

☺ **Report to The Export Group for Environmental Studies**

Time for a rethink!

The EU is at a climate policy crossroads.

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Summary of the report

This report is a contribution to the discussion that has been ongoing within the EU ever since the UN Climate Change Conference in Copenhagen in December 2009. The starting-point for the analysis is that global warming has the potential to cause serious problems in the future. The report discusses the issue of whether *international cooperation* on measures aimed at significantly reducing the risk of serious climate change can be sufficiently rapidly mobilised. Its aim is to highlight the fact that the EU is now at a major crossroads. All the climate policy decisions taken by the EU over the next few years will have a long-term impact. If the EU is convinced that global emission trends must be reversed in the very near future, it now faces a strategic choice in the wake of the Copenhagen Conference: Should it continue to pursue the same line of action it has taken for the last ten years? Or is it time for a major rethink? The report discusses an alternative to the international climate policy strategy pursued by the EU up until now.

There is broad consensus among natural scientists that greenhouse gas emissions exacerbate naturally occurring global warming. A higher concentration of greenhouse gases in the atmosphere causes the land and sea to heat up; this warming is further exacerbated by various feedback mechanisms. A rise in the global temperature will result in a number of climatic changes with a long-term impact on humans: greater temperature variations; changes in precipitation patterns resulting in flooding and drought; a change in the thickness of snow and ice cover; a higher sea level; poorer availability of fresh water in some areas and greater availability in others. In its latest report, the IPCC makes the assessment that greenhouse gas emissions must be reduced in order to stabilise their atmospheric concentrations. The long-term stable concentration of greenhouse gases is determined by how fast this reduction occurs. To have a good chance of avoiding global warming that exceeds 2°C, greenhouse gas

emissions will have to culminate within the next five years and thereafter significantly decrease.

It is difficult to produce a political solution to the problem of global warming. There are three basic reasons for this. Firstly, the atmospheric concentration of greenhouse gases is independent of where the emissions take place and who causes them. In other words, countries are not directly affected by their own emissions. Furthermore, it is not the emissions *themselves* that cause the problem; it is more the total amount of greenhouse gases that amass in the atmosphere over time. This means that no one country alone can come up with a lasting solution to the problem simply by reducing its own emissions. Coordinated international effort is therefore required to stabilise and reduce the atmospheric concentration of greenhouse gases.

The second factor that exacerbates climate cooperation is the fact that the most negative effects of global warming have yet to manifest themselves. Politically speaking, the problem doesn't therefore just affect people alive now, but also those who are yet to be born: to (partly) solve the problem, current generations must foot the bill for the benefit of future generations.

The third fundamental difficulty is that appropriate solutions also have profound consequences for the very cornerstones of a country's economy. Governments can therefore easily perceive international cooperation aimed at limiting greenhouse gas emissions as an unacceptable intrusion into their national sovereignty.

The climate problem has been high up on the international political agenda for over twenty years. Since 1994, efforts to find a solution have concentrated on a UN process linked to the *United Nations Framework Convention on Climate Change*. UN climate negotiations cover a

large number of complicated questions, more so than any other international negotiation. The report contains a brief historical review of the efforts to find a solution to the problem of how to cooperate on climate change. The difficulties involved in reaching an agreement, which could form the basis for a legally binding global architecture with the power to induce *global* changes in behaviour, have proven significant. The United States will not enter into a legally binding international climate agreement unless it receives a commitment from the major emerging economies of the world that they too will limit their greenhouse gas emissions. For their part, these emerging economies, led by China and India, have made it clear that they will not allow themselves to be restricted by any form of legally binding undertaking, and reject the demand for emission limitations as an unacceptable intrusion into their national sovereignty. The report also highlights some of the peculiarities of the UN negotiation process, which have no doubt significantly impaired the chances of reaching a legally binding global agreement. The report also summarises and comments on the *Copenhagen Accord* that was signed there in 2009.

In the wake of the Climate Conference in Copenhagen, it is clear that UN negotiations have come unstuck. The report provides several arguments as to why the negotiation process must undergo fundamental reform if it is to be possible to reach agreements that lead to a solution to the climate problem. The climate negotiations are overburdened with complicated questions. An agreement presupposes that very complicated problems are solved *simultaneously* - on the *global level* - in the prevailing negotiation model. It is unlikely that negotiations in which all UN member states are expected to reach consensus will result in such an agreement. Theoretical studies lend support to this assessment. A recent summary of game theory-oriented literature on international environmental agreements highlights the following three results: (i) it is unlikely that a global agreement ratified by all parties create

will create equilibrium; (ii) neither is it likely that equilibrium will be created in the form of a uniform and self-reinforcing global agreement; (iii) global equilibrium is more likely to be created by a structure consisting of several coalitions of various sizes. An implication of these theoretical observations is that any global agreement on climate change will in practice consist of a *retroactive* approval of an architecture that has emerged as a result of cooperation in smaller groups of countries as well as between these groups.

Arguments explaining why the EU must now find new forms and different fora for multilateral climate work are developed and analysed in the report. The aspiration to secure a global and legally binding agreement that has guided the EU up to now should be abandoned in favour of a more opportunistic approach: it is now more important to utilise the emerging opportunities for climate cooperation than to strive unilaterally for a solution to the climate issue within the UN framework.

The report sketches an alternative to the strategy followed by the EU up to now. This alternative course of action involves the development of a climate architecture as part of a *decentralised* cooperation initiative. Such cooperation is characterised by: (i) diplomatic powers concentrating on negotiations between a small number of *key countries*; (ii) an architecture that provides scope for a *diversity of measures*, adapted to the economic and political prerequisites and interests of each individual party; and (iii) an architecture that contains a framework within which political commitments can be made in such a way as to enable the parties to implement monitorable measures. At the same time, the report points out that it would be better if the UN gave formal support to a cooperation initiative of this kind. The EU should therefore demand and promote a reform of the negotiation process as a condition for resuming UN negotiations.

The report also ascertains that there is a great risk associated with leaving the UN negotiating table and it is difficult to foresee the consequences of such a decision. The alternative course of action shall however be weighed up against the option of continuing discussions within a UN framework, which in all likelihood will not result in any efforts being made to slow down global warming, not at least at a rapid enough pace. The risks associated with continued greenhouse gas emissions should therefore be weighed up against the political risks involved in breaking off UN negotiations.

Chapter I The aim and structure of the report

The starting-point for the analysis is that global warming has the potential to cause serious problems in the future. The report discusses the issue of whether *international cooperation* on measures aimed at significantly reducing the risk of serious climate change can be rapidly mobilised.

The report has been written in the light of the discussions that have recently taken place within the EU in the wake of the UN Climate Change Conference in Copenhagen in December 2009. Prior to every meeting of EU heads of state and government during the year, the President of the European Council, Herman van Rompuy, has intended to discuss the EU's strategy in international climate negotiations post Copenhagen. However, other issues have dominated the agendas of these meetings.¹ At the European Council meeting on 25-26 March, President van Rompuy reported that the Council intended to revisit the climate issue in September at an extra meeting, in the presence of EU foreign affairs ministers, for a “strategic debate with a broad perspective”. Unfortunately, however, this meeting was once again dominated by other issues.² EU heads of state and government have still not held the strategic debate announced by van Rompuy. This report is a contribution to the preparations prior to such a debate.

The report starts with a general introduction to the climate problem and the international efforts made up to now to find a solution. It then summarises the content of the political

¹ During the first six months of 2010, they were dominated by discussions on the Greek national debt crisis and the European emergency financing mechanism constructed during the spring.

² In addition to the European debt crisis, the September meeting dwelt on France's expulsion of Roma and the ensuing conflict between European Commission President José Manuel Barroso and French President Nicolas Sarkozy.

agreement reached in Copenhagen. Part I ends with an attempt to identify some very problematic obstacles in international climate work. Part II of the report presents arguments for a radical departure from the path chosen by the EU in international climate work up to now.³ My aim is to highlight the fact that the EU is now at a major crossroads. All the climate policy decisions taken by the EU over the next few years will have long-term consequences. It is therefore appropriate to seriously discuss alternatives to the strategy followed by the EU up to now. Readers who are already familiar with the climate issue can skip Part I and go directly to Part II.

³ The basic idea of the proposal began to emerge in the early hours of 19 December 2009, as I listened to the concluding debate at the Copenhagen conference. It was a peculiar experience to see how the millions of working hours put in by politicians, diplomats and officials for two years, descended into chaos and apparently insolvable conflict. Both prior to and after the Copenhagen conference, I have had the opportunity to discuss the climate issue with Björn Carlén, Peter Frykblom, Bengt Kriström, Bo Lidegaard, Lars-Erik Liljelund, Lars Lundberg, Staffan Tillander and Marku Ruumakainen. These discussions have laid the foundations for this report. Whilst writing it, I have received extraordinary support from the reference group linked to the project. The group was made up of Magnus Allgulín, Fredrik Hannertz, Henrik Horn, Svante Mandell and Lars-Erik Liljelund. Björn Carlén, Peter Frykblom and Lars Lundberg have also offered valuable comments on earlier versions of the text. It goes without saying, however, that I am solely responsible for both the recommendations given in the report and the analysis upon which they are based.

Part I

We know the fault lines because we've been imprisoned by them for years...We can choose delay, falling back into the same divisions that have stood in the way of action for years. And we will be back having the same stale arguments month after month, year after year, perhaps decade after decade, all while the danger of climate change grows until it is irreversible...

Barack Obama in Copenhagen on the morning of 18 December 2009.

Chapter 2 Global warming and international cooperation

Sections 2.1 and 2.2 by way of introduction summarise the complex of problems associated with climate policy. This is followed by a brief history (Sections 2.3-2.7) of the efforts to reach international agreement on how cooperation on the climate issue should be formulated. In order to clarify the arguments in the report, I have chosen to end each section in Chapter 2 by highlighting an elementary observation. Taken together, these observations form the basis of the proposal for action presented in Part II of the report.

2.1 An intensified greenhouse effect

Industrialisation and population growth over the last two hundred years have resulted in *increasing* greenhouse gas (GHG) emissions.⁴ Emissions that accumulate in the atmosphere remain there for up to a hundred years before they degrade. There is broad consensus among natural scientists that GHG emissions exacerbate naturally occurring global warming.⁵ Higher concentrations of greenhouse gases in the atmosphere cause the land and sea to heat up; this warming is further exacerbated by various feedback mechanisms. A rise in the global temperature will result in a number of climatic changes with a long-term impact on humans: we can expect greater temperature variations; changes in precipitation patterns resulting in flooding and drought; a change in the thickness of snow and ice cover; a higher sea level; poorer availability of fresh water in some areas and greater availability in others. A fundamental aspect influencing the political scope for dealing with these problems is the fact that different countries will be affected in different ways and to differing degrees by global

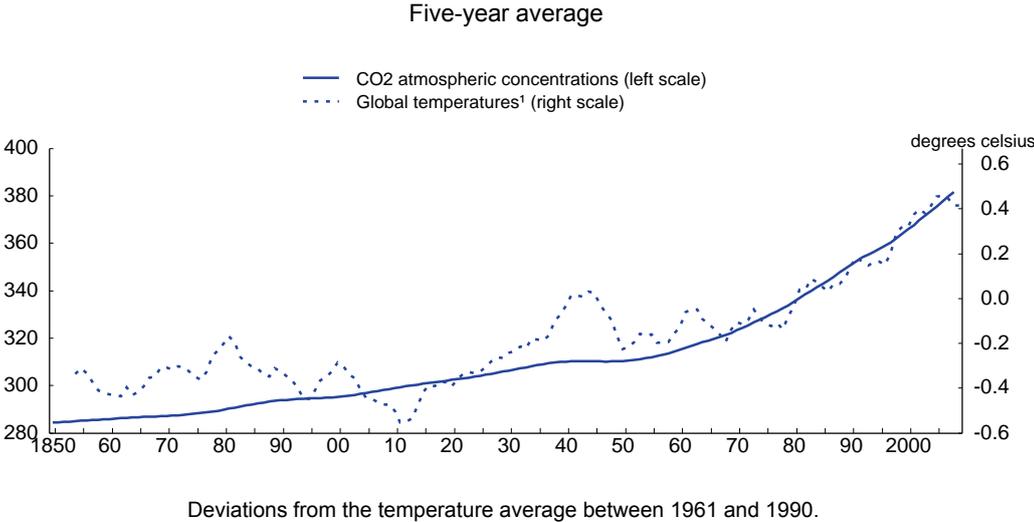
⁴ The group of anthropogenic GHGs, i.e. those originating from human activities, includes carbon dioxide, methane, nitrogen oxides and a number of fluorinating agents.

⁵ IPCC (2007a) summarises the research thus: "...most of the observed increases in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (page 10). See also National Academy of Sciences (2010).

warming: some countries will be negatively affected, while others - at least in the short to medium term - will benefit from climate change. Most of this change will have a far-reaching impact on the bio- and hydrosphere, which may lead to a drastic deterioration in the conditions for human life.

Since the middle of the 19th century, atmospheric concentrations of carbon dioxide - the most important anthropogenically generated greenhouse gas - have risen from 280 ppm to about 390 ppm⁶; the increase since World War II has been particularly pronounced.⁷ (See Figure 2.1)

Figure 2.1. Atmospheric concentrations of CO₂ and the global average temperature are rising



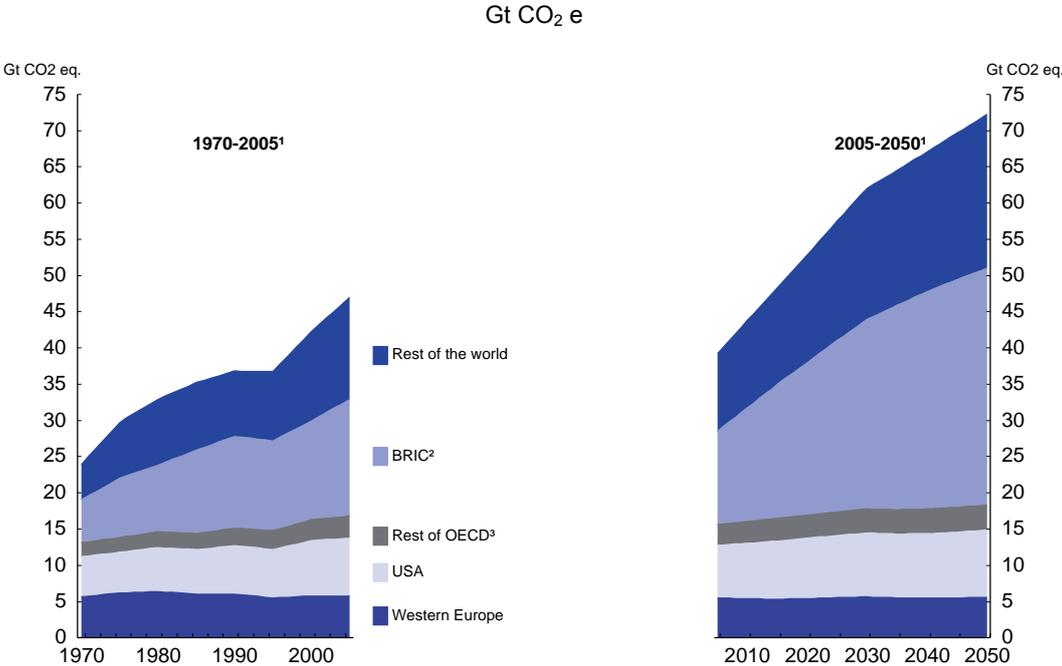
Source: World Meteorological Organization.

⁶ ppm stands for *parts per million* and is a measure of greenhouse gas concentrations in the atmosphere. Over the last 800 000 years, concentration levels have never been higher than what they are today, National Academy of Sciences (2010).

⁷ Concentrations of other greenhouse gases have also risen. Scientists currently believe, however, that the warming effect of these greenhouse gases is significantly neutralised by the occurrence of *aerosols* in the atmosphere, substances also generated by human activity, IPCC(2007a), page 4.

The *rate of increase* in global greenhouse gas emissions has tended to rise over time. The average rate of increase between 1970 and 1995 was 1.7 percent; between 1995 and 2005, it was 2.5 percent. This rise is mainly explained by economic growth in the world’s emerging economies, particularly China. According to the OECD, global GHG emissions, in relation to 2005 emission levels, will increase by 35 percent by 2020 and by 84 percent by 2050 unless additional measures are taken to reduce them (see Figure 2.2).⁸

Figure 2.2. Forecasted greenhouse gas emissions in a *business-as-usual* scenario



1. Including emissions from land use, land-use change and forestry before 2005 and excluding after 2005.
2. Brazil, India and China.
3. Rest of OECD does not include South Korea, Mexico and Turkey, which are aggregated in Rest of the World.

Source: OECD.

While the OECD-countries have been responsible for the build-up of atmospheric GHG up until now, the majority of future emissions will occur in developing countries (see Figure 2.2).

⁸ OECD (2009).

According to the *International Energy Agency* (IEA), 7 percent of the increase in global GHG emissions from now until 2030 will occur in developing countries.⁹

The *Intergovernmental Panel on Climate Change* (IPCC) ascertained in its latest report that global average temperatures have increased by 0.74 °C between 1906 and 2006. Much of this temperature rise has occurred since 1980 (see Figure 2.1). Warming takes place with a certain natural delay, which means that we are yet to see the full temperature effect of the emissions that have already occurred. According to the IPCC, the global average temperature will, as a consequence of increased atmospheric GHG concentrations, increase by between 1.1 and 6.4 °C over the next one hundred years unless measures are taken. In the worst-case scenario, the temperature rise may be even greater.

