TÄLLBERG FOUNDATION

Climate Policy Post-2012 – A Roadmap

The Global Governance of Climate Change

A discussion paper for the 2007 Tällberg Forum by
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Foreword

While public concerns on climate change reach a crescendo, the prospects of arriving at an international agreement on real emissions reductions seem distant. The climate convention was agreed upon more than fifteen years ago. In spite of this, GHG emissions are increasing more rapidly than ever before.

To some the prospects look somewhat more positive after the 33rd G8 meeting in Heiligendamm, June 2007. The fact that President Bush now agrees that there is a problem, and that anthropogenic emissions are the major cause, increases the likelihood of a more constructive approach by the US Administration in the preparations for a post-2012 agreement. For a post-2012 deal to become reality, however, attitudes amongst the main actors have to change dramatically. Negotiations so far resemble a trench war more than anything more constructive.

It is easy to forget that tensions between the US and the rest of the world are but one of several fault-lines. An equally large rift exists between the traditional industrial societies of the North and the fast-growing economies like China, India and Brazil of the South. The latter rightly perceive that the "ecological space" is already more or less used up by the Northern economies. This applies to the capacity of the atmosphere to absorb greenhouse gases. But it is also true for many other vital resources on the planet, like minerals and important renewable resources.

The question of equity is at the core of the debate. Industrialized countries created the problem of climate change and account for almost 80% of cumulative emissions. Emissions have built up over more than a hundred years from technologies and land-use changes that helped raise living standards in our part of the world.

If industrialised countries are genuinely interested in having developing countries as active partners in the efforts to curb emissions, they must give priority to the following: First of all, a demonstration of real leadership in reducing GHG emissions. The record so far is not impressive. Only a few industrialized countries have managed to reduce emissions. Secondly, an offer of real partnership to assist developing countries in their efforts in relation to both mitigation and adaptation. Initiatives so far – and this goes for CDM as well as for the GEF and the Adaptation Fund – are woefully inadequate.

To prevent "dangerous climate change" both the Stern and the IPCC reports stress the need for global emissions to start declining within 10-15 years. Otherwise, "Earth will be a very different place", to quote climate expert Jim Hansen. Hence, no time can be wasted.

People all over the world are putting their hopes in the UN-led negotiation process. Knowledge amongst ordinary people about the process is very limited, however, which means that the opportunities for public pressure to exert influence on the negotiations are limited. This is the background for producing this report.

The Tällberg Foundation is deeply engaged in climate change-related issues. We aim to use our analytical capacity and our global network to its fullest potential in order to move the policy agenda forward.

This report by Hermann Ott represents an important contribution to the overall discussion on climate change and a post-2012 climate regime. Hermann provides important insights regarding the history of the climate convention and various negotiating positions. He defines the major barriers for an effective post-2012 agreement and suggests possible action to overcome those barriers. We are very grateful to Hermann for his contribution and hope it will stimulate debate the world over.

Tällberg, June, 2007

Bo Ekman, Founder and
Chairman, Tällberg Foundation

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Executive Summary

Latest scientific research tells us that action to stop climate change must begin immediately and be fundamental if irreversible damage is to be avoided. The next 10-15 years must bring about a global turn-around in emissions in order to stay with some certainty below a global rise in temperatures of 2°Celsius. However, there is a big gap between the call for action resulting from the findings of the IPCC and what actually happens at the national and the international levels. Due to the long-term nature of planning required to tackle global warming, and due to the unequal distribution of impacts around the globe, climate change is developing into a central challenge for mankind. However, it also holds the promise of greater co-operation, continued economic prosperity and the eradication of social inequalities if the challenge is met adequately.

The fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC AR4) has confirmed mankind's responsibility for a warming climate, has emphasized the dangers associated with rising global mean temperatures and has provided an assessment of the means and costs required and available to fight climate change. The report by Sir Nicholas Stern in late 2006 has also emphasized the difference between the costs of fighting global warming now or paying for the damages later. According to this most comprehensive economic assessment so far, tackling climate change would cost about one percent of global gross domestic product yearly, whereas inaction could cost between five and twenty percent of global purchasing power per year.

The diplomatic processes to co-ordinate the international responses to climate change are slow and ineffective. The main process is the UN sponsored Framework Convention on Climate Change and its Kyoto Protocol. It has been characterized by the absence and obstruction of the process by the United States and by the entrenched positions of both good-willed industrialized and developing countries. Each side accuses the other of copping out. The traditional industrialized countries have so far refused to take the necessary first steps that are required for building trust. Thus the negotiations for a follow-up after the expiry of the first commitment period after 2012 have not even resulted in a negotiating mandate.

In addition to the multilateral process under the umbrella of the UN a host of technology-based initiatives have been established, in order to promote the capture of methane from waste dumps, the use of hydrogen as an energy carrier or the capture and storage of carbon. However, none of these initiatives – and also not the US sponsored Asia-Pacific Partnership for Clean Development and Climate – have yet yielded substantial results. The G8 summit in Heiligendamm did not bring about the desired break-through, although it might have eased the climate negotiation later this year in Bali, Indonesia. It remains to be seen whether the Gleneagles Process under the auspices of the G8 will be more successful at the meeting in September 2007.

There are three possible scenarios for the future development of climate policy that are expanded upon in this paper:

In the first scenario (business-as-usual) nothing is done and the negotiations post-2012 fail. The world is locked onto a fossil fuel path and concentrations of greenhouse gases in the atmosphere increase continuously. Shortly after 2020, concentrations reach a

level where temperatures are set to increase by more than 2°C. Hectic attempts at geo-engineering are not successful; governments fear uprisings of their populations and do not take serious measures to limit emissions. Global mean temperatures will rise to 4,5°C in 2100 and more afterwards. The world is a different place from the Earth we know.

In the second scenario (structurally conservative) governments and companies do act, but without resolve and by preserving the growth paradigms of current economic thinking. Economic and technological structures are left unchanged, but central and large technologies (nuclear power, "clean" coal, large biomass and large hydropower) cannot stop the trend in emissions. Partially rising shares of renewable energies and efficiency gains are eaten up by stronger demand, in traditional industrial as well as in the emerging economies. Since decisive steps to reorganize energy production have not been taken, the goal of 2°C will be missed. It is not sure that a turn-around can be achieved after 2020. A slide into the first scenario is possible.

In the third scenario (eco-fair), governments finish the negotiations for a post-2012 regime in time. As a precondition, industrialized countries offer substantial support for mitigation measures in the emerging economies, in order to allow them to leapfrog the fossil fuel era. They also offer adequate financial means to help the least developing countries adapt to climate change. At the national level, governments and business in industrialized countries reorganize the energy systems to allow decentralized feed-in by millions of renewable energy sources. Combined with a massive increase in energy efficiency and the phase-out of coal, the world society manages to stay below 2°C. Even in this scenario, large-scale environmental disruptions take place. But global catastrophe might have been averted.

There is an enormous range of proposals for the future of the climate regime after 2012, ranging from specific regulations in the Kyoto Protocol to an analysis of alternative options to the protocol. This paper examines some of the options discussed and offers some guidance as to potential choices: There are clear advantages of continuing the process in the context of the FCCC and its Kyoto Protocol. The timeframe for commitments should range from short-term binding targets to longer-range aspirational targets for 2030 or 2050. Besides the quantified targets in the current protocol, dual or no-lose targets combined with a sectoral approach appear to be promising for integrating emerging economies. Adaptation to the impacts of climate change must be part of any comprehensive negotiation package.

In the last chapter, the paper makes a proposal for breaking the deadlock between South and North. It recommends that industrialized countries make the first move to leave the trenches and build trust. Essentially three building blocks could achieve this aim:

First, industrialized countries must agree on substantial reductions for the phase after 2012. The EU's offer for a 20 percent cut in emissions by 2020 is a good start, but should be increased to 30 percent. As studies have shown, this target is realistic if adequate measures are adopted soon. The US should be integrated via the adoption of a strong national target after the elections in 2008 and via a binding declaration under international law that this national target is considered part of the negotiation package. This might be sufficient to convince especially the large emerging economies that the North is serious in reducing its footprint and leave some space for them to grow.

Second, industrialized countries must offer substantial support for mitigation in the emerging economies, allowing them to leapfrog the era of fossil fuels. Cost estimates for supporting low- and no-carbon solutions in developing countries range from 20-30 billion per year in the Stern Review to $10-200 billion per year estimated by the World Bank's Chief Scientist Bob Watson. The real numbers will depend on the ambitiousness of the program and on the efficiency of the measures taken. In any case, large and steady amounts of financial resources will be needed. The North should show a credible willingness to contribute towards making non-fossil fuel solutions economically viable. Markets can be part of the solution, but cannot expect to produce miracles. Governments must provide the stable basis of funds and this must be coupled with intelligent solutions for the transfer of technology North-South and South-South.

And third, industrialized countries must provide substantial support for the adaptation of least developed countries to climate change. A certain degree of climate change is unavoidable; the atmosphere is already "loaded" with enough greenhouse gases to produce another 0,7°C of warming. Adapting to the impacts of sea-level rise, widespread drought, flooding and food shortages will require between $10 and 40 billion according to estimates of the World Bank. Adequate funds that go far beyond the means now foreseen in the three funds of FCCC and Kyoto Protocol must be provided. Many creative solutions have been proposed, like a levy on transactions in the context of emissions trading or an insurance fund to which large energy companies contribute according to their share in the provision of fossil fuels.

These three building blocks might be able to overcome the deadlock in the negotiations and lead both sides out of the trenches. True, a host of other big problems loom large – of which the integration of the US and Russia are only two. But the history of the climate negotiations has shown that progress was always dependent on the combined force of the European Union (and some allied countries) and the large number of developing countries. The latter feel an increasing gap between the demands of industrialized countries towards participation and what they actually perceive them of doing. There are certain steps that the emerging economies can reasonably be expected to take, not only because of climate change but also for reasons of energy security and local benefits. However, the traditional industrialized countries do not have the right to only demand it. They should to their best, invite others to do their share and support these efforts. This will provide the basis for successful negotiations in 2008 and afterwards. Not more, but also not less.

I. Introduction

Climate policy is at a crossroads. This statement appears all too familiar – when was climate policy not in some decisive phase? - but it was never more true than today. The reasons are twofold: First, the science is unequivocal and tells us that action must begin immediately and be fundamental if irreversible damage is to be avoided. The next 10-15 years must bring about a global turn-around in emissions in order to stay with some certainty below a global rise in temperatures of 2°Celsius. Global emissions must decline after 2015. And, second, the enormous increase in energy needs in some large emerging economies has led to a rush towards coal on a massive scale. Since also in the industrialised North large parts of the energy infrastructure have to be replaced, energy investments in the order of 15-20 trillion dollars will be required in the next 20-25 years. If these investments go into the wrong direction, most of the global economy would be locked into a fossil fuel path for the next 40-50 years. On the other hand, if these investments are used wisely, this situation also presents a unique opportunity to move into the right direction – towards a sustainable energy path that preserves the Earth for future generations while providing an affordable energy supply for the present.

It is thus paramount to embark on a global turn-around towards renewable energies and massive improvements in energy efficiency, i.e. the way we produce and use energy. However, progress appears to be painfully slow and in some cases the focus already shifts from denial of the problem straight to the call for adaptation measures. Needless to say, this would not be a solution because ecosystem changes would occur on such a scale as to make adaptation extremely costly and in many cases impossible. But this quick shift does reflect a fundamental doubt about the ability of man to change. Climate change thus represents the biggest challenge that humanity has faced to far, requiring enormous progress in our imagination, our ability to plan and our capacity to implement far-reaching decisions against traditional short-term interests that benefit from the status quo.

Change must happen at every level of society, from the individual and the local via companies and nation states towards the global level. This paper addresses mainly the level of international negotiations, but the author is quite aware that progress at the global level requires millions of piecemeal changes at other levels. Most importantly at the moment, it requires that business faces up to the challenge, puts short-term considerations aside and starts thinking in medium and long-term categories. This is not to say that business leaders are ignorant to the challenge or organise wilful obstruction. But business leaders – if they are aware of the problem – in many cases feel like being trapped in a straightjacket brought about by short-term profitability demanded by shareholders and financial markets. They are also intimidated by volatile consumer demands and thus prefer a risk-averse product strategy. Furthermore, national and international politics do not yet provide the long-term framework for emission reductions needed by business for longer-term strategic planning.

This is not the time for small steps and hedging – the world needs decisive action by leaders in business and government. The greatest gap is not between the governments of Europe and the US, although the recent summit of the G8 at Heiligendamm could have given this impression. The biggest rift is between the traditional industrial societies of the North and the fast-growing emerging economies of the South like

China, India and Brazil. The latter rightfully feel that they have come too late and that the available "ecological space" has already been used up by the Northern economies. This does not only concern the absorption capacity of the atmosphere for greenhouse gases, this analysis is true for almost all resources of the planet, the living and the non-renewable resources.

In a certain sense, climate change fulfils a function like a "canary in the coalmine": Since it is the weakest part of the Earth's systems, it reacts first to the over-consumption of our global industrial metabolism. Successfully tackling climate change provides the chance to alter the industrial basis of our societies and to avoid the multiple problems associated with the depletion of resources like fossil fuels, minerals, water, forests and the living resources of the oceans. This strategy does, however, demand that the change is not just a replacement of one fuel with another, like to replace oil with coal. This would not only bring us closer to catastrophe (even if storage technologies like CCS would work to a certain extent), but it would close the door towards a real transition of our economies towards a system not built on the exploitation of this planet.

Climate change or "global warming", as it is sometimes called, thus has the capacity to bring about the worst and the best of humanity. Far from being a detached scholarly issue it will affect the lives of everyone on this planet. If the global turn-around is successful, mankind has proven that it is intelligent and prudent not only at the individual but also at the global level. And it will show the way on "How on Earth can we live together", the motto of the Tällberg Forum.

