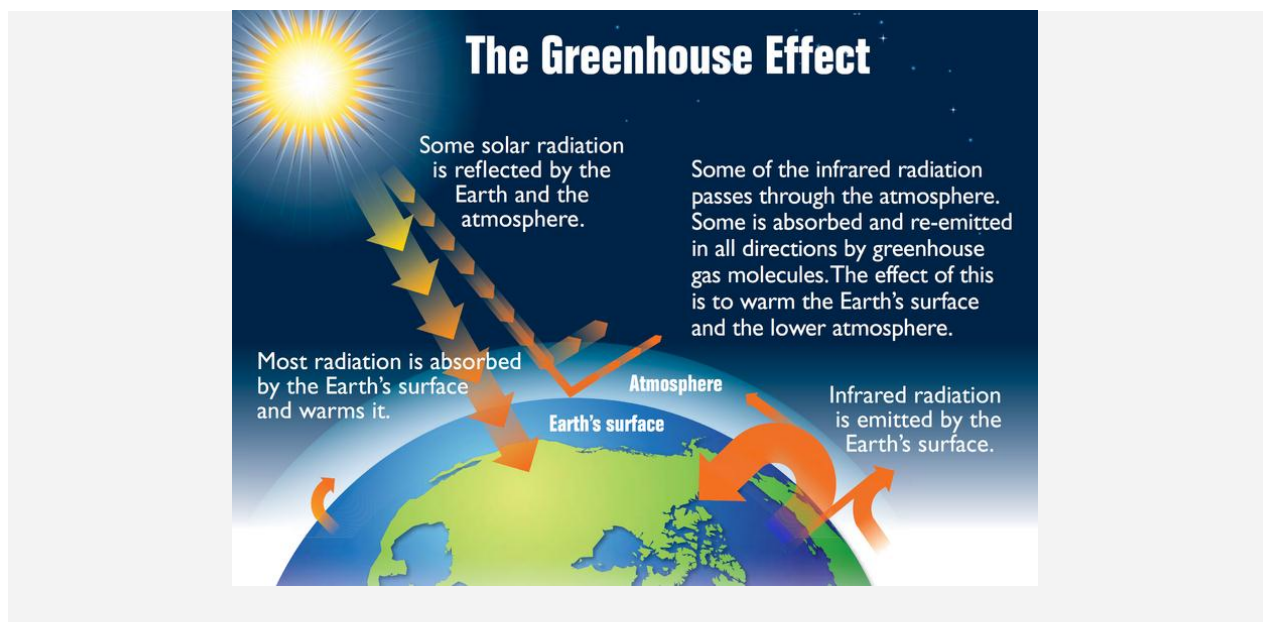


# WHAT IS CARBON FARMING?

**Greenhouse gases** (carbon dioxide, methane, nitrous oxide, fluorinated gases, and ozone) work like the glass walls of a greenhouse and are responsible for the **greenhouse effect**. What is the greenhouse effect? It's a process in which greenhouse gases let the radiation from the sun onto the Earth's surface. At the same time, they trap the heat that reflects back up into the atmosphere.



Source: <http://www.epa.gov/>

The greenhouse effect keeps our planet at an average 59 degrees Fahrenheit (15 degrees Celsius). However, if the greenhouse effect is too strong, our planet gets warmer and warmer. This is what is happening now — the greenhouse effect is becoming stronger because of increased release of greenhouse gases in the atmosphere. The result of a stronger greenhouse effect is **climate change**.

**Carbon dioxide (CO<sub>2</sub>)** is the primary greenhouse gas emitted through human activities. CO<sub>2</sub> enters the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement).

