

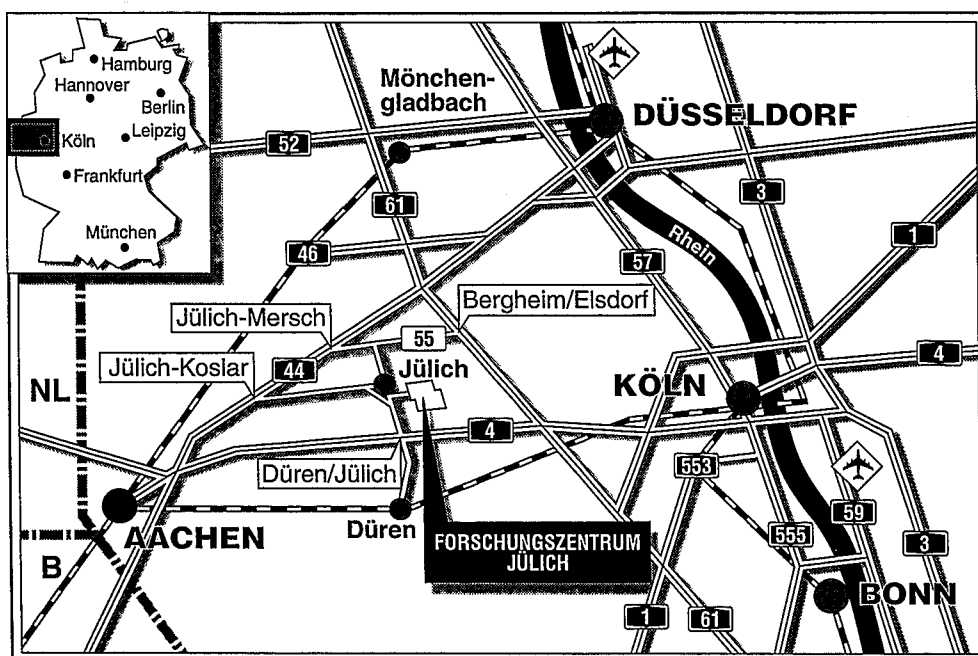
Programmgruppe Technologiefolgenforschung

**Internationale
Treibhausgasverifikation Nr. 4**

Climate protection and international policy

The Rio-conference between global responsibility
and national interests

Wolfgang Fischer



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VORWORT

Eine Reihe von Staaten, darunter auch die Bundesrepublik, streben bereits für die internationale Konferenz über Umwelt und Entwicklung in Brasilien im Jahre 1992 eine unterschriftsreife internationale Rahmenkonvention sowie - auf ihrer Grundlage - Protokolle über das wichtigste anthropogene Treibhausgas, das Kohlendioxid (CO_2) und den Schutz der Regenwälder an. Möglichst viele Staaten sollen diese Abkommen unterzeichnen und in Kraft setzen. Sie werden sich damit verpflichten, ihre Emissionen von CO_2 einzufrieren oder sogar um eine bestimmte Menge zu reduzieren bzw. die Zerstörung von Regenwäldern schrittweise zu beenden.

Später können andere Treibhausgase, etwa Methan (CH_4) und Distickstoffoxid (N_2O), in weiteren Protokollen eingeschlossen werden. Ein Vorbild für solche internationalen Maßnahmen stellt die "Wiener Konvention zum Schutz der Ozonschicht" und ihr "Montrealer Protokoll" dar.

Bei Verhandlungen über diese Verträge werden die Staaten klären müssen, ob sie die rechtlichen, institutionellen und instrumentellen Vorkehrungen treffen wollen, durch die überprüft werden kann, ob alle Vertragsstaaten auch wirklich ihren Pflichten zur Reduktion der Emissionen und dem Schutz der Wälder nachgekommen sind (Verifikation der Vertragstreue).

Auf deutscher Seite werden diese Arbeiten im Rahmen des BMFT/IKARUS-Projekts durchgeführt, das im Oktober 1990 mit einer 3-jährigen Laufzeit eingerichtet wurde. Ziel des Projekts ist es, Instrumente für nationale Klimagasreduktionsstrategien zu entwickeln. Dabei besteht das Instrumentarium aus einer Datenbank mit technischen, ökologischen und wirtschaftlichen Daten heutiger und zukünftiger Komponenten des deutschen Energiesystems sowie aus einem Simulations- und Optimierungsmodell, das auf diese Datenbank zurückgreift.

KFA-TFF ist für das Gesamtprojekt-Management sowie für das Teilprojekt 9 'Internationale Treibhausgasverifikation' zuständig. Teilprojekt 9 stellt somit eine Verbindung zu den internationalen Anstrengungen zur Emissionsbeschränkung dar.

Bei der Suche nach Vorbildern internationaler Verifikationssysteme in anderen Politikfeldern stößt man zwangsläufig auf die Rüstungskontrolle, insbesondere auf die Überwachungsmaßnahmen ("Safeguards") der Internationalen Atomenergieagentur (IAEO) im Rahmen des atomaren Nichtverbreitungsvertrages (NPT). Analysiert man diese Verifika-

tionsbereiche, so scheinen drei Einflußfaktoren von besonderer Bedeutung zu sein, nämlich Verifikationseignung, -fähigkeit und -dichte.

- Systematischen Charakter trägt die Verifikationseignung eines Objektes, eines Sektors etc., der einer Überwachung unterliegt. Diese Verifikationseignung ergibt sich aus den Strukturen, Charakteristika und der Konfiguration des zu überwachenden Objektes.
- Schließlich hängt die praktische Implementation eines Verifikationssystems von der Verfügbarkeit über qualifizierte personelle Ressourcen und angemessene Methoden, Ausrüstungen und Instrumente ab, um die Verifikationsmaßnahmen mit der erforderlichen Sensitivität und Genauigkeit vorzunehmen. Diese Voraussetzungen bezeichnen wir als Verifikationsfähigkeit.
- Die Verifikationsdichte wird von politischen Triebkräften bestimmt. Je größer die Gewißheit sein soll, daß andere Länder den Vertragsbestimmungen gefolgt sind, desto genauer muß man überprüfen, was sie tun. Die Verifikationsdichte muß erhöht werden.

Zur Festlegung eines praktikablen Verifikationssystems müssen diese wesentliche Faktoren und Spezifika jeweils für das einzelne Treibhausgas analysiert und festgelegt werden. Im einzelnen ergeben sich daraus die folgenden Aufgabenstellungen:

- den politischen Verifikationsbedarf festzulegen
- die Charakteristika von Emissionsquellen zu analysieren
- die quantitative Erfassung von Treibhausgasen zu untersuchen
- institutionelle Aspekte der Verifikation zu überprüfen
- eine Identifikation und Bewertung der Verifikationsinstrumente vorzunehmen
- eine Synthese dieser Arbeiten vorzunehmen und Verifikationskonzeptionen zu entwickeln.

In allen diesen Bereichen werden im Rahmen des IKARUS-Projekts Studien auch in Zusammenarbeit mit auswärtigen Institutionen durchgeführt, die in der Reihe "Internationale Treibhausgasverifikation" veröffentlicht werden.

Abstract

The Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) took up work in February 1991 on the basis of a resolution by the General Assembly of the United Nations in the year 1989. The results of the negotiation process were approved at the United Nations Conference on Environment and Development (UNCED), held in June 1992 in Rio de Janeiro (Brazil), in the form of a United Nations Framework Convention on Climate Change (FCCC).

This paper analyzes the climate policy of 24 states or groups of states. In order to structure the interests in the climate issue area, the theorem of the 'environmental policy interest triangle' is here referred to: environmental policy agents are described in relation to the environmental pollution process and an interest distribution pattern is thus obtained. This relation of interests between agents comprises the conflictive *originator or polluter* and *affected interests* as well as the intervening *helper interests*.

In a theoretical discussion, typical contents will first be allocated to all three interests in order to determine the presence and influence of these interests and of other factors on the climate policy of the states under investigation as revealed by the INC discussions. The other variables influencing climate policy, i.e. *structural* (capability of action) and *specific* (political, economic, constitutional etc.) variables, are also included in the analysis. Based on such a structuring of interests within and above all between the states, proposals will be made to build up an effective and dynamic climate regime, capable of consensus, and the foreseeable limits of climate protection policy will be defined against the background of results from other negotiation processes and environmental protection agreements.

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Introduction

It is acknowledged that unique international cooperation would be required within the global community of nations to cope with the threat of anthropogenic induced climate change.¹ The problem can be adequately described by the key words: protection of a collective asset and the free rider phenomenon. It has already been analyzed on many occasions how difficult it is in international politics to coordinate the behavior of states under such conditions. Nevertheless, a first step towards cooperation seems to have been made by the United Nations Conference on Environment and Development (UNCED) held in June 1992 in Rio de Janeiro (Brazil). There is even the optimistic expectation that (after Rio) the international community is entering an "era of sustainable negotiations" (Bertram I. Spector), a process of international regime building by which sustainable development issues will be resolved.

The UNCED was the provisional climax in a series of conferences and activities on climate policy conducted to an increasing extent since the beginning of the eighties. The climate problem was placed on the international agenda first by scientific and sometimes later by societal groups. It was then recognized as a political issue in the mid-eighties, but it soon became apparent that many governments were rather concerned about an extensive propagation of the claim, raised primarily by scientists, for a radical change especially in energy policy. Consequently, the Intergovernmental Panel on Climate Change (IPCC) was a mixture of scientific activity and efforts at reaching international political consensus. It would be interesting to determine the mixing ratio by means of sociological research and gain insights into the process of making the climate problem an international topic in terms of an interaction process between science and politics.² Against the background of an increasingly vehement discussion of the climate problem in certain countries, especially in Germany and the Netherlands, but also in the USA during and after the 1988 draught, the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) took up work in February 1991 on the basis of a resolution by the General Assembly of the United Nations in the year 1989. The results of the negotiation process were approved at the Rio Conference in the form of a United Nations Framework Convention on Climate Change

¹ The greenhouse theory as such is uncontested. But beyond a certain point of agreement there is considerable controversy over the consequences of the greenhouse effect and whether nations should respond resp. how the response should look like (cf. Stone 1992).

