KEY FEATURES OF DOMESTIC EMISSIONS TRADING SCHEME IN JAPAN (INTERIM REPORT)

- Tentative Translation -

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Domestic Emissions Trading Subcommittee
Global Environment Committee, Central Environment Council·

CONTENTS

INTRODUCTION

(1) Background

The climate change problem is an urgent issue, which threatens human security across national borders, and which calls for urgent enhancement of solidarity among the international community. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) published in November 2007 stated that the 'Warming of the climate system is unequivocal', considering that 'Delayed emission reductions significantly constrain the opportunities to achieve lower stabilisation levels and increase the risk of more severe climate change impacts.'

Japan sets 25% reduction of greenhouse gas emissions by 2020 from 1990 level as its mid-term goal, which is premised on the establishment of a fair and effective international framework in which all major economies participate and on agreement by those economies on ambitious targets. Japan informed the United Nations Framework Convention on Climate Change (UNFCCC) secretariat in writing about the willingness to be associated with the Copenhagen Accord, and presented that emission target.

In addition, in U.S.-Japan Joint Message on Climate Change Negotiations of November 2009, both countries declared they would reduce their own emissions by 80% by 2050, and endorsed a global goal of reducing emissions by 50% by that year. In G8 Summit Muskoka Declaration of June 2010, Japan reiterated with other G8 countries its willingness to 'share with all countries the goal of achieving at least a 50% reduction of global emissions by 2050' and to 'support a goal of developed countries reducing emissions of greenhouse gases in aggregate by 80% or more by 2050, compared to 1990 or more recent years.'

Other countries have started to utilize climate change countermeasures, as a trigger for overcoming barriers to introduction of green engineering and energy-saving technologies, and in order to encourage new businesses for new technologies and services. The United Nations Environment Program (UNEP) estimates that the world market of environmental industry at around $1.37 trillion in 2006 will grow up to $2.74 trillion by 2020; the global investment amount in the clean energy sector is estimated at $173 billion in 2008 and $162 billion in 2009. These worldwide trends should be taken into account when promoting global warming countermeasures in Japan.

As for the efforts toward achievement of the mid-and long-term goals set by Japan, the government is taking actions to reduce greenhouse gas emissions from a comprehensive standpoint so as to encourage green innovations and other economic

activities and lifestyle changes, while ensuring sustainable economic development with high quality of life and internationally competitive industries. For this end, the government adopted the Bill for Basic Act on Global Warming Countermeasures in March this year, and submitted it to the previous regular session of the Diet. The bill was not passed by the end of the regular session and therefore scrapped in June, but then re-submitted to the Diet in October as it was.

The bill stipulates, in addition to the aforementioned mid-and long-term goals, basic principles concerning global warming countermeasures, responsibilities of national and local governments, businesses and citizens as well as a number of particular measures such as establishment of domestic emissions trading scheme, consideration of tax for global warming countermeasures, and establishment of Feed-in Tariff for renewable energy.

(2) Governmental Study on Domestic Emissions Trading Scheme

Domestic emissions trading scheme is a system that sets emission caps for greenhouse gases emitted by major emission sources to ensure reduction of emissions, thus aiming at steady implementation of greenhouse gas emission reduction. In doing so, trading emission allowances or equivalents is admitted as an option to provide flexibility for compliance.

The Ministry of the Environment (MOE) has studied domestic emissions trading scheme as a measure to fulfill the greenhouse emission reduction commitment under the Kyoto Protocol. Main issues and options were discussed in *Key Features of Domestic Emissions Trading Scheme in Japan* (Commission for Establishing of System for Emissions Trading) dated June 2000. After that, *Issues of Domestic Emissions Trading Scheme for Greenhouse Gases* (Research Commission on Emissions Trading and Kyoto Mechanisms) of July 2002 proposed step-by-step approach to introduce domestic emissions trading scheme toward the 1st Commitment Period of Kyoto Protocol, and trial implementation of domestic emissions trading scheme as the first step. According to this proposal, the MOE Pilot Project on Greenhouse Gas Emissions Trading Scheme was implemented in 2003-2004. Since 2005, more comprehensive Japan's Voluntary Emissions Trading Scheme (JVETS) with specific emission allowances and registry system started to accumulate knowledge and experience. In this context, *Final Report on the Assessment and Review of Kyoto Protocol Target Achievement Plan* issued in February 2008 by the Joint Committee of Central Environment Council and Industrial Structure Council as well as *Kyoto Protocol Target Achievement Plan* fully revised and decided by the Cabinet in March cited domestic

emissions trading scheme as an 'issue for urgent consideration.' These documents called for expansion of JVETS to accumulate useful knowledge and experience, and comprehensive consideration including evaluation of particular proposals and plausibility of introducing domestic emissions trading scheme.

