The Emission Trading and Integration of the Voluntary Approach to the Legal System in Europe[1)]

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Abstract

Quantitative goals for the reduction of global warming gases were decided in Kyoto Protocol. Three kinds of economic instrument by Kyoto mechanisms (emission trading, joint implementation, clean development mechanism) were introduced as policy means which could realize the reduction target. However, developing countries opposed the Kyoto mechanisms, and the negotiations had rough going. In the meantime, movements that integrate the voluntary approaches to the legal system in the field of environmental policy have recently begun to come out of Europe. This paper surveys the present state of Voluntary Approaches in Europe and related countries, and analyzes the relation to emission trading as found in the Kyoto mechanism.

Keywords: Kyoto Protocol, Kyoto mechanisms, emission trading, joint implementation, clean development mechanism, voluntary approach

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Contents

1. Introduction

The 3rd Session of the Conference of the Parties (COP3) to the United Nations Framework Convention on Climate Change (UNFCCC) was held in Kyoto in December 1997, when the interest was collected in the global warming problem, and "Kyoto Protocol" was adopted. In Kyoto Protocol, mutual agreement was obtained like the following on emission problem of the global warming effect gases of developed countries (Parties included in Annex I of UNFCCC). (1) The emission reduction object gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6)[2]. (2) Standard year of the emission reduction target: 1990 (HFC, PFC and SF_6

2) On the basis of the strength with which they warmed the atmosphere, these gases were converted into quantities of the carbon dioxide. The amount of increase and reduction were the calculated in terms of the total value.

are 1995). (3) The handling of the carbon dioxide absorbents: greenhouse effect gas absorption that increases as a result of activities such as new tree planting, replantation forest and forest decline after 1990 are deducted from emission totals. (4) The first target phase: 2008 from 2012. (5) The reduction target: in respect of artificial gross emission of object gas of whole developed country. The target for the first phase (mean value of the emission in the phase) is a reduction of 5.2% on average in comparison with the standard year. The numerical target, which differs by reduction target of each country, reflects present state of economic society[3]. (6) Banking: reductions which exceed the reduction target (superfluous reductions) maybe added to the reduction which is necessary during the target period after the next, if the emission falls further than the allotment during the target phase. (7) The cooperative achievement of multiple countries (bubble): it is considered achieving the target if the gross emission of related countries participating in the bubble falls below the sum total quantity of the allotment of each country (For example, EU). Agreement was also reached on "Flexible Mechanisms (the Kyoto Mechanism)" such as "emission trading (ET)", "Joint Implementation (JI)"and "Clean Development Mechanism (CDM)[4]".

In the meantime, Taiwan is not a member country of the United Nations or other relevant international organizations. However, the international environmental movement cannot help but have a large impact on Taiwan, which is highly dependent on international trade. Taiwan's Environmental Protection Agency (TEPA) has therefore put forward the following policy concerning

3) The emission of the greenhouse effect gas must be reduced in the whole world in order to check the global warming phenomenon. Moreover, it is necessary to continuously maintain the reduction effort for over 50 years. It is also essential that emissions from the developed countries be reduced, if the rapid economic development of developing country is taken into consideration.

the Kyoto Protocol of UNFCCC. (1) They worry about classifying Taiwan as a Party to the Annex I. (2) The international society will not agree Taiwan has been treated as well as developing countries. (3) As a "Newly Industrialized Country" which has established an industrialized base, Taiwan should rationally share the burdens of global warming effect gas reduction[5]. (4) Regarding the target of the reduction of the CO_2 emissions of Taiwan, the TEPA takes 2000 to be the standard year, and it envisions emissions in 2020 to be 90% of that base (Chen, 1999).

