The Treesolution

Why CO_2 is no polluter
Why all climate negotiations have failed
Why paying taxes to stop climate change has no effect

Learn how to create wealth from CO_2

Pieter Hoff

The Treesolution Pieter Hoff

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I dedicate this book to the memory of Prof. Dr. Wangari Maathai. In 2004 she was awarded the Nobel Peace Prize , and she dedicated her life to make the earth habitable by planting trees. Her unrelenting labor inspired me to write this book. Those who wish to know more about her dedication and work can visit www.greenbeltmovement.org Unfortunately Ms. Maathai left us on September 25, 2011, too early to see the full fruition of her work.

The publication of this book is funded by my brother Matthie Hoff. I thank him for his support and sharing the dream of reforestation of the world.

I thank my son, Wout Hoff; my neighbor, André Nieuwlaat; and my good friend and a walking tree encyclopedia living in Oman -who is helping me planting trees in the Oman deserts- Clive Winbow for the improvements they suggested on the contents of the book and for their linguistic advice.

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Introduction

In 2009 the G8 Summit was held in L'Aquila, Italy. One of the subjects on the agenda was climate change. During the Summit the eight participating countries decided to accept a 2°C increase in temperature of the atmosphere until 2050, because in their opinion the world is not capable of sufficiently limiting the emission of CO_2 to avoid this.

The December 2009 Copenhagen Climate Conference failed to come up with solutions. The 2010 Cancun Conference also did not bring any solution to prevent climate change. The 2011 Durban Conference was again paralyzed, unable to come up with any solution to the problem. The Rio+20 Summit gave hope to so many; but again, the result was a paper full of empty promises. The 2012 Doha Conference and 2013 Warsaw Conference were the most recent chances to get to a new Climate Protocol. The negotiators failed again.

After reading this book you will understand why this happens. The basic principles of the Kyoto Protocol -mankind's intended instrument to reduce CO_2 emission- are so full of flaws that no solution based on them will ever work, unless these flaws are acknowledged and removed. Unfortunately I have not seen any willingness or commitment to do so until now.

CO_2 experts, who believe in climate change and who plead for measures to prevent it from happening, seem just as stubborn as their opponents who deny climate change. Although I have been writing about these flaws since 2008, it seems CO_2 experts prefer to ignore them instead of removing the flaws from a new treaty, so that all parties involved are able to sign it.

After having read this book, you will understand why all negotiations about a new climate treaty have failed. In this book, I offer a completely different view on the CO_2 emission problem; and -as you can expect from an inventor- a solution to solve it.

Holland, January 2014
Pieter Hoff

The fifth edition

The year 2014 has arrived, and no significant progress has been made towards cleaning the air of CO_2 and other greenhouse gases. Since 2011 we have discovered that in recent years, both climate change 'believers' and climate change 'skeptics' have been providing us with incorrect figures. We even have a 'climate-gate' scandal which shows how unreliable 'climate facts' have become. Many take positions, not with the aim to reduce the CO_2 emission, but simply to make money from the problem. Multinational companies are busy developing incredibly expensive, polluting, and inefficient 'Carbon Capture and Storage' technologies; and they are trying to influence governments to spend money on these technologies. Banks have huge interests in carbon trading, and that is why they support the present policies. Governments need more money, so they use 'climate change' as an easy way to levy more taxes on the public and corporations. Each of these parties is trying to influence the debate, and they are able to do so because most people lack any basic knowledge of what we are talking about.

This book has been updated with the developments that have taken place between August 2008 -the publication of the first edition- and December 2013. I hope it will help you to better judge 'solutions' proposed by parties who have a financial interest, and who want to make you pay for solutions that are often both unnecessary and ineffective.

I am confident that after reading this book, you will start to support the only solution that makes sense, that makes money (instead of costing money) and that is given to us by Mother Nature itself: the Treesolution.

Inspiration

In the years that I ran a business in lily hybridization, I traveled to more than 50 countries to sell my lily bulbs. On my business trips I encountered a problem that occurs everywhere: groundwater levels are dropping at an alarming rate. The groundwater took hundreds of millennia to build up; however, if we continue using groundwater for irrigation purposes on the scale of today, we will have depleted our groundwater supply in a matter of centuries (and in some locations, decades). Although the world is frantically worried about energy, CO_2, and climate change; the drop in groundwater levels due to large-scale extraction for drinking water and irrigation might be even more serious. Yet hardly anyone seems to be paying any attention to it; simply because the problem is literally invisible, below the surface of the earth.[1]

As a lily specialist, I saw my customers worldwide using groundwater. When I found out what the consequences are for groundwater levels, I started to worry. I also witnessed large scale deforestation. For years I drove several times between Rome and Naples, and on these trips I passed Caserta -home of the enchanting Palazzo Reale di Caserta. In the 18th century this was the world's largest building; combined with some of the most beautiful gardens in the world, it is a pleasure to visit this place.[2]

Near Caserta are the Apennines. Once these mountains were covered by a lush, green blanket of pines; but now they are dry, eroded and bare. Whenever I saw them, I thought: *'what a shame this is. How will we ever be able to restore this?'* As you may know, irrigation does not work on slopes because it relies on nearly pressure-less systems. Because of this fact, on one of my journeys I had an inspiration: to make water out of air. I sold my lily company in 2003 and concentrated on working out the details of this idea.

In the years that followed I have developed a practical and affordable solution for planting. I have named this technology that allows people

to plant trees, shrubs or vegetables in their gardens or on wasteland, the Groasis Technology.[3,4] In 2010 the Groasis Waterboxx, which is an integral part of the technology, was voted by Popular Science, America's oldest and biggest science magazine with 3 million readers, winner of the Green Award in its 'Best of what's new 2010' competition. The competition consists of 11 classes and the Groasis Waterboxx also received the honor of being chosen as overall 'Best of what's new 2010', beating 116 other fantastic Fortune 500 products: like the Apple iPad, the Philips led lamp, the Green Porsche etc. I was overwhelmed by this honor and it stimulated me even more to come up with a practical solution to many of the challenges that we are facing. After reading my book you will have learned more about the CO_2 problem, and you will understand how the Treesolution can help solve them.

I hope you enjoy reading this book.

Groasis Waterboxx

The fascinating CO_2 problem

CO_2 doesn't need to be a problem; it can be a gift, a challenge, and an opportunity. The reason for this will be explained in the following pages.

An important aspect of this book is that figures and statistics have been kept to a minimum. If the calculations or examples seem too complicated, feel free to skip them. If you like, first read the book to get the big picture; and later, go back to learn the details if you need them and want to know more.

There is enough information on this topic to fill 1,000 pages. No doubt you will be able to find a lot more information if you continue to explore this topic after reading my book. However, my purpose is to make the Treesolution understandable and accessible to everyone; therefore, I have chosen to write this book in such a way that it can be read in one evening.

The CO_2 concept

Carbon dioxide or CO_2 is a gas that is released when fossil fuels such as coal, oil or gas are burned. It is also released during decomposition of organic matter. Plants produce CO_2 and use oxygen at night; they use CO_2 and produce oxygen during the daytime. We exhale CO_2. There are many sources of CO_2. The idea that humans are the main source of this gas is misleading; We are not. Actually, nature is by far the biggest producer of CO_2.

Of the total CO_2 emission on earth, only 6% is directly caused by human activity.[5,6] If we reduce worldwide CO_2 emission caused by mankind by 5.4%, -as intended by the present Kyoto Protocol- then the *total CO_2 emission* worldwide would drop by 5.4% of 6% = 0.324%.

Besides CO_2, there are many other gases that can absorb heat radiation: CH4 (methane), PFC's (perfluorocarbons), HFCs (hydrofluorcarbons), SF6 (sulfur hexafluoride), etc.[7] These are called 'greenhouse gases' (GHG). Some of these gases absorb ten to thousands times more heat radiation than CO_2. Then there is also the emission of NOx (nitrogen oxides), which causes acidification and smog. During combustion soot particles are also released. Finally, through all kinds of mechanical processes, dust particles enter our planet's atmosphere.

As CO_2 represents the abundant part of 'greenhouse gases', (about 82%, we will focus in this book on CO_2.[8]

Production losses and CO_2 emissions

Production losses occur when fossil fuels are produced. They can be compared to expenses you have to incur to earn a certain income. Suppose you get a job as a sales representative that pays a monthly net income of US$ 5,000. But in order to get that salary you have to pay your monthly car costs, gas, telephone and maintenance expenses. If these expenses are US$ 1,200, your real net monthly income is US$ 3,800. Spending US$ 1,200 to earn US$ 5,000 is your production loss.

There was a time when it was easy to produce oil. In many places it simply gushed out of the earth. But these places are now almost non-existent.
Production of oil is going on in ways and places that require a lot of energy:

- By heating and/or pressure, oil can be extracted from old oil fields. In order to extract 3 liters of oil in this way, one liter is used = a 67% return since only 2 out of 3 liters remain
- Oil can be extracted in remote, inhospitable places. In order to extract and transport 2.5 liters, 1 liter of oil is used = a return of 60%. Only 1.5 out of 2.5 liters remain
- Oil can be extracted from tar sand. In order to extract and transport 2 liters approximately 1 liter is used = a return of 50%. Only 1 out of 2 liters remains [9]

So if we increase the efficiency of a car by 20% and its oil is extracted from tar sand, we have accomplished the following:

- Production of 2 liters of oil
- Use of 1 liter of oil in order to facilitate production
- The car drives 10 kilometers on the remaining 1 liter of oil in the old situation
- In the new situation the car drives 12 kilometers (20% efficiency increase) on the remaining 1 liter

Effect:

- Efficiency increase of the car is 20%
- Net efficiency increase of the energy process is only 10%, because in order to use 1 liter, 2 liters need to be extracted

Some will say that the production of natural gas is much cleaner than that of coal or oil. That is a misconception. Producing gas in remote areas and transporting it to the place where it will be used means it has to be processed. First it is made liquid by cooling it down to a temperature of minus 161 °C, and upon arrival it needs to be heated up to be ready for use. This process, including transport, causes a 30% production loss. In order to be able to consume 7m³ of gas, we need to produce 10m³.

Although burning coal creates more CO_2 and dust particles than the other two fossil fuels, the production and transport process is very efficient. To produce and transport 10 tonnes, only 1 ton is needed. That is a return of 90%. Since it produces the same energy value as gas and oil, coal -if we don't look at the dust particle production- is not much worse if we only look at the CO_2 emission.[10]

Now you understand that even if you insulate your house or buy a more efficient car, this has little effect on the long term because the efficiency improvement will be negligible.

- Human activity accounts for only 6% of the total worldwide CO_2 emission
- Efficiency measures affect the energy we consume, but not the energy required for production

We need to find better and more effective solutions.

CO_2 prejudices

The vast majority of CO_2 experts are convinced that CO_2 is responsible for global warming and climate change. However, it is a well known fact that -even in science- the opinion of the vast majority of experts is not necessarily the right opinion. I give you an example from early history where scientists were forced by rulers to publish a certain point of view while they maybe didn't support it: the majority of Roman Catholic authorities ordered the European Catholics from about 400 CE until the Middle Ages to believe that the earth was the center of our solar system; while the Greeks Aristarchus of Samos (310 BCE - 230 BCE), and Seleucus of Seleucia (190 BCE - 150 BCE) had already asserted that the sun was the center of our solar system -not the earth. The following example shows that it sometimes happens that scientists who are financially dependent from their point of view, lose their neutrality: for the greater part of the 20th century, many scientists and doctors believed that there was no harm in smoking tobacco; some doctors even encouraged their patients to smoke tobacco, believing it to be a harmless means of relaxation. Similarly, a blind acceptance of the assumption that CO_2 is causing the climate to change can therefore be dangerous.

Here are some examples of the dangers of majority pressure that you see happening in the discussions about CO_2:

- Scientists who hold a different view from the majority will frequently be treated as outcasts by their peers, certainly if it concerns the 'possibility' of climate change [11]
- At first, scientists who held the view that CO_2 was the cause of climate change received insufficient funds and now the scientists who believe that CO_2 isn't the cause receive insufficient funds [12]
- Research into a topic which is popular attracts attention. Because research funds are available, institutes, even renowned ones, follow the money. Currently, institutes that research climate change are generously funded. Institutes that research the shortage of water are not
- If it turns out that CO_2 has no effect on the climate, research funds could be discontinued. Organizations and companies receiving research funds therefore have an interest in keeping both people and governments in doubt about the real effects of CO_2 emission

- A number of organizations, people and governments who have imposed taxes ,based on the assumption that CO_2 is dangerous, make money from the CO_2 problem. They have become 'CO_2 dependent' and a solution to the problem would mean loss of income
- Whenever a climate convention is organized they will screen *An Inconvenient Truth*,[13] but not *The Great Global Warming Swindle*.[14] The Bali Conference in 2007 is a good example of this: Al Gore, maker of *An Inconvenient Truth* to whom we must be grateful that he opened the eyes of 'the world' to the climate issue, was invited as main speaker, but Martin Durkin, maker of the film with a dissenting view was not. The minds are apparently closed to information that doesn't fit

If tomorrow it turns out that CO_2 is not the cause of climate change, it would be a financial catastrophe for the hundreds of thousands of people who are currently involved with the CO_2 problem. If researchers, specialists, bureaucrats, employees of institutes and organizations and most governments -through their climate taxes- are now financially dependent on the continuation of the CO_2 problem; how can we expect there to be any space for independent research and any room left for dissenting opinions or for new solutions?

The answer is that finding the solution to the problem has to provide more opportunities and more income than the preservation of the problem.

The debate on climate change

As stated, there is a general consensus among CO_2 experts and government agencies who believe that CO_2 is causing the climate to change.[15] However, there is also a determined group who say that it isn't. This book argues that the debate about whether or not CO_2 is responsible for climate change is irrelevant.[16] Hence, the billions of US$ that are spent annually on research into climate change ought to be spent in a better way.

There are good arguments to support the claim that there may be other causes of climate change. Some scientists see the 11-year sun cycle as a cause, and others think it is linked to deforestation and erosion. Still others claim that there is no climate change at all, and some say that the change is only temporary. One could also argue that the earth currently might actually be too cold. A large part of the earth's land mass is above latitude 50° north, and 90% of this land is uninhabitable because of the low temperature there. So one might as well claim that the earth is too cold, and that global warming is fortunately arriving at the right time -when we need more habitable land for a population increase from 6.5 billion to 10 billion people.[17] Then there is the influence of water vapor. In general, science claims that it accounts for 95% of the greenhouse effect. Finally, one could argue that all factors combined are causing climate changes; this probably makes the most sense. [18,19,20,21,22,23,24]

When you study the history of weather over the last 700 years in Europe, it is striking how common significant -but temporary- changes in weather have been. Here are two examples of periods of great changes in weather that cannot have been caused by mankind.

From 1300 to 1400 CE there was continuous rainfall.[25] In Europe, crops failed in 28 out of the 100 years and the population number dropped dramatically. In all of Europe the weather was out of whack causing all kinds of disease in crops; because of constant moisture, combined with heat during the summer. This caused the mould that normally dies or is

in abeyance in dry conditions to thrive. The food shortage made the people weak and therefore susceptible to disease. Finally, people started to live close to each other in unhygienic cities. Dante's famous book *'The Divine Comedy'* describes the decimation of the Italian population as a result of the bubonic plague in this period.[26]

From 1430 to 1860 CE there were two 'Little Ice Ages' in Europe.[27,28] Temperatures were much lower than usual. During this period the salt water of the North Sea, between England and the Netherlands, sometimes froze for some kilometers away from the shore. Carts could cross the Dutch Zuiderzee. There are many Dutch paintings with icy scenes, of which Hendrick Avercamp's masterpiece '*A scene on the ice near a town'* is possibly best known.[29] This prolonged period of cold was abnormal and 400 years later the temperatures returned to normal.

The weather has always been subject to small and large changes. Whether or not it is still changing is therefore uncertain. If the weather is changing, then it might be permanent or temporary. It is also uncertain whether CO_2 is the cause, in light of the large changes in the past when mankind-related CO_2 emission was significantly lower than it is today.

It is because of these uncertainties that there is no agreement on whether or not the climate is changing. But whatever the truth may be, it is irrelevant to the main theme of this book, which is to provide a solution to the excess of CO_2 emission.

Conceptual perception

Here are some examples of the ways in which what we learned as children influences us for the rest of our lives.

The problem with formal education is that we have to impart children knowledge, but in the process they risk losing their capacity to think independently. In Holland for instance, all children are taught that the climate is changing because of CO_2 emission, even though this has not been proven.[16] Children are being forced to accept conceptual assertions instead of thinking for themselves. If a child during a test writes that according to him climate doesn't change, he may receive a low mark.

You may be asking yourself whether using the wrong concept or using the wrong word is such a big problem. However, the solution to a problem starts with the correct analysis or description of it. When you describe the problem incorrectly, the solution that you come up with in the end will inevitably be the wrong one.

We always hear about 'Carbon Capture and Storage', also known as CCS. This terminology is misleading as not only the atoms of C(carbon) but also those of O(oxygen) are stored underground. In this way *oxygen is taken out of the atmosphere*. The same concept of 'Carbon Capture and Storage' is also used in forestry. But here C and O atoms are disconnected, where the C is stored in wood and humus, and the O *returns into the atmosphere as oxygen.* We are using the same description 'Carbon Capture and Storage' for two entirely different concepts: in one case the oxygen *is lost forever*, and in the other the oxygen *can be used forever.*

In the same way we have been taught a temperature concept that puts us in a fixed thinking pattern:

Celsius once created a temperature scale in which he called the freezing point of water 0 degrees and the boiling point 100 degrees, and because we (in Europe) learn this concept in school, we are now programmed

this way. As a result, our body temperature and the temperature of 37 °C does not seem so hot when compared to the boiling point of water. But this conceptual experience has major implications for our perception of the earth's temperature fluctuations. The fluctuations are expressed in the Celsius scale; therefore, they seem more shocking than if we use the only scale that is correct until 2012*, that of Kelvin. That's why it is so strange that scientists, who use the Kelvin scale as a standard in their profession, suddenly stop using it when they try to impress climate change fears on us. If the atmosphere's average temperature rises from +12 degrees to +12.74 degrees on the Celsius scale, then this is an increase of 6%, which seems quite disturbing.

After further research on temperatures, minus 273°C turned out to be the temperature at which all thermal motion ceases in the classic description of thermodynamics. Kelvin called this temperature 'absolute zero' because it is the lowest possible temperature. The scales of Celsius and Fahrenheit could not deal with this temperature. They already had their own zero point, referring to a much higher temperature. How reliable is a scale, like that of Celsius or Fahrenheit, that uses two 'zero points'? Kelvin, a physicist, thought it wasn't; so he developed the only correct temperature scale that had only one 'zero point'. In this scale we do not use the concept of 'centigrade' and the concept of 'minus' doesn't exist. That makes a lot of sense. After all, there can be only one 'point zero' and each rise of temperature above zero is therefore a 'plus'. In fact, Kelvin's scale is the only scale we should be using. By doing so we would perceive all kinds of concepts differently:

- The 'freezing' (= cold feeling) point of water at 0 °C (= low temperature) is 273 Kelvin (= high temperature)
- Human body temperature at 37°C (= moderate temperature) is 310 Kelvin (= very high temperature)
- The fluctuation in the earth's temperature goes from 12°C to 12.74°C (= an increase of 6% = a large figure) which is equivalent to 285 Kelvin to 285.74 Kelvin = an increase of 0.2526% (= a small figure)

The "possible" global warming during the last 100 years, from +12 to +12.74°C appears to be 6% on the Celsius scale.[30] On Kelvin's scale - the only correct one in science - it is 0.2526%, slightly more

* During 2012 the Ludwig Maximilian University of Munich has created an atomic gas that goes below absolute zero. It was published in Science on January 4, 2013. The research was inspired by ideas of Nobel Price Winner of Physics Norman F. Ramsey (USA) and physicist Allard Mosk (Holland)

than a quarter percent. That sounds much less disturbing than a 6% rise. Graphics based on the Kelvin scale would also show much less alarming increases and decreases. The exaggeration is caused by using the Celsius scale because we have lost the correct perspective. Why do scientists use this scale? Maybe they do it to influence your opinion, as they know that your concept of thinking is in °C and not in Kelvin. This is the climate change supporter's way to try and scare you.

With the right temperature scale, we see what a source of heat life really is: most organisms have temperatures in the range between 273 and 333 Kelvin. Trees also live in these temperatures!