This paper will proceed along the following lines: Chapter II will explore the background of the problem, starting with the scientific findings of the Intergovernmental Panel on Climate Change in its recently published fourth report. It will furthermore highlight the analysis done by Sir Nicholas Stern in his report on the economic implications of acting now or paying later. Finally, the background chapter will document the diplomatic efforts to tackle climate change in the context of the United Nations and other arenas.

Chapter III will present three narrative scenarios of possible developments in the years to come. The first and the third scenario are depicting two extremes, namely a dark vision of business-as-usual and the light vision of an eco-fair development. The second scenario portrays a development that makes an attempt to solve the problem, but does not dare to change the basic structures and thus is bound to fail. The challenge for humanity will be to steer as much as possible towards the third scenario – and there is a good chance to do so in the next years.

Chapter IV embarks on an overview of proposals for a climate regime after 2012 and attempts to shed some light on the multitude of issues that have to be dealt with. Chapter V, finally, proposes some building blocks for a successful negotiation strategy. It is based on the recognition that traditional industrialised countries have the responsibility to make constructive proposals for the emerging economies and other developing countries. It is guided by the conviction that the North cannot expect more rational, ethical and forward-looking behaviour from the Southern elites than it is prepared to show itself.

II. Background

The climate problem has a complex over-all structure. Its intrinsic complexity stretches the capacity of human imagination, ability to plan, determination and courage to the limits. In a nutshell: The climate system itself with all its causes and effects is not yet understood completely and the consequences of climate change may be much more drastic than we tend to assume. One obvious problem is that the results of human action now become visible only several decades or centuries into the future. Furthermore, the impacts of human activities are felt harder by innocent people in other parts of the planet and not by the originators themselves. The causes of climate change (namely the use of fossil fuels and the changes in land-use) are spread by the billions across the globe. What makes things worse, fossil fuels are the energetic basis for our machine-based civilization, the roots of our wealth and that of the biggest corporations around the globe. So far, neither our economic nor our political systems do face up to the challenges of systemic environmental change on a global scale. And finally, at least to date the human horizon of planning and interests does not satisfy long-term, structural challenges.

1. Climate change – facts and costs

The message was not new, but since it came from a widely respected mainstream economist it caused a big stir: "The scientific evidence is now overwhelming: climate change presents very serious global risks, and it demands an urgent global response", writes Sir Nicholas Stern, former Chief Economist of the World Bank and now Head of the Economic Service of Great Britain's government, in his widely noticed Stern Review, published in October 2006.[1] The challenges represented by climate change as described by Stern seem shocking. They are, however, nothing new.

Scientific progress and the IPCC

Since the 1960s, every year has seen the emergence of better and more reliable data on climate change. Every set of data, whether atmospheric measurements, ice-core analysis, satellite pictures or climate statistics, point in the same direction: Our planet is experiencing a massive warming. And it is our own doing that is causing this change. There are natural variations, but man's emissions have "taken over" and do cause significant warming.

In order to evaluate the causes and effects of climate change and to collect measures against it, the Intergovernmental Panel on Climate Change (IPCC) was created in 1988 by WMO and UNEP. The panel does not carry out any research of its own, but collects scientific peer reviewed and published scientific and technical literature on the topic. Out of this vast expanse of data, every report is created over a period of several years by a few hundred scientists, and reviewed by a few thousand. In 1990, the IPCC published its first assessment review, followed by two others in 1995 and 2001. During this year 2007, the fourth Assessment Report (AR4) is being published in several parts. With every review, the data has become more precise and irrefutable.

[1] Stern, Nicholas: The Economics of Climate Change; Cambridge Univ. Press (2007) www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm.

Although the final editing of the reports was influenced by politics (and the results thus weaker than they would be if written only by scientists), the conclusions of the IPCC cannot be taken lightly. *Its unsettling message*: The unfettered emission of greenhouse gases will have dramatic consequences. *Its reassuring message*: Measures against climate change are cheaper than thought, and cheaper than non-action.

If nothing is done, a worst-case scenario like the following could become reality (based on the report of Working Group II of the IPCC):[2]

Projected climate changes according to the IPCC

- 2020 (+1°C): 30-40% of all known species are threatened by extinction. Most coral reefs are bleached. Heat waves, floods and draughts cause a raised mortality rate among humans.
- 2050 (+2°C): Biological systems undergo a massive change, with mainly negative outcomes concerning biodiversity and the supply of water and food worldwide. Many millions of people all over the world live in severely flood-threatened coastal regions.
- 2050-2080 (+3°C): Health systems around the globe face increased pressure. The world's food production decreases heavily. About 30% of global wetland area has dried out. Extreme weather events increasingly frequent and intense.
- 2080 (+4°C): More than 40% of all plant and animal species are extinct. The world's gross national income goes down by 5%. Because of at least partial melting of Greenland's and Antarctic ice sheets, maritime water levels will increase by another four to six metres in the decades to come.

Box 1: Projected Changes according to the IPCC AR4, WGII

This is a dark vision of the future. Some impacts of climate change can be observed already today, though. Both physical (e.g. glaciers, ice sheets, lakes etc.) and biological systems (e.g. habitats of different species) are changing because of alterations in regional climate, especially the rise in temperature. Economic and human systems are affected, too. In Europe and Asia, mortality from heat waves has risen (2003's heat wave in Europe has caused approximately 30.000 deaths). Farming cycles in the Northern hemisphere have already changed.

Every rise in temperature leads to a worldwide reduction of water and food supply, leads to an increased burden on ecosystems (including the extinction of species on a massive scale because their habitats will vanish and they cannot move anywhere else) and threatens millions of people in coastal regions and river mouths. The number of tropical diseases, allergies and climate-related diseases and fatalities will grow alarmingly.[3] One of the most critical areas is the Arctic, where temperature rises today

[2] The reports of the IPCC can be found at ww.ipcc.org.
[3] Intergovernmental Panel on Climate Change: Climate Change 2007 - Impacts, Adaptation and Vulnerability.

are already twice the average and where projections show much larger temperature increases of up to six or eight degrees Celsius until the end of this century (see Fig.1).

As the time-line in Box 1 indicates, the dangers of climate change rise dramatically in the future. Even if the rise of global mean temperature could be stabilised at a relatively low level compared to pre-industrial times, still the health risk will increase considerably, flash floods and storms will occur more often, and the corals will die. With every increase of temperature the effects on humanity and nature will be more severe. If the temperature should rise above +3.5°C, all systems, biological, physical and societal, would surpass the limits of adaptation.

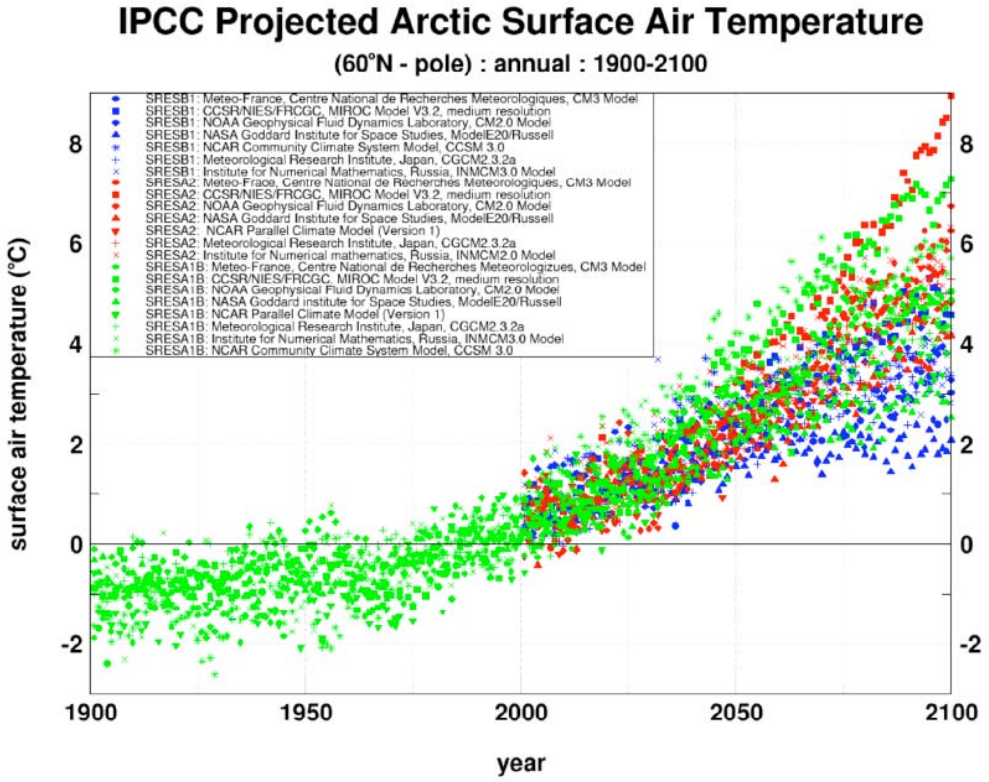

Fig.1: IPCC Projected Arctic Surface Air Temperature. Source: IPCC AR4, 2007

It is highly unsure how such a future might look like, especially in highly affected regions such as the Arctic or Sub-Sahara and in Asian river deltas that are especially prone to heavy flooding. Difficult to imagine but, as NASA-Scientist James Hansen warns, it would be "a different world". It is especially troubling that temperatures will continue to rise even if all emissions were stopped tomorrow. As a consequence of the inertia of the climate system, the average temperature increase - which so far has been 0.7° C, compared to pre-industrial times - is likely to increase another 0.7 degrees over the next decades. This fact makes quick emission reductions even more urgent.

Choosing a path of non-fossil energy and thus reducing greenhouse gas (GHG) emissions as fast as possible can attenuate many of the mentioned effects. As explained

Working Group II contribution to the Fourth Assessment Report of the IPCC; will be published November 2007 at Cambridge University Press.

above, some changes of the climate cannot be stopped, though. Therefore, substantial measures of adaptation have to be undertaken. Possibilities of adaptation are manifold and technological measures (e.g. dams, infrastructure), change of human behaviour (e.g. change of diet, transport habits etc.) and prevention (political and economic measures, targets and standards) will have to go hand in hand to halt climate change.

The scientists of the IPCC thus call for fast and extensive adaptation and climate change measures. Acting late would lead to irreversible damage and cause considerable costs.

The Stern report on the economics of climate change

The analysis by Sir Nicholas Stern points in the same direction. According to the "Stern Review on the Economics of Climate Change", extensive measures of adaptation are of the highest priority – and the costs of preventing climate change are significantly lower than the projected damage. This report, published in October 2006, analyses the economic challenges and possibilities of climate change. Surprisingly enough, the liberal mainstream economist Stern comes to the conclusion that climate change "is the greatest and widest-ranging market failure ever seen."

On almost 600 pages, Stern and his team have examined the expected climate change for different scenarios and their effect on the economic and also social welfare of communities and individuals. The report analyses possible measures against climate change. Using diverse economic methods and modelling techniques, the projected costs of action and inaction are scrutinized. And finally, the report recommends policy options for the reduction of greenhouse gases and the adaptation to the unavoidable climate change together with ways of international cooperation.

In the same way as the scientists of the IPCC, Stern emphasises the economic benefits of early and thorough action vis-à-vis the expected cost of postponing action. According to his calculation, the cost of prompt action would be about one percent of global consumption per capita– in his view a high but bearable load. Approximately, this amounts to the money spent on advertisement globally in a given year, or the cost of a global influenza pandemic as estimated by the World Bank.[4] It should be pointed out, however, that Stern's cost estimates are based on the assumption that the GHG concentration in the atmosphere will not exceed 550 ppm CO_{2eq}.[5] This level, according to most scientists is far too high to be able to limit the average temperature increase to max +2°C - a target set by the EU in order to avoid "dangerous climate change". Had Stern focussed on a lower concentration more in line with the 2°C target, like 400 or 450 ppm CO_{2eq}, the cost estimates for averting dangerous climate change would have been higher.

[4] Gaby Hinsliff, Landmark report reveals apocalyptic cost of global warming, The Observer, 29. October 2006.

[5] The concentrations of greenhouse gases (GHG) in the atmosphere are measured in warming equivalents of carbon dioxide, CO_{2eq} in short.