However, the policies of TEPA were based on the conclusions of "The National Energy Conference". Fundamentally there has been little or no progress in the policy of the global warming problem in Taiwan, and the problem has remained[6]. Especially, CO_2 emissions reduces only to 297 million

4) (1) Emission trading: The system which adds the excess reductions to other developed country at (in the compensation) transfer and reduction of handed over country it achieved the emission reduction, as some developed country exceeded the allotment. (2) Joint implementation: The international transfer of the reduction by the project. The regime which adds the part of emission reduction quantity by the business to the reduction of the developed country (the investment country to the concerned business, etc.) of other it carried out the countermeasure business in some developed country, and it reduced the emission. (3) Clean development mechanism: The regime added to the developed country (the investment country, etc.) at (in the compensation) transfer and reduction of the country emission reduction quantity by this business was internationally checked on the industrializing one's own country carrying out business such as the emission reduction, and on it utilizing for the environmental-protection development in the industrializing country.

5) As characteristics of "newly industrialized country", (1) By Export Oriented Industrialization, the growth rate of economic growth and national income is high. (2) The advanced economic growth of newly industrialized country begins from 1970's, and it is hard to be called the maturation economy subject, and the emission of the global warming effect gas is limited to industrial structure and economic growth rate, and the time-related adjustment needs it for the emission reduction. (3) The reduction target of newly industrialized country should be separately determined (for example, emission reduction target standard year: 1990, first target period: 2020).

tons from 501 million tons, further this does not allow for countermeasures concerning the emission of the CO_2 from the energy sector before 2020. Thus, even if the proposed adjustments of the industrial structure and energy saving policy are completely achieved, the necessary reduction of 223 million tons cannot be achieved (Chen, 1999). Therefore, it is better for Taiwan to make use of Kyoto Mechanism for emission frame of 74 million tons of the shortage.

Regarding the discussion of the Kyoto Mechanism, the government of Taiwan paid close attention to "CDM" which was widely discussed[7]. In the background, Taiwan's isolation in the international society prevents it from being a party to the UNFCCC. For participation in JI and ET, the cooperation of other contracting country will be hard to obtain. However, the author believes that it is dangerous for the government of Taiwan to focus only on CDM. Instead, examination of "Kyoto Mechanism" particularly JI and ET is

6) In "The National Energy Conference" in May 1998, following policy direction were taken. (1) The desired value of growth rate of the GDP is corrected from 5.9% to 3.5% in the downward. (2) It makes efforts the accumulation energy-saving rate with the aim of 16% and 28% in 2010 and 2020 respectively. (3) The demand of LNG is increased to 13 million tons and 16 million tons in 2010 and 2020 respectively. (4) Besides Fourth Nuclear Power Plant under commencement of work, in nuclear power plant (3 plants) of commerce on stream, power generator (nuclear reactor) is newly installed. The ratio of the atomic energy at all power generating installation quantity is maintained at 19-20%. (5) By the adjustment of industrial structure such as high additional value, low energy consumption and high industry relation effect, emission of the CO_2 of 48 million tons is reduced.

7) In December 1999, "The Research Report on CDM" was done (http://sd.erl.itri.org.tw/fccc/). In February 2000, the international symposium of "Participation of CDM of the Private Sector in Taiwan" was held under the sponsorship of Environmental Protection Agency (http://sd.erl.itri.org.tw/fccc/). Then, research was asked from specialists on United Nations Conference on Trade and Development in order to participate in clean development mechanism, the "Workshop for the Participation to CDM" was undertaken simultaneously.

urgently needed[8].

For the present, this paper focuses on ET even though it has been little discussed in Taiwan and in spite of the fact that it is used on the case of industrially developed countries. This will be done principally by analyzing the "Outline Proposals for a UK Emission Trading Scheme".

2. Emission Trading

Emission trading (ET) is a system that can be achieved by the market mechanism, when all emission possible quantity was given. (1) All trade is a result of others to obtain profits by both the seller, who is the trade subject, and the buyer who is trading. (2) The system of ET effectively functions by emission reduction cost of each enterprise respectively differing. For example, the enterprise in which the cost for CO_2 emission reduction of the 1 unit is small carries out many emission reductions over the goal in-house, and it is possible to obtain the profit by selling the excess CO_2 reductions to other company. When purchasing a relatively cheap emission frame becomes smaller than reducing in-house, an enterprise in which reduction costs are high will also use the mechanism to reduce its total costs. As an index of the degree to which this is done, the enterprise will compare the marginal cost of emission reduction of the other enterprise in the

8) Article 17
The Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading. The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3. Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article.

form of the emission frame price with respect to the in-house countermeasure, and it will undertake the most rational method of combining in-house reduction with the emission frame purchase (Ogawa, 2000) [9].

