



THE ROBERT SCHUMAN CENTRE
FOR ADVANCED STUDIES

Rapporteur
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The Next Steps:
A Climate Change Briefing
for European Decision-Maker



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Policy Paper

02/13



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EUROPEAN UNIVERSITY INSTITUTE, FLORENCE
ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES

**The Next Steps:
A Climate Change Briefing for European Decision-Makers**

James Meadowcroft
(rapporteur)

Policy Papers, RSC No. 02/13

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Robert Schuman Centre for Advanced Studies
Printed in Italy in December 2002
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole (FI)
Italy

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PREFACE

In September 2000, the Robert Schuman Centre of the European University Institute inaugurated a new Transatlantic Programme, established to conduct policy-oriented and basic research on the subjects of transatlantic relations and transatlantic governance. Throughout its first two years of activities, the programme has focused largely on the US-EU relationship, including trade and economic issues, as well as the roles of the transatlantic partners in larger questions of global governance.

Throughout the life of the Transatlantic Programme, the issue of climate change has proven to be one of the most important - and one of the most difficult - issues in transatlantic relations. As James Meadowcroft's report demonstrates, the United States and the European Union have long taken starkly differing approaches to the problem of global climate change. These differences have, in turn, manifested themselves in persistent disagreement at the global level, particularly as the international community moves to implement the commitments of the 1992 Framework Convention on Climate Change and the 1997 Kyoto Protocol. Transatlantic tensions turned into transatlantic rupture when, in March 2001, the Bush Administration announced that the United States would not be bound by the Kyoto Protocol, which it pronounced "dead."

The departure of the United States from the Kyoto Protocol has raised a number of pressing policy issues for the European Union and its Member States. These issues were the subject of a transatlantic workshop held at the European University Institute on 21-22 June 2002. The findings of this workshop, and the policy recommendations that emerged from it, are concisely summarized in this report by James Meadowcroft. As the conference organizers, we asked Dr. Meadowcroft to write a report that would be simultaneously accessible to the general reader and specific enough in its analysis and its proposals to be of help in directing European climate change policy. It was, frankly, a nearly impossible task, but one that Dr. Meadowcroft has managed to pull off.

A few words of thanks are in order, not least to the participants of the workshop, who are listed in the appendix to the report. Thanks also to the Transatlantic Programme and its Director, Helen Wallace; to the BP Corporation, which generously provided sponsorship for the programme and for the workshop. Above all, we wish to thank James Meadowcroft for an excellent and informative report on the policy options open to the European Union as it struggles to implement the Kyoto Protocol without America.

Susan Baker, University of Cardiff

Mark A. Pollack, University of Wisconsin-Madison

EXECUTIVE SUMMARY

Since 1990 the international community has conducted complex negotiations to secure global agreements to address climate change. The Framework Convention on Climate Change (1992), the Kyoto Protocol (1997) and the Marrakech Accords (2001) are important landmarks in this process. The Kyoto Protocol, which limits greenhouse gas emissions from the developed countries, is likely to enter into force in 2003.

The US decision not to ratify the Kyoto Protocol has significant consequences. The absolute *emission reductions* secured under the agreement during the first commitment period (2008-2012) will be substantially less than originally anticipated. There will be *less demand for credits secured through the three flexibility mechanisms* (Emissions Trading, Joint Implementation and the Clean Development Mechanism), and the associated financial flows will be reduced. The *legitimacy of the regime* has also been weakened by the refusal of the world's only super-power, and largest emitter of greenhouse gasses, to participate.

US reluctance to implement a significant programme of domestic greenhouse gas reduction acts as a drag on other state's efforts to maintain and intensify their abatement efforts. In particular, it strengthens the worry that those who take vigorous action will be at a competitive disadvantage in relation to US industries that continue to rely on cheap supplies of carbon energy.

Two broad issues now confront European decision-makers: the *domestic implementation* of the agreements concluded to date, and *the future evolution* of the climate change regime.

On the domestic front, European leaders must ensure that they have in place policies and measures to secure the agreed reductions. In the year 2000 EU carbon dioxide emissions were 0.5% down on 1990 levels. Thus the EU achieved its declared goal of stabilising carbon dioxide emissions at 1990 levels by 2000, and it has realised almost half the 8% cut in total greenhouse gas emissions required by the Kyoto Protocol. Yet the picture remains worrying. The bulk of the reductions were secured in just two member states, Germany and the United Kingdom. Projections suggest that in the absence of new initiatives EU greenhouse gas emissions in 2010 will be at 1990 levels -- that is 8% above the Kyoto target.

Proposals for additional measures now working their way through EU decision procedures or that are under active consideration include directives on emissions trading, the energy performance of buildings, the regulatory and fiscal promotion of biofuels, combined heat and power production, transport infrastructure and user charges, energy-efficient public procurement, and fluorinated gases. The EU emission-trading scheme is especially important. Provided it is not weakened as it passes through the EU's complex co-decision procedures, it has the potential to encourage significant cost-efficient abatement.

Continued reduction of greenhouse gas emissions through the first Kyoto commitment period and beyond will require a complex mix of policies across the EU. In developing new initiatives particular attention should be given to: *public education; transparency, accountability and participation; exploiting policy synergies; abolishing polluter subsidies; sectoral integration; developing green technologies; research; and adaptation.*

On the international front thoughts are already turning to the second commitment period (2013-2017). Future negotiations will be shaped by many factors including: developments in climate-related events and science; whether the US initiates credible domestic and/or cross-national abatement programmes; the structure of the existing regime, and the fact that new targets are to be agreed before experience has accumulated with the practical operation of the Kyoto mechanisms; and prevailing economic conditions and the broader international context.

In engaging with the international process European decision-makers should continue to press an ambitious climate change agenda, make greater efforts to support developing countries, and engage constructively with the United States. With respect to the next commitment period, *targets for developed states* should signal their intention to maintain a downward *emissions* trajectory. Excess emissions allowances -- 'hot air' -- should be curtailed. And a flexible and differentiated approach should be adopted to draw developing countries into emissions abatement efforts. Greater attention should also be devoted to adaptation, because many of the poorest countries are expected to bear the initial brunt of the negative impacts of the changing climate.

Climate change is a long-term problem, but *decisions made in the next two or three decades could have a dramatic impact on rates and levels of warming experienced during the remainder of the twenty-first century.* Technologies that would allow a major reduction in greenhouse gas emissions

already exist or are within reach. But their adoption requires economic and social change and a substantial political commitment.

In coming years the international community is likely to take modest additional steps towards carbon abatement. Such efforts can slow the growth of global emissions – holding out the hope of lowered rates and levels of warming in the coming century. And they provide experience in developing technologies and building institutions needed to make a more determined assault on the problem in the future.

REPORT

Over the past fifteen years climate change has emerged as an increasingly important issue for domestic and international policy. At a point when the Kyoto Protocol – the first legally binding international agreement to cap greenhouse gas emissions – appears about to enter into force, it is worth pausing to assess the implications of this dossier for European policy makers.

Climate change first attracted international attention in the mid-1980s. Concern about the long-term build up of greenhouse gasses in the atmosphere and the possibility of damaging the global climate system led to calls for action. In 1988 the United Nations Environment Programme and the World Meteorological Organisation established the Intergovernmental Panel on Climate Change (IPCC) to review scientific knowledge in this area. The results of the IPCC's First Assessment Report in 1990 were sufficiently worrying to prompt the opening of formal international negotiations to draft a climate change agreement.

Subsequent IPCC Reports suggested that a human influence on global climate was now discernible, and that warming was likely to accelerate in the coming century. According to the IPCC's Third Assessment Report (2001), global surface temperatures rose 0.6°C over the course of the 20th century. In the Northern Hemisphere it was likely that the 1990s was the warmest decade, and 1998 the warmest year, in the past 1,000 years. 'Most of the warming observed over the last 50 years' could be attributed 'to human activities'.¹ And, in the absence of remedial measures, temperatures could be expected to rise between 1.4°C and 5.8°C over the next century.

While many uncertainties surround climate change, the scientific consensus is that its overall impact will be problematic.² As temperatures rise, weather patterns will shift. On a global scale precipitation will increase, but changes to its geographic and temporal distribution will lead to increased risks of both drought and flooding. Extreme weather events may become more frequent and damaging. Sea levels will rise due to thermal expansion of the oceans, the retreat of glaciers, and perhaps some melting of polar ice. Warming will be most pronounced at higher latitudes, but regional and local climactic effects will vary.