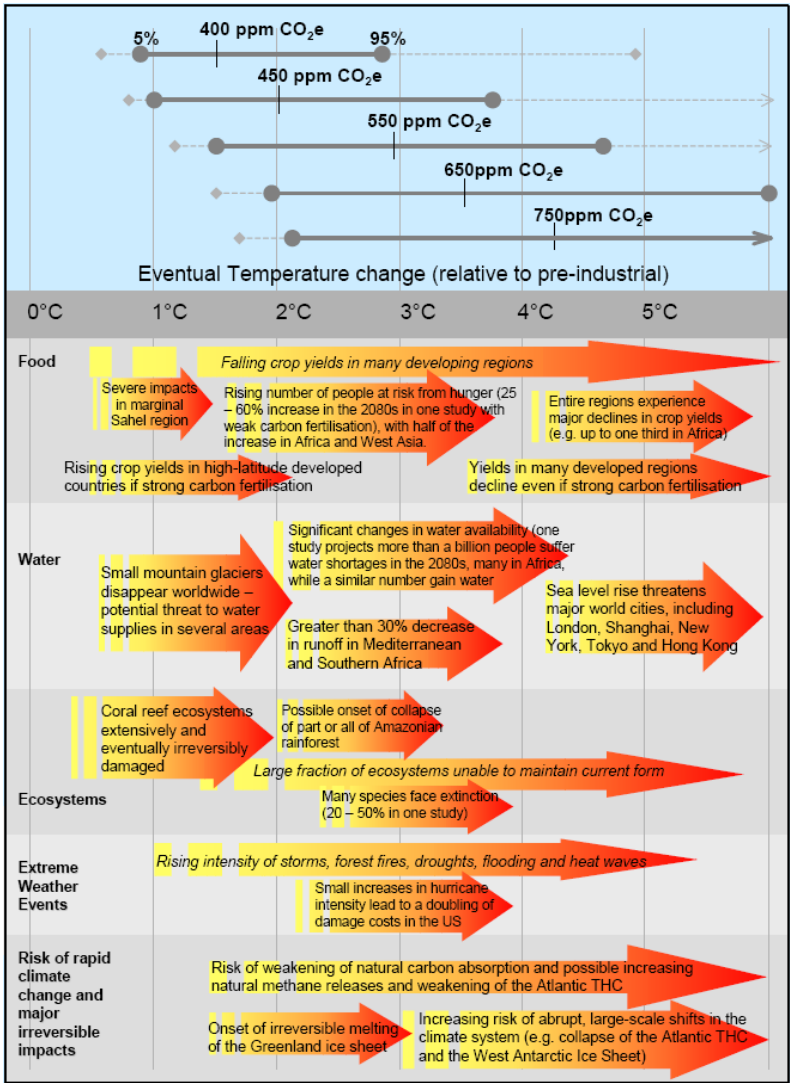

Fig.2: Projected Impacts of climate change. Source: Stern Review, 2006

If no steps are taken (the so called case of "business as usual") there is a possibility, according to Stern, that the impacts of climate change might cost up to 20 percent of consumption per head and per year, but at least "least five percent, now and forever." The enormous spectrum of this estimation follows from the more or less conservative method of computation: The lower five percent are the results of the model used (PAGE2002) and thus represent the minimum. The costs would rise to 11 percent of per-capita consumption if factors not represented in the model were taken into account, like e.g. the impact of changes on the environment and on human health. These impacts are still difficult to ascertain, but their impact may be considerable.[6]

It is thus apparent that the real economic impacts of rising global temperatures cannot be ascertained with accuracy and that even the upper limit in the Stern report may be too low. In any case, the dimensions are difficult to grasp – the review tries to illustrate this by pointing out that the effect of climate change will have the approximate dimension of the two world wars or the economic depression of the first half of the last century.

[6] The impact could reach 20 percent of global GDP according to the Stern Review if other factors are taken into account, for example, the risk that the climate system will be more susceptible than expected or the fact that damages will occur mainly in the poor countries of the South.

It is important to note, however, that Nicholas Stern perceives climate change not only as a threat, but also as a chance for the global economy. The development of emissions trading systems, technological advancements and the mechanisms laid out in the Kyoto Protocol can clear the path to new markets and possibilities of trade. Climate change according to Stern therefore does not only constitute an obstacle to growth, but bears significant possibilities for development – not least for developing countries and countries in transition. Stern - the economist of the liberal mainstream - thus comes to the same conclusions that environmental economists have already been drawing for some time. Quote from the review: "Tackling climate change is the *pro-growth* strategy for the longer term, and it can be done in a way that does not cap the aspirations for growth of rich or poor countries" (*italics by the author*).

Climate change is a global problem, which demands an answer by all the countries of the world. Because of this, Stern calls for a binding international framework for combining emissions trading, technical cooperation, the reduction of deforestation, increased reforestation, and measures of adaptation. It is his opinion that climate change can no longer be denied, but that the worst effects can be averted by quick and effective international cooperation.

2. Climate change – the diplomatic efforts

Climate diplomacy is still less than twenty years old – it was as late as 1990 when negotiators met for the first time to create the legal basis for the cooperation in fighting climate change. Negotiations culminated in the adoption of the United Nations Framework Convention on Climate Change in New York, May 1992. This Convention was then signed at the Earth Summit in Rio de Janeiro by the attending heads of state and government in June 1992.

This convention did not break much ground. Since the delegations could not agree on concrete and binding measures to mitigate climate change, the less binding form of a framework convention was chosen. The commitments were limited to research cooperation and a view to more collaboration in the future. This approach followed a trend of the late Eighties and Nineties to solve the regulation of international environmental problems in a step-by-step process, beginning with noncommittal "action plans", then adopting a framework convention and finally agreeing on a protocol with binding targets. This had been successful in the fight against air pollution in Europe (see Geneva Convention on Long-range, Transboundary Air Pollution, LRTAP 1979) and had also been fruitful for the yet unparalleled effort to protect the ozone layer. (Vienna Convention (1985) and its 1987 Montreal Protocol).

In accordance with this approach, negotiations on a mitigation protocol started when the Framework Convention on Climate Change entered into force in March 1994. During the following year's "First Conference of the Parties" (COP1) in Berlin, chaired by then-environment minister Angela Merkel, the "Berlin Mandate" was adopted, as an agenda for those negotiations. The schedule until the adoption of a protocol had been kept deliberately tight. A marathon of 9 negotiation rounds finally led to the adoption of the Kyoto Protocol in autumn 1997 in the old imperial city of Japan.[7]

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[7] See Oberthür, Sebastian/Ott, Hermann E.: The Kyoto Protocol. International Climate Policy for the 21st Century; Springer Verlag (Berlin, Heidelberg et al.) 1999; Yamin, Farhana/Depledge, Johanna: The International Climate Change Regime: A Guide to Rules, Institutions and Procedures; Cambridge Univ. Press 2004.

The Kyoto Protocol

The assessment of this protocol is necessarily ambivalent: On the one hand it can rightfully be declared a "milestone" in the history of foreign environmental policy, since it establishes for the first time absolute limits (caps) for the emissions of greenhouse gases.[8] On the other hand it falls considerably short of the prerequisites for an effective fight against climate change, especially because the agreed mitigation targets (all in all approx. five percent of the industrialised countries' emissions) are much too low.

Since many details had been left open in Kyoto, negotiations continued – until the dramatic moment by the end of 2000, when the Conference of the Parties collapsed in The Hague because of a clash between European and US negotiators. After March 2001 the whole process appeared finally to be dead: The new US president George W. Bush declared in a letter to members of the US Congress his "opposition" to the Kyoto Protocol. This opposition had an enormous impact since the USA as the political, military and economical leader of the world is essential for the solution of any global challenge. Furthermore, this one country, with only four percent of the global population, is responsible for 25 percent of worldwide emissions of greenhouse gases. Without the active participation of the US, every regulation will therefore be limited in scope and success. On the other hand, this demonstrative denial by the US government was the reason for a similarly demonstrative reunion of the rest of the world. Actually, the agreement might never have been possible without this denial. In the end, the EU, Japan and developing countries evened out their differences and adopted the so-called "Marrakech Accords" by the end of 2001, amending the Kyoto Protocol.

Countries included in Annex B to the Kyoto Protocol and their emissions targets	**Target (1990** - 2008/2012)**
EU-15*, Bulgaria, Czech Republic, Estonia, Latvia, Liechtenstein, Lithuania, Monaco, Romania, Slovakia, Slovenia, Switzerland	-8%
US***	-7%
Canada, Hungary, Japan, Poland	-6%
Croatia	-5%
New Zealand, Russian Federation, Ukraine	0
Norway	+1%
Australia	+8%
Iceland	+10%

The EU's 15 member States will redistribute their targets among themselves, taking advantage of a scheme under the Protocol known as a "bubble". The EU has already reached agreement on how its targets will be redistributed.
** Some EITs have a baseline other than 1990.
*** The US has indicated its intention not to ratify the Kyoto Protocol.
Note: Although they are listed in the Convention's Annex I, *Belarus* and *Turkey* are not included in the Protocol's Annex B as they were not Parties to the Convention when the Protocol was adopted.

Box 2: Quantitative commitments of Annex B – Parties under the Kyoto Protocol. Source: www.unfccc.org

[8] See Ott, Hermann E.: The Kyoto Protocol. Unfinished Business; in: Environment, Vol. 40, No.6 (1998), pp. 16-20, 41-45.

The adoption of this agreement was of course supported by the political developments outside of the climate arena. After the terrorist attacks of September 11, 2001, the USA was more than ever dependent upon the active participation of the world in the fight against terrorism. Worldwide solidarity was unbroken by the end of 2001 and the USA did not want to endanger this by stubbornly blocking the adoption of the Marrakesh Accords.

In return for non-intervention, however, the US had asserted far-ranging amendments to the Kyoto Protocol, for instance the inclusion of so-called "carbon sinks" (the absorption of carbon by plants, LULUCF), which cut further into the effectiveness of the treaty.[9] This and other amendments led to a decrease of the commitment by the group of industrialised states from originally five percent to approximately two percent. However, these decisions adopted in Marrakech finally rendered the protocol operational. In particular, the "flexible mechanisms" had been worked out, i.e. the economic instruments of emissions trading, Joint Implementation (JI) and the Clean Development Mechanism (CDM). This greatly eased the ratification of the protocol by the industrialised states.

However, it still took more than three years, until the end of 2004, until ratification by the required 55 parties representing 55 percent of industrialised countries' emissions was reached. This delay was caused mainly by the diplomatic strategy of Russia. Its ratification was formally necessary for the protocol's entry into force, and it used its newly found bargaining power to the greatest extent possible. Only after the European Union had terminated its opposition against it joining the WTO, Russia ratified the Kyoto Protocol. Three months after the deposition of Russia's ratification with the UN Secretary General in New York, the protocol entered into force on 16 February 2005.

Negotiations post-2012

At this moment the dynamic nature of the climate regime became visible again, because negations on the revision of the treaty started immediately after the protocol's entry into force – just like in the case of the framework convention. Background to this is the fact that the obligations of industrialised countries are limited to the five years between 2008 and 2012. In strictly legal terms, emissions are thus allowed to rise again after 2012. This time period of five years had been chosen originally to even out economic oscillations, which, when pin-pointing a specific target year, could potentially have made compliance difficult. Since a sentence like "and for the time thereafter" is missing, negotiations practically have to start from scratch.

Therefore, negotiations on the extension of mitigation targets post-2012 started at the first Conference of the Parties to the Kyoto Protocol (COP/MOP1) in Montreal by end 2005.[10] With the growing urgency of the climate problem, the Montreal outcomes were truly inadequate: they lack a clear mandate and a concrete deadline for negotiations. The First Meeting of the Parties adopted neither a clear mandate for negotiating the extension of the industrialised states' commitment post-2012, nor a mandate for integration of important developing countries to the group of committed states.

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[9] Halting deforestation is absolutely necessary because it represents already more than 15 percent of global emissions. However, counting in land-use changes has allowed some industrialised countries to emit more because it can be offset against their commitments.

[10] Wittneben, Bettina; Sterk, Wolfgang; Ott, Hermann E.; Brouns, Bernd: The Montreal Climate Summit: Starting the Kyoto Business and Preparing for post-2012 The Kyoto Protocol's First Meeting of the Parties (MOP 1) and COP 11 of the UNFCCC. In: Journal for European Environmental and Planning Law (JEEPL) 2/2006, S.90-100.

This impression is put into perspective, however, when the dynamics of the negotiations and the enormous opposition against effective action are taken into account. This does not only apply to the United States, which in the final phase of George W. Bush's presidency have not altered their position on the Kyoto Protocol. Neither does it only apply to Japan, which has fallen into somewhat of a political apathy after a short high in the end-nineties, making effective climate policy very difficult. The biggest stumbling block for a quick agreement on the future of the climate regime after 2012 is the ongoing and sometimes abstruse logic of these negotiations, according to which, time and again, progressive industrialised states and big developing countries fight an irreconcilable trench war. Instead of emphasizing common concerns and interests, negotiations are predominantly seen as a zero-sum game, where one side "must loose" what the other side gains.

A snapshot of the current climate negotiations

The climate negotiations are not easy to follow for a layman. Many different and parallel activities are ongoing, often based on vague mandates. A snapshot of the climate negotiations in mid-2007 reveals the following:

The parties to the Kyoto Protocol have installed an "Ad-hoc Working Group (AWG) on Article 3.9 of the Kyoto Protocol". This group shall only negotiate the reduction commitments of industrialised countries bound by the Kyoto Protocol; any discussion of developing country issues is expressly *prohibited*. No timeframe could be agreed upon, either. This has not changed after the Second Conference of the Parties (COP/MOP2) in Nairobi by the end of 2006.[11] A concrete agenda for the negotiations failed because the industrialised states did not want to go ahead unless the developing countries would agree to a discussion of commitments for themselves (see below). The attempt of the EU to introduce a much-needed target of staying below a global mean temperature of 2°C was blocked by the G77 and China. Therefore, the year 2007 will be devoted to the discussion on potentials for mitigation and, hopefully, a mandate for the post-2012 negotiations will be adopted at COP/MOP3 in Bali by the end of 2007.

The reverse side of these negotiations was the attempt by industrialised countries to push for a mandate for the review of the Kyoto Protocol according to its Article 9. This review, different from the afore-mentioned Article 3.9, provides the possibility to discuss the effectiveness of the protocol as a whole. This would also imply an analysis of whether developing countries would also need to adopt some form of commitments to rein in their emissions in the future. Developing countries opposed this, underlining the responsibility of industrialised countries for historic emissions and that these ought to act first and agree on their commitments post-2012. In the end, the parties could agree on a timetable for the review, but under the condition that the findings *would not be the basis* for new commitments – the negotiations of commitments for developing countries will thus require a formal mandate.

Finally, the parties to the FCCC established a parallel dialogue process in the context of the convention, which explicitly excludes any negotiations. Originally, it was mainly designed to integrate the USA and Australia who have not ratified the Kyoto Protocol and are therefore excluded from post-2012 negotiations under Article 3.9. This process had a promising start immediately after Montreal, but lost steam after only one year.

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[11] Sterk, Wolfgang; Ott, Hermann E.; Watanabe, Rie; Wittneben, Bettina: The Nairobi Climate Change Summit (COP 12 – MOP 2): Taking a Deep Breath before Negotiating Post-2012 Targets? In: Journal for European Environmental & Planning Law (JEEPL) 2/2007, pp.139-148.

