

Building New Regime for Tomorrow

Keio University Faculty of Economy

Yamaguchi seminar 7th Post Kyoto Part

Yosuke Arino

Naoko Seki

Akiko Nakaya

Koji Hayashi

Yumi Hibino

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Introduction

Many attempts have been done to construct international framework to deal with the Climate change issue. These attempts have been fruit as United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto protocol, and now we are waiting for the Kyoto protocol to be come into effect. However, the Kyoto protocol only refers to the effort which developed countries should make till 2012. The developing countries, that are not obligated to reduce GHGs emissions in the Kyoto protocol, are showing drastically increase of the emissions. In addition, the U.S., who is the largest GHGs emitting country, has already announced that she will secede from the Kyoto protocol. Also Russia, who has the key of making Kyoto protocol into effect, is not willing to ratify it for the time being. This causes international disappointment. We must keep in mind that this protocol is only the first step of long spam problem solving.

From these reasons, we consider it necessary to look over the Kyoto protocol and to discuss what we ought to do and how new framework ought to be after 2013.

Chapter 1 The Characteristics of the Global Warming

1-1 The Present Condition of Global Warming

According to the IPCC, the global average surface temperature has increased over the 20th century by $0.6 \pm 0.2^{\circ}\text{C}$. And there is new and strong evidence that most of the warming observed over the last 50 years is attributable to human activities. Also, the present tendency of global warming has already affecting the weak ecosystems and that it could harm other ecosystems, expand the infectious disease, harm agriculture and give economical disaster. Moreover the globally average surface temperature is projected to increase by 1.4 to 5.8°C over the period 1990 to 2100. As you can see from these facts, it is clear that we should act as soon as possible.

1-2 The Characteristics of the Global Warming

There are four main characteristics of global warming. The first point is that the earth is global public good. The good effect due to a country tackling global warming will benefit not only the country but also the whole world. This allows some countries to receive such benefit without making effort by themselves. They are so-called free riders. This discourages each country from making effort and that this would weaken the regime itself. Therefore it is important to put an emphasis on making it easier for countries to join in such regime to prevent free riders.

The second point is that the source of emitting the GHGs has a large variety. For this, it is meaningless to handle this problem just by limiting certain country or region's specific activities. We should target on wide range of economical activities of household, transportation, industry and so on of both developing countries and developed countries. Thus, the global warming has huge impact on the global economy. It can not be neglected as it is an important economical problem. The cost to deal with this problem and its effect should meet and the equity must be considered seriously.

The third characteristic is that the global warming is not the problem of flow but it is the problem of stock. The cause of global warming is not the GHGs emitted in the sort period of time but the concentration of GHGs accumulated in the long run (more than 50 years). The change of GHGs emission in 10 years or so does not effect the concentration greatly. Therefore the measure of GHGs should be sustainable and be tackled in the long run instead of making strict restriction for the short period.

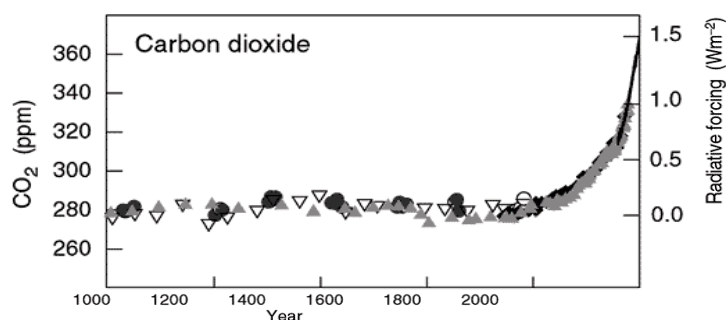
The fourth characteristic is the uncertainty. Even according to the third assessment report of IPCC, the global warming expected in year 2100 is 1.4 to 5.8°C and the rise of sea level is by 9 to 88cm, which means there are great gap between its minimum and the maximum. In present, we still don't know how worse the global warming may get, and how much we should pay to stop it. There is also no certain way to stop the global warming. Thus decision making of the global warming issue will be done under the uncertainty. To make matters worse, if the decision was not appropriate, it is possible that it could harm the next generation severely. From this, you should keep in mind that such uncertainty is left when thinking of international framework for global warming.

Therefore, you should discuss in consideration of these four characteristics of the global warming when you think of new international framework for it.

Chart 1 Change of CO2 concentration (Stock side)

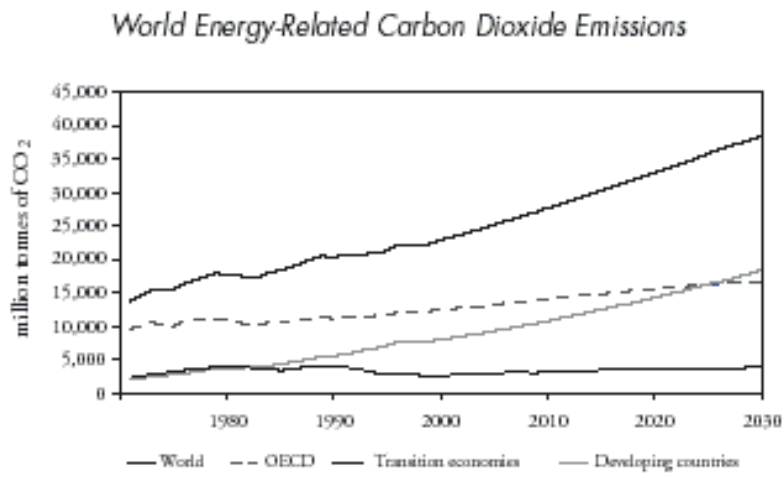
Indicators of the human influence on the atmosphere during the Industrial Era

Global atmospheric concentrations of three well mixed greenhouse gases



Source : IPCC(2001)

Chart 2 Change of GHGs emissions (Flow side)



Source: IEA(2002)

Chapter 2 Kyoto's Fantasy Land

The Kyoto protocol was adopted in December 1997 in Kyoto. The biggest feature of this protocol is that Annex B countries were obligated to reduce GHGs emissions. It was a remarkable step to set certain caps over the GHGs emissions. However, this protocol won't work well for some problems. This is why we call the Kyoto protocol a fantasy land. In this chapter, we would like to show you three problems which we should consider when we think of new regime for global warming.