If we use a cell phone we do not stop and think about how this little device communicates by radio waves to transmitters that are located in space or on high masts. These waves penetrate walls and allow us to use the phone anywhere. The waves carry our voice via satellites to someone on the other side of the earth in the same time it takes you to pronounce a word. So these radio waves travel over thousands of kilometers even through walls in a matter of seconds. Such is the force of waves.

The same waves, although of a different length but with roughly the same speed, and also the ability to penetrate solid walls, are used for transporting heat. For example: infrared waves transport energy from the sun to earth and from earth into space in minutes. Because the human body temperature of +37 °C does not seem very hot and the tree temperature of +20 °C appears even cooler, we do not realize what tremendous heat sources they really are. But if we show temperatures in Kelvin, 310 K for a human at +37 °C and 293 K for a tree at +20 °C, then we suddenly realize just how hot these two life processes actually are. That means that these life forms are actually sources of continuous heat energy transmitted into space via infrared waves.

Trees have thousands of leaves and because of their combined surface, an enormous amount of energy radiates via infrared waves into space. As a result, the tree and especially the leaves cool down causing water vapor in the air to condense on them.

This phenomenon of leaves getting wet whilst there is no rain, dew or fog, is called 'damping'. This water is one of the main reasons why a tree can survive in the desert or during droughts. Trees have two ways to regulate atmospheric heat, and that is why they are so interesting to us. On the one hand they use heat for photosynthesis. That is why it feels cool in a forest on a hot day. On the other hand they radiate a tremendous amount of heat into space by infrared waves, much more than bare soil does, during the night. That is because the total surface of billions of tree leaves is much larger than the surface of the soil the tree stands on. There is a much greater radiation surface if we plant trees, allowing for better cooling of the earth and the atmosphere. This explains the earth's miraculous self-cooling ability through infrared heat radiation from trees. Later on we will come back to this phenomenon.

It is important to understand the relativity of the earth's heating and cooling. A deviation of 0.2526% is no cause for alarm. Once the temperature rises, the earth's radiation of infrared waves into space will automatically increase -if we have enough trees radiating infrared waves. But we *must* prevent the temperature of the atmosphere from rising because once this process starts, we will probably not be able to stop it. That's why the G8's decision in 2009 to accept an increase of 2° Celsius is wrong.

CO_2 viewed from a different angle

So let's set aside the debate on whether or not CO_2 has any influence on the climate and look at the CO_2 problem from a different perspective. What if we regard *too high CO_2 concentrations* simply as *pollution*? In that case we no longer need a debate.

There is actually a 100% consensus that the concentration of CO_2 in the air nowadays is higher than it used to be. In 2011 an atmospheric concentration was measured of 394 ppm (parts per million). In ice samples from 1832 the concentration was found to be 285 ppm, which is 27,6% less.[31] If we have no doubts about increased concentration we don't need any further investigation and debates, which will save us money and time.

Atmospheric CO_2 emission and climate change should be considered as two separate issues. We have gone off on a tangent with the CO_2 argument because we include the climate change question alongside it. Hence we are focusing more on the negative consequences of unbalanced atmospheric CO_2 emission than on the undisputed fact alone that CO_2 concentrations, as a result of human activity, have increased over the recent centuries. As a consequence, we hand an advantage to opponents of cleaning up CO_2, who consistently doubt the future impact of increased CO_2 concentrations. The topic of discussion about CO_2 emission, the existence of which is undisputed, is thereafter diverted to a guessing game about the extent of future climate change.

If we agree that the difference between the original concentration that was present -before mankind increased it by its actions- and the current too high concentration as a cause of those actions is 'CO_2 pollution,' then let's take a closer look at how we could deal with this pollution.

Comparing air to water

Let's compare the way we think about air to the way we think about water. In most countries that practice water treatment, all used water goes into the sewers and it is pumped back to the sewage treatment plant. Once there, all of it is filtered and purified and returned to nature. With air, we don't do that. Anyone can use and pollute as much air as they please. Whether you are firing up a heater in your factory or driving a car, all air is free for use and in most cases can still be emitted without purifying it, without further consequences. Why do we purify water 100% whilst we release air virtually untreated? Why do we pay for every m^3 of water we use but not for every m^3 of air we use?

Perhaps this is because water can be felt, seen and tasted whereas air -with the exception of wind- not. Maybe it is because our sense of smell is less prominent than our sense of taste. This means that our perception of treatment of air may be influenced by the fact that air pollution isn't very detectable by our senses.

Suppose we were to treat air like we treat water, so we would pay for the air that we use and for the pollution we create the air would have to be cleaned again. Such a policy to clean polluted air for a 100% would mean that the entire climate debate becomes irrelevant. Do you agree that the current way of thinking, that it isn't necessary to clean up the air for a 100%, is actually illogical?

If someone were to propose that we agree on a Kyoto Water Protocol that ensures that of every 100 liters of dirty water we clean up 5.4% and release the other 94.6 dirty liters back into nature, everyone would think of this as a preposterous suggestion.

So why do we take the negotiators who created a Kyoto Protocol with the aim of reducing CO_2 emission by 5.4% seriously?

To achieve this goal, they don't even intend to purify all the 5.4% but to store a quantity of the CO_2 in empty gas fields and oilfields. We don't store polluted water in our lakes, do we? If we emit 5.4% less CO_2 like the Kyoto Protocol requires, aren't we still bringing 94.6% CO_2 emission back into the atmosphere? Can you agree with me that this policy doesn't feel like a solution?

From the moment we start to think of *too high concentration of CO_2 as pollution* and treat it like we treat polluted water, we can concentrate on solving the CO_2 problem instead of studying the climate. It would save us billions that could be invested in the solution.

The Kyoto Protocol

Governments around the world have taken an interest in the possible climate change problem. Their interest is a good thing, whether or not the climate is actually changing. It means that people worldwide are willing to resolve damage caused by mankind. The Protocol, which resulted from this interest however, is a very complex 'solution' that virtually nobody understands, and which is hard to explain.[32,33,34]
These are the main points of the Kyoto Protocol:

- In December 1997, about 160 countries decided to 'reduce' their CO_2 emission levels. Today 191 states and one regional economic integration organization -the EU- are participating.
- These countries have divided themselves into two groups. One group calls itself the Annex-1 nations. There are now 38 of them + the EU which has also applied as an entity. Then there are the remaining 153 Non-Annex-1 nations. As you will see later on, the grouping defies logic
- The Annex-1 nations have agreed a target of 4 to 8% reduction in CO_2 emission by the year 2012 as compared to the emission levels of 1990. By committing themselves to this, they claimed for themselves the eternal right to emit CO_2 ranging from 92 to 96% of their emission levels of 1990. The worldwide target is an average of 5.4% 'reduction' in 2012 compared to 1990. This goal will not be reached this year, in spite of the economic downturn of the recent years, and it will probably never be reached. The EU decided in January 2008 to set a goal of 20% reduction in CO_2 emission compared to 1990 levels, to be reached by 2020.
- The Non-Annex-1 nations have not restricted their CO_2 emission levels. They can emit as much as they like.
- If a nation doesn´t meet its reduction target, it is allowed to buy 'emission rights'. These are actually 'emission rights' from another nation. What this means is that, - when you compare CO_2 to water - it would be the same as one nation letting its dirty sewage drain into a far away virgin river in another nation that isn´t polluted yet by factories and cities.

- Instruments have been developed, for instance the Clean Development Mechanism (CDM) and the Joint Implementation (JI) system, in order to change the place where reduction of CO_2 emission takes place from one nation to another nation. *(The thought behind this is that an equal investment leads to more emission reductions in poor countries than in wealthy countries).* Besides that, an emission trading system has been set up to allow trading of CO_2 emission rights between companies.

Let's study this in more detail and see what the Protocol means by the word 'reduction'.

Reduction is delay

When the Protocol talks about CO_2, the concept of 'reduction' is used in every publication.

'Reduction' implies that something is 'reduced' = 'decreased.' The most important question is whether CO_2 emissions are really demonstrably reduced by the Kyoto Protocol's measures. The answer, unfortunately, is a clear 'no.'

The final total quantity of CO_2 emission will not be lowered, nor reduced or decreased, only delayed; in spite of the Kyoto Protocol measures.

In general, scientists and governments strive for a 'reduction' of CO_2 emission by means of two processes. These are: energy efficiency improvements and application of renewable energy sources. Let's take a look at their effects.

Energy efficiency improvement:
Suppose the total global supply of gasoline is 5 liters and there is one car in the world. This car, a SUV (Sports Utility Vehicle), does 10 kilometers on 1 liter of gasoline, and the owner drives 10 kilometers a year. It will use 1 liter of gasoline a year and after 5 years all the gasoline will be depleted. In order to reduce CO_2 emission, the government prohibits the owner from driving and parking his SUV in the city. The owner gets rid of it and buys a smaller, more fuel efficient car that can go 12 kilometers on one liter of fuel. The owner uses 20% less gasoline for the same distance. It seems as if this efficiency improvement reduces CO_2 emission by 20% but that is just appearance. Because of the efficiency improvement there is now enough gasoline for 6 years instead of 5. The owner of the car does not stop driving after 5 years but continues to drive to the end of the sixth year, when the gasoline supply is depleted.

This means that the final total quantity of CO_2 emission has not been reduced: the same 5 liters were used. The emitted quantity of CO_2 emission is just delayed over a longer period: 6 years instead of 5.

Renewable energy sources:
Governments are promoting renewable energy production by means such as wind or solar power. This, too, will not reduce the *final total quantity of CO_2 emission.* As long as mankind continues to consume the *entire supply* of fossil fuels until it is depleted, the CO_2 emission will come from this entire supply. Using renewable energy sources is also nothing more than a delay, spreading the CO_2 emission over a longer period of time.

It is incorrect to speak of 'reduced,' 'decreased,' or 'lowered' emissions if all we actually do is to 'delay' them.

Delay is not wrong, but it is no solution either

Let us briefly review the previous information:

- CO_2 emission by nature: 94%
- CO_2 emission by humans: 6%
- Target of Kyoto Protocol: 5.4% less emission of 6% of the output = 0.324% less emission

Do you think that we can stop the possible climate change if we emit 0.324% less CO_2 over a longer period? Does it make any sense to invest billions and pay billions in taxes for a delayed CO_2 emission of 0,324%?

These facts lead us to conclude: First of all, we have to invest our billions in an entirely different way. Secondly, we have to be much more ambitious because 0.324% delay in emission will not stop climate change, if it exists. We must not aim for a 0.324% delay in emission but instead we should clean up 100% of the man-made CO_2 emission. Besides that, we should also strive to clean up our surplus emission from the past.

Is 'delay' of emission a wrong turn of events? There is nothing wrong with using our scarce energy supplies more efficiently, because they are finite. But the purpose of that shouldn't be the prevention of climate change - because such a negligible amount of 0.324% less emission won't be able to prevent it if it exists - but to preserve our finite supply of fossil fuels and improve their efficient use.

One of the ways to slow down emissions without punishing people is to set a norm for maximum emission within a product category and lower this norm year after year. The cleanest product within the category is taxed the least. The most polluting product within a product category is taxed the most. This principle is now applied in Holland for cars and it is successful. The same system could be applied to every other product that uses energy.

Such a system encourages companies to continue their research and development. It also prevents manufacturers from shipping antiquated technologies to developing countries that then keep on producing energy-guzzling products while sending these products back to the countries where the outdated technologies are no longer used or even prohibited.

It is also better to deal more efficiently with energy processes because the delay means we have less CO_2 to disconnect annually. It costs less money to clean up all the CO_2 emission if there is less to clean up.

A 'delay' of emission can easily be achieved if it has a sound economic basis. If a more efficient energy process requires a 20% higher investment but then returns a 30% saving annually (because less energy is consumed), it is economically justified. If this product is made cheaper because of tax advantages, it is even more advantageous to use it. Delaying emission is good because it gives us time to find ways to produce energy without emitting CO_2. However, delay does not mean reduction, so it is only a partial solution that forces us to keep searching for a total solution.

The 'redistribution' of CO_2 emissions

By pretending that *'what you can't see doesn't exist'* a number of environmental issues are 'concealed.' Waste is dumped in developing countries, governments accept dumping nuclear waste underground, and now they present underground storage of CO_2 as a solution. Besides 'dumping' CO_2, the Kyoto Protocol employs another principle as a solution: the relocation of CO_2 emissions. In this way, it has developed three instruments to achieve the 'reduction' of CO_2 emission. On close examination these three instruments are based on the redistribution of the delay, instead of being based on reduction.

Instrument 1: Clean Development Mechanism

Under the rules of the Clean Development Mechanism (CDM), industries that emit more CO_2 than the emission rights that they have received (often awarded 'free of charge') have the obligation to compensate for this. They are allowed to do so by collaborating with corporations or other entities in foreign countries (usually where there is no CO_2 emission limit) to make investments that cause CO_2 emission delay. The reason they do this abroad is that they achieve more CO_2 emission delay for the same dollar spent in a poor (cheap) country than in a wealthy (expensive) country.[35]

Instrument 2: Joint Implementation

The rules of the Joint Implementation (JI) are similar to those of the CDM, but with one difference. Collaboration can only be formed if, without this support mechanism, no measures are taken to delay CO_2 emission.[36]

Instrument 3: Emission Trade

The last instrument to delay emission is 'Emission Trade':
a company that emits less CO_2 than it is allowed can sell the 'unused' rights, and a company that emits more CO_2 than it is allowed can buy such rights. Can you believe this? A company doesn't emit enough, so it earns money by selling its emission rights, then others can emit more... .[37]

CDM is destroying the economic development of countries. An important aspect of CDM and JI that needs to be emphasized is this: Annex-1 nations are trying to lure Non-Annex-1 nations into signing the next Protocol after 2013 by promising large investments under the CDM and JI. Africa, for instance, is being promised that US$ 12 - 18 billion will be invested by the Annex-1 countries under the CDM. On paper, projects in Africa receive this money, but this money is subsequently used to buy technology from corporations in the Annex-1 nations. So the money goes from the Annex-1 nations to Africa and back again. Africa makes no gains from these investments and its economies will not grow as a result. Maintenance of these advanced technologies, aside from their increasing energy use, is extremely expensive and ensures that after installation a constant stream of money is leaving Africa instead of entering it. CDM or JI offer no economic advantage for developing countries and will turn out to be a great disadvantage in the long run.

Does all this, devised by experts during 20 years of negotiations and costing billions, make any sense?

CO_2 is no pollution

About 94% of CO_2 emission originates from nature: oceans, plants, and rotten crops. These naturally-caused emissions can even be accelerated or reduced -output and input- by nature itself. If the earth's temperature rises, billions of tonnes of CO_2 and CH_4 will be released from the humus and plant remains that are now frozen in permafrost regions (regions which don't thaw out even in summer). The Arctic thaw would also greatly raise the water temperature because the sun's rays would no longer be reflected by the ice and snow. This could cause new developments such as CO_2 release from gas hydrates. It is estimated that this process would release three times the current amount of CO_2 into the atmosphere. That could cause an irreversible exponential increase in CO_2 concentrations, meaning that the speed of increase would grow continuously. Global warming might accelerate to over 5°C on average if CO_2 were the cause of it. We should try to prevent that from happening. Why should we take the risk? If all this happens it could be a global catastrophe comparable to the one that caused the extinction of the dinosaurs. Only this time the species under threat would be Homo sapiens.

If a too high concentration of CO_2 is the cause of global warming, we can stop global warming by reducing the emission today instead of just delaying the annual emission by 5.4% or 20%. Why would we take an enormous risk by not solving a problem that could potentially threaten our existence if we already have a solution?

It is however important to understand that CO_2 is only pollution for the part that is higher than normal concentrations: all plant life on earth needs CO_2 and greenhouse growers even fertilize their crops with CO_2. They do this by firing up a water heater during the day when the sun is shining. The combustion gases contain high concentrations of CO_2 that are fed to the plants through hoses and are released at the base of the plants. The gas rises upwards because it is hotter than the surrounding air, the leaves absorb the CO_2 and the plants grow significantly better.

The hot water from the heating kettles is useless because the sun is shining, so it is stored in large tanks. At night when it is cold, this hot water heats the greenhouse, allowing the heaters to be turned off. Every year, Dutch greenhouse growers also use approximately 450,000 tonnes of Shell's CO_2 emission to fertilize their crops.

At higher temperatures and in surroundings with higher CO_2 concentrations, plants are capable to disconnect higher quantities of CO_2.[38]

CO_2 is thus very useful and can be considered as the basic substance for plants to live on. It doesn't make sense that lawmakers worldwide have categorized CO_2 as a polluting gas. If the water level is too high, and you have no boat and you can't swim, you drown, but this doesn't make water a pollutant. Compare a too high concentration of CO_2 with a too high concentration of oxygen: without oxygen you would die. As long as about 20.5% of air is oxygen, you continue to live. When air becomes 50% oxygen, it is lethal. Everything needs to be seen from the proper perspective.

That is why I invite you to take a different point of view on the solution to too high CO_2 emissions.

Mankind emits 6% of all CO_2

The 6% of CO_2 emission that is caused by human activity is caused by:

1. Burning of coal, oil and gas
2. Cement industry [39]
3. Population growth [40]
4. Deforestation [41]
5. Other processes

Suppose the climate does actually change as a result of human activity, and suppose that CO_2 is the cause. Then we should analyze whether the proposed measures of the Kyoto Protocol can actually have an effect. Let's take a look at that:

Item1: burning of coal, oil and gas (fossil fuels). In general we could say that as a solution here, four policies are implemented:

1. Energy efficiency improvements

We have already seen that energy efficiency improvement leads only to a 'delay,' as you have read in the chapter about 'Reduction is delay', page 26.

Insulating your house or buying a more efficient car can only have an impact on the quantity of emission per year, on the length of the period of emission and on your wallet but not on the *final total quantity of CO_2 emission.* The motivation towards efficiency improvement should therefore not be based on the argument of 'preventing climate change,' but instead on saving resources, saving money, and saving time to find new sources of energy. This means that we should stimulate efficiency improvements in a different manner. Not 'because the climate will improve', but because efficiency improvement 'is better for your wallet'! Efficiency improvement should therefore lead to higher incomes due to making money through savings instead of lower incomes due to environmental taxes.

2. Renewable energy sources

Generating energy from renewable sources (hydro-, wind-, solar-, nuclear and/or other forms of energy) would only have an effect on the

final total quantity of CO_2 emission if the generation of these forms of energy caused us to stop using fossil fuels. But alongside these renewable energy sources we will continue to use fossil fuels until they are depleted. Again, this is also simply a form of emission 'delay'.

3. *CO_2 storage technology (CSS - Carbon Capture and Storage)*

For this we return to the water example. If we wash our hands with water and soap, and filter and purify the water 100%, then we have used the water, but not polluted it. By this method, we can continue to reuse it indefinitely without harming our environment. Instead of using this same cyclical method with air, enterprises and governments are now proposing CO_2 storage. When analyzing the arguments in favor of storage - which I'll come to in a minute - you cannot come to any other conclusion than that the only reason for governments to propose this is not because they want to clean up the emission, but it is proposed as a result of the lobby of the companies who stand to make billions in sales of their capture and storage technologies, paid by "the taxpayers".

Fifty years ago, experts assured the public that nuclear power plants were safe, and that the risk of any accidents happening was theoretical at best. Disasters in Harrisburg in 1979 and Chernobyl in 1986 showed them wrong. But after these catastrophes, we were told that everything would become safer. However, in 2008 leaking pipes were discovered in two nuclear power plants in France. The plant in Romans-sur-Isère had been leaking enriched uranium into the soil for many years. In 2011 we learned that an earthquake in combination with a tsunami, while placing all energy generators necessary to cool the energy plant if electricity would fall out under the water level, are enough to cause another disaster on a scale we could never have imagined. The Fukushima Daiichi disaster teaches us that safe nuclear energy doesn't exist and it is just a matter of time until some maniac, terrorist or country crashes a rocket or an airplane into a nuclear power plant.

We can ask many questions about the safety of CO_2 storage, too. Suppose that, against all expectations, it does escape, for instance after an earthquake or an explosion? CO_2 storing is done at a pressure of at least 40 bar. That's a pressure of 40 kg per square centimeter or a pressure

of 400,000 kg per square meter. Consider how high this pressure is per square kilometer. Can we be sure that such a pressure is safe? Suppose there are effects we cannot anticipate? Suppose that CO_2 turns out not to have any effect on climate change after all, who is then going to pay for the investments and the lifelong maintenance? Suppose that even one of these theoretical dangers is real, then what? Besides, CO_2 is not the only greenhouse gas. Moreover, soot and dust particles will not be removed by this CO_2 storage technology.

