vehicle

Litres of fuel consumed is the most accurate way to determine your vehicle's CO2 emissions, as the conversion of fuel to carbon dioxide emissions through vehicle engine combustion, is scientifically known.

The calculation methods provided are designed to assist you make the most accurate assessment of your total fuel consumption. Trucks, buses and motorcycles must use either the 'weekly litres' or 'weekly fuel cost' calculation methods.

The level of CO2 emissions is also dependent on the type of fuel used by the vehicle, as each fuel type (e.g. petrol, diesel, lpg) differs in respect of it's carbon content.

Fuel consumption estimations based on kilometres travelled, are calculated according to the average fuel consumption of a representative sample of vehicles with a particular engine size: the fuel consumption of each vehicle within the sample is based on tests conducted under the new international standard for vehicle testing: the United Nations Economic Commission for Europe Regulation 101 (UN ECE R 101).

Importantly, fuel consumption can differ depending on driving conditions, driver behaviour and the condition of your vehicle. No test can simulate all possible combinations of these and other variables and hence the test averages are a simplified alternative to direct knowledge of your fuel consumption.

The conversion of litres of fuel to kilograms of CO2 is worked out using the 'point-source emissions factor' figures from the Australian Greenhouse Office's 2004 Factors & Methods Workbook. 'Point-source' does not include the non-direct emissions from refining and transporting the fuel. Elementree does not consider non-direct emissions to be the responsibility of the vehicle owner, but in recognition of the importance of these non-direct emissions, Elementree is actively pursuing accountability for them with the source providers and distributors.

Importantly the direct emissions are expressed in terms of CO2-equivalent (CO2-e), which includes CO2 as well as the global warming effect of the relatively small quantities of CH4 and N2O emitted at the point of combustion.

air travel

The tonnes of CO2 created by your air travel identified by the calculator, represents your individual contribution according to the average mileage (fuel burn) per passenger: it is a fraction of the total CO2 produced by the flight.

As with vehicle emissions, litres of fuel consumed is the most accurate way to determine CO2 emissions from your air travel, as the conversion of aviation fuel to carbon dioxide emissions is scientifically known.

Calculating the litres of fuel consumed from your air travel is made difficult by the fact that a typical flight itinerary will involve different types of aircraft, occupancy levels and flying conditions.

It is important to note that while the levels of fuel consumption vary considerably across aircraft types, so do the level of passengers each can accommodate.

A study of the rate of fuel consumption to seating capacity, across the range of major commercial aircraft types operated by Qantas, British Airways and Virgin Blue, reveals an average mileage per passenger of approximately 0.070 litres/km/passenger, at 80% occupancy.

electricity and gas

If possible, enter an ANNUAL amount based on the information provided on your most recent utility bills. If you do not have access to a past bill you can call your utility provider's accounts enquiries number and they should be able to tell you your usage over past billing periods. Alternatively, you may use the 'national averages for consumption per person', provided with the calculator.

If you subscribe to a 'Green Power' or renewable energy scheme, you may choose to reduce the annual consumption entered to account for that initiative.

The greenhouse gas emission factors (rates of conversion) used in the estimation of greenhouse emissions from the consumption of electricity and natural gas, are provided by Australia's principal authority on greenhouse emissions, the Australian Greenhouse Office, in it's 'AGO Factors and Methods Workbook', dated August 2004.

The emission factors used for electricity reflect the most recent changes in the composition of the national fuel mix (generation fuel) used to produce electricity.

The emissions produced by the use of electricity are produced during the mining and production of the generation fuels used by the power plant; at the point of combustion at the power plant; and through the transmission and distribution of that electricity. The sum of all three is known as the True or 'Full Fuel Cycle' (AGO) cost from the use of electricity.

Elementree does not consider emissions from the manufacture of generation fuels and the delivery of electricity, to be the responsibility of the home owner. However, in recognition of the importance of these emissions, Elementree provides you with the option to offset these emissions (True Cost) in addition to actively pursuing accountability for them with the natural gas providers and distributors.

For natural gas, a distinction is drawn between the emissions produced through the final consumption of gas (burning through water heaters, stoves, ovens etc.) and emissions produced in the production, processing, transmission and distribution of the gas. The sum of the two is recognized as the True or 'Full Fuel Cycle' (AGO) cost from the consumption of natural gas.

Elementree does not consider emissions from the manufacture and distribution of natural gas to be the responsibility of the home owner. However, in recognition of the importance of these emissions, Elementree provides you with the option to offset these emissions (True Cost) in addition to actively pursuing accountability for them with the natural gas providers and distributors.

Greenhouse Challenge members are instructed to use the True (Full Fuel Cycle) Cost for estimating and reporting emissions generated by the use of electricity and natural gas.

calculating the number of trees to do the job.

Predicting and measuring carbon stocks in trees is complex. Precise calculations are made extremely difficult by the fact that the rate and level of sequestration varies with site, species and other environmental conditions. For this reason, the number of trees required to offset the carbon dioxide emissions has been calculated using the estimated carbon sequestration rates for broad tree growth zones in Australia, provided by the Australian Greenhouse Office in their booklet, "Growing Trees as Greenhouse Sinks".

As Elementree plantings are distributed within those areas categorized as 'low' to 'medium-low' rainfall, the guidelines would estimate a rate of sequestration somewhere between 193 and 291 tonnes of carbon dioxide equivalent (CO_2-e) per hectare (respectively) over 30 years. At a stocking rate of 1000 trees per hectare, that equals a sequestration rate of approximately 0.25 tonnes of CO_2-e per tree, over the first 30 years of its life.

IMPORTANT NOTE: Carbon sequestration is generally reported in tonnes of carbon or tonnes of carbon dioxide. It is important to note which is being used. The carbon in trees is not in the form of carbon dioxide. The carbon in trees is often reported as 'elemental' or 'wood' carbon. To convert tonnes of carbon in trees to tonnes of CO_2, the carbon figure should be multiplied by 3.67.