The target of ET leaves emission frame of the greenhouse effect gas to free trade based on the market principles, because the free trade mechanism, decreases the reduction costs of the whole world. In the meantime, it is unavoidable that the reduction efforts within contracting countries may become careless. However, this mechanism induces total reduction costs in the cheapest way. Because the introduction of this system is based on the mutual agreement in the COP 3, and it will be positively evaluated as a principle.

On the reduction by ET, for the claim of the EU that an upper limit should

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9) On emission trading regime executed actually, as a representative emission trading regime, there are "Allowance Trading System" and "SO_2 Emissions Trading Program" in the U.S. In Acid Rain Program of U.S. Environmental Protection Agency, the target of keeping SO_2 gross emission for the 0.55 million ton/year for 263 power generating installations in phase I (1995-1999) was stated. In this SO_2 emission trading regime, the target observance rate of each enterprise has achieved 100%, and it seems to become a reference of future GHG emission trading market, since the activation method of the market also considerably develops. And, it agreed to February 2000 in U.S.A. northeast of 12 states in rising in SO_2 emission trading as a technique for reducing the noxious smog in power plant and factory. This mutual agreement was obtained in Ozone Transport Commission composed of northeast or 12 states in the central Atlantic Ocean shore, Colombia special ward and high official of the rice Environmental Protection Agency and relation staff member. The U.S. Congress founded this committee before several years; because multiple northeast states opposed it, when exceeding the state line, mid west part of U.S. and power plant in southwest area scatter the pollutant in a scatter. The smog is the condition that the chemical substance of the atmosphere was mixed with nitrogen oxides, and solar light and heat form it. Especially, the noxious smog wills the most frequently arise in the summertime. And, the aircontaminants from the factory is called having the close relationship between

be established, U.S.A. and Japan argue that there is no need for establishing an upper limit. In the sixth Session of the Conference of the Parties (COP 6) to the UNFCCC held in Hague in November 2000, the examination on details of the Kyoto Mechanism proposed in Kyoto Protocol were examined and a similar conclusion was reached. The movement for the reduction has already begun in great numbers on developed countries in each fields such as motion planning of voluntary approach of the industry, economical incentives such as the carbon tax, technology development for energy saving etc.

3. Emission Trading in EU and European Climate Change Programme

On March 8, 2000, the Europe committee (EC) in European Union (EU) announced two basic policies concerning the global warming countermeasures. (1) That European Climate Change Programme (ECCP) will be de-

asthma and other disease. This time, it agreed to participate in the plan of emission trading as all of 12 states reduce emission of nitrogen oxides. However, on the principle of emission trading, though the mutual agreement was made, it is the stage that the research is carried out on the mechanism of the trade in the council of the EPA at present. In the schedule, the enterprise becomes that 2 kinds of emission trade frame can be used. (1) In "rate-based emission credits", enterprise is possible to record the reduction minute, when the reduction was realized by exceeding emission reduction quantity in which the supervision organization required. And, it is correspondent to the council rule, and the sale is possible in respect of it. (2) In "mass-based discrete emission reduction credits", in respect of emission reduction frame itself; it is possible to sell pond or ton as a unit. In 22 states, the EPA is being announced with that the pollutant as a reason of the smog of discharging from power plant and factory was reduced in last year. However, it was until now actual condition that it caused the litigation to the partner and has won suspended sentence for the plan of the EPA on many states of mid west part in respect of the Federal Government. In U.S., the market of emission trading has already been realized. It is considered that present mutual agreement activates more such the movement. Emission trading is noticed as a new business chance.

cided within one year[10]. (2) By 2005 the common Emission Trading System (ETS) in EU will be established.

