Climate Change & Global Warming

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Information

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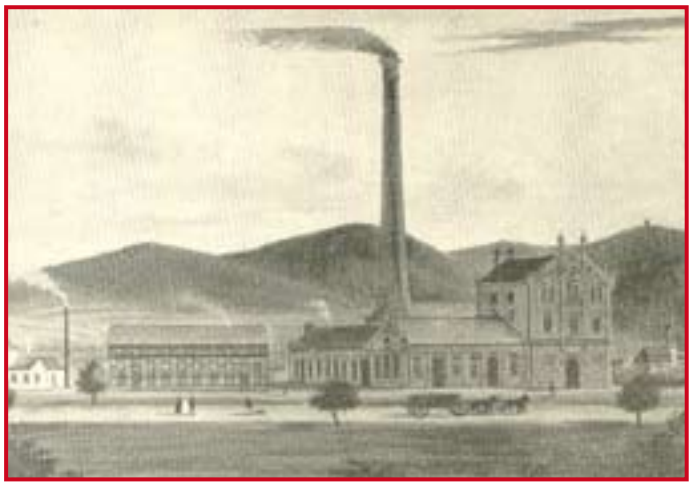
What causes Global Warming?

In the 1970's scientists discovered manmade changes in global average temperatures. It was getting warmer. Not much though for the rise was 0.3 degrees from 1870 to 1970, but the scientists saw it as a worrisome sign and believed the greenhouse effect was the cause.
100 years earlier a Swedish scientist Arrhenius had discovered the greenhouse effect. The glass roof of a greenhouse allows the rays of the Sun inside but the glass holds back the heat so that it only slowly seeps out of the greenhouse. The gas CO2 makes the atmosphere work like a greenhouse. CO2 is invisible and without smell but will hold on to heat. If there was no CO2 at all the temperature on the Earth would fall a staggering 30 degrees Celsius so that snow storms would often hit Central Africa. CO2 is thus a good thing but too much or to little is a problem. CO2 is produced naturally by living organisms and when something is rotting or burnt. Plants use CO2 to grow and so establish a natural balance of CO2. However, if forests are burnt down or cleared for farmland CO2 will be released, and much worse if people burn oil, gas or coal more CO2 is produced than plants can absorb. These energy sources are called fossil fuels because they were made by plants that grew on the Earth millions of years ago and sank to the bottom of lakes or the sea where high pressure turned it into coal, oil or gas. Every year people burn more fossil fuels than nature can produce in hundreds of thousands of years. This practice started with industrialization in the 1800's forcing CO2 level to go up and the Earth to warm up.
Arrhenius believed this process would take thousands of years, but scientist were in 1970 able to measure how CO2 was increasing and temperatures rising at the same time at a much faster rate than previously thought.

Oil companies, coal mine owners, car producers and others that make a profit when large amounts of CO2 are produced did not like this news.
They argued against global warming. After all 0.3 degrees is very little. You hardly notice if your room warms 0.3 degrees. "Do Not Worry about Global Warming", they would say. Politicians always dependent on those with a lot of money did little when they got the news.
The scientists, at first, expressed their findings cautiously because they by training were used never to take any finding for granted until it had been tested and examined over and over again.



A German iron factory burning coal in 1870. Since then more and more CO2 has been emitted into the atmosphere causing temperatures on the Earth to rise.

Former vice president Al Gore receiving the Nobel Peace prize negotiated the Kyoto protocol but none of the 100 senators in the US senate voted for the protocol.

This made it easier for politicians to spread doubt about the reality of global warming as some do even to this day. In Kyoto in 1997 a treaty was signed by many countries and by the then US vice president Al Gore, aiming at slowing down the increase in CO2. But in Washington 100% of the senators voted against the Kyoto protocol, claiming that it was not good for American business and Al Gore's signature was useless. Since 1997 several countries that did sign Kyoto have not lived up to their obligations.

Since 1970 global average temperatures have increased another 0.4 degrees and scientists of many types are increasingly worried. While a great many other people are unconcerned as they sense no immediate danger from climate change. Today the people produces more CO2 from burning fossil fuels than ever before. Cars fill the streets not only of American cities but of Beijing, Mexico City and other capitals around the world. Goods are transported far and wide in ever larger quantities. Trees are cut down for timber, firewood and to make room for more farming and because trees use CO2 when they grow fewer trees means more CO2 and thus more global warming. At the same time a growing world population means more demand for energy, food and goods.