² A first attempt is being made with the hypothesis of epistemic communities and social learning.

(FCCC), a treaty under international law, by which all contracting states recognize the general need for protection of the atmosphere and in which the industrialized nations listed in an Annex additionally recognize the aim of reducing greenhouse gas emissions to the 1990 level, however, without fixing a date.

The agenda of the UNCED, in which 178 states and approx. 120 heads of governments and presidents took part, comprised many other environmental and development policy issues in addition to the climate problem, which had been dealt with by a Preparatory Committee (PrepCom) for more than a year.³ The outstanding document resulting from this work was Agenda 21, a comprehensive agenda for the 21st century containing numerous environmental and development policy topics. It may be compared to an extensive menu which must satisfy greatly different tastes and from which the states are now required to select a series of dishes in order to initiate the discussion between North and South on sustainable development. For this purpose, the Sustainable Development Commission was set up at the UNCED as a new institution subordinate to the UN Economic and Social Council (ECOSOC). In contrast to the FCCC, however, Agenda 21 is not a treaty under international law, but both a guideline and compilation of rules designed for policy orientation.⁴ However, the FCCC also created the basis for an institutional infrastructure⁵ and for a political negotiation process aimed at more substantial and obligatory climate protection through international protocols within the next few years.

This paper, which is based on a study,⁶ only considers one segment of the global climate problem, i.e. greenhouse gas emissions (GHG) and, in particular, carbon dioxide (CO₂) from the countries' (commercial) energy sectors⁷ and the attempt to contain these emissions by an international climate protection policy. This restriction is not only required for reasons of economy of effort and methodology, but can also be justified by the prominent role currently played by the energy sector with a contribution of well over 50 % to the anthropogenic greenhouse effect.

³ Cf. Strong 1992; Casey-Lefkowitz 1991 and the regular reports in the periodical *Environmental Policy and Law*.

⁴ Reference is made here to the Rio Declaration on Environment and Development whose 23 principles define fundamental, but at the same time not internationally binding, rules for the conduct of states in the issue area between environment and development.

⁵ A secretariat to make - among others - arrangements for the sessions of the Conference of the Parties (the supreme body of the convention); Subsidiary bodies for scientific and technological advice and for Implementation.

⁶ Cf. Fischer 1992, also containing those references which are largely omitted here.

⁷ Not included are non-commercial, i.e. unmarketed energy resources, such as firewood, dung, etc. collected by the consumers themselves.

1. The Interests of States in the Climate Issue Area

The climate policy of states is determined by various interests and interest constellations, and also by the structural features of political, economic etc. systems and factors of influence from the international system (conduct of other states, transnational societal agents). On the other hand, the contents and processes of a country's climate policy are still governed by ("national") interests, and their identification plays a significant role in answering the question as to whether and how these interests can be modified to make climate protection more effective and where the limits of climate protection policy are in an international system in which nations still set the tone (theory of neorealism).

In order to structure the interests in the climate issue area, the theorem of the environmental policy interest triangle is here referred to: environmental policy agents⁸ are described in relation to the environmental pollution process and an interest distribution pattern is thus obtained. This relation of interests between agents can be described by an interest triangle in environmental policy comprising the conflictive *originator or polluter* and *affected interests* as well as the intervening *helper interests* (cf. Prittwitz 1990). This triangle will be the basis for analyzing the climate problem as a subject of international policy. In a theoretical discussion, typical contents will first be allocated to all three interests in order to determine the presence and influence of these interests and of other factors on the climate policy of 24 states and groups of states as revealed by the INC discussions. The other variables influencing climate policy, i.e. *structural* (capability of action)⁹ and *specific* (political, economic, constitutional etc.) variables, are also included in the analysis. Based on such a structuring of interests within and above all between the states, proposals will be made to build up an effective and dynamic climate regime, capable of consensus, and the foreseeable limits of climate protection policy will be defined against the background of results from other negotiation processes and environmental protection agreements.

⁸ In this study agent does not denote individuals, but micro- and macrosocial entities, including states.

⁹ Capability of action denotes a country's economic, technological and political-institutional equipment and flexibility which can be used for the solution of problems. There is an international hierarchy of action capabilities ranging from the western industrialized nations through the former planned economies to the developing countries. The capabilities are naturally also different within these groups so as to present a multifaceted global picture.

1.1 Originator Interests

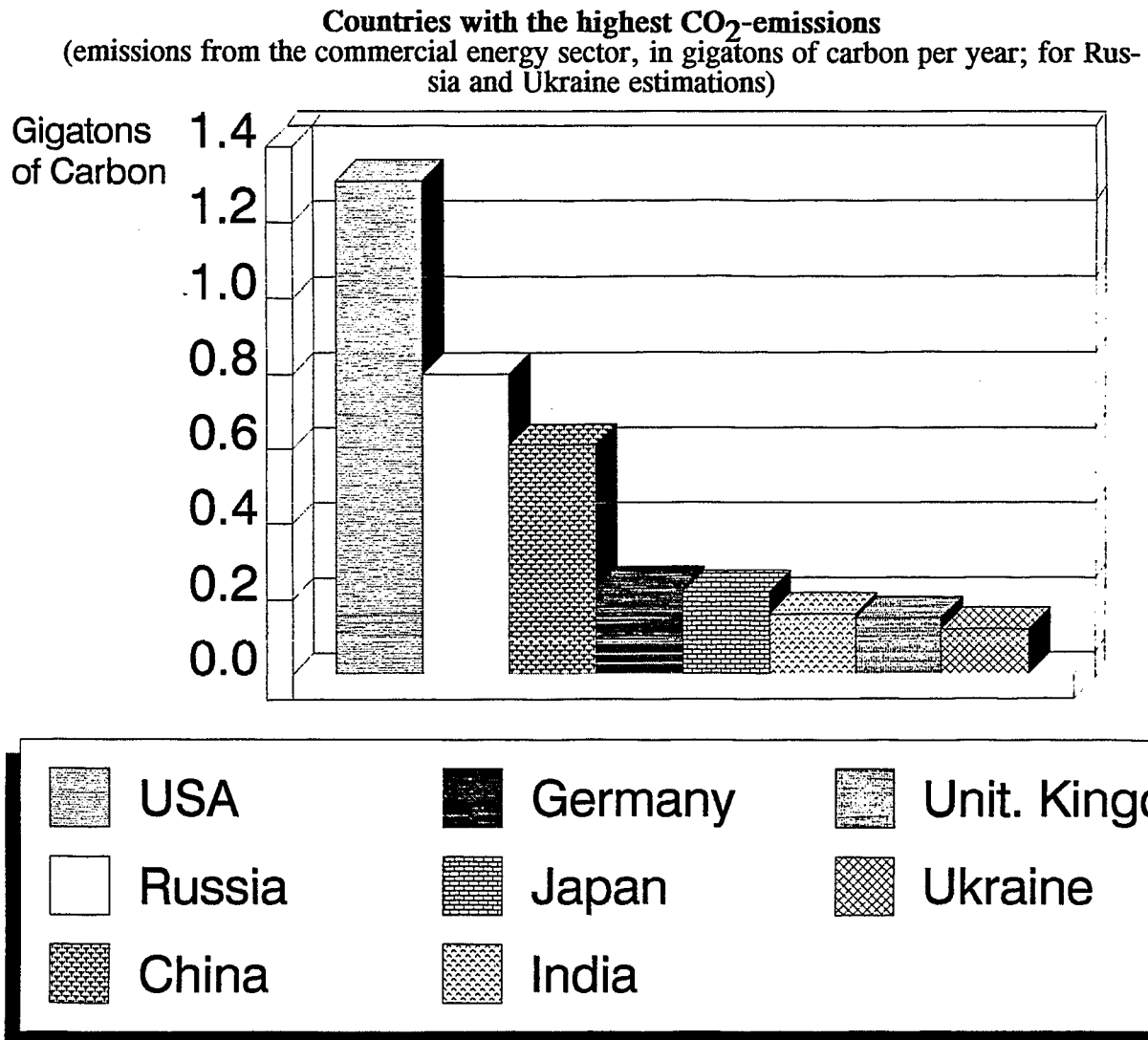
The originators of an environmental problem, i.e. the emitters of pollutants, are hardly inclined to do anything about their emissions and make relevant investments if they are not affected by the resultant damage. They are therefore interested in devolving the undesirable side effects of their production and consumption onto the community or other countries (externalization). International environmental policy gives many examples of this type of strategy, for instance the case of a state situated near the source of a river polluting its waters or the construction of higher chimney stacks in a country so that pollutants are blown into neighboring countries.

The situation for greenhouse gases is different, however, since they are emitted in all countries and, moreover, are evenly distributed in the atmosphere, so that any attempt to shift the load onto other countries becomes senseless. Greenhouse gas emissions thus present a global network pattern in which everybody basically pollutes everybody else.

As a general rule, almost any human activity produces greenhouse gas emissions but, as already mentioned, the energy sector is of paramount importance. Consequently, polluter interests in general and those of the energy sector in particular are present in all states, although their influence on national climate policy differs greatly. This is due, on the one hand, to the specific features of national energy systems, for example the different significance of the coal sector for the economy and the labour market, but is also a result of the characteristics of the respective political system which offers such interests access to the decision-making process to a greater or lesser extent. Secondly, the asymmetric structure of GHG emissions plays a role because national contributions to greenhouse gas emissions are very different. This is particularly evident for energetic CO₂ emissions where the eight major emitters (USA, Russia, China, Germany, Japan, India, UK and Ukraine) account for a good 2/3 of global emissions (see **Diagram 1**). If the proposals from scientists were observed, CO₂ emissions would have to be reduced by about 80 % especially in the industrialized countries. This would affect polluter interests to such an extent that it is not surprising that even today they exert considerable pressure to block such demands by a hesitant or negative attitude to climate protection.

In summary, it may be stated that originator/polluter interests in climate policy are ubiquitous because action mostly involves greenhouse gas emissions.

Diagram 1



Sources: Boden & Kanciruk & Farrel 1990.