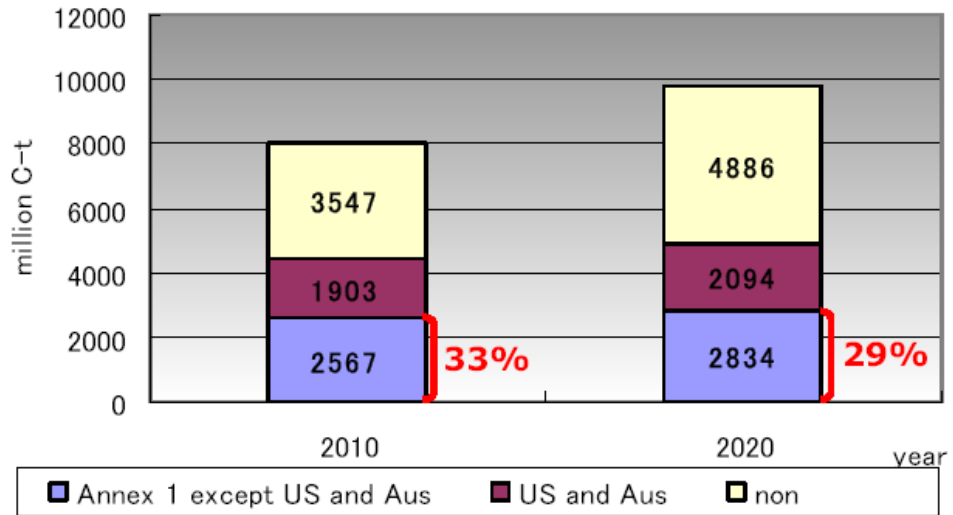
The first problem is about the costs. The Kyoto protocol takes "cap and trade" approach. This approach set caps over the GHGs emissions. Annex B countries can emit GHGs within their caps. They can also buy the permits to emit GHGs from other countries if it is more inexpensive to do so than reduce GHGs by themselves. In short, they can trade their permits. This is what "cap and trade" is. This cap and trade approach has some problems about costs. Absolute values of caps leave the global economic growth out of consideration. It can also affect the economy when the caps were set too low. This is because the costs to achieve the targets might be very high. In addition, the abatement costs to achieve the caps differ among countries because the caps were set without considering the conditions of each country. Although the trading system solves this problem equalizing the abatement costs among countries, the cost uncertainty still remains because it is still uncertain how much the equalized cost may be. As we mentioned in chapter1, the global warming has huge impact on the economy, it's a fatal problem that the Kyoto protocol lacks consideration for the costs.

The second problem is that the developing countries, which are not included in Annex B, aren't obligated to reduce GHGs emissions. Some of them are showing a marked rising tendency of GHGs emissions. In addition, the U.S., who is the largest emitter in the world, doesn't ratify this protocol. As a result, the Kyoto protocol covers only 1/3 of emissions over the world. (See chart 3) It will have little effect on global warming.

The third problem of the Kyoto protocol is about non-compliance procedure. The Kyoto protocol gives penalty for the countries who fail to achieve their target while non-participants don't have any penalties. This is the opposite way to other treaties. General treaties are generous to insiders while hard for outsiders. However, the Kyoto protocol is hard for insiders while generous to outsiders. As a result of this wrong system, the outsiders can be free riders. As we mentioned in chapter1, we should prevent free riders when we work on the global warming issue. Therefore the new framework should be more flexible for insiders.

Chart 3

Transition of Carbon Emissions



Source : Ministry of Economy, Trade and Industry (2003)

Chapter 3 Alternatives and Our Proposals

In this section, alternatives and proposals will be stated by going along with the problems we have given in the very beginning. Before going any further, let's clear up some important facts about our essay. In Kyoto Protocol, the most serious problem is that the protocol covers only one-third of world's total emission. This problem was actually caused by the total effects of three major problems: cost uncertainties, participation of developing countries, and non-compliance procedure. Rather than making strict obligations with less country like how Kyoto Protocol did, it is more important to make such regime including gentle obligations with broader participation. As we stated in chapter 1, because of the fact that global warming is something that should be dealt in world-wide scale, the new system should be very flexible for the new comers. Also, the main purpose of global warming measures is not on the side of quantity, like how much reduction we can make in the certain terms, but it is on the side of quality side, like how much control we can make over the future. By keeping in mind about such system, including "broader participation with durability" to overcome the one-third problem, this section will make a study about following topics: cost problems, participation of developing countries, and non-compliance procedure.

3-1

a) Comparison of Three Different Approaches

In order to solve the cost problem, it is necessary to compare different types of alternatives. This chapter will compare three major options for the architecture of a global warming treaty. The very first approach has been called 'Cap and Trade'. In Kyoto Protocol, the approach of capping emissions at particular quantities has been taken. The second approach would focus on coordinating emission taxes. This approach will set control over the price of emissions. The third approach has been called 'Hybrid System'. It is a hybrid of the trading and tax system. By comparing these three approaches, we will be drawing our proposals in the end.

Cap and Trade:

'Cap and Trade', the approach which has been taken in Kyoto Protocol, provides caps over emissions at particular quantities, and Kyoto Mechanism has been accepted as the one of the flexible actions of 'Cap and Trade'. Emission Trading can be

given as the most famous systems of Kyoto Mechanism. This system would allow an industrialized country to increase its emission cap by purchasing part of another industrialized nations' Kyoto allocation. This will be the best ways to keep abatement cost stable by the market power. It appears to be a very effective system since 'Emission Trading' gives control over quantities. However, as we said in the last chapter, the disadvantage of this system is cost uncertainty. As a result, there may be a risk that government force economies to bear extremely high costs of cutting emissions more rapidly.

International Carbon Taxes:

'Carbon Taxes' is an approach of controlling the price of emissions. There are two main advantages for this system.

The first one is about efficiency. Unlike 'Cap and Trade', this approach lightens the burden sharing. It will make governments to solve the thorny allocation problem because it does not require allocating and securing property rights in the form of emission permits. Also, this approach can plan long-term investment which works out for such 'stock' systems like climate change. The risks of climate change are mainly a function of the slowly growing 'stock' of CO₂ in the atmosphere. From these facts, 'Carbon Taxes' can be economically more efficient than 'Cap and Trade'.

The second advantage comes from its cost certainty. As we said in the very beginning, taxing emissions will put control over prices. Greater certainty of cost makes it easier for forms of plan such investments, and this may also increase the number of countries to join the system.

On the other hand, setting a 'Carbon Taxes' may come up with some difficulties. There is no strong and intrusive international institution. This will make large revenues shift from emitters to the governments that apply the taxes. 'Carbon Taxes' will make us pay from the very first amount of emission. From this fact, although 'Carbon Taxes' seem very efficient, it is hard to make private sector understand. Also, we cannot run a way from the fact that the tax system is extremely difficult to monitor real impact of taxes that are applied to economies in tandem with other tax and investment policies.

There is another objection for coordinating Carbon taxes. It comes from the fact that the tax instrument would require harmonization at a common tax level. In order to figure out the approximate tax rate, we must measure the marginal cost for every single countries, and that is unrealistic. In such condition, it is almost impossible to set taxes in harmonized way. It may probably end up with the

interference in the domestic actions.

Hybrid Approach:

Now, let's move on to the last approach called 'Hybrid Approach'. This approach is a hybrid of the trading and taxing systems. Governments would set targets for emission quantities as well as targets for emission prices. The caps over emissions will be decided by conference of parties. The cap over prices, which stands for the rate of tax, can be (Ex. X-dollars per 1t. of emission) set internationally even, or it can also be decided differently among the nations. Having limited quantities, governments would create an emission trading system. Unlike 'Emission Trading', governments would also commit of selling additional permits at the target price. The cost of permits would therefore never rise above the target price. This is the way how the approach of 'Hybrid approach' works.