Another drawback of the storage technology is that, if implemented worldwide, it will cost hundreds of billions of US$ annually. If this creates a solution for a 100% of the CO_2 emission then maybe we have to accept this. The problem is that this technique is only applicable when energy is produced near a site where CO_2 emission can be stored. It can also only be applied in large scale energy production in 'fixed locations.' For energy production that takes place in small or moving locations such as cars, tractors and boats, CO_2 storage is not a solution because CO_2 cannot be siphoned away. It means that it is not even a solution for all the emission, but just for a part of it. That is, if you want to use the word 'solution' instead of 'hiding our waste.'

The next drawback of CO_2 storage technique is that it requires an enormous amount of energy. This is because of the uneconomical filtering process and the compression of CO_2 gas to a required pressure of 40 bar by means of huge compressors in order to be able to pump this emission back into empty gas fields. Because of this CO_2 storage, the efficiency of power plants drops by 25-40%. It also increases the investment in power plants, depending on the technology chosen, by 20 to 90%.[42] This means that if we apply CO_2 storage worldwide in the production of electricity, given a fixed energy demand, we need to build and make use of a 25-40% increase in the number of power plants. On top of that, the energy consumption would go up by 25-40% to produce the same amount of usable electricity. With an increase in energy consumption, CO_2 emission levels will increase accordingly and this CO_2 also needs to be filtered out. Eventually CO_2 storage will create ever-increasing energy consumption and as a consequence an increase

in CO_2 emission that needs to be filtered out. As explained, CO_2 storage technology will cause energy consumption to increase by 25-40%. This means that our natural resources will be depleted much sooner. This makes it increasingly urgent to come up with renewable energy sources. So CO_2 storage cancels out all of the efficiency improvement that we have achieved.

Eternal
The proponents of CO_2 storage say that it's eternal. But which civilization has been eternal? Who is going to prevent the CO_2 escaping from its storage once our civilization ends?

The final drawback of CO_2 storage is also the *best reason* not to go through with it. The name 'carbon storage' is misleading. Both carbon *and* oxygen are being stored. By storing CO_2 we do not only remove C (carbon) but also billions of tonnes of O (oxygen). Extra C atoms are being put into the atmosphere by consuming the fossil fuels, but O atoms not, while when burning fossil fuels O atoms are taken *from* the atmosphere. This means that through CO_2 storage we're removing the most important gas on the planet, the one we need to live, from the atmosphere. If we store the O connected to the C underground as CO_2 then we remove one of the most important building blocks of the plant world, CO_2, including the most important gas for humans, O (oxygen), from the atmosphere.

Item 2: the cement industry

The cement industry is one of the world's largest CO_2 emitters. They account for more than 5% of all emissions caused by human activity. The same arguments apply for the cement industry as for fossil fuels; efficiency improvement only causes delay of emission.

Item 3: growth of the world's population

If the world's population continues to grow, emission of CO_2 will grow accordingly. Because the global population will increase by 50% this century, the human-caused emission of CO_2 will too.

This issue, the growth of the world´s population, is not taken into account in the Kyoto Protocol. How is this possible? If there is climate change, you can't escape the conclusion that the growth of the global population is to blame. This might be because the subject is too sensitive. No government wants to tax human reproduction, so they start to tax energy consumption, although human reproduction is the cause and energy consumption is the result of it. This aspect, due to its apparently insoluble nature, is underexposed. For over 500,000 years the earth´s population was fairly stable. Only about 200 years ago, for the first time ever there were 1 billion people. After that, mankind began multiplying at an incredible rate: within 125 years there were two billion people. This multiplication accelerated a little more and 35 years later, in 1960, it reached the 3 billion mark. Another 15 years later, around 1975, there were 4 billion people and currently, in 2012, we are in excess of 7 billion. If this trend continues (and nothing indicates that it won't) the estimation that there might be 9 to 10 billion people by the year 2050 might even prove to be too low.

All in all, we can conclude that the terms of the Kyoto Protocol as a basis of CO_2 emission reduction are nullified by the increase of global population alone.

Item 4: deforestation

Trees emit some CO_2 but disconnect more CO_2. The net disconnection on a yearly basis depends on where the tree grows. Fifty years ago, in a cold climate, 1 hectare of forest disconnected approximately 2,500 kilos of CO_2 annually. Where temperatures are average, this amount was approximately 5,000 kilos. In the tropics it was about 8,000 to 10,000 kilos of CO_2. Nowadays these figures are approximately 50% higher as we see in the chapter 'Scientific research proves that earth has a flexible CO_2 disconnecting capacity', page 70. This means that every hectare of forest that is cut down in tropical regions such as the Amazon or Indonesia deprives the world of 13,000 kilos of CO_2 disconnecting capacity per year. Deforestation is indirectly contributing to higher CO_2 concentrations because there is less disconnecting capacity for the emission caused by human activity.

The period in which mankind has used fossil fuels has also witnessed enormous worldwide deforestation. It may even be possible that the increased CO_2 levels, as a result of human activity, have not been neutralized for that very reason.

We have simply destroyed the disconnecting capacity of Mother Nature.

Item 5: other processes

Countless other processes cause CO_2 emission, such as chemical factories, car tire production, the 'Production losses and CO_2 emission' for the production and transport of fossil fuels (as described on page 11). Some processes might destroy the CO_2 disconnecting capacity, for instance the acidification of the oceans and the erosion of the soil.

The sum of these five CO_2 emission processes teaches us that there:

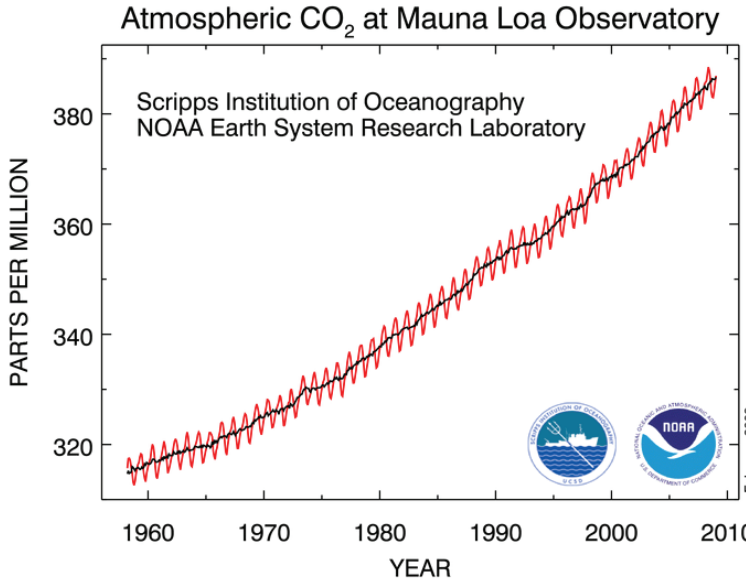
- There are three processes where emission can be delayed but not reduced
- There is one process which will cause emission to increase by 50% in the 21st century
- there is one process which causes the reduction of the disconnecting capacity of our planet to decrease CO_2 concentrations

The split position of the United Nations

One of the Millennium Goals of the United Nations is the growth of mankind's prosperity. It is an undisputable fact that the amount of CO_2 emission is directly proportionate to human prosperity.

This means that the United Nations' Millennium Goals of prosperity growth are at odds with the Kyoto Protocol drafted by the same United Nations. The global economy is growing between 1.5% and 3% annually, and it therefore comes as no surprise that since 1990 we observe an annual increase in CO_2 emission by at least 1.5% to 3%, and often even more. Even during the economic crisis of 2011 the CO_2 emission caused by fossil fuels rose at an annual rate of 3.2%.

In order to demonstrate this, we may take a look at this graph from the Mauna Loa website.[43]



Monthly mean atmospheric carbon dioxide at Mauna Loa Observatory, Hawaii

The carbon dioxide data, measured as the mole fraction in dry air, on Mauna Loa constitute the longest record of direct measurements of CO_2 in the atmosphere. They were started by C. David Keeling of the Scripps Institution of Oceanography in March of 1958 at a facility of the National Oceanic and Atmospheric Administration (Keeling, 1976). NOAA started its own CO_2 measurements in May of 1974, and they have run in parallel with those made by Scripps since then (Thoning, 1989). The black curve represents the seasonally corrected data (courtesy: Mauna Loa Observatory).

The curve shows unequivocally that the implementation of the Kyoto Protocol measures in 1997 has had no effect at all in slowing down the increase in CO_2 concentration in the air. The data provide scientific proof that the Kyoto Protocol measures are not working, despite the huge costs and the poverty they cause.

Choosing between useless and useful investments

We have to ask ourselves if we want policies to remain unchanged in the decades to come. If the policies don't change, trillions of dollars will be invested in efficiency improvement and renewable energy sources, with the only result being an extension of the period of possible use of fossil fuels. Considering the enormous tax increases that go with it and the 0% total reduction of CO_2 emission as a result of these measures, the only sensible answer to this question is a definite 'no'.

Let's have a look at a document from the U.S. Energy Information Administration.[44] It shows that since the implementation of the Kyoto Protocol in 1997 worldwide emission has increased from 23 billion tonnes of CO_2 per year in 1997 to 30.4 billion tonnes of CO_2 per year in 2009. This document confirms the findings of Mauna Loa Observatory in the previous chapter. The next example, with figures taken from the same document, tells you why expensive efficiency measures have no result at all:

- The Netherlands emitted about 250 million tonnes of CO_2 in 2008
- China, India and the US, three countries without any limitation on emission, emitted respectively 6,804, 1,474 and 5,833 million tonnes of CO_2 in 2008. This is a combined total of 14,111 billion tonnes. Their annual rate of increase in emission is from 5 to 10% -depending on their economic growth at that time- which comes down to an annual increase in emission of from 706 to 1,412 million tonnes of CO_2
- So their annual increase in emission is three to six times more than the total annual emission in the Netherlands
- If we assume a 5% increase in CO_2 emission in these three countries, then their emission in 2012 will be 17.152 billion tonnes: that is 47 million tonnes a day
- If the Netherlands were to reduce its emission by 20% of 212 million tonnes, which is the official EU target for 2020 -something that will cost billions and will have an enormous impact on the prosperity of the Netherlands- this would constitute a reduction of 42.4 million tonnes This reduction of 42.4 million tonnes is equal to less than 1 day of the increase of the tonnes of emission of China, India and the US
- So the efforts costing billions, and risking poverty in the Netherlands would be cancelled out by the *increase* of emission of these three countries in less than 1 day

It is useless to channel our expenses entirely in the direction of efficiency measures as they are offset by population and economic growth, if they are not accompanied by a far more intelligent solution. Whether we have 50 or 100 years' worth of fossil fuels, an efficiency improvement of 20% or even 50%, it makes no difference: it will not lead to a sustainable solution. Suppose we increase efficiency by 50% and suppose that there is now for 100 years' worth of fossil fuels at current demand levels, then the fossil fuels will be depleted after 150 years instead of after 100 years. This means that we need an answer to the energy problem in 150 years (100 years +50%) instead of 100 years. So the delay doesn't lead us to a solution, only to postponing.

As investments in CO_2 emission delay are pointless, mankind should use the money that can only be spent once for two useful purposes:

1. To start cleaning up 100% all CO_2 emission immediately
2. To develop a new kind of clean energy that can be used as replacement for fossil fuels and not just act as a delayed continued use

Clean energy

Instead of investing in solutions which only result in delay, it is infinitely more useful to develop a completely new form of energy production that is cheap, reliable, efficient, safe and non CO_2 emitting.

Which options do we currently have?

Hydropower

Hydropower is one of the biggest sources of clean energy at the moment, and it is available 100% of the time, unless periods of drought cause lack of water in the water reservoirs. The energy is cheap and the technology is reliable. Hydropower produces about 20% of the world's electricity and constitutes 97% of all renewable energy. [45,46]

Charcoal

I put this one in second position as charcoal is still energy source number one for half of earth's population. It can also serve as fuel locally for a number of simple processes such as cooking, washing and heating. On balance, charcoal is a CO_2 zero emission form of energy, because while growing, trees disconnect the same quantity of CO_2 molecules as are reconnected while burning charcoal.

Solar energy

For obvious reasons most solar panels produce energy only 50% of the time. Solar panels have the advantage of producing energy when demand is highest. The current peak production is therefore easily processed. But during the night most solar technologies don't work and we still need energy during the night. We therefore have to invest extra in a power plant to have energy available at night, which means that we have double costs while producing the same amount of usable energy. However there are interesting new technologies being developed where for instance the energy of the sun is transmitted to other energy carriers (storage) that allow around-the-clock electricity production. The Desertec Foundation among others has presented very interesting solutions to produce sufficient energy from the sun, e.g. in the Sahara. Their method produces energy 24 hours a day.

It is also possible that this form of energy will eventually be produced in outer space because there sunlight can be collected 24 hours a day.[47] Another possible solution is an earth-spanning network of solar panels, but fluctuations in light intensity and political frictions could pose problems there.

Wind energy

Windmills produce energy about 25 to 50% of the time. The key problem of this technology is intermittency. This form of energy production is only a complete alternative as long as we have fossil fuels as a backup to produce energy when there is no wind. Because of the necessity of double investments in energy production locations, energy will become expensive. With windmills we also may ask the question whether they produce an equal quantity of energy to the quantity needed to make them. If extracting iron ore, transporting, melting and molding it, then producing and erecting the windmills, have to be done with electricity produced by them instead of with fossil fuels as happens now, is it still economically feasible to produce windmills? If not, then how can we produce sufficient energy output with windmills once fossil fuels are finished? If we only use windmills we can also, because of the lack of technology for storing energy, currently meet no more than 25% of our total energy requirement. Finally, with the current state of technology we have difficulties in processing the high energy peaks that strong winds can cause. All in all it doesn't seem logic to solve our 21st century energy problem with this technology from the 14th century.

Biogas

As long as biogas is derived from waste material, there are no ethical objections to using it. This method does provide a means of producing energy 24 hours a day but the capacity is too small to supply mankind with its energy requirement.

Biofuels from waste material or from crops from wasteland

Relatively new techniques are being developed for producing ethanol or butane from waste materials by means of bacteria and producing biofuels from products in desert areas where at present no food is produced. This invalidates any objections regarding food shortage resulting from biofuels production.

Biofuels from timber grown on wasteland

As far as net return on biofuels from wood or bamboo is concerned, there are good prospects. As soon as we can produce sufficient volumes of biofuel from each m^3 of wood it is guaranteed that trees or bamboo with a high yield in wood have an amazing future. This does however mean that we need to plant *now* in order to have sufficient wood to produce biofuels in the future. Otherwise we will have the technology but not the supply of wood to convert to biofuels, causing more cutting down of virgin woods.

The advantage of wood is that the soil doesn't get exhausted by roundworm (Nematode) infestations. As long as there is enough variation in species, there is no need for crop rotation in forests. Moreover, forests are planted every 20 to 40 years and they are less sensitive to drought and rain, and they can grow in soils that are unfit for seed (food) crops. With sowing crops there is a major problem if a drought keeps the seeds from germinating or if too much rain prevents sowing. Forests don't need to be sown and harvested annually, which saves a lot of effort and energy. The last advantage is that forests don't need fertilization, herbicides, fungicides, pesticides or the annual fossil fuel-produced energy to sow, maintain and harvest them. Forests are billions of years old and have grown for an eternity without our help. The strength of the tree is infinite.

Geothermal energy

This is heat that is present deep within the earth. Some countries like Iceland are already making extensive use of it. It seems like the possibilities of this simple form of energy, which is available 24 hours a day, are still underestimated.

Thorium

The use of thorium in nuclear reactors is drawing more and more attention worldwide. It seems to be much safer than energy from uranium, there is an abundance of thorium on earth and with small adjustments nuclear reactors working on uranium can be modified to use thorium. India is ahead in this way of producing energy, but

countries like the USA, Russia, Norway and Poland are also focusing on this promising possible source of energy. The production of this form of energy seems to be cheaper than that of coal, and it is available 24 hours a day. Apart from the mining of it, the use of thorium is an energy form without CO_2 emission.

Cold Fusion

Over 10 groups are currently developing cold fusing technology or LENR (Low Energy Nuclear Reactions). Cold fusion is a safe, clean and inexpensive system, that drives steam turbines through heat in order to drive without radioactive waste or danger of explosions. It has zero emission. In Italy, Professor Andrea Rossi from Bologna University in cooperation with National Instruments developed a low temperature E-Cat reactor that can be used for domestic hot water heating and energy production. He is also working on a high temperature reactor that is able to replace coal and gas heating plants.

Magnetic-Gravitation and Plasma Reactors

A very interesting technology is that of Plasma reactors with Magnetic-Gravitation. This technology has been developed by Belgian nuclear physicist Mehran Keshe. Keshe has published a number of books in which he explains his new technology. He has formed the Keshe Foundation, which offers this technology to all nations for the benefit of humanity. This new technology is said to produce inexpensive and unlimited energy.

Nuclear fusion

Fortunately, governments worldwide are doing a lot of research into this encouraging production process of energy.

Nuclear energy

With the knowledge we currently possess this isn't an alternative in the long run: there is a limited known quantity of uranium on earth and there's a large safety hazard. Does it matter for mankind whether once every 25 or once every 50 years a nuclear power plant blows up? Given the current

state of technology, this energy production process is only a temporary solution for mankind.

Unlike solar and wind energy, nuclear power does produce energy 24 hours a day. If we are able to solve the safety problems, 1) it is vulnerable to attacks or natural disasters; and 2) there is nuclear waste leaking at storage far out of sight in deep salt deposits, then it would be a good solution; especially if we were to find more uranium. The attack on the Twin Towers has demonstrated however, that in the mind of a madman nothing is too mad and next time the target may be a nuclear power plant. The 2011 tsunami in Japan proved once again that a nuclear power plant will never be really safe.

Biofuels from land that can produce food

I have put biofuels in the last place because I am very much opposed to them. The currently applied means of producing fuel from food that is produced on fertile soils not only causes hunger, but also it is the only possible way to produce this because we have cheap fossil fuel energy. You work the soil, sow, irrigate, maintain, harvest, transport the crops to the factory and process them into biofuels. Whoever makes up an energy balance has to conclude that the energy input from fossil fuels is larger than the output in biofuel energy. Do you really think that a hectare of corn that is grown in Brazil (for which we first have to cut down a rainforest that disconnects 13.000 kilos of CO_2 per ha annually) has a net return concerning CO_2 emission after the cultivation and processing business? What's more, did you know that in order to produce five liters of ethanol in a dry place where crops need to be irrigated, you need over 10,000 liters of water? You can find this shocking information in the report 'Water embodied in bio ethanol in the United States' published by the University of Minnesota.

Did you know that if this policy causes food prices for a poor family to rise by one dollar a day, then that is equivalent to a rise in US$ 30 a day in a developed country? [48] That is why making fuel out of food is a crime. If this crime continues, we can't exclude the possibility that this development will cause more hunger-related deaths in the next 25

years than all of the wars in the entire 20th century put together. The same arguments are valid for the second generation of biofuels. Although in this case the biomass itself and not only the fruit are used for production, this crop is still being produced on a fertile soil where food could be produced. As long as a rich person has more money to buy fuel than a poor one has to buy food, biofuels instead of food will be produced if policies don't change. It appears that the production of biofuels is becoming an unintended genocide among poor people .[49,50]

California has the honor of being the first to implement this disastrous policy. The EU ordered every EU member to mix at least 5.75% biofuels in normal gasoline by 2010.[51]

Moreover, the m^3 proceeds with biofuels produced from food are way too low. If we want to supply the global demand for energy using crops such as *Jatropha curcas* (Jatropha oil) or *Elaeis guineensis* (palm oil), then the entire earth's surface won't suffice to grow these crops. Jatropha for example yields only about 1 to 2 m^3 per hectare and palm oil about 8 to 12 m^3. These low proceeds are the reason that thousands of hectares of rainforest are being cut down just to supply an infinitesimal quantity of fuel. Moreover, when planting soy, corn and rapeseed it is necessary to perform weed and mould control with chemical agents and to use fertilizer to make them grow. The environmental advantage with these biofuels, if you were to make a balance again, eventually turns out to be a disadvantage. These immense areas of monocultures cause the extinction of hundreds, if not thousands, of species. If you add these problems to the food shortage problem it becomes clear that every politician should have the courage and strength to stop this crime against humanity. Or must fifty million people first die before we change our ideas? In 2008 for the first time in history over one billion people suffered from hunger.

Therefore, my synonym for *biofuel* is *biocruel*.