1.2 Affected Interests

If there were only originator interests, no practical and serious steps to reduce emissions would be initiated in environmental policy. The same also applies to climate policy. However, originator interests are not the only factors of influence. The introduction of affected interests into the parallelogram of forces could shift the weights. If affected interests gain in significance, there will be increased political pressure to avert climate change. Whether and where affected interests will gain acceptance depends on the respective interrelation of forces within a country and the degree of influence ex-

erted by other states and international societal agents. If agents suffer from the consequences of originator actions, they are greatly interested in rapidly and sustainably averting the dangers. They will urge the originators to discontinue their polluting actions. Those affected are typical supporters of a strategy of avoidance, i.e. damage should not occur at all due to the reduction of pollutant releases. For example, the Scandinavian countries, whose lakes were acidified by sulphur-containing precipitates from power plants in other European countries, expressed their affected interests in the seventies e.g. by campaigns against the polluting states; comparable observations can be made concerning the relations between Canada (affected by acid rain) and the USA (polluter). A similar situation could arise with respect to the climate problem if countries see themselves endangered by the greenhouse effect - today this would primarily concern the Alliance of Small Island States (AOSIS) which fear the flooding of their islands as a consequence of the greenhouse effect.¹⁰ Affected interests are thus in complete contrast to originator interests.

However, affectedness in the climate problem is difficult to define, which makes the climate problem difficult to cope with. It should first be noted that agents may be both affected parties and originators, which creates internal contradictions in defining a strategy. Moreover, two general aspects of affectedness should be differentiated in connection with the climate problem. They may be described as follows and will be discussed below:

- affectedness due to the consequences of climate change;
- affectedness due to the consequences of measures for the avoidance of climate change.

1.2.1 Consequences of Climate Change

There is currently no definite detectable man-made greenhouse effect as yet and affectedness must therefore be of a hypothetical nature. It must be established by means of risk assessments. For this reason, affected interests cannot be determined in concrete terms, but only by intellectual exercises (e.g. scenarios) outlining possible future world conditions and transforming conceptions of a more remote future into the present - with all its uncertainties and ambiguities. These interests could only be mobilized on a larger scale if concrete events such as storms and storm floods could be attributed to climate

¹⁰ Sea-level-rise both by thermal expansion of (warmer) oceans and the melting away of glacier.

change. Several protagonists of a climate protection strategy are undertaking efforts in this direction.

All countries can potentially be affected by climate change and the opinion is widely held that, at least in the long run, all countries would be adversely affected by a greenhouse effect so that ultimately all will be losers. As a consequence, they ought to cooperatively pursue a deliberate avoidance strategy. This unanimity of interests is by no means ensured, however, for there are indications that climate change will have different consequences for the various countries and that the countries' capabilities of adapting to a new climate also differ in degree (cf. Policy Implications 1991).

Climate models do not provide unambiguous information about the regional consequences of climate change. This applies in particular to the quantities, distribution and intensity of precipitations. It is therefore not possible to make any reasonably stable predictions about the consequences of climate change in different countries. Nevertheless, attempts are being increasingly made even today at the international (cf. IPCC 1990 b) and national levels to anticipate consequences for countries and their inhabitants, for national economic sectors and less extensive ecosystems on the basis of climate change scenarios. In this field, the USA is particularly active, but climate change impact research as a new research priority is also financially supported in Germany by the Research Ministry which has established an institute in Potsdam near Berlin (Potsdam Climate Impact Research Institute, PIK). The attention of scientists worldwide is specifically directed towards the consequences of climate change for agriculture and forestry and for particularly sensitive ecosystems, such as the Alps and coastal regions in Germany, in addition to a rise in sea level. The first results from international studies show that regions in which agriculture and forestry are difficult even today (e.g. semi-arid regions) would have to cope with the greatest problems in the event of climate changes and an associated change of the water regime. These regions are primarily located in the south of the globe, but also in some parts of industrialized countries. Apart from the primary consequences (e.g. impact on productivity and yields in agriculture), already at issue today, consequences of a higher order are also increasingly attracting attention, for example the consequences for a country's position in the global agro-economy, for the food supply (secondary consequences) and for its international power position (tertiary consequences) e.g. in the event of a country changing from an agro-exporter to an agro-importer (and vice versa). Behind these considerations are fears that, in particular, rapid climate change could initiate destabilizing processes in the international system (e.g. migration) and trigger wars. These theories have met with fairly wide public and political response, but have been subjected to theoretical and

empirical objections from the specialist community (cf. Homer-Dixon 1991; Deudney 1990).

In addition to uncertainties, a further obstacle to a coordinated climate policy is the fact that countries may be asymmetrically affected by the consequences of climate change, some of them could even derive benefit from climate changes (cf. Ausubel 1991) e.g. in that their agricultural production is increased, energy consumption is reduced as a consequence of warming, frozen sea routes are opened or resources become accessible in permafrost regions (cf. Gleick 1989; Fulkerson et al. 1989). The supporters of a ruling scientific theory are reluctant to address this winner-loser problem, whereas a "revisionist" school questions the thesis that there will only be losers in a climate change as well as other hypotheses concerning the consequences of climate change and instead refers to the probability of a complex and changing pattern of winners and losers (Table 1).

There are good reasons for this reluctance to join the discussion on winners and losers. Expectations of a gain must be speculative and no state can visualize itself reliably and permanently on the winning side today. Apart from weaknesses in the climate models, there are global interdependences which would ensure that nobody could escape at least the indirect impact of climate changes. Depending on the degree of integration into the international system, changes caused by the greenhouse effect in a country will have repercussions even on remote agents due to the political and economic mechanisms of the international system. Any self-centred assessment and evaluation of the consequences of climate change, related exclusively to one's own nation, will thus be impossible. Secondly, if GHG emissions increase in a continuous and unrestrained manner, climate change will also go far beyond the temperature and precipitation changes etc. expected today for a doubling of the (equivalent) CO₂ content in the atmosphere. Moreover, it is not implausible to assume that positive and negative consequences will be equally felt within a (large) country. It should be extremely difficult to offset all gains and losses against each other since many of them cannot be (completely) expressed in monetary terms. How should a government offset the gain from a gradual extension of the agricultural area under cultivation against the loss of a military guarantee from a protecting power which has been substantially weakened by the consequences of climate change? Can the increase in agricultural production be compared with an influx of refugees?

In spite of these imponderabilities, some countries are speculating about possible gains of this type (Gleick 1989), and political perceptions of what might be are often more important than real conditions. If, therefore, a government believes that its country

could benefit from climate change, this is a factor which might obstruct an active climate policy. The significance of such speculations for the respective climate policy cannot be conclusively determined without further detailed studies. The observation of the INC process, however, gives the impression that the expectation of gains does not (yet) have any definable influence on policy.

Table 1

Competing Hypotheses on Climate Change

<i>Ruling Theory</i>	<i>"Revisionist" Theory</i>
* The faster the climate change, the greater the damage * There will be no winners in climate change, but only losers * The most important consequences of climate change concern agriculture and sea level rise * Extreme events (storms, floods) are of greater relevance than the change in average climate data * There is no model for the climate change to be expected * The consequences of climate change will especially affect the developing countries	* Not the velocity as such is decisive, but the anticipation of climate change * There will probably be a complex and changing pattern of winners/losers * More attention should be paid to water resources and the protection of natural ecosystems * Thresholds and discontinuities must be determined in order to assess the consequences of climate change * Climate change must be related to experienced climate variability * Developed countries could be particularly affected by climate change and emission reduction strategies

After: Ausubel 1991

The winner-loser discussion is complicated by the introduction of the category of relative winners or losers. In contrast to the possibilities of absolute gain discussed above, for instance by an increase in agricultural production compared to an initial value, relative gain implies a comparison between countries in the course of climate change: all

can win (or lose) but at the end some countries are in a better position than others, i.e. they have gained more (lost less). The international power structure would thus have shifted in their favour. Neorealist categories of power, domination and conflict, which have their roots and find expression in practical international policy, govern this thinking. Of course, these relative losses and gains would be even more difficult to anticipate than absolute gains or losses, since the degree of change would have to be known, compared and calculated for all relevant states.

However, the introduction of the multifaceted winner-loser problem into the political discussion probably cannot be avoided in the long term. Government-supported improvement of climate models, which will hopefully provide more precise insights into the regional consequences of climate change, should accelerate this process,¹¹ since it will become clearer where climate changes are particularly decisive and where not. Certain scientists therefore argue in favour of accelerating the post-Rio process and reaching rapid international agreement on more comprehensive principles and concrete commitments concerning the protection of the atmosphere as long as there are considerable uncertainties about regional consequences of climate change in the countries. As long as there is unclarity about affectedness, all states could be inclined to cooperate in reducing the risks. As soon as some of them know that they have little or nothing to fear, their national egoism may become dominant.

As a general rule, precaution ranks higher under conditions of uncertainty. This should also be the case for the climate problem, and the opinion is widely held that precaution should aim at avoiding climate change. Even if this assessment is not as such generally shared in science (Stone 1992)¹² and also in sections of the political community, it nevertheless dominates the discussion on climate policy. The practical situation in politics is different, however, since the actual willingness to act is influenced by still other factors in addition to the aim of risk reduction so that, in reality, reaching consensus faces many obstacles. Factors of influence include the price (cost) of precaution, the perception of the urgency of the problem (time perspective) and the behavior of other

¹¹ This will produce conflicting political aims. On the one hand, it must be attempted to regionalize the information obtained from climate models in order to possibly conceive methods of adaptation to climatic changes. On the other hand, this could heat up the winner-loser discussion and thus reduce the opportunities for internationally agreed action.

¹² In the opinion of most economists, precaution can also mean providing the future generations with the means enabling them to repair the (environmental) damage caused by their ancestors. This argument forms the basis for a strategy of adaptation to climate change.

agents (coordination problem). A further obstacle to international consensus may be the countries' different capabilities of adaptation to changed climatic conditions.

