

# The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

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## ***Table of Contents***

### **Introduction**

#### **Chapter 1 The necessity of Kyoto Mechanisms for Japan**

- 1.1 Cost-effectiveness of Kyoto Mechanisms
- 1.2 The difficulties of domestic emissions trading
- 1.3 Why the Japanese government should focus on JI and CDM?

#### **Chapter 2 The necessity of the three measures**

- 2.1 Creating the government system of purchasing carbon credits
- 2.2 Establishing project investment funds
- 2.3 Improving of investment environment
- 2.4 Realizing the compliance with the Kyoto target

#### **Chapter 3 The concrete ways to utilize the Japanese public funds**

- 3.1 The concrete structures of the government system of  
purchasing carbon credits and project investment funds
  - 3.1.1 Foreign examples
    - ① ERUPT/CERUPT
    - ② PCF in the World Bank (IBRD)
    - ③ Carbon Funds in international financial institutions
  - 3.1.2 Analysis of options
    - ① Options the Japanese government can take
    - ② Analysis
  - 3.1.3 Proposal
- 3.2 Improving investment environment
  - ① Capacity-building
  - ② Insurance
  - ③ MoU conclusion and utilize NSS

#### **Chapter 4 The issue of funds source**

- 4.1 The scale of the public funds
- 4.2 How to secure the source of public funds
- 4.3 The issue of financial additionality (the problem of diversion of ODA)

### **Conclusion**

### **Annex**

National registry and the compliance with the Kyoto target

### **References**

## *Introduction*

Climate Change has been the common concern of human beings ever since IPCC first assessment report, which indicated its seriousness, was published in 1990. The international community positively reacted to the report by adopting UNFCCC (United Nations Framework Convention on Climate Change) in 1992. The international community continued negotiations on the issue and made great progress. In 1997, the Parties to this convention gathered at the third Conference of the Parties (COP3) held in Kyoto and reached a historical agreement, which would be known as the Kyoto Protocol later. The Kyoto Protocol can be seen as a milestone in the history of international Climate Change negotiations for the following two reasons. First, the quantified emission limitation and reduction commitments were imposed on all Annex I countries. Second, Kyoto Mechanisms were introduced as methods to reduce GHG (Greenhouse Gases) emissions cost-effectively. Kyoto Mechanisms enable Annex I countries to comply with the Kyoto targets by purchasing reduced emissions from other countries or by carrying out GHG reduction projects in other countries, where reduction costs are relatively lower. Although the post-Kyoto negotiations were very difficult, the international community finally agreed on the detail of the Kyoto Protocol at COP7 held in Marrakesh, Morocco. It can be seen in the Marrakesh Accord, which was published soon after the conference.

While the international community has thus moved forward, how has the situation of Japan been like? Japan committed itself to reducing GHG emissions by 6 % relative to the 1990 level under the Kyoto Protocol. It is very important for Japan to reach this target because Japan is responsible for mitigating the impacts of Global Warming as a member of the international community. However, GHG emission of the year 2000 is 8 % bigger than the 1990 level. This means that Japan have to reduce GHG emissions by 14 % compared to the 1990 level in order to achieve the target. Moreover, since Japan has already made many efforts to reduce GHG emissions, the cost of reducing further GHG emissions is very high in the country. These considerations lead to the conclusion that the utilization of cost-effective Kyoto Mechanisms is necessary because the policy that solely depends on domestic measures would certainly incur unacceptable level of damage on the economy. Amongst three mechanisms, JI (Joint Implementation) and CDM (Clean Development Mechanism) need to be promoted first because immediate starts are possible for these project-based mechanisms whereas ET (Emissions Trading) is expected to start in 2008.

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

As the above shows, the promotion of Kyoto Mechanisms with special focus on JI and CDM is necessary for Japan to comply with the Kyoto target. This raises an important question for Japan, which is “What should the Japanese government do to promote JI and CDM? ”. The aim of this paper is basically to answer this question. To say the conclusion first, the Japanese government should actively utilize public funds to promote JI and CDM in the following three ways. First, it should utilize public funds to create the government system of purchasing carbon credits generated from JI and CDM. Second, it should do so to establish project investment funds. Third, public funds should be utilized to improve investment environment. The combination of these specific measures is what this paper proposes.

The argument of this paper is arranged as follows. Chapter 1 will prove more concretely that the promotion of Kyoto Mechanisms with special focus on JI and CDM is necessary for Japan to reach the Kyoto target. Then chapter 2 will discuss that it is important for the Japanese government to utilize public funds in order to promote JI and CDM. The chapter will propose the above three ways and explain how they can promote JI and CDM. The chapter 3 will analyze the concrete structure of the government system of purchasing carbon credits and project investment funds, drawing experience from abroad when necessary. Furthermore, the chapter will discuss what can be done to improve investment environment. Finally, the chapter 4 will deal with the issue of funds source. The use of ODA (Official Development Assistance) will be discussed there.

## ***Chapter 1***

### **The necessity of Kyoto Mechanisms for Japan**

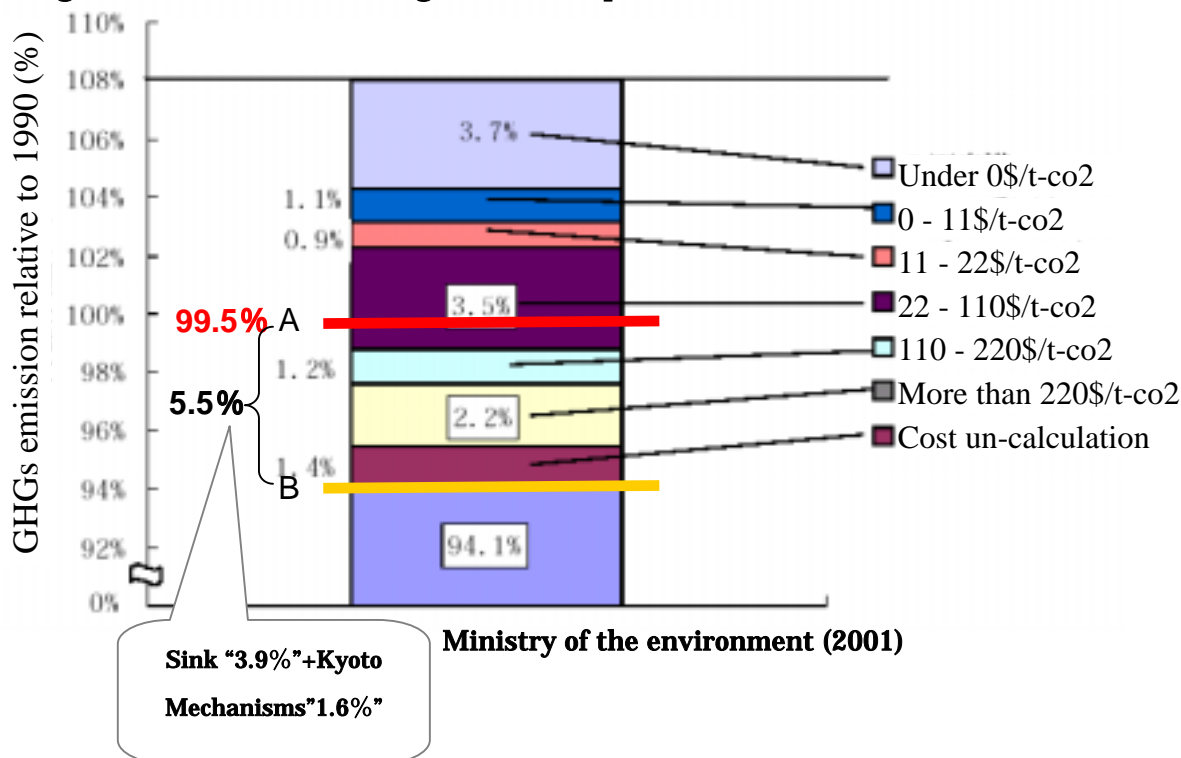
This chapter will discuss why Kyoto Mechanisms are necessary for Japan to comply with the Kyoto target. The section 1 will show that Kyoto Mechanisms are more cost-effective than domestic measures. Then the section 2 will make it clear that the introduction of domestic emissions trading is very difficult. These two sections will prove that Kyoto Mechanisms are necessary for Japan. Finally, the section 3 will argue that the Japanese government should focus on JI and CDM (particularly CDM) among Kyoto Mechanisms for the time being.