Parallel diplomatic tracks outside of the UNFCCC

Besides the global climate negotiations in the context of the United Nations and the G8, a series of international initiatives for the advancement of certain technologies has developed in the last ten years, mainly driven by the United States. The Asia-Pacific Partnership for Clean Development and Climate, in particular, has earned some fame, launched by the USA as a Kyoto Protocol alternative (http://www.asiapacific partnership.org). The Partnership was introduced in July 2005 at a meeting of South East Asian countries. Australia, China, India, Japan and South Korea signed the treaty apart from the US. There have been some meetings since, but due to the non-binding character of the agreement the promise of real cooperation regarding new technologies has not been fulfilled so far. The impact of this initiative thus appears to be rather limited, but it also has so far not had any negative impact on the Kyoto Protocol.

Other cooperation agreements between governments on specific technologies include the Carbon Sequestration Leadership Forum (http://www.cslforum.org/about.htm) for the advancement of technologies to store carbon, the program "Methane to Markets" (http://www.methanetomarkets.org/) for the development of technologies to capture methane (for example from waste dumps), and the International Partnership for the Hydrogen Economy (http://www.iphe.net/) for cooperation in the field of hydrogen technologies. Germany participates in the latter two initiatives. These platforms for technological cooperation are mostly noncommittal and of limited effectiveness concerning the reduction of greenhouse gases. A convincing form of technology cooperation to fight against climate change would look different.

An adequate answer to the looming climate crisis was widely seen by many to lie with the large industrialised countries assembled in the G8 (Group of Eight). Instigated by the British presidency, participants of the G8 summit in Gleneagles 2005 agreed upon a joint resolution in relation to the deadlocked negotiations within the UN convention. It was the goal of the Gleneagles initiative to integrate not only the G8 countries, but also the biggest and most important emerging economies (Brazil, China, India, Mexico, and South Africa) into a common climate agenda. At the same time a support plan for Africa was initiated, in order to address the Millennium Development Goals more proactively but also to avoid that the poorer developing countries would oppose the G8+5 climate initiative.

The G8 – Summit in June 2007 in Heiligendamm, Germany, did not present a major breakthrough, but it achieved more than expected by many: There is recognition that the UNFCCC is the appropriate forum for the climate negotiations, and the year 2009 is mentioned as the year when negotiations for a post-2012 regulation should be finalised. This acknowledgement can be used in the run-up to the next climate conference December 2007 in Bali, Indonesia.

However, the statement of the "+5-countries" (Brazil, China, India, Mexico and South Africa) in Heiligendamm also very precisely describes the challenge ahead for the negotiations: The emerging economies confirm their commitment to fight climate change and their support for the FCCC. They call for a "flexible, fair and effective global framework." And they emphasize that "means for adaptation need to be included in a future agreement along with enhanced technology cooperation and financing." This is exactly what this paper is about.

This impulse for a top-down solution via the G8 originated in Great Britain, not purely incidental, because already since the beginning of the new millennium some enlightened members of the economic elite had been convinced of the reality of climate change. Especially John Browne, the Chief Executive of BP, realigned his company's course accordingly ("beyond petroleum"). A few years later, the British government and some major companies reached a consensus that (1) climate change is a reality, that (2) this danger can only be fought with the means of the global financial markets and transnational companies, and that thus, (3) the global regulatory instruments should be designed to provide maximum positive incentives for financial markets and energy companies to curb emissions. The Gleneagles Process, initiated by the British Presidency of the G8 in 2005, was a cornerstone of this strategy.
In conjunction with the Gleneagles Process, parliamentarians from the G8+5 countries initiated a global dialogue. This legislator's climate dialogue aims at complementing the dialogue among governments and is involving more than 100 legislators from the G8+5 countries, including the European Parliament. This dialogue is supported by the EU Commission, several governments and by 15 multinational companies. The main objective is to come up with innovative suggestions for a post-2012 climate regime. The major focus is on market mechanisms, technology cooperation, energy efficiency and adaptation.

Why is the diplomatic progress so slow?
The contrast between the urgency of the climate problem and the slow diplomatic progress is striking. This has been an issue since the inception of climate negotiations in 1990, but it provoked renewed criticism after the climate conference December 2006 in Nairobi. The reasons for this slow pace are manifold, but first it must be emphasized that compared to the glacial progress of traditional international diplomacy, progress on climate change has been relatively quick. Even established diplomatic processes like disarmament or trade negotiations are characterised by many years of delay between the first meetings and the more or less successful conclusion (e.g. the Doha Round in the WTO trade talks started in 2001). Achieving agreement among approximately 190 sovereign governments on any issue is likely to be a difficult task.

Having said that, a number of aspects render climate negotiations particularly difficult. Most importantly, the success of climate negotiations depends to a large extent on domestic climate policies. National and international policies are inextricably linked with each other, because without an effective climate policy at home no government is in the position to seriously commit to stringent targets at the international level.[12] Of course, sometimes it also works the other way round: In some cases ambitious international targets can be used to support effective climate policy at home, pushed for example by the environment ministry against other ministries. But normally government positions are formulated by cabinet decision where considerations other than climate change play an important role. Since only a handful of countries have relatively effective national climate policies, only a handful of countries are in the position to push for substantial commitments (apart from the potential victims of climate change, of course).

[12] Sachs, Wolfgang/Ott, Hermann E.: A New Foreign Policy Agenda. Environmental Politics is Resource Politics is Peace Politics; in: Internationale Politik, Journal of the German Council on Foreign Relations (IP-Global Edition), Vol.8, 1/2007, pp.16-22; at http://www.wupperinst.org/en/publications/berlin_office/index.html

This is where national politics thus comes into play. Since climate policy is perceived traditionally as a burden on the economy, established economic actors will be reluctant to support effective measures. The fundamental importance of the Stern Review lies in the fact that he destroyed the myth of the costliness of climate policy and put it in perspective against the projected losses due to unabated climate change. Some dynamic has furthermore come from the business sector, where more and more companies demand decisive action from their governments – most notably in the United States.

The opposition of the United States government against an effective climate agreement is another important reason for the slow progress of climate diplomacy. This has stymied progress from the beginning – although it was the US that put global warming on the agenda in the late 80s. It is very difficult and almost impossible to negotiate global solutions for global problems without the only remaining superpower. The structural weight of the United States in terms of economic and political clout as well as in terms of greenhouse gas emissions (about a quarter) is enormous. It is thus remarkable that any progress has been possible at all. This resembles the achievements to set up the International Criminal Court or to adopt the treaty to ban landmines, where agreement was also possible against the will of the United States. But of course, these issues are easier to solve because they do not involve questions of economic competitiveness. Positions change, however, and there are many signs that the US Administration from 2009 will pursue a different attitude.

And finally, there is one more reason why progress is so slow: The rift between the traditional industrialised countries of the North and the emerging economies of the South. The recent diplomatic wrangles at the G8 Summit in Heiligendamm between the German Chancellor Merkel and US President Bush have more or less obfuscated the real issues. The real gap is between the haves and the have-nots, between the old industrial powers that have exploited all available environmental space against the latecomers that find there is no room for growing. Since these countries do not see real leadership on the mitigation of climate change by industrialised countries, they are insisting on their right do development and against restriction in the emission of greenhouse gases. Diplomatic history has shown, however, that progress was always dependant on a coalition between the EU (and other progressive countries) and the developing countries. Bridging the gap between North and South has thus become a paramount policy objective in the climate negotiations.

The implications of whether the gap can be bridged or not are explored in the three scenarios below. Chapter V makes an attempt to identify the building blocks required for overcoming the stalemate.

III. Scenarios of climate policy post-2012

In the following chapter, three possible scenarios for the development of climate politics after 2012 will be discussed.[13] These scenarios are necessarily of an archetypical nature and reality will lie somewhere between. Their purpose is to help the reader imagine what alternative courses of action could lead to and, hopefully, agree with the author about the urgency to agree internationally on the measures necessary to make a real transformation of our energy and transportation systems possible. The background for all the scenarios, as just recently attested by the IPCC, is the need to act effectively very soon in order to set the world on a more or less secure climate path.

1. The business-as-usual scenario (nothing is done)

The international negotiations for a post-2012 agreement fail, despite the fact that most governments have understood the danger of looming climate change, and know there is not much time to lose. In some of the industrialised countries, initiatives for a change of policies are being developed, and even China makes serious efforts to improve energy efficiency and increase the use of renewable energy. But still, the impulses for an effective fight against climate change are not strong enough because:

- most governments do not have the courage to take risks today and act according to the longer-term interests of their countries and peoples;
- many companies feel locked into a system that demands short-term profits, disregarding the long-term objectives of a stable climate;
- the majority of the populations of many rich northern states are reluctant to change their lifestyles and consumption patterns;
- the rapidly industrialising countries of the South see no alternative solution and carry on unlimited economic growth on a fossil fuel basis with full force – the quest for social stability through rapid economic growth is put before long-term ecological (and thus social) stability.

The negotiations also fail due to the "trench mentality" of both the governments in North and South that impedes a coordinated approach. This pattern, which was already visible in the negotiations on a mandate at the Conference in Nairobi 2006, is repeating itself and the negotiations remain antagonistic. The European Union and some other industrialised states are in principle prepared to take on further commitments, but only provided that developing countries move as well. On the other hand, the Southern governments argue that it is not their turn yet, that they first have to focus on economic development, and that the actions of the industrialised states so far can only be described diplomatically as inadequate.

The new administration of the US after the 2008 elections shows an inability to free itself from vested interests and a lack of courage to make a deep change for climate protection because of a lack of support from its population. The US thus still rejects the Kyoto protocol and makes possible solutions more difficult through offers to the

[13] These are narrative scenarios, based on calculated scenarios of the IPCC, cf. http://www.ipcc.ch. A description of the scenario planning approach can be found in NIES/IGES: The Future Climate Regime: Using the Scenario Planning Approach to Develop Options, October 2005. An explanation of energy scenarios is provided by IEA/UNEP: Analysing our energy future. Some Pointers for Policy-makers; April 2007. See also http://www.tellus.org/seib/publications/Great_Transitions.pdf for a good example for the use of narrative scenarios by the Global Scenario Group.

emerging economies concerning technology transfer and technological cooperation. But the hopes of the South to receive access to new technologies and know-how remain unfulfilled. South and North retreat back into their trenches.

The negotiations keep dragging on. At the end of 2009 no agreement is reached and negotiations are stuck in the unfortunate patterns described above. Negotiations on an interim solution, for example an informal extension of the Kyoto Protocol's commitments until a new agreement has been reached, fizzle out. Thus, already in 2011 the developing carbon markets break down because of the lack of a long-term framework and perspective. The EU-internal emissions trade system collapses because of continued over-allocations caused by considerations of national competitiveness and insufficient efforts to control emissions and the EU fails to get on a path towards achieving its self-declared goals. Consequentially the EU misses its target established in March 2007 to reduce emissions by at least 20 percent by the year 2020.

As after the warning signals of the seventies and eighties, societies fall back into a waiting position. Climate change is being played down; many are declaring to "enjoy life to the fullest one last time". The companies invest in coal, coal gasification, and reassure the public with the promise to store carbon dioxide in subterranean facilities. Attempts to establish decentralised and highly efficient electricity grids are not successful. The share of renewable energies in the overall energy supply rises, but the gains are "eaten up" by higher energy consumption.

Thus emissions rise unfettered. The consequences in terms of an increase in extreme weather events, droughts and water scarcity are felt all over the world, in particular in many low-income countries. Large-scale migration becomes reality, as people have to leave regions that are increasingly uninhabitable due to rising sea levels and desertification.

The trend of increasing emissions is getting stronger. Already in 2020 the assumed upper limit of greenhouse gas concentrations (450 ppm CO_{2eq}, including CO_2, CH_4, and N2O without halocarbons) is exceeded. At this time it is too late for a turn around. To even limit climate change to plus 3°C globally would require such drastic measures that every government would risk being swept away by the wrath of its people. Finally, the situation becomes so uncomfortable that politicians wake up as the public demand action. Hectically, large amounts of money are spent on gigantic carbon storage projects, huge areas are being afforested, gas is pumped into vast subterranean reservoirs and billions of small mirrors are shot into space to reflect the sunlight. But the accelerating climate change destroys most of the afforested areas, the reservoirs cannot hold the carbon dioxide properly, and the mirrors fall back to Earth. Each country and each company fights on its own to muddle through.

The world is on a climate path, which leads to a rise of mean temperature of up to 4,5°C until 2100.[14] Earth is, in the words of James Hansen, a very different place - the temperature difference between the last ice age and today averaged about 5°C, albeit in the other direction.

[14] See Meinshausen, Malte: What Does a 2°C Target Mean for Greenhouse Gas Concentrations? A Frief Analysis Based on Multi-Gas Emission Pathways and Several Climate Sensitivity Uncertainty Estimates; In: H-J. Schellnhuber et al. (Eds.): Avoiding Dangerous Climate Change; Cambridge Univ. Press 2006.

2. The structurally conservative scenario (the wrong things are being done)

International negotiations on the Kyoto Protocol post-2012 are successful, but only reach a minimal consensus – and it does not include the United States. An agreement is reached after extremely tedious negotiations in the year 2011. These had been marked by the above mentioned "trench mentality", by industrialised and developing countries besieging each other on the theme of "first move loses the game". Petty conflicts regarding the responsibility for climate change reign supreme. The industrialised countries stubbornly hold on to the established rights to emit (grandfathering), while the developing countries and emerging economies continue copying the Western development model.

This scenario represents a structurally conservative model; it is driven by the inability of the energy industry to see that they must accept serious political moves to modify the basic principles and structures of the economy and the international system in the fight against climate change. Not only British companies have climate change on their screens. In Europe and also in the United States many business initiatives are formed – especially in the wake of the Stern Review. Many company representatives understand that climate change could severely endanger their businesses. In 2007, for example, the Swedish energy company Vattenfall releases a proposal for the global allocation of emissions (Curbing Climate Change) and launches the initiative "3C" (Combat Climate Change, www.combatclimatechange.org), which is joined by almost 40 major European enterprises, amongst others E.on and EnBW, business rivals to Vattenfall in Germany. 3C has the express goal of creating a global carbon market and aims to influence proactively the negotiations for a post-2012 regime. Another initiative of 2007 is the US-American Climate Action Partnership (USCAP, http://www.us-cap.org). Participants include for instance General Electrics, DuPont and Caterpillar. At the "World Economic Summit" 2007 in Davos climate change is the most prominent topic.