The opinion is widely held that, in fundamental contrast to developing countries where, moreover, the most sensitive ecosystems are located, many industrialized nations would be in a position to cushion negative effects of climate change by active adaptation measures (technology development, water management, structural and regional policy) on the basis of a high capability of action (Ausubel 1991a; Policy Implications 1991; Fulkerson et al. 1989). As a general rule it is assumed that technological upgrading and structural change will reduce the dependence on climate factors and thus the sensitivity of countries to climate change. Technologies are already available today or will be available in the foreseeable future enabling the developed countries to adapt even to fairly rapid large-area climate changes at tolerable costs (Ausubel 1991a). An American economist even comes to the conclusion that the USA would only lose about 1 % of its GNP from a greenhouse effect caused by a doubling of the atmospheric CO₂ content (Nordhaus 1991a). These and similar calculations (Development and the Environment 1992, 160) have undoubtedly only reached the status of mental experiments involving many imponderabilities. They show, however, that it is quite possible for countries with a high capability for adaptation and resilience to free themselves from the need for preserving the climatic status quo as far as possible. They can further increase their flexibility and resilience, so to speak as an insurance premium for future climatic risks. There are a number of voices in favour of such a strategy of adaptation. In this context, energy policy could be a model since it has only little influence on the external factors of uncertainty in energy supply, but tries to minimize the consequences of possible disturbances in supply by a strategy of risk spreading, flexibility and reduction of vulnerability by technology policy. Even if it is assumed that many developing countries would be less affected by primary climate change than industrialized nations, their reduced flexibility could lead to greater economic, societal and political vulnerability.

On the other hand, a preference by industrialized nations for a strategy of adaptation to climate change would also carry certain risks because the stress capacity of the ecosystems is not precisely known and climate change could increasingly lead to extreme events causing severe damage (storms, aridity, floods).¹³ Moreover, a one-sided preference for adaptation measures could lead to a North-South conflict over the aims of

¹³ Ausubel (1991) points to the different consequences of such events for the national economies of industrialized and developing countries. Whereas in the industrialized countries the per-capita damage is clearly higher than in developing countries, damage in the South, measured against the very low GNP, is more than ten times that of the North. Rich industrialized countries can therefore afford catastrophes more easily.

climate policy if developing countries were the only victims of the greenhouse effect. The argument that climatically relatively sensitive economic sectors such as agriculture and forestry generally contribute less than 10 % to the gross domestic product (GDP) in the industrialized countries¹⁴ is also only valid to a limited extent since the significance of an economic sector cannot be measured solely by its contribution to economic performance. Nobody would relegate e.g. the petroleum economy, and thus a country's supply security, to second place just because its direct contribution to the GNP is in the range of a few per cent. This is analogously true of the agrosector where a certain basic food supply should remain in the national or, in the case of the European Community, in the regional domain in order to reduce dependence on external supply. Water management also contributes only small fractions to the GNP although constraints due to climate change would have enormous implications. A purely cost- or GDP-oriented discussion of the consequences of climate change disregarding (inter)national political and social impacts would be inadequate.

1.2.2 Consequences of Climate Protection Strategies

Whereas in the preceding sections the damage and gains which countries may expect, directly or indirectly, from climate change and its consequences have been discussed, the second aspect of affectedness concerns the consequences of climate protection strategies. They are capable of turning branches of industry and even entire nations into losers, but also of creating some winners. This causes a problem. Even if all states shared the goal of rigorous GHG emission reduction, conflicts would still have to be expected between them concerning the distribution of costs and gains incurred by climate protection. The Rio Conference has already revealed possible lines of conflict. Two potentially negative consequences of climate protection strategies were referred to in the discussions and these could affect countries in a different manner:

- The reduction in fossil energy consumption leads to a shrinkage in sales markets and diminishes the income of energy exporters.
- Energy conservation and efficiency programmes burden national economies and reduce international competitiveness.

One aspect at least associated with scientific doubts, and perhaps not even to be anticipated, relates to the repercussions of radical measures for emission reduction on the

¹⁴ Cf. also Development and the Environment 1992. In large parts of Asia and Africa their share in the GDP is between 20 and 39, but not infrequently more than 40 %. In Latin America the share tends to be less than 20 %.

(global) economy in general and the energy economy in particular, especially on the energy-exporting developing countries. Their foreign trade and exchange earnings depend almost completely on oil exports. This applies first and foremost to the Organization of Petroleum Exporting Countries (OPEC), but also to Russia. For other countries coal is an essential export item (Poland, Australia, Columbia) and a decline in global consumption would considerably and permanently reduce their income, as in the case of the oil exporters, due to sales losses and collapsing prices. As will be shown further below, such considerations have determined the policy of some countries in the INC. The restricted use of coal and of conventional and unconventional oils (oil shales, tar sands) would devalue the reserves and the even larger resources of many countries which could otherwise support their national energy strategies and cover growing worldwide consumption for many decades through exportation. Any conceivable solutions to this problem would imply the provision of extensive international funds to compensate for export losses and convert the energy systems as far as possible to low-carbon energy resources.

Nearly all governments are concerned today about the negative economic consequences of efficiency and conservation programmes for drastic CO₂ emission reduction. Impacts on competitiveness and economic activity are feared. The costs of such programmes and the question whether they have in fact negative and not perhaps also positive consequences for the economic entities and/or national economies are disputed because many factors playing a role can be neither specified nor quantified. The actual level of GHG emission reduction, the technological equipment of states, societal flexibility and many other aspects still remain to be clarified.

The discussion of energy policy, which can be largely seen in the continuity of debates since the late seventies, cannot be further pursued here. It should be remembered that efficiency increases receive the greatest political and public sympathy, and the dispute concerns the question to what extent technically possible energy savings would be economically reasonable and would meet with societal acceptance. In this dispute, the arguments of those who calculate investments in climate protection on a purely microeconomic level are opposed to the objections of supporters of a conception of societal costs who refer to the negative external effects of economic activity and argue that this damage to nature, man and property is not covered by any cost accounting system. The greater the damage, the more can be invested in environmental and climate protection policy without any misallocation of investments from a societal point of view. Nevertheless, even if the argumentation meets with general approval, the level of these negative external effects, this gap between individual economic rationality and societal ag-

gregate, and the costs required to fill this gap remain contested. What is known for sure is that the costs of climate protection grow disproportionately, the more extensive the measures for climate protection and increase in energy efficiency are and the faster they are to be applied (Helman 1990). The repercussions on economy and society would be correspondingly more intensive. It is therefore assumed (although rarely stated in public) that above all the economic and social consequences of radical interventions to reduce CO₂ emissions by about 80 % would be more serious than the negative consequences of climate change.¹⁵ In reply it is argued that the picture changes with less radical and less rapid steps. The World Bank (cf. *Development and the Environment* 1992, 1ff, 114ff, 160ff) points to the possibility of both increasing disposable income and reducing environmental pollution and CO₂ emissions by selective energy and environmental policies (win-win policies). This applies not only to industrialized but as well to developing countries and former planned economies. These win-win policies could be mobilized, among other measures, by a reduction of subsidies for energy. In political reality, however, such steps meet with many forms of (mostly intrasocietal) opposition.

However, the economic consequences of climate protection strategies could also produce winners, and not only losers. Countries with large natural gas resources would theoretically profit from a policy of CO₂ reduction since gas would be preferred due to its low carbon content and its market price would rapidly rise. These strategy winners are conceptually interwoven with the helper interests (see next section). Such gas resources are available in Russia as well as in Iran and other Middle Eastern countries. However, high transport costs have so far prevented this natural gas potential from being exploited. Moreover, there is some reluctance to make countries dependant on conflict-prone, instable supplier countries.

Political scientists point to the fact that conflicts about means (unlike conflicts about objectives) can be solved relatively well by funding (Efinger & Breitmeier 1992). Conflicts between states about the distribution of losses and gains arising from an agreed climate protection strategy belong to this type of conflict about means. The fact that they can be tackled has been shown by the Montreal Protocol establishing the Interim Multilateral Fund which enables developing countries to build up production capacities for CFC substitutes. In spite of the basic agreement at the UNCED to increase the Global Environmental Facility (GEF) fund for international environmental protection under the World Bank's auspices, there have been no binding financial commitments

¹⁵ For this reason, an optimization of GHG reduction and societal adaptation measures is sought; cf. Nordhaus 1991.

from the industrialized states to date. The states as a whole do not give the impression that they consider the climate problem to be so imminent a challenge in terms of security that they would provide the required funds. This applies to both industrialized and developing countries which show little willingness to appropriate a larger share of their budget to environmental protection. The fact that countries are in a position to act if their interests concerning security and economic order are directly threatened was demonstrated by the Gulf War when a large-scale support fund was set up for military operations.¹⁶

In summary, the affected interests in the greenhouse effect issue area are present nearly everywhere. They comprise those who fear the consequences of climate change, and a second group includes those who are afraid of absolute or relative disadvantages from climate protection strategies for themselves and also those hoping for a gain from a protection strategy. This leads to the third category of interests in climate policy.

1.3 Helper Interests

In environmental policy there are not only originators and affected parties, but also helper interests. Helpers offer solutions to problems, quite in their own interest, may act as intermediaries between originators and affected parties and gradually substitute their contribution for the originator interests. The Du Pont company, for example, took on a helper position by developing and marketing substitutes for CFCs. This also represented a milestone in the solution of the ozone problem since pressure was now exerted on the originators who had to cut back their CFC production more or less rapidly (cf. Oberthür 1992a).

There has been no study to date analyzing where and how helper interests could constitute themselves in the climate problem. At the level of government agents it would be conceivable that this mediator activity could be performed by countries with large low-carbon gas resources sharing their development and low-cost exploitation with other countries or incorporating those who provide financial and technical aid to increase the capabilities of action in other countries also with the aim of establishing their own sales market there. There are quite a number of approaches in national energy policies aimed at exploiting indigenous resources or increasing the percentage of natural gas in the primary energy input by importation.

¹⁶ The payments by countries to cover the allied war costs amounted to approx. 55 billion US dollars.

Domestic societal helper interests are probably of particular significance. They include science and enterprises (development of efficient energy technologies), but also societal pressure groups interested e.g. in low-emission production and consumption. Helper interests would be structurally anchored if climate protection became a consumption, sales and production hit on a national and international level. Domestic policies, the incorporation of negative external effects in pricing, and the 'strategic capability' of political systems for an ecological upgrading of production methods (cf. Weizsäcker 1992; Jänicke 1991, 1990; Prittwitz 1990) also reducing GHG emissions could therefore play a key role in constituting helper interests.