Natural ecosystems and human societies are certain to suffer disruption. Changing temperatures and rainfall will affect agriculture and other economic activities. The erosion of food security, more extreme weather events, and the spread of disease will affect human health.³ And settlements will be threatened by rising sea levels. Some natural systems will experience irreversible damage,

while elsewhere species already under pressure will face increased risk of extinction.

Negative consequences will be more *widespread* and also more *pronounced* for faster *rates* of change and for higher absolute *levels* of warming. The impacts will be especially acute in *developing countries* where populations are more vulnerable, and resources to fund adaptation are limited.⁴

Particular worries that emerge from the scientific findings are:

- *the pace of change*: the rate of warming anticipated for the next century is likely to be faster than any experienced in the past 10,000 years, and such a rapid shift in climate will make it difficult for human and natural systems to adapt.
- *the possibility of large-scale discontinuities*: historical evidence suggests that the climate system does not display a smooth response to perturbation. At a certain point, small additional increases in temperature could provoke dramatic shifts in regional or global climate. Significant changes to the pattern of ocean circulation (such as shutting down the Gulf Stream that warms the climate of northern Europe), or the melting of the polar caps (provoking a dramatic rise in sea levels) cannot be excluded in the longer term.
- *the extended nature of the problem*: substantial warming is already locked into the system, because of the historic accumulation of emissions. So long as greenhouse gas concentrations in the atmosphere continue to increase, warming will go on. Indeed, even after the stabilisation of atmospheric concentrations of greenhouse gases the momentum of the climate system implies that temperatures will continue to rise (at a gradually decreasing rate) for several centuries.
- *the magnitude of relevant uncertainties*: although climate science has advanced rapidly, great uncertainties remain. Even the equilibrium temperature that would eventually follow from maintaining a particular atmospheric concentration of carbon dioxide remains unclear. Current estimates for carbon dioxide stabilisation at 450 parts per million (ppm) suggest a temperature rise ranging between 1.5°C and 3.9°C. For stabilisation at 550ppm (approximately double pre-industrial levels) these figures rise to between 2°C and 6°C.⁵ This is to say nothing of the difficulty of establishing thresholds that might trigger large scale changes to the climate system, understanding feedback mechanisms which could slow or accelerate

warming, or developing detailed predictions of regional and local consequences attendant upon any given temperature rise.

- *the scale of emissions reductions necessary to limit the temperature increase to a few degrees:* to stabilise greenhouse gas **concentrations** in the atmosphere, it is necessary to radically reduce ongoing **emissions**. The IPCC analysis suggests that to stabilise concentrations at 450ppm (60% above pre-industrial levels) global carbon dioxide emissions would need to fall below 1990 base-line levels 'within a few decades', and to 'continue to decrease steadily thereafter' until they constituted 'a very small fraction of current emissions'.⁶

Many industrial and agricultural processes produce greenhouse gasses, especially the combustion of fossil fuels that have powered economic development since the industrial revolution. As economies, population levels and standards of living grow, emissions typically rise. Industrialised countries have been responsible for four fifths of carbon dioxide emissions during the twentieth century. They currently account for two-thirds of global emissions. In per capita terms the difference is stark: US per capita carbon emissions now stand at more than five times the global average. Per capita emissions in China and Brazil are about half the global average. India's are a quarter of the average, while many of the poorest countries have per capita levels less than 10% of the global average.⁷ Nevertheless, emissions in many developing countries are rising. The International Energy Agency reports that over the next thirty years two-thirds of the increase in energy-related carbon dioxide emissions will come from developing countries.⁸ But on current trends, annual releases from China (the largest developing country emitter) will remain below US levels for decades to come.⁹

Responding to climate change implies two fundamental tasks:

- *action to slow the accumulation of greenhouse gases in the atmosphere in order to forestall further warming and*
- *adaptation to warming that is already underway*

Releases of methane (from agriculture, waste, and fossil fuel extraction and distribution), nitrous oxide (from agriculture, industry and catalytic converters) and fluorinated gasses must all be brought under control. But over the long term the impacts of carbon dioxide predominate.¹⁰ Central to reducing net carbon dioxide emissions are efforts to: i) increase energy conservation and efficiency, ii) switch to low-carbon, carbon-neutral, and non-carbon fuels, iii) expand natural 'sinks' which draw-down carbon from the atmosphere (such as forests), and iv) encourage carbon sequestration (long term storage in geological formations such as oil wells).

Adaptation implies forward planning and expenditure to allow human and natural systems to adjust to the changing climate. It has implications for agricultural practices, fresh water management, flood defences, settlement patterns, public health priorities, and nature conservation. Adaptation is a critical issue in many developing countries where changing weather patterns will pose a direct and immediate threat to human life and welfare.

International climate negotiations – the story so far

Since 1990 international climate change negotiations have followed a tortuous course. Important landmarks in the process were the conclusion of the Framework Convention on Climate Change (1992), the Kyoto Protocol (1997) and the Marrakech Accords (2001) (see Box A). As compared to some other industrialised countries, the European Union has in recent years generally favoured more stringent legally-binding emissions targets. An early priority for its negotiators was securing the 'EU bubble' which allowed abatement commitments to be redistributed among member states so long as their summed emissions remained within the overall EU allowance. This approach allowed the EU to take account of differences in the energy structure, emissions patterns and development levels of individual member states (see Box B). The EU has been sceptical of the 'flexibility mechanisms' built into the Kyoto accord (see Box C), and looked for fixed limits on the extent to which they could be used to meet mandatory reduction targets. It resisted the expansion of the range of land-use, land-use change and forestry activities (LULUCF) which could be counted against the Kyoto targets, and supported a strong compliance regime.

The United States was more hesitant about mandatory controls, and later worried that its Kyoto target was too strict. It advocated a regime covering all the major greenhouse gasses (not just carbon dioxide), championed emissions trading, and the inclusion of LULUCF activities – in order to lower compliance costs and ensure it could meet its target. Other industrialised countries such as Australia, Canada, Norway and Japan shared many of the US concerns. Another group of developed countries included Russia and other successor states to the former Soviet Union. Since their emissions had fallen well below the 1990 benchmark levels, these countries looked forward to selling entitlements to this 'hot air' to other industrialised states that might be struggling to meet their Kyoto targets through domestic reductions.

The developing states of G77 + China tend to approach climate change within the context of broader disputes with the industrialised world. They have looked for increased financial flows and technology transfers to accelerate their development efforts, to assist the shift to cleaner energy, and to develop climate response strategies. They are resistant to early domestic abatement targets, and

have remained adamant that the industrialised states must take the first step. Two smaller groups of developing countries have also influenced negotiations. The Alliance of Small Island States (AOSIS), concerned about rising sea levels, has advocated vigorous action. And OPEC nations, worried about falling oil revenues, have tried to slow proceedings.

[Box A]

International climate change agreements

Three agreements lie at the core of the international climate change regime.

The Framework Convention on Climate Change (1992) established the basic international commitment to address risks posed by human induced climate change. The Convention entered into force in 1994, and now includes 186 parties. Its key features include:

- the objective of stabilising 'atmospheric concentrations of greenhouse gases at levels that would prevent dangerous anthropogenic interference with the climate system'.
- 'principles' to guide the international response to climate change including 'equity', a notion of the 'common but differentiated responsibilities' of all nations, the precautionary principle, sustainable development, and cost effectiveness.
- an obligation on all parties to take action to deal with climate change including the preparation of programmes for mitigation and adaptation, the encouragement of scientific research, and submission of reports on national emissions and response efforts.
- a specific obligation for industrialised states (Annex 1 countries) to take the lead in mitigation efforts, as they are responsible for the largest share of emissions and can better afford action. An indicative (non-legally binding) target was set for Annex 1 parties to return their greenhouse gas emissions to 1990 levels by the year 2000. The most prosperous of the industrialised states (Annex 2 countries) assumed the additional obligation of assisting developing countries to adjust to climate change and to meet their obligations under the Convention.
- the establishment of the Convention institutions including the Conference of the Parties (that meets annually to review developments), two specialist organisations (the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation that meet twice a year), and a permanent international Secretariat.

continued...