The advantages of this system are as follows: (1). Can reach certain amount quantity target. (2). There will be no cost uncertainty. However, it is actually quite difficult to set an approximate tax rate. If the emission price is too low, people might think that it is okay to emit whenever they want because they are paying money. If the emission price is too high, it will make people use only an emission trading. At the same time, it might create an interference of domestic acts.

By going through the comparison of three major options, it is clear that there are both disadvantages and advantages for the future. By keeping in mind about "broader participation with durability", we will state which approach would be the proper one.

First of all, because of the fact that 'Carbon Taxes' would require harmonization at a common tax level, there will be an interference in the domestic actions. Also, when we consider about specific national circumstances, it is extremely difficult to make harmonization for tax rate. Even though 'Carbon Taxes' have many advantages, they are not effective for broader participation. As a result, the possibility is quite low.

Then what about other two approaches? Unlike 'Cap and Trade', where there is a right to make certain domestic actions, 'Hybrid Approach' may end up by having an interference in the domestic actions like how 'Carbon Taxes' did. The reason comes from the fact that 'Carbon Taxes' would require to put same rate of taxes for exceeding emissions without concerning about specific national circumstances. In such case like

this, 'Hybrid Approach' may end up by narrowing the participation. Also, when abatement cost differs among each countries, the country might limit the participation for emission trading in order to prevent industrial transference. At the same time, such incentive works out for both government and industrial sectors to set out the low prices. As a result, the emission reduction will no more be effective. In such case like this, each countries would do whatever they want. As we already said in the very beginning, Global Warming includes the problem of public goods, so every countries must face it. By making a comparison among each options, we figured out that continue the use of 'Cap and Trade' would probably be the best way. Even if only developing countries were included in Kyoto Protocol, the facts about reaching certain targets with international agreement and holding flexibility for new comers must be highly evaluated. It is true that the 'Cap and Trade' approach holds the cost problem. However, by making periodical review and set flexibility for initial allocation, it reduces the risk of cost matters.

In the next section, we will be stating the way to set initial allocation for bringing the 'Cap and Trade' approach properly.

b) Indicator for bottom up approach

Emission efficiency is quantity of GHG emission per GDP
$$\text{emission efficiency} = \text{GHG emission} / \text{GDP}$$

In generally, quantity of GHG emission grows as the economic of the country grows. However, some countries have been tried hard to reduce GHG emission in the past. For such countries, it costs more to reduce GHG emission compared with who haven't tried to reduce GHG emission. So, in deciding abatement target, it's necessary to think about this point from the viewpoint of equity of cost among countries. Using emission efficiency as an indicator to decide abatement target, it becomes possible to reflect effort for a country to have been tried to reduce GHG emission in the past. There are other indicators like energy efficiency.

$$\text{Energy efficiency} = \text{energy consumption} / \text{GDP}$$

However, using energy efficiency as an indicator, it's difficult to evaluate the effort of countries, which have tried to reduce GHG emission by some ways like energy conversion, in the past properly. What is important here is to reduce GHG emission? So, if a country doesn't emit GHG more, it's not to be blamed for a country to consume more energy. It can be said as the effect that the country pursued the way for

sustainable development. In the viewpoint that the important point is to reduce GHG emission, we offer emission efficiency as an indicator. To make it possible to use emission efficiency as an indicator for bottom up approach, change the formula above into setoral level.

Emission efficiency of a sector = GHG emission of a sector / GDP of a sector
And then, calculate and decide the quantity of expected improvement rate of emission efficiency, and next, expected GHG abatement per sector, and finally, sum up abatement targets of sectors to decide national GHG abatement target. We offer to use quantity for a target, not improvement rate of emission efficiency. This is because it makes easier to do emission trading. In doing emission trading, what will be traded is quantity of abatement. So, using quantity for a target is preferable.

Using emission efficiency as an indicator, it may promote new technologies and energy conversion. Like top runner approach, a sector of a country which has achieved the highest level of emission efficiency can give a suggestion for the same sector of other countries which haven't achieved such level.

Each country decide abatement target taking national circumstances into consideration, but the target should be accountable for internationally. So, it is preferable for the target to be decided through international negotiation. And, as we offer quantity of abatement for a target, we have to think about such case that a country succeeded in improvement of emission efficiency, but because of unexpected economic growth, the country failed to reduce the quantity of GHG emission. In such case, if the reason of non-compliance is accountable, the country should be treated through international negotiation, and the treatment should be supportive, like financial support and technology transfer. We also have to mention that, using multi-sector approach, there will be a possibility that the abatement target of whole world fall below that of KP. However, what is needed for global warming policy is the way to promote broader participation, and it is not like Kyoto protocol, which covers only one third of the world CO2 emission. What we want to propose is not to reduce decided quantity of GHG emission in decided short time, but to make a regime that can be lead to reduce GHG from a point of long view by broader participation. Also from this viewpoint, we would like to propose bottom up approach using emission efficiency as an indicator for the way to decide initial allocation of a country.

As we saw through i) and ii), by using emission efficiency as an indicator for bottom up approach, it becomes possible to make much of notion of cost, and to take national specific circumstances into consideration.

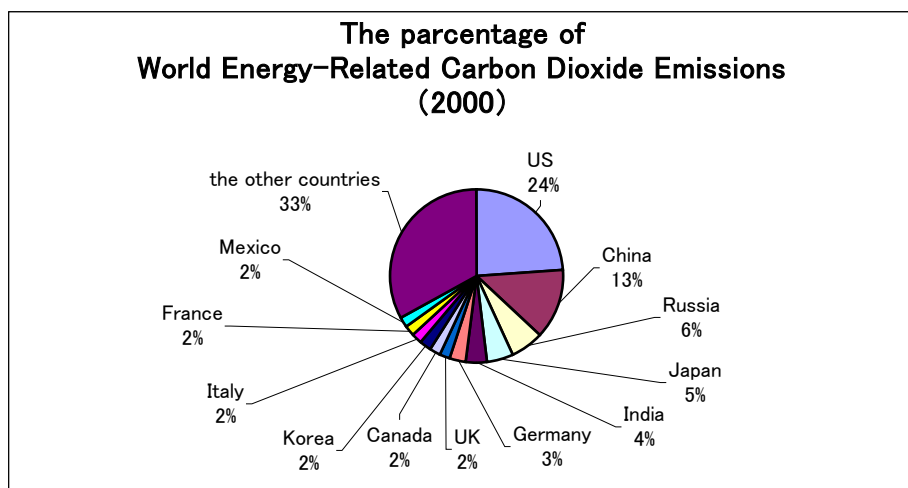
3-2 Participation of Developing Countries

3-2-1 Introduction

As we mentioned in the second chapter, the second problems of Kyoto Protocol is the participation of developing countries. In the Kyoto Protocol, the developing countries are not obliged to reduce the CO₂ according to “common but differentiated responsibility” shown in UNFCCC. However, in the reality, it is said that the total emissions of developing countries will surpass that of developed countries by the 2010 and 2020 as can be seen from the outlook of the world’s CO₂ emission. If we think about the effective measure against global warming, it is necessary that the developing countries also control the CO₂ emission. In the other hand, it does not mean that the developing countries do not have the rights to pursuit economical development and that they will be prevented from doing so. Here, the problem of the Timing of when to make the developing countries take on the duty of reduction should be discussed.