There is still a lack of analytical and empirical work substantializing the notion of helper interests and identifying the influence of these interests on the societal process or their relation to traditional (originator) interests. It would therefore be important to know whether Germany's active climate policy is promoted by a strong presence of such innovative helper interests and, secondly, how the interest structures present themselves in other member states of the EC and the Organization for Economic Cooperation and Development (OECD). Selective political promotion of such innovative interests, which would in turn be enhanced by the implementation of an upgrading policy, could initiate a dynamic innovation process capable of reducing the energy input and GHG emissions as well as increasing international competitiveness.

1.4 Constellations in the Interest Triangle

This theoretical analysis of the triangle of environmental policy interests illustrates the problems encountered in defining a consistent climate strategy capable of achieving consensus on an international level. Unique parallelograms of forces are still not perceivable even after the Rio Conference. **Table 2** (schematic representation of interests in the climate issue area) shows the interest constellations to be theoretically expected, which are only characterized here by the two attributes of 'parallel' and 'conflicting' interests and would have to be further refined in future studies. It should also be borne in mind that generally more than one of these interests are present in a country at a given time, so that policy definition does not follow a unidimensional interest definition, but is specifically governed by the respective weights prevailing in the countries' triangle of environmental policy interests.

It can also be seen from the table that the interests of originators, climate strategy losers and climate change winners all go in one direction: they do not want a conven-

Table 2

Schematic representation of interests constellations
in the climate issue area

A f f e c t e d	Originator ¹	Climate Change negative ²	A f f e c t e d Climate Change positive ³	Climate protection strategy, loser	Helper & climate protection strategy winner
	Originator ¹	conflicting	parallel	parallel	conflicting
	Climate Cha. negative ²	parallel	conflicting	conflicting	parallel
	Climate Cha. positive ³	xxxxxxxxxxx	parallel	parallel	conflicting
	Climate pro- tect. stra- tegy, loser	xxxxxxxxxxx	xxxxxxxxxxxxx	parallel	conflicting
	Helper & climate pro- tect. stra- tegy winner	xxxxxxxxxxx	xxxxxxxxxxxxx	xxxxxxxxxxxxx	parallel

¹Polluter. ²Traditional concept of a climate change loser. ³Traditional concept of a climate change winner.

tion with substantial and obligatory reductions. On the other hand, countries negatively affected by climate change as well as helpers and those deriving profit from a climate protection policy must press for such a convention.

With what policy did the countries start off in the INC, under what boundary conditions did helpers define their interests, how strongly are they represented within the countries, what were the reasons for their political behaviour, which elements of the environmental policy interest triangle (originators, helpers, affected interests) can be identified in national policies, which of them dominate policy, can the capability thesis or another factor contribute towards explaining climate policies?

The analysis covered the most important emitter states and those countries and country groups which pursue an accentuated policy, even if they are rather marginal CO₂ emitters relative to the energy sector (e.g. Malaysia and the OPEC countries). The EC as a supranational organization has been dealt with in a separate chapter. Since the scientific as well as the public and political discussion is concentrated on the contribution of CO₂ from the energy sector, the (lack of) willingness to enter into commitments for limitation in this sector (limitation of growth, freezing, reduction of CO₂-emissions) is in the foreground of investigations. The discussion on limitation was closely interwoven with the developing countries' claims for additional¹⁷ financial and technical aid, which were basically acknowledged in the Climate Convention, but only led to moderate promises at the Rio Conference. Since the question of financing and technical assistance from the aspect of climate protection involves the ratio of target and means, this study concentrates on the target level, i.e. the policy of states with respect to their GHG emissions, especially the aspect of CO₂ emissions from the energy sector. In total, the countries discussed (without the "group 77" of developing countries)¹⁸ are responsible for over 80 % of the current CO₂ emissions from the energy sector. Their attitude is thus decisive both for the climate problem and its control.

¹⁷ Beyond the public development assistance programmes already established today.

¹⁸ Some of these countries will be explicitly considered.

2. Climate Policy of States in the INC

One and a half years of work in the INC have produced a framework convention on climate change (FCCC) which, it is to provide the framework for further steps, exhibits certain similarities with the Vienna Convention for the Protection of Ozone Layer, but as far as the obligations are concerned, at least with respect to the OECD states, already goes beyond the agreement reached in Vienna in 1985 on building up the ozone protection regime. Opinion is divided as to whether the UNCED was a success or rather a failure or something in between. This question can only be answered after some time has elapsed and when it is evident whether or not the FCCC has initiated further concrete agreements (protocols) on climate protection. The following considerations can therefore only furnish a contribution to this discussion. Without understanding the reasons which induced the states within the INC and in Rio to define their interests in a certain manner, however, no reasonably reliable assessment can be made on what is to be expected in the climate issue area within the next few years.

2.1 *Driving Forces of Climate Policy*

What were the interests and goals dominating the countries' policy within the INC and at the UNCED? In order to answer this question, the interests in the climate issue area were related to each other in Table 2. Fischer (1992) has analyzed their presence in and influence on the policy of states in detail for the countries mentioned. It was found that the schematic pattern was too rough to adequately reproduce the interests involved. Table 3 further differentiates the originator, affected and helper interests:

- Primary and secondary originator interests must be differentiated assuming that primary originator interests rooted in the use of *national* fossil resources have a stronger influence on the states' policy than interests which are only based on *imported* energy carriers (secondary). Primary interests are anchored in various societal domains such as regions, sectors and labour markets which can drastically influence the political decision-making process.
- The affected interests were also differentiated according to primary and secondary interests in the subgroup "negatively affected by climate protection strategies", although this differentiation does not reflect the weight of interests. It is only intended to show that states can be affected in two ways by the negative ef-

- fects of a climate convention: directly through the *reduction* of energy exports (primary) and indirectly through other *consequences* of the climate protection strategy such as the impacts of higher energy prices, the consequences for domestic development and foreign trade etc. (secondary).
- Finally, the helper interests were broken down according to *technology* and *resources* interests. The first result from the scientific, technological and economic contributions which a country could make towards coping with the climate problem, the second interest category relates to the (already existing or achievable future) potential of a country in terms of low-carbon and carbon-free energy resources, both as means for national energy supply and export.
 - Added was an evaluation of the *capability of action* as well as a column with *other factors* influencing climate policy, for it had been found when studying the driving forces of climate policy that actual and structural factors, which have little or nothing to do with climate, are in some cases of vital significance for policy within the INC.¹⁹

Table 3 summarizes the results of country studies by means of the categories mentioned above.²⁰ The following results are worth noting:

The traditional winner and loser arguments do not seem to exert any noticeable influence on the states' climate policy. (An exception is the AOSIS whose sole political means of influence is their particularly endangered situation as small island states.) Apparently, the possibilities of direct (primary) gain and loss through climate change are still so unclear and remote that, for the time being, they cannot form any sustainable basis for political interests.

Very pronounced are the originator (polluter) and, in particular, the secondary affected interests (through climate protection strategies). The developing countries primarily regard themselves as future emitters and therefore reject any binding commitments to climate protection, while the interests in industrialized and threshold countries are in-

¹⁹ The respective interests have four attributes: they are 'missing', '(very) low', 'middle' or 'strong'. 'High' in the column for capability of action corresponds to 'strong'. 'Not perceptible' means that no indications were found that this interest had become virulent at all. A question mark stands for indirect indications that at least temporary discussions took place on the positive impact of climate change. The attributes in the column 'affected interests, climate change negative' reflect above all the intensity of scientific discussions. It should be noted that attributes do not permit any direct conclusions to be drawn about the influence of the respective interests on the policy process and its result, since other factors intervene. Cf. for details Fischer (1992).

²⁰ The order in which the countries are listed corresponds to their order of priority as CO₂ emitters.

fluenced by their currently high emissions. Nearly all states fear that their economic efficiency, competitiveness and growth potential will suffer from a decisive climate protection policy. A look at the category 'additional factors of influence' shows that this fear is specifically enhanced in OECD states due to their sluggish economic development resp. recession and the stressed financial situation.

The unidimensional interest structure of Saudi Arabia and other, primarily Arab, OPEC states is clear and contrasts with the AOSIS. There is no fear of a climate change, but the countries rather fear a decline in their oil revenues following a climate protection policy. A slightly modified, but similar interest structure is found for Malaysia and (to some extent) for several other tropical forest states perceiving climate protection as a restriction of their sovereign timber export and development policies.

The helper interests seem to be basically concentrated in the Netherlands (cf. Dinkelmann 1992), Germany and other OECD states where they are assumed to influence the course of climate policy. They are largely missing in other states. However, their influence on the OECD states' negotiating positions, in general, does not seem to have been very pronounced and even in the Netherlands and Germany helper interests are in the retreat. They are in general either not yet sufficiently organized, and thus politically ineffective, or else they have lost their influence due to the deterioration of economic situation. In general, the category of helper interests must be more precisely analyzed and empirically validated using examples of national climate protection policies.

A high capability of action seems to be a necessary, although not sufficient, condition for an active climate protection policy. In fact, an active policy is not always pursued by those countries which, from a capability aspect, would be in a position to reduce GHG emissions (e.g. the USA and to a certain extent also Japan). Capability of action does not seem to derive from technological and economic potentials alone, but is the result of a policy process which, as such, contributes to the determination and perception of action capability. Therefore the Clinton administration will have an influence on the US-energy and CO₂-policy. Value change may also play a role, although its influence on climate policy is generally rather overestimated.

Finally, there is no indication that INC policy has been influenced by the assessment of adaptability to climate change. An essential reason could be that adaptation requirements and the time available for adaptation cannot yet be defined so that the potential for adaptation cannot be specifically assessed. This will possibly change in the course of broader climate impact research.