The Kyoto Protocol (1997) set the first legally binding greenhouse gas emissions targets for the industrialised states. Key features of the Kyoto Protocol include:

- the commitment of Annex 1 countries to meet quantitative emissions targets during a first commitment period (from 2008 to 2012), for a basket of six greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).
- the definition of individual emissions targets for each Annex I party (ranging from an 8% reduction on 1990 levels for EU states to a 10% increase on 1990 levels for Iceland) which, when taken all together, would result in at least a 5% reduction in total Annex 1 country emissions.
- the creation of three ‘flexibility mechanisms’ – joint implementation (JI), the clean development mechanism (CDM) and emissions trading (ET) – to allow countries to co-operate in achieving reductions and to reduce the cost of meeting their commitments.
- the inclusion within the accounting framework of certain ‘land-use, land-use change and forestry’ (LULUCF) activities (that can reduce emissions from forest clearances or increase long-term carbon storage in biological ‘sinks’).
- the provision for the Protocol to enter into force when it is ratified by 55 parties including Annex 1 countries accounting for 55% of total 1990 carbon dioxide emissions.

The Marrakech Accords (2001) provided agreement on the detailed rules for the actual operation of the Kyoto Protocol. Among the more important features were:

- finalising detailed rules for the operation of the three flexibility mechanisms (CDM, JI and ET), and the inclusion of a proviso that reductions achieved through the use of such mechanisms should be ‘supplemental to domestic action’.
- broadening the range of LULUCF activities included within the accounting framework, and increasing significantly the maximum allowance for forest management credited to Russia.
- establishing three new funds to assist developing countries with their climate change adjustment and mitigation efforts.
- adopting a comparatively strict compliance procedure, which includes close monitoring of national efforts and reporting, and penalties for failure to meet targets.
- accepting the principle that emission reduction should proceed in ‘a manner conducive to narrowing the per capita differences between developed and developing country Parties’.

The architecture of the Kyoto Protocol is a complex amalgam, reflecting the compromises required to keep the parties at the table.¹¹ Many of the proposals of US negotiators – particularly the six-gas approach, emissions trading, and a broad interpretation of LULUCF activities – were incorporated into the agreements. And yet the likelihood of US ratification of the Kyoto Protocol was small even before the Bush administration publicly repudiated the agreement in March 2001. Many US politicians remain unconvinced of the need for urgent action on climate change. Indeed the Senate had already passed a resolution in 1997 opposing US acceptance of a binding agreement unless the administration could demonstrate that no additional costs would be imposed on the US economy, and that a ‘meaningful commitment’ to greenhouse gas reduction had been secured from developing countries.

Paradoxically, the public US disavowal of Kyoto helped galvanise the resolve of other states to reach an agreement that would allow the Protocol to come into force. The EU and the G77 + China provided the critical drive to finalise the Kyoto ‘rulebook’ in Marrakech.¹² But the US withdrawal also strengthened the negotiating hand of Russia and other developed states (whose support was then essential if the Protocol was to be ratified by enough parties so that it could enter into force). And the EU had to give way on many issues, including a numerical cap on use of the flexibility mechanisms, the extension of credited LULUCF activities, an increase in the forest management allowance for Russia, and a weakening of the compliance regime.

During recent negotiations (COP 8, October/November 2002) divisions between developed and developing states again occupied centre stage. Despite EU efforts, the ‘Dehli Ministerial Declaration’ included no reference to abatement efforts after the end of the first Kyoto commitment period in 2012. Developing countries resisted opening the discussion on the broader future of the climate regime, as they were unwilling to consider any extension to the range of countries involved in mandatory controls. In a remarkable turn around, US negotiators agreed that it would be unfair to expect developing countries to consider emissions targets. Nevertheless, the meeting made progress on a number of technical issues, including rules for the CDM, reporting requirements, and funding mechanisms.

[Box B] EU burden sharing in reducing greenhouse gas emissions:		
Member state	Kyoto Target	Burden- sharing target 2008-2012
Austria	- 8	- 13
Belgium	- 8	- 7.5
Denmark	- 8	- 21.0
Finland	- 8	0
France	- 8	0
Germany	- 8	- 21
Greece	- 8	+ 25
Italy	- 8	- 6.5
Ireland	- 8	+ 13
Luxembourg	- 8	- 28
Netherlands	- 8	- 6
Portugal	- 8	+ 27
Spain	- 8	+ 15
Sweden	- 8	+ 4
United Kingdom	- 8	- 12.5
EU 15	- 8	- 8

Kyoto and its critics

Political and economic interests that have opposed ratification of the Kyoto Protocol in the United States and other developed countries have emphasised the *uncertain science surrounding climate change and the high cost of carbon abatement*. They argue that at this point there is doubt about the scale of the problem, and that mandatory emissions controls would impose significant economic costs. The suggestion is that we would do better to wait for scientific clarity, and that the more prosperous and technologically developed societies of the future will be better placed to take appropriate action.

The response to such criticism points out that there is already a substantial scientific consensus that the first effects of human induced climate change are becoming manifest, and that the longer term consequences may be serious. The complexity of the climate system means that substantial uncertainties will remain far into the future. And the risks of deferring action may be significant, especially if warming turns out to be at the high end of the spectrum or the climate system proves especially sensitive to perturbation. Moreover, the costs

of early abatement action are likely to have been substantially overstated. And the earlier societies engage with the problem, the more time they give themselves to learn how to adapt to climate change and to control emissions, so facilitating a smoother transition to a carbon-neutral energy system.

Opponents have also *derided the environmental effectiveness* of the Kyoto accords. Projections of carbon dioxide emissions over the coming century show that implementation of these abatement targets causes barely a blip in the overall trend of rising greenhouse emissions. Even if proportionate reductions were secured in each subsequent commitment period, global emissions would continue to rise. Inclusion of the US in future rounds could improve matters somewhat. But ultimately the upward trend would prevail.¹³ The explanation is that the falling emissions of Annex 1 countries are overwhelmed by rapidly rising emissions from the developing world.

Yet the Kyoto Protocol was never intended as a comprehensive solution to climate change; and scenarios that extrapolate its impact over many decades while assuming no extension of the countries involved in abatement efforts miss the point. Instead, the Protocol has been understood as part of a long-term process to create global institutions to stabilise atmospheric concentrations of greenhouse gasses. It is a first step that commits Annex 1 countries to modest initial reductions, and can serve as a bridge towards more substantial future cuts, and the extension of the pool of participating countries, in subsequent commitment periods.

A parallel criticism suggests *the Kyoto regime is unfair* because it requires some states to make reductions while others are let off the hook altogether. As with the previous objection, attention is drawn to the position of developing countries. Why should these nations – especially those with rapidly rising standards of living (such as South Korea, Chile or Singapore) or huge populations (such as China or India) – be exempt from action, while industrialised countries are obliged to assume costs that may place them at a competitive disadvantage? One response here is simply to point to the text of the Framework Convention on Climate Change. This explicitly emphasises the obligation of industrialised states to take the lead in abatement efforts.

More fundamentally, the idea of **equity** – of a fair contribution from each country – must be a cornerstone of any serious collective international response to climate change. On the one hand, equity suggests that those who have created a problem should take responsibility to deal with it. And Annex 1 countries still account for two-thirds of global emissions. Moreover, if one considers historical emissions patterns the overwhelming responsibility of the industrialised countries is even clearer. On the other hand, equity also suggests that those best

able to take remedial action should do so. Again, the wealthy countries of the North are better placed to curb their emissions than the poorer countries of the South.

[Box C]

Flexibility Mechanisms of the Kyoto Protocol

The Kyoto Protocol established three 'flexibility mechanisms' to facilitate cost-effective greenhouse gas abatement efforts.

Emissions Trading (ET) allows countries subject to binding emissions controls (Annex 1 Parties) to buy and sell emission entitlements from each other. States that can achieve low cost abatement are able to sell on 'assigned amounts units' to those having more difficulty meeting their targets, thus reducing the overall cost of international compliance.

Joint Implementation (JI) involves project-based co-operation within the Annex 1 area. It allows states to gain credit for emissions reductions they have helped to secure in the territory of another Annex 1 Party. Such 'emissions reduction units' could be acquired, for example, by replacing an outdated power plant with a more carbon-efficient alternative. LULUCF activities are permitted under JI, but parties have agreed not to count nuclear power under this framework.

The Clean Development Mechanism (CDM) involves project-based co-operation between developed and developing states. Annex 1 countries can gain credit for emissions reductions they help achieve in non-Annex 1 countries. Afforestation and reforestation activities can be included up to a specified limit, and again nuclear power projects are excluded.

In order to benefit from the flexibility mechanisms parties must have ratified the Kyoto Protocol and have satisfied its reporting and procedural requirements. Each Annex 1 Party must maintain a reserve to ensure that trades will not endanger meeting its commitment period target. Complex rules regulate the detailed operation of ET, JI and the CDM, and bodies have been established to monitor and authenticate activities conducted under the three mechanisms.

