Working Paper
Research Unit Global Issues

Stiftung Wissenschaft und Politik
German Institute for International
and Security Affairs

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Kyoto's Grandfathering Principle as an Obstacle to be Overcome

Contribution to the conference
»Post-2012 Climate Policy:
Architecture and Participation Scenarios«
on invitation of the
Fondazione Eni Enrico Mattei (FEEM)
Venice, June 20-21, 2005

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Working Paper FG 8, 2005/04, June 2005
SWP Berlin

Content

Introduction

The Kyoto Protocol is a child of the 1990s. It came at a time when President Bush Senior had announced a new world order after the end of the Cold War. The peace dividend had to be materialized, and Europe looked for its way to take over leadership as a civil power. Although at the United Nations Conference on Environment and Development (UNCED), which took place in Rio de Janeiro in 1992, differences and difficulties between the United States and the EU as well as with the South became visible in the negotiation process, the compromise of the Framework Convention on Climate Change (FCCC) was encouraging. In contrast to the strong focus on the least-cost principle that has dominated contemporary due to the tremendous investment required, the moral impetus at that time was stronger as the driving force. The Climate Convention with its "common but differentiated responsibilities" (Article 4, FCCC) paved the way to a two class structure – those states that are committed to an emission cap and those that are not. This differentiation, however, will create major difficulties to be overcome in a post-2012 architecture. The idea behind it is convincing: Those who created the problem of climate change, the industrialized countries, have to take over the responsibility to make the first step towards its solution. They also have the instruments to do it. Having agreed on this "differentiated responsibility" the industrialized countries (called Annex I Parties in Kyoto Protocol terms), which alone accepted hard commitments, were free to define the principle that structured the commitment architecture.

The grandfathering principle

The principle they applied has been, from the very beginning of the negotiations, unacceptable to the countries of the South (Non-Annex I Parties).[1] China and India argued strongly during the Kyoto negotiations in the direction of an allocation on the basis of a per capita emission rights distribution that again is founded on a moral position but not based on political power reality. If the industrialized countries have to take the first step alone, they certainly would also decide about the principle according to which they will organize the burden sharing. They did it on the basis of the grandfathering principle[2], mainly for three reasons, described below.

One, it accepts that countries with high greenhouse gas emissions can keep a much higher share in global emission in comparison to their population than poor countries with low emissions. This makes the acceptance among economic actors domestically easy. All countries that are requested to participate in a commitment structure share the interest to reach this acceptance domestically on a low cost basis. It also extends, however, inefficient economic structures. It conserves, for instance, the U.S. use of almost 70 percent more energy per GDP unit than in the EU. It also allows, for instance, Germany (my own country) to behave like a world champion in emission reduction (Kyoto target minus 21 percent), although Germany still emits, providing that all EU countries will meet the 2012 target, 23 percent more per capita than the EU-15 average and this while the GDP per capita in Germany is currently not above EU-15 average.

Secondly, the grandfathering principle makes the committed countries look much better if they can demonstrate reduction results than if the emissions (for instance of the Western industrialized, the Annex II countries) were measured in absolute terms, since they exceeded world average per capita emission in 2002 by more than three times and even more than in the base year 1990 (Table 3).

The third reason that the grandfathering principle was chosen is that it makes the introduction of a cap-and-trade system relatively easy among the committed parties because all participants are expected to have similar and relatively small problems in meeting the target, which means the emission trading will not have obvious

[1] Sebastian Oberthür, Hermann E. Ott, Das Kyoto-Protokoll, Leske+Budrich, Opladen 2000, pp.245-248

[2] The grandfathering principle defines the distribution of emission rights according to the emission distribution in a base year before emission restrictions came into force. In a next step it restricts the emission rights proportionally to this base year structure, usually some percent less than in the base year. In the case of the Kyoto Protocol the restrictions are not exactly proportional to the base year: The EU has to reduce greenhouse gas emissions by 8 percent, the United States by 7 percent, Japan by 6 percent, Russia by zero percent. This differentiation, however, is small to negligible in comparison to the difference of existing per capita emissions between countries such as the U.S. on the one hand and China or India on the other (table 3)

winners and losers. This, however, applies only for the Western industrialized countries (Annex II) but not so for the Economies in Transition (EIT, former Soviet bloc countries) that are, as Annex I countries, also part of the commitment structure. Their emissions were already approximately 30 percent below the base year (1990) emissions in 1997 when the Protocol was signed due to the breakdown of the centrally planned systems and the restructuring of their economies. Already during the Kyoto negotiations this problem of trading "hot air" was discussed extensively.[3] The above mentioned ***zeitgeist*** of the 1990s and the political necessity to get to a result produced this inefficient treatment of the EITs, a sacrifice which is a burden not only for post-2012 negotiations, as will be explained later.