Support

Although I wrote this paragraph above in 2008, it takes a long time for politicians and others involved to take their responsibility. However, things are changing now. In August 2012 the CEO of Nestlé, the world's biggest food producing industry, Mr. Peter Brabeck, called for the 'end of use of food' for the production of biofuels. I cite a part of his remark: *'our problem is that almost half of U.S. corn production and 60 percent of European rape is being used for fuel production. Biofuel production is adding pressure on food prices which are already being boosted by climate change. (Food) prices are increasingly prone to swings and correlate more and more with oil prices.'* [52]

The ethical frontier

The red line between biofuel and biocruel is:

- Every liter is produced on soil that is able to produce food
- Every liter is produced from a crop that can also be used as food
- Every liter that causes less production of food is the direct cause of a person suffering or even dying from hunger

When biofuel is produced according to the above mentioned three conditions, it becomes biocruel and the use of it is unethical.

Currently unimaginable new forms of energy

It is expected that in the future there will be many other forms of energy production that we don't know about today. For a fish, the concept of fire is incomprehensible. So if we are the 'fish' then possibly there are a number of energy concepts that are currently incomprehensible and may later be childishly simple. We can expect anything, such as use of gravity, expansion, magnetism, interaction between positively and negatively charged particles, lightning, the earth's rotation or other, still unheard-of forces. We have to start searching for these unimaginable concepts today.[53,54,54,55,56] It will only be a matter of time before someone presents the solution for the energy challenge. Personally I think the energy problem is one of the smallest problems we have, if it is even a problem at all. Overpopulation, water and food shortage will turn out to be much more challenging to solve.

Any government that is focused on the future should therefore invest solely in these developments and see to it that a too high concentration of CO_2 caused by CO_2 emission is solved in alternative ways. The most logical way is to increase the cost price of fossil fuels so much through extra taxes that consumers pay for their own efficiency measures. Then governments won't have to spend money on subsidies but instead receive tax revenues. They can invest this in the objectives described in the previous chapter and consumers will use the scarce fuels that are available more efficiently.

Wealth through a head start

Every country that realizes that the end of the fossil fuel era is at hand -whether it is because fossil fuels are about to be depleted, because they are too harmful or because they are too expensive- and adapts its policy accordingly, is wise to do so. So Germany's decision in 2011 to stop nuclear production and develop an energy policy that is non-dependent on fossil fuels is smart, and it will undoubtedly prove to be their best decision of 2011.

By developing new kinds of energy instead of spending our tax revenue on a delay of emission that has insufficient effect, we will achieve four important things:

- We become independent of the whims of potentially arrogant governments
- We become the new suppliers of energy producing processes after fossil fuels are depleted
- We can supply energy to our population that is affordable without dependence on third parties
- We finally accomplish emitting no CO_2 instead of reducing the emission by a few percentage points

It is better to start a race for knowledge for energy production -with which we secure our future- than an arms race for the possession of the finite supply of fossil fuels, creating the possibility that we no longer have a future because of (self) destruction. The activities of Canada, China, Denmark, Russia and the USA in the North Pole area, show that several governments are still thinking in terms of fossil fuels instead of alternative energy solutions.

Why the USA refuse to ratify the Kyoto Protocol

There is one important country that until now, 2014, has refused to ratify the Kyoto Protocol. This happens to be one of the largest emitters of CO_2 in the world: the United States of America. During the Bali Climate Conference in December 2007, the USA was put under heavy pressure to sign. In fact, that was one of the reasons for me to start writing this book as it was unclear to me why one of the most progressive countries in the world refused to ratify the Protocol.

During my research into CO_2, it became clear to me that the Kyoto Protocol has various serious flaws which have partly inspired the rejection by the US. The flaws however are not a reason to abolish the Protocol. We should view the Protocol as a first step of mankind towards a solution for a serious problem. Just like the simple car of 1900 has become the smart and sophisticated car of 2014; in the same way we must give the Kyoto Protocol the chance to develop to get the solution we need.

However, Canada announced at the end of 2011 that it will step out of the Kyoto Protocol. In 2012 Brazil, Japan and Russia confirmed that they will not participate in a second commitment period under the Kyoto Protocol. They are focusing on creating a legally binding international climate change regime that can be put into place by 2015. Russia says that a second Kyoto period is 'ineffective' in combating climate change. The reason is that the list of participants with obligatory reduction commitments covers only 15% to 17% of global greenhouse gas emissions.

We have to improve the Kyoto Protocol, not in order to prevent climate change but to clean up all CO_2 emission instead of just 5.4% of it.[57] However, not a single serious attempt is made to get rid of the flaws in the Kyoto Protocol, all climate conferences fail. When you read the next chapters, you will understand why.

What needs to be improved in the Kyoto Protocol

As you understand by now, the question of whether or not CO_2 is the cause of climate change and whether there is any climate change at all is not what matters. If we want to treat air like we treat water, which is to pay for its use and clean it 100% after use, no debates are needed. Air simply needs to be cleaned, filtered and purified 100%, just like water.

So the question is not 'do we need to protect ourselves, and if so, how do we protect ourselves against climate change?' The question is 'does the Kyoto Protocol help to reduce CO_2 emission?'

The answer is 'no.'

Six flaws in the Kyoto Protocol must be corrected. The facts speak for themselves: between 1997 and 2011, during the Kyoto Protocol period, CO_2 emission rose from 23 to 30.4 billion tonnes per year, and we see this clearly in the Mauna Loa graphics, page 40. The current Protocol will never achieve its original goal, which is an actual reduction of CO_2 emission, all because of these six important flaws.

The six flaws are:

1. The Annex-1 nations have received free emission rights that are **based on bad behavior** in the period before the Protocol was signed
2. The Non-Annex-1 nations and the corporations that are based there -or those that moved there- **are allowed to develop their industry without any investments in preventing CO_2 emissions**
3. Emission rights are **forever instead of annual**
4. Emission rights are **not per capita of the population**
5. CO_2 emission is **not reduced but only delayed** by the Protocol
6. Participating countries have awarded themselves the **right to emit**

Item 1: the Annex-1 nations have received free emission rights that are **based on bad behavior** in the period before the Protocol was signed

The first flaw of the Kyoto Protocol is that the Annex-1 nations have promised to delay their CO_2 emission by 4 - 8% and in return they

have given themselves free emission rights. The quantity of freely awarded emission rights is based on bad behavior in the past,[58] because the participants took the emission levels of 1990 as a baseline. A nation that was a heavy polluter in 1990 received generous emission rights. (Developing) countries on this Annex-1 list that produced very little CO_2 emission received very few emission rights. It is true that some balance out has been done, but the only fair way to grant each nation a right to pollute —if you believe that someone should be allowed to grant themselves a right to pollute— should be based on an amount of emission per inhabitant of that nation. Personally, I think nobody should be permitted to grant themselves a right to pollute.

An example: the Netherlands emitted 212 million tonnes of CO_2 in 1990 and promised to reduce these emissions to 94% = 199 million tonnes by 2012. In exchange for that promise, the Netherlands received 199 million tonnes of free emission rights. The value of this gift was 3,184,000,000 US$.[59] Poor countries such as Belarus, Estonia or Bulgaria received far fewer emission rights and therefore a smaller gift. If you study the Annex-1 list, page 61, closely, you will see that the countries that emitted the most in 1990 have been given the most generous emission rights.

Another problem is that virtually all countries have so far freely extended these rights to industries that have the best contacts with the government.[60] These gifts do not stimulate good behavior on the part of industries to clean up their emissions. It is also a way of monopolizing the market because newcomers have more difficulty entering and competing in a market if they have no emission rights and/or have to purchase these at a high price. It is true that industries that want to grow, have to purchase their growth in emission rights but the fact remains that their base quantity is free of charge, yielding a considerable cost advantage compared to a new competitor. Look how valuable these gifts are: a company that receives 1 million tonnes continuous emission rights can in fact put these rights on their balance sheet for 16 million US$.[59]

Item 2: the Non-Annex-1 nations and the corporations that are based there -or those that moved there- **are allowed to develop their industry without any investments in preventing CO_2 emission**

The Non-Annex-1 countries have no restrictions whatsoever on the emission they want to cause. This condition, or rather, permission, was the only way to get them to sign the Protocol. So they can let their industries grow without boundaries. This is the main reason that the United States is not participating in the Protocol. If you study the subject and consider the influence of population growth, as described in the chapter ' The 'forgotten' population growth', page 64, you have to conclude that the USA is right.[61]

Let's just look at the facts: what is the positive effect of the Kyoto Protocol if all Non-Annex-1 countries like Brazil, China and India can emit as much CO_2 as they like? This means that the American industry -even if the USA were an Annex-1 nation- would have to make enormous investments to delay the emission of CO_2 while the industries from Non-Annex-1 countries don't have these costs. The figures prove that the American refusal is justified: the global emission of CO_2 is rising with enormous speed despite -and maybe even because of (!)- the Kyoto Protocol. All the figures indicate that by 2030 the global emission of CO_2 will have doubled compared to current levels. The Kyoto Protocol forces all the emitting industries from Annex-1 countries to move to Non-Annex-1 countries where there is little or no environmental regulation. Not only it is industry driven away, but also products have to be shipped back to the consumers (currently mainly to Annex-1 countries). This causes a serious increase in CO_2 emission because of the energy that is required for transport. What is the point if the European emission is delayed by 20% by the year 2020 when the emission of China and India, that have a combined population that is eight times larger than that one of Europe, will be more than double? [62] In 2007 alone for instance, China built coal-fired power plants at such a speed, that it now uses more coal than the US, Europe and Japan combined.[63] With this development, will installing a solar panel on the roof of your house have any effect on the climate? I don't think so.

Even more serious is the fact that history has taught the Non-Annex-1 countries to try to produce as much CO_2 emission as possible. This will ensure that, as soon as a limit is put on their emission, their limit will lead to the highest possible emission rights per capita for them as well. That is why China has an interest in increasing its emission as soon as possible.

The unlimited emission rights of the Non-Annex-1 countries are the largest flaw of the Kyoto Protocol and probably one of the main reasons for the USA not to participate. What the United States hasn't done until now, and which I think they should do as the leading country in the world, is to bring forward an alternative showing how they would like things to be.

Item 3: emission rights are **forever instead of annual**

Under the Kyoto Protocol, the Netherlands are allowed to emit 94% of 212 million tonnes of CO_2 every year. This would seem to be 199 million tonnes a year, but it isn't. In 10 years' time the country will have emitted 1.99 billion tonnes and over a period of 100 years it will be 19.9 billion. In this way the Kyoto Protocol looks for an excuse to tax the population billions of dollars based on emission generated -for instance on cars- instead of reducing emissions. This gives the populations a feeling of safety because they believe that something is being done, while their countries have actually acquired eternal rights to emit. Even worse, some countries have granted certain 'strategic industries' unlimited emission rights. If such a company receives or even buys one tonne of emission rights, then in fact that is not one tonne. It is one tonne per annum and therefore 100 tonnes over a period of 100 years. Such a system creates little motivation to stop emitting. Free emission rights that are renewed every year or every five years, actually making them eternal, are in fact a good reason to continue emitting forever.[64]

Item 4: emission rights are **not per capita of the population**

The flaw of the Protocol is clearly proven by comparing these two European countries with nearly equal levels of GDP.

- The Netherlands with 15 million people (in 1997) was 'given' 199 million tonnes in free emission rights. That is an emission right per capita in 1990 of 14.3 tonnes

- Italy with 54 million people was 'given' 406 million tonnes in free emission rights. That is an emission right per capita in 1990 of 8.09 tonnes
- Italy received only slightly more than half of the emission rights per capita that the Netherlands received. Why is that, and is it fair? Again there is no logic at all

Since 2007 China has become the largest emitter in the world. However, China still produces 'only' about 3 tonnes of CO_2 per capita. That is five times less per capita than the eternal emission rights the Netherlands has received per capita -14.3 tonnes- as a gift. Based on the Kyoto system, the Annex-1 countries cannot ask either China or any other growing economies -whether this is industrial growth or population growth- to deal with their CO_2 emission without damaging their credibility. That is why China and India are going to build tens if not hundreds of millions of small cars in the next 25 years. Just like the developed countries, they want one car for every two inhabitants.[65]

Item 5: CO_2 emission is **not reduced but delayed** by the Protocol

The point has already been made that efficiency improvement doesn't lead to emission reduction but to emission delay, until finally the whole supply of fossil fuels is depleted.

Item 6: participating countries have awarded themselves **the right to pollute**

It is sheer arrogance that governments grant themselves the right to rise the concentration of CO_2, meaning they have awarded themselves pollution rights. Even if the EU achieves its goal of emitting 20% less by 2020 than in the baseline year of 1990, it would still emit 80% of what it emitted in 1990.

What right does a government have to decide it can pollute the air of its own country and neighboring countries with too high concentration of CO_2? Who gave governments the right to decide that Non-Annex-1 countries should receive a right to pollute anyway? Of course no country can grant itself or another country the right to pollute. Every person, or

entity, organization nation has a moral obligation to organize society in such a way that the net effect of CO_2 emission is 0%.

An example of the right to pollute that governments have granted themselves is the development of the European Union Emission Trading Scheme (EU-ETS) in which European Union Allowances (EUAs) are traded. These are rights that entities can purchase to pollute (!).

What the EU does now is awarding more CO_2 emission rights to wealthy countries than to poor ones. As long as a country pays, it is allowed to pollute. Again, we will take water as an example: if the same policy was applied there, then the poor would not be allowed to wash while the wealthy were allowed to wash themselves abundantly! On top of that we would allow the wealthy man to pour back his filth into the rivers. With water this is unthinkable and therefore it should be unthinkable with air.

This demonstrates that the 'EU-ETS' is unethical, unacceptable and unsustainable.[66] Fortunately the big four, Brazil, China, India and the USA, have not opted for this arrangement that costs European civilians billions and has practically no effect on pollution whatsoever.

The peculiarities of the Annex-1 countries list of the Kyoto Protocol

This list of 39 Annex-1 countries plus the EU has the following peculiarities:

- Poor countries like Belarus, Bulgaria and Romania must limit their emissions, with the result that their industries can't grow, even though they are currently so poor; while Ireland, the country with -until 2008- the second highest income per capita in the world, is allowed a 13% increase
- At the time of installing the Protocol, wealthy countries like Spain, Portugal and Greece were allowed to increase their emissions
- A wealthy country like Sweden, although having so much hydropower production possibilities, is allowed to increase its emission
- Iceland can increase its emission by 10% while this country has natural hot springs that it can use to produce energy without emitting CO_2
- Wealthy countries like Israel, Kuwait and South Korea can increase their emissions without limitation
- The differences between the allowed emissions agreed upon for these wealthy and poor countries are significant and are sometimes greater than 100%

Explanation of the table below:
A positive number is the percentage of CO_2 that a nation is allowed to emit more than its emission level in 1990 and a negative number (with a 'minus' sign) is the quantity that a nation is allowed to emit less than the CO_2 emission level in 1990.[67, 68] GHG stands for Green House Gas.

The table shows some inexplicable per capita emission rights for nations of the 39 Annex-1 countries: wealthy Australia with so much capacity for solar energy production got 16.3 tonnes emission rights per capita; Norway with so many hydropower options got 19.1, Lithuania with its cold winter climate causing high energy needs for heating has 3.87 and Turkey that still has a largely undeveloped economy is permitted only 3.14 tonnes per capita.

	Nation	1990 total GHG	% Reduction	2012 net GHG	GHG per inhabitant*
1	Australia	418	8		16.3
2	Austria	79	-13		8.5
3	Belarus	127	-8		6.6
4	Belgium	145	-7.5		9.7
5	Bulgaria	132	-8		5.46
6	Canada	595	-6		20
7	Croatia	31	-5		5.18
8	Czech	196	-8		11.48
9	Denmark	70	-21		9.8
10	Estonia	42	-8		14.1
11	Finland	70	0		12.6
12	France	567	0		6.2
13	Germany	1,227	-21		9.79
14	Greece	108	25		8.73
15	Hungary	115	-6		5.65
16	Iceland	3	10		7.6
17	Ireland	55	13		10.4
18	Italy	516	-6.5		7.69
19	Japan	1,272	-6		9.84
20	Latvia	26	-8		3.07
21	Liechtenstein	1.23	-8		6.76
22	Lithuania	49	-8		3.87
23	Luxembourg	12	-8		24.9
24	Monaco	0.107	-8		3.34
25	the Nether-lands	212	-6		8.74
26	New Zealand	61	0		7.8

	Nation	1990 total GHG	% Reduction	2012 net GHG	GHG per inhabitant*
27	Norway	49	1		19.01
28	Poland	586	-6		8
29	Portugal	59	27		5.63
30	Romania	282	-8		4.16
31	Russian Federation	2,989	0		10.5
32	Slovakia	72	-8		6.7
33	Slovenia	20	-8		8.1
34	Spain	287	15		7.72
35	Sweden	72	4		5.89
36	Switzerland	52	-8		5.47
37	Turkey	170	No limit		3.14
38	Ukraine	923	0		6.98
39	UK	771	-12.5		12.68
40	European Union	4,257	-8		
compare		6,229			20.4

* Values from 2004

Keep in mind that this list is continually changing. The current list and status of these countries can be found in the source list.[69.,70]

I left Canada in the list above, but they left the Kyoto Protocol at the end of 2011. Understandably so, as they have enormous tar sand oil deposits near Edmonton. With tar sand oil, you consume one liter of oil to extract two liters as I explained before, so they know they can never comply with this Protocol. Of course they are not willing to throw away this economic opportunity, and the Kyoto Protocol doesn't know how to deal with economic opportunities. Instead of that, the Kyoto Protocol is killing economic opportunities.

This is why Brazil, Canada, Japan and Russia stepped out, why China and India will never sign and the USA will never ratify a new Protocol, unless all the flaws are rectified. These are countries where politicians, unlike their European counterparts, still try to protect the increase in wealth of their populations.

The 'forgotten' population growth

As argued before, the Protocol does not take population growth into account. The consequence of this is an even greater inequality among countries.

The EU expects its population to remain stable between 1990 and 2025. This means that if it wants a 20% CO_2 emission delay in comparison to the levels in 1990, its population will be allowed to emit 80% of the level of CO_2 emission per capita in comparison to 1990. The USA expects a population increase of 40% between 1990 and 2025. This means that if it wants to achieve an absolute reduction in emission to 80% CO_2 compared to 1990, its population is allowed to emit a mere 57% per person in comparison to the levels in 1990. So the EU has to achieve a reduction of merely 20% per person while the USA has to achieve a 43% reduction per person. This means that due to the population increase the USA has to delay its emission by double the amount compared to the EU. It is clear that this is an impossible demand.

Influence of population growth on the effort obligation for CO_2 emission		
	Nation 1	Nation 2
Population 1990	1,000	1,000
Population 2025	1,000	1,400
Population growth	0%	40%
Absolute CO_2 emission in 1990	1,000	1,000
Desired absolute CO_2 emission 2025	800	800
Absolute difference in CO_2 emission 2025 compared to 1990	20%	20%
Difference in emission reduction target per person	80%	57%

The USA cannot possibly participate in the present Protocol or in a future version in which these flaws have not been solved. As of now nobody is discussing these flaws, and it is highly unlikely that they will be solved.

Six failed Climate Conferences

The terms of the Kyoto Protocol expired in 2012. That is why the participating countries have started negotiations for the next period. The first step was taken at the Bali Conference in December 2007. It was a big disappointment. The current Protocol was glorified. Everyone was parroting each other; independent and dissenting views were neither heard nor tolerated. The main objective of the Conference was to put pressure to the USA into participating instead of removing from the Protocol the reasons behind the USA rejection. The Copenhagen Climate Conference in December 2009 was planned to be the stage for final agreements. It failed. The Cancun Climate Conference in 2010 failed. The Durban Climate Conference in 2011 also failed. The Rio+20 Conference has led to nothing but empty promises.

The Doha Conference in November 2012 was again an attempt to get to a new Climate Protocol. Over 10,000 negotiators were present, and failed still: the conference merely agreed to extend the -not working- Kyoto Protocol for another eight years until 2020. Even worse, Brazil, Canada, Japan and Russia made a definitive decision to step out. In 2013 the Warsaw Conference failed.

So, is there a way to overcome these failures; Is there a solution that every country can accept?

Yes, there is.