Of course, the key categories of the convention (Annex 1 and non-Annex 1) are extremely crude. There are marked differences among developed states with respect to levels of economic development, structural factors that underpin emissions, and gross and per capita emissions. This is why the EU burden

sharing agreement can be justified by equity as well as expediency. But there are even greater differences within the developing world: some states are rapidly approaching the standards of living (and emission levels) of Annex 1 countries; others are growing but have comparatively low emissions; while some remain mired in economic stagnation and poverty. Differentiating the responsibilities of these states remains a key task for the future. But it does not obviate the obligation of the industrialised countries to take the first step today.

A rather different set of objections is formulated by those who accept that serious action on climate change is necessary, and agree that developed states must go first, but argue that *Kyoto was not the best way to begin*. Such critics point to the overly complex structure of the agreement, worry about the technical and organisational demands placed on the Protocol's administrative bodies, and are concerned about opportunities for parties to manipulate the system. The argument is that the arcane structure of the accord results from two early blunders. The first was to search for a solution within the UN framework. This implied vastly complex negotiations among more than a hundred countries with very different preoccupations. And it burdened the discussions with the legacy of past UN disputes and intrigues.¹⁴ The alternative would have been to explore a solution among a smaller group of like-minded industrialised countries, perhaps within the ambit of the OECD. Such a limited initial agreement could have been extended later to additional parties – an approach that has already proven its worth in other international environmental conventions.

The second mistake was to insist on binding targets, when so much uncertainty surrounds climate change. For as soon as caps were to be binding, national negotiators were under pressure to keep their own target low (to minimise the danger of overshoot). And the states most worried about the stringency of their targets had an incentive to broaden the agreement's coverage (more gasses, sinks as well as emissions) so as to widen their compliance options. It has been argued that a better approach would have involved a hybrid 'quantity-cap / price-cap' emissions trading system focused on carbon dioxide.¹⁵ National emissions targets, and a maximum price for emissions permits, would be agreed at the outset of the commitment period. Then, should some unexpected shock push the carbon price above the agreed ceiling, national governments would be empowered to issue additional permits at the capped price. Such a regime sacrifices environmental certainty (no more than X tons of carbon will be released) for economic certainty (the price of carbon cannot exceed Y). But since the reduction targets are in any case arbitrary (no time frame or concentration level for stabilisation has been agreed), a reduction in economic uncertainty is more valuable -- because it reassures actors they are not undertaking a commitment that could prove economically ruinous.¹⁶

Although there is truth to some of these arguments, in the immediate context their relevance is limited. The historical trajectory climate change negotiations have traced over the past 15 years cannot be ignored. The agreements result from complex interaction among many parties, and they are not those that would have been generated by an ideal process of design. As the architecture of an inclusive and comprehensive regime was built up over time, it became difficult to reverse direction without unravelling the whole enterprise. While a 'quantity-cap / price-cap' approach has advantages, it also has difficulties – particularly in setting the international price at which additional emission permits could be issued.¹⁷ In any case, such an approach – which allows states to agree to pursue more ambitious quantity-targets because they have the assurance of a maximum price -- could still be considered by the Parties to the Kyoto protocol for subsequent commitment periods. Moreover, it should be remembered that *it was not the detailed architecture of the current system that caused the US government to balk at ratifying the Kyoto Protocol*. Rather it was their current unwillingness to accept any system of mandatory controls of greenhouse gas emissions in developed countries.

A bifurcation of the international regime

Assuming that Russia makes good on its pledge to ratify, the Kyoto Protocol will probably enter into force in 2003. Today all states remain linked through the institutional structures of the Framework Convention on Climate Change. Yet with respect to mandatory emissions reductions the regime has bifurcated. On the one hand, the vast majority of countries will participate in the Kyoto system that imposes legally binding restrictions on developed country emissions, and ties developing countries to this effort through the CDM and various financial and technology transfer mechanisms. On the other hand, the United States – joined perhaps by Australia – will for the time being remain outside the system.

This situation has significant consequences for the functioning and anticipated impacts of the Kyoto regime. In the first place, *the absolute emission reductions secured under the Protocol during the first commitment period will be substantially less than originally anticipated*. Some developed states will not be bound by the targets. Moreover, the compromises on sinks made in the final round of negotiations mean that the *emission reductions* required of states inside the mandatory regime to meet their Kyoto targets will be lessened. This is because carbon-dioxide draw-down from a more extensive range of LULUCF activities can be counted against each party's Kyoto objective.

Second, there will be *less demand for credits secured through the three flexibility mechanisms, and the associated financial flows will be reduced*. The United States had been expected to rely heavily on these mechanisms to meet its commitments. Without US demand for emission entitlements, the price of purchasing emissions allowances from states with a surplus, or of gaining credits for carbon reduction under JI or the CDM, will fall dramatically.¹⁸ Indeed, recent studies suggest the price of carbon could approach zero unless Russia and other CIS states 'bank' (hold over until the next commitment period) a substantial proportion of their excess reserves.¹⁹ This is particularly true because the EU has pledged to meet most of its reductions internally. On one side, this implies lowered compliance costs for industrialised countries that have ratified Kyoto. On the other, it reduces financial benefits to Russia²⁰ and other transition states, and restricts the potential advantage to developing countries from participation in CDM projects.

The longer-term political consequences of the US defection are more difficult to assess. That the Kyoto system does not include the world's only super power, and the largest emitter of greenhouse gasses, significantly reduces the regime's overall effectiveness and legitimacy. It increases uncertainty in an already uncertain context. To the extent that the US is joined by other industrialised states, the legitimacy and effectiveness of the Kyoto regime would be further undermined.

Moreover, the US refusal to implement a significant programme of domestic greenhouse gas reductions acts as a drag on the resolve of other states to maintain and intensify their abatement efforts. In particular, it strengthens the worry that countries which take vigorous action will find themselves at a competitive disadvantage in relation to US industries which continue to rely on cheap supplies of carbon energy. Nor does this bode well for efforts to further engage developing countries in the control of greenhouse gas emissions. Without US participation it can be argued that the commitment of the developed states remains implausible. If the world's richest nation is unprepared to expend resources to address climate change, why should developing states make sacrifices to do so?

Still, there have been suggestions that a bifurcation of the control regime is not entirely negative. It opens the possibility of a multi-track approach to emissions abatement, where different groups of countries experiment with different ways of tackling the problem.²¹ Since even Kyoto enthusiasts admit the accords are far from perfect, perhaps it is wise to keep options open in case the Kyoto approach proves impractical in the future.

The problem is that any serious alternative system would depend first and foremost on the *willingness of the US to take domestic action* to control greenhouse gas emissions. The Climate Change Initiative launched by the Bush administration in February 2002 proposed to reduce the greenhouse gas intensity of the US economy by 18% between 2002 and 2012, largely through voluntary action in the corporate sector. Analysis of the plan suggests that this target barely differs from a 'business as usual' scenario, and would actually be compatible with a 30% increase in US emissions by 2012.²² The Initiative does have positive features, notably an explicit admission of the importance of climate change, increased research expenditure, and provision for establishing accurate inventories (which could enlarge the US corporate constituency favouring mandatory emission controls). In the US more generally, there have been a host of recent climate initiatives at the local and state level²³ (notably legislation in California concerning carbon dioxide emissions from cars), and some evidence that the legislative branch is beginning to take climate change more seriously.

Nevertheless, there is no indication that the current US administration has any appetite for mandatory controls. And until the US moves in this direction, any 'competition' from a rival regime would amount to little more than a drag on the efforts of states that are prepared to act within the Kyoto framework.

The challenge facing Europe

In light of the general evolution of the climate dossier, there are two broad issues that confront European decision-makers. The first relates to European emission abatement and the practical implementation of the agreements negotiated so far. The second relates to the international stage, and the future evolution of the climate change regime. The two issues are inter-twined, but are best approached in turn.

Implementation within the European Union

On the domestic front, European leaders must now ensure that they have in place policies and measures that can secure the reductions in greenhouse gas emissions to which they are committed. In the year 2000 EU carbon dioxide emissions were 0.5% down on 1990 levels. And total greenhouse gas emissions were 3.5% below those of 1990.²⁴ Thus the EU achieved its declared goal of stabilising carbon dioxide emissions at 1990 levels by 2000, and it has realised almost half the 8% cut required by the Kyoto accord. This is a significant achievement considering developments in other industrialised states (see Box D).