#### **1.1 Cost-effectiveness of Kyoto Mechanisms**

The Japanese government estimated that GHG emissions of 2010 would be 8% bigger than that of 1990 in the case that 7 nuclear power stations were newly built by the year 2010 (Ministry of the environment, 2001a). Assuming that this estimation is correct, Japan has to reduce GHG emissions by 14 % relative to the 1990 level, since it has the 6 % reduction commitment compared to the 1990 level under the Kyoto Protocol. According to “the Global Warming Prevention Action Plan” published in 2001, the Japanese government plans to achieve 5.5% reduction by the utilization of sinks and Kyoto Mechanisms (3.9% by sinks and 1.6% by Kyoto Mechanisms, respectively). This means that the remaining 8.5% out of 14 % has to be achieved by means of domestic measures. The figure 1-1 in the below shows the MAC (marginal abatement cost) of reducing GHG by domestic measures. In this figure, the yellow line represents the 6 % reduction commitment. Moreover, the square between the yellow line and the red line represents what sinks and Kyoto Mechanism are supposed to reduce. The remaining 8.5% to be reduced by domestic measures are shown as the square above the red line. The figure says that the MAC of reducing GHG by domestic measures is between 22 to 110US\$/t-CO<sub>2</sub> in the purple area that contains the red line. The MAC gets higher in lower areas and the MAC gets lower in higher areas. On the other hand, the cost of reducing GHG by Kyoto Mechanisms is expected to get between 5 to 11US\$/t-CO<sub>2</sub> before the first commitment period begins (Natsource LLC with GCSI, 2002). As long as the MAC of reducing GHG by domestic measures is bigger than 11US\$/t-CO<sub>2</sub>, it can be said that Kyoto Mechanisms are more cost-effective than domestic measures. Since the Japanese current climate change policy states that domestic measures will reduce GHG emissions by the amount equivalent to the areas above the red line, it is reasonable to

conclude that Kyoto Mechanisms are necessary for Japan to reduce GHG at lower cost.

**Figure1-1 MAC of reducing GHG in Japan**



## 1.2 The difficulties of domestic emissions trading

Domestic emission trade (cap and trade) is very cost-effective way to reduce GHG as well as Kyoto Mechanisms. It is the system that the government allocates the fixed amounts of emission allowances (cap) to private sectors and private sectors can trade them freely. This system has two merits. First, since the government determines the overall amount of emission allowances, the system can certainly reduce the expected amount of GHG. Second, the system enables the government to reach the Kyoto target at minimum cost because the MAC of all the private sectors can be equalized in theory. Those who have relatively lower MAC reduce more than necessary and obtain extra emission allowances. Those who have relatively higher MAC purchase them. If the system works properly, private sectors reduce GHG emissions by the expected amount themselves. Therefore the Japanese government does not need to utilize public funds in order to obtain or purchase carbon credits from abroad. However, it is important to note that domestic emissions trading is not feasible because of the following two main problems. First, the government cannot monitor GHG emissions of all the private

sectors perfectly. Second, since the allocation of emission allowances is something to do with the vested interests of private sectors, it is very difficult to make a consensus on how to allocate emission allowances. It would take a lot of time and money to reach an agreement on this matter. For these reasons, it can be said that domestic emissions trading is not a feasible way to comply with the Kyoto target for the time being. Therefore Japanese government should promote Kyoto Mechanisms by utilizing public funds in order to obtain enough emission allowances.

### **1.3 Why the Japanese government should focus on JI and CDM?**

As the previous sections mentioned, Kyoto Mechanisms are superior to domestic measures in terms of cost-effectiveness. Moreover, Kyoto Mechanisms are superior to domestic emissions trading in terms of feasibility. For these reason Kyoto Mechanisms should be promoted. This section will discuss which mechanisms should be promoted first.

Kyoto Mechanisms consist of three mechanisms, which are IET (International Emissions Trading), JI (Joint Implementation), and CDM (Clean development Mechanism). Among these three mechanisms, IET is likely to have the superiority over the other two mechanisms in terms of cost-effectiveness because the price of carbon credits in the IET market is expected to decline for the following two reasons. First, the U.S, which was supposed to be the biggest buyer in the market, withdrew from the Kyoto Protocol and thus will not participate in the market. Second, the biggest seller of carbon credits, Russia, is expected to increase the supply. As the cost-effectiveness of IET thus increases, the cost-effectiveness of JI and CDM relatively decrease. CDM is particularly costly compared to the other two. AIJ experiences indicate that transaction costs would be very high. Moreover, "share of proceeds" is deducted from issued CER. It includes the financial assistance for developing countries that are particularly vulnerable to Climate Change (2% if issued CER) and the administrative expenses of Executive Board, which supervises CDM.

However, although JI and CDM are less cost-effective than IET, JI and CDM should be promoted for the following four reasons. Firstly, prompt starts are possible for JI and CDM. According to the Marrakech Accord adopted at COP7, JI and CDM projects that start from the year 2000 or later are eligible for approvals. Secondly, JI and CDM themselves can be business chances for private firms. Thirdly, by working on JI and CDM, Japan can deepen the necessary knowledge for carrying out projects. Lastly, if Japan decides to depend solely on IET simply because it is most cost-effective,

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

developing countries would blame Japan. For these reasons, Japan should promote JI and CDM.

Between these two mechanisms, the priority should be placed on CDM for the following two reasons. First, the crediting period of CDM starts from 2000 whereas that of JI starts from 2008. This means that Japan can acquire carbon credits from CDM quite earlier than from JI. Second, CDM can encourage sustainable development in developing countries because it encourages the transfer of technology, of human resources and of funds to developing countries.

The above considerations lead to the conclusion that JI and CDM should be promoted and the priority should be placed on CDM.



## *Chapter 2*

### **The necessity of the three measures**

The chapter 1 showed that Japan need to utilize Kyoto Mechanisms, focusing on JI and CDM, in order to comply with the Kyoto Target. The chapter 2 will argue that the Japanese government should utilize public funds to promote JI and CDM. This chapter will introduce three concrete ways of utilizing public funds. These are the creation of the government system of purchasing carbon credits, the establishment of project investment funds, and the improvement of investment environment. The rest of the chapter will examine how they can promote JI and CDM and how they can realize the compliance with the Kyoto target.

#### **2.1 Creating the government system of purchasing carbon credits**

The government system of purchasing carbon credits is an effective way of using public funds for Japan to comply with the Kyoto target for the following two reasons. First, It can encourage private firms to carry out JI and CDM projects. Second, it can ensure the transfer of ERU and CER to the retirement account (see Annex for the explanation of the retirement account). This section will analyze these two good effects of the system.

This system has the effect of encouraging private firms' participation because it reduces the risk of investing in JI and CDM. Basically, private firms invest only in the commercial-based projects, which are profitable even when they cannot get any revenue from the sales of carbon credits. In other words, they do not invest in the projects, which can be profitable only when they can sell obtained carbon credits, because there is the risk that there would be not buyer for the credits. The government system of purchasing carbon credits can reduce this risk significantly because this system assures private firms that the government will certainly buy the certain amount of credits. Therefore this system can enable private firms to invest in the projects, which can be profitable only when obtained credits are sold. The government system of purchasing carbon credits can thus promote JI and CDM and increase the number of JI and CDM projects. Moreover, if the system is designed in such a way that private firms can know the price of credits before carrying out projects, it can remove the price fluctuation risk as well. JI and CDM can be further promoted in this way. The promotion of JI and CDM leads to the increase in the supply of ERU and CER. This causes the price of carbon credits to decline and makes it possible for the government to purchase them more cheaply. Not

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only the government but also private firms and host countries of projects can obtain benefits. The promotion of JI and CDM itself is the creation of new business chances for private firms. Host countries can benefit from it because JI and CDM encourage the transfer of technology, human resources and funds to them.

