

How many trees do we need to absorb the released CO₂ from our vehicles?



The simple answer is that you need one tree per 1000km's of driving.

There are a lot of variables involved so some assumptions need to be made:

If you are travelling by car at 100km/h for one hour then you will cover a distance of 100km. If we assume the fuel economy of the vehicle is 8l/100km, you have burned 8 litres of fuel. As the density of petrol fuel is 737.22 kg/m³, the 8 litres of fuel that you burned weighs 5.9 kilograms.

When fuel burns a chemical reaction takes place.

The hydrogen and carbon atoms in the fuel separate and react with oxygen from the air, the hydrogen forms water and the carbon forms carbon dioxide. As a result, the amount of carbon dioxide being produced exceeds the mass of fuel being burned by a factor of 44 twelfths multiplied by seven eighths. (12 = the weight of a carbon atom, add the two oxygen atoms to form carbon dioxide and the atomic weight is 44 - hence the 44 twelfths. The seven eighths represents the proportion of carbon by mass in petroleum).

In short, for each 1kg of fuel burned you get 3.2kg of carbon dioxide and your 100 km trip would therefore produce a total of 18.88kg of CO₂. This is the amount your trees would need to offset.

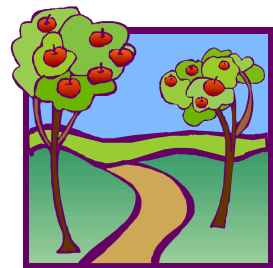
A typical fully-grown tree has a mass of around 3000kg. 60 to 70% of this mass is cellulose obtain from carbon dioxide in the atmosphere through the process of photosynthesis. One tree therefore sequesters about 2000kg of CO₂ in its lifetime. One tree would sequester about 100 times as much CO₂ throughout its lifetime as your one car journey would produce. **Or, simply put, one tree would sequester enough carbon to offset about 1000 kilometres of driving.**

As the average South African driver travels approximately 2,000 km per month, we will each have to plant 24 trees annually to remove those CO₂ emissions caused by our vehicles alone.



However, there's a problem.

Wood is often burned as firewood. When a tree is burned it releases all that carbon back into the atmosphere. In effect all it has done is to act as a temporary store. We need to ensure that the carbon is retained after the life of the tree.



One solution is a tree which sequesters more CO₂ in it's lifetime than it releases when it dies. In this respect you need trees that produce an annual harvest of nuts, fruit, berries, gum, resin etc. A mature fruit tree producing a healthy annual yield will give a net reduction of atmospheric CO₂ of between 20 and 40kg. The actual amount is dependent more upon where the tree is planted and how it is looked after than anything else.

Another is to preserve the wood in furniture, which would prevent the release of the carbon into the atmosphere. Off-cuts and trimmings can also be used as compost. Even stumps and large branches can be left to rot, as this would allow the carbon to be reused by worms, insects, plants and other trees and once again prevent the release of the carbon into the atmosphere.

Atmospheric CO₂ is currently measured at 388.15 parts per million, compared to 385.91 in August 2009 and 384.15 in August 2008. **Know that every little bit makes a difference!**