[Box D]

**Evolution of carbon dioxide emissions for selected
Annex 1 parties**

	Change 1990-2000
Australia	+ 25
Canada	+ 21
Japan	+ 11
Norway	+ 17
United States	+ 17
EU 15	- 0.5

Calculated from data in UNFCC online greenhouse gas inventory, November 2002.

Yet analysis of the character of the emission reductions and of current trends in member states reveals that the situation is more worrying.²⁵ The bulk of the reductions were secured in a handful of member states – especially Germany and the United Kingdom. According to the European Environment Agency about half of this was related to ‘one-off factors’, including German industrial restructuring (following unification) and the shift in UK electricity generation from coal to gas.²⁶ While declines in methane and nitrous oxide emissions have been substantial, carbon dioxide emissions have proven more resistant, and emissions of fluorinated gases are rising rapidly. In the transport sector carbon dioxide emissions are growing strongly (up 18% between 1990 and 1999), eroding reductions secured in the energy and industrial sectors.²⁷

Trends in EU energy use are not encouraging.²⁸ Energy consumption continues to rise especially in the transport and household sectors. Efficiency improvements remain modest, with the energy intensity of the economy falling by only 0.9% per year during the 1990s. And without the German contribution energy intensity would actually have risen.²⁹ By 2010 the switch from coal to gas will have been largely completed, and the retirement of existing nuclear facilities will put further pressure on carbon dioxide emissions. Renewable energy grew relatively slowly until the end of the 1990s, increasing its share of total energy consumption from 5.0% to 5.9%.³⁰ While the fastest rise was in wind and solar, these still only make up 0.12% of total energy consumption.

[Box E]

EU Burden sharing:

Member state targets and actual emissions change 1990-2000

Member state	Burden-sharing target 2008-2012	Change 1990-2000 as percentage of 1990 levels
Austria	- 13	+ 2.7
Belgium	- 7.5	+ 6.3
Denmark	- 21.0	- 1.7
Finland	0	- 4.1
France	0	- 1.7
Germany	- 21	- 19.1
Greece	+ 25	+ 21.2
Italy	- 6.5	+ 0.7
Ireland	+ 13	+ 24.0
Luxembourg	- 28	- 45.1
Netherlands	- 6	+ 2.6
Portugal	+ 27	+ 30.1
Spain	+ 15	+ 33.7
Sweden	+ 4	- 1.9
UK	- 12.5	- 12.6
EU 15	- 8	- 3.5

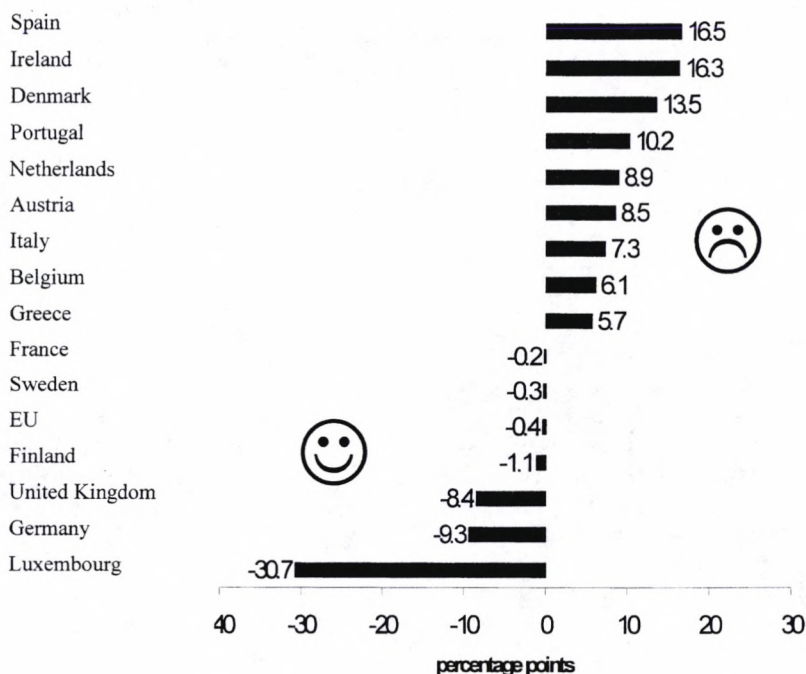
Targets expressed as percentage change on 1990 levels for Kyoto controlled greenhouse gasses excluding land use change and forestry.

Source EEA April 2002.

Of the member states allocated cuts under the EU burden sharing agreement, emissions in 2000 were up on 1990 levels in Austria (2.7%), Belgium (6.3%), Italy (3.9%), and the Netherlands (2.6%) (see Box E). Of member states allocated increases under the EU burden sharing agreement, emissions in 2000 had already surpassed the 2008-12 target level in Spain (33.7% increase, with an EU target of 15%), Ireland (24% increase, with an EU target of 13%) and Portugal (30.1% increase with an EU target of 27%).³¹ The relative position of member states in meeting their burden sharing targets is captured by the EEA's 'Distance to target indicator' (see Box F).

[Box F]

**Distance-to-target for EU Member States in 1999
(Kyoto Protocol and EU burden sharing targets)**



Source: European Environment Agency

Projections suggest that in 2010, in the absence of new initiatives, EU greenhouse gas emissions will be at 1990 levels – that is 8% above the Kyoto target. According to the EEA ‘large additional efforts’ will therefore be required from the EU and its member states if they are to collectively achieve their Kyoto target.³²

EU member states have put in place a variety of policies and measures to control greenhouse gas emissions, including climate taxes, regulatory standards, and voluntary agreements with industry. Policy frameworks are particularly developed in Germany, Sweden, Denmark, the Netherlands and the UK. At the European Union level recent initiatives include directives on landfill, the efficiency of electrical appliances, and renewable energy, and an agreement with

auto manufacturers to reduce carbon dioxide emissions from passenger cars. The European Climate Change Programme (ECCP), established in June 2000, sponsored a multi-stakeholder review of more than 40 additional policy options.³³ It identified measures that could in principle achieve reductions more than twice the size of the implementation gap identified by the EEA, at a cost of less than € 20 per carbon dioxide equivalent metric ton.³⁴ Proposals that are now working their way through EU decision procedures or are under active consideration include directives on emission trading, the energy performance of buildings, the regulatory and fiscal promotion of biofuels, combined heat and power production, transport infrastructure and user charges, energy efficient public procurement, and fluorinated gases.

Among measures under discussion, the EU emission-trading scheme is especially important.³⁵ The Commission proposal envisages a system covering carbon dioxide releases from 4000-5000 major industrial facilities whose emissions are expected to account for about 45% of the EU total in 2010.³⁶ After a pilot phase the scheme would become mandatory across the EU, with substantial penalties (€50-100 per metric ton and automatic offset) for non-compliant firms. Member states would be responsible for setting emissions caps and allocating permits, subject to Commission review. The possibility of mutual recognition with trading schemes operated by other parties bound by Kyoto targets (such as Japan) would allow a linkage into the Kyoto emissions trading regime. When issues of monitoring are resolved it should be possible to extend the system to cover other gases, and eventually also a broader range of emitters. Moreover, the Commission has indicated its inclination to establish a link with the project-based Kyoto mechanisms of Joint Implementation and the CDM.

The broad-based nature of the system implies a considerable potential to encourage cost-efficient abatement. Considering that 29 of the 39 parties in Annex B to the Kyoto Protocol could ultimately be involved in the scheme (the existing EU, plus three EEA countries, and ten Accession countries)³⁷, it could represent a significant leadership opportunity for the EU in pressing forward international greenhouse gas abatement efforts. But everything depends on the details of the scheme that is actually agreed through the complex co-decision procedures of the EU. To be economically efficient and environmentally effective, the system must be mandatory, with no opt-outs for member states, sectors or facilities, and control on the allowances issued by member states. In practice, restraining temporary opt-outs to the minimum is a more realistic expectation. But there are many other problematic details including how to achieve a link to the Kyoto flexibility mechanisms while maintaining the EU commitments to secure reductions domestically and to avoid meeting targets by expanded LULUCF activities.

Whatever the precise configuration of the emissions trading system, it is clear that continued reduction of greenhouse gas emissions through the first Kyoto commitment period and beyond requires a complex mix of policies across the EU – involving governmental initiatives at the local, national and EU levels, and action in all economic sectors. *The EU cannot rely on just a few states to provide reductions*. Nor can the burden simply be imposed on large emitters in the energy and industry sectors. Over time, control efforts from other sectors such as transport and agriculture, from medium and smaller sized industrial facilities, and from service and retail enterprises, will become more important.

