

Quick Scan on Sustainable Development and Climate Change

Worldconnectors thematic background document

9 June 2008

Research and text by Roeland Muskens and Mariëtte Heres (Wereld in Woorden)

Introduction

1. What is at stake? Some facts and figures

- 1.1 What is climate change/global warming?
- 1.2 What are the causes?
- 1.3 Rising GHG emissions and rising temperature
- 1.4 Population growth
- 1.5 Growing use of natural resources
- 1.6 The rise of new powers China and India
- 1.7 Melting ice caps and the consequences
- 1.8 Rising sea levels
- 1.9 Oceanic currents
- 1.10 Fossil fuels and their alternatives
- 1.11 Biofuels
- 1.12 The Economics of Climate Change
- 1.13 Forests & deforestation
- 1.14 Agriculture and climate
- 1.15 Meat consumption and climate change

2. Climate change and development

- 2.1 Carbon footprint
- 2.2 Poor countries as victims of climate change
- 2.3 Climate Change and gender equality
- 2.4 Is there enough room for poor countries to develop?

3. What can be done? What must be done?

- 3.1. Mitigation
- 3.2 Adaptation
- 3.3 Kyoto Protocol
- 3.4 Bali
- 3.5 The road to Copenhagen
- 3.6 Personal Carbon Trading
- 3.7 Carbon Capture and Storage
- 3.8 Why effective climate policies materialise slowly
- 3.9 How to finance the fight against climate change?

4. Climate sceptics

5 Actors

5.1 Some of the major international organisations on climate change

5.1.2 International research institutions

5.2 An overview of EU policies and European organisations

5.2.1 A few European organisations:

5.3 Some Dutch governmental initiatives and policies

5.3.1 What can local governments do?

5.4 Examples of local initiatives

5.4.1 Other Dutch organisations that focus on local governments

5.5 Corporate initiatives

5.6 Civil society organisations on climate change

5.6.1 Some relevant international civil society organisations

5.7 What can individuals do?

5.7.1 Some websites on individual action

Introduction

Climate change is without a doubt one of the biggest challenges facing the world today. Even according to the most moderate estimates of the level of global warming and the effects this will have on the planet, it is obvious that 'business as usual' is not an option. It is time for action.

This, however, is easier said than done. Acting against climate change involves considerable 'first mover disadvantages'; it is costly; involves radical changes in our way of life; has a possible detrimental effect on economic growth and prosperity; involves difficult discussions about burden sharing; can lead to 'free rider' behaviour, etc. The world needs new leadership regarding climate change policies. Only if politicians, policy makers and other leaders face their responsibilities, sufficiently radical changes can be made to really turn the tide. If we want to maintain the global temperature increase below 2.4 degrees Celsius (associated with CO₂ levels of 450 parts-per-million), according to the recent World Energy Outlook 2007¹, published by the International Energy Agency: "Exceptionally quick and vigorous policy action by all countries, and unprecedented technological advances, entailing substantial costs, would be needed to make this case a reality."

The notion of human induced climate change, in fact, is old. Already in the 19th century scientists discovered the Greenhouse Effect and the potential human involvement in rising CO₂-levels caused by burning carbon based fuels. In the last couple of decades increasing emissions, rising CO₂ levels and measurable temperature rise, coincided with the development of sophisticated, computer based ways to measure and monitor climate change. But the issue only became problematic in the seventies of the last century.

One of the renowned warning voices in the last century was the Club of Rome. Its 1972 book, 'Limits to Growth', sold twelve million copies in 37 languages. Although the Club of Rome did not focus primarily on climate change, it did state that if the world's consumption patterns and population growth continued at the same high rates at that time, the Earth would reach its limits within a century. Current rising prices of primary resources indicate that the Club of Rome was essentially right.

In 1979 the first 'World Climate Conference', organised by the World Meteorological Organization (WMO), expressed concern that "continued expansion of man's activities on Earth may cause significant extended regional and even global changes of climate". It called for "global cooperation to explore the possible future course of the global climate and to take this new understanding into account in planning for the future development of human society." The conference appealed to nations of the world "to foresee and to prevent potential man-made changes in climate that might be adverse to the well-being of humanity".

In 1985 a joint UNEP/WMO/ICSU Conference was convened in Austria focussing on the "Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts". The conference concluded, that "as a result of the increasing greenhouse gases it is now believed that in the first half of the next century (21st century) a rise of global mean temperature could occur, which is greater than in any man's history."

Another early report in which climate change was presented as a possibly life threatening development was the 1986 report of the Brundtland Commission; 'Our Common Future'.

In 1988 WMO and UNEP established the Intergovernmental Panel on Climate Change (IPCC), a scientific body, whose reports are based on scientific evidence, reflecting existing viewpoints within the scientific community. The findings of the first IPCC Assessment Report in 1990 played a decisive role in the run up to the United Nations Framework Convention on Climate Change (UNFCCC), which was signed during the Rio de Janeiro Summit in 1992 and entered into force in 1994. The Assessment Reports by the IPCC provided the key input for the negotiations of the Kyoto Protocol in 1997, the 2007 Bali climate conference and all UNFCCC *prepcoms* in between. The IPCC continues to be a major source of information for the negotiations under the UNFCCC on the road to Copenhagen.

1. What is at stake? Some facts and figures

1.1 What is climate change/global warming?

Climate change is the change in the Earth's global climate over a time period that ranges from decades to millions of years. The increase in the average temperature in recent decades is also called global warming. The United Nations Framework Convention on Climate Change (FCCC) defines climate change as: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."² The Intergovernmental Panel on Climate Change (IPCC) concludes "[that] most of the observed increase in globally averaged temperatures since the mid-twentieth century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

1.2 What are the causes?

The Earth's climate is dependent on the balance between the amount of energy the Earth receives from the Sun, and the amount of energy the Earth releases back to space, in the form of infrared heat energy. Causes of climate change involve any process that can alter this global energy balance. Scientists call this 'climate forcing'. There are internal and external types of climate forcing processes. External processes operate outside planet Earth, and includes changes in the Earth's orbit around the sun, and changes in the amount of energy received from the sun. Internal processes operate from within the Earth's climate system, and include changes in the global energy balance due to changes in ocean circulation or changes in the composition of the atmosphere. Also volcanic eruptions and even collisions with comets or meteorites can alter the Earth's climate.

Besides the many natural causes of climate change, recently we have become concerned with the effect mankind's pollution of the atmosphere has on the global climate. A natural greenhouse effect takes place on Earth, which keeps it much warmer than it would be without an atmosphere. Greenhouse gases in the atmosphere trap infrared heat energy trying to escape back into space. In doing so they raise the temperature of the Earth's atmosphere. During the last 200 years, mankind has been releasing substantial quantities of extra greenhouse gases into the

atmosphere, through the burning of fossil fuels and deforestation. These gases are trapping more heat in the atmosphere, and it is now suspected that the observed warming of the Earth by about 0.6°C since the late 19th century is mainly due to this man-made increase of the natural greenhouse effect.³

The biggest concern is the increase in CO₂ levels due to emissions from fossil fuel combustion. Other causes are the carbon dioxide produced when making cement (responsible for 2.5% of total worldwide emissions from industrial sources) and the environmental change through land use, like irrigation, deforestation and agriculture. Another important contributor to greenhouse gas emissions is our livestock. According to a 2006 United Nations report, 'Livestock's Long Shadow'⁴, livestock is responsible for 18% of the world's greenhouse gas emissions as measured in CO₂ equivalents. This however includes land usage change, meaning deforestation, in order to create grazing land (in the Amazon Rainforest 70% of deforestation is to make way for grazing land). In addition to CO₂ emissions, livestock produces 65% of human-induced nitrous oxide (which has 296 times the global warming potential of CO₂) and 37% of human-induced methane (which has 23 times the global warming potential of CO₂).⁵

The opposite of a CO₂ source is a CO₂ sink. This is a carbon dioxide reservoir that is increasing in size. The main natural sinks are the oceans and plants and other organisms that use photosynthesis to remove carbon from the atmosphere by incorporating it into biomass and release oxygen into the atmosphere. This concept of CO₂ sinks has become more widely known because the Kyoto Protocol allows the use of carbon dioxide sinks as a form of carbon offset⁶.

1.3 Rising GHG emissions and rising temperature

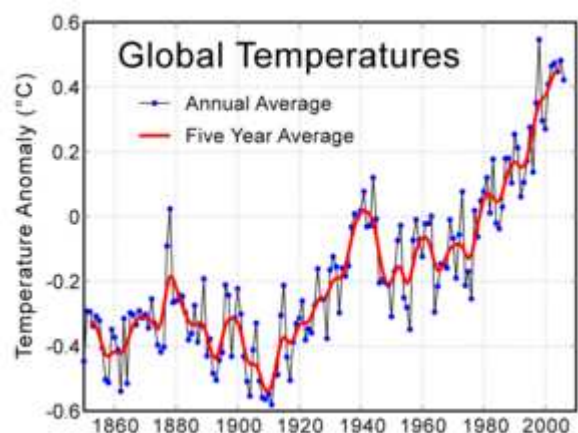
According to future scenarios the emissions per year will double in the next fifty to a hundred years.

In 1850 the concentration of CO₂ levels was 280 parts-per-million (ppm), while today it is more than 380 ppm. These increases are projected to reach more than 560 ppm before the end of the 21st century. Along with methane levels, these changes are anticipated to cause an increase of 1.4-5.6 degrees Celsius between 1990 and 2100.

Since the late 19th century the average temperature of the Earth's surface has risen by 0.6 °C, and about 0.2 to 0.3 °C over the last 25 years. It is expected to increase by another 1.4 to 5.8 °C by the year 2100⁷. The intensity of the warming has varied from decade to decade, from region to region and from season to season.

1.4 Population growth

The rapid growth of the world population is a recent phenomenon in the history of the world. It is estimated that 2,000 years ago the population of the world was about 300 million. For a very long time the world population did not grow significantly, with periods of growth followed by periods of



decline. It took more than 1,600 years for the world population to double to 600 million. The rapid growth of the world population started in 1950, with reductions in mortality in the less developed regions⁸. Growth remains high in the Middle East, South Asia, Southeast Asia, Latin America, and in Sub-Saharan Africa⁹. There is an obvious correlation between fast population growth and the growing use of natural resources and energy use.

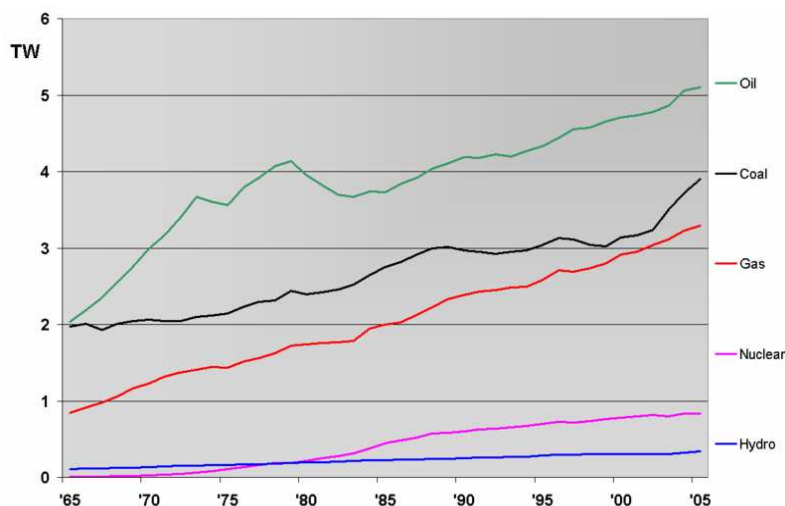
1.5 Growing use of natural resources

At the UN Conference on Environment and Development in 1992 it was stated: “One of the most serious problems now facing the planet is that associated with historical patterns of unsustainable consumption and production, leading to environmental degradation, aggravation of poverty, and imbalances in the development of countries.” However, fifteen years later, the use of natural resources is still growing.

The BP Statistical Review of World Energy 2007 calculates that:

- Global coal consumption increased in 2006 by 4.5% to 3090.1 million tonnes oil equivalent;
- Global gas consumption rose in 2006 by 2.5% to 2850.8 billion cubic metres;
- Global oil consumption grew in 2006 by 0.7%. In 2006 global oil consumption growth was less expansive than the 1.2 million barrels per day (1.4%) growth in 2005. Growth was weakened by rising prices and mild weather despite the global economy growing more strongly.

The worldwide energy consumption has been growing steadily since the industrial revolution. In 1890 the consumption of fossil fuels roughly equalled the amount of biomass fuel consumed by households and industry. Since then global energy consumption has been rising fast; from 0.7 TW (=10¹² Watt) in 1900 to 15 TW in 2004, 86.5% caused by burning fossil fuels.



