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EMISSIONS TRADING**

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Proposal of Upstream Emissions Trading in Japan

by

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FOREWORD

This paper was prepared by Hidenori Niizawa (Institute of Economic Research, Kobe University of Commerce, Japan), Tatsuyoshi Saijo (Institute of Social and Economic Research, Osaka University) and Akinobu Yasumoto (Global Industrial and Social Progress Research Institute) for the OECD Global Forum on Sustainable Development: Emissions Trading and Concerted Action on Tradeable Emissions Permits (CATEP) Country Forum, held at the OECD Headquarters in Paris on 17-18 March 2003. The aim of the Forum was to bring representatives from OECD and non-OECD country governments together with representatives from the research community, to identify and discuss key policy issues relating to greenhouse gas emissions trading and other project based mechanisms for GHG emission reduction, such as Joint Implementation and the Clean Development Mechanism. The Forum also aimed to promote dialogue between the various stakeholder groups, and discuss policy needs in the design and implementation of tradeable emissions schemes. Forum participants included representatives from OECD and non-OECD governments, as well as from the research community. Those from industry and other institutions involved with emissions trading, joint implementation and clean development mechanism projects such as the European Commission and the World Bank were also represented.

The OECD Global Forums are one of the two pillars of the new architecture of the Centre for Co-operation with Non-Members, agreed upon by the Committee on Co-operation with Non-Members. The Global Forum on Sustainable Development (GFSD) provides a mechanism for achieving the OECD Ministers' outreach objective and will complement other work on sustainable development. Within the organisational framework of OECD, the GFSD will aim to facilitate a constructive dialogue between non-member and OECD economies on key issues on the sustainable development agenda.

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The ideas expressed in the paper are those of the author and do not necessarily represent the views of the OECD or its Member Countries.

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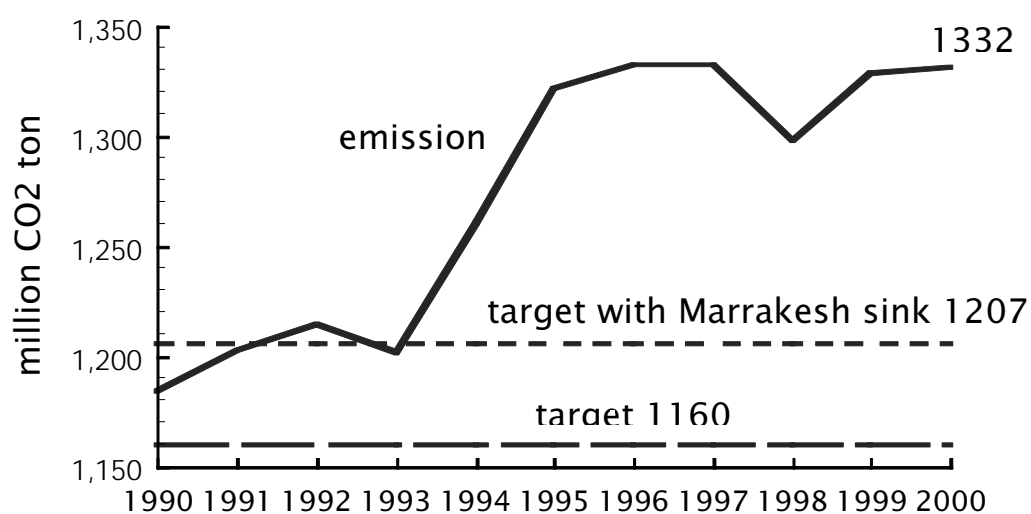
1. INTRODUCTION

Japan ratified the Kyoto Protocol in June 2002. The target for Japan is 94% of baseline emissions, that is 1160 million tonnes CO₂. The Marrakech Accords gifted us with 47 million CO₂ tonnes of sinks. Greenhouse Gas (GHG) emissions have increased since 1990 as shown in Figure 1. It was 1332 million tonnes CO₂ in 2000, which is 8% higher than that in 1990.