Ensuring the transfer of ERU and CER to the retirement account is another good effect of the system. ERU and CER that private firms obtained would not be always used for the compliance with the Kyoto target of the country because private firms can sell the carbon credit to different countries. However, if the Japanese government runs the system of purchasing carbon credits and signed purchasing contracts with private firms, carbon credits will be certainly transferred to the holding account of the government. Unless the government has much more carbon credits than what is needed (this kind of situation is unlikely to happen in Japan), it would not sell them to foreign countries. Then carbon credits will be certainly transferred from the holding account of the government to the retirement account and will be certainly used for the compliance with the Kyoto target.

As the above shows, the government system of purchasing carbon credits can promote JI and CDM. Moreover, the system can ensure the transfer of obtained carbon credits to the retirement account and thus can contribute to the compliance with the Kyoto target. For these reasons, it is reasonable to conclude that Japan should create the government system of purchasing carbon credits, which is a very effective way of using public funds to reach the Kyoto target.

## **2.2 Establishing project investment funds**

Establishing project investment funds is another effective way of using public funds for Japan to comply with the Kyoto target. As well as the government system of purchasing carbon credits, it has the two good effects. First, it can promote JI and CDM by reducing the risk for investors of projects. Second, it can ensure the transfer of ERU and CER to the retirement account. This section will closely look at these two effects to show how project investment funds can help Japan to comply with the Kyoto target.

Project investment funds can promote JI and CDM because establishing them means collecting money that will be certainly as well as solely used for JI and CDM. Moreover, project investment funds can reduce the project failure risk because invested money can be distributed to several projects. For example, even if the project, which had been utilizing forest to absorb CO<sub>2</sub>, failed as a result of unexpected forest fire, investors can obtain carbon credits from several other projects. Projects investment funds can thus reduce the risk for investors and encourage their participation. JI and CDM can be

promoted in this way as well.

Another good effect of project investment funds is that they can ensure the transfer of ERU and CER to the retirement account. Since the government can invest public funds in project investment funds, it can obtain the corresponding amount of carbon credits. These carbon credits will be transferred to the holding account of the government, and eventually to the retirement account. Thus project investment funds can contribute to the compliance with the Kyoto target.

### **2.3 Improving of investment environment**

In addition to the above two ways, the government should utilize public funds to improve investment environment for the purpose of encouraging private firm's participation in JI and CDM. Capacity building and concluding Memorandum of Understanding (MOU) are the examples of concrete measures. These measures can promote JI and CDM projects by private firms because they can reduce various kinds of risks and eliminate barriers to carrying out projects. Chapter 3 will discuss this issue in more detail.

### **2.4 Realizing the compliance with the Kyoto target.**

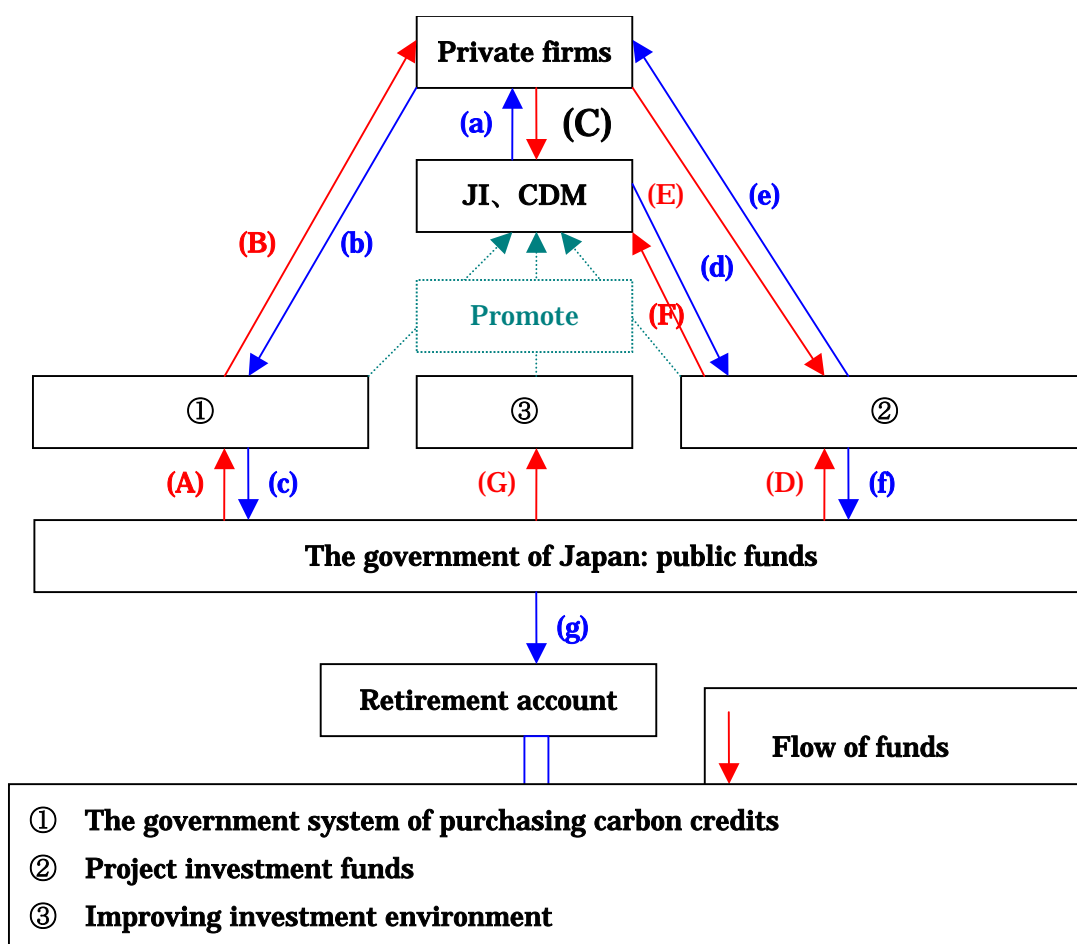
As the above three sections show, the government can promote JI and CDM by utilizing public funds. Moreover, it can make the compliance with the Kyoto target more certain by doing so. This section will visualize these arguments to summarize the previous and to enable better understanding of the proposal. The figure 2-1 in the below shows three concrete ways of using public funds and how they can realize the compliance with the Kyoto target. In the figure and in the below, the government system of purchasing public funds, project investment funds and improving investment environment are represented by ①, ②, and ③, respectively. The figure tells that these three ways can promote JI and CDM by reducing various kinds of risks. Furthermore, it says that ① and ② certainly bring obtained carbon credits to the holding account of the government. These credits will be eventually transferred to the retirement account and used for the compliance with the Kyoto target.

The figure 2-1 explains the detailed flow of funds and carbon credits. The alphabets written in blue and red in the following sentences are equivalent to those in the figure. The flow of funds and carbon credits for ① is as follows. First, the government prepares public funds for purchasing carbon credits (A) and makes purchasing contracts with private firms (B). Private firms invest in JI and CDM projects (C) and obtain carbon credits (a). Based on purchasing contracts made in

Kyoto Mechanisms Group  
The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

advance, private firms sell carbon credits to the government (b). The government thus can obtain carbon credits (c). When it comes to ②, the flow of funds and carbon credits is a little more complicated. The government invests in established investment project funds (D). Private firms can invest as well (E). Collected funds are used to finance JI and CDM projects (F). After these projects finished, carbon credits are obtained (d). These credits are allocated to the government (f) and to private firms (e), depending on how much they invested. In addition to ① and ②, public funds are utilized to improve investment environment (G). The aim of this is to further promote JI and CDM projects. The carbon credits that the government obtained through ① and ② are transferred to the retirement account after the commitment period (g) and are used to reach the Kyoto target. This is the overview of what this paper proposes.

**Figure 2-1 The flow of funds and carbon credits**



## ***Chapter 3***

### **The concrete ways of utilizing Japanese public funds**

The chapter 2 made it clear that the Japanese government needs to utilize public funds for the following three measures in order to promote JI and CDM and to comply with the Kyoto target, which are creating the government system of purchasing carbon credits, establishing project investment funds, and improving investment environment. This chapter will carry out in-depth analysis of these measures. The section 1 will examine the concrete structures of the first two measures, drawing experiences from abroad. The section 2 will discuss what has to be done to improve investment environment.