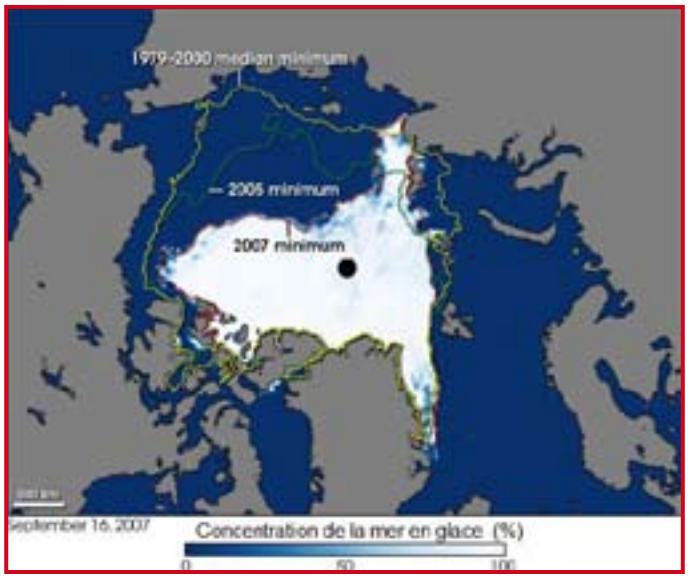
While the average temperature of planet Earth has only warmed 0.7 degrees since 1870 some areas have warmed faster. The North Pole is in the midst of a big ocean. For millions of years this sea has been covered by ice. This region has already warmed 3 degrees, causing most of the ice to melt. Ice reflects sunlight so that heat from the Sun is reflected right back into space. Open water however absorbs the rays of the Sun. In a few years most of the North Polar ice will have melted. Then the area will continue to warm as the sun heats this ocean. And because we have only one Earth rising temperatures on the far away North Pole will in time affect the rest of the globe making the heating up go faster than ever.

Global warming and climate change have happened many times before in the history of the Earth. 13,000 years ago ice covered much of Europe and North America and the world was 5 degrees colder than today.

Since then, however, the temperatures have been relatively stable giving plants, animals and human societies a mostly predictable and hospitable planet to live on.

Past changes in temperatures have caused small changes in the amount of sunlight that reaches the lands and the oceans as the Earth's orbit around the Sun fluctuates slightly over long periods of time. Likewise the living Earth with its plants and animals influences the temperatures as plants remove CO2 from the atmosphere and forest fires, microbes and animals return CO2 to the atmosphere, mostly with the effect of stabilizing temperatures to a level favorable for the living.
Global warming today however is caused not by many plants and animals but by one species only, man.

Many scientists have tried to predict how temperatures will change over the next 100 years and the UN has set up an Intergovernmental Panel on Climate Change. The IPCC predicted in 2007 that temperatures will rise between 2 and 6 degrees by 2100. The IPCC however was under pressure from politicians to only include in their predictions events and effects they were very sure about. Thus they did not take into consideration the effect of the melting North Pole ice until after 2080 while the ice will likely be all gone in the summer of 2015. Neither did they include the full effect of deforestation as it happens around the world because of logging and expansion of farming, nor the fact that the oceans which absorb some of the CO2 from fossil fuel burning and stores it in the deep seas is less and less able to do so as the level of CO2 in the sea water goes up. Thus if we add up all this it is likely that the highest prediction - plus 6 degrees in 2100 - will come true. This is also confirmed by recent measurements that point to the fact that temperatures and CO2 are increasing faster than in the most extreme predictions made by the IPCC.



The picture shows what was left of the North Pole ice in 2007. The IPCC has not included the effect of the melting of the North Pole ice in their predictions of global warming in the 21st century.

Climate Changes caused by Global Warming

The climate of a country is determined not only by average temperatures but by changes in temperature between the seasons, by the amount of rain in different seasons and by winds.
The climate determines what plants can grow and which animals can live in an area and is thus of greater importance to people and communities than the temperatures.
If the average temperature of the Earth warms 2 degrees by 2030 some areas might get much warmer, while oceans that cover 70% of the Earth may warm only 1 degree. Inland areas of Africa will become 3-4 degrees warmer. When temperatures rise the land will become much more dry because the heat evaporates water from the soil and leaves it hard baked. A large increase in rainfall is needed for the soil to remain as moist as before. There will be more rain because more water will evaporate over the oceans. But most of Africa, Asia, Australia and Latin America will get a drier and less hospitable climate.
More of the rain falling in a warmer world will come in violent storms that result in more flooding and destruction of crops because higher temperatures will produce stronger winds. Especially South and South East Asia, Western South America and Eastern Africa will see many floods. The higher temperatures will melt glaciers on mountains and in polar areas that have been frozen for thousands or millions of years leading to rising sea levels that eventually will flood low lying coastal areas.
These are some changes that can be expected in the years to come:

1970

Nobody is yet aware of the problem of global warming. The climate of the Earth has been quite stable for the past 200 years. Many scientists believe that it is more likely that the world will cool than warm up. A few years later some climate scientists present evidence of warming from greenhouse gases.

