carbon calculation** starts becoming useful. It stops being a technical idea and starts becoming a management tool

Once calculated, the next step is to track

The first calculation is only the starting point.

Once the business has a basic footprint, it should track it every month or every year. For example:

- compare electricity use year-on-year
- monitor fuel use in the van
- track whether waste reduces after better separation or operating practices
- see whether efficiency measures reduce both cost and emissions

This is where the business moves from carbon calculation into carbon tracking.

Then the business can start to manage it

Once a business begins tracking emissions, it can **start asking better operational questions:**

- Can air-conditioning settings be improved?
- Can refrigeration be maintained more efficiently?
- Can lighting be upgraded?
- Can delivery trips be planned better to reduce fuel use?
- Can waste be reduced or separated more effectively?

That is how a simple carbon footprint becomes more **useful carbon management**.

The first objective is visibility.

The second objective is better decision

A practical message for SMEs

For SMEs and medium enterprises including smaller PLCs, the key lesson is this: carbon calculation does not need to begin with complex software or all 15 Scope 3 categories at once.

It can begin with:

- what the business owns and controls
- what the business buys in electricity
- which indirect categories are relevant and reasonably measurable

From there, the business can calculate, track, and improve over time.

That is often the most practical way to start.

Closing line

Once a business has calculated a basic footprint and started tracking it, carbon stops being just a number. It becomes a management tool — helping the business improve efficiency, respond more credibly to stakeholders, and build greater readiness for what comes next