#### **3.1 The concrete structures of the government system of purchasing carbon credits and project investment funds**

One of the most important criteria when designing the structure of the above two ways of utilizing public funds is cost-effectiveness. This is because they are unlikely to be adopted if they are not cost-effective. This section will introduce and analyze the foreign example of the above two ways first. Then the section will propose the concrete scheme to obtain carbon credits for Japan

##### **3.1.1 Foreign examples**

- ① ERUPT/CERUPT
- ② PCF in the World Bank (IBRD)
- ③ Carbon Funds in international financial institutions

###### **① ERUPT/CERUPT**

ERUPT/CERUPT are the Dutch government systems of purchasing carbon credits generated from JI and CDM in different countries through international tenders. The target projects of ERUPT and CERUPT are JI and CDM, respectively. The institution to operate tenders is the governmental organization called Senter Internationaal. The responsible institutions for ERUPT and CERUPT are the Ministry of Economic Affairs and the Ministry of Environment, respectively. Tenders have been carried out twice for ERUPT (ERUPT2000, ERUPT2001) and once for CERUPT (CERUPT2001). The result of ERUPT2000 has been already made public

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

and the Table3-1 shows this. The results of ERUPT2001 and CERUPT2001 will be publicized at the end of this year<sup>1</sup> (project selection process is underway).

**Table 3-1 The result of ERUPT2000**

Types of projects	Firms to implement projects	Host countries	Offered volume of ERU (t -CO <sub>2</sub> )	Total amount of purchase (EUR)	Prices (EUR/ t -CO <sub>2</sub> )
Biomass Energy Portfolio	BTG Biomass Technology Group B.V.	Czech Republic	MAX) 1.2M	10.8M	9
			MIN) 0.52M	4.7M	
Wind Power Farm	NUON International Projects BV	Poland	583,500	5.25M	9
Hydro Power Plant	United Power Company	Romania	612,631	3.06M	5
Municipal Cogeneration	N.V. Nuon Warmte	Romania	1,536,140	13.94M	9.08

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<sup>1</sup> The Dutch government expects to acquire 3.9 million t-CO<sub>2</sub> in ERUPT2000. It aims to acquire 10 million t-CO<sub>2</sub> from both ERUPT2001 and CERUPT2001. Moreover, it opens the third tender for ERUPT from 24<sup>th</sup> of October 2002 until 30<sup>th</sup> of January 2003.

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The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

The biggest merit of this system is that the Dutch government can minimize the purchasing cost through international tenders. The government can select cost-effective ones from a number of offers made from all over the world. The purchasing price of carbon credits in ERUPT and CERUPT proves this merit. The average price of carbon credits was 8.02 EUR/t-CO<sub>2</sub> in ERUPT2000 and was 5 EUR/t-CO<sub>2</sub> in ERUPT2001. The U.S withdrawal from the Kyoto protocol is likely to have contributed to the decline in the price of carbon credits. In CERUPT, the maximum bid prices are set in advance, depending on the types of projects<sup>2</sup>. The highest maximum price is set for renewable energy (excluding biomass) projects and it is only 5.5 EUR/ t-CO<sub>2</sub>. These prices are far lower than the marginal abatement cost (MAC) of domestic measures in Netherlands. Moreover, these prices can compete against expected price of carbon credits traded in the international emissions trading market in the future. Therefore it can be said that that the Dutch government acquires carbon credits very cost-effectively by utilizing this system.

②PCF in the World Bank (IBRD)

PCF stands for Prototype Carbon Fund. It is the pilot model of project investment fund managed by the World Bank. The aim of this is to activate the international carbon credits market. The structure of PCF is as follows. First, the World Bank collects funds from governments and private firms in various countries. Then it invests these funds in “relatively low-profitable” GHG reduction projects<sup>3</sup>. Obtained carbon credits are distributed to investors in accordance with how much they invested. It is a kind of the trust fund. The World Bank had received 135 million dollars until the first investing period finished in April 2000 and started PCF. In the March of 2002, 6 governments or governmental organizations and 17 private firms invest 145 million dollars in the fund<sup>4,5</sup>.

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<sup>2</sup> The maximum prices are as follows.

· Renewable energy (excluding biomass)	EUR 5.50
· Energy production by using biomass (excluding waste)	EUR 4.40
· Energy efficiency improvement	EUR 4.40
· Others, among which fossil fuel switch and methane recovery	EUR 3.30

<sup>3</sup> In PCF, fund manager is supposed to invest in “relatively low-profitable” projects. “Relatively low-profitable” projects are those than can be profitable only when obtained carbon credits are sold. Private firms are not willing to carry out this type of projects individually. Therefore, PCF is needed to promote this kind of projects.

<sup>4</sup> Investors of Japan are as follows. JBIC(Japan Bank for International Cooperation), 6 electric power companies, Mitsui Corp and Mitsubishi Corp. Investors of other countries are the governments of Canada, Netherlands, Finland and so on.

Kyoto Mechanisms Group  
The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

The biggest merit of investing in this fund is that investors can acquire carbon credits cost-effectively. The World Bank has a great deal of know-how, information and a number of talented people concerning GHG emissions reduction projects. These have been accumulated by GEF's emission reductions projects<sup>6</sup>. Therefore the World Bank can find cost-effective projects. Moreover, the World Bank succeeds in reducing the price of obtained carbon credits and making them competitive in the market by investing in various types of cost-effective projects in various areas<sup>7</sup>. The World Bank reduces transaction costs by binding complicated procedures for several JI and CDM projects. The World Bank aims to provide carbon credits at 3 \$/t-CO<sub>2</sub> (not commitment). If the credits are provided at this price, the government that invests 10 million dollars in PCF can acquire more than 3 million t-CO<sub>2</sub>. Like this, it is expected that the cost-effectiveness of acquisition of carbon credits in PCF is very high, so the demand for PCF's services is quite large. Taking that into account, the World Bank have decided that it will extend the size of the fund to 180 million dollars, and extend the period of activity to accomplish projects portfolio.

③ Carbon Funds in international financial institutions

Finally we will explain the carbon funds similar to PCF. As we mentioned above, the World Bank (especially GEF) has already obtained a lot of know-how, information and talented people concerning the emission reduction projects, therefore it can provide investors with credits competitive in price. So, to put it the other way around, if the funds are established in international financial institutions that have know-how and excellent fund managers who can find cost-effective projects, they may acquire the credits competitive in price. Actually, based on this idea<sup>8</sup>, some carbon funds were (will be) established in international financial institutions.

(1) The case of multiple investors in a fund

We can take EEERF as an example of this case. EEERF stands for

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<sup>5</sup> It is decided that one unit of investment is 10 million dollars for the government and 5 million dollars for private firms.

<sup>6</sup> GEF stands for Global Environment Facility. GEF is the organization in the World Bank. It has invested in many projects since 1992 based on the Article 4 of UNFCCC in order to preserve global environment and promote sustainable development in developing countries.

<sup>7</sup> The World Bank can reduce risks concerning acquisition of credits by investing in various types of projects in various areas.

<sup>8</sup> Of course, PCF was also established based on this idea.



**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

Dexia-FondElec Energy Efficiency and Emissions Reduction Fund. This is the fund to invest in mainly energy-saving projects in the East European countries, with which Dexia (the financial institution in France), FondElec (the investment firm in United States) and EBRD (European Bank for Reconstruction and Development) are now establishing cooperations. The maximum size of this fund is approximately 150 million EUR. Dexia and EBRD invest 20 million EUR each and 4 Japanese firms invest 31 million EUR (PCF also invests in this fund).

The merit to invest in this fund is, unlike PCF, that investors may obtain both the commercial profits and carbon credits generated from projects at the same time. For originally the sources of funds in EBRD are often investments from the private sector, and they are the ordinary investment funds which aim at commercial profits and think much of returning them to investors. Indeed, EBRD declares that it invests in the projects whose internal rates of returns (IRR) is more than 15%. Moreover, EBRD has much know-how and the like accumulated by ESCO<sup>9</sup> business EBRD has made an effort at, and it can provide not only commercial profits but credits competitive in price by utilizing them.