The IPCC report also states that GHG emissions must culminate in the very near future and then significantly decrease if their atmospheric concentrations are to be stabilised. The long-term stable concentration of greenhouse gases is determined by how fast this reduction occurs. In its analyses of a number of stabilisation scenarios, the IPCC indicates that carbon dioxide emissions will probably have to culminate no later than 2015 if it is to be possible to stabilise GHG concentrations at a level compatible with a rise in temperature of only 2 °C.¹⁰

2.1.1 Observation I

To have a good chance of avoiding global warming that exceeds 2°C, greenhouse gas emissions will have to culminate within the next five years and thereafter significantly decrease.

⁹ IEA (2008).

¹⁰ See table SPM 5, page 15, IPCC (2007b).

2.2 *A problem of international cooperation*

It is difficult to find a political solution to the problem of global warming. There are three basic reasons for this. Firstly, the atmospheric GHG concentration is independent of where the emissions take place and who causes them. In other words, countries are not particularly affected by their own emissions. Furthermore, it is not the emissions *themselves* that cause the problem; it is more the total amount of GHGs that amass in the atmosphere over time. This means that no one country can come up with a lasting solution to the problem simply by reducing its own emissions.¹¹ Coordinated international effort is therefore required to stabilise and reduce the atmospheric concentration of greenhouse gases. Since different countries will be affected in different ways by global warming, and since this risk is at least partly viewed from differing perspectives, it is very complicated politically speaking to reach consensus and devise a common action plan for how to tackle the threat. And even if consensus could be reached on how to reduce emissions, all parties are constantly incentivised to depart from the agreed action plan.¹²

The second factor that exacerbates climate cooperation is the fact that most of the negative effects of global warming have yet to manifest themselves. They are expected to take place some time in the future. Politically speaking, the problem doesn't therefore just affect people alive now, but also those who have yet to be born: to (partly) solve the problem, current

¹¹ The problems that atmospheric GHG emissions can cause include what is referred to as *the tragedy of the common good*, i.e. a situation where a common resource is overexploited to the detriment of all parties. Overexploitation occurs when the benefit to the individual user of exploiting the resource is greater than the collective benefit to all users; as it is impossible to check and restrict the extent to which the public resource is being exploited, the individual user causes a negative external impact. Ostrom (1990) discusses the common good problem in general, gives a number of empirical examples of overexploitation of common resources and analyses successful attempts to solve the problem.

¹² The problem of cooperation can be described as a *prisoner's dilemma*, i.e. a situation where there is strong incentive for all countries to try to free-ride on the initiatives taken by other countries to reduce GHG emissions. Barrett (2005) analyses this aspect of the cooperation issue.

generations must foot the bill for the benefit of future generations. Governments and politicians who want to implement appropriate - and costly - measures have to convince the citizens of their respective countries that measures taken today, for the benefit of future generations, are both justified and meaningful.¹³

The third basic difficulty is that appropriate solutions are built on the premise of billions of people changing their habits and consumption patterns. Emissions are a by-product of impatient day-to-day decisions aimed at increasing human well-being. Any solution to the problem will have profound consequences for the very cornerstones of a country's economy. The practical policies that must be developed to provide an incentive for these behavioural changes, e.g. adapting production processes so that they don't give rise to carbon emissions, presuppose determined action by governments. In many cases, however, governments have neither the capability nor an interest in exerting the kind of influence necessary to achieve essential structural reforms of the economy. Governments can therefore perceive international cooperation aimed at limiting GHG emissions as an unacceptable encroachment on their national sovereignty.¹⁴

2.2.1 Observation II

Unswayable international cooperation is required over time to solve the climate problem. Such cooperation will out of necessity restrict individual countries' room for manoeuvre.

2.3 International cooperation and the UN Climate Convention

¹³ This is especially a problem for developing countries, see e.g. Gomez-Echeverri (2000).

¹⁴ Skolnikoff (1990).

In the mid-1980s the global warming theory had been developed to such an extent that it convinced both scientists and politicians that measures to combat continued GHG emissions were justified.¹⁵ Probably¹⁶ other factors also contributed to pushing the climate issue high up the political agenda in the late-1980s.

In the mid-1970s, scientists demonstrated how *chlorofluorocarbons (CFCs)* were damaging the ozone layer surrounding the earth; an important function performed by stratospheric ozone being to protect humans from carcinogenic ultraviolet radiation from the sun. It quickly became clear to decision-makers that the use of CFCs had to be phased out. At a meeting in Vienna in March 1985, twenty countries reached agreement on the *Vienna Convention for the Protection of the Ozone Layer*. The Vienna convention was a *framework convention* and did not require any action to be taken to reduce CFC use in the countries who were party to it; the convention only established a fixed framework for future negotiations. Discussions on how to avert the threat to the ozone layer made rapid progress, primarily because the United States drove the negotiations forward, and in March 1987, twenty-four countries signed the *Montreal Protocol*.¹⁷ The signatories to this legally binding agreement undertook to halve their consumption and production of CFCs within a fixed time period.

¹⁵ Weart (2008).

¹⁶ Bodansky (1993).

¹⁷ A detailed account of these negotiations is given by the US chief negotiator, Richard E. Benedick, in Benedick. Benedick provides a composite picture of the basis for US commitment to the issue. He highlights in particular the significance of the support given by the US President as a necessary pre-condition for the US's role as a driving force in the negotiations. Benedick writes: "...Ronald Reagan, who had, incidentally, undergone removal of two skin cancers in 1985 and one in 1987, probably became the world's first head of state to approve a national position for the ozone negotiations" (page 67).

About the same time as the Montreal Protocol negotiations were in progress, scientists discovered a hole in the ozone layer above Antarctica. This discovery received major media attention and gave rise to a lively discussion on the effect humans were having on the atmosphere. This discussion, in combination with a very hot summer in the US, also led to the climate issue being debated during the American presidential campaign of 1988.¹⁸

Encouraged by the success of the Montreal Protocol, the Canadian Government organised a “semi-political” conference on global warming in 1988; “semi-political” in that the delegates received personal invitations and were not formally considered to be representatives of their respective governments. The conference – *the Toronto Conference on the Changing Atmosphere: Implications for Global Security* – was a follow-up to the publication of the Brundtland Report the year before and the ensuing debate it caused.¹⁹ Delegates from 46 countries attended the conference; In addition to government officials, research scientists and civil society representatives, the prime ministers of both Norway and Canada also took part. In the final declaration from the conference, delegates recommended an initial package of measures: (i) to reduce global carbon dioxide emissions by 20 percent, compared to 1988 emission levels, by 2005; (ii) to develop a global convention for the protection of the atmosphere; and (iii) that a fund should be established to finance initiatives that would benefit the atmosphere through taxes and charges on the use of fossil fuels in developed countries.²⁰ However, the package of measures was based more on what seemed political feasible rather

¹⁸ George Bush *the elder* said at the time: “Those who think we’re powerless to do anything about the ‘greenhouse effect’ are forgetting about the ‘White House effect’. As President I intend to do something about it.”, Bodansky (1993).

¹⁹ Our Common Future (<http://www.un-documents.net/wced-ocf.htm>).

²⁰ Bodansky (1993) and Benedick (1997). See also the UN’s own historical documents, in which the Toronto conference is identified as a milestone in the development of the Climate Convention; *UNFCCC Handbook* (2006).

than being underpinned and justified by real facts. No deeper analysis of the economic-political consequences of the proposals was carried out - neither before nor while the conference was being held.²¹

The climate issue continued to be discussed at the highest level. In September 1988, the UN General Assembly broached the subject for the first time. The discussions resulted in a resolution that was adopted by the General Assembly later in the autumn of the same year. The resolution advocated the formation of the IPCC, and challenged the world's governments, scientists and environmental activists to "prioritise the climate issue".²² The IPCC was called upon to compile a detailed review of current knowledge on the climate issue, present possible courses of action to combat climate change and state how countries could best adapt to it. The IPCC published its first report two years later. It ascertained that if development continued as it had until that point, global average temperatures would rise by 0.3°C every decade over the course of the next century.²³ Shortly after the IPCC had presented its report, a number of OECD countries - several of them European - chose to unilaterally adopt reduction targets of the kind proposed at the Toronto conference.

²¹ According to Richard Benedick, the Toronto conference didn't just affect the discussions leading up to the formulation of the UN Climate Convention but was also a prototype for the Kyoto Protocol. Benedick gave the following description of how the delegates arrived at the Toronto objective: "Kyoto's approach is based on faulty premises that predated the start of climate negotiations nearly nine years ago. They originated, in fact, at the 1988 Toronto Conference...That conference, following soon after the acclaimed Montreal Protocol, took precisely the wrong lesson from the ozone experience: it recommended that governments negotiate an international treaty requiring industrialized countries to cut greenhouse gas emissions by 20 percent by the year 2005. As participant in this conference, and accepting due co-responsibility for the error, I can aver that this target was manufactured literally out of thin air. It was argued that one percent per year seemed not unreasonable, 2005 was 17 years out (it seemed a long time, then), round it up to 20 percent – and voilà!", (Benedick (1997), page 24).

²² G.A. Res. 43/53(<http://www.pfcmc.com/Depts/dhl//resguide/r43.htm>).

²³ Bolin (2007) gives a detailed account of the IPCC's work on this report.

Between February 1991 and May 1992, UN-led negotiations on how the climate issue should be driven forward continued under heavy political pressure; modelled on the Montreal Protocol, civil society organisations were also given a place at the discussion table. The efforts resulted in the document adopted at the UN Conference on Environment and Development in Rio de Janeiro in June 1992 as the *United Nations Framework Convention on Climate Change*.²⁴ At the conference, 154 states signed the convention and it came into force on 21 September 1994.²⁵ Up to now, 192 countries have ratified the Climate Convention.²⁶

2.3.1 Observation III

The climate problem has been high up on the international political agenda for over twenty years. Since 1994, efforts to find a solution have concentrated on a UN process linked to the Climate Convention.

2.4 The UN Climate Convention: some comments

The Climate Convention constitutes the legal basis for the UN-led negotiations pursued since 1994. It clearly defines the objective of combating global warming as follows:

²⁴ *United Nations Framework Convention for Climate Change*, often referred to in short as the UNFCCC (<http://www.unfccc.int/15158>). Hereinafter, I shall refer to this as “the Climate Convention” or simply “the Convention” instead of writing it out in full.

²⁵ A detailed account of these negotiations is given by Bodansky (1993).

²⁶ Of UN member countries, only Andorra, Iraq, Somalia and the Holy See have not ratified the Convention.

*The ultimate objective of this Convention .. is to achieve... stabilisation of greenhouse gas emissions in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.*²⁷

There is (as yet) no consensus on what that concentration level is. The EU has interpreted the aim of the Convention as limiting the rise in average global temperatures to 2°C compared to the pre-industrial era.²⁸ How the objective is to be achieved is not set out in the Convention. This was the ambition when the Convention was being prepared. Here, the negotiations leading to an agreement on tackling CFCs and the threat to the ozone layer provided a useful template.²⁹ In contrast with the Montreal Protocol, however, the Climate Convention contains no legally binding requirements on the parties to take specific measures. Instead, the developed countries shall commit themselves to:

*.... returning individually or jointly to their 1990 levels for these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol.*³⁰

The parties to the Convention soon realised, however, that the lack of commitments leading to lasting reductions in GHG emissions was a problem. The parties then came to the conclusion that legally binding commitments were required to have any chance of realising the ultimate objective of the Convention.

²⁷ Article 2, Climate Convention.

²⁸ An account of the history of the 2°C target can be found in Randalls (2010).

²⁹ Bodansky (1993).

³⁰ Article 4, Climate Convention.

The problems of global warming and ozone-depleting CFCs differ in several key technical and economic respects. This provides one explanation as to why it has been more difficult to reach an international agreement on how to solve the problem of global warming. Furthermore, the political processes that produced the two documents were fundamentally different. The Vienna Convention and the Montreal Protocol were negotiated among a much smaller group of countries over a ten-year period.³¹ In contrast, the vast majority of the UN's 196 member countries were, in some way or other, involved in the development of the Climate Convention right from the start; these negotiations only went on for eighteen months and expectations for reaching a negotiated agreement in good time prior to the Rio de Janeiro conference were high. An analyst following the process described the negotiations as "doomed to success".³²

A number of stumbling-blocks became evident during the Climate Convention negotiations; several of which have continued to hamper climate negotiations up to the present day.³³ An explanation for this is that the negotiations have tackled these stumbling-blocks by - as is the norm in international diplomacy - finding sufficiently vague and ambiguous wordings in order to paper over the cracks and at least enable some form of agreement to be reached. This was

³¹ The work to achieve an international agreement on the phase-out of CFCs began with exploratory discussions as early as 1977. These discussions became concrete negotiations in 1982 when the first conference was held in Stockholm. Only a handful of countries participating in the talks to start with. In March 1985, 43 nations, including 16 developing countries, gathered in Vienna to conclude the negotiations by establishing a framework convention for future work. 20 countries signed the Convention at the Vienna conference. At the Montreal conference in September 1987, a total of 60 countries took part. The following 24 countries signed the Protocol at the Montreal conference: Belgium, Canada, Denmark, Egypt, Finland, France, Ghana, Italy, Japan, Mexico, the Netherlands, New Zealand, Norway, Panama, Portugal, Senegal, Sweden, Switzerland, Togo, the United Kingdom, the United States, Venezuela, and West Germany; The European Commission also signed the Protocol at the Conference. Benedick (1997) and Benedick (1998).

³² Bodansky (1993).

³³ Dodds (2005).

also achieved but at the cost of merely pushing these stumbling-blocks further into the future and not tackling them head-on.

The developed countries³⁴ saw global warming and accompanying climate change primarily as an environmental issue. The developing countries, on the other hand, saw it as a question of economic development and said it was vital that climate measures did not impede their economic development. The Climate Convention reflects this in the explicit distinction it makes between developed and developing countries. The developed countries are put into a special group - *Annex I* countries, who are expected to be the first countries to take measures to combat GHG emissions.³⁵ This categorisation of the countries of the world still plays a key role in the negotiations. People have however begun to call it into question in recent years.

The developing countries stress the historical responsibility of the developed countries for the build-up of atmospheric GHGs. The developing countries said they weren't prepared to take measures to reduce GHG emissions - referring to the historical responsibility of the developed countries - unless the latter footed the entire bill for such measures. The developed countries said they were prepared to finance such measures, *but* not because they felt they has a historical responsibility for past emissions. Instead, their argument was that measures in developing countries would only be financed if the developing countries undertook to develop

³⁴ The concept of “developed countries” and “developing countries” is misleading in this context - as indeed it is in several others (see www.gapminder.org). I have considered using the collective terms “north” and “south” to describe the dividing lines in the climate issue, but these two concept are also misleading: Australia and New Zealand are in the southern hemisphere but belong to the “north”; China and India are in the northern hemisphere but belong to the “south”. For want of a better alternative, I have therefore stuck to the concepts used in the climate negotiations. However, as I argue in Chapter 3, the two concepts are far from adequate.

³⁵ Annex I countries include the OECD and former Warsaw Pact economies; See Table 3.1 in Chapter 3 for a list of countries included.

national GHG emission-reduction programmes and report the measures taken to implement them.

The developed countries felt that an existing fund in the UN system should be used to manage the financial flows.³⁶ The developing countries opposed this, saying that a new institution must be created for this purpose and that the resources in this new fund should be managed by the Climate Convention parties directly. The developing countries were obliged to concede this issue, but it has continued to be the subject of hot debate. This antagonism can be seen in the agreement struck as part of the *Copenhagen Accord* on creating a *Green Fund* for climate policy purposes (see Chapter 2.7).

The developed countries were quickly able to reach a consensus on most of the issues discussed during the negotiations. They could not agree on one key issue, however. EU countries felt that the Climate Convention should establish binding *targets* and *timetables* - similar to those recommended at the Toronto conference - for future efforts. The United States categorically opposed this. This conflict is the main reason why the Climate Convention failed to establish any binding commitments and measures to realise its aim. And this conflict has continued.

Among the heterogeneous group of developing countries, there was and still is a number of different opinions on key issues. The opinion of small-island states as to how quickly and extensively anti-global warming measures should be deployed is diametrically opposed to that of Saudi Arabia, for instance. While the island states demand immediate reductions in GHG

³⁶ Global Environmental Facility (GEF); see <http://www.unfccc.int>.

emissions, Saudi Arabia is of the opinion that such measures can only be approved if it is compensated for future income losses caused by a falling demand for oil. Conflicts of this kind have often led to developing countries not being able to act unanimously in the negotiations.

It is also important at this point to consider the political circumstances here that have had a substantial influence on the negotiations and that have helped to keep the developing countries together as one block. Since the 1970s, these countries have, largely unsuccessfully, demanded global income and resources be more equally divided and tried to have a greater influence in international financial institutions such as the World Bank and the International Monetary Fund. Prior to Rio, the developing countries made the assessment that the domestic pressure on the governments of developed countries to reach agreement on GHG emission restrictions was much greater than in their own countries. They were seen as keener to agree and hence more inclined to compromise. The developing countries decided to take advantage of this and adopted a hard-line negotiating position in an attempt to increase their share of the world's collective resources.³⁷ The attempt failed. And even though economic and political development post 1992 has improved the conditions with which they were dissatisfied, the political sentiment that formed the basis of their negotiating strategy prior to Rio has changed very little.