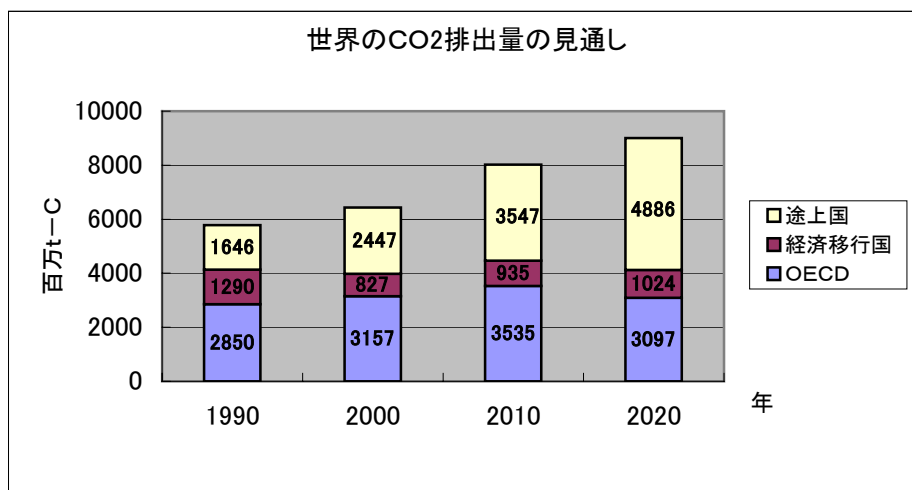
Though it is necessary for the developing countries to take duty of reduction the CO₂, it is very hard to determine clearly the actual timing of when to do so. In this section, we will look into the specific plan that is introduced according to this timing and will propose the regime, which enables the developing countries to take on its duty smoothly.

Chart 4



Source: Ministry of Economy, Trade and Industry (2003)

Chart 5



Source: Ministry of Economy, Trade and Industry (2003)

3-2-2 Who is developing countries ?

Before start talking about the problem timing, we should confirm the category of developing countries. This is because it has not been done so though the words developing country and developing country are frequently used in United Nation and other international organization. This problem has been discussed in the negotiation of UNFCCC, however none of the proposals has been agreed and in the end, in stead of defining these two words, the list of developed countries have been added as an attachment of the treaty. The developing countries are to be identified as the countries that are neither developed countries nor transition economies. However, this list bases on the signatories of OECD and not on the specific number. Also there are some countries that have succeeded in economical development but are not on the list. This shows that we should keep in mind there are different kind of levels even inside the category of present developing countries. (Chart 6and 7)

Chart 6

Table 6					
<i>Countries Ranked on Per Capita Energy-related CO₂ Emissions (2000, tonnes per person)</i>					
Rank	FCCC Party	CO ₂ per capita	Rank	FCCC Party	CO ₂ per capita
1	Qatar	59.99	32	Kazakhstan	8.26
2	Kuwait	31.53	33	New Zealand**	8.26
3	United Arab Emirates	23.66	34	Austria**	7.74
4	USA**	20.57	35	Iceland**	7.69
5	Bahrain	20.44	36	Poland*	7.58
6	Luxembourg**	18.24	37	Norway**	7.48
7	Australia**	17.19	38	Italy**	7.38
8	Canada**	17.13	39	Libya	7.34
9	Netherlands Antilles	15.23	40	Slovenia*	7.27
10	Brunei	14.95	41	Spain**	7.13
11	Saudi Arabia	12.58	42	Slovakia*	7.01
12	Belgium**	11.73	43	South Africa	6.91
13	Trinidad and Tobago	11.63	44	Turkmenistan	6.59
14	Czech Republic*	11.56	45	France**	6.18
15	Netherlands**	11.13	46	Ukraine*	6.08
16	Ireland**	10.88	47	Portugal**	5.96
17	Finland**	10.59	48	Sweden**	5.86
18	Singapore	10.45	49	Malta	5.84
19	Russia*	10.34	50	Switzerland**	5.80
19	Estonia*	10.22	51	Belarus*	5.55
21	Germany**	10.14	52	Hungary*	5.51
22	Israel	10.01	53	Venezuela	5.32
23	Oman	9.82	54	Bulgaria*	5.23
24	Chinese Taipei	9.69	55	Uzbekistan	4.64
25	North Korea	9.51	56	Islam. Rep. Iran	4.59
26	Denmark**	9.38	57	Malaysia	4.56
27	Republic of Korea	9.17	58	Former Yugoslavia	4.31
28	Japan**	9.10	59	Macedonia	4.14
29	United Kingdom**	8.89	60	Croatia*	4.06
30	Cyprus	8.36	61	Bosnia Herzegovina	3.86
31	Greece**	8.31	62	Romania*	3.85

Source: Data from IEA. * indicates Annex-I membership, ** indicates Annex-II membership

Source: OECD/IEA (2002)

Chart 7

Table 7					
GNP per capita 2000, Purchasing power parity (international dollars)					
1	Luxembourg**	45,470	32	New Zealand**	18,530
2	Liechtenstein	... a	33	Slovenia*	17,310
3	United States **	34,100	34	Korea	17,300
4	Bermuda	... a	35	Portugal**	16,990
5	Switzerland**	30,450	36	Greece**	16,860
6	Norway**	29,630	37	Malta	16,530
7	Iceland**	28,710	38	Bahamas	16,400
8	Cayman Islands	... a	39	Barbados	15,020
9	Belgium**	27,470	40	Bahrain	<i>14,410 a</i>
10	Denmark**	27,250	41	Czech Republic*	13,780
11	Canada**	27,170	42	Argentina	12,050
12	Japan**	27,080	43	Hungary*	11,990
13	San Marino	... a	44	Saudi Arabia	11,390
14	Austria**	26,330	45	Slovak Republic*	11,040
15	Netherlands**	25,850	46	St. Kitts and Nevis	10,960
16	Monaco**	... a	47	Seychelles	... a
17	Ireland**	25,5270	48	Antigua and Barbuda	10,000
18	Australia**	24,970	49	Mauritius	9,940
19	Germany**	24,920	50	Estonia*	9,340
20	Brunei	<i>24,910 a</i>	51	South Africa	9,160
21	Singapore	24,910	52	Chile	9,100
22	Finland**	24,570	53	Poland*	9,000
23	France**	24,420	54	Uruguay	8,880
24	Sweden**	23,970	55	Mexico	8,790
25	United Kingdom**	23,550	56	Malaysia	8,330
26	Italy**	23,470	57	Trinidad and Tobago	8,220
27	Cyprus	20,780	58	Russian Federation*	8,010
28	U. Arab Emirates	<i>19,410 a</i>	59	Costa Rica	7,980
29	Israel	19,330	60	Croatia*	7,960
30	Spain**	19,260	61	Belarus*	7,550
31	Kuwait	18,690	62	Brazil	7,300
63	Botswana	7,170	71	Tunisia	6,070
64	Latvia*	7,070	72	Colombia	6,060
65	Turkey	7,030	73	Iran	5,910
66	Lithuania*	6,980	74	Venezuela	5,740
67	Grenada	6,960	75	Dominican Republic	5,710
68	Namibia	6,410	76	Panama	5,680
69	Romania*	6,360	77	Equatorial Guinea	5,600
70	Thailand	6,320	78	Bulgaria*	5,560