World power usage in terawatts (TW), 1965-2005

Energy consumption increases with the increase of the gross national product. There are exceptions, like the significant difference between the consumption levels of the United States with 11.4 kW per person, and Japan and Germany with 6 kW per

person. Developing and under-developed economies have the lowest energy consumption.

Most of the world energy resources are from the sun's rays hitting Earth - some of that energy has been preserved as fossil energy, some is directly or indirectly usable e.g. via wind, hydro or wave power. The estimates of remaining worldwide energy resources vary. It is estimated that the available renewable energy sources exceed by 8,000 times the total current yearly energy use¹⁰.

1.6 The rise of new powers China and India

The economies of China and India are growing fast. In 2007 the real growth rate of the GDP of China and India were 11,4% and 8,5%¹¹. With the growing economy, the energy use is also expanding. In 2006 the energy use of China grew with 8%, which makes China responsible for 15% of the current energy use worldwide¹².

The electricity consumption worldwide is 16,700 trillion kWh¹³.

1. United States 3,186 trillion kWh,
2. China 2,859 trillion kWh
8. India 488,5 trillion kWh.

The oil consumption worldwide is 80.3 million barrels-per-day (bbl/day).

1. United States 20,8 million bbl/day
2. European Union 14.6 million bbl/day
3. China 7 million bbl/day.
7. India 2.4 million bbl/day

China's coal consumption increased over 2006 with 8.7%, which makes China responsible for 38,6% of the world coal consumption. India's coal consumption increased with 7.1%, which makes India responsible for 7.7%¹⁴.

The carbon dioxide emissions of China increased between 1990 and 2004 from 2390 metric tonnes of carbon dioxide to 5007. This is an annual change of 7.8%. China's share of the world total carbon dioxide emissions has grown from 10.6% to 17.3%. In comparison, the share of the United States of America in the total carbon dioxide emissions of the world is 20.9% (2004)¹⁵.

Some projections on the future economic growth and subsequent growing energy needs of China and India can be found in the World Energy Outlook 2007

<http://www.iea.org/Textbase/npsum/WEO2007SUM.pdf>.

The conclusion that of IEA that, given the current policies, in 2030 China's per capita emission will be 60% lower than in the United States, is important.

1.7 Melting Ice Caps and the consequences

If the temperature rises it may be causing floating icebergs to melt. This has no effect on the water level. However, when the rising temperature causes land glaciers to crack and fall into the ocean, ocean levels will rise a little. If the polar caps would melt entirely, then the ocean would rise significantly. Polar caps are without a doubt melting, but the speed of this process is uncertain.

The main ice covered landmass is Antarctica, with about 90 percent of the world's ice (and 70 percent of its fresh water). Antarctica is covered with an ice cap that has an average thickness of over two thousand meters. If all of the Antarctic ice melted, sea

levels around the world would rise over sixty meters. But the average temperature in Antarctica is -37°C , so the ice there is in no immediate danger of melting. At the other end of the world, the North Pole, the ice is not nearly as thick as at the South Pole, but the ice is floating, so sea levels would not be affected.

There is a significant amount of ice covering Greenland, which would add another 7 meters to the oceans if it melted. Because Greenland is closer to the equator than Antarctica, the temperatures there are higher, so the ice is more likely to melt. But the melting of Greenland's ice cap is a slow process. Small glaciers and ice caps on the margins of Greenland and the Antarctic Peninsula might contribute to rising sea levels of about 0.5 metres. While the latter figure is much smaller than the figure for Antarctica or Greenland, it probably will occur relatively quickly (within the current century).¹⁶

1.8 Rising sea levels

Since the peak of the last ice age, about 18,000 years ago, the sea level has risen about 130 meters. From 3,000 years ago to the beginning of the 19th century sea level was only rising 0.1 mm/year. Since then sea level has risen at 1 to 2 mm/year.¹⁷ Since 1991 the average is 3.1 mm/year. Thermal expansion, melting glaciers and ice caps and the polar ice sheets have contributed to this rise. However it is unclear whether the faster rate reflects decadal variation or an increase in the longer-term trend. The IPCC estimates that the sea level change by the year 2100 is a 50 cm rise. The lowest estimates are 15 cm, the highest 95. This could have a big effect on coastal cities.¹⁸ The Environmental Protection Agency (EPA) of the USA estimates that global warming is most likely to raise the sea level with 34 cm by the year 2100. The EPA states that stabilising global emissions in the year 2050 could reduce the rate of sea level rise by 15 percent by the 2100. If the emissions are stabilized by the year 2025, the EPA estimates that it could cut the rate of sea level rise in half.¹⁹

The ocean level can also rise without polar ice melting. If the water temperature rises, the density of water decreases and the same weight of water occupies a bigger space. With the overall temperature increasing, rising water levels are inevitable.²⁰

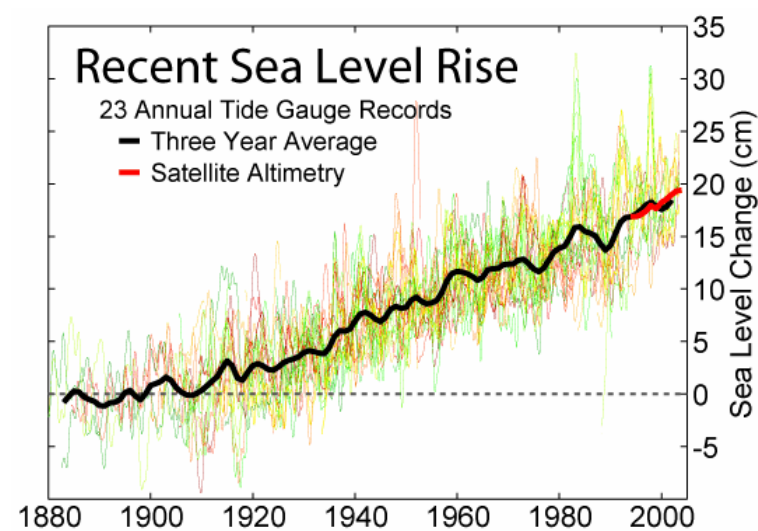


Image recent sea level rise²¹

According to the UNDP 'Human Development Report 2007/2008 (HDR), Fighting climate change: Human solidarity in a divided world', an increase of global temperature with 3 or 4 °C could result in 330 million people being permanently or temporarily displaced through flooding. Over 70 million people in Bangladesh, 6 million in Lower Egypt and 22 million in Vietnam could be affected. And tropical storms are more regular through warming seas, which can have devastating consequences for over 344 million people currently exposed to tropical cyclones.²²

For maps about the consequences of sea level rise, go to https://www.cresis.ku.edu/research/data/sea_level_rise/index.html.

1.9 Oceanic currents

Ocean currents are important in determining the climates of the continents. For example, the Gulf Stream makes the northwest of Europe more temperate than other regions at the same latitude. Evidence is growing that the *thermohaline* current may be influenced by cold fresh water inputs of the Arctic and North Atlantic oceans, if arctic sea ice or the Greenland ice sheet will melt on a large scale. The ocean will become less salty and the water will be less dense and will not sink. This will stop or slow down the Gulf Stream. This happened during the last ice age, some 10,000 years ago: the Gulf Stream shut down and in a few decades temperatures in northwest Europe fell by 5 degrees Celsius. This could happen again, but a reduced Gulf Stream with substantial cooling is unlikely to occur this century.²³

1.10 Fossil fuels and their alternatives

Fossil fuels (coal, petroleum and natural gas) have great advantages; they are easy to distribute and there is an existing infrastructure. Moreover petroleum has a high energy density in terms of volume and mass, which is important when fuelling tanks of cars and airplanes. However, vehicles use only 15% of the energy from the fuel, the rest is expended as waste heat. And this heat and the emissions harm the environment. The burning of fuels produces around 11.6 billion tonnes (= 11.600 Mt) of atmospheric carbon dioxide per year.

The extraction of fossil fuels also results in environmental degradation, such as strip mining and mountain top removal of coal. Another issue is that fossil fuels are unsustainable resources, which will become exhausted. This will have a lot of consequences for carbon dependant societies.²⁴

Because of the downsides of fossil fuels, there is a growing demand for alternatives. Obvious alternatives are carbon based (bio)fuels derived from wood, corn, palm oil, sugar cane, non-fossil natural gas, and other bio mass products.

And even more obvious are renewable non-carbon energy sources such as: wind, solar, nuclear, geo thermal, and water. Especially in combination with hydro-based storage and transport technologies these are, no doubt, the energy sources of the (not so distant) future.

1.11 Biofuels

Biofuels (also agrofuel) are energy sources (in liquid, solid or gas substance) derived from recently dead biological material. This distinguishes it from fossil fuel, which is derived from long term dead biological material.

Biofuel can be produced from any (biological) carbon source. Many different plants and plant derived materials are in fact used for biofuel manufacture. For example sugar cane, oil palm and algae. Biofuels are used all over the world and are expanding rapidly in Europe, Asia and the Americas. The most common usage of biofuels is as gas for cars.

Besides the climate argument, the use of renewable biofuels provides increased independence from petroleum and enhances energy security. Biofuels are a hot topic, particularly in relation to high oil prices and international targets on greenhouse gas emissions reduction. In theory the growing and subsequent burning of plants and trees is climate neutral.

Unfortunately though, the large scale use of biofuels is not without downsides. The production of crops for biofuel can have serious environmental effects, for example deforestation, soil erosion, heavy use of limited sweet water supplies and contamination of soil, air and water sources.

Another important objection against food for oil strategies is that it shifts the food production potential from human consumption towards fuel production: the 'food vs. fuel debate'. This could possibly lead to hunger and malnutrition in certain areas. It is thought that the current price inflation of food (for example rice and wheat) is partially caused by the (expected) higher demand of food for fuel.

Many of the objections against biofuels are restricted to the 'first generation biofuels'. Second generation biofuels are possibly a more sustainable solution. These biofuels are derived from non-food sources, including waste biomass, the stalks of wheat, corn, wood etc.

Even third generation biofuels are in production. This refers mainly to biofuel from algae. Algae provide 30 times more energy per acre than land feedstock and algae fuel is biodegradable. The Dutch company Ingrepro bv, for example, produces biofuel from algae on an economically viable scale.

The United States Department of Energy estimates that if algae fuel replaced all the petroleum fuel in the United States, it would require 40.000 square kilometres²⁵, about the size of the Netherlands.

In the Netherlands several stakeholders have issued a list of considerations regarding the use of (imported) biofuels and the import of large quantities of biomass from developing countries. These 'Cramer Criteria'²⁶ (called after environment professor Jacqueline Cramer, who chaired the Cramer Commission and who is now Environment Minister in the Netherlands) are:

- Biofuels must lead to at least 30% less CO₂ emissions (50% for biofuels used for electricity production).
- 'Food security': there should be no local food scarcity in the location from which the biomass is secured, nor scarcity of energy, medicines and building materials because of biomass production.
- Biomass importing companies must report on the effects of biomass production on biodiversity; there should be no impacts on 'valuable' protected nature reserves and conservation areas.

- Biomass importers must report on the social effects of the biomass they secure or produce in the host country; basic local rights must be respected.
- Labour conditions should be compliant with local laws, workers must have the right to organise themselves in a union.
- Biomass producing companies must abide by all local environmental laws with regard to pollution, noise, odour and emissions control and fertiliser management.
- All biomass producers must comply with local regulations dealing with the preservation of soil quality; moreover, they may not contribute to soil erosion and must even improve the quality of soils.
- All biomass producers must comply with local laws regarding water quality.

These 'Cramer Criteria' were written in consultation with a consortium of Dutch organisations, including oil company Shell and the multinational company Unilever, who both oppose the introduction of biofuels.

Some environmentalist and development organisations in the Netherlands think the criteria and the certification mechanisms are not stringent enough, whereas developing countries call the report and the work by the NGOs an exercise in 'green imperialism', as they have had no say in the formulation of the criteria.

1.12 The Economics of Climate Change

In 2006 Nicholas Stern released the report 'Stern Review on the Economics of Climate Change', in which he discusses the effect of climate change and global warming on the world economy. Stern estimates that if we do not act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year. The review states that even if a wider range of risks and impacts is taken into account, the estimates could rise to 20% of GDP or more. To avoid the worst impacts of climate change by reducing greenhouse gas, a yearly 1% of global GDP will have to be invested. The investment of the next ten or twenty years will have a profound effect on the climate, Stern calculates.²⁷ But the longer we wait, the more expensive it will get.