2008 - 0.4 degrees

Hurricane Katrina was the most destructive ever to hit New Orleans.

For 35 years scientists have known that the Earth is warming up. Since 1990 every new year seems to set a new record as the warmest ever. Many unusually violent storms have been observed around the world, flooding English towns, Mozambican villages, Kenya, Ecuador, Bangladesh and famously New Orleans in the USA. Small islands in the Pacific Ocean are being flooded as sea level slowly rises, forcing people to flee.

Drought hits Southern Africa more and more often. Heat waves strike Europe where thousands of older people die from heat strokes.
Climate changes trigger social unrest in Kenya, where the conflict is largely due to fight over the fertile land in the Rift Valley, and in Darfur, where rainfall has been reduced by a third in the past 80 years.

2015 - 0.7 degrees

More and more farmers in Northern India, Mexico, Western US, Northern China and in the Mediterranean region are forced to give up farming as affordable groundwater can no longer be obtained for irrigation.
The capital of Yemen with 2 million inhabitants has no more groundwater, but must make all of its freshwater from sea water.
The same happens for Lima in Peru, a city of 10 million, since it no longer gets river water after most glaciers in the Andes Mountains have melted.

2020 - One degree

While the average global temperature is 1 degree warmer, Southern Africa - except for its coastal zones are 2.5 degrees warmer and rainfalls have decreased 10%.

Limpopo River flood in 2000

Up to 60 million people in sub-Saharan Africa are forced from their land because of desertification.
200 million people are in risk of floods in 2020.
Las Vegas must be abandoned because of lack of water.

2025 - 1.3 degrees

Livestock production is reduced by half in most of the dry parts of Southern Africa.
Social conflicts may erupt in countries such as Rwanda, Malawi, Kenya, Nigeria, Pakistan, as the amount of farm land per person decreases. (0.07 ha is considered a minimum to survive. Average in the developing world is now 0.17 ha).
Maize is no longer the main food crop in much of Southern Africa due to the hotter climate and less rain.

2030 - 1.7 degrees

Much reduced harvest among small farmers in Namibia. A quarter of the population has lost its livelihood.
Sea levels have risen by 1 meter (much faster than predicted by the International Climate Panel) because ice sheets melt much faster than predicted.

Flooding in low-lying areas destroy crops and soils with salt. People are forced to move because of rising sea levels. Guinea-Bissau (2% of the population), Mozambique (1%), Belize (5%), Guyana (15%). Many more have to move during tropical storms. Much reduced water for irrigation from the river Indus in Pakistan as most of the Himalaya glaciers have melted. More rain in north eastern India, Bangladesh and South East Asia leads to recurring floods.

2035 - Two degrees

Southern Africa, except the coastal zones, will be 4 degrees warmer. Malaria has spread to higher elevations, bringing 100 mill. more Africans into malaria zones.

2040 - 2.3 degrees

Crop and animal production of farmers in South Africa are reduced by 50%.

2045 - 2.7 degrees

The global land area under droughts is twice as large as today.

2050 - Three degrees

Rainfall in the Botswana region has decreased by 20%. Globally, 7 billion people, or most people of the world are affected by water stress and water scarcity.
Sea levels have risen by 2 meters.
Half of farm land in Central and Northern Mexico, and much of Western and Central America, are affected by desertification and salinization.
Droughts lead to the collapse of much of the Amazon rain forest. More fires and less carbon stored in the trees speed up the destruction of the remaining forest.
The harvests of farmers in India reduced by one third.