Source: Data from World Bank

Notes: a: 2000 data not available; ranking is approximate. Figures in italics are the most recent estimates for 1998 or 1999. * indicates Annex-I membership, ** indicates Annex-II membership

Source: OECD/IEA (2002)

3-2-3 Alternative Proposal for Timing

In this section we will consider the timing of when to make the developing countries take on their duty of reduction.

i) It took 15 years for Annex I to take on the obligation. Therefore the developing countries will have to take on obligation 15 years from Post Kyoto's conclusion of the negotiation.

This plan is using the MP. In the MP the extra 10 years are given to the developing countries in order to acquire the skill effectively. But this plan is not suited to deal with global warming. Reduction of CO₂ and the economical development has strong relationship with each other. Ignoring the difference of economical level between developing countries and set the time lag 15 years will be too shallow.

ii) Divide the countries in three sections by using three criteria; the standard of living, historical responsibility, and the opportunity.

This plan was proposed by Claussen and McNeilly (1998). The first group is "must act now", the second group is "should act now, but differently", and the third group is "could act now". According to them, not all the developed countries belongs to the first group and not all the developing countries does not belong to the first group. This plan is flexible and faire in the sense that they provide three different time lag for the timing as well though considering the present economical condition and the past amount emission.

iii) Make the developing countries to take on their duty when they reached the certain level.

This plan is to set certain level, for example, GDP per capita or emission of CO₂ per capita and when the country reached the level they are to take on their duty. In other words it is called advancement system.

As we mentioned in 3 – 2 – 2, there are many developing countries who have made great progression in economical phase and its economical level has caught up with that of developed countries. In detail, about twenty-five non-Annex I countries have per capita emissions above those of the lowest Annex I Party, about forty such countries have a per capita GDP above that of the lowest Annex I Party.

This plan is effective in the sense that the level is clear and that the equity will be kept. So how will this plan work out? Berk and den Elzen (1998) have assessed the compatibility of such "multistage" approach. They assume that developing countries will take on targets when their per capita income reaches half the 1990 Annex I per capita income. When they reach three-quarters of 1990 Annex I per capita income, it is assumed that developing countries will join the Annex I group. This assessment leads to

the conclusion that the emission pathway leading to stabilization at 450ppm is abandoned in 2020 – even if Annex I country emission were below zero, and the stabilization at 550ppm remains possible, but would leave very little emission space for the whole Annex I. The reason of this conclusion is that major developing countries like China and India would only start participating after the middle of this century.

This plan is practical in the sense that the category of developing countries and developed countries will be looked over by developing countries joining developed countries (Annex I) under the specific level. However, we can see that a per capita income threshold for participating in global emission reduction efforts may result in too long a delay in the participation of non-Annex I regions to meet a desire goals. It is urgent that we come up with the system that would make developing countries being obliged of reduction CO₂.

3-2-4 Our Proposal

Now we have overviewed the alternatives for Timing. Especially, by the assessment of Berk and den Elzen, we find that the major emitters should be obliged to reduce CO₂ even though they are still developing. So, we will propose our new alternative, which combines the proposal of Claussen and McNeilly with the advancement system. To tell in detail, this plan rank countries into three groups like Claussen and McNeilly, and make the second and third groups be taken on duty to reduce CO₂ emissions when their GDP per capita or their CO₂ emission per capita reach a certain level. The point of our proposal is that the historical responsibility is reflected when countries are categorized. Historical responsibility, which is own by many developing countries who have been emitted great amount of CO₂, is reflected to the Timing not to the initial allocation. As a result, we can decide the initial allocation making think of cost and can solve the problem of historical responsibility. It is said that past emission should be reflected to allocation, but we insist that past responsibility should be reflected to Timing.

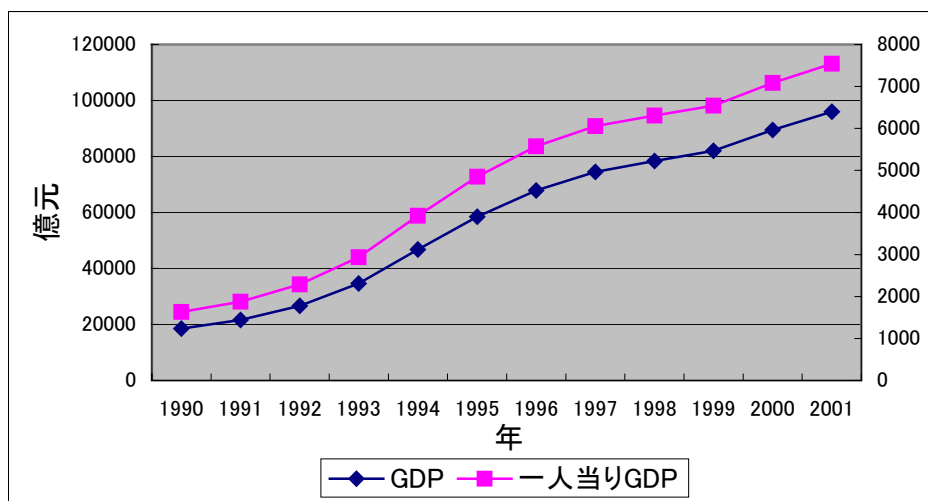
There are three important point what we should confirm; the first point is that will it be fair for developing countries, and the second point is that will it possible to set this approach for those who are major emitters like China even though they are developing countries, and the third point is that will it be possible to check the category of developing countries timely.

First of all, the timing of developing countries who belongs to the second and third group owing reduction duty is after when their some criteria like GDP per capita surpass a certain level. In other words, their obligations come into effect after they have

developed to some degree. So we can say that this plan is fair for developing countries.

Secondly, China, who is exponent of big emitter in developing countries, is probably in Group1. We regard her standard of living as the growth of GDP. The average growth of China's GDP from 1991 to 1995 is 12.0% and that of from 1996 to 2001 is 8.1%, so the growth of GDP is dramatically. Attended by the growth, China's standard of living become high (Chart 9). Next, we compare past emission volume of China with that of UK, who accomplished the first Industrial revolution (Chart 10-1 and 10-2). It is sure that the emission volume from 1840 to 1970 of UK is much larger than that of China, but the increase of China's emission volume after 1970 is dramatically. The recent emission volume of China equals in the whole past emission volume of UK (Chart 10-3 A≐C). Thus, according to the standard of living and the past emission volume, China is probably in Group 1. So this plan can demand the duty from major emitters even they are developing countries. But we should not misunderstand that the countries belongs to Group1 take on the same obligation. We are talking in this section about the timing when she assumes the reduction duty, not about the degree of the duty. The degree of the duty is determined when the initial allocation is decided.