Deficiencies of the grandfathering principle: empirical evidence

As Table 1 shows, the countries committed to emission restrictions (Annex I) held a share in global CO_2 emissions from fuel combustion[4] of almost two third in 1990s global emission (65%). This share declined to 56% in 2002. The share held by Annex I countries actually committed to Kyoto was 41% in 1990 and less than a third (31.8%) in 2002 global emissions.

Table 1

CO_2 Emissions 1990-2002

from fuel combustion

Billion tons

			growth		share in world emissions	
	1990	2002	absolute	relative	1990	2002
Annex I Countries	13.852	13.837	-0.015	-0.1%	65.0%	56.4%
Kyoto committed Annex I Countries	8.739	7.798	-0.941	-10.8%	41.0%	31.8%
Annex II Countries	9.843	11.047	1.204	12.2%	46.2%	45.0%
Kyoto committed Annex II Countries	4.730	5.008	0.278	5.8%	22.2%	20.4%
Non-Annex I Countries	6.812	9.873	3.061	44.5%	32.0%	40.3%
China	2.431	3.432	1.001	41.2%	11.4%	14.0%
India	0.614	1.054	0.440	71.7%	2.9%	4.3%
United States	4.852	5.705	0.853	17.5%	22.8%	23.2%
EU	3.137	3.210	0.073	2.3%	14.7%	13.1%
World	21.313	24.528	3.215	15.8%	100%	100%

Source: IEA, CO_2 Emissions from fuel combustion, 2004 edition

[3] Sebastian Oberthür, Hermann E. Ott, Das Kyoto-Protokoll, Leske+Budrich 2000, pp.245, 255-256

[4] CO_2 emissions from fuel combustion cover the major share (75% to 80%) of overall greenhouse gas emissions. The IEA statistics "CO2 Emissions from Fuel Combustion" and "World Energy Outlook" are used because there is no equally consistent statistical material for overall greenhouse gas emissions available. For the sake of the arguments of this article that has its focus primarily on comparative shares and relative changes and less on absolute emission data it is not to be expected that the overall greenhouse gas data would deliver principally different results.

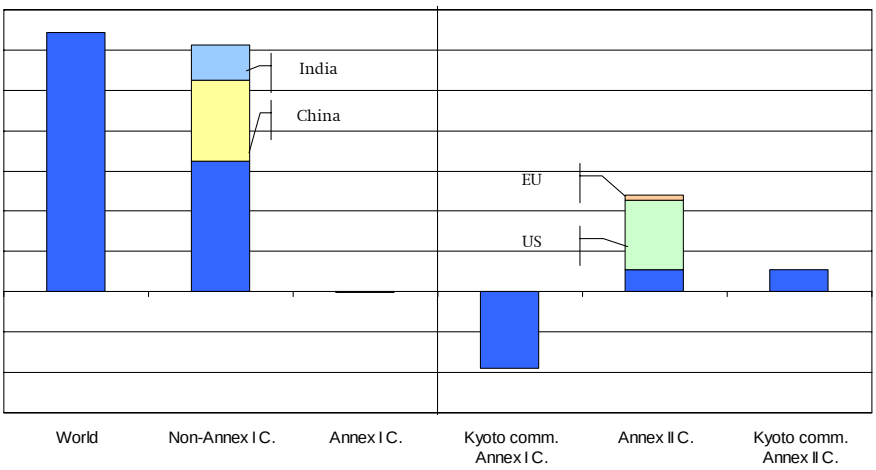
This tendency towards a diminishing importance of the Kyoto committed countries in global CO_2 emissions becomes even clearer if the absolute growth figures are taken into consideration. Non-Annex I countries had a share of 95% of the emission growth between 1990 and 2002 (3.1 out of 3.2 billion tons, table 1).