2070 - Four degrees

Agricultural production reduced by:
40% in Southern Africa - 60% in Northern half of India - 10% in China - 25 % in Latin America - 35 % in Mexico and South Western USA.
These figures could be even higher if the effects of floods, soil degradation, falling ground water tables, social unrest, more pests and diseases become more serious.
Southern Africa - except for the coastal zones - will be 6 -7 degrees C. warmer.
Areas around Madrid, Sicily, parts of Portugal and Greece have become semi-desert.
People are forced to move because sea levels have risen by 3 m. Guinea-Bissau (6% of the population), Mozambique (3%), Belize (10%), Guyana (25%), Vietnam (26%), and Bangladesh (3%).
30 % of land species are pushed to the brink of extinction.

Conclusion on Global Warming

One of the big questions of today is whether global warming and climate change can be stopped or whether it is inevitable. Though worried, most scientists believe that if we act now, "serious" climate change and global warming can be avoided. A few, such as James Lovelock who created the GAIA theory of the Earth as a living organism, believes that is far too late to stop the changes that are now unfolding. Politicians either deny that there is a problem or act as if there is plenty of time to do something. After weighing the arguments we in The GAIA-Movement have had to conclude the following:

- Global Warming and Climate Change are unavoidable as they are already going on and have been so for quite some time,
- they constitute an inevitable catastrophe that will unfold in the years and decades to come,
- this fact cannot be reversed as the politicians in power will not provide the leadership needed to implement the monumental changes needed to reduce greenhouse gas emission and
- the processes set in motion are of such magnitude that they by now can only be postponed or prolonged so as to allow more time for adaptation.

The scientist James Lovelock in front of a statue of the Greek God Gaia - predicts that as climate changes less than 1 billion people will be able to live on planet Earth.

Rally for an American politician trying to be elected as president without talking about climate change.

We have made our conclusion because we can see that great changes have already taken place. Even if no more CO2 was emitted into the atmosphere by man the CO2 that is there now and the polar ice that has melted would force the temperatures to rise for the next hundred years or more. Furthermore there is no reason to think that CO2 emissions will stop anytime soon, nor that deforestation and other factors contributing to climate change will stop in the near future.

Scientists and politicians are, however, not the only players of importance as the great drama of global warming and climate change is played out in the 21st century. The people of the 21st century are most central players in shaping the world. Apathy in regard to global warming and climate change characterizes the attitude of most people in wealthy nations that might often have some knowledge about the issue, while the people in poorer nations that can expect the most dramatic consequences of global warming and climate change often know little about its causes and what to do about it. However this does not have to be so. As this is a truly global phenomenon the people of the world has the potential to make giant steps forward and together in face of this disaster for all - rather than succumbing to the dire predictions of scientists that see no other outcome than mass starvation and possibly global wars as the going gets tougher when the world warms up.

People of the 21st century

We must strive to build solutions, to join hands with others, to seek other truths than the conventional wisdom even the inconvenient one, so that the people of the 21st century can deliver a planet to the people of the 22nd century that can sustain the human body and spirit.

After reaching this conclusion we have gone on to consider what can and should be done.
We have outlined a range of Local Defensive Actions to be implemented around the world to protect people from the attack of global warming and climate change.

We have pinpointed a number of Local Political Actions to be carried out locally mobilizing people in the communities, local leaders, authorities and even provincial and national governments and leaders.

Finally we have considered a number of Global Practical and Political Actions that may take the struggle against global warming and climate change to a global level.

Material and research used

We have reached our conclusions on global warming, climate change and the consequences thereof for food production and a number of other issues after studying books, films, websites, radio interviews, scientific magazines and reports.
The information we have found points in a clear direction and has thus enabled us to make a clear conclusion.

A basic book has been *"Six Degrees"* by Mark Lynas, a journalist who has studied many scientific reports and from that has been able to describe what may happen to the Earth as it warms 1-2-3-4-5 and even 6 degrees.
Elizabeth Kolbert has written *"Field Notes from a Catastrophe"*. She has met many scientists working on global warming and the book has much dramatic information.
Several other authors have written books that give many details on global warming and climate change such as *"The Last Generation"* by Fred Pierce, *"The Weather Makers"* by Tim Flannery, *"A Rough Guide to Climate Change"* by Robert Henson, *"The Revenge of GAIA"* by James Lovelock and *"An Inconvenient Truth"* by Al Gore, who received the Nobel Peace Prize for his effort to inform about climate change. The last book is also on film and there are several other films that tell about different aspects of climate change and what can be done to build a world on renewable energy.

The Intergovernmental Panel on Climate Change, a UN working group, which also received the Nobel Peace Prize made their latest report in 2007. We have studied the report which presents several models for how the climate may change during the next 100 years.

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