In addition, aiming at achievement of the mid-and long-term goals for greenhouse emission reduction, *Approach to Japanese Emissions Trading Scheme (Interim Report)* of May 2008 (Advisory Committee on the Emissions Trading Scheme, Ministry of the Environment) summed up major issues underlying the scheme, considered individual elements of the scheme as well as basic infrastructure for smooth implementation of the scheme, and proposed scheme options based on these considerations.

The whole government also presented its considerations on domestic emissions trading scheme through trial implementation in *Toward Low-Carbon Society, Japan – Proposals by the Study Group on Global Warming Issues* (July 2008). As the result, the *Action Plan for Achieving a Low-Carbon Society* approved by the Cabinet in July 2008 provided 'experimental introduction of an integrated domestic market for emissions trading' (hereinafter referred to as "Trial Implementation"), which has been put into practice as a government-wide action since October that year.[1]

(3) Establishment of Domestic Emissions Trading Subcommittee

Article 13 of the Bill for Basic Act on Global Warming Countermeasures stipulates establishment of domestic emissions trading scheme as one of basic policies; an agreed draft is to be produced within one year after the enactment of this act as a milestone.

As a result, in order to conduct expert consideration and discussion on domestic emissions trading scheme for its future scheme design, Domestic Emissions Trading Subcommittee was established in April this year under Global Environment Committee of Central Environment Council.

[1] As for the Trial Implementation, the governmental follow-up in April 2010 confirmed that the Trial Implementation was not to be foundation for future full-fledged system stipulated in Article 13 of the Bill for Basic Act on Global Warming Countermeasures.

I. History of Consideration by Domestic Emissions Trading Subcommittee

The Domestic Emissions Trading Subcommittee established in April this year held public hearings from industrial, economic, labor and consumer organizations, NGOs, local governments and other organizations (total of 21) during 2nd through 5th sessions. Also, the Subcommittee collected public comments on cap-and-trade based domestic emissions trading scheme, and utilized Public Dialogs on Global Warming Countermeasures at 7 venues throughout the country as opportunities of hearings. Thus obtained opinions were summed up at 6th session. Besides, officials in charge of global warming issues from Europe and U.S. were invited to 7th session for hearings and exchange of views. At 8th through 10th sessions, individual issues related to the scheme design were discussed based on the previous hearings and findings. This resulted in a report titled *Discussion Points on Scheme Design of Domestic Emissions Trading Scheme*, which were presented to 90th session of Global Environment Committee of Central Environment Council (August 2010).

After that, discussions about options of cap-and-trade based domestic emissions trading scheme were held at 11th and 12th sessions, and discussions on evaluation and individual issues of the scheme options were held at 13th through 16th sessions.

This interim report provides expert considerations of the Subcommittee and summary about key features of domestic emissions trading scheme in Japan, based on the aforementioned discussions, and aiming at future scheme design.

II. Basic Approach to Scheme Consideration

In order to contribute to the global greenhouse gas emissions reduction, and to bring about a society that emits as little greenhouse gas as possible ahead of other countries, Japan sets up the mid-and long-term goals for greenhouse gas emissions reduction and promotes global warming countermeasures while ensuring economic growth, stable employment and stable supply of energy.

Important principles to promote global warming countermeasures based on building such a society are:

- To create a society that can reduce greenhouse gas emissions, while realizing sustained economic growth through the establishment of new lifestyles and other means
- Engagement in active promotion through international cooperation
- R&D of technologies contributing to prevention of global warming, and dissemination of R&D achievements
- Development of industries contributing to mitigation and adaptation to climate change; expansion of opportunities for job creation; to ensure stable employment
- To ensure a stable energy supply
- To gain understanding of effects and impacts of global warming countermeasures on economic activities and people's daily lives.

In order to achieve the ambitious mid- and long-term goals set by Japan based on such principles, it is necessary to create a mechanism to ensure reliable and efficient reduction of greenhouse gas emissions.

Considering individual emission sources, it is necessary to steadily reduce emissions from large-scale factories, buildings and other facilities which emit significantly more greenhouse gases than small emission sources, because large-scale emission reduction measures are to be effective, and because public authorities are more able to manage them than other sources.