But the international climate negotiations are not necessarily advanced by these activities. Both governments and companies flinch at the dimension of the structural changes needed. They cannot believe that structural change will generate opportunities and do not trust that their investors and voters would accept change on such a scale. The mantra of perpetual conventional economic growth remains untouched – quite the contrary, economic growth is still seen as a major prerequisite for the protection of the climate.[15] The technical structures that are the basis of dominance by large energy companies are also maintained in this scenario. In most European countries these are for instance represented by the old and centralised electricity grids, not suitable for the challenges posed by the feed-in of diverse and decentralised renewable energy sources.

The adherence to a central, fossil fuel-based energy supply is followed by most national energy policies: In Germany, up to 40 coal plants are planned in the beginning of 2007. The global drive towards coal is unbroken as well, fuelled by the desire to protect energy supply. The international development banks (e.g. the World Bank in its Energy Investment Framework of 2007)[16] are still funding mainly fossil fuel based energy

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[15] Conclusions of the chair of the Gleneagles ministerial meeting (3-4 Oct. 2006, Monterrey), www.defra.gov.uk/environment/climatechange/internat/pdf/chairs-conclusions-mexico-october06.pdf.

[16] http://www.defra.gov.uk/environment/climatechange/internat/pdf/chairs-conclusions-mexico-october06.pdf, cf. also How the WORLD BANK'S ENERGY FRAMEWORK Sells the Climate and Poor People Short. A Civil Society Response to the World Bank's Investment Framework for Clean Energy and Development, September 2006 (http://www.seen.org/PDFs/Energy_Framework_CSO.pdf).

projects. Two coal-fired power plants were erected every week at the beginning of the millennium, emitting more than one billion tons of carbon dioxide per year. However, this trend even increases in the following years: In 2008 – 2012 enough coal plants are built to emit an additional 1.2 billion tons of CO_2 into the atmosphere.[17]

The depletion of natural resources thus continues without restraint, and the reserves of oil and gas are squeezed out to the last drop. Clinging to the old structures of energy supplies leads to a focus on alternatives to oil and gas – coal gasification, oil sands and nuclear energy in the electricity sector. Oil is expensive and scarce, but the alternatives are all but climate-friendly. If coal is gasified (CTL) – in order to use it as a fuel for cars – the emissions of carbon dioxide are approximately twice as high as from the combustion of oil. Furthermore, the Canadian oil sands must be washed out with massive amounts of energy and water – a catastrophe for the climate and for the region's ecology, since the mining leaves veritable moonscapes. Finally, the frenzy for oil surrogates leads to the mining of the vast stocks of methane hydrates stored in the arctic permafrost and under the seabed in order to meet humanity's growing energy needs.

Out of fear of disruption and system change, politics and the economic sector promote mainly central and large-scale technologies: nuclear energy (even though it can only meet a few percent of the world's energy needs at best), coal (with the promise of harmless combustion because greenhouse gases would be stored subterranean), large-scale bio energy (even though it becomes clear quite quickly that there is competition for cultivable land among food and energy plants -visible by the "tortilla crisis" in Mexico in early 2007), and large-scale hydropower (with all its negative side effects and also declining reliability due to the impacts of climate change.)

A shift to rigorous improvements in energy efficiency and renewable energies does not take place. Although in countries such as Germany, Spain or India wind power reaches market readiness more rapidly than expected, traditional interests prevail. Thus the specific support systems for renewable energies, for example by introducing highly effective feed-in laws, are stopped, and the next phase of the renewable energy boom is missed. Thus, although wind power in Germany had reached a market share of six percent between 1998 and 2006 and generation capacity had been enlarged on a scale impossible with conventional plants, solar energies remain at the fringes of energy supply: The structurally-conservative powers prevail.

At the international level, due to an unusually lively communication in the context of the G8+5 and the Gleneagles processes, initially a relaxation of industrialised and developing countries' relations takes place. But it is soon visible that rich countries of the North do not intend to limit their own emissions of greenhouse gases in order to leave some headway for growth to the developing countries.

An indicator for this unwillingness can be seen in the plan put forward by Vattenfall, which envisages the allocation of rights to emit according to the global GDP (http://www.vattenfall.com/www/ccc/ccc/index.jsp). Following this plan, every state would be given as many emission rights as was its share of the global gross national product. True, this would favour those states that had already achieved a good ratio

[17] Projection in the Christian Science Monitor, 22. März 2007, http://www.csmonitor.com/2007/0322/p01s04-wogi.html.

between energy use and economic performance, thus being comparably energy efficient. But at the social level this formula punishes those whose economic development has come late. It only gives to those that have already.[18] Even though equity considerations have been taken into account, therefore, the proposal thus falls short of providing ways out of the deadlock.

Curbing Climate Change – the Vattenfall proposal

- First proposal for a truly global strategy from the company level;
- Global burden sharing model based on binding emission caps, the allocation is based on the share of global GDP by a country;
- No "rich country" should go through "disruptive change" and the plan is thus designed to maintain today's relative competitiveness;
- No "poor country" shall be denied the right of development;
- Industrialised countries start with reductions;
- Developing countries enter later, but have steeper reductions;
- Equity recognised as important, contains adjustment mechanisms.

Critical points

- Scenario is based on 550ppm CO_{2eq} – implying plus 3°C rise;
- Equity criteria not oriented at per-capita level, but share of GDP;
- Allocation rule thus not perceived as fair by emerging economies.

Box 3: Curbing Climate Change – the Vattenfall proposal

The international climate negotiations therefore do not make much progress. Although an agreement for the period post-2012 is reached, the package is not adequate to seriously address the problem. The USA are not part of this agreement and the remaining industrialised states commit themselves to an over-all reduction of only eight percent in relation to 1990 (with far-reaching allowances of emissions through avoided deforestation), while developing countries make voluntary commitments to advance renewable energy technologies and increase energy efficiency. Since ratification takes longer than the first commitment period in 2012, a gap between commitments opens that is filled by an interim agreement. But the confidence of the markets is gone, and emissions trading is not taken seriously anymore. Many citizen initiatives for different lifestyles develop. However, the biggest parts of the global economy do not make real advances on energy efficiency and overall share of renewable energies remains small.

When the amendment to the Kyoto Protocol finally enters into force in 2016, the world is on an emissions path that could lead to a global mean temperature rise of up to 4,5°C by the end of the century as well. It is uncertain whether a turnaround in emissions after 2020 would work. Too mighty are the old interests, too weak the alternatives, and too great the temptation to use "imperialistic" policies of force to ensure the energy needs of the affluent North and the aspiring South. A slide into the first scenario cannot be ruled out.

[18] For an extensive evaluation see Baer, Paul/Athanasiou, Tom: Curbing Climate Change? A Critical Appraisal of the Vattenfall Proposal for a Fair Climate Regime; Heinrich Böll Foundation, Global Issue Papers No.31, June 2007, http://www.boell.de/downloads/global/global_issue_paper31.pdf.

3. The eco-fair scenario (fast and equitable action)

The international climate negotiations on a follow-up of the Kyoto Protocol after 2012 are concluded before the end of 2009. Although, as usual, the talks are affected by bitter diplomatic battles, these can be put under control. The newly gained confidence between the industrialised and developing countries due to the Gleneagles process proves helpful. The G8 governments do not bow to the pressure for a structurally conservative solution exerted by the industry, but use the initiative to form a fundamental agreement on the cornerstones of a post-2012 strategy.

Following the example of the EU, which had committed to a 20 percent reduction of greenhouse gases until 2020 in March 2007, Japan, Canada and some of the smaller states agree to strengthened commitments. They do not commit to the same target as the EU. However, the European commitment also amounted to something less since the EU had grown from 15 to 27 states, and the Eastern European states had brought with them their reductions ("wall-fall profits") attained after 1990.[19] The Europeans succeed, however, to convince their partners of the solidity of their unilateral commitment. In return, these countries commit to reductions averaging at 10 percent for the second commitment period and the Union increases to 25 percent. These targets are still not strong enough to lead the climate towards a safe emission path. But the negotiators insert a clause to review the adequacy of those commitments immediately after the entry into force of the amendment and to enter into negotiations on a stronger follow-up. And, not to forget, the policy induced technological change surpasses all expectations, leading to rapid technology advances in renewable energies, storage and efficiency technologies after 2012.

The United States cannot enter into a commitment under the amended Kyoto Protocol, since the new administration has only taken office in early 2009. However, the new administration takes climate change very serious, it utilizes the climate protection measures already initiated by the various federal states and the changed opinion in Congress. The federal government adopts a far-reaching climate policy package aiming at the reduction of emissions back to the level of 1990 by the year 2020. This strategy is "non-partisan", supported by both major parties. At the core of the strategy is the introduction of an emissions trading system for companies similar to the EU's, and the massive promotion of renewable energies. At the end of 2009 during the climate summit on the conclusion of the post-2012 negotiations, the USA presents its national strategy and issues a unilateral declaration, binding under international public law, to be bound by this voluntary national target.

This binding declaration is accepted by all other states and becomes part of the package deal. In particular the larger emerging economies (the +5 countries) relieve their mistrust against the USA and declare that these steps fulfil their conditions for a constructive first step. Another condition proves harder to fulfil: The states of the South expect generous financing of their own climate-related mitigation activities, and part of the costs of necessary adaptation to climate change. Traditionally, the rich states of the North have difficulties with financial transfers to the South – on their part the suspicion remains that the money often goes directly into the pockets of the Southern elites.

[19] CF. (in German) Luhmann, Hans-Jochen; Sterk, Wolfgang: Klimaschutzziel für Deutschland. Kurzstudie für Greenpeace Deutschland, Energiebereich. Hamburg: Greenpeace, Februar 2007 (in German);

URL: http://www.greenpeace.de/fileadmin/gpd/user_upload/themen/klima/Klimaschutzziel-40Prozent_01.pdf

According to experience with international negotiations, real money only flows in the face of extreme danger – for example in the case of the protection of the ozone layer: The Montreal Protocol established a separate fund for so-called "incremental costs" of measures to phase out ozone depleting substances, meaning the added costs of using non-ozone-depleting agents. The financing need for leap-frogging the fossil fuel age certainly is a lot greater than was the case with ozone-depleting substances (roughly US$ 2.2 billion). However, the dangers of climate change are of a similar or greater degree. Because of this, the post-2012 talks succeed to agree on a funding solution, which builds on the existing funds of the Framework Convention on Climate Change and the Kyoto Protocol. The costs of adaptation are met by another fund. This fund draws partly on the revenue from the auctioning of emission rights in Europe and elsewhere. The agreement foresees the establishment of a global emissions trading system as long-term objective after 2020 – even containing hinting at a provision that a part of the revenues stemming from auctioning the emission rights might be refunded to the people.[20]

In return, the rapidly industrialising countries of the South show their willingness to commit to emissions reductions themselves. These targets are not "quantitative" on the national level as for the industrialised states yet, i.e. they do not set a fixed cap on emissions per country. But for certain sectors (e.g. steel, energy, cement etc.), the countries agree on concrete measures for greenhouse gas reductions. Moreover, until the year 2020, a minimum of 30 percent of energy supply in these countries shall stem from renewable energies. Additionally, cooperation in the development and diffusion of climate-friendly technologies - including energy efficiency - is stipulated in a set of chapters on technology. The obligations do not apply to all developing countries, but only for the "emerging economies" the rapidly industrialising countries that have reached a certain level in their economic development and emissions. This level is calculated via a complex index, combining criteria of historical responsibility, economic power and mitigation potentials of the states.[21] The Least Developed Countries (LDCs) do not have to take on any reduction or limitation commitments, but are aided in their energy needs via renewable energies and in their adaptation to climate change.

Because of the quick resolve of the climate negotiations by the end of 2009, the markets continue to trust in emissions trading and the long-term target of climate protection. Ratification of the post-2012 agreement needs more time than expected, but for the interim period the existing commitments (2008-2012) are extended. In mid-2014, the amended post-2012 Protocol enters into force. Even before that, talks on the tightening of the Protocol have started – this time together with the USA. The Europeans successfully convince the US and China of the necessity for a long-term stabilisation target and a global reduction in the emissions of greenhouse gases in the range of 50 percent until the year 2050 is agreed. This goal has the potential to form the basis of a strategy for the global allocation of emission rights on a rational basis.

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[20] Cf. e.g. Barnes, Peter: Capitalism 3.0: A Guide to Reclaiming the Commons; Berrett-Koehler Publ. 2006.

[21] See e.g. Ott, H.E., Winkler, H., Brouns, B., Kartha, S., Mace, M.J., Huq, S., Kameyama, Y., Sari, A.P., Pan, J., Sokona, Y., Bhandari, P.M., Kassenberg, A., La Rovere, E.L. & Rahman, A. (2004): South-North Dialogue on Equity in the Greenhouse. A proposal for an adequate and equitable global climate agreement; GTZ Climate Protection Programme, May 2004, (http://www.wupperinst.org/uploads/tx_wiprojekt/1085_proposal.pdf).

Not only in Europe and Japan, but also in the United States the course is set for the solar economy. The leading positions that US-American enterprises had in the 70s and early 80s is soon re-established – after the right policy framework has been put in place, the US economy experiences an unparalleled boom of renewable energies. Similar to 2007/8, when billions of investments triggered a race towards bio-energy, the global capital now seeks to invest into the whole spectrum of solar energies. Even Exxon, one of the oil "dinosaurs", infamous for the financing of counter-consultancies against climate change, sees the writing on the wall and establishes a large renewable energy branch. Exxon will remain the largest enterprise of the world, even in the solar age.