The Kyoto Protocol requires the EU to reduce emission of the greenhouse effect gases 8% from the standard year 1990 between 2008-2012. However, according to the report of the EC, the emission of the greenhouse effect gases of the whole EU is increasing. From the standard year 1990, an increase of about 6-8% is expected. Therefore, further efforts are necessary in order to achieve the target of Kyoto Protocol. The EC coordinated future basic policy as EU. The basic policy consists of two documents. These are "EU Policies and Measure to Reduce Greenhouse Gas Emission: Towards a European Climate Change Programme (ECCP)" and the "Green Paper on Greenhouse Gas Emissions Trading within the European Union".

In the communication paper "EU Policies and Measure to Reduce Greenhouse Gas Emission: Towards a European Climate Change Programme (ECCP)" announced on March 8, 2000. Various measures to be taken by the EU in future are reported. Among the most important are the following (Annex 3): (1) Access to the grid for decentralized electricity production, increasing the share of renewable energies. (2) Energy efficiency in the electricity and gas supply industries. (3) Improvement of energy efficiency standards for electrical equipment. (4) Improving energy efficiency by limiting CO_2 emissions (for boilers, construction products, etc.). (5) Development of an EC wide policy framework for emission trading. (6)

10) The Communication on EU policies and measures to reduce greenhouse gas emissions spells out the main components of this programme. It establishes a multi-stakeholder consultative process (including Member States experts, industry and green NGOs, besides the different Commission Services) focused on the key areas for emission reduction.

Development of a framework for voluntary agreement between government and industry. (7) Transport pricing and economic instruments for aviation. (8) Revising the transport policy (rail, road freight, modal-shift, maritime, aviation).

4. Voluntary Approach

Voluntary approaches emphasize action on environmental preservation from "private sector". On environmental preservation, private voluntary efforts make it possible to more efficiently achieve environmental preservation by complementing defects from "market failure" and "governmental failure". Regarding the practicability of voluntary approaches, many policy decision makers made various arguments. Opposition to utilize voluntary approaches centered on the following reasons. (1) Without a basis in law, the security and effectiveness of emission reduction cannot be guaranteed[11]. (2) The effectiveness of voluntary approaches may not be recognized by domestic or international regimes[12]. Reliance on voluntary efforts may also make it more difficult to determine domestic measures, which are needed in order to fulfill the Kyoto Protocol. In response, advocates of voluntary approaches have argued, (1) The performances of voluntary approaches are announced every year, and there is no problem on the effectiveness because the performances of voluntary approaches will be evaluated by organized market council. (2) The question is that whether voluntary approaches connect the existence of basis law with the sure reduction effect? However, it is necessary

11) Since the location of the responsibility in not realizing the target is indefinite, there is no security of the policy-accomplishing target on voluntary approach.

12) With only in independently decided targets, emission reduction targets of the whole country cannot be achieved.

to put the global warming countermeasures as a main column, though voluntary approach does not exist in basis law.

4-1. The Classification of Voluntary Approach

(1) Unilateral Commitments

Unilateral Commitments are plans for environmental improvement prepared by private enterprises for individuals to whom they are responsible (employee, stockholder, consumer, etc.). In such cases each enterprise determines its environmental preservation target as well as the techniques used to accomplish the target.

(2) Public Voluntary Schemes

Public voluntary schemes consist of mechanisms (for example, certification acquisition of the ISO 14000 series, eco-management and audit scheme (EMAS), ecology labeling, etc.) in which the enterprise independently agrees to a standard and specification (environmental improvement goal, technology, business management) which are subject to oversight from public environmental administration organizations.

(3) Negotiated Agreements

Negotiated agreements consist of negotiated contracts between public subjects (state level, district level) and industry. Both independent judgments entrust whether it agrees to the contract or not.

4-2. The Outline of Environmental Voluntary Agreements in Europe

Voluntary agreements often known as "environmental agreements" or "environmental covenants". However, it is not the meaning with name and definition that were especially decided on these terminologies in Europe. It is general policy goals of environmental policy through concrete mutual agreements between government and business as opposed to legal regulation. As a single policy technique, agreement on pollution prevention is famous in Japan. However, the agreement regimes in Japan are at the local public sector level, and they have a characteristic of complement means of legal regulations. In contrast, the agreement regimes in Europe are at the country level, and they are used as an alternative to regulatory measures. In EU and EU member countries, the promotion of the countermeasures by voluntary agreement has advanced in various environment fields. Within the 15 countries of EU, voluntary agreements on over 300 items had already been concluded between business groups in 1996, and they have steadily increased since then. Voluntary agreements are used especially widely in Germany and the Netherlands.