Orienting further domestic initiatives

This suggests that with respect to the European abatement effort particular attention should be given to a number of elements:

- **Public education:** substantial resources should be committed to raising citizen awareness about climate change. Polling data reveals that general levels of understanding of this issue remain disturbingly low. An effective and stable policy response cannot be based on public indifference. Addressing climate change will require a sustained social effort over many decades and have implications for all sectors of society. Unless the policy consensus is underpinned by genuine understanding, the people of Europe will not go on accepting changes that appear costly and inconvenient. Educational initiatives should popularise scientific understanding of the climate system, the sources and the potential impacts of climate change, and alternative remedial strategies. They should deal honestly with uncertainties, risks and the limits to knowledge. Attention should be paid to natural science, social and economic concerns, and ethical issues relating to future generations, developing countries, and non-human nature. The focus should be not only on schools and higher educational establishments, but also on public and governmental bodies, workplaces and businesses, the media, and the cultural industries.
- **Transparency, accountability and participation:** these essential democratic values must be strengthened in making and implementing climate-related initiatives. Citizens will only accept the costs of an active climate policy if they are convinced that it is being developed in a fair and transparent manner. Moreover interactions with stakeholders are essential to identify practical and cost effective response strategies. Transparency and accountability are particularly important with respect to the central institutions of EU, for at present European political leaders are regarded with increasing scepticism by ordinary citizens. It is imperative that institutional reforms being undertaken in the context of enlargement make procedures

more straightforward and transparent, maintain the independence of the Commission, and prevent EU decision-making being dominated by closed-door deals among national governments. Otherwise EU structures will lack the legitimacy required to orient climate policy successfully.

- **Policy synergies:** it is important to fully exploit the potential synergies between climate change and other policy areas. This allows the attainment of multiple objectives, increases the 'benefit' side of the 'cost/benefit' equation, and helps consolidate political coalitions and public support for reform. For example, promoting a modal shift from road to rail for goods transport alleviates air pollution, noise and congestion – bringing immediate economic, health and amenity benefits – as well as reducing greenhouse gas emissions. Energy efficiency initiatives can provide important financial savings, and more vigorous action with respect to end-use energy efficiency would be of particular value to small and medium enterprises.³⁸ And the shift towards more sustainable agricultural practices (reducing livestock density and chemical applications and encouraging organic farming) can benefit human health, improve water and air quality, increase rural incomes, and promote nature conservation, as well as moderating greenhouse gas outputs.
- **Abolition of polluter subsidies:** subsidies and tax advantages are still being granted that encourage non climate-friendly economic behaviour. Their abolition is an example of the potential synergies referred to above – contributing both to climate change objectives and saving public money. Tax exemptions on fuel for agriculture, on energy for particular industrial producers, and support for carbon-rich fuels such as coal are cases in point. So too is the present structure of the Common Agricultural Policy with its emphasis on production subsidies. The absence of tax on aviation fuel, and VAT exemptions for airline tickets, have contributed to the explosive growth in this sector.³⁹ There are major political obstacles to movement on such issues. And there are risks that hardship will be imposed on those whose livelihoods are bound up with such subsidies and exemptions. But changes can be phased in over time, and include provision for transitional relief.
- **Sectoral integration:** the integration of climate change considerations into decision-making across all policy sectors is essential. Again, it is only in this way that policy synergies can be identified and that the burden of adjustment can be equitably distributed across society. In this respect transport remains perhaps the most challenging sector. Emissions from road and air travel continue to grow, and member-state and EU initiatives in this area remain weak. A push to encourage a shift towards rail for the goods sector, to improve long distance passenger rail travel, and strengthen support for urban public transport are important. Measures to reduce car and truck emissions

should be another priority. It is unclear that biofuels actually have the potential in the transport sector that current EU policy suggests⁴⁰, and emphasis might be better placed on hybrid and fuel cell vehicles.

- **Green technologies:** governments should aggressively promote the development and practical deployment of green technologies that can help reduce greenhouse gas emissions. Support should go to technologies, products and processes that can have some impact on emissions by the end of the first Kyoto commitment period (2012). But substantial resources should also be devoted to innovations that hold promise for the medium and longer term. Technology-forcing regulations, subsidies and tax deductions, public/private R & D consortia, and market-building initiatives should all be employed to accelerate technological development and commercial implementation. *The objective should be to place EU enterprises at the forefront of global carbon-reducing, carbon-neutral and carbon-free energy technologies.* Areas that require support include: energy efficiency in industrial, commercial and domestic contexts, co-generation, the accelerated introduction of new renewables (such as wind and solar), the integration of renewable and conventional supplies, the storage of renewable energy, and transport related initiatives (hybrid vehicles, alternative fuels).⁴¹ Particular emphasis should be placed on the hydrogen energy economy – including technologies for fuel cells and hydrogen distribution and storage – as there is tremendous medium-term potential to green the automotive sector and to integrate new renewables into the energy system. Again there are synergies with other areas, including job creation. For example, more than 16,000 jobs in Denmark in 2000 were related to the wind energy sector.⁴²
- **Research:** increased resources should be devoted to investigating the climate change problematic. Greater knowledge is essential if policy makers and citizens are to make environmentally prudent and economically sound decisions about appropriate response strategies. Important issues include the overall understanding of the climate system, the links between climate and ecological and human systems, social vulnerabilities and social adjustment, and abatement and mitigation options. Emergent technologies are crucial, but broader social, cultural, and ethical dimensions should not be neglected. And, while there are pressures to concentrate funding on a smaller number of large scale projects and consortia, a more pluralistic and decentred approach to research is appropriate, as it remains far from clear which avenues of investigation hold out the most promise.

- **Adaptation:** programmes at member state and EU levels that can begin to adjust social practices to the changing climate are also important. Issues to be addressed here include water management; the evolution of agricultural systems; settlement patterns; the conservation of biodiversity; and disaster preparedness and relief. Business and other stakeholders should be actively involved in the development of such measures that have significant financial implications – for example in the insurance sector.

Action on the international stage

Assuming that the Kyoto Protocol enters into force, international attention over the coming year will be focused on getting its structures up and running. But thoughts are already beginning to turn to the broader future of the climate regime, with negotiations on the second Kyoto commitment period (2013-2017) scheduled to begin in 2005 and conclude before 2008.

Future negotiations will be shaped by many factors including:

- major developments in climate-related events and science;
- whether the US (and any other hold-out states) initiate credible domestic and/or cross national abatement programmes;
- the structure of the existing regime, and the fact that new targets are to be agreed before experience has accumulated with the practical operation of the Kyoto mechanisms; and,
- prevailing economic conditions and the broader international context.

Issues that will attract attention in future negotiations include continued emissions control in developed states, squeezing 'hot air' from the Kyoto envelope, and deepening the involvement of developing countries.

With respect to *emissions control in developed states* a basic problem confronting negotiators is whether to try to agree longer-term targets and principles to guide the development of the abatement regime or to continue with the existing ad hoc and incremental practice. Possibilities for a more foundational approach include agreeing a) a maximum temperature rise *target* or an ultimate stabilisation target for greenhouse gas concentrations and/or b) *principles* to distribute future abatement burdens or emission entitlements.

A long term *target* would operationalise the Convention objective of avoiding dangerous disruption to the climate system by fixing a maximum level of future warming (say 3°C) or a stabilisation level for the atmospheric concentrations of greenhouse gasses (say 550ppm for carbon dioxide). Such targets are inter-related, but formulating a temperature-target emphasises the

link to social and ecological impacts, while a concentration-target points to the emissions driving the process. Since the Convention is about preventing damage it would be logical to start with a temperature-target (fixed by assessing anticipated impacts and risks), to work back to determine the required stabilisation level (and concentration trajectory)⁴³, and then to fix the necessary emissions abatement pathway. But at each step in the causal chain (that leads from emissions to concentrations, to global temperature, to climate patterns, to human and ecological impacts) there are vast uncertainties. Establishing such long-term targets involves moral and political decisions about the size and distribution of acceptable damage and risks. Moreover, it has dramatic implications for the future emission trajectories and abatement costs for all states, including developing countries. In 1996 the EU Council of Ministers proposed that the global temperature rise should be limited to 2°C.⁴⁴ But it is difficult to see how broad international agreement around such a figure could be secured in the next few years.