³⁷ An account of the ideas forming the basis of the developing countries' negotiation strategy is given in South Centre (1991).

2.4.1 Observation IV

The UN climate negotiations cover a large number of complicated questions, and are far more extensive than for example the negotiations on limiting CFC emissions. Both in substance and on a purely political level, the climate negotiations are in fact just as complicated as international free trade negotiations. As was the case with the negotiations on limiting CFC emissions in order to preserve the stratospheric ozone layer, the climate negotiations are about how to preserve a common resource. In the case of the climate, this means a stable atmospheric GHG concentration compatible with continued favourable living conditions. In contrast to the ozone problem, however, the benefits of cooperation lie far in the future.

2.5 The Kyoto Protocol

Agreement on the Climate Convention initiated a process of annual conferences - *Conferences of the Parties (COP)*.³⁸ Shortly after the Rio conference, harsh criticism was directed at the very weak commitments made in the Convention by the developed countries. And at the first COP in Berlin 1995, it was formally agreed that these commitments were “inadequate”.³⁹ A roadmap for tackling the problem was established at the conference; known as the *Berlin Mandate*.

In the Climate Convention negotiations, the United States had opposed the idea of a single country making commitments on emission reductions of the type found in the Montreal

³⁸ COP is the highest decision-making body and is responsible for reviewing implementation of the Climate Convention and all its associated legal instruments. See Article 7.2 in the Climate Convention. Most UN conventions prescribe some form of cooperation between the parties similar to that specified in the Climate Convention.

³⁹ According to the original text, see <http://www.unfccc.org>.

Protocol and as recommended at the Toronto conference.⁴⁰ Less than 12 months after the Rio conference, the Bush administration was replaced by Bill Clinton (and Al Gore). The new administration agreed that only the developed countries should adopt quantitative reduction targets to be achieved within a set time-frame. This commitment was to be included in a protocol tied to the Climate Convention, and be negotiated before the end of 1997. The US fought hard for a flexible emissions trading system as the core of an agreement on how a stipulated target should be achieved.⁴¹ For reasons that remained rather unclear, the EU opposed key components of such a system and actively worked against the American proposal.

The actions of the Clinton Administration also led to domestic criticism. Strong forces were of the opinion that an agreement containing commitments only for the developed countries was not in the US's interest. And the administration was accused of provocation when it agreed to the development of such an agreement without first gaining the support of the Congress.⁴² Six months before the final negotiations in Kyoto, the Senate unanimously adopted a resolution stating that the US would not support an international agreement that i)

⁴⁰ A possible explanation for why the international community chose to use the Montreal Protocol as a model when establishing quantitative reduction targets and deadlines in the Kyoto Protocol is given by Victor & Coben (2005). The authors stress the fundamental difference between the problems of ozone depletion and global warming. The fact that the politicians still chose the same model to solve the climate problem can, according to the authors, be explained by a kind of knee-jerk *flock behaviour*: one chooses a framework that seems to have worked well previously regardless of whether it is sufficiently well adapted to the problem at hand. Victor & Coben also provide another example of international environmental treaty where the choice of framework seems to have been decided by flock behaviour.

⁴¹ Wiener (1999) and Stewart & Wiener (2003) give an interesting insight into the US's thinking; both authors worked on developing international climate policy in the American Administration during the 1990s.

⁴² In July 1997, Senator Hagel said of the administration's actions: "The credibility of the US is not enhanced when the administration negotiates a treaty that has no hope of ratification in the U.S. Senate...". Peterson (2009).

only required the developed countries to reduce their GHG emissions - a pre-condition for US acceptance of binding restrictions is that they also include the developing countries - and (ii) that could damage its own economic interests.⁴³

The position of the Senate created enormous problems for the Clinton administration: ratification by the US of an international agreement similar to the one signed in Kyoto requires the support of two-thirds of the Senate. Nevertheless, US negotiators approved the Kyoto Protocol in December 1997. The day after, however, the Clinton administration declared that it did not intend to ask the Senate to ratify the protocol until the developing countries had made commitments to reduce their GHG emissions. Despite no such commitments being forthcoming, President Clinton signed the protocol himself in November 1998, although he did not submit it to the Senate for ratification. The future negotiating position of the US regarding the protocol was hence very unclear, but negotiations on the detailed design of the protocol's regulatory framework continued nonetheless.

In March 2001, the US position was clarified when newly elected President George W Bush rejected the Kyoto Protocol, thus casting doubt over its survival. After substantial diplomatic efforts - particularly by the EU - the remaining parties managed to negotiate the final details of the protocol and secure its ratification in a requisite number of countries. The EU has now changed tack as regards how the aim of the Kyoto Protocol was to be realised, and argued

⁴³ S. Res. 98, "Byrd-Hagel, Resolution", 25 July 1997(<http://www.nationalcenter.org/KyotoSenate.html>). The resolution was passed 95 votes to zero.

convincingly for an emissions trading system. Finally, in May 2005 the protocol could finally come into force.⁴⁴

2.5.1 Observation V

The United States will not enter into a legally binding international climate agreement unless it also requires the major developing economies of the world to limit their GHG emissions.

2.6 From Bali to Copenhagen

The parties began to negotiate the conditions for a second commitment period under the Kyoto Protocol in December 2005; discussions focused on what reduction targets should be imposed on Annex I countries; The US did not take part in these talks. Two years later, the parties met in Bali and took the decision to open another line of negotiation. The plan adopted by the parties after very tough negotiations, was given the name *the Bali Action Plan* and established that the work should be brought to a conclusion in Copenhagen in 2009.⁴⁵ The US did take part in these discussions though. However, the decision to open up another line of negotiation complicated the UN process even further and has not exactly enhanced the chances of reaching a successful outcome.

After the conference in Bali in 2007, the EU was first to formulate an objective for the outcome of negotiations in Copenhagen. The EU advocated a legally binding, global

⁴⁴ In brief, the Kyoto Protocol requires *Annex I* countries (in the Climate Convention) to collectively reduce their GHG emissions by an average of 5.2 percent in relation to 1990 emission levels between 2008 and 2012. See Grubb (2003) for an economic analysis of the Kyoto Protocol.

⁴⁵ In the COP decision, the parties describe the future work as: "...a comprehensible process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session in Copenhagen in December 2009" (<http://www.unfccc.int>).

agreement post-2012. According to the EU's vision, such an agreement would ensure that global average temperatures, in relation to the pre-industrial era, did not rise more than 2°C. Shortly afterwards, the EU adopted its own climate policy, with the target of reducing GHG emissions by at least 20 percent by 2020, in relation to its emissions in 1990. Furthermore, the EU pledged to reduce its emissions by 30 percent if other developed countries made similar commitments to reduce their emissions as part of a global agreement. The EU's position is to get the countries of the world to agree on a common reduction target, in the same way as EU Member States have done; the burden of achieving the target would then be fairly distributed among the parties. The reduction target should create a global GHG price while at the same time ensuring that it is achieved at the lowest possible cost and stimulates development and the spread of climate-friendly technology that can replace the GHG-emitting technology of today. The agreement should also contain a detailed timetable setting out the pace at which the target shall be realised, a rigorous monitoring regime, and internationally coordinated sanctions for those who fail to deliver their contributions to target achievement. The model is built on a vision based on scientific analysis, multilateralism, and efficient administrative systems that ensure its environmental and economic integrity. Put simply, the EU wants its own climate policy to be adopted worldwide.

UN negotiations were sluggish, however: positions had been deadlocked for a long time, something which became clear at the COP in Poznan in December 2008. Not until January 2009, just over 10 months before the Copenhagen conference, did discussions get off the ground. Ever since George W Bush's rejection of the Kyoto Protocol, the US had made concrete progress in the negotiations very difficult. In his presidential campaign, Barack Obama promised a new American climate policy. His opinion on how to tackle the climate problem tallied in many respects with the European view: Thus, the American negotiating

position changed overnight when Barack Obama took office. The Obama administration felt a need to repair US international relations in the wake of the Bush era.⁴⁶ It refrained from putting forward a clear alternative of its own to the EU's model for a climate agreement, something which might have exacerbated the confidence-building efforts vis-à-vis the EU.⁴⁷ This resulted in the EU's detailed vision becoming a benchmark for what could be considered a successful outcome in Copenhagen. But there were, and still are, significant differences between the EU model and the American approach to tackling the climate problem.

The US President needs to adapt the American negotiating position to his own domestic political situation: without political and formal support from the Congress, an American president cannot enter into an international agreement that restricts US sovereignty. The decisive factor for the US is that legally binding GHG emission limits are the same for the US as for the world's emerging economies such as China and India. This position is partly based on the widespread fear in the US of losing competitiveness in relation to these rapidly growing development economies. The EU on the other hand does not - at least not officially - consider this a serious problem. There are also significant differences between the EU and the US as regards how to finance climate work in the long term.

Despite these differences, however, the Obama administration chose to team up with the EU and try to convince the large emerging economies to reach an agreement in Copenhagen that was close to the EU's vision of a global accord. This proved to be difficult, however. Several attempts to prise open the deadlocked positions of the various countries were made in various fora with very little success. When the 17 largest emission countries met in July 2009 at *The Major Economies Forum (MEF)*, agreement was only reached on the fact that there is

⁴⁶ Purvis & Stevenson (2010).

⁴⁷ Purvis & Stevenson (2010).

scientific evidence supporting GHG emission limits to ensure global average temperatures do not rise by more than 2°C.⁴⁸ Other elements of the EU model were rejected by the developing countries, however. China and India in particular were averse to being restricted by some form of legally binding commitments, and especially to being subjected to an internationally sanctioned review of their compliance with such commitments. These components of the model were described as “an unacceptable encroachment of our national sovereignty”, and an attempt at an “unfair restriction of the right of developing countries to economic growth”.

At the end of the summer 2009, it was obvious that UN negotiations had come unstuck. The situation was exacerbated by the difficulties facing Barack Obama to get the US Congress to adopt a domestic climate policy, which he had claimed was a precondition for the US to enter into an international agreement. Several independent assessors now felt that the overinflated expectations at the Copenhagen conference were unrealistic.⁴⁹ The chances of the parties concluding the negotiations at the Copenhagen conference were deemed non-existent. The Danish presidency of the UN conference had already reached the same conclusion and worked hard to at least achieve a political agreement on the objectives for future negotiations. Shortly after Sweden took over the EU Presidency, discreet diplomatic efforts began to try to identify what it might be possible to agree on in Copenhagen. These efforts were to prove crucial for the outcome of the climate summit.⁵⁰

⁴⁸ See <http://www.majoreconomiesforum.org>. On his return home, the Indian prime minister Manmohan Singh was heavily criticised for having supported the 2°C target. India’s chief climate negotiator, Shyam Saran, said in an interview that the agreement made by his prime minister “was immaterial, since the only legitimate forum is the UN negotiating process”. Singh was also obliged to submit a formal explanation before the Indian parliament for why he had signed the agreement. (Internal report from the Swedish Embassy in New Delhi.)

⁴⁹ See e.g. Victor (2009) or Levi (2009).

⁵⁰ Work began at a meeting at the Swedish Prime Minister’s Office in Stockholm on 16 July. In addition to representatives from Sweden and Denmark, the meeting was attended by government officials from the UK, Germany, France and the European Commission.

The conference in Copenhagen turned out to be dramatic. The fact that any agreement was reached at all was the result of unprecedented commitment on the part of the heads of state and government. During the last 24 hours of the conference, a few of these made an attempt to reach a political agreement, based on the silent efforts made during the latter half of 2009, that could form the basis for future UN negotiations. Five countries played a key role in these talks: the US, China, India, Brazil and South Africa. The EU was forced to accept being presented with a *fait accompli* at the decisive moment, and had little influence on the concluded agreement.⁵¹

European heads of state and government were forced to accept that the EU model for how to organise international climate cooperation had not gained international support. When the Danish presidency in the early hours of 19 December tried to get the parties to support the agreement - *the Copenhagen Accord* - chaos broke out. A handful of countries almost managed to block the attempt to give the agreement some form of broader approval.⁵² After a

⁵¹ See text Mark Lynas, *How do I know China wrecked the Copenhagen deal? I was in the room*, Guardian, 21 December 2009; Jørgen Steen Nielsen, *Ond vilje, uduelighed, teknisk uheld eller cirkelns kvadratur?*, Information, 8 January 2010. See also Meilstrup (2010) and Toje (2010).

⁵² This was a disparate group with a variety of different reasons for trying to block the agreement. The island nation of Tuvalu felt that it was too weak and that the aim should be 1,5 °C instead of 2 °C. Sudan was the harshest critic of the agreement, claiming that it was a “suicide pact” based on the same values that had led to the holocaust during the Second World War. (“It is a solution based on the same values that funnelled six million people in Europe into furnaces...”, Lumumba Stanislaus-Kwa Di-Aping; my own notes.) That the Sudanese representative characterised an agreement in such terms came as no surprise. As early as 8 December – in the middle of the negotiations – he described a possible settlement in similar terms (see <http://www.adamwelz.wordpress.com/2009/12/08>). Venezuela agreed with the Sudanese criticism - perhaps not in the same draconian terms but still with an aggressive tone - claiming that the agreement had emerged in a hugely undemocratic process; Bolivia, Cuba and Nicaragua supported Venezuela’s criticism. There are obvious national interests uniting these countries, save that Sudan and Venezuela are oil countries with strong links to OPEC.

long and occasionally fierce debate, the parties decided to “take note of” the agreement, which is the weakest form of recognition a UN document can be given.

2.6.1 Observation VI

An agreement was possible at the Copenhagen conference only once the negotiations had been taken over by a small number of heads of state and government. However, the UN process did not give the *Copenhagen Accord* the formal support the majority of the parties had been arguing for during the final debate.

2.7 Copenhagen Accord: the agreement in brief

The Copenhagen Accord (CA) is the most important result achieved at the UN conference in Copenhagen.⁵³ The parties could not, however, conclude both UN lines of negotiation as intended; in the vast majority of issues, the parties were very far apart, both politically and as regards proposals for technical solutions.

The CA emerged from discussions among a smaller group of heads of state and government from countries that together are responsible for 80 percent of global carbon dioxide emissions. The group contained representatives of both developing and developed countries. Apart from the US, the EU and China, it included the Maldives and Ethiopia. In brief, the CA involves the following:

- It is *not* a legally binding agreement, instead it is said to be “politically binding”;
- The 2°C target is established and the parties agree to evaluate the target in 2015; there is a window here for tightening the target to 1.5°C;

⁵³ <http://www.unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

- a global structure is established for how countries can make commitments to implement specific measures: the parties can report how much they intend to reduce GHG emissions in an annex to the accord;
- fundamental rules are set out for transparent monitoring and verification of implemented reduction measures, adaptation measures and deforestation initiatives;
- a structure for the financing of initiatives in developing countries is established consisting of: pledges on *fast-start financing*; pledges on long-term financing and the amounts involved; it has also been suggested that a *Green Fund* should play a role in the future financing architecture;
- It establishes that the parties shall continue with the two UN lines of negotiation and report the results at forthcoming COPs.

2.7.1 Some comments

The CA is an agreement between heads of state and government for countries responsible for more than 80 percent of global GHG emissions. This means that the CA quite possibly carries greater political weight than a COP decision taken by civil servants and junior government ministers. The fact that the CA was only “taken note of” by the parties in Copenhagen does not therefore mean that it can’t set the standard for international climate cooperation. If the countries that negotiated the CA choose to develop the cooperation, the Accord is far-reaching enough to form a platform for an internationally coordinated climate policy of the future. Admittedly, a political agreement does not need to be ratified by national parliaments, and it sends a weaker signal as regards the seriousness of the commitment. The legal status of an international agreement has limited significance however as regards the scope for safeguarding its compliance.⁵⁴ Generally speaking, states also take non-legally binding agreements extremely seriously and make an effort to comply with them.⁵⁵

⁵⁴ See Barrett (2005) for a discussion.

⁵⁵ Bodansky (2010).

In April 2010, 76 countries, who are collectively responsible for about 80 percent of global emissions, had reported their reduction pledges to the UNFCCC Secretariat and formally backed the CA.⁵⁶ An analysis of these pledges indicates that the measures are collectively insufficient to achieve the objective of limiting global warming to 2°C: There is more than a 50-percent risk of global warming exceeding 3°C in 2100.⁵⁷

Despite the insufficiency of the commitments made in the CA, the fact that the large emerging economies of China, India, Brazil and South Africa have now agreed to the 2°C objective and have stated which emission reductions they intend to jointly implement to achieve it is a sign of progress.

Nonetheless, the CA is far from the type of agreement the EU has been advocating for many years. For the EU, the outcome of the Copenhagen Conference was a setback.⁵⁸

The EU wanted the CA to establish the medium- and long-term reduction target agreed by the G8 countries at their meeting in L'Aquila six months prior to Copenhagen.⁵⁹ This proved unsuccessful, however. China was resolutely opposed to such targets. It was also opposed to the developed countries unilaterally incorporating such targets in the CA.⁶⁰ The following is a likely explanation for this opposition: China realises that if it supported the 2°C target, a medium-term reduction commitment from the developed countries, incorporated into an

⁵⁶ For up-to-date information on how many countries have now agreed to the CA, see <http://unfccc.int/home/items/5262.php>.