However, these measures do not take effect as quickly as expected. Especially in China and India, emissions continue to rise for quite some time – mainly because of their intensive use of coal. Moreover, the potential of storing CO_2 in deep strata and old natural gas fields (CCS) is proving to be more limited than previously thought. The companies involved cannot, except in special cases, provide a guarantee that the greenhouse gases will stay underground. Popular movements against the storage of carbon dioxide in populated areas form, people are concerned about the deadly risk posed by the release of these gases. Furthermore, citizen movements against coal spring up in many parts of Europe, like an initiative that was founded already 2006 against a coal-fired power plant in Mainz, Germany (http://www.kohlefreies-mainz.de). In most of the European states, a moratorium on new coal plants without CCS is being set at the beginning of the second decade. In the USA and Canada, the ban comes around 2015, in China in 2020. Gigantic wind parks and solar-thermal power stations are constructed with the help of billionaire-investors for the closing of possible energy gaps. As the rest of the world, China's power grid is reconstructed for the acceptance of decentralised feed-in of renewable energy with high storage capacities. The hitherto over-heated economic growth settles and social disparities within China decrease.

Greenhouse gas concentrations in the atmosphere in this scenario cross the magical limit of 450 ppm CO_{2eq} as well, leaving less than a 50 percent chance to limit warming to plus 2°C globally. Concentrations of greenhouse gas will even jump up to 480 ppm CO_{2eq}, but thanks to the reorientation of energy policy will continuously fall after that, slowly at first, then faster and faster. The slow reaction of the climate system turns out to be an advantage and there is good chance that global warming will not exceed plus 2 – 2.5°C. Earth is different from how our ancestors knew it. Great efforts in adaptation have to be made and a large share of the population in many coastal areas has to be resettled. But the catastrophic development of runaway climate change might have been averted.

IV. Overview of proposals post-2012

Supposedly not many issues in international politics have received a similar attention in the literature as the international climate negotiations. Academia, business and interest groups have produced an enormous amount of material on how to proceed with the climate regime after the expiry of the first commitment period of the Kyoto Protocol. There are literally hundreds of papers dealing with this question and maybe 50 different approaches can be ascertained.[22] Some of the proposals are dealing with narrower issues, e.g. the design of commitments for developing countries in a future regime, other pursue a broad avenue of the various elements required for a successful negotiation process. One truth has certainly emerged from past negotiations: Because of the complexity of the issue itself, only a complex package will finally have a chance of balancing all the interests involved.[23]

The issues that have to be dealt with are numerous. The following overview thus cannot be exhaustive, but just highlights a few distinct proposals that have been made in the last years.

The question of forum

Will the future regime still be built on the Kyoto Protocol, in the light of open resistance by the US government against this treaty? Or should the rest of the world budge and rather pursue a different approach built on a new treaty? Or, maybe, would it suffice to take the backbones of the Kyoto Protocol, transfer them to another treaty and give it a different name?

Most of the proposed approaches for the post-2012 regime assume that the Framework Convention and the Kyoto Protocol will remain the main arena for climate policy in the years to come. Indeed, even those proposals that pursue a very different approach make an attempt to adjust the rules of the regime rather than replacing it.[24] This makes good sense, for mainly two reasons: First, the convention and the protocol provide a stable basis for the future, institutions and processes that work. The routine and trust thereby established are invaluable assets. Second, and more importantly, negotiating a different regime would take many years – and speed is of the essence. Furthermore, there would not even be a guarantee that such negotiations would be successful.

Others have proposed a multitude of treaties based within different regimes like the G8 or the G20, but this appears to be an unworkable solution.[25] This does not mean, however, that the Kyoto Protocol could not be supplemented by another protocol for specific tasks like adaptation (see below). And as for the US question – many close

[22] Daniel Bodansky (with Sophie Chou and Christie Jorge-Tresolini) lists about 40 proposals in his overview, cf. Bodansky, Daniel: International Climate Efforts Beyond 2012: A Survey of Approaches; Pew Center on Global Climate Change (2004). Short description of most proposals can be found in this useful document. See also Swedish Environment Protection Agency: Climate cooperation beyond 2012; Naturvardsverket 2004.

[23] From an Asian perspective see Kazuhisa, Koakutsu/Watanabe, Rie: Energy security and developmental needs; in: Srinivasan, Ancha (Ed.): Asian Aspiration for Climate Regime Beyond 2012; International Institute for Global Environmental Strategies (2006), p.15-34.

[24] See e.g. Reinstein, Robert: A Possible Way Forward on Climate Change; in: 9 Mitigation and Adaptation Strategies (2004), pp.295-309.

[25] See Sugiyama, Taishi/Sinton, Jonathan: Orchestra of Treaties: A Future Climate Regime Scenario with Multiple Treaties among Like-minded Countries; in: International Environmental Agreements (2005), pp.65-88.

observers of the US argue that another administration, that takes climate change seriously, will have no problem with the name and structure of the treaty as long as their interests are duly taken into account.

The question of timeframe

Should the successor agreement pursue a short-term objective like the Kyoto Protocol, or should it rather pursue a longer-term vision with long-term targets for the year 2030 or even 2050? There are good arguments for both approaches: Short-term targets (of whatever kind) are needed because any ambition going beyond a couple of years ahead escapes the attention of most governments and companies. As said before, time is of the essence and there is no reason to believe that these actors would start bringing down their emissions if confronted with a long time-horizon. Long-term targets, on the other hand, provide certainty about the general direction of national and international policies and are thus important for planning and investment strategies. Obviously a combination of long- and short-term targets would present the optimum: This could take the form of consecutive five-year periods of legally binding targets combined with a vision of aiming at a 30 percent reduction globally in 2030 and a 50 percent reduction in the year 2050 (compared to 1990 levels). It should be noted, however, that the short-term targets must include a provision for their extension into the next commitment periods. Otherwise building trust in the carbon markets will be very difficult and negotiations always have to start from the scratch.

The design of commitments or targets

Should the approach of the Kyoto Protocol be extended into the future, using legally binding, quantified reduction targets as the main instrument? Or should the commitments be framed in a softer language, like voluntary pledges? Should there be different kinds of targets for different groups of states? There are numerous proposals putting forward alternatives to the reduction targets of the Kyoto Protocol. They range from a framework for domestic carbon taxes[26] to a Climate Marshall Plan.[27] There are also proposals for agreements on certain policies like energy efficiency targets.

The target approach with legally binding, absolute emission reductions from a certain base-year used in the Kyoto Protocol certainly has its advantages and disadvantages. On the negative side, it does not provide any support on how to reach these targets and needs to be supplemented with concrete measures. It also presumes the ability to gather and process large amounts of data – difficult for most countries except the most advanced. On the positive side, it provides for a high degree of stringency and certainty while at the same time leaving enough room for individual countries to choose the policies they think fit best to their particular circumstances, making the approach highly efficient. It already worked well in the context of the Montreal Protocol, although the targets in this case were aimed at production and consumption of ozone depleting substances, not at the emissions as such. It is debatable whether this should have been the approach in the case of the Kyoto Protocol as well, using e.g. the consumption of fossil fuels as a basis. But since the origins of the climate regime lie with the IPCC, a more "scientific" approach was used.

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[26] See e.g. Cooper, Richard: Toward a Real Treaty on Global Warming; in: 77 Foreign Affairs (1998), pp.66-79.

[27] See Schelling, Thomas C.: What Makes Greenhouse Sense? Time to Rethink the Kyoto Protocol; in: 81 Foreign Affairs (2002), pp.2-9.

There are thus good arguments that speak in favour of quantified, binding reduction targets – not the least that it was pushed by the United States in the Kyoto negotiations and is also pursued by state-based initiatives in the US like the Regional Greenhouse Gas Initiative (RGGI, http://www.rggi.org) of the North-Western States. However, these types of absolute targets are usually perceived as not being suitable for developing countries like the emerging economies, since these are still in a phase of rapid industrial growth. Most of the scientific literature therefore concentrates on how to adjust this target-based approach of the Kyoto Protocol to these different circumstances.[28] The options require a careful balancing of advantages and disadvantages regarding their environmental effectiveness.

A certain range of proposals aim at the strictness of the targets. Their nature changes, for example, from being absolute to relative if targets for emission reductions are coupled with an indicator like the GDP.[29] These so-called "intensity targets" (because they influence the energy efficiency of a country) have the advantage that they do not appear to limit economic growth under conventional thinking. Argentina in 1999 proposed a voluntary target that would restrict the rise in emissions to 0.5 percent for each growth in GDP by one percent. The downside of this type of target is the fact that it does not provide certainty with regard to the overall emissions – its environmental effectiveness is therefore limited. The economic efficiency is impaired as well, because it does not provide for a definite cap on emissions, thus presenting difficulties for an emissions trading system. In short: intensity targets are far from ideal.

Another way to render targets less stringent is the introduction of so-called "dual targets": Under this approach, a country would have two quantitative targets. If the lower target (meaning higher reductions) is reached, the country is in compliance and can sell the excess allowances on the carbon market.[30] If the higher target is achieved (meaning lower reductions), this country would still be presumed to be in compliance but could not take part in emissions trading. Only if the higher target is exceeded the country would be in non-compliance. A variant of this proposal is called "no-lose" target: There is only one target and if this is reached, the country may take part in emissions trading. If the target is missed, nothing happens – a country can gain, but not lose under this approach.[31] These are interesting proposals, especially with regard to developing countries or emerging economies. However, the environmental effectiveness is limited, especially in the case of the no-lose target.

A different approach is presented by the attempt to set targets not for a country as a whole, but for certain sectors of its economy only. This sectoral approach[32] has the

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[28] A comprehensive overview can be found in Höhne, Niklas, Dian Phylipsen, Simone Ullrich and Kornelis Blok.: Options for the second commitment period of the Kyoto Protocol, research report for the German Federal Environmental Agency; Umweltbundesamt, Berlin 2005. http://www.umweltdaten.de/publikationen/fpdf-l/2847.pdf.

[29] See e.g. Swedish Environmental Protection Agency: Kyoto and Beyond. Issues and Options in the Global Response to Climate Change; Naturvardsverket 2002; Swedish Environment Protection Agency: Climate cooperation beyond 2012; Naturvardsverket 2004

[30] See e.g. Kim, Y-G./ Baumert K.A.: Reducing Uncertainty through Dual-Intensity Targets; in Baumert, K.A./Blanchard, O./Llose, S. /J.F. Perkaus (Eds.), Building on the Kyoto Protocol: Options for Protecting the Climate. Washington DC: World Resources Institute 2002.

[31] Philibert, Cedric: How could emissions trading benefit developing countries; in: 28 Energy Policy (2000), pp.947-956.

[32] Philibert, Cedric/Pershing, Jonathan: Considering the options: climate targets for all countries. 1 Climate Policy (2001), pp.211-227.

advantage that much less information is needed to assess the emissions of a given sector and that renders it suitable for many developing countries. Targeting some economic sectors only could also alleviate fears that economic development might be unfairly restricted. If this approach were applied to all major emerging economies, it would also ensure competitiveness. Since the targets are absolute, the environmental effectiveness is high and the country could even take part in emissions trading. One variant of this approach is the extension of the CDM to sectoral activities, like for example improving the efficiency of cement production in a developing country. There are, however, a number of difficulties associated with this approach.[33]

An alternative approach is presented by proposals to move away from numerical reduction targets, but concentrate instead on specific policy objectives like a certain share of renewable energies or energy efficiency improvements. This type of target would take the development objectives of developing countries as a start and couple these with measures that achieve lower emissions than would be achieved under a business-as-usual case.[34] Since these "Sustainable Development Policies and Measures" (SD-PAMs) are supported financially by industrialised countries, this option is especially interesting for countries with a lower level of economic development.

These different types of targets outlined above could easily be combined with each other to form a complex regime of multiple targets with multiple stages. Many authors have therefore proposed so-called "multi-stage" proposals, where countries move gradually in line with their economic development from one stage of commitments to the next.[35]

The question of differentiation

Differentiation between countries therefore moves centre stage and has produced a sizeable library on its own. It is quite apparent that countries have different starting points and conditions and that therefore they cannot be treated alike. Since the differentiation process in the run-up to the Kyoto Protocol was based on power play, intransigence and in some cases pure chutzpah, there are strong arguments in favour of a more rational, transparent and fair process.

Such a differentiation process could be built on current emissions of a country, the per capita emissions, the historical responsibility for emissions or the level of wealth (measured in GDP or the Human Development Index). It is quite apparent that only a combination of many of these factors will guarantee that the special circumstances of

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[33] See Sterk, Wolfgang/Wittneben, Bettina: Addressing Opportunities and Challenges of a Sectoral Approach to the Clean Development Mechanism. JIKO Policy Paper 1/2005, Wuppertal Institute, August 2005. Available at http://www.wupperinst.org/jiko.

[34] Winkler, H./Spalding-Fetcher, R./Mwakasonda, S. /Davidson., O.: Sustainable development policies and measures: starting from development to tackle climate change; in: Baumert, K.A./Blanchard, O./Llose, S. /J.F. Perkaus (Eds.), Building on the Kyoto Protocol: Options for Protecting the Climate. Washington DC: World Resources Institute 2002, pp. 61-87.

[35] See e.g. Gupta, Joyeeta: Encouraging developing country participation in the climate change regime. Discussion Paper E98-08. Institute for Environmental Studies, Free University of Amsterdam, Amsterdam (1998); Höhne, Niklas, Dian Phylipsen, Simone Ullrich and Kornelis Blok.: Options for the second commitment period of the Kyoto Protocol, research report for the German Federal Environmental Agency; Umweltbundesamt, Berlin 2005. http://www.umweltdaten.de/publikationen/fpdf-l/2847.pdf.

countries are truly taken into account and that amount to a fair treatment.[36] There is also no doubt, however, that such rational models for differentiation have a limited value. They can inform the negotiations and provide a starting point for the diplomatic process – but the end result will always be the outcome of a political bargaining process.