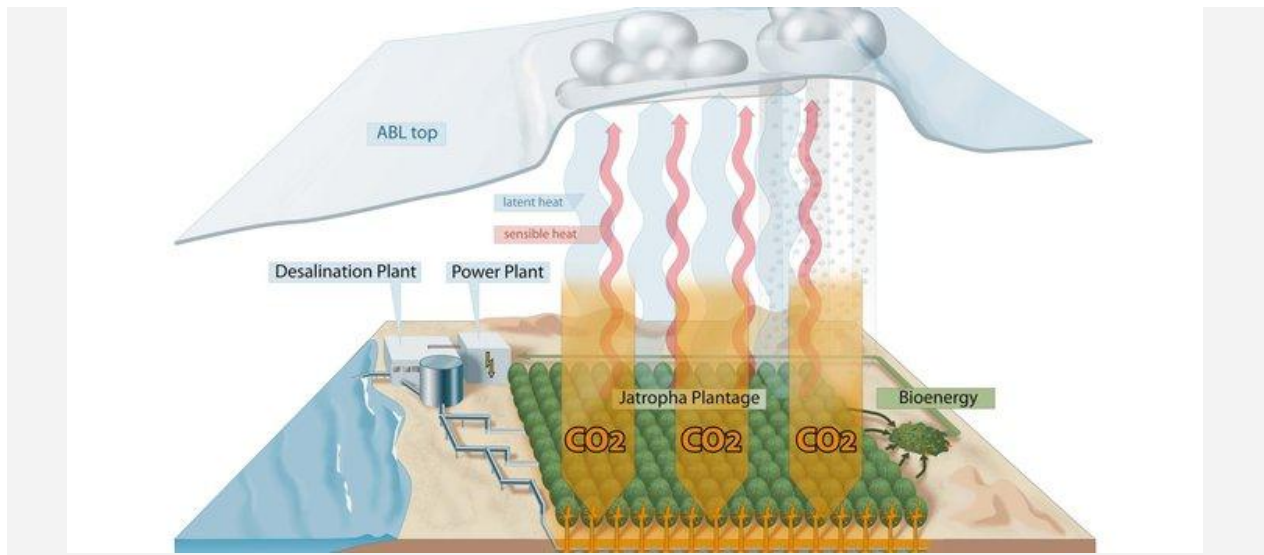
Carbon dioxide is removed from the atmosphere when it is absorbed by plants as part of the biological carbon cycle. Using energy from the sun, plants transform carbon dioxide and water into glucose and oxygen through the process of photosynthesis. CO<sub>2</sub> is said to be removed, captured or sequestered (in such a context, these three words have the same meaning).

To mitigate climate change, a group of German scientists has now come up with an environmentally friendly method to capture CO<sub>2</sub> — in other words, a method to remove CO<sub>2</sub> from the atmosphere. The method, dubbed **carbon farming**, consists in planting trees in arid regions to capture CO<sub>2</sub>.

The team of investigators, in a paper published in the scientific journal *Earth System Dynamics* on July 31, 2013, shows that *Jatropha curcas* does a great job at sequestering CO<sub>2</sub> from the atmosphere. *Jatropha curcas* is a small tree very resistant to aridity. Therefore, it can be planted in hot and dry land in soil unsuitable for food production. Because the plant needs water to grow, coastal areas where desalinated seawater can be made available are ideal.

The new Earth System Dynamics study shows that one hectare of *Jatropha curcas* could capture up to 25 tonnes of atmospheric carbon dioxide per year, over a 20 year period. A plantation taking up only about 3% of the Arabian Desert, for example, could absorb in a couple of decades all the CO<sub>2</sub> produced by motor vehicles in Germany over the same period. With about one billion hectares suitable for carbon farming, the method could sequester a significant portion of the CO<sub>2</sub> added to the atmosphere since the industrial revolution.

The main limitations to implementing this method are lack of funding and little knowledge of the benefits large-scale plantations could have in the regional climate, which can include increase of cloud coverage and rainfall. The Earth System Dynamics paper presents results of simulations looking into these aspects, but there is still a lack of experimental data on the effects of greening arid regions. In addition, potential detrimental effects need to be evaluated carefully — an example of potential detrimental effects is the accumulation of salt in desert soils. The team hopes the results from their study will get enough people informed about carbon farming, so to establish an experimental pilot project.



Processes involved in carbon farming (Credit: Becker et al. 2013)

Source: <http://theglobalfool.com/what-is-carbon-farming/>