⁵⁷ Roger & Meinshausen (2010).

⁵⁸ Swedish environment minister Andreas Carlgren described the outcome of the conference as “a disaster...a great failure” (Fiona Harvey, Amy Wheatley, & Jonathan Wheatley, *Climate change alliance crumbling*, Financial Times, 22 December, 2009).

⁵⁹ See http://www.g8italia2009.it/G8/G8-G8_Layaout_locale-1199882116809_Home.htm.

⁶⁰ Mark Lynas, *How do I know China wrecked the Copenhagen deal? I was in the room*, Guardian, 21 December 2009; Meilstrup (2010).

agreement supported by China, could implicitly put pressure on China to implement further measures. If a clause stating that the developed countries shall reduce their GHG emissions by 80 percent by 2050 is incorporated into the CA, high climate sensitivity could lead to a temperature rise in excess of 2°C despite the reductions of the developed countries. This being the case, further demands for additional reduction measures, based on the 2°C target in the CA, could be directed at China. The Chinese wish to avoid such a situation.

The US has made conditional commitments in the CA: these commitments will be applicable only if the American Congress agrees to the targets stipulated by the US. This indicates how difficult it is for the US to enter into international agreements. Furthermore, the interests of both the US and China coincide here: both countries are basically unwilling to commit themselves internationally. It must also be noted that at a critical stage of the negotiations, the US did *not* seek alliances with major economic powers such as the UK and Germany or Japan, something which it has tried to do in geopolitical contexts at least up until the mid-1990s.⁶¹ Instead, the US pursued bilateral talks primarily with China. Neither did the cooperation between the US and the EU prior to the Copenhagen Conference result in any clear European influence in the agreement concluded by the US with China, India, Brazil and South Africa. EU heads of state and government were instead faced with a *fait accompli* and had to choose between accepting or rejecting the agreement presented to them by Barack Obama shortly before he returned to Washington.⁶²

2.7.2 Observation VII

⁶¹ Dodds (2005).

⁶² Meilstrup (2010).

UN negotiations have come unstuck and are no longer driving forward development of international climate policy. Climate Convention work must undergo fundamental reform so that it is possible within the foreseeable future to reach agreements that lead to a solution to the climate problem.

Chapter 3 *Gordian knots in international climate work*

3.1 UN negotiations

UN climate negotiations are saddled with complicated questions. An agreement presupposes a number of simultaneous solutions to several *complex questions* - on a *global level* - in the negotiating model for which the Climate Convention forms the legal basis. It is unlikely that negotiations in which all UN member states are expected to reach consensus will result in such an agreement. The countries of the world have placed far too great a burden on UN climate negotiations, something which the parties are aware of. This manifests itself, for example, in the lack of clarity surrounding the decision-making rules.

As early as the second COP in 1996, preliminary rules on how decisions should be taken at COPs had already been drafted.⁶³ The parties have not agreed to these rules, however. Despite this, however, the rules are applied provisionally when the parties agree to them at the start of every session. The parties must however be unanimous in their decisions. The rules are applied with one exception: in the draft of the decision-making rules, there is a paragraph stipulating that decisions can be taken with a qualified majority (i.e. with the support of two-thirds of the parties), but this rule is not applied provisionally.⁶⁴ This has resulted in all decisions requiring 100% consensus in practice, giving individual countries the chance to block them. It is understandable that countries have been against giving the UN negotiations

⁶³ This section is based on what is known as a *background memorandum* drawn up by the EU expert group on legal issues (EGLEX) after the Copenhagen conference (*Decision-making in the context of the UNFCCC: possibilities for improvement*, 6 April 2010).

⁶⁴ The EU legal experts do not feel this necessarily constitutes an obstacle for applying majority decisions, but accept that it does in practice. Deviation from the consensus rule requires powerful countries like the US and China to drive through decisions jointly; as long as they choose not to do so, the consensus rule applies. After Copenhagen, where states such as Venezuela and Cuba were allowed to act unhindered, it will probably be more difficult to deviate from the consensus model.

the authority to make decisions that can have very widespread consequences for their development opportunities. The demand for consensus decisions has, on the other hand, made it difficult, if not to say impossible, to carry UN work forward.

Another example of how the UN process impedes progress is the breakdown of countries into “developed” and “developing” countries in the Climate Convention. The basis for this breakdown was made up of different objective criteria, such as GDP per capita and GHG emissions. But instead of specifying the criteria that qualify a country for specific commitments in the convention, it was decided to split the countries up into two lists: Annex I and non-Annex I respectively.⁶⁵ According to the Convention, countries in Annex 1 were expected to take the lead in combating climate change and the adverse effects thereof.⁶⁶ This has led to only Annex 1 countries making quantitative reduction commitments; Non-Annex I countries, on the other hand, have categorically refused to do so. Table 3.1 lists the Annex I countries and their share of global emissions in 1990 and 2006 respectively.

⁶⁵ Bodansky (1993).

⁶⁶ Article 3 of the Climate Convention

Table 3.1 GHG emissions from Annex I countries in 1990 and 2006 respectively.

Annex I	Emissions in 1990; Mton CO ₂ e	Share of global emissions	Emissions in 2006; Mton CO ₂ e	Share of global emissions
<i>USA</i>	4 922.0	23.30%	5 770.8	20.25%
<i>EU (27)</i>	4 182.3	19.79%	4 119.1	14.46%
<i>Russia</i>	2 227.9	10.54%	1 614.4	5.67%
<i>Japan</i>	1 113.5	5.27%	1 247.6	4.38%
<i>Germany</i>	969.2	4.59%	842.3	2.96%
<i>Ukraine</i>	699.7	3.31%	317.1	1.11%
<i>UK</i>	560.3	2.65%	545.4	1.91%
<i>Canada</i>	442.2	2.09%	549.7	1.93%
<i>Italy</i>	417.7	1.98%	471.9	1.66%
<i>France</i>	365.3	1.73%	388.6	1.36%
<i>Poland</i>	350.2	1.66%	313.3	1.10%
<i>Australia</i>	263.8	1.25%	399.3	1.40%
<i>Spain</i>	220.0	1.04%	354.6	1.24%
<i>Romania</i>	171.8	0.81%	98.2	0.34%
<i>Netherlands</i>	158.6	0.75%	179.7	0.63%
<i>Czech Republic</i>	158.4	0.75%	123.1	0.43%
<i>Turkey</i>	139.1	0.66%	263.4	0.92%
<i>Belarus</i>	116.5	0.55%	65.8	0.23%
<i>Belgium</i>	113.7	0.54%	121.3	0.43%
<i>Bulgaria</i>	77.3	0.37%	48.5	0.17%
<i>Greece</i>	76.9	0.36%	101.8	0.36%
<i>Hungary</i>	70.5	0.33%	58.2	0.20%
<i>Austria</i>	59.0	0.28%	75.2	0.26%
<i>Slovakia</i>	58.5	0.28%	39.3	0.14%
<i>Finland</i>	55.2	0.26%	67.7	0.24%
<i>Sweden</i>	54.0	0.26%	49.7	0.17%
<i>Denmark</i>	51.4	0.24%	56.6	0.20%
<i>Switzerland</i>	43.3	0.20%	46.1	0.16%
<i>Portugal</i>	42.9	0.20%	60.5	0.21%
<i>Estonia</i>	36.7	0.17%	15.5	0.05%
<i>Lithuania</i>	34.0	0.16%	14.1	0.05%
<i>Ireland</i>	31.4	0.15%	47.4	0.17%
<i>Norway</i>	30.2	0.14%	38.8	0.14%
<i>Croatia</i>	23.0	0.11%	22.5	0.08%
<i>New Zealand</i>	21.8	0.10%	37.4	0.13%
<i>Latvia</i>	18.6	0.09%	8.2	0.03%
<i>Slovenia</i>	13.1	0.06%	16.1	0.06%
<i>Luxembourg</i>	10.8	0.05%	11.6	0.04%
<i>Iceland</i>	1.9	0.01%	2.2	0.01%
Annex I in total	14 289.9	67.29%	14 483.9	50.82%

The red figures in the fourth column indicate countries/groups of countries whose emissions have increased since 1990; green figures signify a reduction in emissions compared to 1990.

Despite being responsible for very small amounts of emissions, Monaco and Liechtenstein are also Annex I countries.

Source: World Resources Institute.

Table 3.1 shows how Annex I countries were collectively responsible for two-thirds of global emissions in 1990; in 2006, their share had fallen to about one half. A downward trend is also clear in future forecasts: Annex I countries are expected to be responsible for a third of emissions in 2030, and a quarter in 2050. (See Figure 2.2). This trend was first predicted when the Climate Convention was being drafted. However, the developing countries refuse to adopt any quantitative limits, which they say would impair their economic development. Instead, it was negotiated that the OECD and former eastern bloc economies should start the reduction efforts, a natural consequence of these countries being responsible for the greatest share of global emissions in 1990. Other parties to the Convention were expected to start their reduction measures later on. This breakdown also formed the basis of the Kyoto Protocol: which only imposes quantitative reduction commitments on Annex I countries.⁶⁷

It has proven difficult to increase the number of countries with quantitative commitments. In 1997, the US tried to introduce a clause in the Kyoto Protocol that would enable non-Annex I countries to adopt emission limits voluntarily. The attempt was blocked by China, India and Saudi Arabia.⁶⁸ As a result, the rules on how a country can join the group of countries covered by the Kyoto Protocol emission limits are now very long-winded. Addenda to both the Climate Convention and the Kyoto Protocol are needed to make this possible. Furthermore, these addenda have to be ratified by all parties to the Convention and the Kyoto Protocol before they are fully applicable. The case of Kazakhstan illustrates how difficult it is in practice for a country to qualify for inclusion in the quantitative limits.

⁶⁷ The Berlin Mandate also established that the negotiations that formed the basis of the Kyoto Protocol would not involve any new commitments for non-Annex I countries. The Berlin Mandate states that the process must not "...introduce any new commitments for Parties not included in Annex I." Implicitly this agreement still provides a starting-point in the negotiations for a second Kyoto Protocol commitment period, something which is evident in the way G77 and China interpret the *Bali Action Plan*, see Petsonk (2009) for a discussion.

⁶⁸ Petsonk (2009).

In November 1998, The Kazakhstani Government formally began the prescribed process for a country to join the group of countries with emission limits, thereby enabling it to fully participate in the Kyoto Protocol emission trading scheme. It is still - 12 years on - unclear *when* and *if* the parties will grant Kazakhstan its wish.⁶⁹

The way the Climate Convention divides up the countries of the world is obsolete and constitutes an almost insurmountable obstacle since the current circumstances differ on a number of key points from the situation in 1990. Table 3.2 shows the countries/regions responsible for more than 90 percent of global emissions in 2006 and how rich they are. The table indicates that there were 93 countries in 2006 with a higher GDP per capita than the poorest Annex I country, Ukraine. 63 of these countries are *not* in Annex I.

Table 3.2 proves that the way the Climate Convention divides up the world is no longer valid: the division into “developed countries” and “developing countries” reflects neither the current magnitude of GHG emissions - the aggregated emissions of non-Annex I countries currently being as large as those of Annex I countries - nor the level of economic development. Forecasts for emissions and for economic growth clearly show that this asymmetry will get worse over the coming decades.

⁶⁹ Petsonk (2009) provides a detailed account of Kazakhstan’s difficulties.

Table 3.2: Greenhouse gas emissions in 2006. Countries/regions that together are responsible for more than 90 percent of global emissions, ranked according to volume of emissions.

	Mt CO₂e	Share of global emissions (%)	Aggregated emissions as a % of global emissions	GDP per capita; \$ (global rank)
China	6 206.6	21.78	21.78	4 524 (106)
<i>USA</i>	5 770.8	20.25	42.03	42 672 (8)
<i>EU (27)</i>	4 119.1	14.46	56.49	27 642 (27)
<i>Russian Federation</i>	1 614.4	5.67	62.16	12 797 (57)
India	1 331.1	4.67	66.83	2 416 (129)
<i>Japan</i>	1 247.6	4.38	71.21	31 041 (23)
<i>Canada</i>	549.7	1.93	73.14	35 660 (12)
South Korea	503.5	1.77	74.91	23 884 (34)
Iran	472.2	1.66	76.57	9 721 (69)
Mexico	441.2	1.55	78.12	13 025 (54)
<i>Australia</i>	399.3	1.40	79.52	32 175 (20)
Indonesia	360.4	1.26	80.78	3 335 (125)
Brazil	355.5	1.25	82.03	8 745 (77)
Saudi Arabia	353.6	1.24	83.27	21 372 (39)
South Africa	348.4	1.22	84.49	8 862 (76)
<i>Ukraine</i>	317.1	1.11	85.60	6 032 (95)
Taiwan*	279.9	0.98	86.58	29 600 (24)
<i>Turkey</i>	263.4	0.92	87.50	11 584 (62)
Thailand	236.6	0.83	88.33	6 702 (90)
Kazakhstan	184.1	0.65	88.98	9 529 (71)
Egypt	168.6	0.59	89.57	4 530 (105)
Malaysia	166.4	0.58	90.15	12 205 (60)

Countries in *italics* are Annex I countries.

* Taiwan is not party to the Climate Convention.

Source: World Resources Institute.

In conclusion, I would like to highlight a problem that is not directly related to the design of the UN process but nevertheless constitutes an enormous barrier to progress.⁷⁰ Negotiations have now been ongoing for nearly 20 years. Several negotiators have been involved right from the start. In the developed countries, the issue has mainly been dealt with by respective environment ministries, where it has been seen as an environmental question, and for a long time they have run the negotiations with very little disturbance from finance and foreign affairs ministries - the climate has previously not been seen as important for economic and foreign policy development. This has meant that environment ministry negotiators have not

⁷⁰ This is an example of what theoretical literature calls a *principal-agent* problem. The problem lies in how a governing body ("the principal") can incentivise its representative ("the agent") to represent its interests and not act with just (the agent's) self-interest at heart.

always had a mandate to agree on central issues. When such issues have been on the table, the negotiation mandates have been shown to be very limited, partly because finance and foreign affairs ministries have not always been so familiar with the very complex negotiations. This has impeded progress and reinforced traditional antagonisms between environment ministries on the one hand and finance/foreign affairs ministries on the other. Environment ministry negotiators have often expressed frustration at the lack of insight among other government ministries back home. Negotiators from developing countries on the other hand have enjoyed considerable independence with plenty of scope to make their own decisions; these are made up of career diplomats and government officials with strong political clout in their home countries.⁷¹ There is minimal political control of developing country negotiators. All in all, this has created a special “club feeling” among negotiators from both developed and developing countries alike: they meet regularly in different places around the world - often cooped up together for one or two weeks at a time - and repeat well-known positions, but prefer to be left alone by their respective governments. Progress not initiated by the negotiators themselves is often seen as a threat to their own authority. This has, among other things, resulted in opposition from developing country representatives to hand over negotiations to politicians. In connection with the conference in Copenhagen, this unwillingness was made evident in the statements from G77 country representatives, who described the elevation of negotiations from civil servant to environment minister and then head of state and government level as “undemocratic”.⁷²

⁷¹ See footnote 48!

⁷² This attitude can be said to be typical of G77 negotiators. When Papua New Guinea proposed a high-level meeting of environment ministers in the run-up to COP16 in Cancún, the G77 spokesperson protested and said: “We negotiators are the only experts. It would be dangerous and deeply undemocratic to let ministers handle this issue...”(my own notes from the concluding plenary session at the planning meeting in Bonn, 4 Nov 2010).

3.2 *The United States & China*

Successful climate cooperation presupposes the participation of both the United States and China. Up to now, however, neither country has taken part in international climate work to an extent that corresponds to their level of GHG emissions (see Table 3.2). The prospects of the US and China entering into a legally binding UN agreement within the next few years are currently non-existent. There are deep political and institutional reasons for this.

The US attitude in negotiations can be characterised as ambivalent. In contrast to his predecessor, the current president sees global warming as a serious problem. But the ambivalence is more deeply rooted than that. The attitude reflects a deep-lying political reluctance to encroachments on US sovereignty.⁷³ This basic view has made the US unwilling to enter into multilateral agreements. The US position on the *United Nations Convention on the Law of the Sea* (UNCLOS) illustrates this view: this convention was ready in 1982 and has been ratified by the majority of the world's countries. Both Republican and Democrat presidents have backed UNCLOS, as have the US armed forces and merchant navy. And the US abides by the convention in practice. But no president has dared to put UNCLOS before the US Senate for ratification, since less than two-thirds of senators are prepared to restrict the US's freedom of action at sea.⁷⁴

The principle of sovereignty is fundamental in American politics. Agreeing to legally binding commitments that are not also aimed at large emerging economies like China and India is therefore totally unthinkable for the US. It would be perceived as an encroachment on the

⁷³ Purvis & Stevenson (2010).