The Circle

The objective of this book is to show that mankind can solve the CO_2 problem entirely. We just need to look at the problem in a way which completely differs from the usual. In order to find out how to accomplish this, we should first look at some aspects of the natural world. If we don't understand the principles of nature, then we may never find a solution for this natural problem that is caused by mankind's unnatural actions. The principle of nature is :

"Everything on earth is a circle"

A CO_2 molecule consists of two kinds of atoms that are CO_2 (in this combination) but can form other materials in other combinations. The one C (carbon) atom combined with two O (oxygen) atoms is carbon dioxide (CO_2). Two H (hydrogen) atoms combined with one O atom form water (H_2O). So in nature there is never more or less of something. Everything there is cannot grow into more. Only the combinations of atoms are different, so as a result we see other 'manifestations' (forms, materials).

"The number of atoms is fixed; the 'manifestation' of atoms is variable"

This means we cannot 'reduce' the number of atoms. We can only influence the 'manifestation' of the material -or how the atoms are attached. If we really want to 'reduce' the CO_2 emission in the air instead of 'delaying' it, then we have to reconnect the C and O atoms to other ones. The definitive solution to the CO_2 problem is to disconnect the atoms of the CO_2 molecules and connect them to other atoms. The question is now: '*to which other atoms should we connect this one C atom and the two O atoms?*' What is the most effective and affordable 'disconnecting and connecting solution'? The answer is astoundingly simple; it is an invention of nature itself:

"Photosynthesis"

Photosynthesis [71,72,73] takes place in bacteria, algae, trees, and so forth. In photosynthesis, CO_2 molecules are disconnected and reconnected into different kinds of molecules. This combination of atoms and the result of that combination depend on the external circumstances. This causes other manifestations to emerge from the same C and O atoms when connected to other atoms in different combinations. From the surplus of manmade CO_2 emission we can create many valuable materials by means of photosynthesis: the C atoms form wood, fruit, medicines, perfumes, rubber, etcetera. In photosynthesis the oxygen (O_2) is disconnected from different molecules (H_2O/CO_2) allowing to facilitate this process. Despite the fact that it is still hard for mankind to comprehend the processes that stimulate the growth of algae and bacteria, the solution to solve CO_2 emission -using photosynthesis- is very simple:

"The tree is the key to solving the CO_2 emission problem"

In addition to the above arguments, trees have another positive effect. It is known that Greenhouse Gasses (GHG) block infrared waves, as clouds do. This is why some scientists say that a higher concentration of GHG in the atmosphere is the cause of climate change; since less energy, sent to us by the sun, leaves our planet at night into space.[74,75] As explained in the chapter 'Conceptual perception', page 17, trees send their energy through their leaves via infrared waves to space. As their surface area is much larger than bare soil, forests send more energy back to space than wasteland. Since they disconnect the CO_2 molecules that prevent infrared waves from traveling to space, more of the energy sent into space through the trees will leave our atmosphere.

All other solutions like emission delay, underground storage, et cetera:

- They have no benefits
- They are less effective
- They are more expensive
- They do not produce oxygen
- They do not disconnect CO_2 atoms
- They cost money instead of generating money
- They cannot solve the increase of emission (or of dust particles)
- They require additional energy consumption, with additional CO_2 emission as a result

We can eliminate CO_2 emission by simply creating a new lifecycle of C and O atoms using photosynthesis.

Scientific research proves that the earth has a flexible CO_2 disconnecting capacity

On August 2, 2012 an important breakthrough was published by the University of Colorado, USA about the earth's capacity to 'soak up' CO_2. Personally I prefer the term 'disconnect' as the oxygen is disconnected from carbon and is returned to the atmosphere again, but the meaning is the same. The authors of the study included CU-Boulder Professor Jim White, CU-Boulder doctoral student Caroline Alden and National Oceanic and Atmospheric Administration scientists John Miller and Pieter Tans. Miller is also a research associate at the CU-headquartered Cooperative Institute for Research in Environmental Sciences.[38]

They conclude that, (and I quote their press release) *"despite sharp increases in carbon dioxide emission by humans in recent decades that are warming the planet, earth's vegetation and oceans continue to soak up about half of them, according to a surprising new study led by the University of Colorado Boulder".*

The study looked at global CO_2 emission reports from the past 50 years. It shows that while carbon emission has quadrupled, earth's capacity to disconnect the CO_2 has doubled. This led to the important conclusion that earth's capacity to disconnect CO_2 is flexible. Although it didn't evoke much reaction in the world of 'CO_2 specialists', this is the greatest and most positive news of the last 20 years about CO_2 emission.

It means that we are able to influence the capacity of earth to disconnect CO_2 molecules, either positively by planting trees, or negatively by cutting down trees. This is a scientific confirmation of my claim in 2008 that we can solve the CO_2 emission problem with the 'Treesolution'.

Scientific support

On July 31, 2013 another groundbreaking feasibility study was published by Professor Volker Wulfmeyer and Professor Thomas Berger from the University of Hohenheim in Stuttgart in cooperation with Professor Klaus Becker from Atmosphere Protect GmbH in Göttingen, Germany. It shows that Jatropha plantations could annually capture up to 25 tons of carbon dioxide from the atmosphere. This estimation is more than 3 times higher than the 7,5 tonnes that I use in this book as explained in the next chapter 'The enormous purification power of the tree', page 72

I have used this low disconnecting capacity by purpose as I do not want to give people with critics room to use the argument that I use too positive figures in order to show that the Treesolution is viable. Instead of that my estimations are conservative so that the objective of this book -to create the belief that the Treesolution is viable- will be reached.

The University of Hohenheim supports the idea that the Treesolution (they don't use this word) is environmentally friendly, economically and technically feasible. The scientists propose the idea to slow climate change through big scale biomass plantations in desert regions. The researchers describe their approach as 'carbon farming', a description that I like a lot as it makes people clear how the Treesolution can work for us. For this reason I have used the description of 'carbon farming' in this book. The study is published in the journal "Earth System Dynamics", a journal of the European Geosciences Union (EGU)[76]

Since the first publication of my book 'CO_2, a gift from heaven' in 2008, the forerunner of this edition, more and more scientific studies support the view that trees can be the solution to reduce the CO_2 concentration in the air. I hope it is a matter of time until all scientists start to openly and strongly support the Treesolution. A special word of thank must be addressed to the teams of the University of Colorado and the University of Hohenheim for their achievements. Their findings will help politicians make better decisions.

The enormous cleaning power of the tree

Are trees a serious alternative? Yes, they certainly are.

One hectare of trees disconnects a large quantity of CO_2 molecules and reconnects them into all kinds of new and useful 'manifestations'.

How many tonnes of CO_2 emission can one hectare of forest disconnect annually? These were the old figures:

- In cold climates: about 2,500 kilos per hectare per year
- In temperate climates: about 5,000 kilos per hectare per year
- In the tropics: about 8,000 to 10,000 kilos per hectare per year

According to FAO, on a global average, both young and old forests in cold, temperate and warm places, have in the past disconnected around 5 tonnes of CO_2 per hectare per year.[77,78] However, the study of the University of Colorado shows us that the disconnecting capacity of earth rises when the concentration of CO_2 is higher. They conclude that earth's disconnecting capacity has doubled. This means that if we follow their findings at present the average disconnecting capacity of forests is over 10 tonnes of CO_2 per ha. The University of Hohenheim found already a disconnecting capacity of 25 tonnes per hectare.

In order to be conservative and not be too optimistic I will use the figure of an average of 7.5 tonnes of disconnecting capacity per hectare of forest for my calculations on the next pages.

The disconnection of C atoms from O atoms by trees, plants and algae

The tree manifests the C atom in wood, leaves and fruit. The leaves fall off once per year, rot to form humus, and the fruit gets eaten. The C atoms in that fruit pass for a big part through our respiratory system. They are connected with O atoms to form CO_2 and are released in the air again. Another part leaves our body through digestion and changes into humus. The C atom in the wood remains stored as long as the tree remains alive and as long as the wood doesn't rot. When it rots in a favorable location, on the soil, its C atoms will be connected to particles of soil and humus. Only if we burn wood, the C atoms will be connected to O atoms again. The C atoms in the leaves that fall on the ground will be stored there after the leaves have been degraded by microbes and will be connected to soil and humus. We are all warned by climatologists about the disaster that will happen if the permafrost in Siberia ends. They warn us that at that moment unimaginable quantities of CO_2 and CH_4 will enter the atmosphere. These unimaginable quantities have been stored into the ground through the process of rotten plants and fallen leaves and needles of trees.

Trees and their falling leaves are able to help store unimaginable quantities of C atoms, much more than we can ever achieve by any technical method, such as the energy guzzling carbon storage methods that companies suggest we should use.

Algae also have a huge capacity to disconnect C atoms from O atoms. Wherever there is water, algae can live. However, we cannot influence this area.

Plants also have a huge capacity to disconnect CO_2 molecules. Corn produces up to 100 tonnes of harvest per ha per year. That is an enormous CO_2 disconnecting capacity, almost 10 times higher than tropical forests. However, we harvest it instead of letting it rot in the soil. In all modern agricultural producing methods, the organic matter content of the soil drops. That indicates that C atoms are connecting to O atoms in the air. This is the opposite of what we need.

If we left the corn to rot in the field, the disconnecting capacity of corn would be great. But we don't. In general we can say that most parts of earth where plants can grow, and where we have no agriculture, the soil is already covered by them. So we cannot influence this area. Even worse, to grow more plants for food, we cut forest. The cutting of the Amazon for soy production for the industrial beef-industry is an example of this.

The area where trees grow can be influenced and this is the most advanced 'CO_2 disconnecting' solution that nature has provided; in order to tackle the CO_2 problem, we should start to plant more of them.

The Treesolution

A lot of data exist about current global CO_2 emission caused by the use of fossil fuels. In this book we use the average amount of 30 billion tonnes of CO_2 emission a year. [44]

The study from the University of Boulder tells us that half of this emission is cleaned up by earth's present disconnecting capacity. So the extra emission to be cleaned up is equivalent to approximately 15 billion tonnes. If we divide this emission of 15 billion tonnes by the average 7.5 tonnes per hectare of CO_2 disconnecting capacity per year, we have to plant a mere extra 2 billion hectares of trees to clean up all emission. If we plant 50 million hectares a year, we can reach this goal in 40 years' time.

Simply put:
Planting two billion extra hectares of forest will disconnect all too high concentration of CO_2 caused by CO_2 emission.

Even after 40 years we should continue planting, for the following reasons:
Historically, the CO_2 emission problem has existed approximately since 1760 (the start of the industrial revolution), and hasn't been tackled to this day. The concentration in that year was 27,7% lower compared to the current level, as described in the chapter 'CO_2 viewed from a different angle', page 21. This CO_2 also needs to be disconnected. If we start planting 50 million hectares per year we can disconnect 2.5% of our CO_2 emission in the first year (2 billion hectares of trees planted over 40 years is 2.5% of the area of the earth per year), in the second year 5% and in the third year 7.5%, etc. This indicates that until the year 2054 we will have a higher annual rate of emission than trees can disconnect. After the year 2054 we will be able to increase the disconnecting capacity above the level of the emission. At the same time every year around 15 millions of hectares of forests are being cut down. This means that the earth has less CO_2 disconnecting capacity.

We should also compensate for this, either by replanting where we cut, or elsewhere.

As you can see, the tree also presents a solution to the problems caused in the past. The Kyoto Protocol doesn't cover the problems of the past. It doesn’t even offer a solution for the present emission.

The good thing about trees is that we solve the CO_2 problem whilst making money. Instead of paying evermore taxes to research potential climate change, our governments could lower taxes whilst solving the problem 100% instead of 5.4%.

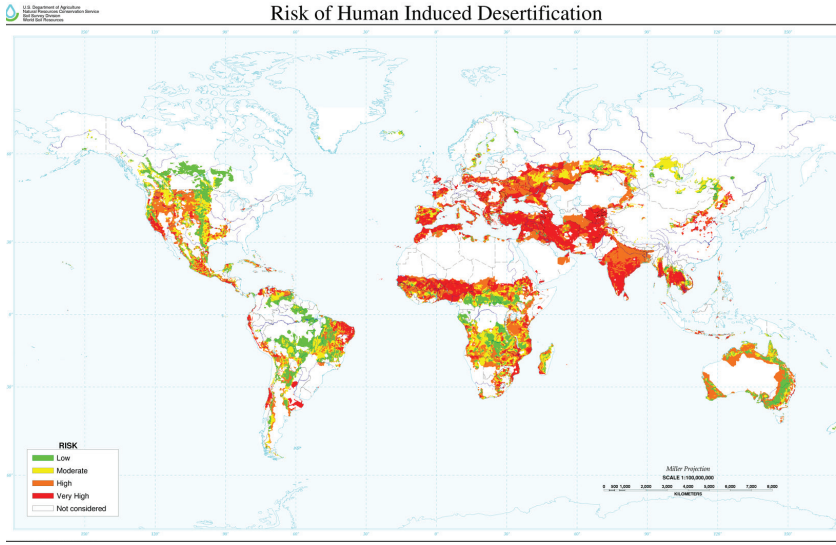
This is the Treesolution.

Have we got 2 billion hectares of land available?

Yes, we have.

The yellow, orange and red areas are approximately 2 billion hectares (5 billion acres). All these areas were forested 2,000 years ago. Over time deserts were created from them, as it was thought the available area to cut down trees was unlimited. However, grazing and browsing animals, such as sheep and goats, prevented trees from regenerating. The area became vulnerable, the soil became dry and started to erode. These areas are nowadays manmade deserts.

If trees once grew there; then we can be sure that if we replant these areas, they can grow there again.



Courtesy NRCS [79]

I have a motto and an article about this on the homepage of my company's website:

'If the area was small enough to cut, it is certainly small enough to replant'.[80]

How large is an area of 50 million hectares?

Below there is a list of the surface area of eight examples of countries and two continents.[81] It shows that we have plenty of space to plant 50 million hectares of trees annually.

Area	Km²	Hectares	% of the solution
Spain	505,992	50,599,200	2.5%
Thailand	513,115	51,311,500	2.6%
Texas	696,241	69,624,100	3.5%
Colombia	1,138,914	113,891,400	5.7%
Algeria	2,318,741	231,874,100	11.8%
Australia	7,741,220	774,122,000	38.7%
Brazil	8,514,877	851,487,700	42.6%
Canada	9,970,610	997,061,000	49.9%
Russia	17,098,242	1,709,824,200	85.5%
Africa	30,244,050	3,024,405,000	151.2%

Extraction speed and planting speed
The world has approximately 3.4 billion hectares of forest. If we plant an additional 2 billion hectares, the total area would then be increased by about 60 percent. However, deforestation is taking place at a rate of 15 million hectares annually: one hectare every two seconds. If we are capable of cutting down one hectare of forest every two seconds, then we should also be capable of planting 50 million hectares annually: one hectare every 0.6 seconds worldwide. Of course we should also compensate for the areas still being deforested. So each year we should plant 50 million hectares and in addition replant the 15 million hectares of forest that are cut down. That is one hectare every half a second.

We only have to plant an area the size of Texas every year to solve the CO_2 emission problem. In total (over a period of 40 years) we have to plant twice the surface of Canada.

Trees grow everywhere

In all soil types, depending on their composition, there are millions of vertical channels, or pipes. These are called 'capillary tubes.' Whenever there is a downpour, the excess water runs underground through the capillary tubes. When the weather is dry, the same tubes transport the water to the surface. Trees have their roots in these capillary tubes -which also contain threads of fungi that are hygroscopic (= attracting water)- and with their roots they soak up the capillary water when it is hot and dry. This is how a tree survives heat. In rocks, minuscule fissures function as capillary tubes.[82]

Even in hotter climates there is usually still more than enough water supply in the soil for a tree to be able to survive and grow under these circumstances. There is also more rainfall in most deserts than we think: often between 150 and 250 millimeters (60 to 100 inches) a year. This is equal to 150 to 250 liter per m^2 (4 to 7 gallons per sq.ft.) because 1 millimeter (mm) of rainfall is equal to 1 liter of water per m^2. That is 1.5 to 2.5 million liters per hectare. In many deserts there is even up to 500 mm of rain a year and some deserts even receive up to 1000 mm annually. The Netherlands, considered a wet country, receive around 700 mm a year. The problem in deserts is not the lack of precipitation, but the time span during which it falls. In some locations it rains for one month and then stays dry for eleven. If the wet period is too short to allow the roots enough time to reach the onset of the hot season or before the soil dries out, the sapling dies. If the wet period is long enough and the roots reach the water available through the capillary tubes, the sapling (assuming a suitable species to cope with the given conditions is used), will survive. Enormous trees can easily grow even on rocky terrain (the Alps, the Rocky Mountains) or on savannas (Mali, Mauritania).

Rocky terrain or temporary drought do not present a problem as the tree is able to use its leaves to absorb condensation water. This is especially no problem when the roots have already grown to the depth of the capillary water.

If we supply the water requirement during the early stages -when a tree is still young and its roots have not grown deep enough to reach capillary moisture- then trees can grow virtually anywhere. In addition to that, a forest creates by itself the right conditions to stimulate its growth. It also provides shade in which other plants can grow. Animals are attracted and distribute seeds. The soil becomes looser and richer and it receives organic matter which is able to hold water and minerals. An environment in which a number of plants can grow is slowly formed.

Nature has always managed to do this without our help, changing bare rock into rich soil.

40 meter high 'Pinus ponderosa' grows on rocks between Sacramento and Reno – USA

Why solve the problem in 40 years' time and not tomorrow?

It is impossible to solve a problem that took 250 years to create, in just one year. The earth is billions of years old and from that perspective, 40 years is no more than the blink of an eye. We simply wouldn't have enough trees to plant all 2 billion hectares, let alone the money, the organization, and most importantly, the will, to realize this plan within a few years. It has taken us a long time to pollute the atmosphere, so we should allow ourselves some time to clean it up. The Treesolution will disconnect 7,5% of CO_2 emission in only three years while the Kyoto Protocol target of 5.4% reduction (which, in fact, is just a delay) still has not been achieved even in over fifteen years.

Planting 50 million hectares of trees every year for at least 40 years is ambitious enough.

The organization of the Treesolution

The existing forests, oceans and plants cannot be included in a calculation of the total number of trees that need to be planted in order to absorb all the present excess of atmospheric CO_2. They disconnect CO_2, but the total amount of CO_2 they disconnect is already factored in. If we want to disconnect more CO_2, we simply have to create more disconnecting capacity. We have to start 'farming' extra carbon. There are companies that deceive consumers (and governments) into making them believe that they are investing in forests that 'capture CO_2'. But instead of planting new forests they buy existing ones. They argue that these forests 'capture CO_2' and therefore compensate for CO_2 emission. Another argument they use is, that if they did not buy these forests, they would certainly be cut down. However, these claims are not correct. If at the present day forests were adequate to disconnect all of the CO_2 emission, then the concentration of CO_2 in the year 1832 would not have been 27,6% less than it is now, as discussed in the chapter 'CO_2 viewed from a different angle', page 21. Today's forests do not have the disconnecting capacity to store all of the C atoms from CO_2 emission at current levels. This way of 'selling CO_2 storage' is pure deception.

The present situation with trees and the Kyoto Protocol
At the moment, some tree-planting projects are being carried out within CDM rules. However, the required procedures for applicants are so complicated and expensive that ordinary people, growers, owners of small business units, etc., are not able to apply for it. The application has to be made by big entities, banks or financial institutions. As a consequence, most of the paid carbon rights enter the pockets of all the parties involved in the application -consultants, funds, bankers- whereas the planters are left empty-handed.

REDD
Something similar is happening with the UN-REDD Program Fund. This is a program that pays countries to stop deforestation. REDD is the world turned upside-down.

It is like rewarding a criminal for not robbing people. Entities that understand the rules, which seem to be written in such a way that almost nobody understands them, visit indigenous people. They invite them to participate in a local scheme where the REDD rules will be implemented. Banks need to pre-finance the application costs, which are so high that as compensation for taking the risks they receive a considerable part of the REDD funds. Then consultants, organizing entities, validating entities, lawyers, institutes and all kinds of other parties who see huge business opportunities, receive a substantial proportion of the proceeds. In the end the local communities usually receive next to nothing from the original REDD revenues. These dishonest methods are a consequence of the complicated and incompetent system and will lead to a situation in which people living in these areas, once they become aware of the way they are being abused, will no longer accept the outcome.

The UN-REDD Fund, as it is being developed at the moment, is clearly developed from the point of view of developed countries. A document from the World Bank, about the financials behind REDD,[83] shows the 'thinking' behind it. It demonstrates three important flaws in its approach and overlooks one advantage to people involved of deforestation. But first some background information should be given.