Chart 8 Transition of China's GDP



Source: Statistics Yearbook of China (2002)

Chart 9— 1 Past Emission Volume of UK

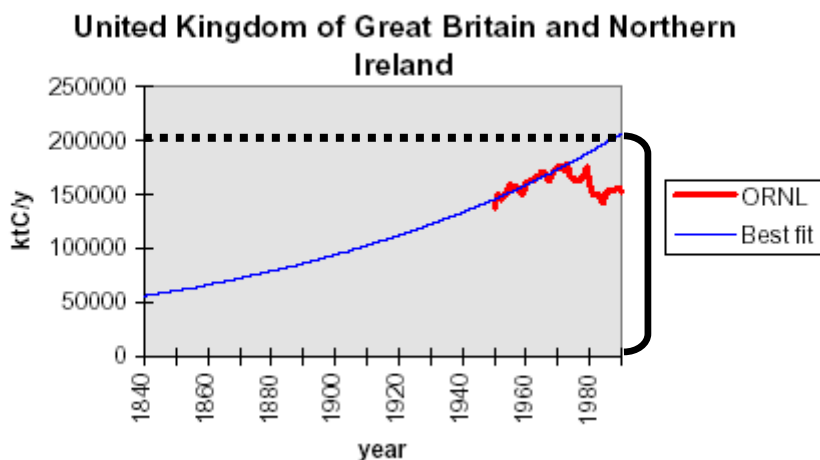


Chart 9— 2 Past Emission Volume of China

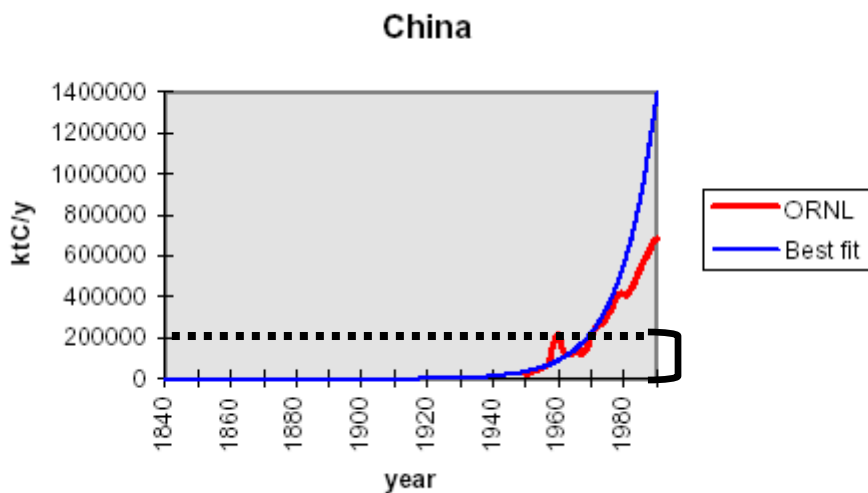
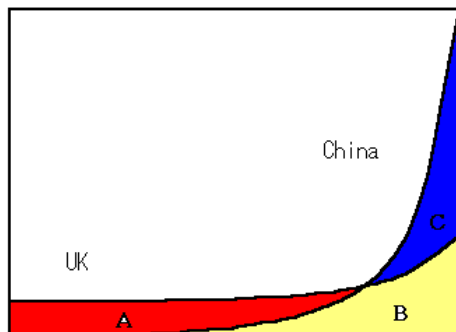


Chart 9— 3 Comparison China with UK



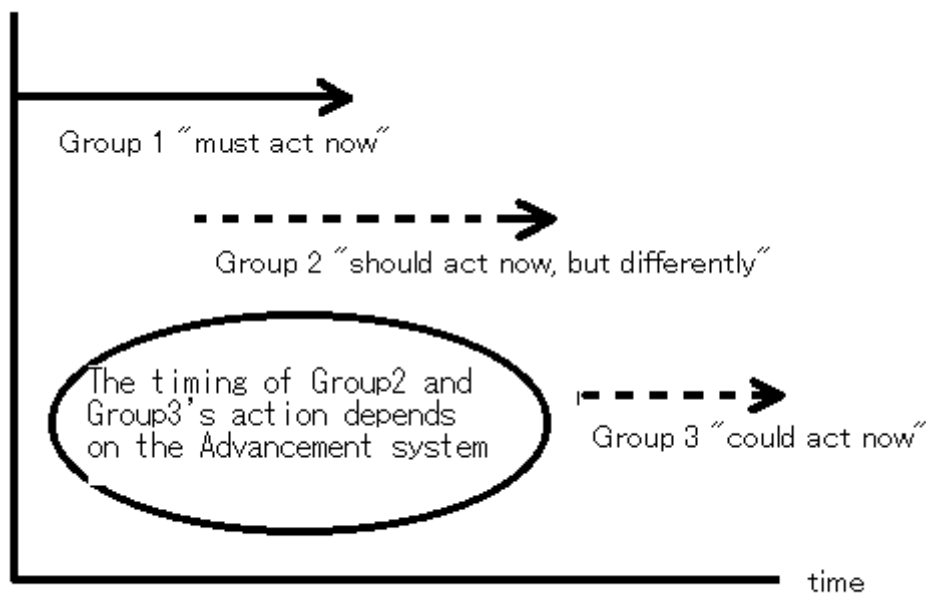
Source: Brazilian proposal

Thirdly, this plan does not divide countries into OECD or not in a hurry. It

categorize countries using several factors which concern with the climate change, and then, it can divide countries more correct because the categorization is reflected on the situation of each country. What is more, in this plan, the countries belong to Group2 and Group3 will have taken on the reduction duty by their level of developing. As a result, it is able to check the content of Group2 and Group3.

So, our proposal covers these three important points. Indeed it is need to think about the setting of standard which use in dividing countries or the advancement system, but we insist that this proposal is very effective in considering the timing when developing countries take on the reduction duty.

Chart 10



3-3 Non-compliance procedure

3-3-1 Introduction

Generally, non-compliance is not to obey an international duty, and in Kyoto Protocol it means failing to reduce GHGs emission obliged to do. From the end of 1980s to the beginning of 1990s, more and more Multilateral Environmental Agreements (MEAs) for protection of global environment have been made. However, the number of countries that complied with their duties has been decreasing in inverse proportion to the number of MEAs established. Under such situation, non-compliance procedure was adopted in Article 8 of Montreal Protocol in 1987 because methods that ensure compliance are needed. Although non-compliance procedure takes two forms; “penalty” or “support”, support for participants is better taking into consideration the attributes of global environmental treaty. Therefore, Kyoto Protocol has a problem, which is going to give participants penalty.