Salient characteristics of voluntary agreements include, (1) It is possible to elicit the more positive response from the industry sector. (2) It is possible to measure the cost effectiveness relative to the actual circumstances of each individual business in a way not possible. (3) They allow industry to cope with problems more quickly and flexibly than would be the case if they had to rely upon case law. (4) Fever they administrative resources (budget, personnel, etc.) are required to achieve administrative and environmental goals. In addition, there is a rapidly growing recognition of the limited effectiveness older regulatory measures aimed at the diversification and

complication of environmental problem in European countries from 1980's.

4-3. The Example of Voluntary Approach

(1) The Covenant Policy of the Netherlands

In the Netherlands, over 100 agreements have been concluded between industry and government. These mainly cover fields such as waste management, reduction of the pollutant emissions, the purification of polluted soil, energy savings and reductions in factory noise. When public institutions are one member of the agreement, the agreement used for a realization of the policy goal is called a "covenant". One important condition for the abundantly use of covenants has been the Netherlands' National Environmental Policy Plan (NEPP).

In NEPP (1989) and NEPP-PLUS (1990), quantified goals concerning over 200 items are listed. Covenants challenge each industry to describe how this goal is to be achieved. By 1996 16 industries had established environmental targets[13]. This covers 90% of the pollutant emission from the Netherlands.

There was a thing of the type in search of the implementation on initial covenant by the law. However, there are many things of the form, which does the security of the implementation by giving contract implementation responsibility on civil affair recently. Though procedures for enacting covenants have not been determined on the law, following process has been used. (1) Integrated Environment Target Plan is decided by negotiation between industry (or, in one a labor union) and the government (including the local government). Target and consistency of NEPP are checked in this

stage. (2) With this plan, the Company Environment Plans (CEP) at the level of individual enterprises are prepared. After the CEP is made, it is given official sanction by the government. It is then revised approximately every 4 years. (3) Signed covenants are reported in journals in official publications.

(2) Voluntary Agreement of Europe Committee and Automobile Manufacturers Association

In October 1998, voluntary agreement was reached between the EC and the European Automobile Manufacturers Association (ACEA). It required the CO_2 emissions of new vehicle be reduced to 140 g/km, etc. by 2008. Monitoring of the progress in each member countries will be done cooperatively and will offer in-service usage data to the EC. In October 1999, voluntary agreement was also reached between the EC and the Japanese Automobile Manufacturers Association (JAMA). It requires that the CO_2 emissions of Japanese passenger cars (new vehicle) sold in the EU be low-

13) The Netherlands' first National Environmental Policy Plan (NEPP 1) in 1989 received international attention for its highly integrated approach to long-term environmental planning, and has produced significant results in prompting pollution reduction among its main target groups - large industries, refineries, and agriculture. The second National Environmental Policy Plan (NEPP 2) in 1993 lays down a framework for the period 1995-1998. Like its predecessor, NEPP 2 focuses on implementation issues, taking an integrated approach driven by objectives for eight environmental themes - climate change, acidification, eutrophication, toxic and hazardous pollutants, waste disposal, environmental disturbances (e.g., air and noise pollution), water depletion, and resource squandering. However, NEPP 2 places additional emphasis on strengthening implementation and targeting difficult to reach groups - consumers, the retail industry, and small and medium-sized enterprises. The NEPP 3 (1998) integrates together the discussion of national and international policy. The chapters on the public authorities, target groups, environmental themes and other issues deal with both the national and international strategies in these areas.

ered overall to a 1-kilo mileage average of 140 grams by 2009. Taking 1995 as a standard, Japanese manufacturers are required to reduce emissions by about 30%. Since there are many medium size and large size Japanese cars with high CO_2 emissions sold in the EU, it was agreed that implementation could be delayed by one year in comparing with the target date for the voluntary agreement with ACEA. The Korea Automobile Manufacturers Association has also accepted a reduction scheme similar to that of Japan.