REDD wants to compensate the costs borne by residents who live in to-be-deforested areas that are not allowed anymore to be changed into productive areas. It also wants to compensate the costs that the country incurs by adhering to this policy. The costs are three-fold:

1. For the individual and the country there are opportunity costs. This is calculated as the difference in yield between income generated from the forests today and what it could generate if forests were transformed into 'productive' land
2. Implementation costs: these are the costs of implementing the REDD program in a country
3. Transaction costs: these are the costs incurred by the parties involved in a REDD payment. E.g. a market regulator, banks, payment system administrator, verifiers, certifiers, lawyers, etc.; all necessary parties that distribute the incoming REDD money to all the parties involved

Once you realize how many parties are involved, it is not really surprising that hardly any profit is left for the planter. These are the three flaws in the approach of the UN-REDD fund:

1. REDD uses the principle that the 'opportunity costs' (= fall in possible income) of an area are the difference between gross and net value. I quote from the report:

'Net vs gross values. It is common to only consider gross values – for example, the value of crops that could be produced on land cleared from forest. This would tend to greatly overstate opportunity costs, however, as well as giving a mistaken impression of deforestation pressures. Producing crops, or livestock, or indeed any other economic activity, involves costs – for labor, for inputs, for working capital. What matters, then, is not the gross revenue that an activity might generate, but rather its net benefit'.

This is a mistaken assumption, as it minimizes the value that the land represents to its owner, the farmer. For example, suppose a farmer works on his field and he spends 2,000 US$ to produce a crop. The crop generates 3,000 US$ per ha. and his own labor costs are 800 US$. If we follow the REDD vision, the opportunity costs per hectare are 200 US$. This is a mistaken assessment, as the 2,000 US$ create opportunities for many suppliers who also run businesses and give work to people from that money. It also cancels out the 800 US$ labor costs of the farmer, which is actually income for his family. It is not true that only the net 200 US$ are the benefit of this changed forest into productive land. The benefit is the entire gross value.

2. Following from this poor assessment REDD uses the approach that the opportunity costs are around 20 US$ (!) per hectare per year. That would mean that REDD offers to the local people an estimated income of 20 US$ per ha. Such a low price can hardly be taken seriously. Who could sustain a family from this income? I have traveled a lot all over the world, and I know from experience that the cost of living in developing countries can be extremely high. Generally speaking, the costs of consumer articles, education at universities, insurance etc, are much higher in most developing countries that I visit than in the Netherlands where I live. So how can a farmer ensure a good future for him or herself and the family, if he only receives 20 US$ per ha per year?

The REDD contract term is 30 years, so REDD offers a 30 years' guaranteed poverty to the families living in these areas. You can find this figure in points 35 and 36 of the document

3. REDD hardly pays attention to two important factors resulting from change in land use from forest to productive land. This is what we read in point 34, 'Multipliers':

'The economic impact of an activity can be wider than their returns indicate. Some activities can induce further economic activities through their effect on demand. If this impact were to be substantially different for forest to non-forest activities, then the estimate of opportunity cost should be adjusted accordingly'.

How is it possible that there 'can be wider' economic activities derived from the economic activities once the area is productive is considered an assumption? There can be no doubt about this, so why to doubt it? It is clear that any dollar spent on creating production, e.g. spent on suppliers or employees, creates an economic impact. It is also clear that the final production itself creates further economic activities. If food is produced, it can be processed to all kinds of consumer products; but we also need to transport it. People start businesses to sell the products; we need telephones, computers, offices, etc. How can this report create doubt that the productive area 'can be wider'? It is for certain that the impact is wider. Every kilo of food creates economic impact on many areas.

Finally, I would like to point out that a very important factor, maybe the most important factor of all, is being overlooked in the REDD view. It is the impact on the costs of living for people in the cities. If there is a shortage of food, the poorest people will suffer from hunger and everybody will suffer from higher food prices. The impact of taking future productive land out of production may be huge for the local population. A price of 20 US$ per ha is too low to compensate for this.

My conclusion is that REDD is meant to save forests; but through its ill-chosen, ill-conceived and complicated rules, it will develop into a new form of carbon-colonialism.[83]

An initiative like REDD should not be rejected out of hand. I really do support this. However, its main objective, to stop the destruction of the remaining virgin forests, is commendable. I only believe in a good future for this program if we ensure that:

- The implementation and transaction costs are not above 10% of the total expenditure
- At least 90% of the money will be earned by the residents in these protected areas
- We pay prices that offer those people a good future, instead of placing them in a 30-year-long poverty trap
- The entry, and implementation of the scheme is made so simple that local people can apply without needing banks, consultants and lawyers

So I ask our governments to adjust Redd in such a way that the poor people living in these areas will receive the fruits of it, instead of the consultants, the banks and the lawyers who now take the biggest part of the cake.

REDD is developed to protect already existing forest. But we know that these forests do not have sufficient capacity to disconnect the current CO_2 emission. So we need extra capacity through planting extra forests. Therefore, in addition to an improved REDD, we have to develop another program of planting extra trees at realistic and economically attractive prices that offer a future to people who plant trees, everywhere in the world. We have to create 'carbon farmers'. This is what the next chapter is about.

'From CO_2 Nature'

Therefore I plead for an implementation as described here. The solution lies in planting *extra forests in additional areas, not just in the present areas* which are already shrinking as a result of deforestation; Inspired by the University of Hohenheim I call this solution 'carbon farming'. We have to farm carbon instead of only maintaining the present areas and colonizing the people living there. The following ideas are hereby proposed:

- Require all companies (private or nationalized) that are active in oil, gas production or mining to pay a 'CO_2 emission surcharge' for every barrel of oil, every cubic meter of gas, every tonne of coal.
- This principle of collecting from the 'few' producers of fossil fuels is far cheaper than the present methods in which it is chosen to tax the millions of CO_2 emitters.
- This surcharge is deposited into the account of the 'From CO_2 Nature' Institute (read: 'From CO2 to Nature'). This could be founded by the World Bank. The World Bank has also founded the Forest Carbon Partnership Facility (FCPF) to build capacity and provide financial incentives for REDD, so they are familiar with the idea.[83] I calculate that if we were to impose an obligatory surcharge only on oil, based on assumptions of 2011, a surcharge of merely 14.87 US$ per barrel produced would suffice to establish a fund that can pay for the planting of 50 million hectares of forest each year, see the chapter 'Figures of the Treesolution', page 89, for a cost analysis.
- 'From CO_2 Nature' selects, monitors and certifies every person and entity that offer to plant and maintain trees. We call these persons or companies 'carbon farmers'. Everybody, no matter how small their plot of land is, can apply for certification to plant and maintain trees. The organizational costs of such a fund are 250 US$ per hectare and have already been factored into the cost price.
- 'From CO_2 Nature' will establish a marketplace in which carbon farmers can offer their services. Every approved carbon farmer can sign up to offer X hectares of forest for Y price to be planted, maintained and allowed to grow for at least a hundred years. If a too small number of hectares are offered, it may offer itself to planting parties up to a certain level as will be discussed in the next chapter.
- 'From CO_2 Nature' contracts carbon farmers to plant trees on the basis of invitation to tender.

- For every hectare of forest that is cut down and for which 'From CO_2 Nature' paid an amount to plant it, the carbon farmer should plant three hectares in another location or pay a commensurate amount of money to 'From CO_2 Nature' so that other people can do it.
- In the 'From CO_2 Nature' program any tree may be planted and will be accepted. In order to disconnect CO_2 molecules, it doesn't matter whether it is a profitably or an ecologically beneficial tree.
- In general, the plan proposed would be to plant profitable trees on easily accessible land, and ecologically beneficial trees on land that is difficult to access. So if the owner has for instance 'X' hectares and a part of land that is difficult to access, he still has to plant this, but with trees that are beneficial to the natural environment. However, as this program is paid by CO_2 surcharges, I support the idea that even if 100% of his land is accessible, we still require a minimum of 15% of the area to be planted with ecologically beneficial trees. A healthy biodiversity is nature's best weapon against plagues and prevents massive use of pesticides.

This solution can be set up within two to five years and is less vulnerable to fraud than other, more complicated ones. And more importantly, the money goes into the pockets of the one who deserves it, the carbon farmer.

Control

In 1993 the Forest Stewardship Council (FSC) was established. It is an organization with offices in over 46 countries that encourages responsible forest management. It sets worldwide standards and rewards compliance with the authorized use of the trademark logo. These standards are 'the 10 FSC principles for responsible forest management'. Independent auditors monitor whether forest owners comply with these principles. An ever-increasing number of nations aspire to create a system in which only FSC-certified timber wood can be processed, traded, exported and imported. It would be advisable for this independent and neutral organization to monitor the planting, maintenance and conservation methods of all carbon farmers.

Figures of the Treesolution

Trees can grow well even in less hospitable climates. As we saw in chapter 'Have we got 2 billion hectares of land available', page 77, there is enough space on earth to plant an extra 2 billion ha. Below, the costs of planting one hectare of forest can be seen. In this calculation I also include management costs and 15 years of maintenance. By including adequate expenditure on maintenance we develop a sustainable local economy in which the population has an interest in careful planting, as well as in maintenance and protection afterwards. In 15 years' time the maintenance costs will be paid from the production of the trees (e.g. fruit, extracts, medicines, oils, and perfumes), and after that an income from a selective extraction of trees is created each year .

Calculations of the CO_2 emission solution.

Cost of planting trees in US$		
Number of trees per hectare		660
Young tree	US$	0.30
Transport	US$	0.06
Planting	US$	1.20
Irrigation system	US$	0.96
Management	US$	240.00
Plant loss 1st year	US$	0.19
Costs per tree	US$	2.71
Total costs of trees per hectare	US$	2,030.00
Unforeseen	US$	240.00
Organizational costs	US$	300.00
15 years of maintenance	US$	7,200.00
Costs per hectare in US$	US$	9,770.00

In the cost price calculation, the costs of the soil are deliberately not taken into account. The reason for this can be read in the chapter 'Land reform', page 114.

The next section describes the amount of additional hectares of forest we need in order to reduce the CO_2 problem to 0%:

How many hectares of forest do we need to disconnect 15 billion tonnes of CO_2 annually?		
Extra annual CO_2 production to disconnect	Annual average disconnecting of CO_2 per hectare of forest	Total required area in hectares
15,000,000,000	7.5	2,000,000,000

The next table shows the annual costs of this investment, including 15 years of maintenance, organization and management:

Cost calculation of planting and maintenance of two billion hectares of trees in 40 years			
Number of hectares per year	Number of trees per year	Investment per Hectare	Annual investment in US$
50,000,000	33,000,000,000	US$ 9,770	US$ 488,508,000,000

The schedule also calculates the cost per barrel of crude oil. This calculation is based on the price of US$ 100 a barrel. In the calculations we use a Euro to USD conversion of 1 : 1.20, the approximate rate in June 2012. The percentage shown is a percentage of the market price in US$. During the George W. Bush administration, the price of crude oil increased by more than 400%. The 17.8% price increase of crude oil given in the calculation below to eliminate all CO_2 emission, can therefore easily be financed without economic damage. On the contrary, the Treesolution can be an instrument to help the world's economy give an annual growth of more than 5% during the coming 40 years.

What are the costs per barrel if we want to solve the CO_2 problem with the Treesolution?			
Worldwide crude oil production	Annual investment needed to eliminate the CO_2 problem in 40/yrs	Cost of this solution per barrel in US$	The % of cost of this solution compared to the market price.
32,850,000,000	US$407,100,000,000	US$ 14.87	17.8%

Of course it has been verified that there is enough space on earth. There is:

Which percentage of the earth's surface area do we need for the Treesolution?		
Surface area of land on earth	Required area in hectares	Percentage of total land area needed
14,893,910,000 ha's	2,000,000,000	13.4%

The current returns of timber per hectare of forest may also be calculated:

Financial returns of timber after 40 years based on current market value (plus fruit, medicine, etc)	
This calculation shows that the CO_2 solution can be paid for by the returns in timber.	
Value of timber per hectare after 40 years in US$	US$ 33,282.24

This next section shows how the average disconnecting figure of 7.500 kg of CO_2 per hectare is obtained:

How is the calculation of 7.5 tonnes of disconnected CO_2 per hectare made?			
Average rate of disconnecting in cold climate	Average rate of disconnecting in moderate climate	Average rate of disconnecting in tropical climate	Average global rate
3	7.5	12.5	7.5

In order to demonstrate that the Treesolution is a viable alternative, some calculations have been made. An interactive document can be found at www.thetreesolution.com which allows you to make further calculations.

The 'CO_2 emission surcharge' level

Global fossil fuel production data in 2011:

Oil extraction in 2011.[85] In November 2011 it was 90 million barrels per day

- In 365 days that is 32,850,000,000 barrels
- One barrel is 138.8 kilos (or 158.987 liters) of crude oil
- The total weight of extracted oil in 2011 was 4,559 billion tonnes

Coal mining in 2011 [86]

- The total weight of explored hard coal in 2011 was 7,036 billion tonnes
- The total weight of explored brown coal and lignite was 1 billion tonnes

Gas production in 2009 [87]

- In total all countries produced 3,177 billion m3
- One m3 of natural gas weighs 0.714 kilos
- The total weight of the explored natural gas in 2009 was 2,437 billion tonnes

Note: according to Wikipedia the quantity of produced gas has gone down a bit, so the 2011 production was probably about the same as 2009. Figures for 2011 were unavailable.

So the total weight of extracted fossil fuels in 2011 was 14,032 billion tonnes.
We can put the 'CO_2 emission surcharge' on all fossil fuels. The price will then be 488.5 billion US$ of annual planting costs / 14,032 billion tonnes = US$ 34.81 per tonne

- That is 4.83 US$ 'CO_2 emission surcharge' per barrel of oil
- That is 0.025 US$ 'CO_2 emission surcharge' per m3 of gas
- That is 34.81 US$ 'CO_2 emission surcharge' per tonne of coal

For the purpose of providing a simple explanation, I will adopt in this book the model of putting a 'CO_2 emission surcharge' only on oil and not on the other fossil fuels. We need 488.5 billion US$ per year to pay for annual costs of the Treesolution and we produce 32,850,000,000 barrels of oil.

So the amount of 'CO_2 emission surcharge' would only be US$ 14.87 per barrel of oil, which means a 17.8% price increase per barrel of crude oil. As end market prices of the refined oil product are on average 3 times higher than the raw material price, the influence of the surcharge is about a mere 6% price rise.

The influence of the Treesolution

This chapter describes the solution that the Treesolution offers to the negative results derived from the six flaws of the Kyoto Protocol, page 54.

Result one: so far, despite 192 members signing the Protocol, CO_2 emission hasn't been delayed.
Influence: the Treesolution will not accomplish a 5.4% or a 20% delay but will eliminate the problem.

Result two: even if the Protocol was effective and emission was delayed because of efficiency improvement, then it still wouldn't have any effect on the *final total quantity of CO_2 emission*. The total of emissions will remain the same; it is simply spread over a longer period.
Influence: the Treesolution will eliminate the too high concentration problem caused by CO_2 emission for 100% within 40 years.

Result three: Non-Annex-1 countries can emit unlimited quantities of CO_2 and consequently take advantage of this right.
Influence: with the Treesolution they can achieve the economic growth they want and at the same time eliminate the too high concentration of CO_2 emissions.

Result four: as a result of this previous flaw, industries are forced to migrate from Annex-1 countries with restrictions to Non-Annex-1 countries without restrictions, which in turn leads to increased transport of produced goods.
Influence: as a result of the Treesolution, there no longer is any need for industries to move, because regardless of its location the Treesolution achieves a 0% emission effect within 40 years.

Result five: as a result of the previous flaw, industries that do not move have serious cost disadvantages and will thus lose their competitive strength. This is partly why the USA, until 2006 the world's largest CO_2 emitter, has not ratified the Protocol. It is also the reason why the EU has already lost several important energy-intensive industries.

Influence: the Treesolution will ensure that industries worldwide will pay the same costs for cleaning up the emissions. This will create equal competition between industries and between countries.

Result six: as a result of industries moving, China has been generating more CO_2 emission since 2007 than the USA, because the Protocol lacks any means to reduce CO_2 emission in Non-Annex-1 countries.
Influence: the Treesolution will end this negative effect.

Result seven: the Annex-1 countries have awarded themselves with eternal CO_2 emission rights, ranging from 92% to 96%, based on their high level of emission in 1990.
Influence: the reward of the Treesolution is for both Annex-1 and non-Annex-1 type countries.

Result eight: governments have often granted eternal emission rights for free to the industries with the most powerful lobbies and the best government contacts.
Influence: the Treesolution aims to eliminate these kinds of inequalities.

Result nine: there is currently no mechanism to reduce the effect of CO_2 emission to 0%. The principle of delay as chosen for the Kyoto Protocol is costing, not generating, money. The Protocol also has no answers to the effects of the Millennium Development Goals and the Population Growth. Nor is there a solution to the CO_2 consequences of high production and transport costs. If CO_2 is not responsible for climate change, then every cent spent on the delay of CO_2 emission is wasted.
Influence: because of the Treesolution, CO_2 concentration levels will be back to normal in 40 years and the solution will generate income. The Treesolution also solves the emission problem according to the Millennium Goals and the population growth; and it compensates for CO_2 emission as a result of production and transportation of fossil fuels, and other anthropogenic emissions, emissions like forest fires. In addition, the investment retains its value if CO_2 turns out not to be the cause of climate change.

Result ten: there is an immensely powerful 'climate change lobby,' causing a biased, unscientific attitude among commissions and independent institutes, in research, in seminars and in conferences that is costing billions; whereas in proportion to the extent of the pollution problem little is invested in stopping CO_2 emission.
Influence: the Treesolution can help to end debates and start to bring the effect of CO_2 emission caused by fossil fuels down to 0%.

Criticism of the Treesolution

Critics say that planting trees is not a solution. Let's review their arguments.

Critics say: after a certain period, when the trees have grown, they are cut down and the stored C atoms will be released again to form CO_2 in the atmosphere

The critics focus on the C storage capacity of the tree in wood. But that is only a fraction of the C stored in humus, which is caused by the rotting of fallen leaves. Based on this, their argument about the trees is wrong. Suppose we plant an additional two billion hectares and 2.5% of that (50 million hectares) is cut down every year. We can counteract the decreased CO_2 disconnecting capacity by planting at least 50 million additional hectares. The deforestation is balanced by the new plantings. The C atoms that are stored in the remaining 97.5% of two billion hectares of forest are safe and if CO_2 does have an influence, cannot disrupt the climate anymore. With all the timber that doesn't rot or isn't used for producing energy, we create an even larger storage capacity of C atoms. Let's assume that 50% of this timber is processed in a way in which the C atoms are released within a year (combustion, paper) and the other 50% in a way in which the C atoms are not released at all (construction, furniture). The total storage capacity of C atoms in wood for an area of 2 billion hectares will then go up by 1 billion hectares to a total of 3 billion.

As long as we make sure that the total storage of C atoms manifested (form) in wood is greater than the storage of C atoms in the manifestation of combusted fossil fuels, our problem is eased. If we disconnect CO_2 molecules with the Treesolution, we are actually discovering a perpetual motion concept for making money: first the fuels make money, then the items we produce with the energy generate money, and finally products from the trees provide us money. Instead of convincing ourselves that we have a problem and paying a lot of taxes, we work on the solution and by doing so create an opportunity to make money.

Critics say: after 100 years forests hardly grow so the CO_2 absorbing capacity stops

The main part of the C ends up in the soil through falling leaves. After 100 years growth the additional wood production slows, but the leaves keep on falling and the C atoms in them will be stored as humus. So the CO_2 disconnecting capacity is even at its highest level after 100 years, as the trees are at their maximum proportion and have the highest leave surface ever. Forests continuously disconnect on average 7.5 tonnes of CO_2 per hectare each year in a never ending process. There is no other invention that is able to do this while making instead of costing money.

Critics say: decomposition causes CO_2 emission

Another criticism is that when trees and leaves start to rot, the CO_2 is released again. This is also true but still not a sufficiently persuasive argument against the Treesolution. If one hectare of forest disconnects 10 tonnes of CO_2 and subsequently stores the C atoms in its growing process then the decay of leaves and fruit starts to reconnect 2.5 tonnes of C with O_2 during that same year, which means that there is still a net clean up effect of 7.5 tonnes.

Critics say: maintenance requires monitoring

Some critics say that the planting of trees may be simple but it does not guarantee sustainability or maintenance of the forests. This is valid criticism that we should not dismiss. Suppose a carbon farmer plants a hectare, cuts it down within three years, and replaces the forest with a factory? This may well happen. However, we don't need to blow this problem out of proportion. Societies have thousands of rules and laws and some people always try to break them. The possibility of someone breaking the law has never prevented us from making laws to start a development. When trees are legally cut down, we can arrange for replanting. It would make sense to increase the size of the area, in proportion to the age of the forest that is cut down. For instance, if a forest ranging from 1-10 years old is cut, twice that area should be replanted, and if 11-20 years old three times the area would be replanted, and so forth. When forests are cut down illegally or are not maintained in accordance with the contracts, then we impose fines and impede participation.