Table 3

Synopsis of factors influencing the climate change policy of selected countries

Country	Originator (polluter) interests		Affected interests		Climate strategy		Helper interests		Capability of Action ¹⁰	Additional Factors influencing the climate policy
	primary ¹	secondary ²	Climate change negative ³	Climate change positive ⁴	primary ⁵	secondary ⁷	Technology ⁸	Resources ⁹		
USA	strong	strong	low	missing	missing	strong	strong	low	high	recession, elections disintegration systems crisis recession, unification ", high energy prices domestic develop. policy recession, privatization disintegration system change, EC-policy recession, confederacy nuclear energy policy recession, domestic strife local env. problems first recession, regional policy system change, EC-policy structur/regional policy oil prices and -exports structur/regional policy recession, energy policy distinct recession domestic crisis forest/sovereign. policy actual energy policy ?
Russia	strong	missing	very low	very low?	strong	strong	missing	strong	missing	
China	strong	strong	very low	missing	low	strong	missing	low	low	
Germany	strong	strong	low	missing	missing	middle*	strong	missing	high	
Japan	low	strong	low	missing	missing	middle*	strong	missing	high	
India	strong	missing	very low	missing	middle	strong	low	missing	low	
United Ki	strong	low ?	missing	missing	middle	strong	missing	middle	high	
Ukraine	strong	middle	very low	missing	low?	strong	strong	missing	missing	
Poland	strong	low	low	missing	middle	strong	low	missing	low	
Canada	low	strong	very low	very low?	middle	strong	middle	middle	middle	
France	middle	strong	low	missing	missing	strong	strong	strong	high	
Italy	strong	low	very low	missing	missing	strong	middle	middle	middle	
Mexico	strong	strong	very low	missing	low	strong	low	middle	low	
Australia	strong	missing	low	missing	strong	strong	middle	middle	high	
Czechoslo	strong	middle	very low	missing	low	strong	middle	missing	middle	
Brazil	middle	middle	very low	missing	missing	strong	low	missing	low	
Korea, S	low	strong	missing	missing	strong	strong	middle	missing	middle	
Saudi Ara	middle	missing	very low	missing	middle	strong	low	missing	low	
Indonesia	low	strong	low	missing	missing	strong	strong	low	high	
Sweden	low	strong	low	missing	missing	strong	middle	low	high	
Finnland	strong	missing	very low	missing	low	strong	missing	strong	low	
Algeria	middle	low	missing	missing	strong	strong	missing	missing	low	
Malaysia	strong	missing	low	missing	strong	strong	middle	missing	high	
Norway	low	low	strong	missing	missing	low	missing	missing	missing	
AOSIS	low	low	strong	missing	missing	low	missing	missing	missing	

(1) using national fossil energies (2) using imported fossil energies (3) affected through climate change (loser) (4) advantages through climate change (winner) (5) affected through international strategies to reduce GHG emissions from fossil fuels (strategy loser) (6) reduction of national income as a consequence of shrinking exports of fossil fuels (7) reduction of national income following higher energy prices, structural and regional change (8) interested in providing environmental technologies and environmentally benign production processes (9) interested in providing low carbon content methane and renewable energies (10) technical, economic and institutional-societal capabilities to develop and implement CO₂-reduction strategies (11) actual factors influencing the climate change policy (polity, politics, policy)

x tendency to strong

On the whole, the structurally anchored interests opposing a climate policy of the states (originators and those affected by a climate strategy) are wide spread and effective. These strategic orientations are clearly reflected by the policy of certain states including OPEC, but also a number of other energy exporters and states with large forest areas. As a rule, these interests do not seem to be fully mobilized as yet, and do not have to be, because there still is a lack of concrete measures for climate protection in nearly all of the states. Climate policy is currently rather governed by short-term economic (recession, national debt, burden from aid to former planned economies), sociopolitical (income distribution conflicts, little readiness by the public to change their behaviour) and political-administrative factors, as is particularly visible in the USA.²¹ The position of the protagonists of a more active climate policy will possibly only be strengthened again by a new impetus for economic growth.

Considerable influence on the states' climate policy is exerted by a second class of interests which have nothing to do with climate, but with political power, order and sovereignty and which are partially superimposed on the cooperation actually required in the climate issue area. No country wants to be placed in a position where it is forced by other states to adopt modes of behaviour which one-sidedly restrict national options and prejudice future actions, commitments etc. This is where the greatest differences appeared between North and South, for example concerning the question of sovereignty which is particularly emphasized by developing countries,²² concerning the amount, terms of payment and control over a climate fund,²³ the conditions of technology transfer, the institutional embodiment of a climate convention, but also old fashioned problems of world trade and the "new economic order". Really novel arrangements in these issue areas within the framework of a climate convention would have had a preju-

²¹ Oberthür (1992) takes the view that no fundamental restrictions on an advanced climate policy can be found above all due to the basically strong position of helper interests in the USA (and in other OECD states) at the level of climate policy interests. Relevant indications may be found in Table 3. It should be noted here, however, that pressure groups have so far been insufficiently formed (helpers) and are in part still missing completely (climate losers and winners) in view of the lack of a practical climate policy.

²² This applies especially to tropical forest countries which regard their forests as a national possession and not as a human heritage, since this would restrict their freedom of action.

²³ The donor countries (western industrialized states) preferred the GEF solution to keep control over the funds through the World Bank. The recipient countries (developing states) wanted a climate fund under the control of the contracting states since they are in the majority. A compromise was found in the Climate Convention which assigns a supervisory function to the Conference of Contracting States, but leaves the operative appropriation of funds to the GEF (World Bank).

dicing effect for other areas and negotiation platforms. This is why the states concerned (mostly western market economies) acted very much on the defensive, whereas developing countries tried to push through their economic and institutional demands - with few success (cf. Brock 1992).

2.2 *The States' Positions within the INC*

In the course of INC activities, groups of countries have emerged whose demarcation and composition have changed from time to time but which, nevertheless, were distinguishable and whose constellation determined the INC's progress and result, the Framework Convention on Climate Change. These groups will probably become active again in future negotiations on concrete protocols for the limitation of emissions from the energy and other sectors. Oberthür (1992) identified six groups of countries: the USA, the other OECD countries, the former USSR and the East Europeans, the Arab OPEC, the AOSIS and the bulk of developing countries. Based on the country studies a slightly modified grouping of agents will be made here:

1. The USA which adopted a central and, in part, blocking position in the INC and at the UNCED by its rejection of a binding CO₂ reduction policy with precise goals and time schedules.²⁴ However, the USA was not isolated within the OECD, as has been represented by the media, since there were close links with the Arab OPEC states and also certain common interests with OECD states in averting far-reaching claims for climate protection. Moreover, it must not be overlooked that the USA did not reject the framework agreement²⁵ and, in fact, has a national programme on GHG emission limitations which is a byproduct of national environmental protection goals (Clean Air Act Amendments, National Energy Strategy, Regional resp. State Environment Policies).

²⁴ It was also due to the resistance of the USA, but some other industrialized countries too, that no special reduction of CO₂ from the energy sector was agreed upon in the FCCC and that, instead, the reduction relates to all GHG (except CFC). Moreover, the concept of net emissions was laid down in the FCCC so that the convention target can also be reached by an increase of sinks (GHG stores). However, both regulations will complicate the verification of compliance by the states. The absorption of GHG in sinks is generally difficult to calculate, GHG emission calculations are not reliable. (The only exception is CO₂ from the energy sector, cf. Fischer 1991.)

²⁵ The USA are one of the first countries ratifying the FCCC.

2. The second group must be broken down into subgroups since the climate policy interests of the agents partially diverge, but political and economic interdependence necessitates a similar or even common policy:

- The first subgroup includes Switzerland and Austria as well as the EC states Germany, the Netherlands and Denmark which have committed themselves to a national climate protection policy going beyond their EC obligations and which have significantly contributed to the EC's commitment to CO₂ emission freezing. They are globally perceived as pacesetters and have strongly influenced the INC especially via the EC, although the formulation and practical implementation of their policy, especially in Germany and the Netherlands, has not yet been really initiated. Even internal demands are increasingly voiced to reduce policy costs by compensation measures or even abandon the respective national goal.²⁶ These states have again and again assumed bridging functions between various groups of states and enhanced consensus although many countries are afraid of being accused by them as "latecomers in climate protection policy".
- The second grouping is the EC which, as a community, wishes to return to the 1990 CO₂ emission level in the year 2000. However, the community policy conceals that some of the member states do not pursue a climate policy of their own and that there is no consensus about the distribution of the community commitment to CO₂ emission freezing among the individual states or about the tools for policy implementation.²⁷ The EC's climate policy is largely the expression of a hegemony of pacesetters with the tactical consent of other countries, such as France.
- Although they consider themselves to be economies in a state of transition (see below), therefore claiming special consideration, Poland, the Czechoslovakia and Hungary had already adopted the EC position de facto, although not as binding, prior to the UNCED for reasons of regulatory policy and against the background of restructuring their energy economy. They represent EC satellites, as it were, in climate policy and also demonstrate in this issue area that they wish to become EC members.

²⁶ There is an emerging consensus in Germany that the country has set its sights too high: Up to the year 2005 only a 10 - 15% reduction of CO₂-emissions is attainable (the objective is 25-30%).

²⁷ There are strong indications that the EC-countries refuse their consent to the mixed CO₂-/energy tax, proposed by the EC-Commission.

3. The remainder of the OECD states outside the EC, nearly all of them having announced a more or less conditional climate protection policy. It is especially in this group that claims for a consideration of particular positions are being voiced including, for example, a bonus for forests as a carbon reservoir or an appreciation of their status as energy exporters. Sympathy for the American line in the INC was indeed to be found here (as well as in EC countries). Since criticism was focused on the USA's policy, their own hesitation remained hidden at least from the public. Important CO₂ emitters, among them Japan, were ultimately satisfied that the USA's hard-line position had led to a Climate Framework Convention keeping loads within close limits and granting sufficient flexibility. Scandinavian countries belonging to this group have assumed certain mediator functions between the OECD and developing countries.

4. The economies in transition, among which Russia and the Ukraine play a prominent role with respect to both power status and CO₂ emissions. For the time being, they are politically paralyzed and economically incapable of acting, they were not active agents in the INC and a real climate policy on their part seems to be excluded for the present.²⁸ A positive side effect of an undesirable development, namely the pronounced economic decay of these states, is the reduction of their CO₂ emissions by approximately one fifth in the years 1991 - 1992. Nevertheless, there are possibilities of cooperation within the scope of the imperative change of their energy system which can also lead to a limitation of CO₂ emissions.