However, there is a point to take heed of. At a glance, it seems cleverer to invest in EEERF than in PCF because of two distributions (commercial profits and carbon credits). But credits are not always issued in the projects invested in by EBRD and returns of credits are not always made. For EBRD invests in “relatively high-profit” projects and there is some probability for the projects to be judged disqualified as JI/CDM in terms of financial additionality by the host countries or Independent Entities/Operational Entities. As a matter of course credits cannot be issued in the projects disqualified as JI/CDM. So, investors (especially who expects the returns of credits) should recognize this risk.

**(2)The case of one investor in a fund**

Secondly, we will show the examples in this case. This is the case that a certain government for itself negotiates with international financial institutions, establishes the carbon funds with the government’s investment and the know-hows of the institutions combined and acquires credits generated in projects. In particular, the Dutch government has established (or is establishing now) funds in some institutions already and contracted with them to acquire credits. The

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<sup>9</sup> ESCO stands for Energy Service Company. This is the company which makes consultation concerning energy-saving.

Kyoto Mechanisms Group  
The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

Dutch government to date has contracted with IBRD<sup>10</sup>(International Bank for Reconstruction and development), IFC (International Finance Corporation) and CAF (Andean Development Corporation), and aims at acquisition of 16 million t-CO<sub>2</sub>, 10 million t-CO<sub>2</sub> and 10 million t-CO<sub>2</sub> respectively. Of course, it doesn't always acquire the target volume of credits, but will be able to acquire plenty of credits.

Moreover, the Dutch government is under negotiations with ADB (Asian Development Bank) for a new contract alike, aims at 15 million t-CO<sub>2</sub> there. In ADB, the know-how and the like accumulated by ALGAS (Asia Least-cost GHG s Abatement Strategy), which is the research about the potentials in emission reduction and the cost-effectiveness of various projects in 12 countries of Asia from 1996, seem to contribute to provision of credits competitive in price. In addition, ADB now promotes the program to introduce the technologies for energy efficiency and renewable energy in Asian countries, called REACH<sup>11</sup> (Renewable Energy, Energy Efficiency and Climate Change Program). Therefore it is considered that the advantages to cooperate with ADB as a strategy for acquisition of credits will be larger and larger.

As shown above, there are some options to procure credits put into practice abroad. Next, taking them into account, we will take options available, analyze them and propose the system the Japanese government should take.

### 3.1.2 Analysis of options

#### ① Options the Japanese government can take

4 options below for the Japanese government to acquire credits are can be thought of.

- (i.) Creating the Japanese purchasing system through tenders like ERUPT/CERUPT
- (ii.) Establishing such a carbon fund as PCF in Japan and raising investments from some governments and private firms
- (iii.) Establishing new funds in international financial institutions individually or with some other governments and private firms
- (iv.) Investing more in PCF

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<sup>10</sup> The Dutch government invests in IBRD, which is different from the investment in PCF.

<sup>11</sup> REACH's program includes capacity building in developing countries. And it consists of cooperation funds from 3 countries —Netherlands, Canada and Denmark.

Kyoto Mechanisms Group  
The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds

We refer to the option (iv) here. As mentioned above, the Japanese government has invested in PCF already. However, PCF is originally the pilot model of carbon funds on purpose of activating the carbon credits market, and has announced that it will withdraw from the market. So there is a little possibility for PCF to raise investments additionally<sup>12</sup>, but here we add (iv) to options assuming that PCF will raise investments continuously.

## ②Analysis

Firstly, to evaluate options in terms of the cost-effectiveness in acquisition of credits, (i)(iii)(iv) are desirable. In thinking about (i), we can refer to the tenders in the Netherlands. In ERUPT2001 where the tender was implemented after the retirement of the United States from Kyoto Protocol, the average price of offered credits is 5 EUR/t-CO<sub>2</sub>. Meanwhile in CERUPT, where the maximum prices of credits are set in advance depending on the types of projects, even the highest price is 5.5 EUR/t-CO<sub>2</sub>. The maximum prices are those which the Dutch Ministry of Environment decided taking into account the price information which it had the American company Natsource expect (The Netherlands (2002) p.51). Considering that, we can say that it would not be impossible for the Japanese government to purchase credits at about 5 \$/t-CO<sub>2</sub><sup>13</sup> with the tender system created in Japan. On the other hand, we can also point out that in that case there is a possibility that the price of credits rises in competition with ERUPT/CERUPT. However anyway, the prices of purchasing through tenders seem to be much lower than the MAC in domestic measures of Japan —90 \$/t-CO<sub>2</sub> by IPCC Third Assessment Report. Next, in thinking about (iii), we can refer to the material about the Dutch fund in IFC. The Dutch government seems to be able to purchase credits at 4 \$/t-CO<sub>2</sub> averagely (The Netherlands (2002) p.52). But, the prices of credits are different depending on where to establish carbon funds, so the option (iii) is not always desirable. And, thinking about (iv), we can say that this option is desirable judging from the merits of PCF and the target price (3 \$/t-CO<sub>2</sub>). On the other hand, in thinking about (ii), we can refer to the report on Feasibility Studies the Japanese government has made to date. For example, from the report of “Feasibility Studies for the Purpose of Promoting

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<sup>12</sup> However, there is a possibility for PCF to raise investments continuously. Actually the World Bank has decided that it will enlarge the size of the fund and prolong the period of activity. Moreover, it has also decided to establish CDCF (Community Development Carbon Fund) in cooperation with IETA (International Emissions Trading Association) as a new carbon fund similar to PCF. The maximum size of this fund is approximately 100 million dollars, and investors can get returns of credits. Like this, the World Bank may offer the opportunities to acquire credits afterwards.

<sup>13</sup> The value of Euro is nearly equal to US dollar (1.01 Euro/USD: 10<sup>th</sup> November 2002).

Basic Survey Projects to Prevent Global Warming” which NEDO<sup>14</sup> implements, we can grasp that cost-effectiveness of projects is low (see the Table 3-2). If Japan could not find cost-effective projects as shown in the report, this option would be in vain. Consequently, judging from figures above, we think the Japanese government should take options ( i ) (iv) primarily and (iii) secondarily at present<sup>15</sup>.

**Table 3-2 The cost-effectiveness in “Feasibility Studies for the Purpose of Promoting Basic Survey Projects to Prevent Global Warming” in 2001**

Price \$/t-CO <sub>2</sub>	1~10	11~100	100~1000	1000~10000	More than 10000
Number of Projects	1	12	27	4	1

Made from Feasibility Studies for the Purpose of Promoting Basic Survey Projects to Prevent Global Warming (2001)

The second, to evaluate options in terms of the risk in acquiring credits, c have an problem. In these options, the utilization type of public funds is investment. In investment, which differs from financing, investors receive returns that vary with results of projects. So there is a risk that returns the government receive will be small if the projects invested in don't go well and don't generate so much credits. On the other hand, in ( i ), there is not such a risk because prices are decided in advance, or the government can reduce such a risk by setting the system of penalties<sup>16</sup> in preparation for the failures in projects. This way of thinking is conservative, but it is true that ( ii )(iii)(iv) have a problem in terms of the risk. Consequently ( i ) is superior to the others.

Finally, to evaluate options in terms of the technological transfer to developing countries, 4 options all are effective because they contribute to promotion of projects not a little to bring about the technological transfer. However, the effect in (iv) is much larger than the others. As mentioned above, PCF invests in “relatively low-profit” projects, so the projects which private firms would not implement without PCF are likely to be implemented. These projects are welcomed by

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<sup>14</sup> NEDO stands for New Energy and Industrial Technology Development Organization.

<sup>15</sup> If the know-how and the like to find cost-effective projects are accumulated in Japan in future, the option ( ii ) will be effective.

<sup>16</sup> There is also a system of penalty in ERUPT/CERUPT.

developing countries. Consequently Japanese government needs to take (iv) prior to the others in this view. The result of this analysis is described in the Table 3-3.