⁷⁴ Bodansky (2007).

right of the US to establish the conditions for its own economic development. And despite its more conciliatory attitude, the current administration is not prepared to do it either.⁷⁵

Ever since the discussions on formulating the Climate Convention began, China has been opposed to making any type of international commitment that restricts the country's freedom of action and scope for economic development. The country has stuck resolutely to this position, even though it risks leading to the collapse of UN negotiations.⁷⁶ A probable explanation for this course of action is a fear of losing control over domestic policies; the Communist regime's reaction to the announcement that Lu Xiabao had been awarded the Nobel Peace Prize illustrates how sensitive it is to all types of international influence on what it regards as strictly national issues. Another explanation is that China prioritises economic development over putting a global price on greenhouse gases that will induce a structural transformation of the global economy. In his speech to the conference in Copenhagen, Prime Minister Wen Jiabao emphasised that:

*...action on climate change must be taken within the framework of sustainable development and should by no means compromise the efforts of developing countries to get rid of poverty.*⁷⁷

⁷⁵ See the speech made by Todd Stern on 18 May 2010 at the Brookings Institute (<http://www.brookings.edu/events/2010/0518>).

⁷⁶ Examples of occasions when China has adopted a *take-it-or-leave-it* attitude include: Berlin 1995 (no quantitative commitments for the developing countries); Kyoto 1997 (same as in Berlin); Buenos Aires (no possibility of voluntary quantitative commitments for the developing countries). China also gave an ultimatum in the closing stages of the negotiations in Bali in 2007 (no international verification of the developing countries' climate measures unless they are financed by the developed countries).

⁷⁷ Wen Jiabao (2009).

A population of over 1.2 billion people puts a heavy strain on the political system, especially during a period of rapid and widespread change. The Chinese leadership has to cope with a permanent risk of the country's internal political structures falling apart.⁷⁸ Any international cooperation deemed a threat to political stability and cohesion in the country is therefore resolutely rejected.⁷⁹ In order to retain power, the Chinese Communist Party must safeguard a welfare development from which an increasing number of Chinese citizens draw benefit.

At the same time, however, China has a self-interest in developing its own climate policy,⁸⁰ not just based on the problems that climate change may cause in the country but also from a purely commercial point of view. China's economic growth has been based on heavy investment.⁸¹ China has chosen to put some of this investment into green technology. An explanation for is the leadership's realisation that they have to deal with domestic environmental problems, not least to avoid social unrest. Another reason for the investment is the export opportunities of green technology.⁸² In addition, China's increasingly important geo-political role means it is being forced to take more responsibility in international politics. This is also true of climate policy.⁸³ All in all, this means that it is in the Communist Party's long-term interest to cooperate internationally on the climate problem. Nevertheless, it is

⁷⁸ Joseph Nye, *China's century is not yet upon us*, Financial Times, 19 May 2010.

⁷⁹ A topical example of this is the debate on China's exchange rate, in which the US, Japan and the EU are demanding China revalues its currency, the *renminbi*. In connection with the EU-China summit in October 2010, the Chinese prime minister warned: "Do not work to pressurise us on the *renminbi* rate...Many of our exporting companies would (if the currency is revalued - my note) have to close down, migrant workers would have to return to their villages. If China saw social and economic disturbance, it would be a disaster for the world." (Alan Beattle, Joshua Chaffin, & Kevin Brown, *China hits out on renminbi*, Financial Times, 7 October 2010).

⁸⁰ Halding, Han & Olsson (2009).

⁸¹ Between 1997 and 2009, the investment share in GDP rose from 32 to 46 percent, while consumption fell from 45 to 36 percent of GDP (Martin Wolf, *How China must change if it is to sustain its ascent*, Financial Times, 22 September 2010).

⁸² Keith Bradsher, *China builds lead on clean energy*, International Herald Tribune, 9 September 2010.

⁸³ Halding, Han & Olsson (2009).

difficult to foresee a change in the Chinese position in the climate talks. During the Copenhagen conference, some form of cooperation started to emerge between China, India, Brazil and South Africa. These countries aligned themselves primarily with the US but also with the EU. Cooperation has continued after Copenhagen and is unlikely to reduce the level of conflict in the UN negotiations.⁸⁴

The political reluctance to surrender parts of national sovereignty, as the US and China see it, is in stark contrast with the European view. An important fundamental prerequisite for European cooperation is a readiness to surrender some national sovereignty to a supranational body (the EU). The same readiness does not exist in American and Chinese politics: their position as global superpowers presupposes freedom of action and unencumbered scope for protecting national interests.⁸⁵

As long as the US and China are not prepared to enter into an equally balanced, legally binding international agreement, the UN process will not provide a crucial breakthrough in the climate issue. Any part-agreements at COP 16 on Cancún, Mexico, or COP 17 in Durban, South Africa, will hardly have any significant impact on global emission trends. There is however nothing to indicate that even such half-baked agreements are possible in the forthcoming years.⁸⁶

⁸⁴ The group use the acronym BASIC. Indian environment minister Jairam Ramesh said after a BASIC meeting in April: "If the Americans are finding China a headache, they will find dealing with India and China a nightmare." (James Lamont, *When Beijing and New Delhi pull together*, Financial Times, 1 April 2010).

⁸⁵ Purvis & Stevenson (2010).

⁸⁶ On a visit to Sweden on 10 September this year, the host of COP 17, South Africa's environment minister, said: "It is a very complicated process. The major obstacle is the tension between China and the US many issues are very tricky to solve." (TT). Even Christiana Figueres, the new head of the UNFCCC Secretariat, has said that the prospects for reaching an agreement in the near future are bleak: "There is no possibility of having a legally binding treaty in Cancún." (Fiona Harvey, *Cancún offers slim*

3.3 The 'top-down' approach

Ever since work to formulate an international climate policy began, the focus has been on reaching a unanimous and global agreement on *by how much* emissions should be curbed, *who* should finance and implement these reductions, and *when* they should be implemented. The objective has been to create a *legally binding* basis for an architecture⁸⁷ which corresponds in principle to the model the EU chose for its regional climate policy. Such an agreement is built on the parties surrendering some sovereignty and agreeing to some restrictions in their national freedom of action for the benefit of all parties. The EU has also been working hard to find this type of global solution.

Such an approach - referred in the literature as *top-down* - is a well-founded theory. The Kyoto Protocol should be seen as an initial step in the development of a *top-down* architecture. Within the framework of such an architecture, the parties can find cost-effective solutions, something which is considered crucial in the Climate Convention.⁸⁸ It is also possible to deal with fairness issues, for example through the generous allocation of emission rights to developing countries, which, in combination with emission rights trading, will induce capital flows from developed countries to developing countries. Furthermore, reduction commitments can, at least theoretically, be adjusted when new information on the state of the climate system emerges. There is no doubt that this model is very attractive.⁸⁹ *If*

hopes of progress, Financial Times, 1 November 2010). Neither have the tensions between the US and China abated in the past 12 months. On the contrary, the situation has been exacerbated as a result of political developments in the US during the autumn: due to the Democrats losing their majority in the House of Representatives in the mid-term elections, the Obama administration will have a lot less room for manoeuvre in its foreign policy over the next two years.

⁸⁷ Here, the word *architecture* means a *unifying structure that limits the number of potential negotiation solutions to simplify the negotiations and drive them forward in the desired direction*, see Jacoby, Schmalensee, & Sue Wing (1999).

⁸⁸ Article 3.3 of the Climate Convention

⁸⁹ See e.g. Stewart & Wiener (2003) for a discussion.

all the countries of the world could agree on such an architecture *and* comply with the agreement, it would be an expedient global regime enabling a solution to the climate problem. Up until now, it has not been possible to reach a politically robust agreement that would enable a global *top-down* architecture.

Even if the negotiations were to result in an agreement in the near future on a second commitment period to the Kyoto Protocol, it will have only negligible impact on global warming. As a result of the United States dropping out of the Kyoto Protocol, in combination with the generous scope for emissions negotiated by Russia in exchange for ratifying the agreement, the protocol currently imposes GHG emission limits on only about twenty countries.⁹⁰ The Kyoto Protocol in itself only delays global warming by a matter of months, or a year or so at most.⁹¹ There are no signs that a second commitment period will include more countries than the first. On the contrary, Japan, Russia and Canada have clearly indicated that they are not interested in a second commitment period unless it covers more countries than the first. And the US maintains that it does not intend to re-adopt the Kyoto Protocol. There is currently nothing to suggest that any parties other than the EU are prepared to enter into a second commitment period. A continuation of the Kyoto Protocol will hardly therefore have a greater limiting effect on global warming than the first commitment period. Even the EU has indicated recently that a second commitment period presupposes broader participation.⁹²

⁹⁰ Barrett (2007a).

⁹¹ Nordhouse (2009).

⁹² Council conclusions, 28-29 October 2010 (<http://www.european-council.europa.eu>).

Part II

Europe is the big loser from Copenhagen. Climate has been the one issue where Europe has led the world. In the end, the continent was too weak to succeed when it counted.

Thomas Kleine-Brockhoff, German Marshall Fund, in Financial Times 21

December 2009

Chapter 4 How should the EU go forward?

A significant majority of the world's countries reject the EU model for a global climate policy. The fundamental principle in the EU's idea is that a global price on greenhouse gases would stimulate innovation and energy efficiency, and act as a catalyst for a transition of the global economy away from fossil fuel dependency. An architecture based on this principle seems to be unacceptable to key countries such as China and India; whose actions ever since the beginning of the 1990s have indicated unequivocally their opposition to such a regime. Neither do the US, Australia, Japan, Russia and Canada support the central components of the EU model. Instead, it seems as though most countries see collective action primarily as a restriction in their economic development opportunities, not as a way to jointly create the pre-conditions for a transformation of the global economy in order to avoid future climate problems.⁹³ It has not been possible to reconcile this fundamental difference in attitude despite over twenty years of discussions in the UN and other international fora. The EU must now decide what this means for future efforts.

4.1 Starting-points

The factual circumstances upon which the EU must now base its decisions as regards its future actions in international climate policy are summarised below. Every point develops the elementary observations presented in Chapter 2, and the circumstances discussed in Chapter 3.

⁹³ This attitude is perhaps an indication of a more general tendency in international politics. In a recently published study, the author summarises development trends in today's international politics thus: "The transatlantic West has been zapped of the ideological power it enjoyed during the 1990s, owing, in part, to resurgence of illiberal democracy and authoritarian capitalism. Efforts to spread Western values across the globe no longer go unopposed by the emerging powers. Policies of states that matter are guided by national interests, not by global community values as they were defined by Western elites during the 1990s.", Toje (2010), page 180.

- There is still a small chance of avoiding a rise in global average temperatures of more than 2 °C (or some other comparable temperature level). Measures that reduce the risk of continued global warming should therefore be taken without delay (Chapter 2.1);
- Coordinated international effort is therefore required to stabilise and reduce the atmospheric GHG concentration. The main political difficulty here is how to agree on a *joint action plan*. The more countries that are involved in the work, the more difficult it is to agree. The chances of forging cooperation that results in concrete measures are better if only a few parties are involved, at least in the initial stages. The number of parties cannot be too few, however. For a long-term solution to be possible, the countries responsible for the majority of current and future GHG emissions must be part of the cooperation (Chapter 2.2);
- The UN process is dysfunctional. The absence of constructive efforts between Bali and Copenhagen clearly indicates the flaws in the approach employed up to now. In light of this, the chaos at the Copenhagen conference was no surprise. The fundamental problem is that the UN process, in its current design, enables individual countries to stand in the way of progress, even though the vast majority of parties are in agreement. The negotiations are unilaterally aimed at achieving a legally binding *global* agreement, not at agreeing to implement measures to reduce GHG emissions. This means that valuable time is lost, time that could be used to develop UN-sanctioned cooperation projects focusing on concrete reduction measures. No reforms of UN negotiations are currently in the pipeline (Chapters 2 & 3);
- The gulf between developed countries and developing countries was not bridged by the Copenhagen Accord. On the contrary, there is more distrust than ever before. The currently prospects for progress in UN negotiations are therefore worse than prior to the Copenhagen conference (Chapters 2 & 3);
- The US and China are far from each other on every issue bar one: both are reluctant to enter into legally binding climate agreements. The domestic political situation and economic developments in the US have also contributed to increasing

- In Copenhagen, the EU lost its position in the vanguard of international climate work. It must now find a new form of leadership, and try to retake a leading position (Chapters 2 & 3).

It is now vitally important to reenergise international climate cooperation. What is currently lacking - despite 20 years of UN efforts - is a structure that induces *global* behavioural change. We must rapidly begin to build such a structure. The EU must act as a driving-force in this work.

4.2 Proposals for action

The EU's long-term aim is to limit global warming to a maximum of 2°C compared to the pre-industrial era. To realise this aim, the EU must play a leading role and be a driving-force in international climate work. The EU lost its leading role at the Copenhagen conference and must now recover it in order to drive forward climate efforts. The UN process is currently deadlocked; it has been treading water for several years, while emission trends remain unaffected. The EU must now take steps to break the deadlock and concentrate its diplomacy on creating a *process* that leads to the *establishment* of an *international* structure to *promote concrete emission reduction measures*. The EU should therefore (temporarily) leave the UN talks and instead channel its energy into creating different types of cooperation with (among) smaller groups of measure-oriented countries. As a pre-condition for resuming UN work, the EU should demand extensive reforms of the design and scope of the negotiations. Such reforms should be implemented as soon as possible, and a decision taken no later than at the

planned UN conference in Rio de Janeiro in 2012.⁹⁴ Within the UN framework, the EU should actively promote the implementation of such reforms. Until these reforms are implemented, the EU should seek to cooperate with countries who are prepared to carry out immediate concrete climate measures instead of participating in any more UN climate negotiations.

⁹⁴ 2012 marks the twentieth anniversary of the establishment of the Climate Convention at the UN Environment and Development Conference in Rio de Janeiro in 1992 (see Chapter 2.3).

Chapter 5 A decentralised regime

5.1 Cooperation based on national measures

Work has been ongoing in individual countries and regions for several years to design and implement various measures aimed at reducing GHG emissions and mitigate the effects of intensified global warming: many countries have introduced voluntary systems to reduce GHG emissions; technological standards and limit values for emissions are applied to an ever-greater degree; subsidies to low-emission technologies have been in place in a large number of countries for some considerable time; with the help of taxes or emission trading systems, it has been possible to put a price on greenhouse gases in parts of the world; and in most developed countries, resources are being put into the research and development of climate-smart technologies, including commercial demonstration facilities, and into programmes for transferring technologies to developing countries.⁹⁵ The economic and political conditions dictate how far the different countries have come. Those countries with strong and relatively well-developed institutions have made the most progress.⁹⁶

A starting-point for the stepwise approach I am trying to describe here is that it must be underpinned by efficient and enduring institutions in order to be successful; in the long-term, such institutions are crucial to the development of international climate work - which must be seen in a century-long perspective.⁹⁷ Up to now, however, the international discussion has

⁹⁵ Jacoby (2007).

⁹⁶ *Institutions* refers here to functions that define and stipulate the way in which economic units can work together and compete with each other, and the bodies that support the maintenance of these functions (see North & Thomas, 1993). In concrete terms and in the climate policy context, it is a question of e.g. the European emission rights trading scheme and the regulatory framework and agencies that regulate trade within it; the European Commission, the Swedish Energy Agency and the Swedish Environmental Protection Agency. Other institutions that are central to climate policy are e.g. national and international patent laws, and the bodies that monitor and ensure their compliance.

⁹⁷ This has been previously highlighted by a number of researchers, such as Schmalensee (1998).

centred on the issue of how to reach a legally binding agreement regulating by how much emissions should be reduced and who should do it.

Efficient institutions can mainly be found on the national level, although the EU is a regional exception. International institutions are on the other hand generally weak; the UN and its various bodies being no different: the principle of *universal participation* – which is fundamental to UN work - in practice gives individual countries the right of veto, which often impairs the chances of making decisions on active measures. The most important role of international institutions is more about codifying existing praxis, coordinating nationally adopted initiatives and bringing attention to vital questions and problems. But their scope for carrying through decisions against the will of individual countries is limited. For this to be possible, individual countries would have to surrender a certain amount of national sovereignty.⁹⁸

The focus of UN negotiations, and the discussions held in connection with them, has been on building up new, or reinforcing existing, international institutions. Very little attention has been paid to national and regional institutions that have the capacity to ensure active measures are implemented. This is a little strange given that the scope and complexity of the climate problem demand powerful *national* initiatives; as long as there is no “global government” with associated “global institutions” to implement “global decisions”, international cooperation presupposes efficient, well-functioning national institutions.⁹⁹

5.2 *A flexible basis for stepwise development*

⁹⁸ Hey (2006).

⁹⁹ Barrett (2007b).

The stepwise approach I have outlined involves the development of an architecture in decentralised cooperation characterised by: (i) diplomatic powers concentrating on negotiations between a small number of *key countries*. At the beginning it is more important to reach agreements between the US, China and the EU than to discuss and achieve a consensus of opinion among all 196 UN members;¹⁰⁰ (ii) an architecture that provides scope for a *diversity of measures*, adapted to the economic and political prerequisites and interests of each individual party. The political conditions for entering into binding agreements differ on several key points between the EU, the US and China (see Chapter 4). A number of important measures to reduce the risk of global warming are nevertheless being implemented in these parts of the world. Instead of ignoring the differences, we should instead consider the real situation and try to coordinate and develop policies that actually exist; and (iii) an architecture that contains a framework within which political commitments can be made in such a way as to *enable the parties to implement monitorable measures*. The latter is the most difficult to achieve.