Monitoring by satellite is very simple nowadays. We must certify and monitor the people, entities or nations that are responsible for these tasks. See also the remarks on expanding the FSC system in the chapter 'The organization of the Treesolution', page 82.

Critics say: there is not enough space on earth

This argument consists of two parts: 1) There is not enough space because we need it for food and biofuels; and 2) there is simply not enough land on Earth. Let's first go through their first argument.

Both causes: 1) population growth = more food = more space to grow it, and 2) biofuels = more space to grow, will ensure that we will be using all the places where it is possible to grow crops without irrigation. Irrigation increases the production costs of food and biofuels, so we will be looking for places on earth where you can sow in periods of rainfall so the seed will germinate without irrigation. This means that the increasing demand for food and biofuels requires us to use all the space with a mild climate, which is where forests currently grow. We see this phenomenon -deforestation in areas with a mild climate- all the time in places like Indonesia and the Amazon. This equates to 15 million hectares per year.

If the unethical policy on biofuels remains unchanged, most of the forests that grow on earth in mild climates will be cut down in the short term, within 100 years. With or without a CO_2 problem, these forests will vanish because global food production must increase in the long term due to population growth. This is to say, between 100 and 200 years, every relatively flat and therefore mechanically treatable (with tractors) surface on Earth with a mild climate and sufficient rainfall will be used in the future for one of these two purposes. If a great part of the 2 billion hectares of extra trees that we plant will be fruit trees, then the need to cut present forests in mild climate areas to produce food, will be less or even fade away. So the Treesolution will also help decrease cutting of present virgin forests.

Because mankind will need timber, we will be forced to plant trees in places where the climate is less mild but still good enough to facilitate

Here we come to the second argument of critics against the Treesolution: there is not enough space on earth. The calculations show that this is not true. In fact, we need only a limited part of the earth's land surface -about 13%- in order to lower the extremely high concentration of CO_2 back to normal levels. This is demonstrated in the chapter 'Have we got 2 billion hectares of land available?', page 77.

Critics say: the remark about the effect of 5.4% delay in the Kyoto Protocol being only 0.324% of the global total is incorrect
To illustrate this, they use the metaphor of inflating a tire. Suppose you can pump it up 99 times without causing the tire to explode. Only the 100th time it will explode. This means that you can prevent an explosion by not pumping a 100th time. Therefore, the critics say, the last 0.324% does have a positive effect.

This comparison is incorrect. The metaphor assumes that after the first 99 times you can cease to pump and that it will prevent the explosion. But CO_2 emission is entirely different. As long as the earth's CO_2 disconnecting capacity is smaller than the CO_2 emission, the concentration in the air will continue to increase. In other words, if we delay emission by 0.324% but still continue to produce 99.676%, and if the earth's ecosystem is unable to disconnect the whole 99.676%, the atmosphere's CO_2 concentration will inevitably keep rising.

Let's make a comparison with water again. A bucket can contain 1,000 drops of water. One drop of water falls every second and after 1,000 seconds the bucket overflows. Now we limit the speed of the drops by 5.4% of 6% of the drops. This means that in the same timeframe, 1,000 seconds, 0.324% fewer drops (996.76) fall into the bucket. This only means that the bucket will overflow after 1003,24 seconds, not after 1000. That is how CO_2 concentrations build up.

Critics say: do not underestimate the role of carbon fixation in the world's oceans

Oceans fix C atoms (carbon) through algae. When these micro organisms die, they sink to the bottom of the ocean where they calcify. It is true and there are countless other ways in which nature disconnects CO_2 into C and O atoms. Nature produces 94% of all CO_2, so most of produced CO_2 is disconnected daily. However, we cannot influence this phenomenon. There is a certain surface area of oceans and we cannot make this bigger. So the disconnecting capacity is indeed working, but we cannot increase it in order to disconnect the increasing quantity of CO_2 atoms caused by using fossil fuels. With trees we can.

Those who calculate, plant trees

During the 2008-2009 financial crisis, the terms 'costs' and 'investments' were often confused. Before we discuss costs and/or investments concerning the planting of trees we should first ensure a firm understanding of these concepts.

An investment is an expense with the purpose and intention of making money. Suppose you invest 1,000 US$ in a machine that bakes bread. This expense allows you to sell 2000 US$ as annual worth of bread and therefore it makes money. Because of maintenance costs you have to get rid of the machine after four years. Suppose its final value is still 200 US$. Then the total costs were 1,000 minus 200 = 800 US$. This is depreciation. The financial result in four years is as follows:

The investment	1,000
The rest value	200
The interest in 4 year x (5% x half of the investment)	100
The annual depreciation costs	800 /(4 x 200)
The total costs of the machine	900

The sales are 4 x 2,000 = 8,000 US$. The gross profit with which we are able to pay all other costs like wages, energy, housing and from which we recuperate the net profit, is 7,100 US$. This is how you make money.

When a government spends money but this money does not generate revenue, then that money is not an investment. The sums spent are costs. In the course of time all that money will be spent so that same government can only afford new expenses when it levies higher taxes or borrows money.

The same principle applies to CO_2 solutions. If we pump the CO_2 underground we don't just deprive ourselves of the oxygen but we also have enormous annual costs. If a government says that we have to *invest* in *carbon* storage, it uses two misleading expressions.

It should say: we must incur *costs* in order to store *carbon and oxygen.* These costs don't generate any return. In contrast, if the machines have worn out after 20 years we have to incur further costs to buy new machinery. This solution will only make us poorer because money lost on costs cannot be invested. Trees on the contrary create a return in the form of products. So Carbon Capture and Storage is a cost that is poverty-enhancing. Planting trees to solve the CO_2 problem is not a cost; it's an investment. It's prosperity-enhancing.

Besides these benefits, planting trees is a matter of long term thought and calculation. The question each of us must ask is: *'where will we get our timber in 40 years when the deforestation of the Amazon Basin and Indonesia is complete?'* In order to be able to cut down trees *then*, we need to plant them *now*. Trees take 40 years to grow and in many places that timeframe is even longer. In 'Figures of the Treesolution', page 89, you can read that the current revenue from timber is already over 33,000 US$ per hectare. Tropical hardwood is about twice as valuable as shown in the calculations of the examples mentioned.

One important factor is the decision when certain trees are cut down. The best way is selective harvesting. This allows a forest to produce timber indefinitely. Selective harvesting allows 100 to 200m^3 of timber to be cut per hectare from a forest over the duration of 100 years without causing permanent damage. If a forest is FSC approved -which we hope will become mandatory within 25 years with all our remaining forests- then 10% of it will always be left untouched in order to prevent genetic degradation. This practice enhances biodiversity, prevents ecological impoverishment, creates a safe breeding ground for a number of animal species and allows forests to function as a gene bank in the future.

Price increase

It is highly likely that the price of timber will increase considerably once it becomes scarce. The same thing has happened to the price of crude oil in the last ten years, despite all the crises. It is expected that the price of

unprocessed timber, depending on what you can do with it, will rise to more than 1 US$ per kilo. This is based on the fact that building materials such as iron and polymers already cost much more than 1 US$ per kilo.[88,89] Since both building materials will become scarce because of population growth, these prices will climb considerably. This will cause the demand for timber as an alternative building material to increase and this will have positive effects on the prices.[90]

Timber could be the new financial standard

Governments worldwide are looking for solutions to their collapsed financial systems. The gold standard was abolished in March of 1973. Since 2008 the financial world goes from crisis to crisis, so it would be advisable to develop a system in which credit risks should always be secured by collateral. This could prevent nations from printing endless sums of money, and causing the next financial bubble, as we saw happening in 2012 in Europe. Such a system could also prevent tens of millions of people from losing their jobs. The solution for this security is closer at hand than governments think: timber could replace gold as the basis for a financial system. If a hectare of forest returns approximately 30,000 kilos of timber and the future value is around 1 US$ per kilo then the collateral value of two billion hectares of forest is 60,000,000,000,000 = 60 trillion US$. This amount should be enough to ensure that the financial system can never collapse again as it has been doing in recent years. In order to fund the worldwide financial system with a firm and reliable collateral, governments could choose to oblige banks to plant 1.5 hectare of trees for each million lent and keep it as collateral.

Trees need time

If we plant trees today, we can start to cut them down when the world's population has increased by 50%. This means that, if we don't start planting today, not only will there be less timber available because we have 'run out' of forests, but also the demand for trees will be 50% higher because there will be more people by then. It will take 40 years -the growing period- to solve this scarcity. We can estimate that it will take even longer

because in order to sustain the increased world population, all fertile land will be used for the production of food. Trees will be banned to places where they grow less well = less fast. Whoever is willing to consider the long term opportunities and hasn't been convinced by the advantages of the Treesolution to eliminate the CO_2 emission, may nonetheless be convinced by the argument of profit. Every person, entity or country that plants trees *now,* will have great economic benefits *later.*

Those who calculate and think ahead, plant trees today.

The cynics are wrong

Cynics would say: *'the world is not willing to cooperate so this will never work.'*

We can be more optimistic than the point of view expressed above, because the world can secure its future with this simple wealth-creating solution. The Kyoto Protocol has shown us that more countries than ever agree with this goal. There are people who say that if the world really wanted to, it could end hunger, poverty and war, and since it hasn't, we will never solve the CO_2 problem. It is true that these three problems haven't been solved but that fact only means that the will or the plan is or was not strong or good enough. An important reason for this lack of will is the sheer disparity between countries: they have dissimilar climates, resources, systems, people, ideas etc. This situation makes it difficult for countries to agree on solutions. However, there is no country that benefits from a change in climate, that might destroy its living environment, so there is a common objective here.

In 1970 the Dutchman Crutzen published his suspicions about the destruction of ozone by NO (Nitric Oxide). In 1974 Molina and Rownland published their hypothesis that chlorine originating from CFC (chlorofluorocarbon), just like NO, could destroy ozone. These publications led to controversial debates. As early as 1989 this research led to the first climate treaty the "Protocol of Montreal" in which all countries decided to prohibit CFCs. In 1995 the three scientists received the Nobel Prize for Chemistry. If we are able to work together on a global scale and prohibit emission of something really harmful (CFCs) within 20 years, mankind can create a strong worldwide system to clean too high CO_2 emission too. This means we can be very optimistic about the implementation of the Treesolution and I appeal to you to be positive too.

‘The damage of the ozone layer’ – Gonzalo Baraja - Ecuador

Let's not create new slavery

In March 2008 Dutch television broadcast a documentary on the inhumane treatment of citizens of a developing country. A Dutch foundation had made a deal with the local government in 1990 to plant three million trees there. In order to honor the contract, the government evicted 4,000 people from the region where they had lived since the year 1400. Many of these people -who obviously did not want to leave- were beaten, some were killed and because they had been driven from their fields, their children starved to death. When confronted with this information the Dutch foundation coolly responded: *'it is not our responsibility how our partner chooses to fulfill their contractual obligations.'* The local population displayed intense anger against the Dutch. One of them said: *'suppose I come to the Netherlands and claim some land for the CO_2 emission that I caused in my country, would you accept that? Why don't you build fewer factories and plant trees in your own country?'*

This man certainly has a point. We should therefore listen closely to his comments and not repeat the mistakes made by this foundation. However, the television program used the suffering of these people in support of its own editorial policy and argued that this is why planting trees is not a solution to CO_2 emission. I think that nobody should reject a good solution because of one single bad experience.

The program interested a few 'experts' who attacked the foundation's tree policy. They used three arguments:

- 'There is not enough space'. The chapter 'Figures of the Treesolution', page 89, demonstrates that this argument is incorrect
- 'Trees can be cut down or leaves can rot. When that happens the CO_2 is released again.' This has also been addressed in the chapter 'Criticism of the Treesolution', page 98, where I showed that a CO_2 disconnecting net remains, due to rotting of the leaves
- 'We should be looking for better solutions than this one because the Treesolution provides an excuse to stop research into better technologies'

This last argument unwittingly supports the view that trees are indeed the solution, but experts use it to imply that the Treesolution gets in the way of the search for other solutions.

Are they right?
We should listen to all sides, so let's examine the last argument.
Is it wrong to exclude the only answer to CO_2 emission we have, because it can be applied inappropriately and because it is so good that it discourages continued research? We haven't stopped using anti-biotics because they are sometimes prescribed incorrectly. On the contrary, we try to improve them all the time and we accept the risk of accidents because the benefits outweigh the drawbacks. If the benefits of the Treesolution outweigh its drawbacks we should not dismiss this solution. If we were to take the advice of these experts and invest billions in further research and/or untested solutions that are currently not available, and eventually we learned that CO_2 is not the cause of climate change (if that is really taking place at all); then the risks associated with these other solutions, and impoverishing effects of these uncertain solutions might even be more hazardous than the risk of the CO_2 problem.

So do we want risk and impoverishing through uncertain solutions, or wealth creation through trees?

***Our* problem is *their* opportunity**

As stated earlier, instead of driving people from their land, we should use the tree to allow people to earn money and acquire a higher standard of living. With the Treesolution we can pay millions of carbon farmers for planting and maintaining trees. This will allow people living in and around wasteland areas to earn a living. First they will make that living from our CO_2 eliminating payments and later, when the trees have grown, from the locally produced products such as fruit, medicine, timber, rubber, charcoal, tourism, etc. In such a scenario people who plant trees and get paid to do this will appreciate us rather than hating us. The income is high enough to allow the work to be carried out satisfactorily, and in order for them to be able to acquire a secure existence: in the Treesolution proposal of this book it is 2,030 US$ per hectare to plant and 480 US$ per hectare annually for a period of 15 years to allow for maintenance.

Because of this income, every carbon farmer involved will no longer view CO_2 emission as *our* problem but as *his* opportunity. Let us fight for that opportunity and develop a tree-economy that solves other global problems that have been caused by urbanization (since 2007 for the first time more than 50% of the world's population are living in cities) such as:

- Food shortage
- Poverty (lack of employment)
- Crime (living on the street in crowded slums)
- Pollution (lack of sanitation, lack of clean water)
- Disease (lack of proper housing, lots of people living close to one another).
- Emigration-immigration (a life in transit camps with as a result the desire to leave for wealthier nations. We all know the scenes at the gates, the sunken boats, the people smuggling problems, the trade in women, etcetera)

For all these problems, the tree is the way to a better life and a symbol of hope.

Support the Treesolution plan

Johan Cruyff, Holland's most famous soccer player once said: '*every disadvantage has its advantage.'* This expression has been confirmed many times and that is why it is used quite often in my country. It certainly applies to CO_2 (the disadvantage) and the Treesolution (the advantage).

Let's look at the economic and social effects of this solution. Currently, billions of people are living in poverty. This is why the UN created the Millennium Goals in the year 2000. Poverty creates immense, virtually insoluble problems in both poor and wealthy countries:

- Migration from the countryside to the cities
- Absence of safe and affordable housing in cities
- Crime thrives and gangs rule the streets in many slums
- In these overcrowded cities, few jobs pay a decent wage
- Over two billion people have no access to clean drinking water and normal sanitation

There is little or no education for children.

- This results in broken families with dire consequences for children
- Fathers and mothers leave their families to make money elsewhere, in their own country or abroad
- Emigrated relatives send money to those left behind. This leads to high inflation in the country of origin which, in turn, leads to new emigration impulses. Those without relatives abroad who send them money simply cannot afford food, goods or housing and have no other choice than to leave the country or live in even worse circumstances

Escaping poverty

- People try to emigrate, legally or illegally
- Illegal immigrants take over jobs from legal residents. They are heavily underpaid and often organized by mafia circles
- This leads to tension, friction and discrimination, resulting in thousands of kilometers of fences (for example: Morocco, Spain, Mexico, US, Israel, Egypt and basically every district worldwide where people with high incomes live)
- People from poorer countries are confronted with strict border controls and/or visa obligations

Unwanted side effects

- Poverty leads to cultivation of illegal products in many countries (for example: Colombia, Afghanistan, etc.). The money made from this is often used for illegal, criminal or even terrorist activities
- Many countries suffer from the brain drain syndrome, the 'emigration of the smartest'
- All these problems created by increasing poverty put the world off balance, which provides an extra impulse for terrorism

The Treesolution can provide a partial solution to many of these problems, if we create a fund of nearly 500 billion US$ annually -as you read in chapter 'CO_2 emission surcharge level' on page 93- and use it to plant 50 million hectares of forest. People will turn back from the overcrowded, unhealthy and unsafe cities to the countryside and start to be carbon farmers. They will find work, income, a balanced family life, clean air and sanitary living conditions there. Local industries based on trees will create an immeasurable quantity of work because of production of fruit, timber, paper, rubber, medicine and derivative products.

Land reform

When calculating the cost price of the Treesolution, the cost of acquiring land hasn't been taken into account. This has not been done for the following reasons:

- If land is expensive, it can and will be used for intensive food production. Trees cannot yet create returns that can compete with annual returns of potatoes, soy or corn
- If land is cheap, or even free, this is because it is difficult or impossible to grow annual crops on a profitable production. The Treesolution can turn this seemingly worthless wasteland into valuable land because it will generate large profits in the long run. You can find this calculation in chapter 'Those who calculate, plant trees', page 103

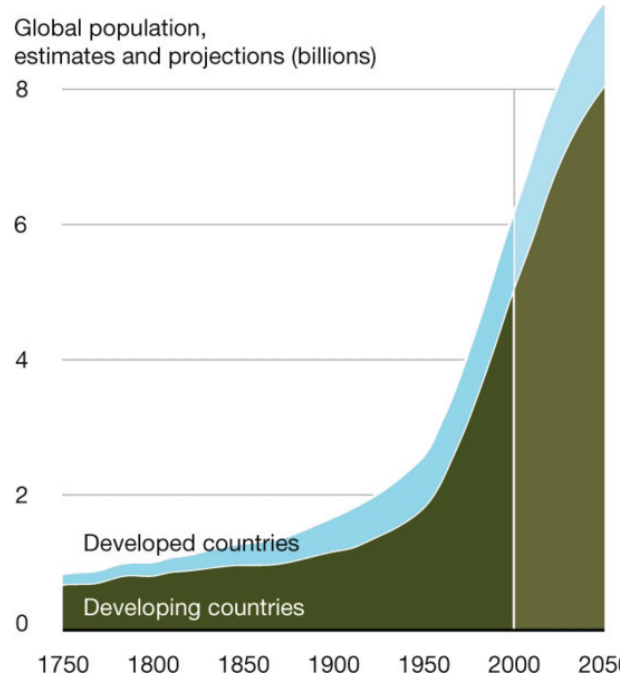
One can assume that the cost of wasteland, which can't be used to grow crops, is very low. The increase in value of the soil due to the planting of trees (and the soil thus becoming fertile) creates wealth. This growth in value – which isn't mentioned in any calculation in this book - is untaxed in almost every fiscal system. In this way trees also present a considerable source of capital growth for humanity, and especially for the owner of the worthless land. The tree can thus create collateral and allow the landowner to borrow money and invest this in his company. This is why I proposed earlier to use trees as collateral for our financial systems.

The Treesolution can create wealth while in the same time solving the problem of the too high concentration of CO_2.

The food challenge

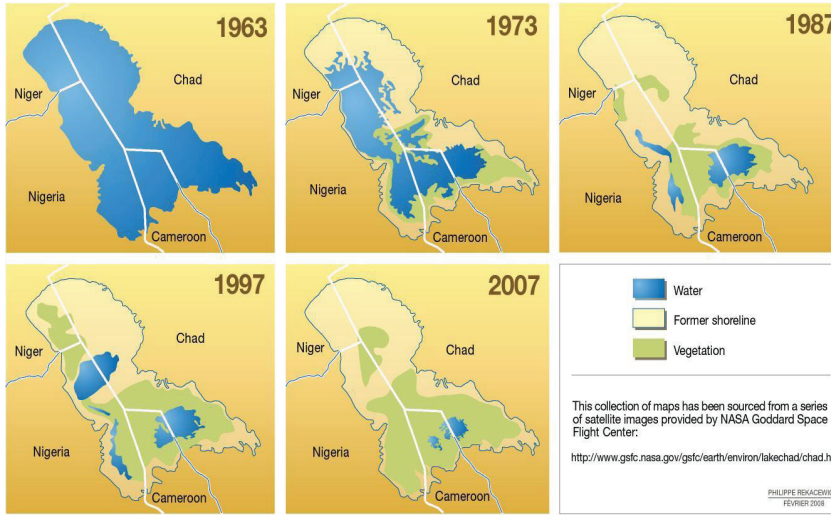
During the last 12 years the world population has grown 1 billion people. That is over 200,000 people per day. In the last century the world population grew fourfold. It is estimated that in 2050 there will be about 9 to 10 billion people. All these people need houses and food. As humans always built their cities on the most fertile soils - this policy shows how far away mankind has gone from logic thinking about food production – we are daily losing huge areas of fertile soil while the world's population keeps on accelerating. So we create by purpose less area to produce food while every day over 200,000 more people who need food are born.