(3) Keidanren Voluntary Action Plan on the Environment in Japan

In "Keidanren Voluntary Action Plan on the Environment" for Japan, business pledged that "By the year 2010, the non-ferrous metal industry (copper, zinc, lead, nickel) will reduce the energy input per unit of output by 12% from the 1990 level" and "With regards to free-nickel, will aim to reduce the energy input per unit of output similarly by 5%". CO_2 emissions from 31 types of industry types represented by the group occupies about 75% of all industrial emissions and about 45% of Japan's total emissions. Reduction targets have been set for every type of industry. CO_2 emission (JAMA, etc.), energy consumption (The Japan Iron and Steel Federation (JISF), etc.), CO_2 emission primary unit (CO_2 emission per product, electric utility untidiness, etc.), energy consumption rate (energy consumption per product, Japan Chemical Industry Association (JCIA), etc.) are targeted. This "voluntary approach", carries with it yearly follow-ups assessing each industry's performance. Announcing the results provides a sufficient incentive for industry to fulfill its pledges while enhancing security and transparency. In the meantime, "voluntary approach" has been positioned in the government as a main countermeasure of the industrial sector in the global warming countermeasure promotion outline. As a result of the 1999 follow-

up, emissions from the participating enterprises were 126 million t-C in 1998. This represented a decline of 2% from 1990 and 6% from 1997 respectively.

Besides the reduction effort of the participating enterprises, a decrease in output due to the economic stagnation in the manufacturing industries is also considered a major factor of the emission decrease. An increase CO_2 emissions of about 10% from 1990 in 2010 is anticipated if countermeasures are not taken.

Four characteristics of the Keidanren's Voluntary Action Plan on the Environment are as follows. The first characteristic of this plan is that it is an entirely voluntary effort in which each industry has used its own discretion free from compulsion by any government or regulatory body. Furthermore, these efforts have resulted in the adoption of plans that are optimum under present economic and political conditions. Further they commit industries to doing all that they can. The second characteristic is that the plan's participants are not limited to the fields of manufacturing and energy but cover an extremely wide range of industries including distribution, transportation, construction, foreign trade, non-life insurance, and more. We are not aware of any other case across the globe in which non-manufacturing industries are participating in such voluntary action plan. Thirdly, many of the participating industries have established quantitative targets for the measures that they have adopted in combating the challenges of global warming and waste disposal. Fourthly, this action plan is subject to an annual review process, the results of which are public (the first review was scheduled for the summer of 1998). Through the carrying out of such periodic reviews, a mechanism will be put in place to ensure

that industrial circles will continue to improve the measures that they adopt in protecting the environment (Keidanren, 1997).

Periodic reviews are thus a mechanism which should allow industry to continually improve on its environment countermeasures.

(4) Emission Trading in the UK and Outline Proposals for a UK Emissions Trading Scheme

Thirty international enterprises that were active in the UK agreed to the establishment of ET market of greenhouse effect gases such as CO_2 by the end in June 1999. The UK has set a target for reducing domestic CO_2 emissions to about 20% over 10 years. Therefore, the introduction of "Climate Change Levy (CCL)" taxed for the use of coal, electricity and natural gas has been scheduled. However, the Emissions Trading Group (ETG) composed of the private sector and several government departments such as Confederation of British Industry (CBI) and the Advisory Committee on Business and Environment (ACBE) of the UK announced "Outline Proposals for a UK Emissions Trading Scheme (ETS)" in October 1999.

In the UK, the ETG submitted the scheme on domestic emission trading (ETS) in October 1999. This scheme is a provisional edition still in preparation and it leaves a considerable number of unresolved points Appendices. However, the proposal, very much deserves the attention that the trial, which is linked with other policy measures and sector of the primary unit goal, are also incorporated. On the ETS, the relevant departments in the government have welcomed the proposals. Especially, the government manifested that they want to emphasize the view on problem of the public policy

proposed to the ETS and role of the government. With the clear recognition that the government must play a key role as a means of reducing the volume of greenhouse gas emissions, domestic emission trading has been positioned in business sector as a flexible cost-effectiveness option, complemented by other climate change policies (Nakanishi, 2000).