The Stern Review garnered a lot of positive response to, but there were unfavourable observations as well. Among them is Richard Tol, an environmental economist and leading author of the IPCC. He characterised the Stern Review as populist science. "There is a whole range of very basic economics mistakes that somebody who claims to be a Professor of Economics simply should not make. (...) Stern consistently picks the most pessimistic for every choice that one can make. He overestimates through cherry-picking, he double counts particularly the risks and he underestimates what development and adaptation will do to impacts."²⁸

1.13 Forests & deforestation

Deforestation is the conversion of forests to non-forest land, like agricultural land or urban areas. It is often regarded as one of the major causes of the greenhouse effect. Deforestation degrades the environment by reducing biodiversity. Trees and plants remove carbon from the atmosphere. When there is deforestation these carbon stores held in the soil are released back into the atmosphere. It is estimated that

deforestation causes some 25% of CO₂ emissions

One fifth of the world's tropical rainforest was destroyed between 1960 and 1990. The FAO concludes that the deforestation continues at an alarmingly high rate, about 13 million hectares a year in the period between 2000 and 2005. Because of forest planting, landscape restoration and natural expansion of forest area, the net loss is estimated at 7.3 million hectares a year (an area about the size of Sierra Leone). It is less than the 8.9 million hectares per year in the period 1990-2000. Africa and South America suffer the largest net loss of forests.²⁹

1.14 Agriculture and climate

Agriculture and climate change are interrelated processes. Global warming and carbon dioxide levels influence the capacity and quality of the food that is produced through agriculture.³⁰ In addition, if the sea level would rise, valuable coastal agricultural land is threatened. Farming causes an estimated 8.5 to 16.5 billion tonnes of carbon dioxide, or 17 to 32 % of all human-induced greenhouse gas emissions.³¹ The use of too much fertiliser accounts for the highest single share of agriculture's direct emissions, currently equal to some 2.1 billion tonnes of CO₂ per year. The second biggest direct emitters are animals. Cattle and sheep in particular, produce large amounts of the potent greenhouse gas methane when they digest food; levels are increasing as a result of the growing demand for meat. Each kilogramme of beef produced results in 13 kilos of carbon emission; for lamb each kilo produces 17 kilos of emissions.

It is not only these direct effects that contribute to climate change. Cutting down forests and other natural cover to make way for agricultural land for grazing, growing animal feed and other crops, removes vital carbon sinks, which causes an increase in global warming. Over the past twenty years, more than 300 million hectares of tropical forests, an area nearly as big as India, has been destroyed, mainly for animal farming.

1.15 Meat consumption and climate change

According to the FAO, the global meat industry uses 25 % of the global land mass (excluding land mass covered by ice). Some 33 % of available agricultural land is used for the production of fodder. Life stock uses 8 % of annual sweet water consumption. Some 18 % of all GHG emissions is related to the production of meat for human consumption. Between 1950 and 2000 meat production rose from 45 billion kilos to 233 billion kilos. Theoretically, limiting meat consumption could have a serious mitigating effect on GHG emissions.

According to CBS and MNP data, the total amount of Dutch emissions in 2006 amounted to 208 Mt (CO₂ equivalent). Of this, 19 Mt can be directly attributed to life stock³².

Extrapolating FAO, CBS and MNP data, instigating a 'meatless day' in the Netherlands could lead to a reduction of some 2,7 MT of emissions. The Dutch organisation *Milieu Centraal* calculates that the average daily meat consumption in the Netherlands is 114 grams per person, leading to an annual CO₂ emission of 475 kilograms of CO₂. For all Dutch citizens this adds up to 7,6 Mt. According to this model, a meatless day would in theory mean a reduction of some 1,1 Mt of CO₂ equivalent.

This remains theory because the actual mitigation effects largely depend on what alternative products are consumed.

The consultancy bureau *Blonk Milieuvadvis* has published a report on the environmental impact of meat consumption³³. Currently *Blonk Milieuvadvis* is working on a report on the CO₂ effects of meat production and consumption in the Netherlands (commissioned by the Dutch Ministry of the Environment, VROM). This report is expected to appear in the summer of 2008.

2. Climate change and development

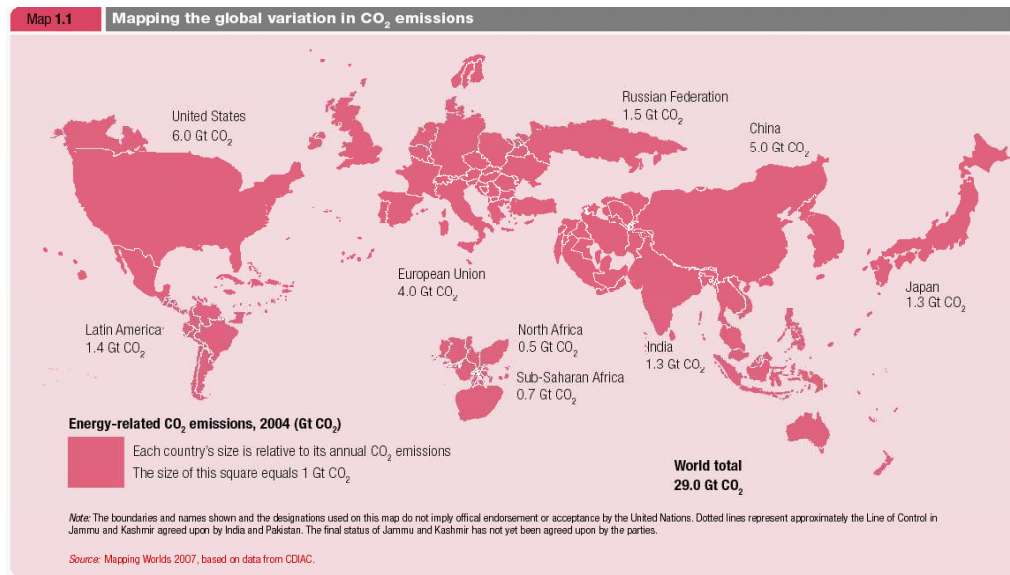
Climate change is one of the greatest obstacles to ending poverty and one of the gravest equity challenges of our time. Over the past century, the industrialised countries have been responsible for the vast majority of global carbon emissions. And yet the developing nations face the greatest difficulties in adapting to the impacts of global warming.

One of the conclusions of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) was that impoverished countries are least capable of coping with the impacts of climate change, including extreme weather events, sea-level rise, drought, disruption of water and food supplies, and negative impacts on health. "Poor communities can be especially vulnerable, in particular those concentrated in high-risk areas. They tend to have more limited adaptive capacities and are more dependent on climate-sensitive practices," the report states.

Most stakeholders agree that rich countries – as the current and historic polluters – have an obligation not only to cut their own emissions, but also to fund the adaptation needs of the most vulnerable poor countries. While mitigation, or the reduction of greenhouse gas emissions, has been the focus of the debate for decades, recently there has been increased pressure on rich countries to redress their historic contributions to the problem by devoting new funds to help poor countries adapt to climate change. This is in part due to the findings of the IPCC, which concluded "[that] even the most stringent mitigation efforts cannot avoid further impacts of climate change in the next few decades, which makes adaptation essential."

2.1 Carbon footprint

The historic responsibility of the industrialised countries had everything to do with their oversized 'carbon footprint'. A carbon footprint is a "measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide."³⁴ It is useful for individuals, organisations and nations to visualise their personal, organisational or societal impact in contributing to global warming. A tool in response to excessive carbon footprints, are *carbon offsets*, or the mitigation of carbon emissions through the development of alternative projects such as sustainable energy or reforestation. The Human Development Report 2007/2008 includes a map (p22) in which the size of a country is determined by its amount of CO₂ emission:



Other telltale facts cited in the HDR: representing 11 % of the world population, Sub-Saharan Africa produces just 2 % of global emissions; the inhabitants of New York City alone have a higher carbon footprint than all of the people living in the fifty poorest countries; The Netherlands emits more CO₂ than Bolivia, Colombia, Peru, Uruguay and the seven countries of Central America combined.

Data on historic emissions elucidate how the ecological 'space' for industrialised countries is much lower than for newly industrialising countries such as China, Brazil and India. According to the HDR: "Historic emissions amount to around 1,100 tonnes of CO₂ per capita for Britain and America, compared with 66 tonnes per capita for China and 23 tonnes per capita for India."

Measure your own carbon footprint on: <http://www.mycarbonfootprint.eu/>

2.2 Poor countries as victims of climate change

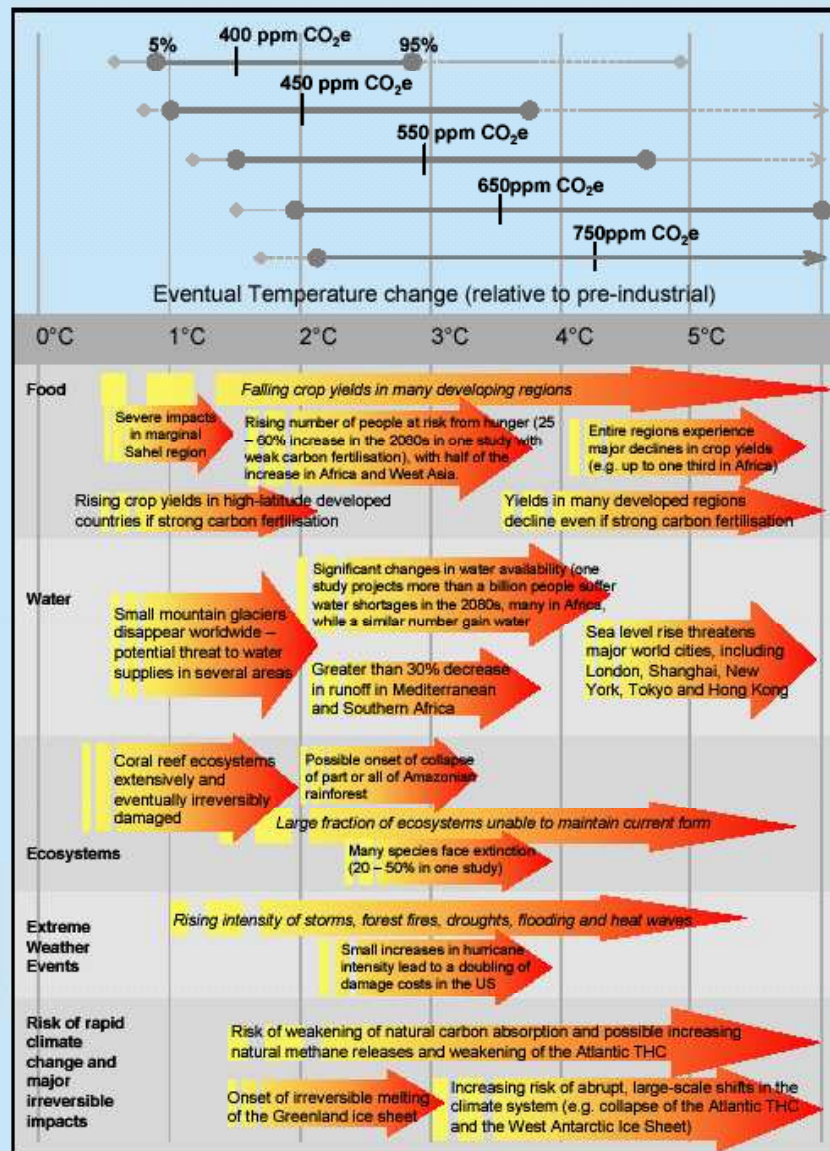
The Fourth Assessment Report of the Intergovernmental Panel on Climate Change projects some phenomena related to climate change and the effects on four sectors important to human survival.

Phenomenon ^a and direction of trend	Likelihood of future trends based on projections for 21st century using SRES scenarios	Examples of major projected impacts by sector			
		Agriculture, forestry and ecosystems [4.4, 5.4]	Water resources [3.4]	Human health [8.2, 8.4]	Industry, settlement and society [7.4]
Over most land areas, warmer and fewer cold days and nights, warmer and more frequent hot days and nights	Virtually certain ^b	Increased yields in colder environments; decreased yields in warmer environments; increased insect outbreaks	Effects on water resources relying on snow melt; effects on some water supplies	Reduced human mortality from decreased cold exposure	Reduced energy demand for heating; increased demand for cooling; declining air quality in cities; reduced disruption to transport due to snow, ice; effects on winter tourism
Warm spells/heat waves. Frequency increases over most land areas	Very likely	Reduced yields in warmer regions due to heat stress; increased danger of wildfire	Increased water demand; water quality problems, e.g., algal blooms	Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and socially-isolated	Reduction in quality of life for people in warm areas without appropriate housing; impacts on the elderly, very young and poor
Heavy precipitation events. Frequency increases over most areas	Very likely	Damage to crops; soil erosion, inability to cultivate land due to waterlogging of soils	Adverse effects on quality of surface and groundwater; contamination of water supply; water scarcity may be relieved	Increased risk of deaths, injuries and infectious, respiratory and skin diseases	Disruption of settlements, commerce, transport and societies due to flooding; pressures on urban and rural infrastructures; loss of property
Area affected by drought increases	Likely	Land degradation; lower yields/crop damage and failure; increased livestock deaths; increased risk of wildfire	More widespread water stress	Increased risk of food and water shortage; increased risk of malnutrition; increased risk of water- and food-borne diseases	Water shortages for settlements, industry and societies; reduced hydropower generation potentials; potential for population migration
Intense tropical cyclone activity increases	Likely	Damage to crops; windthrow (uprooting) of trees; damage to coral reefs	Power outages causing disruption of public water supply	Increased risk of deaths, injuries, water- and food-borne diseases; post-traumatic stress disorders	Disruption by flood and high winds; withdrawal of risk coverage in vulnerable areas by private insurers, potential for population migrations, loss of property
Increased incidence of extreme high sea level (excludes tsunamis) ^c	Likely ^d	Salinisation of irrigation water, estuaries and freshwater systems	Decreased freshwater availability due to saltwater intrusion	Increased risk of deaths and injuries by drowning in floods; migration-related health effects	Costs of coastal protection versus costs of land-use relocation; potential for movement of populations and infrastructure; also see tropical cyclones above

The Stern Report provides a graphic overview of likely consequences at different levels of temperature rise.

