

## TREE CARBON CALCULATIONS

Modern society is becoming increasingly aware of the greenhouse effect, global warming and our individual roles within these processes. Increasingly, government authorities and agencies are requiring proposed developments and activities to be 'carbon neutral' or to have 'carbon offsets'. In order to calculate these figures, it is necessary to know the amount of carbon being stored within a site and the amount of carbon dioxide being taken up. Australian Tree Consultants can provide figures which detail this information.

Trees absorb carbon dioxide from the atmosphere, as part of the process of photosynthesis. They then convert that carbon dioxide into its two (2) elemental components, storing the carbon within the wood fibre and giving off oxygen back into the atmosphere. The two (2) figures provided by Australian Tree Consultants detail the amount of carbon dioxide a tree has absorbed and the amount of carbon it has stored over its lifetime to that point. Budgetary projections can be made by using the estimated value of the sequestered Carbon and Carbon dioxide for the tree population of any given site.

In order to calculate these two (2) figures, it is necessary to determine the biomass of each individual specimen, including its root system. From this, the amount of carbon that the tree is storing and the amount of carbon dioxide that it has taken up can be calculated. As softwoods and hardwoods take up carbon dioxide and store carbon at differing levels, adjustments have been made to the calculation to account for this. The categorization of a specimen is based on its botanical classification. Adjustments for deciduous versus evergreen trees is not necessary as over an annual period, their growth rates generally even out. Evergreen trees grow at a relatively constant rate with slight slow downs during the cooler months. This is offset however by an increase in growth during the warmer months. Deciduous trees are similar, becoming almost dormant during the colder months and then increasing their growth increments during warmer periods.

There are some limitations to our ability to calculate these figures for trees. The calculations are reliable for softwoods with a diameter at breast height of 0.5 meters and for hardwoods, 1.3 meters. For the purposes of these calculations, diameter at breast height (DBH or  $\emptyset$ ) is taken at 1.3 meters from ground. Similarly, the calculation is not yet accurate for trees with multiple stems below 1.3 meters.

The figures are expressed in kilograms, and represent the total amount taken up and stored by the tree up to that point in its life span. Should the tree remain, and be recalculated in the future, its levels are likely to have increased. Different greenhouse gasses can affect the atmosphere to varying degrees. In order to allow direct comparison, all such gasses are converted to a common unit. This is expressed as a carbon dioxide equivalent or CO<sub>2</sub>-e. This unit is equal to 1 weight of CO<sub>2</sub>. Use of this common value allows easier comparison when other greenhouse gases are being evaluated.