We must reduce emissions by 125 million tonnes CO₂, which is hard to achieve. The Cabinet revised the Guideline for Promotion of Measures to Prevent Global Warming in March 2002. The Guideline lists several measures to reduce GHGs emissions. There are, however, no new policies except the amendment of the Energy Saving Law. The Energy Saving Law regulates the energy efficiency of electric equipments, cars, large factories, and large buildings. Although the Law has been contributing to the improvement of energy efficiency, GHG emissions are still increasing because activities themselves are increasing. If we could achieve the target, it should not be the result of the policy but because of economic recession. The Guideline suggests neither how much we should use the Kyoto Mechanisms, nor whether we should use hot air through the international emissions trading. It will be revised again if GHG reductions until 2004 are not enough to achieve the target.

The energy policy was also revised in 2002. It decided to increase the share of natural gas use, as well as to impose a tax on coal. The new law for the promotion of renewable energy will be enforced in April 2003, which obliges electricity generators to use renewable energy.

Figure 1: GHG Emissions in Japan



Last July, the formal domestic approval process for joint implementation (JI) and the Clean Development Mechanism (CDM) was established. The Ministry of Foreign Affairs will take on the negotiations with host countries.

Who will make use of CDM and JI? As there is no legal obligation for private entities except the Energy Saving Law at present, the purpose of using JI and CDM for current participants is limited to an insurance or speculation against uncertain future obligations. Our government has not decided to use tax money for purchasing Emission Reduction Units (ERUs), Assigned Amount Units (AAUs), and Certified Emission Reductions (CERs) like the Netherlands. As the scale of individual JI/CDM projects is not large, we need to introduce emissions trading if we wish to rely a lot on the Kyoto Mechanisms.

Currently, the Kyoto Mechanisms have several risks. First of all, the Protocol may not go into effect. The international price for AAUs depends on the behaviour of Russia. The supply of AAUs by Russia depends on Russia's anticipation of the international AAU market in the future. If Russia anticipates that the price of AAUs goes up, Russia may not supply AAUs so much because she can carry them over. The interim as well as permanent role of our government related to the Kyoto Mechanisms has also been discussed. The general conclusion is that some risks related to the Kyoto Mechanisms should be absorbed by the government.

2. SOME POLICY PROPOSALS

Before we outline our proposal, we refer to some proposals which we don't agree with. In comparing policies, we should have a fixed emission target. If the target is loosened, then the cost of achieving it becomes smaller. We should choose the policy which can achieve the target with the minimum cost.

2.1 Carbon Tax

The carbon tax is an efficient policy, but cannot control emissions directly. The employment of a carbon tax will make Japan's achievement of the target uncertain.

2.2 Low Level Carbon Tax and the Kyoto Mechanisms

The revenue from the low level carbon tax on total emission is used to buy AAUs, ERUs and CERs internationally. The purpose of the tax is to raise revenue. As we mentioned at the beginning, we must reduce about one tenth of emissions in 2000. The carbon tax ratio which is needed to raise enough revenue to buy AAUs, ERUs and CERs of the one tenth of the emission is one tenth of the international price. If the marginal cost for GHG emission reduction in Japan is higher than the international price of AAUs, this scheme could reduce the cost of Japan. But we don't think all of the low-cost reduction options in Japan have been exhausted. The carbon tax which is lower than the international price of AAU will be expensive for Japan because it does not motivate the remaining low-cost domestic reduction options and therefore it obliges us to buy AAUs, ERUs and CERs too much. Moreover, the increased demand of AAUs, ERUs and CERs of Japan will make those prices higher (Saijo and Yasumoto 2002).

2.3 The Energy Saving Law

The Law is aimed at improving energy efficiency in Japan, not controlling total GHG emissions. For example, the emissions from cars are dependent on the fuel economy, the mileage of each car and the number of cars, while the Energy Saving Law regulates fuel economy only. It cannot be said that the cost of improving fuel economy by 5% is always cheaper than the cost of reducing mileage by 5%. The improvement of fuel economy contributes rather to increase the mileage of each car and the number of cars. This story can also be applied to electric machines. In the case of the energy efficiency for production, the cost to improve efficiency by 5% may be higher than the cost to reduce production by 5%. There is no reason to exclude the cheaper options. The policy of reducing the total emissions is more efficient than the policy of improving efficiency alone to achieve the same amount of reductions.