Figure 2 Stabilisation levels and probability ranges for temperature increases

The figure below illustrates the types of impacts that could be experienced as the world comes into equilibrium with more greenhouse gases. The top panel shows the range of temperatures projected at stabilisation levels between 400ppm and 750ppm CO₂e at equilibrium. The solid horizontal lines indicate the 5 - 95% range based on climate sensitivity estimates from the IPCC 2001² and a recent Hadley Centre ensemble study³. The vertical line indicates the mean of the 50th percentile point. The dashed lines show the 5 - 95% range based on eleven recent studies⁴. The bottom panel illustrates the range of impacts expected at different levels of warming. The relationship between global average temperature changes and regional climate changes is very uncertain, especially with regard to changes in precipitation (see Box 4.2). This figure shows potential changes based on current scientific literature.



Many of the signalled effects will occur to a stronger degree in developing parts of the world. And in any case, the adaptation capacity is much lower in poor countries. The UNDP cites some foreseeable effects climate change will have in developing countries:

- The breakdown of agricultural systems as a result of increased exposure to drought, rising temperatures, and more erratic rainfall, will leave up to 600 million more people facing malnutrition
- Semi-arid areas of sub-Saharan Africa with some of the highest concentrations of poverty in the world face the danger of dramatic

- productivity losses of 25% by 2060
- Some 1.8 billion people will face water stress by 2080, with large areas of South Asia and northern China facing a grave ecological crisis as a result of glacial retreat and changed rainfall patterns
- Displacement through flooding and tropical storm activity threatens up to 332 million people in coastal and low-lying areas
- Over 70 million Bangladeshis, 22 million Vietnamese, and 6 million Egyptians could be affected by global warming-related flooding
- Emerging health risks, with an additional population of up to 400 million people facing the risk of malaria

The Stern Report sums up three reasons why developing countries are extra vulnerable to climate change: “First, developing regions are at a geographic disadvantage: they are already warmer, on average, than developed regions, and they also suffer from high rainfall variability. As a result, further warming will bring poor countries high costs and few benefits. Second, developing countries - in particular the poorest - are heavily dependent on agriculture, the most climate-sensitive of all economic sectors, and suffer from inadequate health provision and low-quality public services. Third, their low incomes and vulnerabilities make adaptation to climate change particularly difficult.”

The HDR draws attention to extreme inequalities in adaptation capacity. Rich countries are investing heavily in climate-change defence systems, with governments playing a leading role. By contrast, in developing countries “people are being left to sink or swim with their own resources,” writes Desmond Tutu. Archbishop Tutu coined the phrase ‘adaptation apartheid’ for the difference in coping capacity between rich countries and poor countries.

In the HDR California is contrasted to northern Kenya. In California rising winter temperatures are expected to reduce snowfall in the Sierra Nevada mountain range. As this threatens the availability of water, California has developed an extensive system of reservoirs and water channels to maintain flows of water to the dry areas, while also investing heavily in recycling water. In northern Kenya increased frequency of droughts means that women are walking greater distances to fetch water, often ranging from 10 to 15 kilometres a day, according to the authors of the report. “This confronts women with personal security risks, keeps young girls out of school and imposes an immense physical burden—a plastic container filled with 20 litres of water weighs around 20 kilograms.”

Most reports calculate that between 50 and 86 billion dollars (around 0.2 percent of OECD countries’ combined gross domestic product) is needed annually, to help the poor in their lifesaving struggle against volatile natural developments. In contrast: current spending through multilateral mechanisms on adaptation in developing countries has amounted to 26 million (dollars? Euros?) to date; roughly worth one week spending on the United Kingdom’s flood defences. It is clear, of course, that adaptation funding can only be spent wisely if and when there are sensible and sustainable plans for adaptation.

2.3 Climate Change and gender equality

Not all poor people will be affected equally. Women, who make up 70 % of the world's poor, depend more than men on natural resources that are threatened by climate change. Poor women also lack access to and control over natural resources, technologies, and credit. As a result, they are more vulnerable to seasonal and episodic weather and to natural disasters resulting from climate change.

In the briefing Paper 'Gender and Adaptation'³⁵, Oxfam International summarises the underlying inequalities between men and women and the consequences these inequalities have when they face climate change. More information on gender mainstreaming in climate adaptation and mitigation can be found on the website Gender and Climate Change: <http://www.gencc.interconnection.org/index.html>.

On the eve of the Bali climate conference in 2007, an alternate high level panel led by former Norwegian Prime Minister Gro Harlem Brundtland and Mary Robinson, former President of Ireland, was convened to discuss the relationship between climate change and gender equality. The panel listed a number of recommendations³⁶:

- Gender equality is to be integrated as a cross-cutting issue in the climate negotiations and debates. Women's equal participation must be ensured.
- Governments should take advantage of women's specialised skills in various aspects of their livelihood and natural resource management strategies that lend themselves to mitigation and adaptation.
- Governments should analyse and identify gender-specific impacts and protection measures related to floods, droughts, heat waves, diseases, and other environmental changes and disasters. The global community should prioritise the reduction of the high levels of female mortality rates resulting from climate-induced disasters and livelihood changes.
- Given the vulnerability of the poor, and particularly women, to climate change, adequate funds must be allocated by industrialised countries to help these groups adapt to the impacts.
- Practical tools should be developed that allow governments and institutions to incorporate gender equality in climate change initiatives.
- Governments at national and local levels should develop strategies to enhance women's access to and control over natural resources, in order to reduce poverty, protect environmental resources, and ensure that women and poor communities can better cope with climate change.
- Capacity building and technology transfer measures should draw on priorities put forward by women and poor communities.
- The UNFCCC should develop a gender strategy and invest in gender-specific climate change research.
- Market-based approaches to curbing climate change, such as the Clean Development Mechanism, should be made accessible to both women and men and should ensure equitable benefits.

Between 19 – 22 October 2008 the Third Global Congress of Women in Politics and Governance will focus on gender and climate change. More information on:

<http://www.capwip.org/>.

2.4 Is there enough room for poor countries to develop?

This is the key question on the nexus of environment and development. It is clear that industrialised countries have reached a high level of development and material wealth through the irresponsible use of raw materials and by exercising disproportionate pressure on the 'Global Commons'. Are poor countries allowed to do the same? And: who will stop them if they try? The climate challenge is in fact a 'Tragedy of the Commons' on a global scale.³⁷ Essentially, climate negotiations are about the question how rich countries are willing to mitigate their emissions, and to what extent they are willing to pay for adaptation in poor countries.

When contemplating mitigation and burden sharing, most politicians and government officials highlight possible win-win situations, technical 'silver bullet' solutions and other measures that will not jeopardise the current 'way of life'. Apparently, the climate crisis is not perceived as serious and pressing enough to propose painful measures (such as limiting meat consumption or curtailing car use through law making). The crucial issue here is if climate change can be reversed without the developed world taking a serious step back? Or will climate change itself limit the possibilities of western affluence?

Even Nicholas Stern in his pessimistic Stern Report does not perceive a need for downsizing Western economies: "With strong, deliberate policy choices, it is possible to 'decarbonise' both developed and developing economies on the scale required for climate stabilisation, while maintaining economic growth in both."

Especially the United States seems unwilling to seriously contemplate mitigation. During the Bali climate negotiations, for example, the US-representatives successfully managed to eliminate from the 'Bali Roadmap' every reference to the need to reduce emissions by 25 to 40 % by the year 2020, in order to limit global temperature rise, as calculated by the IPCC.

3. What can be done? What must be done?

3.1. Mitigation

Mitigation of global warming involves reducing the extent of global warming, for example by decreasing the emission of greenhouse gasses.

Some of the possibilities for mitigation are

- Changing to non-carbon energy sources (wind, solar, nuclear, geo thermal, hydro etc)
- Changing to renewable carbon based fuels (biofuels)
- *Greening and cleaning* fossil fuel use
- Capture and storage of CO₂ and other greenhouse gasses
- Putting a cap on CO₂ emissions in combination with emission trading
- Reforestation, avoiding deforestation and restoring damaged forests
- Increasing the oceanic absorption capacity of CO₂
- Improving efficiency
- Saving energy
- Lowering human consumption
- Limiting or reversing population growth
- Downsizing economies

- Changing consumption patterns (e.g. less meat)

Within these broad categories, of course, many choices and options are possible.

3.2 Adaptation

Even if maximum mitigation efforts are made, it is clear that the temperatures on Earth will continue to rise, with possibly devastating effects. The IPCC report predicts that by 2100, average global temperatures will rise to at least 1.8°C and maybe as high as 4°C. In addition to mitigation, humanity must find ways to adapt to the effects of changing climate patterns. The IPCC uses the following definition of adaptation: “Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.”

Some examples of adaptation strategies:

- Constructing coastal defence systems
- Designing and building floating houses and cities
- Creating room to safely ‘store’ access river water
- Augmenting the water storage capacity of land alongside rivers
- Other types of water management
- Creating warning systems
- Relocating people to safer environments
- Research into agricultural varieties that can cope with drought, and/or erratic rainfall and inflow of salt water
- Constructing irrigation systems
- Constructing and augmenting irrigation and sewage capacities
- Changing economies towards other activities
- Changing policies and laws, for example regarding access to, and use of, land and water
- Building and adapting insurance systems

Capacity building and building awareness will be a vital element of all adaptation strategies. The Netherlands, of course, has a long history in protecting itself from rising water levels. But evidently climate conditions are becoming increasingly more erratic, which requires new technologies to be exploited and efforts to be intensified. For example, in the Dutch village of Maasbommel houses are constructed that will float when water levels rise. They provide a case study on how the (developed) world is adapting to the increased risk of flooding. Not only houses can be made to float. The Dutch urban architecture consultancy firm Deltasync designed a whole climate neutral floating city (<http://www.deltasync.nl/>).

Nicholas Stern estimates “[that] the additional costs of making new infrastructure and buildings resilient to climate change in OECD countries could be \$15 – 150 billion each year (0.05 – 0.5% of GDP).”

3.3 Kyoto Protocol

The Kyoto Protocol is an agreement between countries to reduce the emissions of greenhouse gases. It is the most important answer of the international community to climate change. The protocol was agreed up on in 1997, but only entered into force on 16 February 2005, when Russia ratified the agreement. The protocol is part of the

United Nations Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol now covers more than 170 countries. Only the US and Kazakhstan have signed, but not ratified the act. In the US, the protocol was signed under the Clinton administration, but under his successor, Bush, ratification proved impossible. The Kyoto Protocol expires in 2012. Negotiations are currently under way for a treaty to succeed this one.

The Kyoto protocol divides signatory countries into two categories. First, there are the developed countries (referred to as Annex I countries). Annex I countries have agreed to reduce their greenhouse gas emission and must submit an annual greenhouse gas inventory. Non-Annex I countries are developing countries. They are under no obligations to reduce greenhouse gas emission.

At the heart of the Kyoto protocol lies the agreement that, as of January 2008, and running through to 2012, the developed countries have to reduce their greenhouse gas emissions by a collective average of 5% below their 1990 levels. As current emissions are much higher than in 1990, this means that, for example, the EU must reduce its emissions to some 15% in 2012. Countries that fail to meet the Kyoto obligations will be penalised by the introduction of extra reduction obligations of 30%. In addition, that country will be suspended from making transfers under an emissions trading programme.

The Kyoto negotiations have resulted in three 'flexible mechanisms' that allow Annex I economies to meet their obligation to limit their greenhouse gas emission gradually.