The question of adaptation

Finally, which role should adaptation play in the future package? Which institutions, which instruments are needed to effectively support poorer countries in their adaptation efforts? Are existing approaches sufficient? What should be the legal framework – should adaptation be regulated in a separate protocol or should the existing institutional structure be used, i.e. the Kyoto Protocol?

According to preliminary estimates by the World Bank, the yearly cost to "climate-proof" development in low-income countries would be in the range of US$ 10-40 billion. There are no concrete calculations yet but there is no doubt that large funds will be necessary to support developing countries in their efforts to fend off the worst impacts of climate change. This money could come from contributions by industrialised countries, either voluntary or mandatory. Experience shows, however, that voluntary contributions would not be sufficient because they simply do not flow. According to other proposals, the necessary means could come from charging the transactions in the context of emissions trading or putting a levy on airfares. Also most important is the integration of adaptation into development planning and poverty reduction strategies. It would be awkward and not very effective if adaptation was being pursued as a stand-alone activity.

Regarding the question of locality, there are good arguments for both sides: A separate adaptation protocol, as it has been proposed[37], would certainly enhance the status of the issue and provide a unique setting for the protracted negotiations between South and North. However, the integration of adaptation into the rest of the climate processes would certainly benefit from an integration of the rules into the existing legal regime. Moreover, the negotiation power of poorer developing countries would be considerably enhanced if the issues of mitigation and adaptation were connected. There are thus better arguments to place the rules on adaptation into the Kyoto Protocol itself.

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[36] See e.g. Ott, H.E., Winkler, H., Brouns, B., Kartha, S., Mace, M.J., Huq, S., Kameyama, Y., Sari, A.P., Pan, J., Sokona, Y., Bhandari, P.M., Kassenberg, A., La Rovere, E.L. & Rahman, A. (2004): South-North Dialogue on Equity in the Greenhouse. A proposal for an adequate and equitable global climate agreement; GTZ Climate Protection Programme, May 2004, (http://www.wupperinst.org/uploads/tx_wiprojekt/1085_proposal.pdf). See also den Elzen, Michel G.J.; Höhne, Niklas; Brouns, Bernd; Winkler, Harald; Ott, Hermann E.: Differentiation of countries' future commitments in a post-2012 climate regime: An assessment of the "South–North Dialogue" Proposal. In: Environmental Science & Policy, Vol. 10, Issue 3, May 2007, pp.185-203.

[37] Torvanger, Asbjørn/Bang, Guri/Kolshus, Hans H. /Vevatne, Jonas: Broadening the climate regime. Design and feasibility of multi-stage climate agreements; CICERO Report 2005:02, May 2005.

Other questions

Besides of these questions, there are some other issues that would merit attention as well: Are the existing instruments like emissions trading, Joint Implementation and the CDM efficient and adequate? Or do mitigation projects in Africa require a different approach, less dependent on the markets and the primary flows of foreign direct investment? And there is the perennial issue of voting and the dynamics of the regime – should a majority voting system be introduced that would allow progress against a small number of countries?

All these questions and issues are important and have to be addressed, but the main political problem remains the distrust between South and North, the gap between the traditional industrialised countries and the fast growing emerging powers. The last chapter will therefore explore a negotiation strategy that would have the capacity to build trust and to bridge the gap between the two factions. They are not meant to be exhaustive, but rather present the minimum offer required from the industrialised countries if progress is to be achieved in Bali and thereafter, when the post-2012 agreement is being negotiated.

V. Essential building blocks for the climate negotiations

The world is moving closer to the abyss of accelerated climate change. In order to prevent a rise in global mean temperature beyond 2°C, the world may not even have the 10-15 years that are usually quoted: The following table is taken from the Summary for Policymakers of Working Group III of the IPCC. It shows that in order to avoid exceeding 2°C with some certainty, the peak of emissions should be reached latest at 2015.

***Table SPM.5**: Characteristics of post-TAR stabilization scenarios [Table TS 2, 3.10][a)]*

Category	Radiative Forcing ($W/m^{2)}$)	CO_2 Concentration[c)] (ppm)	CO_2-eq Concentration[c)] (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity[b), c)] (°C)	Peaking year for CO_2 emissions[d)] (year)	Change in global CO_2 emissions in 2050 (% of 2000 emissions)[d)] (%)
I	2.5 – 3.0	350 – 400	445 – 490	2.0 – 2.4	2000 - 2015	-85 to -50
II	3.0 – 3.5	400 – 440	490 – 535	2.4 – 2.8	2000 - 2020	-60 to -30

Fig.3: Characteristics of post-TAR stabilization scenarios. Source: IPCC Working Group III, Summary for Policymakers, p.22 (part)

There is thus no time to waste. Recent research led by Michael Raupach of the Australian Commonwealth Scientific and Industrial Research Organisation shows that global emissions are growing even faster than the most pessimistic projections of the IPCC predicted. During the 1990s, emissions grew by 1.1 percent per year on average, but the number went up to 3.3 percent between 2000 and 2004, when the study ended.

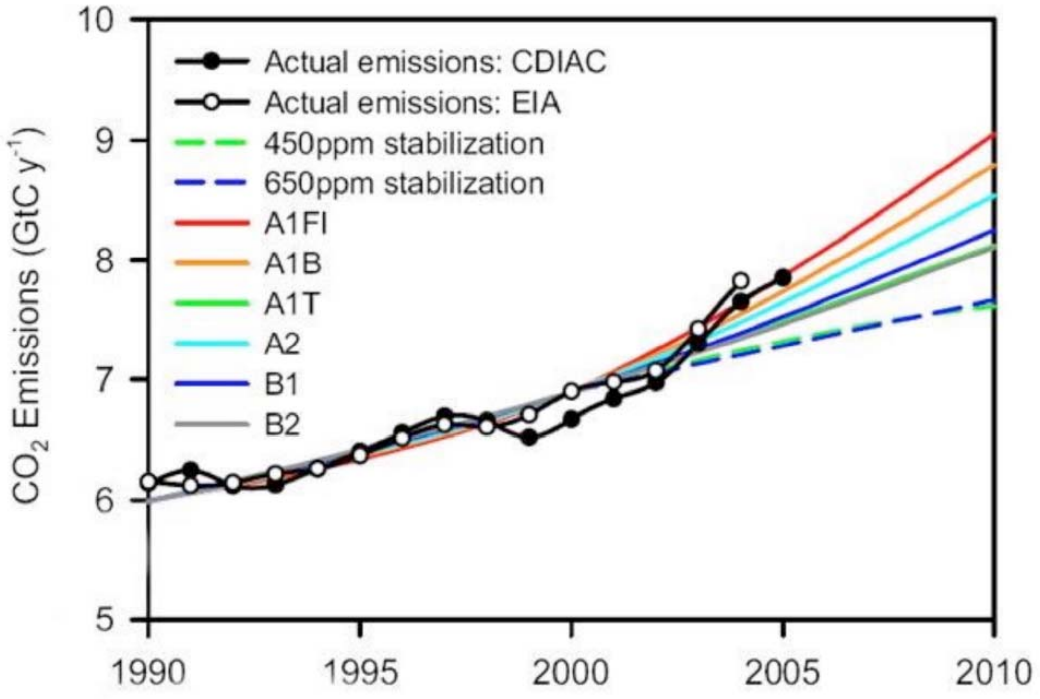

Fig.4: Actual emissions vs. projections. Source: New Scientist, 21 May 2007

The researchers also concluded that the rise in CO_2 emissions, especially in the South, is not due to a growth in global population, but due to a reduction in global efficiency – meaning especially a rush towards coal.[38] The graph shows that that the actual emissions according to two independent sources (CDIAC and EIA) are at the highest or above those projected by the IPCCs scenarios.

If we want to move as closely as possible to the third "eco-fair" scenario outlined above, the relationship between North and South is key. It is imperative to fill the trenches between the industrialised countries and the emerging economies, and the first moves have to come from the Northern countries. As Sunita Narain from India's Centre for Science and Environment put it, "No more kindergarten approach to climate".[39] The reasons not to expect more political rationality from Southern leaders than from their Northern counterparts are manifold: historical responsibility as well as financial, economical and technological capabilities of the North, and still widespread poverty and lack of development in the South. But the most convincing argument for Northern governments should be the fact that the potential of the emerging economies for exercising pressure is mounting. China, India and Brazil do not have to do anything in order to move the world closer to catastrophe – it is enough if they just continue doing what they do and the way they are doing it - copying the North.

Trust building requires three distinct activities: Taking on substantial reduction targets by the industrialised countries themselves, offers to finance mitigation activities in developing countries and financial offers for their adaptation to climate change. It should not be irritating that two of those exercises are of a financial nature. Money is not everything, but those who do not have it perceive financial support as the best indicator for good relations. After all – what would we think of a rich family who does not give any money to their starving relatives but who nevertheless express their deep affection for their siblings, nieces and nephews living in misery?

Strong reduction targets by industrialised countries

International climate policy can only be successful if the national policies of industrialised countries towards reducing emissions are credible – this is a fundamental truth in today's interconnected and interdependent world.[40] With the exception of a few European countries, notably the UK, Sweden and Germany, whose emissions have decreased partly due to genuine climate policy and partly due to non-climate related factors, emissions continue to grow more or less unabated. The recent initiatives by the European Union, especially the unilateral commitment to reduce emissions by 20 percent in 2020 and to increase the share of renewable energy to 20 percent, certainly point into the right direction. However, as outlined above, the real target is somewhat lower because the reductions in the Eastern European countries are taken into account. The unilateral EU reduction target therefore should be strengthened to 30 percent. Reaching 30 percent reduction until 2020 is possible, even without nuclear power, as a report by the Wuppertal Institute for WWF has shown.[41] And the Union must convince

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[38] Proceedings of the National Academy of Sciences (DOI: 10.1073/pnas.0700609104)

[39] CSE's Fortnightly News Bulletin of May 25, 2007, available at http://www.downtoearth.org.in.

[40] Sachs, Wolfgang/Ott, Hermann E.: A New Foreign Policy Agenda. Environmental Politics is Resource Politics is Peace Politics; in: Internationale Politik, Journal of the German Council on Foreign Relations (IP-Global Edition), Vol.8, 1/2007, pp.16-22; at http://www.wupperinst.org/en/publications/berlin_office/index.html

[41] WWF: Target 2020: Policies and measures to reduce greenhouse gas emissions in the EU, October 2005, a report by the Wuppertal Institute, available at www.panda.org/climate/EUtarget2020.

other governments to commit to serious targets themselves, at least in the range of 10 percent as envisioned in the third scenario.

Participation of the US is crucial in the long run. But to wait for the current administration has been and continues to be a wrong strategy. Quite openly, the US refusal to engage in serious negotiations and to block cooperation in the context of the G8 and the UN climate regime amounts to taking the world hostage. The best strategy therefore is to ignore the efforts of the current administration and go ahead. The next US president will have a different attitude, regardless of political background. This does not mean to wait for these elections. There is crucial time until early 2009 that must be used. This is a time for trust building between the EU, Japan, Canada, New Zealand, Norway, Switzerland and the emerging powers of the South. This is a time to set the framework for a global deal for climate negotiations by end 2009.

As outlined in the third scenario, it is unlikely that the US could ratify the Kyoto Protocol for the second commitment period. But there is a way to integrate the USA into the regime without formal ratification: By the end of 2009, the new administration could adopt a comprehensive national climate strategy, including an ambitious target, rendered binding under international law. This declaration could become part of the negotiation package. Formal ratification of the Kyoto Protocol by the US could follow for the third commitment period. It is also clear that, with emissions 20 percent above their 1990 levels, the US cannot commit to the same target level as the EU. This may seem unfair, because the US government has pursued a business-as-usual policy. But in global *realpolitik* it can be wise to accept an injustice in the interest of moving forward. The level of ambition for the targets of other industrialised countries apart from the EU should be in the range of at least 10 percent on average for the next five-ear commitment period. Additionally, the industrialised countries should agree on a long-term reduction target for 2050 in the range of 80 percent compared to 1990 levels. Agreeing on global reduction target in the range of 50 percent will probably be difficult to achieve because of mistrust and resistance in the South, but could be envisaged for the next round of negotiations after industrialised countries have shown their seriousness on climate change.

This move by the industrialised countries will be an essential trust building measure for the South – and it will provide some room for their emissions to grow. There are serious socioeconomic problems in many of the emerging economies that have to be addressed. But there are still ways to integrate these countries in mitigation activities. As outlined above, approaches exist that would make the acceptance of targets for Southern countries more acceptable. These could be dual or no-lose targets, but more promising appears to be an approach based on sectoral targets, maybe coupled with dual or intensity targets for these sectors. This would mean that the emerging economies accept reduction or limitation targets for certain sectors of the economy like the cement industry, the steel industry of electricity generation. Additionally, they could commit to targets for a certain share of renewable energies in electricity production. These so-called Sustainable Development Policies and Measures (SD-PAM) would also be suitable for the less developed countries. In the end, however, the success of these measures will be dependent on their funding by industrialised countries.

Financing mitigation in developing countries

Although there are many co-benefits of climate mitigation policies, in most cases the choice of non-carbon alternatives to fossil fuels will involve higher costs, at least in the beginning. All new technology is expensive in the start-up phase and follows the logic of so-called technology curves. Experiences from many technology areas show that every time demand doubles the costs come down by 10 to 15 percent. Hence, in order to accelerate the introduction of non-carbon technologies in the market, government incentives – like feed-in tariffs and public procurement - are urgently needed. The experience with wind energy in countries like Germany and Denmark demonstrate the effectiveness of such government intervention.

According to the Stern Review, the incremental costs of low-carbon investments in developing countries are likely to be at least $20-30 billion per year – and this is a conservative estimate.[42] Replacing cheap coal with renewable energies will cost several times as much. Bob Watson, the chief scientist of the World Bank, estimates that climate mitigation will cost somewhere between $10 billion to $200 billion per year.[43] This broad range indicates the fundamental ignorance of the dimensions needed, but it also indicates that to finance the incremental costs is an imperative if the North is serious about mitigation activities in developing countries, especially the emerging economies. Financing mitigation activities in developing countries is thus at the same time

- an indispensable second trust-building element to lift the negotiations out of the diplomatic trenches;
- vital for the leap-frogging of the fossil age by the emerging economies into the solar age and
- the best and cheapest adaptation strategy.