**Table 3-3 The result of analysis from three points of view**

	( i )	( ii )	( iii )	( iv )
<b>Cost-effectiveness</b>	○	?	△	○
<b>Risk</b>	○	△	△	△
<b>Technological transfer</b>	○	○	○	◎

### 3.1.3 Proposal

To take analysis above into account, it is effective for the Japanese government to utilize public funds for the option ( i )(iv). However, it depends on the judgment of the World Bank whether the Japanese government can invest in PCF or not<sup>17</sup>, so there is no relying on PCF for a long time. Therefore we think that the Japanese government should take ( i ) as soon as possible. Of course it can take the others at a time, but at present we think the priorities of each options are turns as follows ( i ) > (iv) > (iii).

Now, there is another problem here. That's the problem of sources of public funds. The Japanese government must raise it for the purpose of utilizing effective options. In chapter 4, we will address this problem.

## 3.2 Improving investment environment

Two proposals for promoting CDM were mentioned in the previous section. One is that the Japanese government should create the government system of purchasing carbon credit like ERUPT/CERPT. The other one is that the Japanese government should invests more in PCF or establishes other carbon funds. Next we propose what

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<sup>17</sup> As mentioned above, PCF has announced that it will retire from the market in future.

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

the Japanese government should do, which is to exclude uncertain factors and to improve investment environment. The uncertain factors include lack of the certain organizations that can supervise projects, lack of technologies for monitoring and calculating GHG emissions. In this section, we will explain capacity building, insurance, NSS and MoU to exclude these uncertain factors.

**(1) Capacity-building**

Capacity building can remove barriers when carrying out CDM. For examples, a project cannot proceed if there are no organizations that can supervise project. And if there are no technologies of monitoring, a planning of a project cannot be made. The Japanese government should exclude those barriers by capacity building and should make private sectors promote projects. According to UNFCCC (United Nations Framework Convention on Climate Change), the Conference of the Parties shall develop, periodically update, and publish national inventories of anthropogenic emissions (UNFCCC article 4). And many developing countries have not had environments for this inventory. As the result, UNFCCC also prescribe that developed countries to improve capacity building. Concrete examples of capacity are education, training, awareness, institutional design and technological-assistance. Table 3.2 shows barriers and capacity when carry out CDM.

**Table 3-3 Barriers and capacity when carry out CDM**

sector	barriers	Capacity which is necessary removed difficulty	Capacity building
Industry	The attention of the consumer toward a waste attitude	The ability which reviews the control system	Information exchange, education.
Finance	Lack of the financial service	The ability which provides a financial service.	Investment fund
Industry support	Lack of technological skillful person's.	The ability which develops a training material about a saving of energy	Training. Rising of the research program.
government	A political and economical un-stability	Ability which plans saving energy policy	The establishment of the cooperation system between the government

IDCJ (International Development Center of Japan) (2000)

Capacity-building is a precondition for purchasing carbon credits and investing carbon funds. And insufficient capacity-building cause projects failure, then the Japanese government hardly compliance under Kyoto Protocol. Using ODA funds for capacity-building is possible unlike promoting JI/CDM. So the Japanese government should improve capacity-building positively and hastily.

But, because that general idea of capacity-building is not clear, developing countries tend to require capacity-building beyond the necessity, and hard to find whether it is capacity-building or investment in CDM projects. The Japanese government also should clarify the general idea of capacity-building.

## **(2) Insurance**

Private sectors take too many risks of project failure. For example, natural disasters such as forest fire and earthquake cause failure of projects. In a developing country it is rare to enough regulate environment against natural

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

disasters, so those risks are larger than developed countries. Furthermore political instability has the possibility that breakout of war in a host country and not ratifies Kyoto Protocol. Even if a project is progressing smoothly, those risk cause project failure. Use of insurance under the government leadership can reduce those risks. The Japanese government should recommend private sectors to take insurances.

**(3)MoU conclusion and utilize NSS**

The Japanese government should remove the barriers and risks from different angles before projects promotion. MoU stand for Memorandum of Understanding. MoU conclusion builds cooperation relations between the governments about the information exchange in advance. The Netherlands has already had a MoU conclusion with some host countries for the JI/CDM project promotion. As for CDM promotion, the use of NSS (National Strategy Study) program which provide a research analysis for CDM promotion by the World Bank is useful, too. NSS provide a capacity-building assistance to the JI/CDM host countries. NSS address the issues of assessment of the potential of GHGs reduction amount and costs, the candidate of the concrete project and those priorities. NSS was completed in Indonesia, Thailand already at the present, and the Japanese government should use this knowledge actively. Now, NSS is carried out by the World Bank and the Government of Switzerland, Germany, Australia, Finland, Austria and Canada. And we should consider that Japan cooperates with NSS in the future.



## ***Chapter 4***

### **The issue of funds source**

Above chapters, we had concretely mentioned it is important for Japan to utilize Kyoto Mechanisms to compliance with Kyoto target though using public funds. That is creating the purchasing carbon credits system, investing more in PCF or establishing other carbon funds, and improving investment environment though using public funds. Next problem is how to secure the source of the public funds to utilize Kyoto Mechanisms. In this chapter, we estimate the necessary scale of the public funds simply first. Then, we describe that how to collect enough funds. And finally, we mention problem of ODA diversion which much discussion happen in Japan at present.

#### **4.1 The scale of the public funds**

Estimating the scale of the public funds is needed before examining how to secure the source of the funds. We tried to estimate two cases. First case is the entire of Kyoto Mechanisms use based on the Global Warming Prevention Action Plan are purchased. Kyoto Mechanisms use is 1.6% in 6% reduction relative to 1990 to compliance under Kyoto Protocol. And the amount of GHG emissions of Japan in 1990 which to be baseline is 1.23billion ton-CO<sub>2</sub>. Multiply 1.6% and 1.23billion ton-CO<sub>2</sub> together, the credits to purchase become 19.7million ton-CO<sub>2</sub>. The second case is imitated Dutch climate policy. Dutch announced that half of GHGs reduction was utilize by Kyoto Mechanisms (VROM web site). This case half of the amount of GHGs reduction decided by Kyoto Protocol are purchased as utilize of Kyoto Mechanisms. In Japan, the 6% reduction relative to the 1990 must be achieved and GHG emissions increase 8% in 2000. Totally 14% reduction must be achieved during the period from 2000 to end of first commitment period. In this case, Japan purchase 7% (half of 14% reduction) of 1.23billion ton-CO<sub>2</sub>, namely 86 million ton-CO<sub>2</sub>

On the other hand, the Kyoto Mechanisms costs were expected between 5US\$ and 11US\$/t-CO<sub>2</sub>, and 9US\$/t-CO<sub>2</sub> as current best estimate of average by the first commitment period (Natsource LLC with GCSI, 2002). So, we tried to calculate the scale of the funds about two cases by 3 pattern of 5, 9, 11\$/t-CO<sub>2</sub>. Table 4.1 shows result of calculation.

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

**Table 4.1 The scale of the public**

GHG emissions in 1990 (baseline): 1229million ton

The total ODA amount in 2000: 13.5billion US\$

case1

Purchasing credit:  $1229 \times 0.016 = 19.66$ million ton

CO2 trading cost	Expense required	Ratio of Expense required per ODA
(\$/t-co2)	m\$	
5	98.3	0.73
9	176.94	1.31
11	216.26	1.6

case2

Purchasing credit:  $1229 \times 0.07 = 86.03$ million ton

CO2 trading cost	Expense required	Ratio of Expense required per ODA
(\$/t-co2)	m\$	
5	445.98	3.16
9	774.19	5.47
11	945.96	7.01

This table indicates the fund scale to utilize Kyoto Mechanisms is smaller than Japanese ODA in 2000. Because the value of this table is for one year, and the first commitment period has 5 years (2008-2012), the maximum about 4.8billion US\$ is necessary for compliance under Kyoto Protocol.

## 4.2 How to secure the source of public funds

It can think about the use of the general finances, ODA (official development assistance) funds, and carbon tax to secure the source of public funds. As for ODA, according to Marrakech Accord, CDM should not be to result in the diversion of ODA (Decision 17). And that has been causing many dissections. We examine about ODA diversion details by the next clause.