Graph 1

Growth of CO_2 Emissions 1990-2002

from fuel combustion

Billion tons



Source: IEA, CO_2 Emissions from fuel combustion, 2004 edition

Although this high share of developing countries is partly to be explained by the unique decline of the Economies in Transition emissions during the 1990s, a phenomenon which started to be reversed during the late 1990s, the overall trend will stay if we follow the IEA reference scenario (Table 2). This scenario is a projection of the probable CO_2 emission distribution under the condition that international climate policy will be continued and technology will make further progress but neither on the political nor on the technological side an unexpected breakthrough will happen.

Table 2

CO_2 Emissions 2002-2030 – IEA Reference Scenario

Billion tons

				growth 02-30		share in world emissions	
	2002	2020	2030	absolute	relative	2002	2030
OECD Europe	3.945	4.683	4.785	0.840	21.3%	16.7%	12.5%
US/Canada	6.121	7.472	7.894	1.773	29.0%	26.0%	20.7%
OECD Pacific	2.022	2.426	2.451	0.429	21.2%	8.6%	6.4%
Economics in Transition	2.444	3.200	3.501	1.057	43.2%	10.4%	9.2%
of which Russia	1.488	1.905	2.062	0.574	38.6%	6.3%	5.4%
Developing Countries	8.226	14.392	18.365	10.139	123.2%	34.9%	48.1%
of which China	3.307	5.708	7.144	3.837	116.0%	14.0%	18.7%
India	1.016	1.714	2.254	1.238	121.9%	4.3%	5.9%
World	23.579	33.226	38.214	14.635	62.1%	100%	100%

Source: IEA, World Energy Outlook 2004

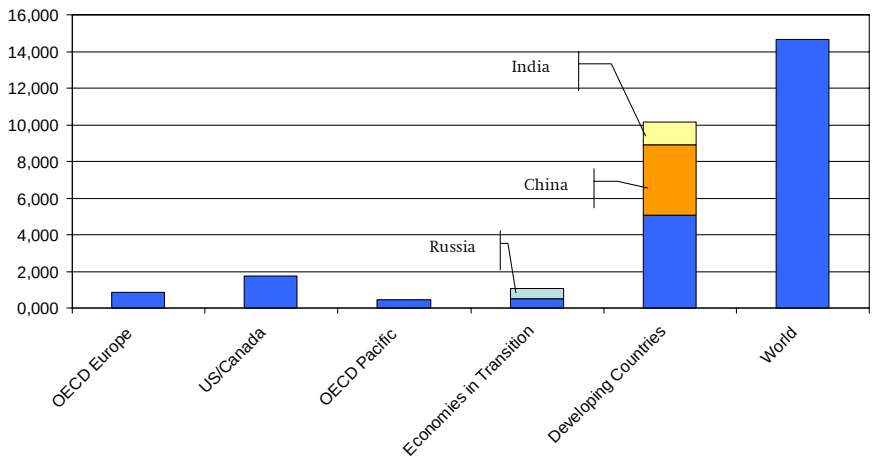
Table 2 demonstrates that the already realized 15.8% growth of global emissions between 1990 and 2002 will be followed by another 62.1% growth between 2002 and 2030. One third of this growth will happen during the decade between 2020 and 2030, which means that no emission peak, not even a considerable decline of the growth rate, will come about during the projection period.

Graph 2

Growth of CO_2 Emissions 2002-2030

IEA Reference Scenario

Billion tons



Source: IEA, World Energy Outlook 2004

As Graph 2 shows 10.1 out of the 14.6 billion tons of this growth (69.2%) will happen in the developing countries (almost identical with the Non-Annex I countries).

It is obvious that the problem cannot be solved without a restriction of emissions in developing countries since the expected growth of these countries between 2002 and 2030 of 10.1 billion tons is more than the absolute emissions of Annex I countries committed to Kyoto in 2002 (7.8 billion tons, table 1). This means even if the Annex I countries committed to Kyoto were to move towards zero emission (and the U.S. and Australia to zero growth), the growth of global emissions would not be stopped.