A set of detailed *principles* for *distributing* future abatement targets among developed countries would provide greater certainty to all actors. But such a formula would have to be agreed by negotiators worried about national particularities, and would remove some flexibility from the regime. It seems unlikely that such principles will be agreed except in very general terms. Thus the more or less ad hoc approach to negotiating commitments seems likely to continue.

There is also a possibility of altering the approach to emissions control. For the first commitment period developed states accepted absolute caps on their greenhouse gas output. But an alternative approach could be adopted for the next commitment period. Options include the 'quantity-cap / price-cap' mechanism discussed earlier, and other systems involving dynamic targets and/or dual targets.⁴⁵ Such approaches might enhance the overall effectiveness of the collective emission reduction effort by reducing the pressure on parties to negotiate weak targets. But they would leave open the absolute emissions reductions that would be secured, add complexity, and require substantial adjustment to the Kyoto framework. It is not clear that much would be gained by opening up this issue before the beginning of the first commitment period, unless of course there was a serious possibility of drawing the US back to the negotiating table.

Assuming negotiations for the second commitment period remain focused on a mandatory cap, the issue becomes one of fixing a new set of emissions reduction targets. No doubt environmental groups will press for ambitious objectives, particularly in light of the de-facto loosening of the Kyoto goals with the last minute inclusion of expanded sinks.⁴⁶ Yet the lack of experience of

operating within the Kyoto framework, and anxiety about the costs of meeting such a target – particularly without a similar effort by the United States – will weigh heavily on the negotiations. *Even holding emissions to Kyoto levels for another five years would require effort, because continuing growth pushes emissions upwards.* No doubt some will suggest that a further round of reductions should be conditional on US willingness to make ‘a meaningful contribution’ to the abatement enterprise.

The EU has already set an internal target of reducing greenhouse gas emissions by 1% a year for the period extending from the end of the first commitment period until 2020.⁴⁷ Added to the 8% reduction from the first commitment period, this would leave EU emissions 16% below 1990 levels by 2020. Yet elsewhere official documents suggest that it is necessary to seek an international agreement to secure a 20% to 40% drop in *global* emissions by 2020, and 70% reductions ‘in the long term’.⁴⁸ But since emissions from developing countries have been rising steadily, an agreement to achieve global cuts on this scale by 2020 would require *a much more concerted effort* from *developed states* than the EU’s 1% per annum target indicates.

With respect to ‘hot air’, the excess emissions allowances enjoyed by Russia and other former communist states represent an historic anomaly. These states would like to preserve their quotas into subsequent commitment periods, as they provide a potential source of revenue and headroom for future economic expansion. But other parties will insist that equity requires that permitted-emissions bear a realistic relation to actual emissions. All the more so, since these countries will be able to carry forward substantial (banked) allowances from the first commitment period.

Eventually *developing countries* must be brought into the mandatory control regime. The key is differentiating among non-Annex 1 countries, and opening the way to their varied participation over time. Elegant proposals have been suggested for a formula that would determine when developing countries would pass into a control regime.⁴⁹ But the history of climate change negotiations suggests obtaining general agreement on any specific formula will be difficult. Broad principles relating abatement to higher per capita GNP and per capita emissions could be agreed; but specific thresholds would be problematic. And the pragmatic consideration of the willingness of a country or group of countries to assume a commitment will be central. While most developing nations will remain outside a mandatory regime, advanced developing countries such as South Korea would be candidates for early inclusion.

A number of approaches remain possible for how to actualise such commitments. States could accede to Annex 1 of the Climate Change Convention, but initially be granted generous growth allowances. Alternatively, a new legal framework could be established under the Convention. Emissions targets for developing countries would not have to follow the pattern of binding caps accepted by Annex 1 parties. It has been suggested that dual intensity targets might be suited to the more uncertain economic conditions found in developing countries, although some analysts remain sceptical.⁵⁰

The fact that most developing countries remain outside a mandatory control regime does not mean that they cannot make an important contribution to mitigation efforts. Indeed, policies implemented in developing countries are already moderating emissions growth, generally as a by-product of efforts to secure 'development and poverty alleviation, local environmental protection and energy security'.⁵¹ There are many ways such activities might be taken forward including systematic linkages to sustainable development activities⁵², further extension of the CDM,⁵³ and additional programmes for technology transfer.

Orienting further international initiatives

On the international front attention should be paid to the following elements:

- **Pushing forward the climate change agenda:** the EU and its member states should continue to press for increased international engagement with climate change issues. One can without exaggeration speak of European leadership in this area over the past decade. To continue this distinctive contribution involves a variety of challenges discussed below, but *it must be underpinned by the domestic measures* considered above. For only if the EU is demonstrably on track to secure its Kyoto targets, and to drive emissions still lower in subsequent years, can it speak with authority on this issue on the international stage.⁵⁴ Indeed, because the EU has played such an active role in relation to climate change, any failure to match deeds to words could seriously undermine its more general credibility as an international actor.
- **Sustainable development:** Europe must step up its assistance and productive interaction with developing countries. Links between the EU and G77 + China were instrumental in negotiations about the coming into force of the Kyoto accords. Climate change cannot be approached in isolation, but must be set in the context of the urgent needs of the poor and the aspirations of developing states.⁵⁵ By accelerating sustainable development these needs can be met while ensuring a more environmentally benign development trajectory.⁵⁶ This creates political and economic conditions favourable to more intensive engagement with climate change as such. Key requirements

here are well known, and include the opening of closed EU markets (especially in the agricultural sector) to developing countries, debt relief, enhanced investment flows and technology transfer.

- **Constructive engagement with the United States:** it is important to engage with the US and other developed states that fail to ratify Kyoto. *Without active US participation a successful long-term emissions control regime is impossible.* The EU should continue high level dialogue with the US, and develop co-operation where possible – for example, on basic research and technology development. Care should be taken in any future elaboration of the Kyoto system not to establish additional obstacles to the emergence of collaborative abatement approaches (between Kyoto and non-Kyoto actors) or to the eventual re-integration of the US to the Kyoto regime. The evolution of the public debate within the US suggests that significant American engagement is unlikely to be delayed for more than a decade. And it should not be forgotten that when the US does decide to act it could do so with great effectiveness.
- **Operation of the Kyoto system:** it is important to ensure that the institutions of the Protocol operate smoothly and that they are adequately resourced. In the run-up to the first commitment period close watch should be kept on emissions trajectories, scientific developments, and experience with the early operation of the flexibility mechanisms. This will allow timely adjustment, should problems emerge, and help identify future priorities. Attention should also be given to other areas under the Convention including its operating procedures.⁵⁷
- **Negotiations for the next commitment period:** Europe should adopt a positive and co-operative attitude toward negotiations for the second commitment period.

With respect to *emissions objectives for developed states*: the clearest thing that can be said at this point is that the EU should press for greenhouse gas abatement targets that will signal the intention of Annex 1 Parties to continue the downward trajectory of their emissions. Other things being equal, agreement around deeper cuts for the second commitment period helps to reduce the environmental risk. More importantly, it signals to domestic actors and to other countries (developing states, and developed countries that did not join the Kyoto system) a greater resolve to deal with the climate change issue. A further reduction in collective emissions of at least 5% would appear necessary if the regime is not to be regarded with derision. But a more ambitious target could be justified on environmental grounds, and a much

more ambitious target might be acceptable if integrated into a quantity-cap / price-cap system.

With respect to *squeezing out hot air*: the equity and environmental integrity of the regime requires a reduction of these surplus emissions entitlements. The most straightforward solution would be to set more ambitious abatement targets for states with exaggerated 'head room', so eroding the excess permitted emissions. This could raise compliance costs for parties seeking to buy Russian allowances. But since the sellers would gain from a higher price, a deal could be forthcoming to draw down hot air over future commitment periods.

With respect to *drawing advanced developing countries into the abatement regime*: it is important to adopt a flexible and differentiated approach. The least developed states, and large developing nations with emissions well-below world averages, cannot be expected to enter an abatement regime similar to that which has been established for developed Parties in the next few decades. But advanced developing states should be encouraged to accept some form of target for emissions control. Acceptance of such commitments by a few key developing countries would create a valuable precedent, and strengthen confidence in the potential of the regime to evolve further.