3-3-2 Process of making non-compliance procedure

Toward COP6 (Hague) in 2000, international negotiations had been done to decide specific rules for the use of Kyoto Protocol, namely, Kyoto (flexible) mechanism, sinks, support for developing countries and non-compliance procedure. However, COP6 could not reach a consensus after all, because EU, who insisted on setting a limit to use Kyoto mechanism and sinks that would cause weak domestic measures, opposed to groups including Japan and U.S. who said that such limits should not be taken, and because each country opposed to one another concerning to support for developing countries and non-compliance procedure. In the following year (2001), in COP6 resumed (Bonn) political consensus was formed, and a half year later, in COP7 (Marrakech) rules for the use of Kyoto Protocol “Marrakech Accords” was adopted at last. As follows, non-compliance procedure of Kyoto Protocol has some points to be improved for the following reasons.

3-3-3 Contents of non-compliance procedure

According to Marrakech Accords, non-compliance procedure is as follows: 1) Deduction from the Party’s assigned amount for the second commitment period of a number of tones equal to 1.3 times the amount in tones of excess emissions; 2) Development of a compliance action plan; and 3) Suspension of the eligibility to make transfers under Article 17 of the Protocol until the Party is reinstated (in other words, it means suspension of the eligibility to join emission trading). Taking a glance at these procedures, you will find them punitive to Parties of non-compliance. In other words, it

is “adding insult to injury” for those who have quantified cap. It is effectively impossible to increase participants at present situation where participants have a big burden and non-participants do not have any burden¹.

3-3-4 What non-compliance procedure should be in MEAs

First of all, the perspective of international cooperation is essential when establishing MEAs. If adopting only punishment and penalty for Parties of non-compliance, it is unlikely to reach an international cooperation. As is natural, it is better that the number of participants is large because the effectiveness of MEAs would be limited with small participants.

Second, according to current international adjudication system, only a country that has directly been damaged by a certain country’s non-compliance is allowed to accuse it. Since in global environmental issues there is not a clear distinction between a wrongdoer and a sufferer, it is effectively impossible to give a legal punishment to a wrongdoer. For these reasons above, supportive treatment for Party of non-compliance is better than punitive one in MEAs, and actually supportive treatment such as financial aid and transfer of technology was selected in Montreal Protocol (1987).

Montreal Protocol must have useful suggestions toward Kyoto Protocol, because ozone depletion and global warming is the same in that both are global environmental issues regardless of the difference of their topics. From the viewpoint of solving global environmental issues, in order to ensure that participants will accomplish emission reduction, supportive treatment is better than punitive one.

3-3-5 Deduction of excess amount

There is also a crucial failure in this content; deduction from the Party’s assigned amount for the second commitment period of a number of tones equal to 1.3 times the amount in tones of excess emissions. In short, Kyoto Protocol does not refer when “the second commitment period” is and how much the allocation of the second period is. The rule of deduction of excess amount will be ineffective as long as there is no definition of timing, period and reduction commitment of the second period.

¹ Although there were opinions that non-participants should be punished economically with trade restrictions, such provisions have yet to be added in Articles. Even if such a discriminatory trade measure is added, it would be quite difficult to increase the number of participants as long as not setting cap convincingly to each country.

3-3-6 Interpretation of Article 18 of Kyoto Protocol²

The second paragraph of Article 18 says that amendment is needed to adopt binding measures. Unless amending to current Kyoto Protocol, penalty will never be carried out. According to Article 20, three fourths of participants must accept the amendment. Even if it is feasible, the amended rule will not applied to those who did not accept the amendment. What does it mean? Professor Murase says that it will produce double standards in legal interpretation of Kyoto Protocol because the second paragraph of Article 18 makes the first paragraph mean non-binding and promotive measures. In short, the Protocol before amendment has support whereas the Protocol after amendment has penalty. He insists that such Protocol which has contradiction in its legal interpretation will not work well. Moreover, it may not be feasible to get acceptances of three fourths (about 90) participants. It is doubtful that Annex I countries with tight quantified cap are willing to accept a rule with penalty.

3-3-7 Conclusion

So far, we showed problems of non-compliance procedure in Kyoto Protocol on three points; 1) what non-compliance procedure should be in MEAs, 2) deduction of excess amount, and 3) interpretation of Article 18 of Kyoto Protocol. It is true that non-compliance procedure would be shifted from penalty to support, but we think it impossible in the current framework of Kyoto Protocol³. Only one possibility left is that in brand new regime, different from current Kyoto Protocol, such correction should be done in order to encourage developing countries which do not have obligation now to take part in the regime.

Finally, we have one more thing to add. Surely, non-compliance procedure is one of the biggest problems in Kyoto, but is relatively a small one compared to crucial problems such as initial allocation and participation of developing countries we have mentioned in previous chapters. The biggest problem of Kyoto is that cap was decided only by political agreements, which could force countries to reduce GHGs emissions regardless of its cost and it could be unjustly high.

² Article 18 “The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, approve appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol, including through the development of an indicative list of consequences, taking into account the cause, type, degree and frequency of non-compliance. Any procedures and mechanisms under this Article entailing binding consequences shall be adopted by means of an amendment to this Protocol.”

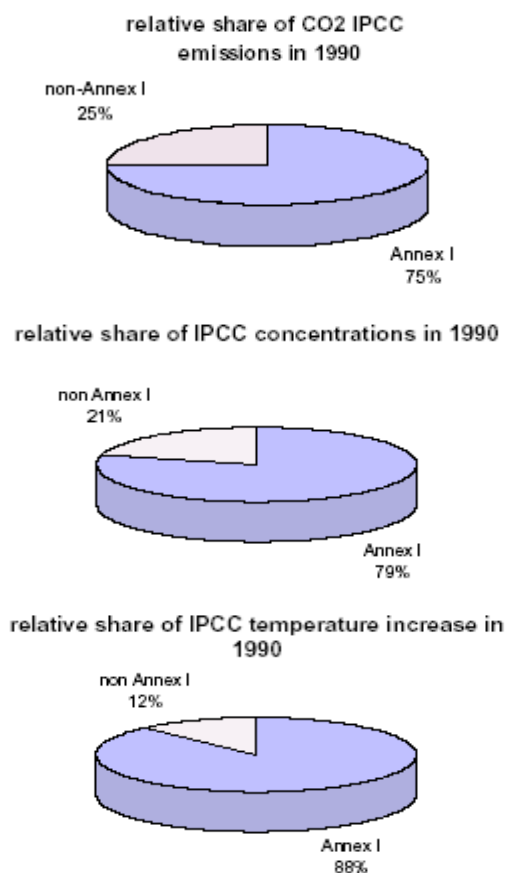
³ Although we have mentioned non-compliance procedure of Kyoto critically, to change its content is infeasible. Marrakech Accords was formed in COP7 as a result of the series of negotiations in COPs. Certainly it is a political consensus of international society.