Table 3

Per Capita CO_2 Emissions

Tons per capita

	1990	2002	change 90-02
Annex I Countries	11.54	11.09	-3.9%
Kyoto Comitted Annex I	9.61	8.33	-13.3%
Annex II	12.21	12.80	4.8%
Kyoto Comitted Annex II	8.89	9.01	1.3%
Economies in Transition	11.48	8.19	-28.7%
Non Annex I	1.59	1.92	20.8%
China	1.99	2.55	28.1%
India	0.70	0.97	38.6%
US	19.37	19.66	1.5%
EU	8.51	8.41	-1.2%
Russia	13.64	10.43	-23.5%
World	3.95	3.89	-1.5%

Source: IEA, CO_2 Emissions from fuel combustion, 2004 edition

If we look, however, at the per capita emission figures, the leverage for forcing the Non-Annex I countries into a commitment structure does not seem very encouraging. While Annex I countries emitted 7.3 times as much CO_2 per capita in 1990 than Non-Annex I countries this figure was still 5.8 in 2002. Much of this small progress is to be explained by the unique emission reduction of the Economies in Transition. If we compare the Annex II countries (Western industrialized countries) with the Non-Annex-I countries, the per capita emission was 7.7 times in 1990 and 6.7 times in 2002. It is obvious that the non-Annex I countries will argue that much more progress is necessary on the Annex I countries' side before the Non-Annex I countries will be willing to agree to restrictions on their own emissions.

On the other hand, it is obvious that the potential for emission reduction is huge in developing countries due to the more inefficient use of energy in comparison to Annex I, in particular to Annex II or EU countries.

Table 4

CO_2 Emissions per GDP unit

kg/$ (based on 1995 US$ Exchange Rate and PPP)

	1990		2002		change 90-02	
	Exch. Rate	PPP	Exch. Rate	PPP	Exch. Rate	PPP
Annex I Countries	0.62	0.67	0.49	0.54	-21.0%	-19.4%
Annex II	0.47	0.56	0.41	0.49	-12.8%	-12.5%
Economies in Transition	3.26	1.34	2.60	1.11	-20.2%	-17.2%
Non Annex I	1.47	0.65	1.30	0.53	-11.6%	-18.5%
China	5.67	1.32	2.71	0.63	-52.2%	-52.3%
India	2.16	0.45	1.97	0.41	-8.8%	-8.9%
US	0.74	0.74	0.61	0.61	-17.6%	-17.6%
EU	0.39	0.45	0.32	0.37	-17.9%	-17.8%
Russia	3.18	1.44	3.20	1.45	0.6%	0.7%
World	0.78	0.68	0.68	0.56	-12.8%	-17.6%

Source: IEA, CO_2 Emissions from fuel combustion, 2004 edition

If, for instance, China with its 2.71 kg emission per US-Dollar GDP (exchange rate) adjusts until 2030 to the EU energy efficiency of 0.32 kg per US-Dollar GDP it could keep a GDP growth of 7.9% (again on an exchange rate basis) annually until 2030 without increasing its CO_2 emissions at all. Even if the big difference in per capita emissions between Annex I and Non-Annex I countries seems to make it difficult to integrate the Non-Annex I countries into a commitment structure, this huge emission restriction potential must be materialized if the problem of climate change is to be solved. The application of the grandfathering principle, however, will not allow the exploitation of this potential due to the rejection of any cap restriction by China, India and others potentially subject to such a regime.

There is one more obstacle provided by the grandfathering principle which is immediate in the EU reality. An integration of the EIT countries into an emission trading market brings an obvious though economically unjustified advantage to them. It gives them a significant potential to sell emission rights while their emissions per GDP unit (PPP) are still at least three times higher than within the EU-15 (Table 4; if measured in exchange rates they are even eight times higher). Poland, for instance, with its much lower per capita GDP than the EU-15 average (42% in 2002) is allowed to emit, even per capita, 8 percent more than the EU-15. This gives Poland either the chance to make a lot of money by selling emission rights within the European Trading System (ETS) or, which is worse in the current economic situation, it attracts energy intensive industries from the EU-15 space due to an artificial and unjustified competitive advantage. This outcome of the grandfathering principle discredits any emission trading system, particularly the ETS.