5. Important Arab OPEC states which reject any arrangement since they see themselves as losers of a climate protection strategy. The same goal is pursued by Malaysia as a tropical forest country with partial interests as a country undergoing the process of industrialization with rapidly increasing CO₂ emissions. Members of this group did not sign the Climate Framework Convention.

6. The AOSIS advocated a strict convention since the small island states could only benefit from such a convention without being committed to climate protection measures themselves. These states tried to appeal to the industrialized nations' conscience presenting themselves as "potential victims of the overconsumption of the rich" and repre-

²⁸ Nevertheless these countries have the same obligation as western industrialized countries to work for the reduction of GHG net-emissions to the level of 1990, but with a greater margin of flexibility. But the FCCC does not commit a fixed date for goal attainment.

sented a type of "model case reflecting the impact of an unjust global system on the South".

7. The bulk of developing countries, among them Brazil and India. They demand binding steps from the industrialized nations, but reject a climate protection policy for themselves as long as there is the possibility that their economic development, measured against GNP growth, may be impeded. Besides this defensive attitude, they actively pursue a policy aiming at increased financial and technical development aid as a necessary precondition for agreement on the UNCED documents. In general, these countries constructively participated in the INC pursuing a compromise-oriented policy. For the most part, they would be prepared under the specified conditions to contribute to climate protection with certain projects provided that these were externally financed, that technologies were made available on preferential terms, that economic growth were not impeded and the projects would additionally furnish a positive contribution to the solution of urgent national environmental and energy problems. China is an active representative of this group, but presents itself as particularly reserved as far as cooperation for climate protection is concerned. A more open policy is prevented here by the phobia about a restriction of sovereignty which can only be explained by the isolated political situation of the last major communist regime.

8. A number of NICs, such as South Korea, reject any commitments of their own since their emissions increase with growing industrialization characterized by energy-intensive industries partly relocated from industrialized states. The countries in this group, whose demarcation from developing countries is fluid, do not possess all the essential features of developing countries any more. They may therefore not expect any financial and little technical aid on preferential terms from the industrialized nations. This is why they pursue a reserved climate policy. Although they did not particularly stand out in the INC, they nevertheless represented special cases due to their objective structure of interests which will become more prominent in future climate policy.

These constellations of specific national interests made it very difficult to reach consensus about a binding climate convention with concrete reduction commitments within fixed periods of time. Almost all states referred to the specific problems facing them in the event of a climate policy and to their particular situation which would have to be taken into account.

INC and UNCED have shown that international climate policy is not a "global domestic policy". However, the formation of an effective uniform climate protection policy is not only hampered by diverging interests. Added to this is the dimension of challenge: Climate change is too global, abstract and remote, too many agents are involved, too many topics and problems are interwoven in the issue area to be successfully dealt with by a political crash programme, if at all. Further reasons are to be found in the political structures and processes: Government policy is rarely influenced by the abstract principle of global community protection and does not give priority to defence against very long-term risks. Priority is still given to the defence of current national (or partial intrasocietal) as well as regional economic and political interests. This is not a deficiency of politicians or the consequence of sheer ignorance of the potential threats. The preference for interests perceived as national is a result of political structures which, despite all functional integration, are still organized nationally (with some transnational integration in the case of the EC). Policies have, not without reason, a short-term perspective even in democracies because the political process is largely governed by legislative periods and political legitimacy significantly depends on the fulfillment of currently urgent wishes and goals. Neither the national state nor the political system can or should be abandoned as a structural condition in the foreseeable future. They are accepted by a majority of citizens and there is no indication of a fundamental readiness to put up with any changes giving precedence to the protection of abstract and remote goods over individual, national and at best medium-term policies. Climate policy must be based on these persistent basic structures. At the same time, national policy has been going through a structural and efficiency crisis for years. It cannot fulfil its tasks without international coordination and agreement, and its results are counterproductive. The impending greenhouse effect again illustrates this strained relation between state and globe, political subsystem and ecological overall system in a relatively new issue area, that of the environment. INC and UNCED were an attempt to reduce this strain. In view of the structural features of politics it is not surprising that this first attempt has so far only produced inadequate results.

3. Tasks, Possibilities and Limits of Climate Protection Policy

The following general insights can be derived from an analysis of the INC process and the UNCED.

Politics and research must give more attention to the economic, societal and international consequences of climate protection strategies. The INC revealed that nearly all states share one or more of the following fears: Such strategies will cost an unreasonably great amount of money, they will strangle economic activity, impair the competitive position, lead to shrinkage of the markets for fossil energy resources and to a decline in prices. These affected interests characterize the positions of intrasocietal agents, but can also reflect objective national interests. They must be taken seriously; otherwise, climate protection policy will meet with almost insurmountable resistance in the foreseeable future. Coordinated climate protection programmes in economic and political integration areas are required cushioning the consequences of such programmes by cooperation and compensation measures and distributing them between all those countries involved. There are certainly limits to regional and more so to national programmes for climate protection in a world economy characterized by division of labour and competition especially in the energy sector. However, the margins for economically meaningful and ecologically desirable efficiency increase in energy production and use have nowhere been fully exploited (win-win policies). An EC climate policy is therefore not only required for reasons of precaution, but is also justified from the energy and economic point of view because it can demonstrate that CO₂ emission reduction may be compatible with economic and political interests.²⁹ Furthermore, specific concepts must be developed for countries with energy-intensive industries and a great dependence on coal and oil exports to integrate them into a climate policy accommodating their concerns. This will also require a solution to the apparent paradox that a reduction in the use of fossil energy resources will lead to price decline which, in turn, stimulates demand. This market mechanism would have to be made ineffective by taxation keeping prices at an internationally high level. This will not be possible, however, without any accompanying international measures relieving weak economies at least of part of the burden produced by high energy prices.

²⁹ Cf. the plan to restore U.S. competitiveness and growth by using energy and environmental efficiency programmes, proposed by J. Romm and A. Lovins (to be published in *Foreign Affairs*, Winter 1992/93). The Plan could be a blueprint for President-elect Clinton's Economic Security Council.

The chances of success must be explored for an active climate protection policy taking the lead in environmental policy. It must become clear how climate protection policies will change economic structures, ensuring novel growth and at the same time environmental protection, what consequences result for competitiveness and prosperity, what "first-mover advantage" a pacesetter has in climate protection and how an ecologically oriented policy in vanguard states will encourage and stimulate those countries which are still hesitant or opposed to a climate policy. The answers are still too nebulous and, what is more, the vitality of the environmental protection market depends quite essentially on variable political framework conditions and requirements which must be improved and stabilized by international coordination. If climate protection really were to become a sales hit, GHG emissions would be reduced more rapidly since a race for ecological innovations would then set in.

There is a close correlation between ecological upgrading and the urgently required mobilization or strengthening of helpers who contribute to overcoming the climate problem in their own interest. Helper interests are primarily found in those industries which offer efficient energy technologies and low-carbon or carbon-free energy carriers. Their mobilization and strengthening requires a consensus on energy policy between the forward-looking and some established societal and political agents and, on this basis, a structural and regional policy which has liberated itself from the grasp of traditional pressure groups. One of the greatest challenges in climate policy is to achieve these two goals. Because at the heart of climate policy is energy policy, the future energy system will decide on the level of CO₂ and other GHG emissions. The World Energy Conference in Madrid in 1992 has revealed the first cautious approaches to an ecological orientation in energy policy, however, without offering a solution to the persistent contradiction between traditional energy scenarios, according to which global CO₂ emissions alone will double within the next few decades, and the demand to freeze these emissions on a medium-term basis to reduce them later on.

Climate impact research will be of increasing importance since there is a latent (but, as shown, yet not fully mobilized) readiness in many countries to rather regard the negative effects of climate change as marginal, possibly even speculating on a bonus due to climate change. Even if definite answers cannot always be found, climate impact research must clarify to what extent expectations are justified, speculative or wrong. This is also necessary because the economically optimum and under reasonably stable political conditions achievable relation between a prevention of climate change and the adaptation to a warmer climate is still undefined. Admittedly, research in this direction could induce states counting on a gain (in absolute or relative terms) from climate

change to reject a precautionary policy. On the other hand, a clearer definition of diverging and common interests is a more sustainable basis for selective policies than a grey field of ignorance.

Which concrete steps should be made in climate policy? Obviously the difficulties in initiating and sustaining a global policy for the prevention of man-made climate change are unique. Nevertheless, worldwide negotiations on the protection of the ozone layer, but also concerning the new Convention on the Law of the Sea³⁰ (cf. Benedick 1991; Sebenius 1991; Feldman 1990) can provide certain insights which should be taken into consideration in climate protection:

As stipulated in the Climate Framework Convention, follow-up negotiations on protocols must be conducted in order to make clear that the FCCC provisions are only of a transitional nature initiating a dynamic process for the further development of climate protection in which there may well be pacesetters within the framework of protocols, as in the case of the Montreal Protocol after its London Amendment or after the Stockholm Conference in November 1992. The policy of pacesetters is of minor objective benefit in the climate policy issue, since the emission increase in other countries rapidly compensates the reduction effect, but the negotiation and demonstration effect should be positively evaluated in that this may put pressure on other countries or even stimulate them to act in a similar way. In the transition phase leading to protocols or later on between protocols, international research and cooperation projects can be carried out in the energy sector and national or regional climate policies can be formulated and implemented. Their problems and results should not only be presented and exchanged by the states at contracting-party conferences, but also within the scope of organizations such as OECD, United Nations Environmental Programme (UNEP), UN Economic Commission for Europe (ECE) and other regional UN organizations or the expanded Conference on Security and Cooperation in Europe (CSCE) in order to gradually build up a system of information and cooperation.

This process of regime building must increasingly incorporate non-governmental international and national organizations whose role was expressly recognized at the

³⁰ The third UN Conference on the Law of the Sea took place from 1973 to 1982. However, the International Convention on the Law of the Sea, which regulates the general law of the sea and the exploitation of the ocean floor, has not been signed by the major sea powers, in particular the USA and UK, due to the provisions concerning the ocean floor regime which also include compulsory technology transfer to a UN authority. Germany also refused to sign.

