WHAT IS A CARBON FOOTPRINT?

Put simply, the term carbon footprint describes the amount of carbon dioxide released into the atmosphere as a result of activities of a particular individual, organisation or community. A carbon footprint is also sometimes referred to as greenhouse gas emissions. The activities are measured according to defined boundaries set by the individual, organisation or community.

A carbon footprint is often measured as an annual quantity and takes into account all of the gases that are known to contribute to global warming, including carbon dioxide, methane and nitrous oxide. To normalise the impact of these gases researchers have assigned a global warming potential (GWP), which measures the warming impact of one unit of gas relative to one unit of carbon dioxide.

For example, methane is considered to have 28 times more warming potential than carbon dioxide, so one tonne of methane is equivalent to 28 tonnes of carbon dioxide. By using the global warming potential the unit of measurement for a carbon footprint can be expressed as carbon dioxide equivalent (CO^2 e).

WHAT IS CARBON OFFSETTING?

The term carbon offset (also referred to as offset schemes) describes a system for individuals, organisations or communities to compensate for every tonne of CO^2e they consume. Carbon offsets balance out activities that generate greenhouse gas emissions, reducing the individual or organisation's carbon footprint. Offsets take many forms, but commonly they seek to restore natural ecosystems, which are highly efficient at using carbon in the atmosphere in their natural cycles. The other common source of offsets is the replacement of existing emissions-intensive processes. This reduces the greenhouse gas load, or avoids emissions by replacing carbon intensive practices with cleaner or renewable methods.

Carbon offsetting is usually undertaken by organisations and individuals with a moral, reputational or legislative drive to achieve Net Zero emissions for an activity that cannot be achieved by avoiding emissions entirely. For every unit of emissions generated through an activity, an equivalent number of offset units are acquired – and usually they are purchased from a reputable offset scheme.

Offsetting should be seen as the final step in the process of achieving Net Zero. Prior to offsetting, efforts should be made to manage your carbon footprint by following the principles of avoid, reduce, reuse and recycle, discussed below.

WHAT YOU CAN DO BEFORE YOU OFFSET

Avoid

The richest 10% of the world's population is responsible for almost half of global lifestyle consumption emissions. Chances are if something is consumable it will have an emission profile.

Reduce

Making adjustments to diet, transport and home energy consumption can help to reduce your individual carbon footprint. Minimising food waste and reducing the quantity of items that you eat from higher up the food chain (meat, dairy) has a surprisingly significant environmental impact. Air transportation is carbon intensive, and the fuel type and efficiency of private vehicles influences their carbon intensity. In contrast, public transport, cycling and walking are generally low or zero emission activities. The design of homes and choice of energy efficient appliances will also influence your home energy profile. In Australia, the domestic energy market produces high levels of greenhouse gases and so home energy consumption is likely to be a significant part of your carbon footprint.

Reuse

Reusing items reduces the requirement for new items to be manufactured. In turn, this avoids the emissions associated with manufacturing processes. Be alert when choosing electronic goods and items that burn fuel: they may be less efficient to operate than new technology alternatives, and may release more emissions over the lifetime of their use.

Recycle

Waste is a big contributor to greenhouse gas emissions with around 1.56 billion tonnes of CO^2e produced globally each year. Recycling items not only reduces landfill emissions but recycled materials will usually have a lower carbon footprint than virgin materials.

HOW DO I CALCULATE MY CARBON FOOTPRINT?

To calculate your carbon footprint you'll need a few items to begin. Start with: utility bills; private vehicle fuel type, fuel efficiency, engine capacity and kilometres travelled; and a travel diary. An understanding of your lifestyle habits, especially diet and waste habits, will also assist. There are many carbon footprint calculators available for individuals. The two sources listed below are a good starting point to discover your basic, standard and advanced footprint calculations.

- Basic – UN Calculator (global)
- Standard/Advanced – Carbon Neutral (Australia)

Products and services that are certified as carbon neutral (or Net Zero) will help to simplify your footprint calculation as you do not need to account for these.

Carbon emissions are organised into three types: Scope 1, Scope 2 and Scope 3. The grading relates to the way emissions are created: Scope 1 emissions are known as 'direct' because they occur at the source of activity; Scope 2 and 3 emissions are known as 'indirect'.

Scope 1

Scope 1 emissions are those directly emitted at the source of an activity. For example, these might be methane emissions for a dairy farm, or process emissions for an industrial plant. Our individual direct emissions are most likely to be the combustion of a fuel, such as natural gas in appliances and fuel in private vehicles.

Scope 2

Scope 2 emissions are those generated by a third party during the process of creating energy consumed by an individual or activity. For most of us, this will be the energy needed to power electricity consumed at home. Other consumable energies might include steam or hydronic heating if it is supplied by a third party.

Scope 3

Scope 3 emissions are those generated in the economy or community that enables an activity. For instance, these are usually services, transportation, manufacture, waste disposal or food products.

WHAT OPTIONS ARE THERE FOR OFFSETTING?

Once you are armed with the knowledge of your carbon footprint, you can choose the action you wish to take. You could aim to decrease your footprint and to offset part or all of your emissions. There are several organisations that help you to achieve this. At the bottom end of the market you may find offsets at AUD$13–15 per tonne of CO^2e. For greater transparency you could seek offset programs with bespoke projects. These provide greater detail about what your offsets are funding and what additional benefits (or co-benefits) the project may have to health, communities or the environment. South Pole and Carbon Neutral have a range of interesting projects. You may also wish to make a donation to tackle climate change.

HOW WILL GOVERNMENT AND CORPORATE POLICY IMPACT IN THE FUTURE?

Carbon offsetting should be seen as a final step after all other means of avoiding emissions have been exhausted. Governments and large organisations are increasingly making Net Zero pledges. There is a risk that rather than finding sustainable solutions these pledges will simply defer the problem through offsets and lead to an expensive offset market.

You can also consider whether you are investing in climate intensive industries. The Australian Ethical superannuation fund provides a calculator that estimates the likely carbon footprint of your investments.

FURTHER READING

SEE Change Canberra sustainability map
Carbon Offsets Offer a Fantasy of Capitalism Without Crises, The Conversation, March 13, 2021
Five Ways Families Can Help Tackle Climate Change, The Conversation, January 16, 2020
Which Form of Transport has the Smallest Carbon Footprint? by Hannah Ritchie, October 13, 2020
Guide to Fossil Fuel Investing, 350.org, 2017
The Environmental Benefits of Effective Giving, The Life You Can Save, 2019