In designing procedures and institutions for financing mitigation activities, a careful balance has to be struck between market and non-market instruments. Markets will deliver certain desired results and higher prices for fossil fuels are thus one of the instruments to achieve a low- and no-carbon economy. But markets cannot deliver miracles. For example, prices alone are not enough to foster the development of specific technologies - if oil is replaced by coal-gasification technologies, the end result will be not only higher prices but also accelerated climate change. Furthermore, pure market instruments imply a fundamental social bias because higher prices will put the poor at another disadvantage. Market instruments like a global emissions trading scheme, as useful as this may be, must therefore be complemented with other regulatory instruments.

The CDM as it is designed has proven to be not the most effective instrument for achieving low-carbon, or better no-carbon, sustainable development. Most credits are earned by cheap reductions in projects to reduce the emissions of Hydrofluorocarbons (HFC23), the mechanism is very complex for small-scale activities and there is a considerable geographical imbalance: Only three percent of investments go to Africa, because projects tend to go where most of the Foreign Direct Investments flow. And

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[42] Stern, Nicholas: The Economics of Climate Change: Cambridge. Univ. Press 2007, pp.491 et seq.; www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm.

43 Greenwire, April 24, 2006, SECTION: SPOTLIGHT Vol. 10 No. 9.

the additional goal of fostering sustainable development is being missed in most cases.[44] Besides of these structural flaws, the CDM is inadequate because it will generate at best funds in the range of hundreds of millions – not in the range of tens of billions as would be required. And finally it should be remembered that certificates generated by the CDM inflate the emission budgets of industrialised countries and allow more emissions in the North. Only after the host countries in the South have accepted binding caps on their own emissions has the CDM the chance to become an effective instrument for reducing emissions.

The EU therefore has to think big and come up with new solutions. There are many options that have been proposed by governments and individual authors, like for example a fund with contributions generated by a global tax, by international aviation levies, by levies on transactions in the context of the European emissions trading scheme or by a global emissions trading system. However, as new and attractive as most of these options appear, little chance they have of being realised. The two percent levy on transactions under the CDM to finance adaptation measures is the first of its kind – but it is only the CDM that carries such a burden (not JI or emissions trading). It cannot be expected that the fundamental opposition of many states towards global taxes or fees on trading will vanish suddenly – and there is no time to waste.

Therefore, when it comes to financing international activities, traditional fund solutions appear to have the greatest chance of being implemented and to provide a stable source of funding.

There is a very successful example of international funding of substitutes for outdated technologies: The Multilateral Fund for the Implementation of the Montreal Protocol, established in 1990, is one of the reasons for the astounding success of the Montreal Protocol in protecting the ozone layer. Operational from 1991, the Multilateral Fund has received contributions totalling US$ 2.2 billion and supported about 5.500 projects in 144 developing countries resulting in the phase-out of several hundred thousand tonnes of ozone depleting substances (http://www.multilateralfund.org). A cornerstone of this success – apart from financial contributions of a considerable magnitude – is the fact that the Executive Committee consists of seven developing and seven industrialised countries with a voting structure designed to ensure that neither donors nor recipients are able to dominate the body. This fund therefore provides a useful blueprint for financing technology alternatives to fossil fuels as well.

It is not easy to ascertain whether the funds established within the climate regime could deliver. The only fund under the Kyoto Protocol is the Adaptation Fund that does not finance mitigation activities. The existing funds under the FCCC are mainly geared towards adaptation as well and have met with considerable criticism from the South. Recent decisions adopted in Nairobi regarding the Adaptation Fund point to possible solutions regarding the internal decision making procedures. But the fact remains that most developing countries are highly suspicious of the Global Environment Facility (GEF), which administers all these funds, because of co-financing requirements and the influence of the United States. It will take some time until developing countries will perceive the GEF as an institution they are having a stake in. In the interest of fast and

[44] Wittneben, Bettina; Sterk, Wolfgang; Ott, Hermann E.; Brouns, Bernd: The Montreal Climate Summit: Starting the Kyoto Business and Preparing for post-2012 The Kyoto Protocol's First Meeting of the Parties (MOP 1) and COP 11 of the UNFCCC. In: Journal for European Environmental and Planning Law (JEEPL) 2/2006, S.90-100, at 97 et seq.

effective action a new fund under the guidance of the Kyoto Protocol and administered by the GEF should be modelled after the Montreal Protocol fund.

Most important, however, is to provide such a fund with the required means for technology change in the South. This does not only refer to an adequate amount of funds, but also to the rules for spending: If the goal is to come as close to the eco-fair scenario as possible, financing fossil fuel technologies should be ruled out. The approach recently taken by the "Clean Energy for Development Investment Framework" of the World Bank Group, with its emphasis on coal, coal-gasification and carbon storage technologies, points exactly in the wrong direction.[45] It falls far short of the Renewable Energy Task Force of the G8, which in 2001 envisioned providing one billion people with access to renewable energy by 2010.[46] Rather, the approach recommended by the World Bank's internal Extractive Industries Review (EIR) should be used. The EIR Report was published in Lisbon on 11 December 2003 and recommended that the Bank and its private sector arm, the International Finance Corporation (IFC), phase out their involvement in oil, mining and natural gas within five years and shift their financing to renewable energy.

The EIR's motivation to recommend phase-out of fossil fuel financing was protection of human rights, but it is also essential for climate protection. To take an example from nutrition and health: if a government wants people to eat more healthily, it should subsidise food that is healthy and initiate awareness campaigns. What it should not do is to heavily subsidise slightly improved burgers and then add salad subsidies "for the health". It is the total input that counts. Renewable energy must replace fossil fuels, not come on top. Financing coal technologies, even improved coal technology, is the wrong way as it will put the Earth firmly on an emission path beyond 2°C.

An important element of this strategy to support mitigation efforts in developing countries is the transfer of technology. This has been increasingly recognised in the climate negotiations, and the FCCC-Secretariat has set up a special website on this issue (http://ttclear.unfccc.int/ttclear/jsp/). The Marakesh Accords in 2001 established an Expert Group on Technology Transfer (EGTT) that has been meeting regularly and whose mandate is currently being revised. Nevertheless, real progress has been marginal, because the issue is riddled with economic and legal pitfalls. Questions of intellectual property rights immediately come up when talking about technology transfer, and most companies are even reluctant to produce latest technology in developing countries for fear of being spied out.

Also in this respect, a new thinking must take place that takes into account the central challenge of climate change to the future of humankind. Not every demand by negotiators from the emerging economies is justified, but there is a general need for intelligent rules and institutions for the diffusion of smart technology. The measures taken to ensure the availability of anti-retroviral drugs against HIV in South Africa, Brazil, India and Thailand should provide ample evidence that patent laws are not above human rights. Efficiency and renewable energy technologies are not directly

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[45] http://www.worldbank.org/energy; see also the criticism by NGOs: How the WORLD BANK'S ENERGY FRAMEWORK Sells the Climate and Poor People Short. A Civil Society Response to the World Bank's Investment Framework for Clean Energy and Development, September 2006 (http://www.seen.org/PDFs/Energy_Framework_CSO.pdf).

[46] http://www.worldenergy.org/wec-geis/focus/renew/g8.asp.

saving people's lives, of course, but they are indirectly determining the survival of many millions and may be vital for the survival of this planet.

Industrialised countries thus should offer the emerging economies a package deal in the form of a Climate Partnership, to help facilitate the transition to a no-carbon economy and to support "climate-proof" development. If such an offer is made, there is a chance that the emerging economies will be willing to consider emission targets in the future. The offer could consist of the following components:

- co-financing of investments for renewable energies at least in the range of $20 billion per year; according to criteria for the financing of incremental costs to be worked out and agreed by the Parties;
- providing large-scale support for efficiency measures, in the more technical fields but also in the building sector;
- financing and other support of activities to stop deforestation, which contributes as much to global emissions as the transport sector, this should be done on the basis of a fund (as proposed by Brazil) and not as part of the CDM;
- facilitating access to alternative technology, ease constraints brought about by Intellectual Property Rights (again, the Montreal Protocol is a good example);
- support the diffusion of key technologies, lowering tariff and non-tariff barriers;
- support for capacity building – to educate and train people in all sectors of society on energy efficiency and low-carbon technology; and
- support for "climate proofing" development – effective adaptation to climate change.

Supporting adaptation in developing countries

While the mitigation of greenhouse gases is crucial for the stabilization of the climate system, strong adaptation measures are needed as well. Because even if all emissions were stopped today, global warming would continue well into the future – the atmosphere is already "loaded" with an additional 0.7°C that will materialise in the course of the next 20-30 years. Moreover, already today some negative consequences of climate change are experienced in many regions of the world. While developing countries run great risks, there are very few examples of governments in the South that have paid specific attention to the likely consequences of climate change in their development planning: Of more than 60 poverty reduction strategies so far adopted, only a handful have made risk reduction a priority.

According to preliminary estimates by the World Bank the yearly cost to "climate-proof" development in low-income countries would be in the range of US$ 10-40 billion. This estimate was made before the last IPCC report and might have to be revised upwards. Although only an estimate, the World Bank figure indicates the magnitude of the problem and the urgent need for additional resources to be mobilised. What to do with the potentially hundreds of millions of refugees in Bangladesh and other low-lying coastal areas, with the inhabitants of Tuvalu that have asked for asylum in Australia and New Zealand? Supporting the adaptation to present and future climate change is thus the third trust building measure vis-à-vis developing countries.

In the face of these challenges the efforts so far are totally inadequate. The Framework Convention (FCCC) recognises the right of poor countries to receive support in adaptation to climate change (e.g. Articles 4.8, 4.9). But action has been slow. After

many years of negotiations, the Parties have agreed on a "Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change" by the end of 2006. This programme still does not engage in concrete activities, but service offers include synthesis reports, technical papers, progress reports and a web-based interface. The Adaptation Fund under the Kyoto Protocol is still not operational, but there has been agreement on some basic principles for its governance.[47] This fund is being filled by a two percent levy on CDM transactions. The World Bank has estimated that it could generate funding in the range of US$ 100 - 500 million through to 2012. Even if this would materialise, it falls far short from the US$ 10-40 billion required *annually* according to estimations of the same source.

The Least Developed Country Fund (LDCF) under the FCCC has supported the preparation of National Adaptation Programmes of Action (NAPAs). It is filled by voluntary pledges and contributions, which amounted to US$ 89 million in early 2006. At the ninth Conference of the Parties, the EU together with Canada, Iceland, New Zealand, Norway and Switzerland reconfirmed a pledge of US$ 410 million by 2005 for bilateral activities, the LDCF and the Special Climate Change Fund (SCCF). However, oil producing countries claim compensation under the SCCF for lost revenues due to climate protection policies and the EU is thus unable to divert development aid into this fund. All in all, the financial means designated for adaptation under the GEF amount to less than one percent of the overall sum.

It is thus imperative to make an offer for funding adaptation measures and capacity building in the range required. Part of that should come from a fund filled by mandatory contributions from industrialised countries according to their share of emissions. If, for example, the emission of one tonne of CO_{2eq} would be charged with 1, this would already generate about 40 billion per year. The Adaptation Fund under the Kyoto Protocol could provide the basis for such a fund, provided the institutional location – whether with the GEF or independent - is resolved.

However, there are other schemes that should be pursued as well, like innovative insurance schemes for the management of climate risks at the local, national, regional and international level. These schemes could be modelled according to the principles of public-private partnerships. Combining risk transfer with risk reduction has proven successful in disaster-prone communities, for example the Turkish catastrophe insurance fund. Already at the beginning of the 1990s, AOSIS proposed an integrated insurance scheme that offered a structure for collective loss sharing.[48]

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[47] Sterk, Wolfgang; Ott, Hermann E.; Watanabe, Rie; Wittneben, Bettina: The Nairobi Climate Change Summit (COP 12 – MOP 2): Taking a Deep Breath before Negotiating Post-2012 Targets? In: Journal for European Environmental & Planning Law (JEEPL) 2/2007, pp.139-148, at p.144.

[48] Ott, H.E., Winkler, H., Brouns, B., Kartha, S., Mace, M.J., Huq, S., Kameyama, Y., Sari, A.P., Pan, J., Sokona, Y., Bhandari, P.M., Kassenberg, A., La Rovere, E.L. & Rahman, A. (2004): South-North Dialogue on Equity in the Greenhouse. A proposal for an adequate and equitable global climate agreement; GTZ Climate Protection Programme, May 2004, (http://www.wupperinst.org/uploads/tx_wiprojekt/1085_proposal.pdf).

VI. Conclusion

Too much time has passed since the world first woke up to the threat of climate change in the late 80s of the last century. Fast and fair action is urgently required, if humankind wants to limit the impacts of global warming – fast, because global emissions must start decreasing before 2020 and fair, because there will be no deal if it is not perceived by the large majority of developing countries as equitable and just. Historical responsibilities as well as economic and technological capabilities demand that the traditional industrialised countries of the North come out of the trenches and start making acceptable proposals towards the countries of the South.

The three building blocks outlined above might be able to overcome the deadlock in the negotiations and lead both sides out of the trenches. The history of the climate negotiations has shown that progress was always dependent on the combined force of the European Union (plus a number of allied industrialised countries like Japan, Switzerland, Norway and Canada) and the large number of developing countries. The latter feel an increasing gap between the demands of industrialized countries towards participation and what they actually perceive them of doing. There are certain steps that the emerging economies can reasonably be expected to take. But it is not perceived as fair if the traditional industrialised countries are just demanding them. What they should do is do their best, invite others to do their share and provide effective support. This will provide the basis for successful negotiations in 2008 and afterwards. Not more and not less.