UNCED. Their channels are often more suitable for propagating learning and cooperation steps than is the case in direct intergovernmental collaboration. New scientific information should not only be disseminated through the institutions of the Climate Convention, which are also information filters, but also through non-governmental organizations. As is demonstrated by the example of the protection of the ozone layer (Breitmeier 1992; Benedick 1991), negotiations are positively influenced and accelerated by this flow of information. A prerequisite for the incorporation of societal agents are democratic political systems which do not combat them as destabilizing elements. Climate protection policy is therefore correlated with strengthened democratization processes in many parts of the world. A development aid policy by the OECD, which makes assistance increasingly dependent on democratization, will therefore also support climate policy.

Efforts must essentially aim at strengthening the developing countries' capability of action by technology transfer and financial aid. There will be conflicts about the level of assistance justified for reasons of climate protection and the level of compensation for the overconsumption of fossil energy resources by industrialized states on which the prosperity of the North is based in the opinion of developing countries and critics of the global economic system. Such discussions and issue area linkages, as described above, always bear the risk of a negotiation blockade. Solutions should therefore be pragmatic in that win-win policies are initiated and supported in developing countries, gradually coordinating and strengthening their aims. In the developing countries and economies undergoing transition rather important increases in efficiency are achievable, economically meaningful and ecologically profitable. They must therefore not be exempted in the long run from concrete commitments and deadlines for the limitation of their GHG emissions. However, the use of energy policy margins also depends here on the initiation of economic and societal reforms without which climate policy must fail.

In the medium term, internationally binding agreements must be reached with concrete protection targets and fixed time schedules, e.g. a protocol with clear arrangements on the protection of forests in the North and South and agreements on the reduction of GHG emissions from the energy sector. The denser the network of regulations, the earlier can climate protection be institutionalized and established as a new issue area in the political systems, as is also the case in other environmental policy areas. In this way, there will be a chance that climate protection is not shifted to the bottom of the national policy agenda in phases of economic weakness and recession, as is still done today, but that it remains an important political goal.

Consciousness raising is a major factor in this connection, since the willingness of citizens to pay more for climate protection and change their behaviour is currently overestimated in sections of the scientific and political communities. It is too often overlooked that surveys do not reflect what people really do and would be prepared to do. Up to the present, the citizens of EC countries have not been challenged by climate protection policies, and it has not been necessary to find acceptance for onerous measures to reduce the energy input. It must be feared that the public will not be the promoter of a radical climate policy, but rather an obstacle to it. This will especially occur if unrealistic expectations are raised that nobody would be worse off even in the case of a reduction of the energy input by up to 80 %. There must be clarity about the dimensions of the challenge so that the opportunities and limits of ecological consciousness raising can be defined.

However, consciousness is not the result of an educational process interlinked with information supply, but is rather formed against the background of political and economic interests and expectations. Climate policy can only be successful if it does not merely protect abstract environmental goods, but serves concrete interests and pursues several goals: In the energy sector this includes reliable, low-disturbance energy supply, management of import dependence, an energy price level which is socially acceptable and permits economic growth (measured against new and changed criteria) while serving environmental and climate protection goals. The policies already referred to above which try to achieve these goals on the basis of a meaningful energy policy and attractive economic measures are an appropriate initial approach to climate policy which is by no means fully explored and, for the time being, seems to be the only practicable approach for many countries (cf. Development and the Environment 1992). This applies, in particular, to the economies in transition to a market economy and to developing countries.

Not all of these goals of energy policy are readily compatible so that a far-reaching climate protection policy as outlined above will not be possible due to conflicting aims. This inconsistency between far-reaching goals in climate policy and feasible measures has not yet been resolved.

Efficiency increases can help achieve many energy policy goals and are therefore rightfully given political preference. Whether it will indeed be possible to exploit the technological potentials for efficiency increase to the extent hoped for, however, has been discussed for almost two decades and appears rather doubtful for economic and sociopolitical reasons. Grubb et al. (1991), Weizsäcker (1989) and other authors point out that energy and CO₂ policies are not technological projects, in essence, but have their

roots in political, economic and cultural boundary conditions which determine the contents and progress of politics quite decisively: "(...) limiting emissions is not just a matter of technology and costs, but of culture, institutions and politics in the broadest sense." (Grubb et al. 1991, 917). A policy aimed at increasing technological efficiency must therefore not overlook the fact that market mechanisms and consumer decisions decide on the exploitation of technological potentials. The analysis of technological conservation potentials can demonstrate the skill of engineers and technicians, but remains without any practical use unless the extent is clarified to which this potential can be really exploited and what is filtered out by cost calculations and consumer sovereignty, does not find acceptance, is socially incompatible or offset by changes in lifestyle. The notion of *technological* conservation potentials³¹ should therefore not be given the significance and autonomous role it plays today in the energy policy discussion.

The importance of the UNCED and the Climate Framework Convention as part of the large package tied up in Rio reaches far beyond this decade. In 1992 the fundamental long-term and unresolved questions concerning the relationship between environment and development were raised for the first time in such a large formal frame and under changed global policy boundary conditions, and a merely verbal solution was found by introducing the rather vague notion of sustainable development (cf. Dixon & Fallon 1989). These questions centrally concern the North-South and probably also the West-East divide, the structure of global economic relations, the guiding principles of economic activity as well as the states' internal political and social structures. If sustainable development were really taken seriously as a general orientation for economic and societal action, a global revolution would be pending in which the highly developed states transfer their wealth and life chances to the South and East where, in return, intrasocietal change is accelerated to combine ecological innovation and economic development with political and social justice. There are so far no indications, however, that the states would be prepared to radically abandon the old (and for quite a number of countries and societal groups not at all ineffective) patterns of development. This applies, in particular, to the industrialized countries which follow only a slightly modified growth model, but also to the economies undergoing transition and the developing states which

³¹ A differentiation is commonly made between theoretical (physical), technological (state of the art), economic (costs and prices) and exploitable (implemented) potential. The latter considers above all psychological and sociological obstacles as well as insufficient information preventing the most efficient technology from becoming accepted in the markets.

cling to a very traditional notion of growth in which environmental protection is often seen as a task of the rich countries and thus deferred to the remote future.

Such a familiar way of thinking and acting is generally not abandoned voluntarily, but under pressure and abruptly. Any revolution is preceded by a revolutionary situation. Is such a situation emerging between North and South, as was occasionally heard in the course of the UNCED?

At least climate and environmental policy does not (yet) seem to have become a driving force of this revolution. The (rough and not quite applicable) division of the world into a fairly rich North with relatively good environmental conditions and a poor South, which is falling into ecological decay and which also includes a number of the former Soviet Union states, is not yet so unstable that it will soon collapse. It is even possible that the gap in environmental quality between industrialized and developing or threshold countries will further increase. Structural change, investments in retention technologies, but also in more environment-friendly production and nature conservation have the potential for improving the quality of air and water in the industrialized countries, and also reducing soil pollution. The opposite trend is to be observed in a large number of developing countries under the pressure of population growth, progressing energy-intensive industrialization and agricultural production. Such a model splitting the world into a (relatively) clean and an increasingly uninhabitable part cannot be maintained in the long run, since ecological interdependence will increase and other effects would have to be expected (e.g. even stronger immigration pressure). However, this division is still conceivable for an unforeseeable period so that the pressure on the industrialized states to really give comprehensive aid to the developing regions in the implementation of sustainable development concepts is not *immediately* felt. The greenhouse effect is one of the few ecological problem areas which *directly and acutely* links the North with the South.³² The participation of all relevant states is required so that

³² A second one is the man-made depletion of the ozone layer. But one has to admit that the ozone depletion is concentrated on the southern hemisphere. The ozone layer depletion ascertained in the north in early 1992 may have its origin in a natural concentration fluctuation or in volcanism. Global trade with toxic wastes, regulated in the Basel Convention, constitutes a relationship between exporter and importer. The re-transfer of toxic substances through products from the south has so far been kept within bounds and can in part be controlled. In this problem area trade is a global problem, but the damage impact remains largely local and/or regional. Other environmental damage, such as radioactive exposure, water and soil pollution, dust emission, SO₂, NO_x, CO emissions and tropospheric ozone, remains local or regional. Indirectly, gradually and in the longer run, some of this damage can also have global effects, such as albedo changes due to forest destruction by pollutants or direct interference.

the North, in its own interest, must help to develop the potentials of the South for limiting GHG emissions. Because the First needs the Third (and the former Second) world, the negotiation position of the developing world is increasing, *if* the greenhouse effect is really regarded as an urgent challenge. This is still not really clear both in the North and South, even after the Climate Framework Convention has been signed. Trends are being felt in all industrialized states towards concentrating on one's own problems or those in the immediate vicinity. Climate policy is still one issue area among many others, its contents biased by other policy goals and not so much by the actual requirements of climate protection. A breakthrough in climate policy to the effect that the scientists' global emission reduction targets are at least generally acknowledged as policy requirements has not yet been achieved. National and international policies are not yet guided by global ecological responsibility. Although there are indications after the UNCED that it is also possible to organize the protection of the atmosphere as a collective good, there is still no global ecological domestic policy in the same way as there is no global nutrition, health or security policy. The objective difficulty of restructuring the globally interwoven energy system and, in particular, the persistence of established interests indicate that global CO₂ emissions will further increase at least over the next 2 - 3 decades, although growth rates can be markedly levelled off by climate protection measures. Climate policy within the next few years will thus not reduce the risk of climate change, as is hoped, but only slightly diminish the extent and rate of changes in climate. However, even a levelled-off emission curve and damping of the man-made greenhouse effect would be a success, although it does not relieve the states of the need to define and coordinate their interests in a climatically changed world, in parallel with efforts at further reducing climate change, in order to keep the international and societal consequences of climate change under control and adapt themselves to new conditions. Although, the climate convention stipulates that the industrialized nations should help developing countries in their adaptation, it is not yet clear whether this approach will be successful and where it will lead (Policy Implications 1991, 5): "Over the next 50 years some nations will probably reduce their vulnerability to climate change, but others may become more vulnerable. Although migration is possible and domestic tranquility can sometimes be maintained, major climate changes could overtax societal capabilities, especially of poor countries. The probability and nature of such unexpected changes are unknown. Therefore, we cannot predict their impacts or devise adaptations to them."

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