Chapter 4 Conclusion

We have mentioned about the Post Kyoto Regime. In conclusion, our proposal are that using Cap and Trade, deciding the initial allocation by multi sector approach, introducing the Advancement system, and making non-compliance procedure supportive. We insist these 4 points as new regime for Post Kyoto Regime.

Annex Brazilian proposal

Brazilian proposal was proposed before COP3, and urged for ANNEX1 countries to reduce CO2 emission for 30 % from the level of 1990. Brazilian proposal urged for the country which industrialized earlier to reduce more, and proposed initial allocation. The basis of this proposal is the effect of past emission called “time delay”. Brazilian proposal divided process of global warming into three phase. First, emission. Second, concentration. Third, temperature change. Emission is a phase that CO2 is just emitted. Concentration is a phase that the emitted CO2 is reflected to the density. Temperature change is a phase that concentrated CO2 increase the temperature. See graphs below. The first graph shows relative share of CO2 emission among Annex 1 countries and non Annex 1 countries in 1990. Second graph shows relative share of concentration among Annex 1 countries and non Annex 1 countries in 1990. Third graph shows relative share of temperature increase among Annex 1 countries and non Annex 1 countries in 1990. These graph shows if “time delay” is considered, relative responsibility of Annex 1 countries will increase because of past emission.



These graphs show the basis of Brazilian proposal that the earlier the country

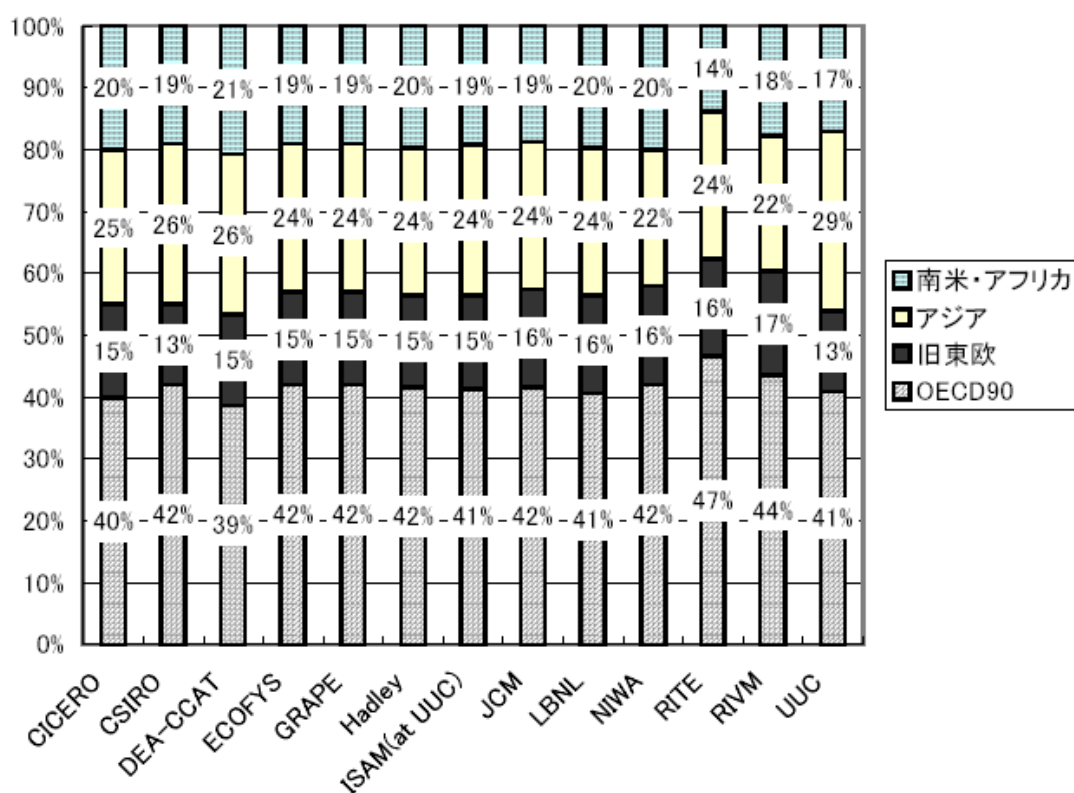
industrialized, the more the country should reduce GHG emission. Original Brazilian is based on this suggestion, and proposed reduction target of each country to reduce CO₂ emission 20% in 2010 from the level of 1990.

Country	Emission reduction in 2010 (as % of 1990 level)	%
United Kingdom		65.99
Luxembourg		43.05
Belgium		38.48
Germany		27.87
Sweden		25.27
Monaco		24.79
France		24.64
United States of America		22.93
Hungary		20.28
Netherlands		18.71
Slovakia		18.11
Czech Republic		18.11
Denmark		17.70
Austria		17.41
Poland		16.49
Canada		15.86
Iceland		15.80
New Zealand		15.75
Ireland		13.58
Switzerland		13.08
Liechtenstein		13.08
Norway		11.92
Lithuania		10.98
Latvia		10.98
Russian Federation		10.98
Estonia		10.98
Australia		10.77
Romania		10.37
Bulgaria		10.27
Finland		10.10
Italy (including San Marino)		9.95
Spain		9.88
Japan		8.79
Portugal		7.71
Greece		6.70

However, Brazilian proposal was rejected because of suggestions from developed countries that data of the proposal is not reliable and the proposal is to blame for their past GHG emissions' negative impact on world climate change when they did not know about the consequences of burning fossil fuels. However, Brazilian proposal was rejected because of the uncertainty of estimation for past emission, and insistences of developed countries that it unfairly punishes the activities of the past when the influence of GHG emission was not known. And, Elzen(the Brazilian proposal and other options for international burden sharing) urged that the proposal is unfair for

developed countries in the point that it uses only CO2 as an indicator. In Elzen's calculation, relative share of CO2 emission of Annex 1 in 1990 is 81.2% and of non-Annex 1 is 18.8%. However, if methane, and nitrous oxide is taken into consideration, the rate will be changed to 61.1% of Annex 1 and 38.9% of non-Annex 1.

As we see above, Brazilian proposal has its significance in proposing the initial allocation thinking about past emission. But it had the biggest problem that uncertainty of past emission is large. Brazilian proposal was proposed in COP8 again, and in that revised proposal, there was an estimation of relative responsibility for global warming from 1890 to 2000 which was calculated by 13 measure institutes in the world. This estimation shows relative responsibility for global warming per region, and emission of CO2, methane, N2O are taken into consideration as indicators. The results of estimations made by 13 institutes have accordance. Responsibility for global warming of OECD countries is approximately 40%, of countries which were once called Eastern Europe countries is 15%, of African countries and south American countries is 20%, and of Asian countries 25%.



Source: FCCC/SBSTA/2002/INF.14.p.7

Through this estimation, Brazilian proposal is now in the spotlight of argument again. It is pointed that the need for reducing uncertainty about data, but it can be said that the proposal made a big progress in the point that it indicated responsibilities for past emission more accurately compared with original Brazilian proposal.

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