- The Clean Development Mechanism (CDM) is an arrangement allowing industrialised countries to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. An important condition is that it must be established that the investment would not have occurred without the additional incentive provided by emission reductions credits.
- Joint Implementation (JI) allows an Annex I country to invest in emission reducing projects in another industrialised country as an alternative to emission reductions at home.
- Emissions trading is the third flexible mechanism. It allows countries to buy and sell emission rights. Only Annex I countries of the Kyoto Protocol with emission limitation and reduction commitments, may participate in such trading. The UNFCCC distinguishes four types of tradable emission rights. Each unit signifies an emission reduction of one tonne of CO₂.
 - An Assigned Amount Unit (AAU), these are the credits awarded to countries at the beginning of the system
 - A Removal Unit (RMU), these are credits for the storage of CO₂ through land use, land use change and forestry (LULUCF) activities
 - An Emission Reduction Unit (ERU) generated by a joint implementation project
 - A Certified Emission Reduction (CER) generated from a clean development mechanism.

Most Annex I countries have established designated national authorities to manage their greenhouse gas trading and CDM-projects.

Developing countries are sometimes critical towards the Kyoto Protocol. Kyoto is based on existing emission levels. Historic emissions are not taken into account, substantial polluting countries from the past are, in fact, rewarded with large emission rights based on past emissions. It would be fair to award equal emission rights per capita. Non-governmental organisations and even the European Parliament endorse this critique.

Another important criticism of the Kyoto Protocol is that it provides no instruments to compensate for climate damage in the South and hardly any funds for adaptation in the South.

Critics also point out that the CDM has not lived up to its expectations. Most countries feel that the burden of proof is too problematic and also Africa is completely neglected within the CDM-practice. The consequence of the system is that the least developed countries do not end up high on the list for investments. In addition, renewable energy has hardly been a target for CDM and JI-investors.

3.4 Bali

The 2007 United Nations Climate Change Conference was held in Bali between 3 and 15 December 2007.

The Bali agreement launches a two year negotiating process – called the ‘Bali Roadmap’ – aiming to secure a binding deal at the 2009 UN climate summit in Copenhagen, Denmark.

At Bali all countries acknowledged that evidence of the warming of the planet is ‘unequivocal’, and that delays in reducing emissions increase the risks of ‘severe climate change impacts’. Developed nations pledged to take on commitments that are ‘measurable, reportable and verifiable’, and ‘nationally appropriate’. Likewise, developing nations pledged to take ‘measurable, reportable and verifiable’ actions to secure sustainable development, supported by technology and enabled by financing and capacity building from rich countries. Rich countries pledged to consider ‘policy approaches and positive incentives’ to reduce deforestation and conserve forest cover, as well as funds from the World Bank to initiate pilot projects under the banner of Reducing Emissions from Deforestation in Developing countries (Redd). In addition, the rich countries promised enhanced cooperation to protect poorer countries against climate change impacts (adaptation). Finally, the rich countries promised to invest in the provision of financial and other incentives to scale up the transfer of clean energy technologies to the developing world.

The United States in particular refused to agree to specific reduction goals. In the final negotiations in Bali, the US representatives only agreed to refer to reduction goals in a footnote.

Even though the mere fact that the negotiators at Bali reached an agreement was good news, many non-governmental organisations were disappointed with the results of the Bali Conference. Greenpeace, for example, describes the Bali agreement as an insufficient instrument to provide an answer to the global climate crisis. The lack of concrete reduction promises is particularly disappointing, according to Greenpeace.

Some NGOs attending the Bali negotiations have stated that Bali focuses on the wrong solutions. They advocate an increased focus on the need of developed

countries to reduce their consumption patterns; capital transfer from rich countries to poor countries to finance adaptation and mitigation; an end to the use of fossil fuels; large investments in energy efficiency; the development of safe, clean and locally controllable renewable energy sources; and finally conservation of natural resources and facilitation of local control over energy, forests, land and water.

In short, they feel that justice should be the basis of the fight against climate change. These groups, mainly from developing nations, decided in Bali to form the 'Climate Justice Now!' Coalition.

3.5 The road to Copenhagen

The 'Road to Copenhagen' refers to the cycle of conferences hosted by the IPCC starting in Bali last December to Poznan in 2008 and Copenhagen in 2009. A rough estimate of the time table:

- March/April 2008: UNFCCC Working Session 1, aimed at developing a detailed work programme
- June 2008: UNFCCC Working Session 2, in conjunction with UNFCCC Subsidiary Bodies meeting
- July 2008 G8 Summit, creating momentum for the negotiations
- August/September 2008: UNFCCC Working Session 3
- November 2008: Roadmap to Copenhagen - second conference. This event will assess the preceding year and will send a strong message to the forthcoming UN negotiations in Poznan
- December 2008, in Poznan, Poland: UN Negotiations (COP 14) (what do COP 14 and 15 refer to?), together with the UNFCCC Working Session 4
- Summer 2009: G8 Summit to send signal to Copenhagen COP that negotiations must be completed at COP 15 in December 2009
- November 2009: Roadmap to Copenhagen - third Conference, to assess the preceding year and to give input to the forthcoming UNFCCC Copenhagen meeting
- December 2009, Copenhagen, Denmark: Completion of UN negotiations (COP 15) on a comprehensive post-2012 framework

In order to correct the lack of public participation in earlier debates, EU Commission Vice-President Margot Wallström, together with Gro Harlem Brundtland (former prime minister of Norway) and Mary Robinson (former president of the Republic of Ireland) have launched: www.roadtocopenhagen.org. This website hosts an online debate about the new agreement to be signed in Copenhagen.

Policy makers involved in the Road to Copenhagen must essentially substantiate the framework that was agreed upon in Bali. The *Bali Action Plan* relates to four topics: mitigation, adaptation, technology development and transfer, and financial investments.

Regarding mitigation the following issues are at stake:

- Setting a long-term global goal for emission reductions;
- Further emission reduction commitments and actions from all developed countries;
- Mitigation actions by developing countries in the context of sustainable

development, supported by technology, financing and capacity-building assistance from the developed world;

- Policies and incentives for reducing emissions through deforestation in developing countries

Regarding adaptation the plan lays out a comprehensive set of issues concerning the increasingly urgent adaptation needs of countries around the world. The plan specifically acknowledges the vulnerability of the least developed countries and the need for international cooperation to support the implementation of adaptation actions.

In Copenhagen a framework must be agreed upon to develop and deploy technologies to support mitigation and adaptation policies. Affordable and environmentally friendly technologies must be transferred to developing countries. The fourth topic is the financial investments needed. The Bali Action plan calls for consideration of a variety of ways to provide financial resources and investment to support mitigation, adaptation, and technology cooperation policies. Most stakeholders, both governmental and non-governmental, stress that funds for mitigation and adaptation should not be derived from current development assistance budgets. Extra money is needed to fight climate change, also in developing countries.

3.6 Personal Carbon Trading

Personal carbon trading refers to the idea of allocating emissions credits to individuals on a per capita basis, within national carbon budgets. Individuals would then have to hand in these credits when buying fuel or electricity. Individuals wanting or needing more energy would have to enter into emissions trading to secure more credits, just as companies currently are obliged to within the EU Emission Trading System (ETS). The underlying idea is that this system will motivate individuals to reduce their 'carbon footprint' through their lifestyle. Each citizen will receive a free annual quota of carbon that they can use to travel, buy food, and to generally go about their business. It has been suggested that by employing this system, two problems could be solved; pollution and poverty. Old age pensioners will be at an advantage, because they fly less often, so they could cash in their quota at the end of the year to pay heating bills, etc.

There are, as of yet, no large scale personal carbon trading systems in existence.

Climate specialists have suggested different ideas:

- The British environmentalist writer David Fleming, designed the Tradable Energy Quotas (TEQs) or Domestic Tradable Quotas (DTQs) in 1996. This idea was further developed by The UK's Tyndall Centre for Climate Change Research (www.tyndall.ac.uk/) and by the project RSA CarbonLimited (www.rsa.org.uk/projects/carbonlimited.asp)
- In their book 'How we can save the planet' Mayer Hillman and Tina Fawcett introduce Personal Carbon Allowances (PCAs). Information on PCAs can be obtained at the Oxford University Environmental Change Institute (www.eci.ox.ac.uk/)
- In 1995 in the US, environmentalist Dr. Kirk Barrett, invented the idea of Tradable Personal Pollution Allowances applicable to any form of pollution, including carbon dioxide

A Norwegian supermarket, the Strømmen Storsenter just outside Oslo, recently started selling CO₂ emission rights to the public. People can buy the right to emit one tonne of CO₂ for 165 Norwegian Kroner. The emission rights on sale are secured through the financing of a wind energy project in India.³⁸

3.7 Carbon Capture and Storage

Many experts are optimistic about the possibility to capture CO₂ and to store it underground, in empty oil or gas fields or in 'natural' geological formations, such as salt domes. Carbon Capture and Storage (CCS) seems like an elegant and effective solution against rising CO₂ levels in the atmosphere: we basically put the CO₂ back where it came from.

CCS is not yet part of the Kyoto Protocol. It is expected that CCS will be seriously discussed within the post-2012 framework of the Road to Copenhagen.

Although CO₂ has been injected into geological formations for various purposes, the long-term storage of CO₂ is a relatively untried concept. There are as of yet no power plants that operate with a full carbon capture and storage system.

CCS could reduce CO₂ emissions in the atmosphere by approximately 80-90%, according to calculations of the IPCC. Capturing and compressing CO₂, however, requires a lot of energy and would increase the fuel needs of a plant with CCS by about 11-40%. The costs of generating energy through CCS are estimated to rise by 21-91%.

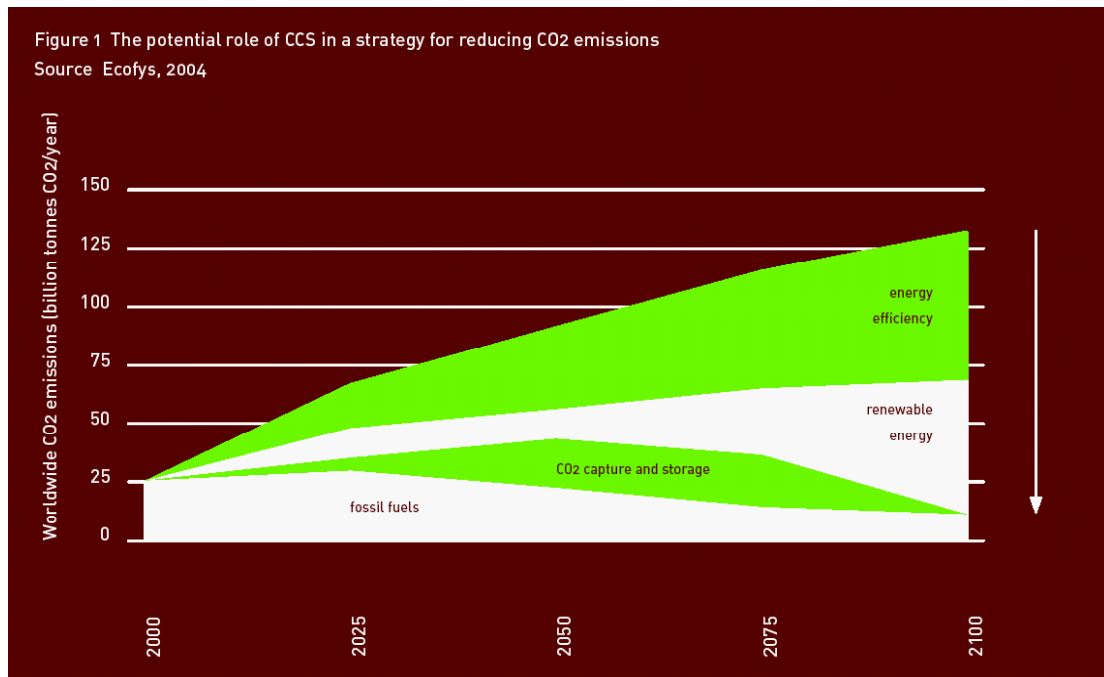
Storage capacity in geological formations is estimated at 2000 Gt CO₂ (currently, 30 Gt per year of CO₂ is emitted due to human activities). Ocean storage (e.g. by forming underwater CO₂ lakes) is believed to be environmentally risky and not permanent. Mineral storage is another option. This entails provoking a chemical reaction between CO₂ and minerals containing magnesium and calcium to form stable carbonates.

The IPCC calculates that the potential of CCS could be between 10% and 55% of the total carbon mitigation effort until the year 2100.³⁹

A report on CCS is available at:

http://www.energiened.nl/upload/bestellingen/publicaties/272_MakingCCSworkCompleet.pdf

At the request of EnergieNed and the Dutch Ministries of the Environment and Economic Affairs, research bureau Ecofys wrote a report on the possibilities of CCS in the Netherlands.⁴⁰ According to authors of the report, titled 'Making large-scale Carbon Capture and Storage in the Netherlands work', CCS in the Netherlands is commercially viable from 2020 onwards. In 2013 large scale tests should be possible. The Rotterdam and the Eemshaven areas are considered most suitable. The report also stresses the importance of a firm role of the Dutch government in developing the necessary technology, and in building and maintaining the required infrastructure such as transport networks and storage facilities. In any case, the Ecofys report predicts that CCS will only be a temporary, and limited, measure to reduce global green house gas emissions. It is vital that the more prominent solutions (energy efficiency and renewable energy sources) are developed and promoted simultaneously.