- **Adaptation:** in the international context this is of particular importance because many of the poorest countries are expected to bear the initial brunt of the negative impacts of the changing climate. The EU should generously support the adaptation fund established under the Kyoto protocol, work to establish an international framework for financing adaptation projects, and collaborate with developing countries to assist in the planning and implementation of adaptation initiatives in the more vulnerable regions.⁵⁸ The idea of negotiating an 'adaptation/impacts' protocol under the FCCC also deserves serious consideration.⁵⁹

Conclusion

Climate change poses a major challenge for contemporary decision-makers. It involves the design and implementation of policy – with implications across society, requiring international co-ordination, and involving substantial costs – in a context of radical uncertainty. It is the most complex environmental issue human kind has had to address. And its resolution is inevitably bound up with issues of distributive justice and the legitimate aspirations of the developing countries.

The problem is long term, with roots extending back to the dawn of the industrial era, and a future that heralds several centuries of changing climate. *Nevertheless political and economic decisions made in the next two or three decades could have a dramatic impact on rates and levels of warming experienced during the remainder of the twenty-first century and beyond.* Technologies that would allow a major reduction in greenhouse gas emissions already exist or are within reach. But their adoption requires substantial economic and social change.

The negotiation of the Kyoto agreements was a significant achievement. It represents a first attempt to establish a binding international process of greenhouse gas abatement. It has led to the establishment of more accurate national emissions inventories, and innovative mechanisms to link the efforts of developed and developing countries in addressing climate change. Yet it is not clear that it has resulted in an effective approach that will prove stable over the long term. Without participation of the world's most powerful state the regime remains fragile. Uncertainty persists over how the Kyoto mechanisms will actually operate, the level of abatement they will secure, and the costs they will involve. The political determination of developed countries to agree further substantive reductions in the second commitment period remains in doubt. And the problem of gradually incorporating developing countries in the emissions control effort remains to be addressed.

At present powerful economic interests believe their ascendancy is threatened by a more vigorous climate change policy. Or at least they believe such a policy stance would cause them substantial inconvenience. Thus continued resistance to the development of greenhouse gas abatement measures is to be expected – whether this takes the form of open defiance (as from much of the business community in the US, Canada and Australia), or of continuing ‘guerrilla warfare’ (as from firms and sectors currently seeking exemption from European emissions trading). On the other hand, some businesses including those in the petroleum sector and perhaps now in the automotive industry are beginning to see possible advantages of a shift away from fossil fuels. This potentially provides additional advocates of a more vigorous climate policy.

So far the European Union has been able to rely on large cuts in a few member states to make progress towards meeting its international commitments. But even with a burden sharing agreement that recognises national particularities, about half the member states are deviating from a track that would meet their commitment in 2008-2012. Countries like Spain, Portugal and Ireland have more or less assumed that carbon control is to be left to others. And even the Netherlands, with a good environmental record and an elaborate policy response, is experiencing difficulty controlling carbon dioxide emissions. The

relative laxity of the Kyoto envelope means that formal EU targets could always be met by buying emissions entitlements or relying on LULUCF activities. The EU has pledged to resist this option. But in light of the ease with which some member-states have shrugged off other commitments (for example, government deficit levels specified by the monetary stability pact), one is led to wonder whether the political resolve will hold.

As we have seen, the Sixth Environmental Action Programme refers to the EU pursuing a global greenhouse gas reduction goal of 20% to 40% on 1990 levels by 2020, and 70% over the longer term.⁶⁰ As applied to developed country emissions this would require declines of 2% or more per year over coming decades. Whether the political will to achieve such objectives survives in a turbulent political and economic context remains to be seen.

Experience with other environmental issues suggest that typically it is only when the scale of a problem becomes evident, and the costs of delaying remedial action appear grave, that political leaders resolve to take decisive action. Thus we should not expect more than modest additional steps towards carbon abatement – accompanied by much finger pointing and arm waving – until there is a clearer acceptance of the risks of inaction. But such modest efforts are not to be depreciated. They can slow the growth of global emissions – holding out the hope of lowered rates and levels of warming in the coming century. And they also provide experience in transforming social practices, developing technologies, and building institutions needed to make a more determined assault on the problem.

Viewed in historical terms, the international response to climate change should be understood as an evolving regime rather than a settled architecture. Its development involves learning about the linkages between the climate system and human social organisation, and complex struggles to redistribute the costs of adjustment. An analogy with the development of structures to manage global financial interactions or the world trade system suggest a complex process whose first steps will stretch over decades, and that subsequently will be subject to continuing reform.

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GLOSSARY

AOSIS: The Alliance Of Small Island States.

Annex 1 countries: the industrialised countries included in Annex 1 of the FCCC.

banking: holding over abatement credits for use in a subsequent commitment period.

CDM: Clean Development Mechanism, one of the three flexibility mechanisms included in the Kyoto Protocol (see Box C).

carbon sequestration: long term storage of carbon dioxide in natural formations.

commitment period: a period of binding emissions targets under the Kyoto Protocol. The first commitment period extends for five years from 2008 to 2012.

compliance regime: mechanisms to ensure states comply with their commitments.

COP: The Conference of the Parties to the FCCC. The highest decision making body of the Convention, it meets annually.

EEA: European Environment Agency.

EU: European Union.

ET: Emissions Trading, one of the three flexibility mechanisms of the Kyoto Protocol (see Box C).

equilibrium temperature: the temperature that would ultimately result from a given atmospheric concentration of greenhouse gases.

flexibility mechanisms: mechanisms to allow parties to the Kyoto Protocol to collaborate to achieve cost effective emissions abatement (see Box C).

FCCC: United Nations Framework Convention on Climate Change (see Box A).

G77+China: a UN negotiating block composed of developing countries.

greenhouse gas: a gas that contributes to global warming. Six gases (or groups of gases) are controlled by the FCCC: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆).

hot air: excess emissions allowances, above and beyond those actually required by 'business as usual' economic activity.

IPCC: Intergovernmental Panel on Climate Change, established in 1988 to provide specialist advice on climate change.

Joint Implementation (JI): one of the three flexibility mechanisms of the Kyoto Protocol (see Box C).

Kyoto Protocol: Protocol to the FCCC adopted in 1997, that has yet to enter into force (see Box A).

LULUCF: Land use, land use change and forestry, activities that can contribute to the uptake or release of greenhouse gasses (see Box C).

Marrakech Accords: an agreement made in 2001 that finalised the details needed for the entry into force of the Kyoto Protocol (see Box A).

non-Annex 1 countries: signatories of the FCCC not included in Annex 1.

OECD: Organisation for Economic Co-operation and Development.

OPEC: Organisation of Petroleum Exporting Countries.

ppm: parts per million.

pre-industrial levels of greenhouse gases: levels prior to 1750.

sinks: natural systems that draw down carbon dioxide.

stabilisation: the ultimate stabilisation of anthropogenic greenhouse gas concentrations in the atmosphere.

NOTES

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APPENDIX: PARTICIPANTS AND THEIR PRESENTATIONS

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Jean Monnet Fellow, RSCAS and University of Wales at Cardiff.
'The Kyoto Protocol Without America: Finding a Way Forward after Marrakech'.

Professor Daniel Bodansky,

University of Washington Law School, Seattle
'The Position of the USA on Kyoto and on Climate Change Management'.

Dr. Charlotte Bretherton,

Liverpool John Moores University, Liverpool
'International Climate Change Management: the Future Role of the EU as Global Actor'.

Dr. Ute Collier,

Head of Climate Change Programme, WWF UK
'Critique from Bellow: the View from an Environmental NGO'.

Dr. James Meadowcroft,

University of Sheffield,
'Preliminary Statement from the Rapporteur'.

Professor Herman Ott,

Director of Climate Policy Division, Wuppertal Institute,
'An Historical and Analytical Overview of International Climate Change Management from UNFCCC to Marrakech'.

Professor Mark Pollack,

BP Transatlantic Chair, RSCAS and University of Wisconsin
'The Kyoto protocol without America: Finding a Way Forward after Marrakech'.

Dr. Lasse Ringus,

UNEP Collaborating Centre on Energy and Environment, RISØ
National Laboratory, Roskilde, Denmark,
'The EU and Developing Countries: Common but Differentiated Responsibilities'.

Dr. Jens Steffek,

European University Institute, Florence

*'Commentary and Presentation on 'The EU and Developing Countries:
Common but Differentiated Responsibilities'.*

Professor Richard Toll,

Michael Otto Professor of Sustainability and Global Change, Hamburg, Vrije
and Carnegie Mellon Universities

'The Clear Skies of Kyoto'.

Dr. Christian Vrolijk,

Natsource-Tullet (Europe), London

*'International Climate Change Management: The EU and Other Industrialised
Countries'.*

Mr. Peter Zapfel,

Environment DG, Climate Change Unit, Brussels

'Putting Kyoto into Practice'



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