Alternatives to the grandfathering principle

Before discussing the alternatives to a target for emission reductions based on the grandfathering principle under the given empirical situation I want at least to touch the question whether we need a global target and national caps for greenhouse gas emissions at all. There is an ongoing debate on this issue. Those who doubt

that targets are a necessary and efficient condition to achieve the goal of Article 2, FCCC, mostly argue that the problem cannot be solved by energy conservation measures and the pushing of renewable energies alone. Rather they argue that what we need are breakthrough technologies and that these cannot be provided as a result of a multilateral negotiation on the distribution of emission caps. This debate deserves, of course, a complex analysis. In short, my position is: In order to meet the goal of Article 2, FCCC, we need both the pull effect of a target framework that at least in tendency internalizes the costs of greenhouse gas emissions and the push effect of R&D efforts and infrastructure measures to create an option for speeding up the decarbonisation process of the energy supply (or the energy-related emissions). Neither push nor pull alone will make it. The very fact that with 16 trillion US dollars to be invested into the energy sector until 2030, according to figures of the International Energy Agency, [5] the market forces will direct this huge amount of capital only into the right direction if an effort is made to internalize emission costs. Public subsidies into R&D and investment alone will not provide the necessary amount to direct worldwide investment into the right direction.

The problem of an adequate distribution of emission rights is approached in many ways. We have the equity and justice discussion and also the least (abatement) cost approach. Both discussions are complex. Under equity considerations we have not only the ideal of equal emission rights per capita. There is also the heritage aspect of the already accumulated carbon concentration in the atmosphere, the accountability of sinks, different efforts to reduce carbon intensity including R&D programs etc, to be taken into account. And, most of all, moral arguments alone are not strong enough to establish a regime that regulates as massive economic interests as are involved in a global carbon emission reduction.

Any serious calculation of the least-cost structure that leads to a global emission reduction in order to meet the Article 2 goal of the FCCC is, of course, most welcome. It does not solve, however, the problem of how to organize to follow such a path. The CDM instrument, for instance, is certainly an attempt to make use of the least emission abatement costs. Nevertheless, the application in a market is difficult.[6]

In order to make progress towards a post-2012 commitment structure that achieves the Article 2 goal, two premises are to be fulfilled. One, it has to be politically feasible, two, it has to make use of the big restriction potential in developing countries besides the potential in developed countries. The political feasibility requires a least-cost approach in order to gain the industrialized countries to agree. It also requires a commitment to equal emission rights per capita in the long run if developing countries are to be included into the commitment structure. China and India had made this clear during the whole negotiation process.[7] Both premises might be fulfilled under the following conditions

- instead of a base year, the requirement of the grandfathering principle, a target year should be agreed on. At the target year the equal emission rights per capita should be the main determining factor.[8] This target year could be far in the future, for instance 2060 or 2080 in order to gain the commitment of industrialized countries
- a global cap and trade system should be established to which all countries can have access that accept the emission distribution structure
- the transition period between 2012 and the target year should be organized in a way that, for all countries emitting greenhouse gases on a per capita basis below the world average, it is economically attractive to join the system since it gives them the opportunity to sell emission rights. This gives the developing countries an incentive to profit from reducing their efficiency potential.

[5] International Energy Agency, World Investment Outlook, 2003 Insights, Paris 2003, p. 25

[6] John Browne, CEO of BP described it in the following way: "CDM was a good idea. In practice, it ... has required governments and investors to do the impossible: estimate the level of emissions that would have occurred in the absence of a project and then to calculate the marginal effect of their actions." John Browne, Beyond Kyoto, Foreign Affairs, July/August 2004 (pp.20-32), p.31

[7] During the Kyoto negotiations the Indian Minister fort the Environment, Saifuddin Soz expressed this in his speech on December 8, 1997 in Kyoto: "Per capita basis is the most important criteria for deciding the rights to environmental space ... Since the atmosphere is a common heritage of humankind, equity has to be the fundamental basis for its management".
http://www.indianembassy.org/policy/environment/soz.htm

[8] Other possible factors that could also play a (minor) role such as energy intensity targets are listed in Christian Egenhofer, Louise van Schaik, Noriko Fujiwara (Rapporteurs), Priority areas for a coherent EU climate change strategy to provide international leadership, CEPS, Brussels (Second draft, 8 April 2005), p. 30

The “contraction and convergence” approach is one but not the only solution that fulfils these conditions. There should be room for negotiations not only about the fixing of the target year but also about the path of the emission rights’ distribution between 2012 and the target year. This room for negotiations should be large enough to keep all important parties interested in the negotiation process. This framework allows all parties to bring the own economic and political interests on the negotiation table. Whether a compromise on the target year and the path of the distribution structure between 2012 and the target year can be found is to be tested in the negotiation process.