Source: *Making large-scale Carbon Capture and Storage in the Netherlands work*, p 15

On 3 April Energy Transition and the CATO programme (in collaboration with TNO and EON Benelux) organised the Third National Dutch Carbon Capture and Storage conference. The conference provided an overview of the current status and future plans for CCS in The Netherlands (further details at: <http://www.co2-cato.nl/>)

Greenpeace feels CCS is used as a rationalisation for enabling more coal-based energy plants, and this will divert the resources away from other options, such as energy saving and investment in renewable energy⁴¹. They also claim the technology is not yet applicable on a large scale and there is a risk of leakage. Greenpeace calls CCS an 'End of Pipe Technology'; it does not prevent CO₂ emission, but it relocates it. Greenpeace advocates other energy options, see: <http://www.greenpeace.nl/campaigns/broeikaseffect-en-klimaatveran/oplossingen>

In the report Green4Sure⁴², six Dutch Civil Society Organisations (ABVAKABO FNV, FNV Vakcentrale, Milieudefensie, Stichting Natuur en Milieu, the Wereld Natuur Fonds and Greenpeace!) do see a role for CCS in the necessary effort to reduce Dutch emissions by 50% in 2030. These organisations oppose subsidising CCS, however. On the Green4Sure site (<http://www.green4sure.nl/>) a (Dutch language) background report is available that (among other things) describes the process of CCS.

3.8 Why effective climate policies materialise slowly

Climate policies are slow to take effect. Large scale mitigation efforts that commence now, will, according to the HDR, only have an effect after 2030 and even then, world temperatures will continue to rise until 2050. This means that climate change policies have a far more long-term reach than the immediate political reality of current

politicians. Politicians and policy makers will not be rewarded within their term for the necessary, yet painful and expensive measures required to curb climate change. Another hindrance is the aforementioned 'Tragedy of the Commons' effect. Individual countries will not be rewarded for extra efforts to mitigate climate change. The burden of climate efforts rests solely on individual countries and the gains are shared collectively. In other words: failing to act for the common good is rewarded. Only international cooperation on the basis of agreed policies and measures can overcome this deadlock.

International competition among countries is a third obstacle to effective global greenhouse gas emission mitigation. For example, the rapid growth of the Chinese economy and the rise of China in challenging the position of the United States as the sole super power, is often seen to clarify the American reluctance to agree to bold steps in the reduction of greenhouse gas emission. The US fear that radical climate change measures will seriously hamper their economic growth and thus allow China to catch up.

Finally, it is difficult to communicate the urgency of climate change. There is a time lapse of about thirty years between our actions and the effects of these actions on the global climate. This means the real results of the last thirty years of unbridled emissions will only materialise in the next thirty years.

In a recent report⁴³ the Dutch HIER campaign proposes five building blocks for an effective societal campaign:

- A strategy focussed on real urgency
- Visible landmarks of real change
- Visible changes in the supply towards consumers
- Coherence in all communications
- Leaderships and taking responsibilities

3.9 How to finance the fight against climate change

Climate change is expensive. The effects of rising temperatures will have enormous economic consequences. One small example: in Egypt, a 0.5 metre increase in sea level is estimated to lead to economic losses in excess of US\$35 billion and the displacement of two million people.

It is extremely difficult to predict the total economic costs of climate change. The Stern Report states: "With 5-6°C warming - which is a real possibility for the next century - existing models that include the risk of abrupt and large-scale climate change estimate an average 5-10% loss in global GDP, with poor countries suffering costs in excess of 10% of GDP." Taking some other, more pessimistic, considerations into account, Stern predicts: "... a reduction in consumption per head of between 5 and 20%."

If there is radical mitigation of emissions, it would be possible to keep CO₂-levels stable at 550ppm. According to Stern "the cost of emissions reductions consistent with a trajectory leading to stabilisation at 550ppm CO₂ equivalent is likely to be around 1% of GDP by 2050."

With regard to the Dutch situation the NGOs Green4Sure report calculates that the total expenses to accomplish a 50% reduction in emission would amount to some 4

billion Euro annually. This is less than 0.7 % of the current Dutch GNP. At the same time, mitigation efforts will result in 40,000 extra FTEs in employment possibilities.

The extra money required for adaptation in developing countries is between 50 to 86 billion dollars annually, if global temperatures do not rise above 2 degrees Celsius. International aid plays a crucial role in adaptation policies. The Human development Report is, however, pessimistic about the availability of aid funding. In 2006 aid levels fell by 5% (not taking into account the debt cancellation Iraq enjoyed). The HDR stresses that it is important the financing of adaptation is additional, and not at the expense of conventional aid. Inevitably, development initiatives will switch their focus from direct poverty alleviation to climate change adaptation, thus weakening the poverty alleviation efforts. Also climate change itself will reduce the effectiveness of development aid, as, for example, natural disasters are likely to destroy what has been built through development cooperation.

The HDR summarises the existing adaptation facilities:

- The Least Developed Country Fund finances the National Adaptation Programmes of Action (NAPAs). NAPAs are intended to identify the local needs for adaptation in developing countries, and to simultaneously develop a framework for bringing adaptation into mainstream national planning. As of yet only twenty NAPAs have been made. Actual spending in terms of delivery through projects is less than 10 million US dollars
- The Special Climate Change Fund has been assured US\$67.3 million, of which US\$56.7 million is earmarked for adaptation. Actual spending under projects to date amounts to US\$1.4 million
- The Strategic Priority on Adaptation earmarks US\$50 million over a three year period for pilot projects in a wide range of areas, notably ecosystem management. To date, US\$28 million has been committed, of which US\$14.8 million has been disbursed
- Under the Kyoto Protocol the Adaptation Fund was created. This Fund will receive its resources (estimated at between US\$160–950 million by 2012). However the Adaptation Fund has not yet supported any activities.

According to the 'Polluter Pays Principle', industrialised countries should finance the bulk of adaptation measures, also in developing countries. Most experts stress that it is important that this is not financed out of the current aid budgets, but additional funds must be obtained. An obvious source of additional funds can originate from the auctioning of carbon emission rights. A part of the revenue of the auctions should be targeted towards adaptation in developing countries.

4. Climate sceptics

Global warming sceptics, or climate change sceptics are usually individuals or groups who disagree with the warnings issued by both environmental groups and (the majority) of climate experts and scientists. They specifically question the scientific value of the IPCC reports. Their comments usually follow one or more of the following lines:

- There is no conclusive evidence that climate change is happening
- The changes in measured temperatures are part of the natural cycle

- Even if the changes are human induced, the scale is not sufficiently large to validate changes beyond some sensible 'least cost' measures.
- The economic impact of making substantial cuts in greenhouse gas emissions on the scale suggested by the IPCC or other groups is too large

The number of climate scientist actually dissenting from the views of the IPCC is relatively small. Their voice, however, is amplified through the work of critical journalists, writers and social/political scientists. The main argument of social/political scepticism is that climate worries are perceived as 'a hype'. Many sceptics also point out that the international environmentalist movement has funded many of the most alarmist climate studies.

Internationally the best known sceptic is Björn Lomborg, associate professor of statistics at the Department of Political Science at the University of Aarhus, Denmark. In the Netherlands economist Hans Labohm, professor at the Dutch Institute of International Relations Clingendael and the Netherlands Defence College, is the most outspoken Dutch climate sceptic.

Some organisations and initiatives active in promoting climate scepticism are: The Competitive Enterprise Institute, the George C. Marshall Institute, the Institute of Economic Affairs, the International Policy Network (UK), the Scientific Alliance (UK) and the Heidelberg Appeal.

Oil Company Exxon has been active in financing dissenting climate change studies⁴⁴. An influential TV documentary feeding the public scepticism on climate change was The Great Global Warming Swindle⁴⁵. This British film argues against the scientific consensus that human activity is the main cause of global warming. The film, made by British television producer Martin Durkin, showcases scientists, economists, politicians, writers, and others who are sceptical of the scientific consensus on anthropogenic global warming. The programme's publicity materials assert that man-made global warming is 'a lie' and 'the biggest scam of modern times'. The film particularly targets the Oscar winning film 'An Inconvenient Truth', claiming the film maker/politician Al Gore deliberately misrepresented scientific facts on a number of occasions.

The UK's Channel 4 premiered the documentary on March 8, 2007. In June 2007 a short version of the documentary was shown on Dutch television (KRO).

5 Actors

5.1 Some of the major international organisations on climate change

UNFCCC

The UNFCC is the leading UN organisation on climate change negotiations. At the UN Conference on Environment and Development in 1992 a treaty was produced, the United Nations Framework Convention on Climate Change (UNFCCC), which aimed to reduce global warming., In 1997 a number of nations approved an addition to the treaty: the Kyoto Protocol, with more legally binding measures. The UNFCCC-secretariat supports all institutions involved in the climate change process. The next big event is the UNFCC Copenhagen Climate Conference 2009. During this conference the parties of the UNFCCC meet for the last time at government level

before the climate agreement needs to be renewed, and the post-Kyoto framework must implemented. www.unfccc.int

IPCC

The IPCC is a scientific intergovernmental body set up by the World Meteorological Organisation (WMO) and by the United Nations Environment Programme (UNEP). IPCC provides information about climate change by assessing the latest scientific, technical and socio-economic literature, produced worldwide, relevant to the understanding of the risk of human-induced climate change, and the impacts and options for adaptation and mitigation. IPCC's reports are the basis of climate negotiations under the UNFCCC. IPCC reports should be neutral with respect to policy, be of high scientific and technical standards, and they should aim to reflect a range of views, expertise and encompass wide geographical coverage. In December 2007, the IPCC was awarded The Nobel Peace Prize 2007 "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change."

www.ipcc.ch

United Nations Environment Programme (UNEP)

The mission of UNEP is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations. Responding to the needs of the countries and following the request from the UNFCCC Secretariat, UNEP/DEC has initiated and implemented a major programme on climate change. The objectives of this project are to provide to governments additional tools for promoting climate change awareness at the national level. In 2007 UNEP published 'Climate Action', an international communication platform established together with Sustainable Development International, to educate businesses, governments and NGOs as to what they can do to reduce their carbon footprint and adapt to the impacts of climate change.

www.unep.org

OECD

The Organisation for Economic Co-operation and Development, OECD, analyses policies and their impacts on the environment and the economy. It is a forum where the governments of thirty market democracies work together to address the economic, social and governance challenges of globalisation as well as to exploit its opportunities. The OECD has an Environment Directorate, but also in other Directorates like Trade and Agriculture or Economics climate change is a key topic. In 2002 OECD initiated the Development and Climate Change Project to explore possible trade-offs in 'mainstreaming' climate change responses in development co-operation projects, development plans and activities. The focus is on links between climate change, natural resource management and economic development plans in developing countries. www.oecd.org,

http://www.oecd.org/topic/0,3373,en_2649_37465_1_1_1_1_37465,00.html

Global Environment Agency

The Global Environment Facility (GEF), established in 1991, helps developing countries fund projects and programmes that protect the global environment. GEF grants support projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. GEF is an independent financial organisation. Funds are contributed by donor countries and the projects are managed by UNEP, UNDP and the World Bank.

www.thegef.org

International Energy Agency (IEA)

The International Energy Agency (IEA) acts as energy policy advisor to 27 member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Its mandate is to incorporate the 'Three E's' of balanced energy policy making: energy security, economic development and environmental protection. Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major consumers and producers of energy like China, India, Russia and the OPEC countries. The IEA conducts a broad programme of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices. www.iea.org

The Climate Alliance

The Climate Alliance unites some 1,400 cities and municipalities worldwide in the struggle to mitigate GHG emissions. <http://www.klimabuendnis.org/>

5.1.2 International research institutions

Worldwide, there are hundreds of research institutes devoted to climate change and sustainability. Some prominent institutes:

World Resource Institute

The World Resources Institute (WRI) is an environmental think tank looking at practical ways to protect the earth and improve people's lives. The mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations.