The source of the funds can be secured by lowering the ground element of ODA without reducing the total amount of ODA. But lowering the ground element will entail much international criticism. Dutch did not utilize ODA for Kyoto Mechanisms, and ERUPT/CERPT were utilized by general finances. But, both realizations that using a general finances and using ODA under the present Japanese severely financial

conditions are difficult. We think that the recombination of a tax and a subsidy that already exists and the carbon tax are comparatively easy to introduce, and are effective measures in the long run. If a carbon tax 24\$ / t-C is introduced, the Japanese government acquire revenues of 7.3 billion US\$ (ministry of the environment 2001). Of course, there are many difficulties to introduction carbon tax as well. Whichever introduced, the scale of the credit purchase is not big compared to total amount of ODA as we had shown above. The Japanese government should consider the influence of the economy and realization of introduce measures. And the Japanese government also secures the source of the funds by combining these measures.

### **4.3 Financial additionality (The problem of the diversion of ODA)**

ODA (Official Development Assistance) is the financial assistance given by developed countries to developing countries. Its aim is to contribute to economic growth and to improve education and welfare in developing countries. If the Japanese government uses a part of ODA for JI or CDM projects, the amount of ODA that can be used for the purpose of development assistance such as the prevention of infectious diseases and the construction of schools and hospitals would be reduced. Since the priority is placed on economic growth and the elimination of poverty rather than combating Global Warming in developing countries, they are against the diversion of ODA for the purpose of stopping Global Warming.

However, the Japanese government wants to utilize ODA for JI and CDM because it is very useful funds source. The amount of Japanese ODA in 2000 is about 13.5 billion U.S dollars. Assuming that Japan decided to achieve 1.6% out of 6% reduction commitment by utilizing the international emissions trading and the price of carbon credits there is 10US\$/t-CO<sub>2</sub>, only 6 % of ODA of the year 2000 is needed. A huge amount of ODA is an attractive funds source for Japan.

The diversion of ODA is a big issue. As the above shows, there is a conflict on this issue. However, there is no international consensus on the definition of the diversion of ODA. Obviously there is a lot to talk about this issue. The section will discuss the issue of the diversion of ODA, in other words the issue of financial additionality.

The conclusion of this paper on this issue is that ODA should not be used for JI and CDM. It can be used for capacity building because the international community agreed on the use of ODA for this purpose. The rest of the section will explain how the author reached this conclusion.

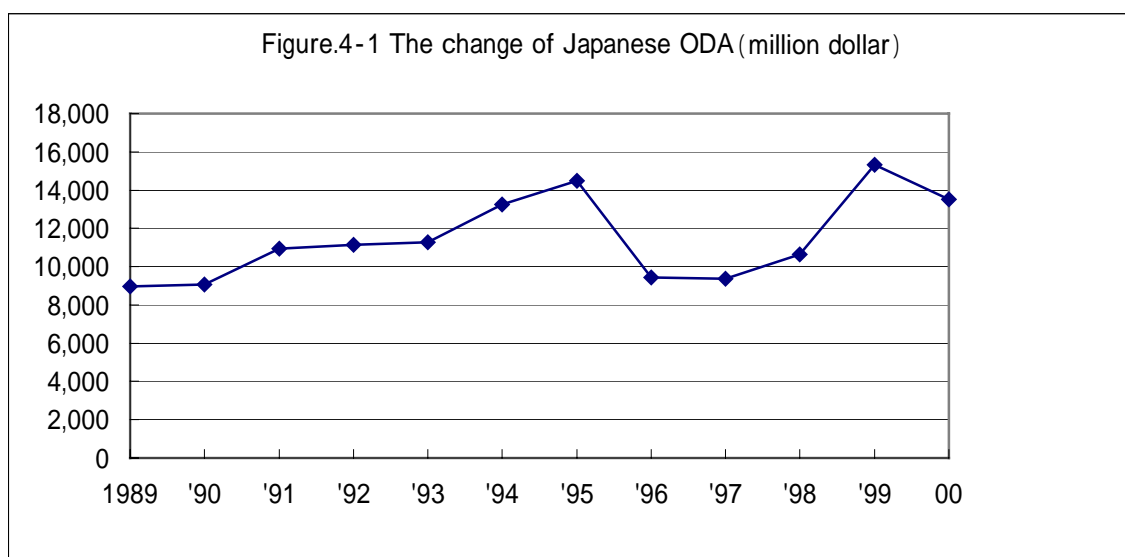
As "Decision 17/CP.7" of the Marrakesh Accord adopted at COP 7 in states that

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

“ . . . public funding for clean development mechanism projects from Parties in Annex I is not to result in the diversion of official development assistance . . . ” , the diversion of ODA has been already prohibited. However, there is no agreement on the definition of the diversion of ODA. This is the problem.

The question is “What is the diversion?” Is it the diversion to utilize a part of ODA, which is newly added to the existing amount? Or, is it the diversion to create new funds for JI and CDM by decreasing the amount of ODA? In order to determine what is the diversion and what is additional, setting the baseline is definitely required. However, determining the baseline is not an easy task for Japan.

One candidate for the baseline is the amount of ODA in the certain years. However, the amount of ODA fluctuates every year (see figure 4-1). It would decrease in the near future because of the huge dept facing the Japanese government. In this kind of situation, it is very difficult for Japan to set the amount of ODA in the certain years as the baseline because it cannot satisfy every country.

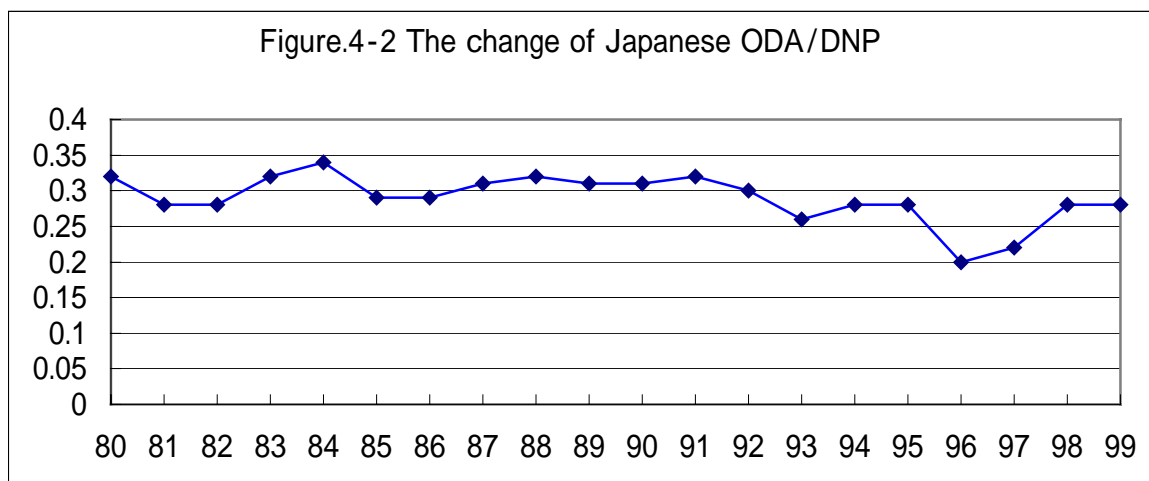


Made from ODA home page

Another possible baseline is the ratio of ODA to GNP. The most appropriate ratio would be 0.7% because this figure is internationally recognized. In this case, if the amount of ODA is 0.8% of GNP, 0.1% is recognized as “additional” to the baseline and thus can be used for whatever purposes including JI and CDM. However, the reality is that only four countries have higher ratios in 2000. These are Denmark (1.06%), Netherlands (0.84%), Norway (0.80%), and Luxembourg (0.71%). Japan has the ratio of only 0.28%, which is much lower than 0.7%. As the table 4-2 shows, the highest ration of Japan for the past 20 years mounts up to only 0.35%. Therefore it is very difficult for

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

Japan to reach the ratio of 0.7% in the near future. It can be said that Japan cannot claim additionality with this baseline.