This graphic shows the world population growth to almost 10 billion people in 2050. If this continues we will be with approximately 16 billion people by the end of this century. [91]



Courtesy UNEP/GRID-Arendal [91]

The same is happening with our fresh groundwater resources. Countries like Jordan, Israel, Qatar and Kuwait are already out of fresh groundwater. Many countries, like for example Ecuador, the USA or Oman, already have big areas with unusable salted groundwater. An interesting example is the development of Lake Chad. One of the main causes of the drying up as mentioned on the UNEP/GRID page is deforestation.



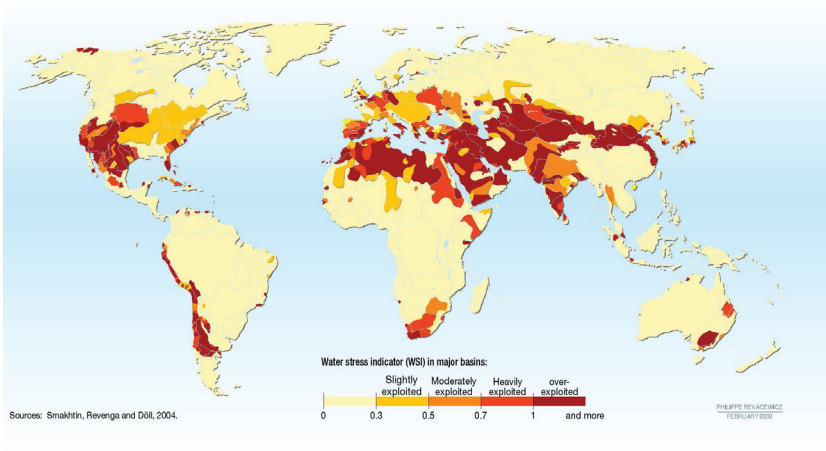
Courtesy: UNEP-GRID - Maps sourced from a series of satellite images provided by NASA Goddard Space Flight Center [92]

Does this mean that we have an unsolvable problem?
It is unsolvable if we keep on thinking within the present food production models like almost all agricultural universities do. The present way of food production is based on the use of fertile soil, using fertilizers on it and with a lot of water. The introduction of genetically modified crops is even making the situation worse. Their size is larger and their weight is higher, so they evaporate more and need more water to grow, but their concentration of solids is lower. It means that we produce more kilos of food using more water, fertilizers and pesticides that have a lower food value per kilo. It also results in more transport with less food value.

Nowadays breeders breed into the direction of bigger plants, thinking they produce more food. However, these plants need more space, more water and more fertilizers while growing. Breeders should breed to smaller plants who evaporate less with a concentration of solids that is 50% higher instead of 25% lower. This way we need 50% less land, less water, less fertilizers, less pesticides, and less transport to have the same quantity of food.

The necessary water mostly falls in the form of rain or it is given through irrigation. Almost all fertile soil on earth is now in use for food production, except the Amazon basin, Congo, Indonesia and Borneo. If we cut all trees there, we can still expand our area of fertile soil. But the effect that this will have on our climate may be enormous. Do we want to take this risk? The water resources for irrigation are already under high pressure. In many river basins, where agriculture is based on the use of irrigation, there is a shortage of water. It is estimated that already over 1.4 billion people are suffering from this problem. This means that their areas have reached the minimum recharge levels. In many countries, for instance Yemen and Syria, water tables have dropped with an average speed of 4 meter per year during the last 10 years. Imagine how deep the water is in 100 years from now.

This graphic helps you to understand where the biggest problems are. As you can see there are not many areas without problems. Almost everywhere where high concentrations of people live, and where a high production of food is urgent, the water resources are being depleted.[93,94]



Courtesy: UNEP-GRID[93]

Food production has to grow with over 100%.
When the world population grows from 7 billion in 2012 until approximately 16 billion by the end of this century, it means that our food production has to rise with more than 100%.

Fruits of trees and shrubs constitute a considerable part of our food. It is impossible to imagine cooking without olives and olive oil. Not counting the enormous arsenal of fruit, they also produce coffee, cacao, coconut and a prodigious quantity of varieties of nuts which are incorporated and used in all kinds of dishes. The factor 'tree' has become an essential part of the modern food industry, and food producing trees are often among the fastest growers. The entire area of currently worthless eroded manmade deserts is 2 billion hectares, as shown in the chapter ‘Have we got 2 billion hectares of land available’, page 77. You now understand that this area is not suitable for sowing seed crops like wheat, corn or vegetables that need high quantities of water. Water that is scarce there. However, trees have no problem growing there. Once all these manmade deserts were covered with trees. What's more: when we replant these areas, there will be more rain again and a better, less arid, climate.

This means that we can solve the CO_2 emission problem for 100% and the erosion problem for 100% with a money making business model based on trees producing food. Here are the numbers:

- 1 hectare of fruit trees is able to produce approximately 5,000 kilos of fruit
- 2.000.000.000 hectares of fruit trees x 5,000 kilos = 10.000.000.000.000 kilos of fruit
- Herewith we can easily feed the 10.000.000.000 people in 2050.
- It is 1.000 kilos of fruit per person per year
- 20 Kilos of fruit per person per week

Hunger does not have to be a problem.

Benefits of the Treesolution

I have almost come to the end of this book and hereby I summarize the benefits of the Treesolution in this list.

It works
Trees disconnect the C atom from the O atoms and reconnect them into other materials or forms like humus, wood, fruit, medicine, rubber, pharmaceutical and a number of other valuable products.

It is inexpensive
We can solve the CO_2 problem within 40 years for less than 14.87 US$ per barrel of oil, using a solution that creates wealth instead of poverty. To the end market price of refined oil it will have a mere 6% influence only.

The investment retains its value, even if we have no more fuels because they are depleted
Every investment requires a period in which an investor can earn it back. Imagine that in around 2050 the fuels that cause CO_2 emission are nearing their depletion. Who in their right mind is going to spend the last 25 years leading up to 2050, investing in highly expensive CO_2 purification or storage techniques? Who is going to pay for the solutions when we are not certain how long we will need these expensive solutions that might or might not prove to be useful? The taxpayer.

We create a better climate
Trees do not only disconnect CO_2, they have many other benefits for the climate.

We create space for biodiversity
If we plant two billion hectares of forest in 40 years and neutralize the 15 millions of hectares that are being cut down each year, we provide habitats for ecosystems. Scientists warn us that nowadays every hour between two and five species become extinct. We can delay and perhaps even prevent this from happening with the Treesolution.

Economic growth will not suffer from this strategic solution
Every technical solution for the CO_2 problem costs money. Trees not only disconnect CO_2 but they also produce economically valuable products. The Treesolution does not put an upper limit on economic growth.

It is a politically attainable solution because all countries can support this neutral solution
There is no argument against planting trees, so this could mean an acceptable solution for all parties.

It is a durable solution in which there is no chance of losing the invested capital
This solution is in harmony with nature. It doesn't matter whether or not climate change is caused by CO_2 emission, deforestation or some other reason. In all cases trees are both natural and profitable, and the carbon farmer ends up with a real, tangible asset that generates positive returns.

It will stimulate the economic development of poorer countries that suffer from erosion, desertification and food shortages
People who are content do not move to cities and fewer crimes are committed when living in small communities with group cohesiveness. Trees can create these economically sound circumstances and therefore also replace fences and prisons. In fact, the global planting of trees is one of the best answers to poverty.

Trees create shade
Trees that are planted to disconnect CO_2 can do more: they create a micro-climate below them, where one can produce food. Moreover, by preventing erosion they create more land that is suitable to grow food crops on. In most hot countries people grow food in the shade of trees.

Trees create value

Trees create their own added value: land that can make money becomes more valuable and can therefore serve as collateral for loans. Trees can give carbon farmers access to the capital market and encourage them to invest in their companies. They can recapitalize worthless land to valuable land. Therefore they make microcredit and, on the long term, macro credit possible because the soil they grow on can serve as collateral.

We need more timber but at the same time want to protect the last virgin forests on earth

Trees that are planted to disconnect CO_2 also produce wood. This way we don't have to cut down the last remaining virgin forests in Brazil and Indonesia and destroy what is left of their wildlife.

Trees cool the earth and its atmosphere

Everyone knows that on a hot summer it is still nice and cool in a forest. This is because trees take heat -energy- from the air and use it for photosynthesis. This reduces the air temperature. At night trees radiate heat back into space via infrared waves. This causes water vapor from the air to condense on the leaves which allows the tree to grow better, even in a dry climate. This phenomenon is called 'damping by branching'.

There will be less erosion and less desertification

Trees are the only solution for these problems.

The future target of a next Climate Protocol, to reduce CO_2 emission for 20%, will be accomplished faster with the Treesolution

By placing a price on reducing the effect of CO_2 emissions to 0% by means of the Treesolution, everyone will calculate the costs of this process. If investing in greater efficiency is less expensive than planting trees, people will choose the most profitable.

The investment will make money even if CO_2 turns out not to cause climate change

Suppose eventually it turns out that climate change is not really happening or, if it is, that CO_2 is not responsible for it. Then trees will have already brought us many benefits and will continue to bring many more. Other technical solutions and investments (e.g. in Carbon Capture and Storage) may turn out to be a waste of money if we discover that CO_2 is not the cause.

Energy

Once we have the technology, we can use trees as a source of energy. In that case they become CO_2 recyclers because for 40 years they were disconnecting CO_2. When wood is burnt the C is connected again with the O_2, but as we start planting trees again, the cycle continues.

Expansion

The amount of trees we plant is flexible. If the population grows by 50% in the 21st century, the area of trees that is planted annually can expand at the same rate. Therefore, it is a flexible solution.

Health

Trees produce oxygen, can be a source of medicines and can produce fruits and other sources of vitamins.

Safety

Suppose we store CO_2 deep below the surface of the earth and the unimaginable happens: the CO_2 escapes, for example, after an earthquake. We will then have to deal with a catastrophe. We have not disconnected the CO_2 and it will pollute the atmosphere. The money spent putting the CO_2 underground has been lost. Any solution that does not disconnect CO_2 molecules for 100% does not offer 100% safety. In fact, we are storing the problem instead of storing C atoms in other manifestations. Trees disconnect the C atom from the O atoms and are therefore a 100% safe solution.

Collateral

Trees can serve as collateral for credits and loans of the millions of small carbon farmers.

Time and urgency

We can continue to spend billions on research and debates to find out whether or not climate change exists and whether it will take 1, 21 or 101 years to become a problem for mankind. Eventually no-one will provide the answers in time, although they are needed right now. This is because only a long measuring period of a few hundred years can supply conclusive and scientifically sound data. If CO_2 really is causing climate change, then all of the extra years spent on research and talking are wasted. If we scale down the problem to what it actually is -overproduction of CO_2 causing too high concentrations- then we can stop all research, debate, conferences and bureaucracy and start solving the problem. This discussion about the 'how' of the solution can again take years and cost billions. If we continue as we have over the past decade, in 50 years we will still only be talking. Why not stop discussing altogether and start acting? We know that CO_2 concentrations in the air are higher than they were 200 years ago so we do not question the fact that there is an over-concentration. We also know that trees disconnect CO_2 and transform it into useful materials which generate money. We have a visible and verifiable problem and an affordable Treesolution that can be implemented tomorrow.

Conclusions:

- Citizens know the surcharge on oil is spent on the solution
- We no longer invest money in talking about the problem
- Nobody has a competitive disadvantage
- Economies are stimulated worldwide
- Everybody participates and benefits
- It is politically feasible
- It is inexpensive
- It is neutral
- It works

Disadvantages: none.

Final words to the reader

Thank you for reading this book. I hope its content will serve you well. I have tried to shed some light on the side of the story of too high CO_2 emission which to my opinion has been neglected, and to describe a wealth creating solution to this problem that we can apply with effect from tomorrow. During the coming years I will continue to work hard to cause the realization of the reforestation of the world through giving planting opportunities to millions of carbon farmers who at present cannot plant because of water scarcity. Currently I am involved in an ever-increasing number of tree planting projects in already over 20 countries and this development will continue to grow. If you think the proposed Treesolution is a good idea then I ask you to support it actively in your own work and living environment. And if you like it, then be part of our community on www.facebook.com/thegreenmusketeer or follow the progress of my mission to cause the reforestation of the world on www.groasis.com .

You have now learned how to create wealth from CO_2.

January 2014
Pieter Hoff

Summary

Introduction
Opening of the book.

The fifth edition
The author explains that 'climate change believers' are as stubborn as 'climate change skeptics' and that therefore we cannot expect any solution from climate change negotiations.

Inspiration
The author explains how he became interested in the CO_2 problem.

The fascinating CO_2 problem
The CO_2 problem appears -after an in depth study- to present unexpected opportunities.

The CO_2 concept
The concept of CO_2 is often used to refer to Greenhouse Gases (GHG) in general, like nitrous oxides, soot and dust particles instead of just carbon dioxide.

Production losses and CO_2
Fossil fuels (e.g. oil, gas and coal) all emit CO_2, but the differences in emission as a result of different production losses per fuel may not be as big as we think.

CO_2 prejudices
We have to try to change the financial dependence of CO_2 experts from researching to solving.

The debate on climate change
The climate has always been subject to changes, even before fossil fuels were used.

Conceptual perception
Due to wrong assumptions, upbringing and education we describe hot or cold temperatures and large or small temperature variations incorrectly. This obstructs development of the right solutions to the problems we are facing.

CO_2 viewed from a different angle
Only a higher concentration of CO_2 compared to the average original CO_2 concentration before the industrial revolution is pollution.

Comparing air to water
We have to treat air the same as we treat water: pay for its use and clean it up for 100% after use.

The Kyoto Protocol
The Kyoto Protocol has divided the world into two groups of countries: those who have committed themselves to reduce CO_2 emissions and in return received eternal limited emission rights and those who have received eternal unlimited emission rights.

Reduction is delay
The Kyoto Protocol neither reduces, nor decreases, nor lowers but only delays the moment when the final total quantity of CO_2 emission has entered our atmosphere.

Delay is not wrong, but it is no solution either
Delay as a process to limit the annual emission is not wrong, but as a solution to -potential- climate change it is inadequate.

The relocation of CO_2 emission
Relocating delayed CO_2 emission to other countries is not a solution.

CO_2 is no pollution
Just like oxygen, CO_2 is useful.

Humanity emits 6% of CO_2

The target of a 5.4% delay in emission as described in the Kyoto Protocol only has an effect of 5.4% of 6% = 0.324% on the total annual emission of CO_2. Such a small limitation has no effect on the climate whatsoever, should CO_2 really be the cause of climate change?.

The split position of the United Nations

The United Nations put two kinds of CO_2 policy in effect: a stimulating policy (the Millennium Goals) and a restraining policy (the Kyoto Protocol).

Choosing between useless and useful investments

CO_2 emission policies cost billions and have little effect now or later as calculations show. These billions should be spent useful rather than useless.

Clean energy

Every government should only invest in an energy production solution that is available 24 hours a day or in energy storage, effectively making intermittent sources available 24 hours a day.

Wealth through a head start

By investing in other forms of energy production now, we can be independent of unreliable suppliers in the future and we create new sources of prosperity.

Why the USA refuses to ratify the Kyoto Protocol

The USA does not participate in the Kyoto Protocol because of its flaws. This is an important reason to improve the Protocol, not to abolish it.

What needs to be improved in the Kyoto Protocol

The flaws of the Kyoto Protocol are the cause that it does not have any effect. They need to be solved during the future Climate Conferences. If they are not recognized and removed from the Protocol, there will never be a new effective Protocol.

The peculiarities of the Annex-1 nations list of the Kyoto Protocol
Emission agreements for the Annex-1 nations are illogical and indicate that other considerations than CO_2 emission have led to the agreed quantities.

The 'forgotten' population growth
In the Kyoto Protocol, population growth has not been taken into account. As a consequence of this deliberately forgotten item, differences in limitations caused by differences in population growth have not been taken into account.

Six failed Climate Conferences
The objective of the future Climate Conferences should be a 100% cleaning of CO_2 emissions caused by fossil fuels.

The Circle
Mankind can solve the too high concentration of CO_2 caused by CO_2 emissions through photosynthesis. This is the instrument to disconnect CO_2 molecules and connect them into other manifestations.

Scientific research shows that earth's has a flexible CO_2 disconnecting capacity
Research by the University of Colorado shows that the earth's capacity to disconnect CO_2 molecules has doubled over the last 50 years.

More scientific support
Slowly but steadily more scientists support the potential of trees to clean the air from CO_2

The enormous purification power of the tree
Trees offer an almost unlimited capacity of air cleaning.

The disconnection of C atoms from O atoms through trees, plants and algae
Nature has various instruments to disconnect the C atom from the O atoms, but for us the most flexible to influence is the tree disconnecting capacity.

Have we got 2 billion hectares of land available?
We have enough space to plant 2 billion hectares of trees.

How large is 50 million hectares?
The size of Texas.

Trees grow everywhere
Trees grow everywhere as long as there is sufficient capillary hanging water.

Why to solve the problem in 40 years and not tomorrow
Three years after its introduction, the Treesolution will have a larger net positive effect on cleaning CO_2 emission than is expected from the present dysfunctional measures of the Kyoto Protocol.

The organization of the Treesolution
Surcharging fossil fuel production and organizing a market place where carbon farmers are allowed to offer tree planting projects, allow us to attack the CO_2 emission problem practically and quickly.

'From CO_2 Nature'
The proposal to a working mechanism that cleans the air from CO_2 excess

The figures of the Treesolution
Investment in the Treesolution is affordable and creates wealth for millions of carbon farmers.

The 'CO_2 emission surcharge'
We can put a 'CO_2 emission surcharge' on oil only, or on all fossil fuels

The influence of the Treesolution
The Treesolution solves the flaws of the Kyoto Protocol.

Criticism of the Treesolution
The Treesolution is subject to criticism, but the arguments are partially

Those who calculate, plant trees
Every person having a long term vision plants trees as they will prove to be a good investment. Trees can serve as collateral for the financial system. Carbon farming will prove to be the motor of the next economic growth spurt and create wealth for millions.

The cynics are wrong
There might be cynics who do not believe in worldwide cooperation, but examples such as the first Climate Treaty of Montreal concerning the ozone layer damage that was organized within a time frame of only 20 years, show that we are capable of cooperating globally.

Let's not create new slavery
The Treesolution should not harm the populations of the places where we plant. Instead, it must present an opportunity for local development.

Our problem is *their* chance
The Treesolution can help end poverty of millions of families starting to farm carbon and in the same time produce food.

Support the 'Treesolution' plan
The Treesolution turns the CO_2 disadvantage into a CO_2 advantage.

Land reform
A new vision and strategy on the property and use of land leads to more wealth.

The food challenge
The Treesolution cleans up fossil fuel CO_2 emissions for 100% through a money making food producing business model.

The benefits the Treesolution
A compilation of all the benefits resulting from tree planting.

Final words to the reader
The author thanks the reader and asks him to support the Treesolution to solve the CO_2 over-concentration problem.

Original work

Countless books and websites have been studied and consulted in the process of writing this book. The numbered sources in this book are displayed as footnotes at the end of a sentence or paragraph. These sources can be found on www.thetreesolution.com. All texts are my original work and all conclusions are my own. Where I have cited others, I have put the source of the text.

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The trunk of Mother Earth

Pieter Hoff is the inventor of the Groasis Waterboxx. It was elected the 'Best of What's New 2010' by Popular Science, one of the most influential science magazines with over 3 million readers around the world. The Groasis Waterboxx beat 116 great products mostly from Fortune 500 companies; amongst them, the fantastic Apple iPad and the incredible Philips led lamp. His innovation allows trees to be planted in deserts, on mountains, eroded areas, rocks and even in the ashes of burned forests. The invention brought him into the world of CO_2, which is explained to the reader in surprisingly easy to understand concepts. 'The Treesolution' clarifies how to solve the CO_2 emission problem and turn it into a CO_2 wealth creating opportunity.

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