<http://www.wri.org/>

Worldwatch Institute

The Worldwatch Institute is an independent research organisation that works towards an environmentally sustainable and socially just society, in which the needs of all people are met without threatening the health of the natural environment or the well-being of future generations. <http://www.worldwatch.org/>

The website http://www.nlbif.nl/browse_organisations.php provides a list of Dutch research organisations on sustainability (with a focus on animal life)

At the website of the California Energy Commission a number of scientific documents on climate change can be accessed:

[http://www.energy.ca.gov/publications/searchReports.php?pier1=climate change](http://www.energy.ca.gov/publications/searchReports.php?pier1=climate%20change)

5.2 Europe - an overview of EU policies and European organisations focussing on climate change

In 1991 the European Commission initiated the first Community strategy to limit CO₂ emissions and improve energy efficiency. The EU wanted to limit its greenhouse gas emissions to 8% below 1990 levels by 2008-2012. The strategy included a directive to promote electricity usage from renewable energy, voluntary commitments by car producers to reduce CO₂ emissions by 25% and proposals on the taxation of energy products.

However, these actions needed to be reinforced by the European Commission and the EU member States, to reach the goals set by the Kyoto Protocol. The Commission responded in June 2000 by launching the European Climate Change Programme (ECCP). The goal of the ECCP is to help ensure the EU meets its targets and to identify and develop all the necessary elements of an EU strategy to implement the Kyoto Protocol. In 2005 the second ECCP was launched (<http://ec.europa.eu/environment/climat/eccp.htm>).

In March 2007 the EU Prime Ministers agreed upon Energy and Climate Policies, including:

- a 30% reduction of greenhouse gas emissions 1990 - 2020 on the condition that other countries also commit themselves to reductions, and with a view to reduce GHG emissions 60-80% by 2050. If an international agreement is not possible, they agreed that the EU countries must reduce GHG emissions at least 20% during the period 1990 - 2020
- A binding target to increase renewable energy to 20% of the primary energy supply in 2020 for the EU countries combined,
- An indicative energy efficiency target of 20% increase until 2020, and
- A binding target for increase of bio fuels in transport fuels in sustainable ways to 10% by 2020

Following the agreements on a European energy policy and climate targets, in January 2008, the EU Commission launched a package of legal measures to implement policy targets:

- A directive on renewable energy, including the aim to reach a national target of 20% renewable energy in 2020 by the EU-27
- An aim to reach the target of 10 % renewable energy in transport by 2020 (instead of the proposed 10% biofuels target),
- Sustainability criteria for biofuels

5.2.1 A few European organisations:

European Environment Agency

The EEA is an EU agency which aims to support sustainable development and to help achieve improvement in Europe's environment through the provision of timely, targeted, relevant and reliable information to policy making agents and the public.

www.eea.europa.eu

Eionet

Eionet is a partnership network of the European Environment Agency (EEA) and its members and cooperating countries. Eionet provides data, information and expertise for assessing the state of the environment in Europe and the pressures acting upon it.

<http://www.eionet.europa.eu/>

European Topic Centre on Air and Climate Change (ETC/ACC)

The European Topic Centre on Air and Climate Change (ETC/ACC) assists the EEA in its support to EU policy in the field of air pollution and climate change.

<http://air-climate.eionet.europa.eu/>

5.3 Netherlands - some Dutch governmental initiatives and policies on climate change

The official policy of the Dutch government is to establish The Netherlands as one of the cleanest countries realising the highest energy efficiency of Europe. According to the Kyoto Protocol and the EU agreements, the Netherlands needs to reduce its emissions by 6% between 2008 and 2012 (compared to its 1990 emission levels). The Ministry of VROM aims to reduce emissions while focussing on efficient energy use, sustainable energy and the reduction of dependence on fossil fuels.

Moreover, the Dutch government wants:

- To reduce emissions (of especially CO₂) in 2020 by 30% in comparison to 1990
- To double the reduction of energy use in the next years from 1% to 2% a year
- To intensify the use of sustainable energy in 2020, from 2% to 20% of the total energy use

One of the ways to reach this last goal is to double the capacity of wind energy on land, from 1500 Megawatt to 3000. Therefore 500 new windmills need to be built. In 2008 the government has allocated 140 to 500 million Euro extra in order to achieve these goals, in addition to the existing budget of 1,3 billion Euro.⁴⁶ But Dutch corporations will make a contribution as well. In 2007 the Dutch government and Dutch businesses signed a sustainability agreement. The corporate world will invest maximum efforts into reducing emissions by 20% in 2020.

Senternovem is an agency on sustainability linked to the Dutch ministry of Economic Affairs. Senternovem can assist companies in achieving sustainability and it provides an overview of the existing Dutch programmes on sustainability and climate change.

Website: <http://www.senternovem.nl/>. Reports are available at:

<http://www.senternovem.nl/senternovem/publicaties/index.asp>

The Nederlandse Emissie Autoriteit (NEA) is the Dutch authority monitoring the trade in emission rights. <http://www.emissieautoriteit.nl/>

Through the Dutch ministry of development Cooperation, the Netherlands supports developing countries adapting to climate change consequences.

The Netherlands Climate Assistance Programme (NCAP) assists developing countries to become self-supporting in formulating climate policy.

<http://www.nlcap.net/>

The Dutch government realises that drastic climate change will ruin the feasibility of reaching the Millennium Development Goals. Therefore, during the July 2007 Schokland manifestation, attention was also focussed on climate. During the manifestation the Dutch Government together with some 25 non-governmental organisations and research institutions, signed the Climate Agreement of Schokland⁴⁷.

The Dutch HIER campaign stresses the need for extra investments by the Dutch government. For example:

- Extra financial compensation awarded to developing countries for adaptation, approximately 600 billion Euros in addition to current ODA
- Substantially increased Dutch contributions to funding aimed at combating deforestation in developing countries
- A Dutch contribution to 'green' energy use in developing countries
- The Netherlands should play a leading role in advocating 'green' international shipping. This sector emits more greenhouse gasses than air traffic

5.3.1 What can local governments do?

Local governments, particularly municipalities, play an important role in the reduction of emissions and global warming. Around 50 % of the world's population lives in cities (set to reach 60 % by 2030) and they consume some 75% of the world's energy and are responsible for 80% of GHG emissions.⁴⁸ There is a broad range of possibilities for municipalities to contribute positively to mitigate climate change, for example through buying sustainable materials, by making energy agreements with housing corporations in relation to building or renovating houses. In addition, local governments can use energy efficient streetlights or stimulate the use of sustainable energy resources.

In the Netherlands the local and central governments reached a climate agreement for 2007-2011⁴⁹. This agreement contains stipulations on:

- a sustainable government
- sustainable energy production
- clean and efficient mobility
- energy efficiency in built-up areas
- sustainable (agrarian) companies
- adaptation of the living environment

For more information about this agreement:

http://www.vng.nl/Documenten/Extranet/Fei/Milieu/Klimaataakkoord_12_nov_2007.pdf

5.4.1 Examples of local initiatives

Rotterdam and the port of Rotterdam are responsible for 25% of the Dutch CO₂ emissions. Rotterdam wants to cut this figure in half by 2025 with the Rotterdam Climate Initiative. This initiative involves the cooperation of four parties: the municipality Rotterdam, the port of Rotterdam (Havenbedrijf Rotterdam NV), DCMR, Milieudienst Rijnmond and Deltalinqs. They aim to transform Rotterdam into the World Capital of CO₂ free energy. Through this initiative, Rotterdam is making an important contribution to the Dutch and European goal of -30% CO₂ in 2020. <http://www.rotterdamclimateinitiative.nl/>

In November 2007, representatives from 14 ports convened in Rotterdam to discuss initiatives and approaches towards reducing CO₂ emissions. The ports were brought together under the auspices of the 'C40 Large Cities Climate Leadership Group' with the support of the Clinton Climate Initiative. On 9, 10 and 11 July 2008, the World Ports Climate Conference will be held in Rotterdam. At that occasion, delegates of more than thirty ports and cities will attend to endorse a common declaration on the contribution of world ports to fight climate change.

<http://www.wpccrotterdam.com/>

Other examples of local government climate policy in the Netherlands, such as;

- Energy efficient housing in Overbetuwe
- A sustainable and energy efficient local government office in The Hague
- A sustainable school building in Groningen

http://www.vng.nl/Documenten/Extranet/Klimaat_op_de_kaart.pdf

5.4.2 Other Dutch organisations that focus on local governments

Klimaatverbond

This is a Dutch network of local governments that works on projects, exchanging knowledge. Furthermore, the network tries to initiate an effective local climate policy, to execute it and to make it visible. 123 municipalities and 11 provinces are members. The Klimaatverbond is the Dutch chapter of the Climate Alliance

<http://www.klimabuendnis.org/>, <http://web-data.net/KVN/>

Vereniging van Nederlandse Gemeenten (VNG)

VNG is the Association of Netherlands Municipalities. VNG protects the interests of municipalities, provides products and services adapted to their needs and provides a joint platform for communication. In 2007 the Dutch national government and Dutch municipalities signed the 'Klimaatakkoord Gemeenten en Rijk 2007-2011'. In this agreement both parties promise to work together towards the aim of making our country more sustainable. The VNG supports municipalities in this effort.

www.vng.nl, climate and energy <http://www.vng.nl/smartsite.dws?id=1771>

COS-Nederland (regional centres for international development cooperation) has launched the 'Duurzaamheidsmeter' where local governments can assess their contribution to sustainability. <http://www.duurzaamheidsmeter.nl/>

5.5 Corporate initiatives

The Bali Communiqué

On the 30 November 2007, 150 global business leaders published the Bali communiqué with a call for a comprehensive, legally binding UN framework to tackle climate change.

Some of the biggest companies and brands from around the world have endorsed this initiative. The Prince of Wales's UK and EU Corporate Leaders Groups on Climate Change played a leading role in the development of the communiqué.

<http://www.balicommunique.com/>

Corporate Leaders Group on Climate Change (CLG)

The Corporate Leaders Group on Climate Change (CLG) brings together business leaders from major UK and international companies (like ABN AMRO, Unilever, Philips, Vodafone and Shell) who believe that there is an urgent need to develop new and longer-term policies in the field of climate change.

<http://www.cpi.cam.ac.uk/bep/clgcc>

Respect Table

Respect Table is an initiative by a number of large companies (among others: Ikea, Whirlpool, Heineken, Toyota, Proctor & Gamble, Reed Elsevier and Triodos) to contribute positively to a comprehensive post-Kyoto strategy.

<http://www.respecteurope.com/DesktopDefault.aspx?tabindex=1&tabid=134&parentid=110&pindex=1&superiorid=134&binde=134>

Many business sectors have initiated structures and research platforms devoted to 'greening' their activities. For example, the cement industry founded the Cement Sustainability Initiative (CSI) to help the cement industry to address the challenges of sustainable development. The cement industry is a major contributor to GHG emissions. See: <http://www.wbcdcement.org/>

EnergieNed

The Dutch EnergieNed federation, under the chairmanship of Hans Alders, unites companies from the Dutch energy sector. EnergieNed is involved in promoting sustainable development and mitigating climate change. Various documents, policy statements and comments can be viewed and downloaded on the website of EnergieNed: <http://www.energiened.nl/>

5.6 Civil society organisations on climate change

HIER

HIER (Dutch for 'Here') is a large Dutch climate programme that is based on the fundamental idea that the immediate necessity to implement adaptation projects and initiatives to climate change needs to be stressed. More than 40 national charity organisations, the government and businesses are involved in this campaign. HIER also lobbies for domestic emission reduction, a stronger role for natural climate buffers in Dutch climate adaptation policies and more financial support for climate

adaptation in developing countries. There is a list of organisations and businesses that are involved in the HIER campaign at: <http://www.hier.nu/hier/partners/>

Many countries have national climate coalitions. A few examples are:

Australia - Climate movement www.climatemovement.org.au

Belgium - Klimaatcoalitie www.klimaatcoalitie.be

Canada - Chaos Coalition www.actfortheearth.org/climatechaos

Germany - Klima-Allianz www.die-klima-allianz.de

New Zealand - Climate Defence Network www.climatedefence.org.nz

Spain - Movimiento Clima www.movimientoclima.org

UK - Stop Climate Chaos www.stopclimatechaos.org

Campaign against Climate Change www.campaigncc.org

USA - Climate Crisis Coalition www.climatecrisiscoalition.org

Step it up <http://stepitup2007.org/>

There is a list of Dutch and international civil society actors and research institutes on climate change/global warming at:

<http://www.klimaatvoorruinte.nl/pro1/general/start.asp?itemid=75&i=7&j=3&k=0&p=0>

5.6.1 Some relevant international civil society organisations

Greenpeace International

Greenpeace is an independent global, environmental campaigning organisation. Climate change is a priority issue for Greenpeace. They 'name names, protest corporations, shame governments and help to make climate change solutions a reality'. <http://www.greenpeace.org/international/campaigns/climate-change>

WWF, World Wide Fund For Nature

The World Wide Fund for Nature is a non-profit organisation. Its mission statement is to stop the degradation of the planet's natural environment and to build a future where humans live in harmony with nature, by:

- Conserving the world's biological diversity
- Ensuring that the use of renewable natural resources is sustainable
- Promoting the reduction of pollution and wasteful consumption
- Stopping the degradation of the planet's natural environment

Climate change is one of their main points of focus. WWF also tries to involve the corporate world. For example, through the One Planet Leaders initiative, a sustainability programme, which enables business managers to explore, challenge and apply the latest thinking on sustainable business practice. The WWF national organisation in the Netherlands is WNF, Wereld Natuur Fonds.