We should think about what would happen if the mileage of each car, the number of cars, the number of electric machines and their operation, and the time of using a shower are to be regulated. It is nothing but a controlled economy!

2.4 Voluntary Action and Emissions Trading

Keidanren's voluntary action is a unilateral action. This voluntary action is based on the threat that a carbon tax would be imposed if industrial sectors do not implement reduction voluntarily. If it is to be adopted in the future, the sectors which have achieved their targets will certainly be exempted from the carbon tax. Then, such unilateral voluntary action will quite reasonably become an agreement between industrial sectors and government. This agreement will include strict monitoring processes and a penalty on the non-compliance. Emissions trading may be applied on the tax-exempted sectors because their targets are not necessarily efficient. This is the exact course which the UK has experienced. The problem which the UK faces now is caused by inconsistencies between a sector-wide (umbrella) agreement and emissions trading. We know that the sector-wide agreement is changing to individual agreements in the UK. Such individual agreements are nothing more than a regulation. The problem of this downstream emissions trading is that it covers only large sources.

3. OBJECTIONS TO EMISSIONS TRADING

Some industrial sectors, such as electric machinery, are trying to practice internal emissions trading. Most of the industrial sectors, however, are opposed to emissions trading, calling emissions trading a "controlled economy." We refute this objection, saying that emissions trading does not restrict production but emissions, and that they may buy allowances if they want. This counterargument may not satisfy them. Their objection is based on concerns about the price level of allowances as well as AAUs and risks related to the Kyoto Mechanisms. If allowances and AAUs can be purchased at a reasonable price, emissions trading would not constrain our economy.

They also complain that emissions trading is unfair. They are complaining because they will be forced to buy AAUs from countries that are technologically less efficient than Japan. The reason why such countries keep using less efficient technologies is that their energy prices are relatively low. The Kyoto targets could have been set to upset their international comparative advantage in energy supply. The comparative advantage of such countries could have been reduced by setting hard targets. However, the actual Kyoto targets are far from that. The Protocol has set a hard target for Japan, whose energy prices and efficiency

are already high. This is the result of negotiation. International trade should be based on the difference of production costs, which is also true for international emissions trading. Those that can reduce GHG emissions at lower costs should be the seller of AAUs.

4. PROPOSAL OF UPSTREAM EMISSIONS TRADING

Importers of fossil fuels should hold allowances to sell them in Japan. Such allowances can be traded. If we start upstream emissions trading early, for example from 2005, the total issuance of allowances will be reduced gradually from business-as-usual (BAU) emissions so that the price of allowances will go up gradually. The price of allowances will be shifted to those that demand fossil fuels. The increase in the price of fossil fuels will reduce their demand. The combustion of fossil fuels occupies 93.7% of total CO₂ emissions. HFCs, PFCs and SF₆ will also be included in this scheme because they are produced intentionally. The GHG emissions which cannot be monitored upstream are not included in this scheme.

We have an experience of upstream emissions trading under the Montreal Protocol. The Montreal Protocol limited the production of Ozone Depleting Substances (ODSs). The Protocol allowed the trading of the production allowances of ODSs internationally.

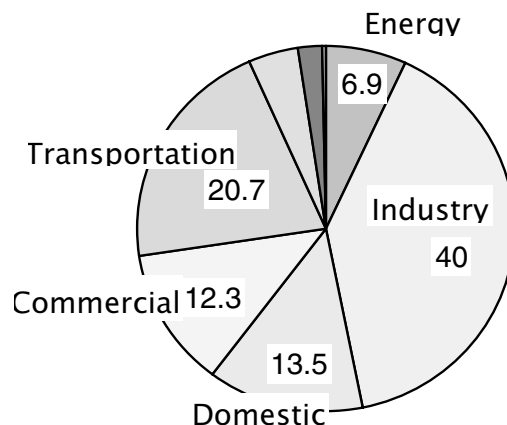
The major advantage of the upstream emissions trading is that it can control most sources including small sources as well as moving sources like cars. The monitoring cost will not be so high because the number of fossil fuel suppliers is about 300 in Japan. As in most European countries, the emissions from the domestic sector and the transportation sector are increasing in Japan. The broad coverage of sources means effectiveness, certainty and efficiency of the policy.

