Establish your baseline **scope 1 and 2 emissions**

What gets measured, **gets managed.**

Measuring your greenhouse gas emissions is the first step on the pathway to net zero. For a business there are 3 categories of emissions to consider, referred to as 'scopes'.

This guide covers **scope 1** – direct emissions from owned or controlled sources, and **scope 2** – indirect emissions from purchased electricity. A companion guide covers scope 3 – indirect emissions from your upstream suppliers and downstream customer use.

CITY SWITCH

What we're **measuring**

We measure emissions in kilograms or tonnes of carbon dioxide equivalent (kg or t CO_2-e) that are released into the atmosphere as a result of a business' activities over a year. Unless energy used comes from 100% renewable sources, it will create emissions.

So, the energy in buildings (for example, electricity or natural gas), and for transport (for example, petrol or diesel), plus some industrial, mining and agricultural activities all create emissions.

Step 1 Which measurement standard?

Large Australian emitters (>50kt CO_2-e) are required to report their scope 1 and 2 emissions under the National Greenhouse and Energy Reporting Act. In May 2022 Commonwealth Bank Australia estimated half of the ASX200 report scope 1 and 2, while many large emitters like Rio Tinto and BHP report scope 1, 2 and 3.

For other smaller emitting businesses there are 2 voluntary measurement standards businesses can use to measure and track their emissions: the Greenhouse Gas Measurement Protocol (known as the **GHG Protocol**) or **ISO 14064: Greenhouse gases**.

Step 2 Define your organisational boundary

For smaller businesses with a single ABN this is pretty straight forward: the organisational boundary is everything paid for by the company.

Larger organisations may have joint ventures and other shared ownership structures which may add a layer of complexity to understanding scope 1 and 2 emissions.

The measurement standards provide guidance on which activities to include in your emissions baseline. For example, refer to section 3 in the **GHG Protocol Standard**.

Step 3 Gather information

CitySwitch signatories who have been through a NABERS rating will be familiar with the process of collecting 12 months of electricity and gas bills to confirm total energy use in your tenancy. For an emissions baseline you only need a little bit more for scope 1 and 2 as shown in the following table.

Step 4 Emissions factors

An emissions factor is simply a number that allows conversion from, for example, a kiloWatt hour (kWh) of electricity, a megaJoule (MJ) of natural gas or a litre of diesel fuel to a number of kilograms or tonnes of CO_2-e.

Governments publish emissions factors based on United Nations rules, adapted to specific local circumstances like the percentage of coal, gas and renewable generation in the power grid.

Australia's **National Greenhouse Accounts Factors** are published by the Department of Climate Change, Energy, the Environment and Water. It's important to use the latest set, as they are updated from time to time.

Scope	Description	Information needed	Example
Scope 1 **Direct**	All natural gas, diesel and other fuels used in buildings, machinery or vehicles under your organisation's control. If you lease your office, your landlord may be responsible for your heating and cooling system, as well as any back-up generators. So you don't need to include these items under scope 1.	A year's worth of energy bills to determine: • natural gas usage measured in Megajoules (MJ) • fuel bills for fleet vehicles owned or leased by the organisation, showing petrol and/or diesel use in litres over the year • any other fuels used on premises. If you control facilities with air conditioning or refrigeration equipment, any releases of refrigerant gases should be included. Your licensed air conditioning maintenance provider can provide this.	Company X leases its offices and doesn't have any other premises. But it does lease 2 vehicles used by its sales staff. Its fuel bills showed 1,000 litres of petrol and 2,000 of diesel were used during the reporting year. Applying the emissions factors from table 4 in the National Greenhouse Accounts Factors, converted to kg CO_2-e per litre from GJ per kl, company X's **scope 1** emissions are: **Petrol: 1,000 litres x 2.3 = 2,300 kg CO_2-e or 2.3 tCO_2-e** **Diesel: 2,000 litres x 2.7 = 5,400 kg CO_2-e or 5.4 tCO_2-e** **Total = 2.3 + 5.4 = 7.7 tCO_2-e**
Scope 2 **Purchased electricity**	All the electricity you buy that is used in buildings under your organisation's control. If you lease your offices, or other facilities, you only need to include the energy you pay for directly, not what is covered in the landlord's outgoings costs.	A year's worth of electricity bills for each facility, so you can add up the total kiloWatt hours (kWh) of electricity used. If your business generates some of its own electricity (for example, by rooftop solar), or it purchases GreenPower or contracts from renewable generators via a power purchase agreement (PPA), that component may be excluded if various conditions are met in the measurement standard.	The electricity bills for company X's leased offices (in NSW) showed total use of 60,000 kWh for the year, with 10% GreenPower used, reducing the total to 54,000 kWh. Applying the emissions factor for NSW from table 5 in the National Greenhouse Accounts Factors, company X's **scope 2** emissions are: **54,000 kWh x 0.79 = 42,660 kg CO_2-e or 42.7 tCO**

Step 5 Calculate the baseline

Once you have the information, calculating your emissions baseline is as simple as multiplying the amount of electricity, gas or fuel you've used in a year by the appropriate emissions factor, and adding up the total.

In the example above, that's 7.7 + 42.7 = 50.4 tCO_2-e.

Help – **I'm drowning in data!**

For those starting out in carbon accounting, the GHG Protocol provides a downloadable spreadsheet calculator.

For larger businesses and those that manufacture or have many suppliers, establishing an emissions baseline and updating it every year can quickly exceed the capability of spreadsheets. That's where a good carbon accounting software system and carbon accountant can help. A NABERS energy rating will also help you measure the environmental performance of your office, including your scope 1 and 2 emissions.

A web search using search terms like 'online carbon calculator' and 'carbon accountant' will reveal many in the market including services that will scrape usage data directly from energy, fleet and other invoices, or take feeds from smart meters without the need for manual data entry. A good system should also provide reports formatted according to the requirements of the various reporting standards.

Here are some on-line tools to get you started.

Climate Clever
Trace
Carbon Neutral

For more information contact us at **info@cityswitch.net.au** and we'll help you with everything you need to know.