WNF: Climate

http://www.wnf.nl/nl/wat_wnf_doet/werkerreinen_wnf/klimaat/index.cfm

WWF: Climate change

http://www.panda.org/about_wwf/what_we_do/climate_change/index.cfm and WWF's Vision for 2050 <http://assets.panda.org/downloads/climatesolutionweb.pdf>

Friends of the Earth International (FOEI)

FOEI is a grassroots environmental network, uniting 70 national member groups and some 5,000 local activist groups around the world. Friends of the earth 'challenge the current model of economic and corporate globalisation, and promote solutions that will help to create environmentally sustainable and socially just societies.'

In the Netherlands FOEI is represented by Milieu Defensie. <http://www.foei.org/>

IUCN

IUCN, the World Conservation Union, is the world's largest network. The Union brings together 82 States, 111 government agencies, more than 800 non-governmental organisations (NGOs), and some 10,000 scientists and experts from 181 countries in a worldwide partnership. The Union's mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

<http://www.iucn.org>

The Dutch IUCN committee: <http://www.iucn.nl/>

C40 Cities Climate Leadership Group

C40 is a group of the world's largest cities committed to tackling climate change. In 2006 the 'C40 Cities Climate Leadership Group' started a partnership with the Clinton Climate Initiative. <http://www.c40cities.org/>

Clinton Climate Initiative (CCI)

In August 2006 the Clinton Foundation launched the Clinton Climate Initiative (CCI) with the mission of applying the Foundation's business-oriented approach to the fight against climate change in practical, measurable and significant ways.

<http://www.clintonfoundation.org/index.htm>

<http://www.clintonfoundation.org/cf-pgm-cci-home.htm>

Al Gore's initiatives

In addition to his Oscar-winning movie 'An Inconvenient Truth' (see:

<http://www.climatecrisis.net/>), former US vice-President Al Gore initiated two

organisations on climate change: the Alliance for Climate Protection and the Climate Project. On his website, Gore also links to the Live Earth website

<http://www.liveearth.org/>, <http://www.algore.com/>

Earth Charter Initiative

The Earth Charter Initiative has a special focus on climate change on their website:

<http://www.earthcharterinaction.org/climate/>

Climate Justice

The Climate Justice initiative is a collaboration of lawyers and campaigners around the world encouraging, supporting, and tracking enforcement of the law to combat climate change. <http://www.climatelaw.org/>

Global Reporting Initiative

The Global Reporting Initiative (GRI) has pioneered the development of the world's most widely used sustainability reporting framework and is committed to its continuous improvement and application worldwide. This framework sets out the principles and indicators that organisations can use to measure and report their economic, environmental, and social performance. The Global Reporting Initiative is a collaborating centre of UNEP. It is a large multi-stakeholder network of thousands of experts, in dozens of countries worldwide, who participate in GRI's working groups and governance bodies, use the GRI Guidelines to report, access information in GRI-based reports, or contribute to develop the Reporting Framework in other ways – both formally and informally.

<http://www.globalreporting.org/Home>

The SEED initiative

The SEED Initiative supports and researches partnerships for locally-led sustainable development. The Seed Initiative is a “pathfinder, seeking new knowledge and understanding its partners and others’ need”. To remain fresh and ‘on the edge’ SEED-project cycles are never longer than two years. The supporters of SEED are the Dutch Ministry of Foreign Affairs, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Swiss Re, the British Department for Environment, Food and Rural Affairs and Global Compact. The core partners are IUCN, UNDP and UNEP and the channel coordinators are the International Institute for Sustainable Development and the Collective Leadership Institute.

<http://seedinit.org/>

5.7 What can individuals do?

Individuals can contribute to the reduction of global warming by saving energy with a proper insulated house and by minimising their electricity use. People can minimise their electricity use through efficient lighting and efficient refrigerators, washing machines, etc.⁵⁰ Other contributions; travel by bike instead of a car; start car pooling; use airplanes as little as possible; and eat less meat. Individuals can also join a campaign, become a volunteer, make a donation, sign petitions or compensate CO₂ emissions.

Nowadays there are a lot of companies selling ‘climate neutral’ products or services. This means that these products, services and companies do not contribute to global warming. The companies and their products and services are climate neutral through emission reduction, the use of sustainable energy resources and the compensation of the remaining emissions. It is possible to compensate flights, the use of a car or the energy use of a household.

For example, compensation can be realised by planting trees or investing in sustainable energy (like windmills). Some tree planting projects have recently been criticised because they were not ‘additional’ and would have taken place anyhow.

A number of Dutch companies (e.g. Essent, Greenchoice or Rabobank) have initiated <http://www.klimaatcompensatie.nl>. On this website stakeholders can access information these companies provide on their contribution to global warming. The label 'Klimaatcompensatie' guarantees customers that the company lives up to certain climate criteria⁵¹.

5.7.1 Some websites on individual action

Climate neutral living (website Milieu Centraal):

Climate neutral flying

www.milieucentraal.nl/pagina?onderwerp=Klimaatneutraal%20vliegen

Climate neutral driving

www.milieucentraal.nl/pagina?onderwerp=Klimaatneutraal%20autorijden

Climate neutral energy use

www.milieucentraal.nl/pagina?onderwerp=Klimaatneutraal%20aardgas

Other sites on climate compensation:

www.greenseat.com, www.treesfortravel.nl, www.climateneutralgroup.com,
www.klimaatcompensatie.nl, www.klimaatneutraal.biz

Knowing your carbon footprint www.carbonfootprint.com or climate footprint www.dekleinearde.nl/klimaat

Cool Climate:

A network of more than 10,000 people, among them writers, actors and journalists. Cool Climate wants a climate law and 3% reduction of CO₂ emissions every year.

www.coolclimate.nu

¹ See: <http://www.iea.org/Textbase/npsum/WEO2007SUM.pdf>

² Source: http://www.ec.gc.ca/climate/overview_what-e.html en Wikipedia

³ Hegerl, Gabriele C.; et al: 'Understanding and Attributing Climate Change' (PDF) ((2007). 'Climate Change 2007: The Physical Science Basis'. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 690.

Intergovernmental Panel on Climate Change, http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_Ch09.pdf

⁴ Download at: <http://www.fao.org/docrep/010/a0701e/a0701e00.htm>

⁵ Wikipedia climate change

⁶ Quoted at: http://en.wikipedia.org/wiki/Carbon_dioxide_sink

⁷ Source: <http://www.foei.org/en/campaigns/climate/faq.html>,
<http://lwf.ncdc.noaa.gov/oa/climate/globalwarming.html>,
http://www.ec.gc.ca/climate/overview_what-e.html

⁸ UN report: 'The World at Six Billion', (1999),
<http://www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf>

⁹ Ron Nielsen: 'The Little Green Handbook', Picador, New York (2006)

¹⁰ http://en.wikipedia.org/wiki/World_energy_resources_and_consumption

¹¹ CIA: 'The World Factbook': <https://www.cia.gov/library/publications/the-world-factbook/index.html>

¹² BP: 'Statistical Review of World Energy' (2006),

http://www.bp.com/liveassets/bp_internet/switzerland/corporate_switzerland/STAGING

[/local_assets/downloads_pdfs/pq/pm_statistical_review_of_world_energy_full_report_2006.pdf](#)

¹³ These numbers are based on: CIA, 'The World Factbook', *supra* note 13.

¹⁴ BP: 'Statistical Review of World Energy' (2007),
http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2007/STAGING/local_assets/downloads/pdf/table_of_coal_consumption_2007.pdf

¹⁵ UNDP: 'Human Development Report' (2007/2008);

http://hdr.undp.org/en/media/hdr_20072008_en_complete.pdf

¹⁶ The Probability of Sea level rise, Environmental Protection Agency, 1995

[http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVMJP/\\$File/probability.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVMJP/$File/probability.pdf)

¹⁷ http://en.wikipedia.org/wiki/Sea_level_change

¹⁸ IPCC: 'Climate Change 1995, The Science of Climate Change' (1995)

<http://www.ipcc.ch/pdf/climate-changes-1995/spm-science-of-climate-changes.pdf>

¹⁹ EPA, 1995,

[http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVMJP/\\$File/probability.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVMJP/$File/probability.pdf)

²⁰ http://en.wikipedia.org/wiki/Sea_level_change

²¹ Image from Global Warming Art

²² UNDP: 'Human Development Report' (2007/2008)

http://hdr.undp.org/en/media/hdr_20072008_en_complete.pdf

²³

http://www.panda.org/about_wwf/what_we_do/climate_change/problems/weather_chaos/gulf_stream/index.cfm

²⁴ http://en.wikipedia.org/wiki/Fossil_fuels

²⁵ Eviana Hartman (January 6, 2008). "A Promising Oil Alternative: Algae Energy". Washington Post.

²⁶ To be downloaded for example at:

<http://www.ez.nl/content.jsp?objectid=145603&rid=142438>

²⁷ Summary of the Stern Review: http://www.hm-treasury.gov.uk/media/3/2/Summary_of_Conclusions.pdf

²⁸ <http://news.bbc.co.uk/2/hi/science/nature/6295021.stm>

²⁹ FAO: 'Global Forest Resources Assessment' (2005);

<http://www.fao.org/forestry/foris/data/fra2005/kf/common/GlobalForestA4-ENsmall.pdf>

³⁰ FAO, www.fao.org

³¹ Greenpeace International: 'Cool farming: Climate Impacts of Agriculture and Mitigation Potential' (January 2008). Download at:

<http://www.greenpeace.org/international/press/reports/cool-farming-full-report>

³² See for example: <http://www.milieuennatuurcompendium.nl/indicatoren/nl0100-Broeikasgasemissies-door-de-land--en-tuinbouw.html?i=9-20>

³³ Download at: http://www.blonkmilieuadvies.nl/html/pub_vleesproducten.html

³⁴ Definition by: en.wikipedia.org/wiki/Carbon_footprint. See also for example: www.carbonfootprint.com

³⁵ Download at: http://www.realizingrights.org/pdf/Gender_and_Climate_Adaptation_Feb2008.pdf

³⁶ The complete declaration can be downloaded at: http://www.wedo.org/files/WEDO-CWWL_declaration_on_climate_change_and_gender_equality.pdf

³⁷ The term 'Tragedy of the Commons' was used by ecologist Garrit Hardin to describe the conflict between individual interests and the common good over finite resources. Hardin uses the example of a pasture shared by local herdsman. Crucially, the division of costs and benefits are unequal: for each sheep a herdsman introduces on the pasture, the individual herdsman gains all the advantage, but the disadvantage of overgrazing is shared among all

herdsmen using the pasture. Consequently, for an individual herdsman weighing these interests, the rational course of action is to add an extra animal. However, since all herdsmen reach the same rational conclusion, overgrazing and degradation of the pasture is its long-term fate.

³⁸ Source: <http://www.oneworld.nl/>

³⁹ This paragraph is based on: IPCC: 'Special Report on Carbon Dioxide Capture and Storage'. Prepared by working group III of the Intergovernmental Panel on Climate Change, Cambridge University Press, (2005). Available at <http://www.ipcc.ch/>

⁴⁰ To download the Ecofys CCS report, go to:

http://www.ecofys.com/com/publications/reports_books.asp

⁴¹ Information: <http://www.greenpeace.nl/news/co2-dumpen-waarom-niet>

⁴² See: <http://www.green4sure.nl/>

⁴³ This report was not yet publicly available when this Quick Scan was written.

⁴⁴ See for example: http://www.sourcewatch.org/index.php?title=Exxon-Funded_Skeptics

⁴⁵ See also:

<http://www.klimaatportaal.nl/pro1/general/start.asp?i=0&j=0&k=0&p=0&itemid=297>

⁴⁶

<http://www.vrom.nl/pagina.html?id=32950&ref=http://www.vrom.nl/pagina.html?id=34502>

⁴⁷ This agreement can be downloaded at:

http://www.bothends.org/Klimaataakkoord_van_Schokland.pdf. See also:

<http://www.akkoordvanschokland.nl/>

⁴⁸ <http://www.c40cities.org/climatechange.jsp>

⁴⁹

http://www.vng.nl/Documenten/Extranet/Fei/Milieu/Klimaataakkoord_12_nov_2007.pdf

⁵⁰ http://www.greenpeace.org/international/campaigns/climate-change/take_action/your-energy

⁵¹ <http://www.klimaatcompensatie.nl/content/view/42/60/>