5. Economic Growth or Environment? The Challenge of Taiwan

Chen and Ueta (2000) argue, that Taiwan which made rapid advanced in industrialization and urbanization, while under martial law, very little consideration could be given to the environment. Though environmental damage was extensive that very fact repeatedly helped with Taiwan's democratization, the positive participation of newly industrialized countries such as Taiwan and the developing country hold the key to the success or failure of global warming prevention and greenhouse effect gas reduction.

For example, the Black-faced Spoonbill (Platalea minor) protection problem that stirred the interest of the world recently is significant, not only for Taiwan's environmental policy but also its industrial policy[14]. Firstly, large scale of energy intensive industries such as steel mills and naphtha plants is made to develop in the improvement in environmental protection consciousness in both international and Taiwanese society. Secondly, as Taiwanese society, which has experienced the social movements of related to self-help relief and environmental pollution, has gradually matured, it has guarded against the strain of the industrial policy that considers economic

14) Black-faced Spoonbill (Platalea minor) is Threskiornithidae, and within all 28 species, 4 species live in Taiwan. It is the international nurture birds in which it verges on for extinction in the whole world at 1998 about 610 wings only.

growth first. As a result the large scale of energy consumption and environmental pollution type industry will be opposed. And the construction of the new industrial policy is required simultaneously. Thirdly, though the construction work of the sixth naphtha plant that became an important object of focus for the self-help relief movement in 1980's was completed, the primary factory started mass-production since February 1999. The self-sufficiency rate of chemical raw material such as ethylene will increase to 80%. If the Seventh Naphtha Plant is constructed, this may result in an excess supply of chemicals in Taiwan, Fourthly, MOEA is proposing measures of economic promotion, which invite large development projects with economic incentives such as facilitating industrial use ground acquisition, simplification of the administration procedures and subsidies due to the "deterioration of investment conditions" in Taiwan. However, further development of the energy intensive and environmentally unfriendly industries will necessarily become a long-term burden to economic society of Taiwan. If in the future Taiwan is allowed into Kyoto Protocol, the desired value of the CO_2 reduction must be introduced into future industrial policy. Taiwan thus ought to wrestle with development while fostering energy saving industries[15].

6. Conclusion

The international approach, which is related to the global warming issue, has been concentrated, since it is controversial in 1980's based on the integration of scientific knowledge in international politics. However, there is little mutual agreement concerning the duties of developing countries. Not

15) Though in the Kyoto conference (COP 3), the carbon dioxide emission reduction is not imposed for developing countries, it is required in order to retain the emission value 2000 for NIEs (newly industrialized economies) such as Taiwan and Korea in Argentina conference (COP 4) by 2020.

only developed countries but also developing countries assert that the economic growth will be kept in the capacity of sustainable development. In the meantime, CO_2 emissions will also rapidly increase with the rapid economic growth in developing countries (especially in Asia).

UNFCCC has scheduled to ratify the Kyoto Protocol in 2002 (Rio + 10). With regards to the tax regime, urgent examination of the ETR will be more important in future, if the achievement of emission targets is to be attained.

But at what level will the situation of the ETR in Taiwan be examined? Unfortunately, the concrete discussion in Taiwan seems to have virtually ignored emission trading. Regarding the utilization of an ET market in Taiwan, it is possible to obtain useful knowledge from the results of CO_2 ETS and voluntary approaches in Europe. Regarding experience in ET, Europe and Taiwan are alike. In Europe, the participants positively participated in ET, and trade was utilized for the improvement in each participant's knowledge, and it was verified to be that the target is observed compatible with the maximization of profits. Including accustoming to knowledge storage and trade market itself in Taiwan in order to prepare for the mutual agreement of international accomplishing target like Kyoto Protocol, it is regarded that the action is early caused on ET as being effective.

If Taiwan is to prepare for participation in international agreements such as the Kyoto Protocol, early action on ET would be a highly effective means of fostering knowledge storage and an internal trade market.

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