The flexibility required by the approach is not based on the countries of the world agreeing on *a common model* for how to put a price on greenhouse gases which will then stimulate the development of new, climate-smart technologies. A global agreement is naturally desirable but must be considered utopian: in the absence of such an agreement, however, the flexibility required lies instead in different countries being able to make different types of national commitments; all countries are not expected to support a specific working model; the legal

¹⁰⁰ A common objection to this approach is that the UN is the only global body with unquestioned legitimacy and all UN members must therefore be involved in the process. This is not a convincing argument. There are several examples of legitimate international cooperation projects of a global nature, which only include a limited number of countries: e.g. GATT, IMF, the UN Security Council are all legitimate cooperative bodies that don't have universal participation.

form for cooperation is a secondary issue to begin with.¹⁰¹ The architecture that emerges from the kind of cooperation I have outlined here is hence out of necessity not uniform and cohesive, nor is it from a theoretical point of view ideal.¹⁰² But it is a very feasible way of changing production and consumption patterns so that economic growth does not also lead to increased GHG emissions. Starting work to link together and gradually strengthen climate policies that are currently being pursued nationally and regionally is the principle interest here and what kind of global architecture this results in is much less important. The ultimate objective should still be a global system, but in order to achieve this, it is necessary for practical political reasons to start by developing cooperation among smaller groups of countries with efficient political administrative systems and try to link these groups together so that a more comprehensive framework can gradually emerge. Such an architecture will probably not be a uniform one with targets and timetables like the one we have been trying to agree on in UN negotiations for almost twenty years, but will probably consist of several different more or less extensive international agreements on separate issues. For example, achieving a separate agreement between the EU, China and the US on how to tackle GHG emissions in the cement industry does not seem politically impossible. In such a limited agreement, it would be possible to regulate emission levels and establish cooperation on technological development, something from which all parties can draw commercial benefit. And finding solutions that don't merely restrict the parties' economic development opportunities but also provide concrete benefits is crucial if cooperation is to be achieved.

¹⁰¹ Flexibility refers here not to the form of flexibility enshrined in the Kyoto Protocol, i.e. deciding how the reduction target shall be met *within* a well-defined internationally agreed framework. Here it is a question of something looser, namely building cooperation around what is actually being done at the national level without necessarily accommodating it within a jointly agreed legally binding framework.

¹⁰² The literature refers to it as a "bottom-up" architecture, Victor (2004). Theoretically speaking, it cannot ensure that the policy is cost-effective, something which can be achieved by a "top-down" architecture.

Such solutions are (probably) easier to identify if only a few parties are involved in negotiations.

Support for a development of the kind I have outlined above can also be found in theoretical studies. A recent summary of game theory-oriented literature on international environmental agreements highlights the following three results: (i) a global agreement ratified by all parties is unlikely to create equilibrium; (ii) neither is it likely that equilibrium will be created in the form of a uniform and global self-reinforcing agreement; (iii) global equilibrium is more likely to be created by a structure consisting of several coalitions of various sizes.¹⁰³ An implication of these theoretical observations is that any global agreement on climate change will in practice consist of *retroactive* approval of an architecture that has emerged from cooperation in smaller groups of countries as well as between these groups.

5.3 A few model examples

There are a few examples of the kind flexible cooperation I have outlined above in economics, characterised by a stepwise development which has gradually strengthened the institutions involved.

European cooperation is an example of how a smaller group of countries can enter into an economic cooperation agreement aimed at safeguarding healthy economic development in peaceful coexistence, which in reality is also the principle aim of climate cooperation. The agreement signed by six European countries in 1951 on coordinated coal and steel production explicitly aimed to “strengthen production and promote good neighbourly relations”. This mainly economic cooperation project has gradually developed into the *European Union*, with very extensive and in-depth economic *and* political cooperation. European cooperation is built

¹⁰³ Carraro (2007).

on individual member states actually relinquishing some of their national sovereignty. This makes it more difficult for them to prioritise their own short-term, narrow national interests above the benefit to the Union as a whole and is a precondition for lasting mutually beneficial cooperation.

World trade cooperation is also an example of how flexible conditions can constitute a platform for successful development. Initiated by the United States, 23 countries agreed to abolish extensive foreign trade regulations in the autumn of 1946. These regulations had emerged in the interwar period but were replaced with excise duties that could be subsequently reduced by means of mutual agreements. The countries also agreed on general principles for how to facilitate future efforts to reduce remaining trade barriers but no targets - such as halving trade barriers within a certain time limit - were formulated. This cooperation has developed into today's *World Trade Organization* (WTO) with 153 members. The WTO is basically a system for mutual commitments and a mechanism for solving trade disputes. It has a system for when governments can apply trade sanctions and how they should be formulated. The issue of whether a nation is complying with WTO regulations is decided on a case-by-case basis - not based on whether an individual country has achieved an overarching objective or not. This regulatory system is fundamentally different to the one the UN is trying to establish as part of the Climate Convention. Work in the WTO is focused on what members *actually do*, rather than on what they *could do* or on *who should do what* to realise a comparatively abstract and overarching objective, as is the case with the Climate Convention.

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¹⁰⁴ Other flexible cooperation models - without quantitative targets and timetables - quoted in the literature include the Marshall Plan, which developed into the OECD, and NATO. See Schelling (1997) and Schelling (2002); the latter article also discusses GATT/WTO cooperation.

Both the WTO and the EU show how increasingly widespread cooperation can be developed from collaboration that is initially much more limited. An important condition for such development is that the cooperation actually rewards the parties so that they chose to participate in it rather than opt out. It is also crucial that one or more countries act as a driving-force in the process; without the initiative of the United States in GATT/WTO, cooperation would not have materialised or been further developed; without the actions of Germany and France, the EU would never have developed into what it is today. The EU should strive to play a similar role in international climate efforts.

5.4 Starting-points for a decentralised regime

For a decentralised regime to be successful, cooperation must be built up around institutions that allow the parties to develop climate policies adapted to the prevailing economic and political conditions in their own countries. At the same time, these institutions should create an incentive structure that gradually drives the process forward towards deeper and broader cooperation.

Even though the climate problem is global by nature, emission data show that a minority of countries are responsible for a substantial proportion of global GHG emissions (see Table 4.2). In 2006, 170 countries reported national emissions of less than 1 percent of total global emissions, amounting in total to about 14 percent of global emissions that year. A handful of countries/regions are responsible for more than 70 percent of annual GHG emissions; China, the US and the EU are jointly responsible for more than half; successful cooperation necessitates the participation of these three actors in coordinated efforts. At an initial stage, however, it is probably more important to build up cooperation around a small yet administratively strong group of countries that can rapidly agree on a well-defined issue and

find solutions that other countries can adopt later on; the linkage of systems for setting a price on greenhouse gases is an example of such an issue (see below). An initially small group is a condition if the very complicated and demanding problems of climate cooperation are to be solved in negotiations. If nothing else, the experience gained from UN work proves this.¹⁰⁵

One method that should form the core of such cooperation is a regularly recurring *pledge and review* process. In every “round” of such a process, the parties should report in detail the measures they intend to implement within a specified time period. Such a process will not in itself generate sufficiently comprehensive and far-reaching emission limits so a mechanism is also needed to critically evaluate the policy packages proposed by the parties, and to review implementation of the planned measures. The primary difficulty here is how to construct a review process that balances the need of the collective for strict review against the sensitivity of individual countries regarding encroachment on national sovereignty.

There are several international examples of how such a process could be formulated: The OECD offers one model; the EU Member State economic policy review mechanism another. Experience shows that such efforts can lead to the development of a policy of long-term benefit to all parties. WTO negotiation rounds offer a more demanding and obligating model. Even the IMF’s review process scrutinising whether members are complying with the Fund’s statutes is very extensive and can involve a country being forced to implement far-reaching adaptation measures.¹⁰⁶

¹⁰⁵ Efforts in the EU to formulate a common energy and climate policy have also highlighted the significant political problems that must be solved if an effective policy is to be implemented.

¹⁰⁶ Chayes & Chayes (1991).

A review mechanism fulfils a number of important functions: (i) it provides parties to the negotiations with information that is important for how cooperation can be intensified and broadened; (ii) it audits whether the parties have implemented their pledges, clarifies the reasons for any failures to do so, and assesses whether new measures have the potential to compensate for earlier failures; (iii) it makes it possible to evaluate the consequences of individual party's contributions for the common good; (iv) it disseminates knowledge and experience to all the parties, which can be used to improve future work; (v) it has the potential to foster a culture of cooperation, which can strengthen mutual trust among the parties and facilitate negotiations on deeper cooperation; (vi) it offers ambitious parties a forum in which they can exercise normative power and put pressure on other parties to expand their policies. The EU has a good chance of being a driving-force in this working model and of recapturing the initiative in international climate work.

5.5 EU ETS: a hub for future climate cooperation

A natural way of linking the climate work of different countries together is via the various GHG price-setting systems that have started to emerge in different parts of the world. The European Union Emission Trading Scheme (EU ETS) is currently the largest and most developed of these decentralised systems. Norway, Iceland and Liechtenstein have recently linked their national trading schemes to the EU ETS.¹⁰⁷ New Zealand also has a functioning trading system. Japan has had a Tokyo-based voluntary trading scheme for a few years and this could be developed into a nationwide, compulsory system.¹⁰⁸ The US and some Canadian provinces also have voluntary trading schemes; it is currently unlikely, however, that the US

¹⁰⁷ <http://www.eubusiness.com/Environ/1193418125.05>; EU Business, 27 October 2007.

¹⁰⁸ <http://artcraftjapan.wordpress.com/2010/07/16/tokyo-metropolitan-government-leads-japan-launches-own-ghg-emissions-cap-and-trade-program/>.

will introduce a compulsory national scheme within the near future.¹⁰⁹ Canada will probably follow developments in the US and wait before introducing a national scheme until its neighbour does so; meanwhile, the current provincial systems for both emission trading and carbon taxes will continue to be developed. In Australia, a draft bill on the introduction of a national emission trading scheme has been delayed in parliament; and a decision is not expected before 2012. South Korea also has plans to launch a national trading scheme. And China is looking into the possibility of introducing a carbon tax, at least at the regional level.¹¹⁰

In accordance with the decisions taken by the EU, EU ETS will continue after the Kyoto Protocol has expired in 2012, regardless of whether or not a global agreement is entered into. The EU has also said that it intends to try to expand the ETS so that it covers the entire OECD area by 2015.¹¹¹ Active efforts to link EU ETS to other national GHG price-setting systems should be one of the main themes of the EU's international work. The EU should also reform EU ETS so that it is as easy as possible to link the scheme to other types of GHG price-setting systems. The EU should also design a system to minimise the problems of ensuring compliance with agreements entered into.

5.5.1 Direct and indirect linkage of GHG price-setting systems

If systems for restricting GHG emissions are regional instead of global, this will not affect the economic effectiveness of the policy as a whole *as long as the GHG price is the same in every system*. In other words, it doesn't matter if one region uses an emissions trading scheme while

¹⁰⁹ Darren Samuelsson & Coral Davenport, *Dems pull plug on climate bill*, POLITICO, 22 July 2010(<http://www.politico.com>).

¹¹⁰ Several Chinese delegations have visited Sweden to study the Swedish carbon tax; information from tax officials at the Swedish Ministry of Finance, and my own discussions with Chinese officials visiting Sweden.

¹¹¹ European Council conclusions from 29-30 October 2009 (<http://www.european-council.europa.eu>).

another has a GHG tax as long as the price of emission rights is on average the same as the GHG tax over the course of each trading period: the cheapest measures will be implemented to the same extent in both regions. The implicit GHG price in administrative control systems - under unique circumstances - can also be the same as the tax or price of emission rights in a parallel system. Measures will also be implemented to the same expense as in the market-based system.

In the approach I outline here, it is very unlikely that the GHG price will be the same in different parts of the world. The price will differ between e.g. the US, the EU and non-Annex I countries, just as it does today. This leads to major efficiency losses.¹¹² Problematic distributional effects are also likely: the resources put into achieving emission reductions in regions where it is very expensive could instead be used for development assistance initiatives if the reductions are implemented in regions where they are relatively inexpensive.

If there is no global system that sets a common GHG price, and the price varies between different regions, there will be risk for what is known as “*carbon leakage*”. Carbon leakage takes place in two ways: (i) production that generates GHG emissions moves from a regulated to an unregulated region, or from a high-price to a lower-price region; (ii) the demand for fossil fuel will drop globally because businesses in regulated regions will use less fossil fuel and look to fossil-free energy instead. The fossil fuel price on the global market will then fall

¹¹² Markandya & Halsnaes (2004) analyse the socioeconomic benefits of allowing countries to trade emissions - which leads to convergence of the GHG price in different countries - as part of the efforts to achieve the aim of the Kyoto Protocol. Without trading, the costs for individual countries of achieving their Kyoto targets vary considerably. If trade is allowed among developed countries (Annex I), the cost falls and it will cost approximately the same for all Annex I countries to implement the policy; if full-scale global trading is allowed, the cost will fall even further and the Kyoto target will be achieved at the lowest possible cost for the global economy. The study points to the very significant efficiency losses associated with not allowing trade. An analysis of what trade means for the cost of Swedish climate policy is performed in Carlén (2007), and in Kriström & Hill (2007).

and it will be cheaper for businesses outside regulated regions to use fossil fuel. This will lead to them buying and using more fossil fuel and generating more GHG emissions.¹¹³

Another problem is that regional trading schemes only have a few actors and the market will therefore be weaker and more unstable than a market with many actors. This can undermine the price signals and provide poorer support for the investment decisions necessary to bring about a transition of the economy. On weak markets with only a few actors, the risk of individual actors exercising their market power and distorting the price signals is also greater.

Linkage of different schemes reduces all the abovementioned problems. Linkage involves the interaction of different GHG emission regulating systems so that the marginal costs of measures will eventually converge.¹¹⁴ Direct linkage of different schemes basically establishes a common market for emission rights

Linkage can be *direct*, i.e. the result of an agreement between two or more parties to link their GHG price-setting schemes. Examples of such linkage include the agreement between the EU and Norway to link their respective trading schemes. The other type of direct linkage, which up to now is the biggest in terms of turnover, is one between a trading scheme and an *emission credits* system. The Kyoto Protocol's *Clean Development Mechanism* (CDM) is the most well-known of these systems, and gives developing countries the scope to implement measures that under certain circumstances generate emission credits that can then be sold to

¹¹³ Whether taxes that put up the price of fossil fuels really have an effect on demand is an issue widely discussed in the literature. It is difficult to say whether the climate policy implemented on a global scale up to now has had an effect on the demand for oil, since any effect can be concealed by coordinated price rises instigated by OPEC.

¹¹⁴ A technical account of how different trading schemes, carbon tax systems and administrative systems can be linked is given in Metcalf & Weisbach (2010), see also Jaffe & Stavins (2008).

developed countries with emission trading schemes.¹¹⁵ The Kyoto Protocol also provides scope for former eastern bloc countries to take measures in partnership with OECD countries to create emission credits, known as *Joint Implementation* (JI). This mechanism has not generated any significant volumes of emission credits, however. Finally, voluntary emission credit schemes have also emerged. The ongoing *Regional Greenhouse Gas Initiative* in north-eastern US also includes emission credits arising in accordance with rules specified in this system.¹¹⁶

Indirect linkage of two schemes takes place when two systems are each linked to a third. In such a situation, trade between the separate trading schemes and the third system affects supply and demand in all three schemes. GHG prices in the three schemes will thereby affect each other. An example of indirect linkage is the one created by the Kyoto Protocol mechanism between EU ETS and the trading scheme in New Zealand. CDM credits can be used in both schemes. This gives rise to competition for existing CDM credits. In the scheme with the highest price for its ordinary emission rights, the purchaser is prepared to pay more for CDM credits than the competitor scheme. This means that CDM credits will go to the scheme with the highest price for emission rights. There will then be a shortage of cheap emission credits in the other scheme, which will push up the price of that system's ordinary emission rights.

The EU can play a very significant long-term leadership role by developing EU ETS so that it is easy to link to other schemes; both to other trading schemes and carbon tax-based schemes.

¹¹⁵ In August 2008, there were 1 100 approved CDM projects, which together were estimated to generate 1.3 billion emission credits by 2012; 52 percent of the projects were Chinese; and 14 percent of them were Indian. Brazil had 9 percent and South Korea 7 percent; other projects were distributed among 46 other developing countries, Jaffe & Stavins (2008).

¹¹⁶ See <http://www.rggi.org>.

The EU should also concentrate the pledges for financial support it gave in the Copenhagen Accord on a limited number of developing countries so that they can further develop emission credit schemes (in case there is no second Kyoto Protocol commitment period, which may lead to the abolition of the CDM scheme), and on direct support to countries wanting to build up their own national trading schemes. The EU should also start discussions with New Zealand aimed at linking EU ETS to the New Zealand trading scheme.