Some people misunderstand that the demand of fossil fuels will not decrease because price shifting is limited. They confuse this issue with a carbon tax. Both a carbon tax and upstream emissions trading use a price mechanism. The important difference of an upstream emissions trading scheme from a carbon tax is that the amount of allowances for selling fossil fuels is limited by the authority. The price of allowances will necessarily increase until the demand for fossil fuels matches with the restricted supply.

There is uncertainty in the price increases of allowances and fossil fuels. It may be reckless for a government to implement such a policy. The authority can control the price of allowances until 2007 by adjusting the amount of allowances. If the amount of allowances equals the amount of BAU emissions, the price of allowances will be zero. Before 2008, the authority will adjust the amount of allowances based on the economic fluctuations. When the business is good, more allowances will be issued to prevent a price rise. When the business is dull, the authority will buy allowances. The price of allowances in 2008 must be equal to the international price of AAUs in 2008.

The authority should adjust the amount of allowances based on the observation of the allowance prices of the UK and European Union (EU) markets. The price of allowances on and after 2008 should be equal to the international price of AAUs. The Kyoto Protocol and the Marrakech Accords do not prohibit trading AAUs - to be assigned for 2008 and after - on the international market in the period before 2008. It will promote the early price formation of AAUs. The authority can use the price as a target price for allowances.

Figure 2: CO2 Emission by Sectors in 2000



The allowances should not be allocated for free. There are two reasons. Firstly, importers of fossil fuels may get a windfall profit by the regulation because of the increase in the price of fossil fuels. Bovenberg and Goulder (2001) analysed the distributional implication of upstream emissions trading with US data. The supply of fossil fuels is regulated by allowances. That results in losses for upstream supply firms. On the other hand, the price of fossil fuels will rise with the regulation. The total impact of the regulation depends on the two effects. They concluded that if all allowances are allocated for free, upstream firms will receive a huge profit. That is, upstream firms will be over-compensated. Only a small part of allowances should be allocated for free to compensate the loss of upstream firms. The remaining allowances should be auctioned. Goulder (2002) analysed the impact of upstream emissions trading on downstream firms. Upstream emissions trading will raise the prices of fossil fuels, causing losses for downstream firms. Goulder supposed that the auction revenue is used to reduce the industry-specific corporate tax on downstream firms. He concluded that only a small part of the auction revenue is enough to compensate the downstream firms. The both results depend on assumptions on the US economy. The crucial assumption is that the upstream firms can shift a major part of their costs to downstream firms and that downstream firms can shift their costs to consumers. We are not sure whether those crucial assumptions are appropriate for the Japanese economy or not. Major competitors of Japanese industry including the US and China have not made commitments to reduce GHG emissions. It means our industry cannot shift the burden in the international market. We are going to analyse this issue.

Secondly, we should care about the revenue recycling effect and the tax interaction effect (Goulder 2000). All existing taxes cause economic losses. The revenue from an allowance auction can be used to reduce the distortionary taxes. Many European countries are realising the revenue recycling effect associated with environmental taxes.

The idea of upstream GHG emissions trading is not new. For example, Canada investigated this option in a discussion paper¹. The paper concluded that upstream emissions trading is the most efficient policy. The latest Climate Change Plan for Canada, which was published in 2002, however, proposes downstream

¹ A Discussion Paper on Canada's Contribution to Addressing Climate Change, 2001.

emissions trading². The EU and UK have employed downstream emissions trading with allowances allocated for free. We understand that downstream emissions trading with grandfathering is favoured by downstream firms. Our interest is whether the same distributional situation can be achieved by upstream emissions trading.

Several people insist that the Kyoto Protocol is flawed because it requires parties to accept the impossible obligation of controlling total GHG emissions. It is possible, however, to control almost all emissions through upstream emissions trading.

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