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As the above argued, there is not baseline that is favorable for Japan and can satisfy every country at the same time. Therefore, if the Japanese government utilizes ODA for JI and CDM and insist that it is not the diversion, it would no be able to get international understandings. This is a huge risk. Moreover, Japan is the only one country that insists the use of ODA. This is a huge disadvantage for Japan

There is another risk to deal with when carrying out projects. Projects need to be approved by both an investing country and a host country. Moreover they should be validated by operational entities. When Japanese private or public entities carry out a project, an investing county is of course Japan. The government of Japan is likely to approve the project even if ODA is utilized. Moreover, there are some possibilities that a host county approves such a project even though the majority of people are against the utilization of ODA. This is because a host country wants more financial assistance, necessary knowledge to set up the institutional framework for JI and CDM, and human resources. On the contrary, an operational entity is unlikely to validate such a project because allowing the utilization of ODA would decease its credibility and the credibility of JI and CDM. An operational entity would not take a huge risk for Japan. For this reason, projects that are partly or fully financed by ODA are unlikely to generate any carbon credits.

To sum up, Japanese government has two risks to take when utilizing ODA for JI and CDM. The first one is that the international community would criticize Japan for the use of ODA at the stage of budgeting. The other one is that operational entities

**Kyoto Mechanisms Group**  
**The Effective Utilization of Kyoto Mechanisms for Japan with Public Funds**

would not validate any projects financed by ODA. Therefore the Japanese government should not utilize ODA for JI and CDM projects. ODA should be used only for capacity building. However, since there are some difficulties in finding other funds source such as negotiation with interest groups, ODA will continue to be an attractive funds source. Therefore Japanese government should continue to negotiate on the issue of the diversion of ODA.

**In The Marrakesh Accords**

“Emphasizing that public funding for clean development mechanism projects from Parties in Annex I is not to result in the diversion of official development assistance and is to be separate from and not counted towards the financial obligations of Parties included in Annex I ”

**Quoted from The Marrakesh Accords**

## ***Conclusion***

We had described what Japanese government should do to compliance under the Kyoto Protocol above. In short, the main issue is to utilize Kyoto Mechanisms thought using public funds positively. In the body we emphasized concretely that need of: 1. creating the purchasing carbon credits system, 2. investing more in PCF or establishing other carbon funds, 3. improving investment environment.

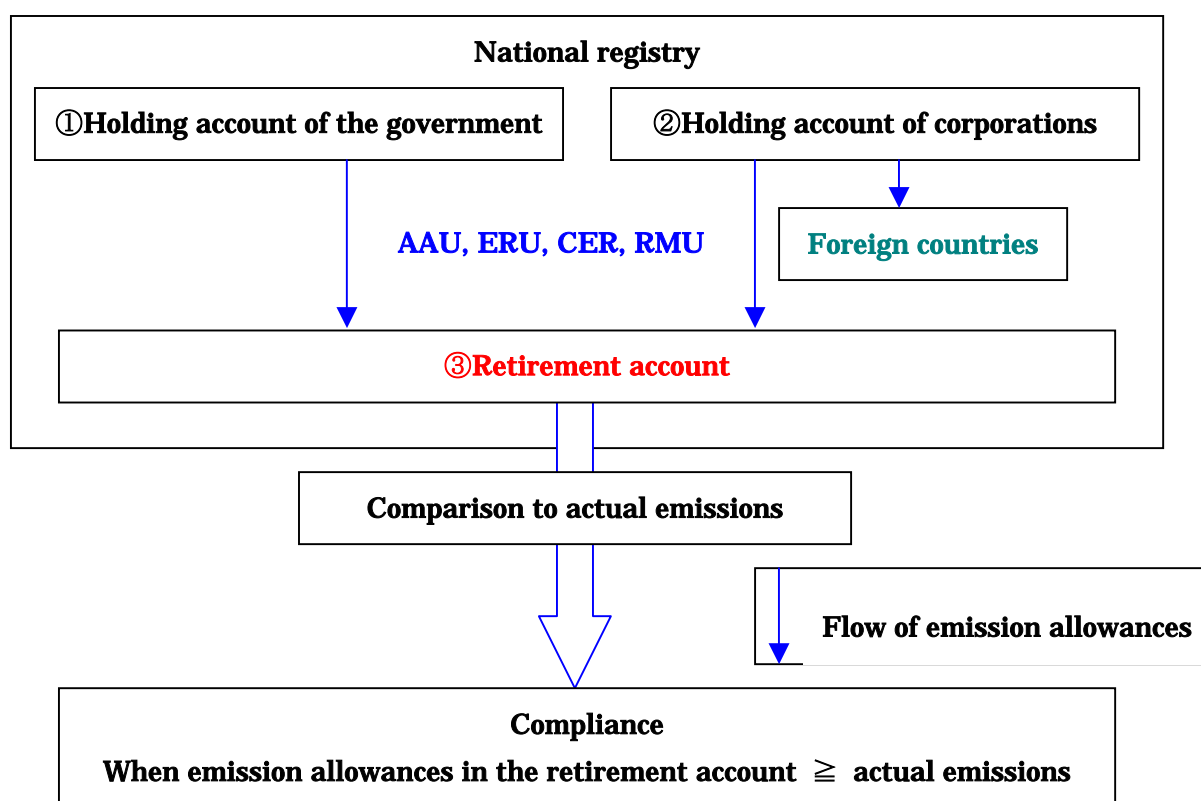
But, Kyoto Mechanisms are just before really starting, and many problems about the system of Kyoto Mechanisms haven't been settling yet. And, there are many uncertain factors such as the amount of hot air supplied, the total amount of ERU/CER, result of the next the US presidential election. All of those international situations are connected with the Japanese profit directly through Kyoto Mechanisms. Even as those conditions, the Japanese government should decide the policy to compliance under the Kyoto Protocol hastily.

The global warming is the problem which influences all over the world and will influences a generation in the future. It is the duty of the Japanese governmental that conduct the private sectors into the sustainable society. We should carefully see what happen to the future.

## *Annex*

### **National registry and the compliance with the Kyoto target**

It is the obligation of Annex I countries (countries that have the quantified emission limitations and reduction commitments under the Kyoto Protocol) to set up and properly run national registries. Any kinds of emission allowances including ERU and CER will be put into and managed there. The figure in the below shows the simplified structure of a national registry. It shows that there are two kinds of holding accounts in a national registry: One is for the government and the other is for corporations. Emission allowances obtained by the government or corporations are put into and kept in corresponding holding accounts. There is another type of account called the retirement account in a national registry. It is used to judge whether a country complies with the Kyoto target or not. If the amount of emission allowances in the retirement account is smaller than actual emissions, the country is judged that it has emitted more GHG than what is permitted to emit and thus fails to comply with the Kyoto target. Therefore it is very important to ensure the transfer of carbon credits to the retirement account in order to have more emission allowances than actual emissions there.





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## Web pages (Organization in Japan)

GISPRI (Global Industrial and Social Progress Research Institute)

<http://www.gispri.or.jp/>

International Trade Insurance Group <http://www.jmcti.org/hokeng/index.html>

Ministry of Economy, Trade and Industry of Japan <http://www.meti.go.jp>

Ministry of Foreign Affairs of Japan <http://www.mofa.go.jp>

Ministry of the Environment of Japan <http://www.env.go.jp>

NEDO (New Energy and Industrial Technology Development Organization)

<http://www.nedo.go.jp/>

Nippon Export and Investment Insurance <http://nexi.go.jp/index.html>

The World Bank Office in Tokyo <http://worldbank.or.jp>

The Institute of Energy Economics, Japan <http://eneken.iecej.or.jp/>

## Web pages (Organization abroad)

ADB (Asian Development Bank)

<http://www.adb.org/default.asp>

CAF (Andean Development Corporation)

<http://www.comunidadandina.org/ingles/who/caf.htm>

IFC (International Finance Corporation)

<http://www.ifc.org/>

PCF (Prototype Carbon Fund)

<http://www.prototypecarbonfund.org/splash.html>

Senter Internationaal

<http://www.carboncredits.nl>

The Ministry of Environment of Netherlands (VROM)

<http://www.vrom.nl/international/>

The World Bank <http://worldbank.org/>

UNFCCC (United Nations Framework Convention on Climate Change)

<http://unfccc.int/>