5.5.2 Buyer liability

A top-down system establishes by how much total GHG emissions shall be reduced in relation to any agreed reference level (e.g. 1990 emission levels). The remaining scope for emissions is then distributed in a centralised process, where the possibility of redistributing this scope by trading in emission rights makes the scheme economically viable. In a top-down scheme, the monitoring of compliance with agreed reduction targets by individual countries is crucial to its efficient functioning. The Kyoto Protocol gives the UN this central role; there is also a centralised process here that approves emission credits generated in countries that are not covered by any quantified reduction targets. A decentralised scheme of the type I have outlined here has none of this. A mechanism will therefore be needed that replaces all the functions on which a centralised, top-down scheme is based. It is especially important in a decentralised scheme to ensure that individual countries really implement emission reductions that correspond to the nominal reduction value of the emission rights. Otherwise, emission rights trading between countries will be associated with major uncertainty regarding the scheme's environmental integrity. Since a decentralised scheme by definition lacks an international superstructure, incentives must be built into the system so that it is in each individual country's interest to maintain the scheme's integrity. One way of doing this is to

base the scheme on what is known as “*buyer liability*”.¹¹⁷ *Buyer liability* refers to a trading scheme where the buyer of emission rights must face the consequences if an emission right does not correspond to a real reduction in greenhouse gases. In current schemes, it is the seller who must ensure the reduction is actually implemented.¹¹⁸ The buyer is not affected if the emission right he has bought turns out in reality not to correspond to a real reduction in greenhouse gases, something which has sparked critical debate in recent years.¹¹⁹ The seller liability manifests itself for example in the UN-administered review system built up around the Kyoto Protocol’s CDM credits. In a buyer liability scheme, this type of supranational institution is not needed, even though the existence of such an institution reduces the trade transaction costs considerably and thereby increases the scheme’s efficiency.

In a system where the trade in emission rights is done by businesses, buyer liability means that the buyer of an emission right must report his emissions and emission rights to the *national* authority responsible for trade in the buyer’s country at the end of each trading period.¹²⁰ If an authority then finds that the buyer has emission rights originating from a business activity, which the authority deems not to have implemented emission reductions corresponding to the nominal value of the emission rights, the *buyer* is obliged to compensate for the difference; either by buying additional emission rights or further reduction measures.

¹¹⁷ The literature discusses both the economic and political aspects of schemes based on *buyer liability*. See Zhang (1999), OECD (2000), Nordhaus, Danish, Rosenzweig, & Fleming (2000), Victor (2001), Bluemel (2007), Keohane & Raustiala (2008).

¹¹⁸ After a long discussion, the parties to the Kyoto Protocol decided at the conference in Marrakech in 2001 to base the protocol’s trading scheme on buyer liability. Buyer liability has several advantages in a uniform trading scheme like the one incorporated in the Kyoto Protocol, but the scheme is vulnerable to the fraudulent issuing of emission rights, i.e. emission rights are sold without representing a real reduction in greenhouse gases. The scheme therefore requires powerful administrative control systems on the supranational level for it to work (Victor (2001), Bluemel (2007)).

¹¹⁹ The Financial Times ran a number of articles on this problem in 2008-2009. See also Wara (2007), and Wara & Victor (2008).

¹²⁰ In the current scheme - the Kyoto Protocol registry system - national governments are given scope to do this (Grubb (2003), page 166).

This means that the buyer has a strong incentive to evaluate whether an emission right really does correspond to a reduction or not before he buys it. As far as the seller is concerned, he must be able to guarantee the quality of the emission rights he offers for sale in order to meet the demands stipulated by the buyer. If not, he will not be able to sell any emission rights, or will be paid less for them than otherwise would be possible. Buyer liability gives rise to (potential) price differentiation that stimulates the seller to take a number of measures that are important for the system: measuring his emission reductions; ensuring that implementation of the reductions can be verified in a way that convinces both the buyer and above all the competent authority in the buyer's country; and ensuring transparent reporting of his reductions and work to guarantee them, in order to attract buyers. Here, the market mechanism does the job that in a seller liability system has to be done by a supranational institution. A buyer liability system eliminates the need for such a political institution. In many ways, a buyer liability system resembles the international bond market. When states want to raise money by borrowing, they issue bonds. These securities have an international sub-market on which bonds are continuously bought and sold. If a state were to go bankrupt, all those who have bonds issued by it would lose their investment; in other words, buyer liability applies on the bond market. For this reason, investors carefully follow developments in countries that have issued the bonds they have in their investment portfolio. Information about the creditworthiness of countries that borrow on the bond market has a market value, which has led to the establishment of credit-rating institutes such as *Standard & Poors* and *Moody's*. The market exerts pressure on countries that borrow on the international bond market to report the state of their economy accurately. If there is a suspicion that a borrowing country risks going bankrupt, holders of bonds issued in that country will want to sell them, causing the value of the country's bonds to fall. On a market for emission rights where buyer liability applies, the same powers will promote a similar development. We can therefore

expect the buyer of emission rights to carefully analyse the risk of the rights not being approved before they are prepared to buy any. This also provides the opportunity to sell reliable information on climate policy measures in countries that sell emission rights. Access to this type of information will reduce the transaction costs and thereby facilitate trade.

In a buyer liability system where there is business-to-business trade, the authorities in the seller's country will act as guarantor to ensure emission rights issued in their own country correspond to real GHG reductions. Businesses in the country will have an interest in the authority maintaining the value of the emission rights generated in the country. This provides the authority with an incentive to cooperate with the authorities in the buyer's country to convince them to approve emission rights issued in the seller's country. If a buyer's country does not consider a seller's country to be serious, emission rights from that country will not be approved or in demand. This will lead to financial losses in the (potential) seller's country.

These self-reinforcing powers to comply with national climate policy and actually deliver emission reductions that can then be sold are built into the system itself when buyer liability is applied. There is no need for a third party to check compliance of commitments made. There is however a need for various measures that reduce the transaction costs for trade. And it is important that this is done.

The EU should amend EU ETS so that buyer liability applies for emission rights *imported from developing countries* that do not have the same type of trading scheme as the EU. At the same time, the EU should support the construction of administrative systems in developing countries so that they can implement emission reductions in a way that allows the EU to approve emission rights from these countries. However, the seller liability shall continue to

apply *within* EU ETS and in cases where EU ETS is *directly linked to* a trading scheme of the same type.

5.6 Scope for cooperation

Initiating a process based on *pledge and review* work, linking together GHG price-setting schemes and amending the rules for the EU emission rights trading scheme are far from sufficient measures to bring about the structural transition in the global economy required to stabilise and radically reduce GHG emissions. Broad and in-depth international agreements in a number of other areas are also required. The EU must find new forms and other fora for multilateral climate work. The aspiration to secure a global and legally binding agreement that has guided the EU up to now should be abandoned in favour of a more opportunistic approach: it is now more important to utilise the emerging opportunities for climate cooperation than to strive unilaterally for a solution to the climate issue within the UN framework. There is every indication that international politics is undergoing profound change, fundamentally altering the conditions for cooperation.¹²¹ What happened at the Copenhagen conference can be seen as manifestation of this trend.¹²² It will become increasingly difficult to gain universal agreement on everything, which has been the basic formula for UN climate efforts up to now. The EU must therefore fundamentally rethink its international climate policy, and henceforth try to reach agreements with fewer parties on limited issues.

There are currently several fora in which the EU can pursue issues connected to the climate problem. In parallel with UN negotiations, what can be described as a *complex of climate*

¹²¹ Haass (2008), and Gideon Rachman, *End of the world as we know it*, Financial Times, 23 October 2010.

¹²² *Lessons of a memorable chaotic gathering*, Financial Times, 21 December 2009.

policy regimes has emerged.¹²³ Figure 5.1 below shows the main institutional elements and initiatives that make up this complex. The elements inside the circle represent fora in which discussions are held on rule-making that directly concerns GHG emission reduction and other climate-related issues; elements outside the circle represent fora in which, as far as can be judged, rules have to be created that support the implementation of an expedient international climate policy.

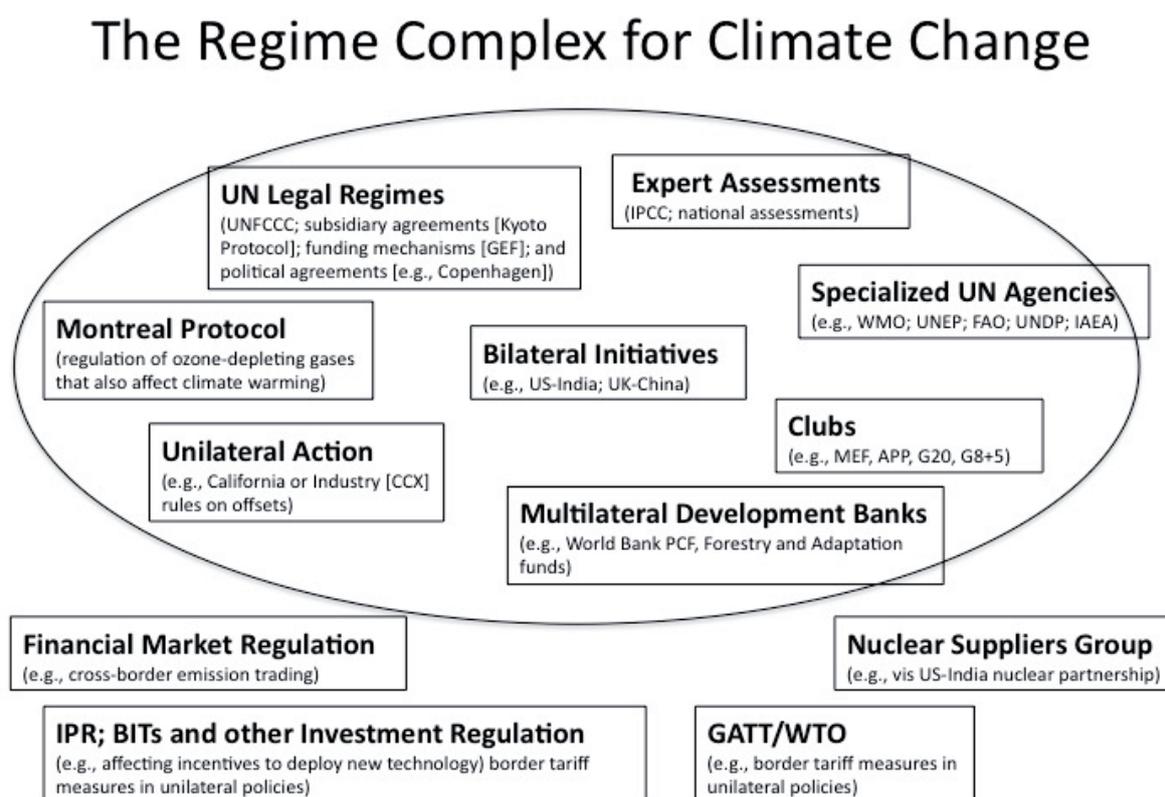


Figure 5.1 The climate policy complex

¹²³ A detailed description of the fora that make up this “complex” is given by Michonski & Levi (2010); a political analysis of the regime complex is performed by Keohane & Victor (2010). Figure 5.1 is taken from Keohane & Victor (2010).

After Copenhagen, it is unclear where in the regime complex it is possible to reach agreements leading to reduced GHG emissions. I do not go through all the elements in the figure above here, instead I refer the reader to the referenced literature.¹²⁴ Instead I will briefly point out four fora in the regime complex where the EU has the opportunity to achieve success that would quickly result in considerable GHG emission reductions, and briefly describe a fifth problem area that has yet to be discussed seriously in diplomatic contexts.

5.6.1 The Montreal Protocol and other links between air and the climate

The Montreal Protocol was established to phase out the use of ozone-depleting CFCs. These substances are also greenhouse gases that intensify the natural greenhouse effect. A side-effect of the CFC phase-out success is that it also combats global warming. According to current estimates from researchers, the Montreal Protocol has helped to delay warming by about 12 years.¹²⁵ This is considerably more than the first commitment period of the Kyoto Protocol managed to achieve.¹²⁶ The EU should therefore intensify its efforts within the Montreal Protocol follow-up mechanism to help reduce global GHG emissions.

Other air pollutants, considered until now to be primarily a local health problem and therefore not discussed within the UN climate talks framework, have also been highlighted in recent years as significant for global warming. Among these, researchers have pinpointed soot particles as particularly important.¹²⁷ Having a dual effect on the climate, both in the atmosphere and after deposition on snow and ice, soot makes a significant contribution to

¹²⁴ See Michonski & Levi (2010), and Keohane & Victor (2010). See also Alfsén & Eskeland (2007) who analyse the issue of how a separate technology agreement could support international cooperation and result in the rapid development and dissemination of GHG-efficient technology.

¹²⁵ compared to what would have been the case without the protocol.

¹²⁶ Velders *et al.* (2007), and Mario Molina, *The ozone treaty can do more for the planet*, Financial Times, 24 August 2007.

¹²⁷ Ramanathan & Carmichael (2008).

regional warming in e.g. the Arctic and the Himalayas. Measures to reduce emissions of soot, as well as other climate-warming air pollutants, have a positive effect on both the climate and health, which might make them attractive for developing countries to implement as they prioritise better human health over GHG emission reductions. The EU should therefore prioritise international efforts aimed at tackling this problem, on both a local and a global level.

5.6.2 Fossil fuel subsidies

At the G20 meeting in Pittsburgh in 2009, it was agreed to reduce fossil fuel subsidies in member countries.¹²⁸ These subsidies are estimated to amount to USD 300 billion a year.¹²⁹ A complete phase-out of these subsidies would not only strengthen G20's public finances but also lead to a considerable reduction in GHG gases. In the G20 context, Sweden should therefore encourage realisation of the agreement, and work towards the objective of phasing out these subsidies completely.

5.6.3 REDD+

Tropical forests cover about 15 percent of the earth's surface and contain a quarter of the carbon bound by the terrestrial biosphere.¹³⁰ According to an IPCC assessment, tropical deforestation in the 1990s gave rise to annual GHG emissions of about 1.6 billion tonnes of carbon, a fifth of total annual carbon emissions. Within a UN framework, discussions have long been pursued to construct a mechanism aimed at reducing emissions from deforestation. At the Montreal COP in 2005, it was decided to initiate a project aimed at providing financial

¹²⁸ "The Pittsburgh Summit: Key Accomplishments" (<http://www.pittsburghsummit.gov>).

¹²⁹ IEA (2009).

¹³⁰ Bonan (2008).

compensation to developing countries who had taken measures to permanently reduce deforestation. This initiative went by the name *Reducing Emissions from Deforestation and Degradation* (REDD). In contrast to many other UN initiatives, REDD has undergone further development. The REDD negotiations were one of the very few success-stories at the Copenhagen conference. The Copenhagen Accord also highlights this initiative; which now goes by the name REDD+ to indicate the progress made. France and Norway in particular have provided important leadership in the further development of REDD+ in the wake of the Copenhagen conference. At a meeting in Oslo in May 2010, 58 countries confirmed that they had entered into a partnership for REDD+, aimed at developing a mechanism that compensates developing countries if they permanently reduce tropical deforestation.¹³¹ The partnership shall develop the mechanism in parallel with UN discussions.

A central component in a REDD+ mechanism can be an emission credit that developed countries can buy and use to cover domestic emissions. The EU should engage in developing a trading scheme for emission credits generated within the REDD+ framework. Buyer liability should also apply in this scheme, since it requires less encroachment on the sovereignty of developing countries and the incentive such a trading scheme creates will improve the scope for ensuring permanent deforestation reduction measures.

5.6.4 GATT/WTO

For several years, academics have been discussing the possibility of using trade sanctions as an instrument to secure compliance with signed climate agreements, and to encourage countries not currently involved in climate cooperation to engage.¹³² The issue was pushed high up the political agenda after the US House of Representatives voted in favour of a draft

¹³¹ See <http://www.un-redd.org>.

¹³² See e.g. Karp & Zhao (2009)

US domestic climate policy in June 2009, which opened the door to unilaterally introducing trade sanctions post 2015 on countries that were not considered to be implementing sufficiently vigorous climate policy measures. After Copenhagen, demands for trade barriers against countries not participating in climate cooperation have also been raised by countries such as France and Italy.¹³³ China - who seem to have realised that the threat of trade sanctions is directed specifically at them - has on several occasions in this year's UN negotiations demanded that the next international climate agreement include an explicit ban on trade sanctions motivated by climate policy. The issue of trade sanctions against countries considered to be pursuing policies that damage the climate will probably continue to be topical for the foreseeable future. It is in the EU's interest to perform an extensive analysis and evaluation of whether, and if so in what way, trade sanctions have a role to play in international climate policy. In a world without a global price on greenhouse gases, trade issues will inevitably play a role in climate policy decisions. In this area, the EU can execute important leadership and strive for a trade policy that combines free trade with policy and leads to reduced GHG emissions, something which could turn out to be especially important in an increasingly discordant world..¹³⁴

5.6.6 Geoengineering

¹³³ <http://www.euroactive.com/en/climate-environment/italy-joins-french-calls-for-eu-carbon-tariff-news-450643>.

¹³⁴ One important business area from a climate policy point of view, and where European industry is possibly being disadvantaged by Chinese investment policy, is windpower turbine manufacturing. The Chinese industry is heavily subsidised, which means that it is currently possible for it to manufacture high-quality windpower turbines and sell them on the global market at an approximate price of USD 685 000 per megawatt of production capacity. This should be compared to about USD 850 000, which is the price European wind turbine producers must charge to cover all their production costs. It is currently unclear whether the Chinese policy violates GATT/WTO regulations - no European country is yet to request the matter be examined by the WTO board ((Keith Bradsher, *China builds lead on clean energy*, International Herald Tribune, 9 September 2010).

While it has appeared increasingly unlikely that the international community will be able to agree on an international policy that prevents significant warming of the earth, a discussion has been pursued among scientists on more or less radical emergency measures. These emergency measures go under the collective name of *geoengineering*.¹³⁵ Some of the measures discussed already occur naturally. When Mount Pinatubo erupted in the Philippines in 1991, very large amounts of sulphur dioxide were spewed out into the stratosphere. This resulted in a transitional global average temperature decrease of about 0.5°C in the 12 months after the eruption.¹³⁶ One proposal put forward is to “buy time” to reverse climate trends by regularly adding sulphur dioxide to the stratosphere for a transitional period when they are no longer sustainable.¹³⁷ Since it is impossible to predict all the consequences of such and similar measures, many scientists are sceptical towards or even reject out of hand all types of geoengineering.

Apart from providing a technical opportunity to (temporarily) combat a rise in global temperatures, *geoengineering* is also a cheap measure in many cases. Cost estimates indicate that active measures amount to only a fraction of what the EU and other developed countries pledged to provide in climate assistance to developing countries in Copenhagen.¹³⁸ This

¹³⁵ The most extensive scientific review of geoengineering research up until now has been performed by the Royal Society and was published in September 2009. The report recommends the countries of the world to begin by trying to reduce the risk of a rise in global average temperatures by reducing GHG emissions. It also recommends continued research and development work aimed at identifying the least risky geoengineering alternatives, Royal Society (2009).

¹³⁶ Crutzen (2006).

¹³⁷ This proposal has been put forward by renowned scientists like chemistry Nobel Prize winner Paul Crutzen. Crutzen received the prize for his research in stratospheric chemistry and especially for his analyses of the harmful impact of CFCs on the ozone layer.

¹³⁸ Teller et al (2003) conclude that it would cost USD 1 billion a year until 2100 to inject particles into the stratosphere to prevent a temperature increase of more than 2°C. This can be compared to the USD 100 billion that the developed countries pledged in the Copenhagen Accord to transfer to developing countries from 2020 onwards.

makes it economically feasible for individual countries to take measures on their own that radically affect the global climate. There is currently no international regulatory framework governing the use of the atmosphere by individual countries like the one governing the use of the sea. Larger economies can therefore take measures aimed at manipulating the climate for their own benefit without being in breach of any international convention. For several reasons, this is a very dangerous situation with security policy implications. The issue of *geoengineering* has not been broached in UN negotiations. The EU should now initiate a number of measures to tackle the issue of *geoengineering*. In addition to systematic research in the area - it may prove necessary to take radical measures to slow down global warming - the EU should take the initiative for talks with the US, China, India and Russia aimed at formulating an international regulatory framework for *geoengineering*.

5.7 A choice of approaches?

Compared to an existing *top-down* architecture establishing a global GHG price, a bottom-up or decentralised approach, with the stepwise intensification and broadening of cooperation, is inferior. It would therefore be ideal if the countries of the world could agree on a legally binding agreement that led to the establishment of a global GHG price and the parties to such an agreement could comply with it. We are not in such a situation, however, despite nigh-on twenty years of trying. It is therefore misleading to compare the properties of a stepwise approach to the cooperation problem with an efficient, top-down architecture. A choice between approaches should therefore be based on the prospects for rapidly reaching a legally binding agreement within the framework of UN negotiations. If these prospects are good, the *top-down* approach seems vastly superior. If, on the other hand, the prospects look bleak, it is an open question as to whether a stepwise approach over time will lead to greater lasting

GHG emission reductions than will be achieved in continued UN negotiations that *might* result in a *top-down* architecture.

Chapter 6 The EU at a major crossroads

Until now, the EU has striven to achieve a multilateral, legally binding agreement within the framework of UN negotiations. The limitations of the UN system became clear at the Copenhagen conference. On its own, the EU cannot exert sufficient influence on global GHG emissions to prevent a rise in global average temperatures of more than 2°C. To accelerate global structural transition away from fossil-based energy, the EU must cooperate with other major economies. *If* the EU is convinced that global emission trends will have to be reversed very soon, it now stands at a strategic crossroads: should it continue to pursue the same line of action it has taken for the last ten years? Or is it time for a rethink?

Post Copenhagen, it is obvious that UN negotiations have reached a dead-end; work since the Copenhagen conference has not changed this situation. It is probably not possible to reach a legally binding agreement of the type advocated by the EU within the framework of UN negotiations. at least not until greenhouse gases have accumulated in the atmosphere to such an extent that it is no longer possible to restrict the rise in global average temperatures to a maximum of 2°C. Awareness of how matters stand makes it less difficult politically to leave the UN negotiations and instead concentrate on creating other forms of international climate cooperation. Leaving the UN negotiations can paradoxically provide an impetus to greater climate cooperation; a crisis is often needed to bring about change. The EU would risk being accused of deliberately creating a political crisis in order to gain ground for a more expedient climate policy. But this is not about *creating* a crisis. The crisis is already upon us and no-one really knows how to deal with it. In such a situation, it can be helpful if someone actually points out that the emperor isn't wearing any clothes at all. Furthermore, the failure of the UN in this issue is not something the EU can be held responsible for. The deadlock in UN

negotiations has effectively led to the climate issue being blocked in other fora. Discussions in e.g. G20 and MEF have been fruitless, mainly due to China and India blocking the issue by referring to the ongoing UN negotiations. Ascertaining that the UN negotiations have broken down and declaring instead that concrete cooperation is being sought with only a few parties can act as a catalyst for international climate efforts. The EU should therefore leave the UN process, at least in practice, and look for other forms of cooperation. In the current situation, there is no reason for EU Member States to continue to pump resources into the UN negotiations. These resources should instead be redirected to try and reach agreements in different climate-related issues with a limited number of countries, and then attempt to broaden and intensify such cooperation. At the same time, the EU should demand reforms of the negotiating process as a pre-condition for resuming UN negotiations. There are two reasons for this demand. Firstly, UN-sanctioned climate efforts are preferable to an international system without the active support of the UN. But for this support to be useful, the UN process must be reformed. Without reform, it is not possible to reach agreements that lead to GHG emission reductions of the magnitude needed to limit global warming to a maximum of 2°C. Such reform should carefully consider other, more successful negotiating processes, such as the Montreal Protocol and GAT/WTO, to see what lessons can be learnt from them. The other reason is that the EU must deal with the political risk involved in leaving the UN negotiations. Leaving the negotiations and demanding they be reformed is a justifiable act. This would wrestle the initiative for blocking concrete progress from the hands of countries who have been opposed to extensive climate reforms up to now.

There is naturally a risk attached to leaving the UN negotiations and it is difficult to foresee the consequences of such a decision. The alternative course of action shall however be weighed against the option of continuing discussions within a UN framework, which in all

likelihood will not result in any efforts being made to slow down global warming - at least not at a rapid enough pace. The risks associated with continued greenhouse gas emissions should therefore be weighed against the political risks involved in breaking off UN negotiations.

References

Material gathered from websites is referenced as footnotes in the text itself. The same is true of newspaper articles and unprinted material such as internal memos and my own conference notes. Books, reports and journal articles are referenced below.

Alfsén, K. H. & Eskeland, G. S. (2007), *A broader Palette: The Role of Technology in Climate Policy*, Report to the Expert Group on Environmental Studies 2007:1

Aldy, J. & Stavins, R., eds. (2007), *Architectures for Agreement: Addressing Global Climate Change in a Post Kyoto World*, Cambridge University Press.

Barrett, S. (2005), *Environment and Statecraft: The strategy of Environmental Treaty-Making*, Oxford University Press.

Barrett, S. (2007a), *A multitrack climate treaty system*, in Aldy, J. & Stavins, R., eds., *Architectures for Agreement: Addressing Global Climate Change in a Post Kyoto World*, Cambridge University Press.

Barrett, S. (2007 b), *Why Cooperate? The Incentive to Supply Global Public Goods*, Oxford University Press.

Benedick, R. E. (1997), *Contrasting Approaches: The Ozone Layer, Climate Change, and Resolving the Kyoto Dilemma*, Wissenschaftszentrum Berlin für Sozialforschung.

Benedick, R. E. (1998), *Ozone Diplomacy: new directions in safeguarding the planet*, Harvard University Press.

Bluemel, E. B. (2007), *Unravelling the Global Warming Regime Complex: Competitive Entropy in the Regulation of the Global Public Good*, 155 *University of Pennsylvania Law Review* 1981.

Bodansky, D. (1993), *The United Nations Framework Convention on Climate Change: A Commentary*, *Yale Journal of International Law*, vol. 18, no. 2.

Bodansky, D. (2007), *Targets and timetables: good policy but bad politics?*, i Aldy, J. & Stavins, R., eds., *Architectures for Agreement: Addressing Global Climate Change in a Post Kyoto World*, Cambridge University Press.

Bodansky, D. (2010), *The International Climate Change Regime: The road from Copenhagen*, Viewpoints, October 2010, Harvard Project on International Climate Agreements.

Bolin, B. (2007), *A History of the Science and Politics of Climate Change*, Cambridge University Press.

Bonan, G. B. (2008), *Forests and Climate Change: Forcings, Feedbacks, and the Climate Benefits of Forests*, Science, vol. 320, no. 5882.

Carlén, B. (2007), *Sveriges Klimatpolitik – värdet av utsläppshandel och valet av målformulering [Swedish climate policy - the value of emission trading and choice of objectives]*, Report to the Expert Group for Environmental Studies 2007:4.

Carraro, C. (2007), *Incentives and institutions: a bottom-up approach to climate policy*, i Aldy, J. & Stavins, R., eds., *Architectures for Agreement: Addressing Global Climate Change in a Post Kyoto World*, Cambridge University Press.

Chayes, A. & Chayes, A. H. (1991), *Compliance without Enforcement: State Behaviour under Regulatory Treaties*, Negotiation Journal 7(3).

Crutzen, P. J. (2006), *Albedo enhancement by stratospheric sulphur injections: a contribution to resolve a policy dilemma?*, Climate Change 77.

Dodds, K. (2005), *Global Geopolitics: A Critical Introduction*, Pearson Prentice Hall.

Grubb, M. (2003), *The Economics of the Kyoto Protocol*, World Economics, vol. 4, no. 3.

Halding, K., Han, G. & Olsson, M. (2009), *A Balancing Act: Chinas Role in Climate Change*, Commission for Sustainable Development.

Haass, R. N. (2008), *The Age of Nonpolarity*, Foreign Affairs, May/June.

Hey, E. (2006), *International Institutions*, International Environmental Law, eds. Bodansky, Brunnée & Hey, Oxford University Press.

Hill, M. & Kriström, B. (2005), *Klimatmål, utsläppsmål och svensk ekonomi [Climate targets, emission targets and the Swedish economy]*, SNS Förlag.

IEA (2008), *World Energy Outlook 2008*, OECD/IEA, Paris.

IPCC (2007a), *Climate Change 2007: The Physical Science Basis. Working Group I*, Cambridge University Press.

IPCC (2007b), *Climate Change 2007: Mitigation of Climate Change. Working Group III*, Cambridge University Press.

Jacoby, H. D. (2007), *Climate favela*, i Aldy, J. & Stavins, R., eds., *Architectures for Agreement: Addressing Global Climate Change in a Post Kyoto World*, Cambridge University Press.

Jacoby, H. D., Schmalensee, R. & Sue Wing (1999), *Toward a Useful Architecture for Climate Change Negotiations*, MIT Joint Program on the Science and Policy of Global Change, no. 49.

Jaffe, J. & Stavins, R. N. (2008), *Linkage of Tradable Permit Systems in International Climate Policy Architecture*, The Harvard Project on International Climate Agreements.

Karp, L. & Zhao, J. (2009), *Suggestions for the Road to Copenhagen*, Report to the Expert Group for Environmental Studies 2009:1.

Keohane, R. O. & Raustiala, K. (2008), *Toward a Post-Kyoto Climate Change Architecture: a Political Analysis*, The Harvard Project on International Climate Agreements.

Keohane, R. O. & Victor, D. G. (2010), *The Regime Complex for Climate Change*, The Harvard Project on International Climate Agreements.

Levi, M. A. (2009), *Copenhagen's Inconvenient Truth*, Foreign Affairs, September/October.

Gomez-Echeverri, L. (2000), *Most Developing Countries are Neither Prepared to Address nor Interested in Climate Change*, i Luis Gomez-Echeverri, ed., *Climate Change and Development*, New York and New Haven: UN Development Program and Yale School of Forestry and Environmental Studies.

Markandya, A. & Halsnaes, K. (2004), *Developing Countries and Climate Change*, i Owen, A. eds. *The Economics of Climate Change*, Routledge.

Meilstrup, P. (2010), *Kampen om Klimatet [The fight for the climate]*, People's Press.

Metcalf, G. E. & Weisbach, D. (2010), *Linking Policies When Tastes Differ: Global Climate Policy in a Heterogeneous World*, The Harvard Project on International Climate Agreements.

Michonski, K. & Levi, M. A. (2010), *Harnessing International Institutions to Address Climate Change*, New York, Council on Foreign Relations.

National Academy of Sciences (2010), *Climate Stabilization Targets: Emissions, Concentrations, and Impacts Over Decades to Millennia*, Washington.

Nordhaus, R. R. (2009), *A Question of Balance*, Harvard University Press.

Nordhaus, R. R., Danish, K. W., Rosenzweig, R. H. & Fleming, B. S. (2000), *International Emissions Trading Rules as a Compliance Tool: What is Necessary, Effective, and Workable?*, Environmental Law Reporter 30.

North, D. C. & Thomas, R. P. (1993), *Västerlandets uppgång [The rise of the west]*, SNS Förlag.

OECD (2000), *An Assessment of Liability Rules for International GHG Emissions Trading*, Paris

OECD (2009), *The Economics of Climate Change Mitigation: Policies and Options for Global Action Beyond 2012*, Paris.

Ostrom, E. (1990), *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press.

Petsonk, A. (2009), 'Docking Stations': *Designing a More Welcoming Architecture for Post-2012 Framework to Combat Climate Change*, Duke Journal of Comparative and International Law, vol. 19:433.

Purvis, N. & Stevenson, A. (2010), *Rethinking Climate Diplomacy: new ideas for transatlantic cooperation post-Copenhagen*, The German Marshall Fund of the US.

Ramanathan, V. & Carmichael, G. (2008), *Global and Regional Climate Change due to Black Carbon*, Nature Geoscience 1.

Randalls, S. (2010), *History of the 2°C climate target*, WIREs Climate Change, vol. 1, July/August.

Roger, J. & Meinshausen, M. (2010), *Copenhagen Accord pledges are paltry*, Nature, vol. 464, 22 April.

Royal Society (2009), *Geoengineering the climate: science governance and uncertainty*, London.

Schelling, T. C. (1997), *The Cost of Combating Global Warming: facing the tradeoffs*, Foreign Affairs, November/December.

Schelling, T. C. (2002), *What Makes Greenhouse Sense? Time to Rethink the Kyoto Protocol*, Foreign Affairs, May/June.

Schmalensee, R. (1998), *Greenhouse Policy Architectures and Institutions*, eds. Economics and Policy Issues in Climate Change, Resources for the Future, Washington DC.

Skolnikoff, E. B. (1990), *The Policy Gridlock on Global Warming*, Foreign Policy, Summer90, Issue 79.

South Centre, (1991), *Environment and development: towards a common strategy for the South in the UNCED negotiations and beyond*, Geneva.

Stewart, R. B. & Wiener, J. B. (2003), *Reconstructing Climate Policy: Beyond Kyoto*, Washington, D.C.

Teller, E., Hyde, R., Ishikawa, M., Nuckolls, J. & Wood, L. (2003), *Active stabilization of climate: inexpensive, low risk, near-term options for preventing global warming and ice ages via technologically varied solar radiative forcing*, Lawrence Livermore National Library, 30 November.

Toje, A. (2010), *The European Union as a Small Power: After the Post-Cold War*, Palgrave Macmillan.

UNFCCC Handbook (2006), Climate Change Secretariat, Bonn, Germany.

Velders, G. J. M., Andersen, S. O., Daniel, J. S., Fahey, D. W., & McFarland, M. (2007), *The importance of the Montreal Protocol in protection climate*, Proc Natl Acad Sci US; March 20; 104(12).

Victor, D. G. (2001), *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming*, Princeton University Press.

Victor, D. G. (2004), *Climate Change: Debating America's Policy Options*, New York, Council on Foreign Relations.

Victor, D. G. (2009), *Plan B for Copenhagen*, Nature, September.

Victor, D. G. & Coben, L. A. (2005), *A Herd Mentality in the Design of International Environmental Agreements?*, Global Environmental Politics 5, February.

Victor, D. G. & Cullenward, D. (2007), *Making Carbon Markets Work*, Scientific American, September 24.

Wara, M. (2007), *Is the Global Carbon Market Working?*, 445 Nature 595.

Wara, M. W. & Victor, D. G. (2008), *A Realistic Policy on International Carbon Offsets*, Working Paper 74, Stanford University.

Wen Jiabao. (2009), *Build Consensus and Strengthen Cooperation To Advance the Historical Process of Combating Climate Change*, Copenhagen, Denmark.

Wiener, J. B. (1999), *Global Environmental Regulation: Instrument Choice in Legal Context*, Yale Law Journal 108.

Weart, S. R. (2008), *The Discovery of Global Warming*, Harvard University Press.

Zhang, Z. X. (1999), *International Greenhouse Gas Emissions Trading: who should be held liable for the non-compliance by sellers?*, Ecological Economics 31.