Regarding such large-scale emission sources, the *Voluntary Action Plan* integrating voluntary targets and efforts based on industry-specific rules played a certain role in achievement of the targets of Kyoto Protocol. However, considering that implementation of emission reduction in Japan in mid- and long-term would require proportional efforts from all social entities, such emission reduction requirements must be integrated in a framework to ensure emission reduction by encouraging businesses to reduce their emissions under more transparent and fair rules.

Domestic emissions trading scheme is a system that sets emission caps for greenhouse

gases emitted by major emission sources to ensure reduction of emissions, thus aiming at steady implementation of greenhouse gas emission reduction. In doing so, trading emission allowances or equivalents is admitted as an option to provide flexibility for compliance. This is expected to promote development and dissemination of world-leading green technologies as well as to bring incentives for additional efforts toward emission reduction through carbon pricing.

On the basis of the goals and basic principles of global warming countermeasures discussed above, we arranged viewpoints to examine individual issues as follows, aiming at fulfillment of the role of domestic emissions trading scheme toward achievement of the mid- and long-term goals.

① Ensure absolute emission reduction

- Ensure stable reduction of domestic greenhouse gas emissions.
- Consideration against increase of emissions on a global scale (prevention of carbon leakage)

② Promote efficient emission reduction

- Promotion of efficient emission reduction by scheme participants, encouragement for development of advanced technologies and products in Japan and their dissemination both home and abroad, reduction of total social costs.

③ Ensure fairness

- Establishment of a system that treats participants fairly while reflecting their past efforts, development of rules being fair between participants and non-participants, based on responsibilities for greenhouse gas emissions.

④ Ensure transparency

- Objective and clear rules leaving no room for arbitrariness.

⑤ Social acceptability

- Aim to ensure economic growth, stable employment and energy supply.
- Avoidance of considerable increase of economic costs for scheme participants.
- Maintenance of international competitiveness of Japanese enterprises.
- Avoidance of market turmoil caused by so called money games (such as over-speculation).

⑥ Comprehensible scheme not requiring complex procedures

- A system with low administrative cost, easily understandable for participants.

III. Consideration of Individual Issues of Scheme Design

The Subcommittee summed up the issues concerning design of domestic emissions trading scheme, and considered handling of every individual issue. Thus obtained results are presented below. The issues of treatment of electricity (whether CO_2 emitted by power generation should be attributed to power companies who emit it directly, or to power consumers who emit it indirectly by consumption) and emission cap setting (free setting (benchmarking, grandfathering) or paid setting, absolute-based or intensity-based methods) proved particularly controversial. These issues were combined into 3 options from the viewpoint of environment protection and economic impact, so as to find direction toward consensus. This is explained in Section IV.

1. Scheme Period

(1) Issues

Scheme period and when implementing domestic emissions trading scheme must be determined.

Scheme period is a period during which the basics of the scheme remain unchanged; this corresponds to 'phase' in EU-ETS.

Generally, reduction measures are taken under multi-year prospects of implementation and effects. Therefore, fixing rules on emission limits and other elements for a certain period will be helpful for scheme participants to make projections for their measures.

In addition to duration of scheme period, commencement date of the initial scheme period (that is, the start of domestic emissions trading scheme) must be considered.

(2) Considerations

① Commencement date and initial period of domestic emissions trading scheme

When determining the period of domestic emissions trading scheme, we must first of all consider the target period. Since the Bill for Basic Act on Global Warming Countermeasures sets Japan's mid-term target for 2020, the mid-term period till 2020 is taken as a base for determination of the scheme period.

Society-wide efforts toward achievement of the targets should be initiated and facilitated as soon as possible. Domestic emissions trading scheme is an effort toward achievement of the mid term goal set by Japan. The progress chart of New Growth

Strategy 'Blueprint for Revitalizing Japan' schedules establishment of domestic emissions trading scheme from FY2011.

However, even if the scheme is adopted in FY2011, its implementation will start from 2013, at the earliest, because about 2 years are required for preparations. Therefore, when considering duration of the scheme period, we assume commencement of the scheme in 2013. It should be noted that measures available for scheme participants are limited in case of a short scheme period starting from 2013.

② Division of initial scheme period

In domestic emissions trading scheme, the reduction measures required of scheme participants are normally conducted based on multi-year prospects of implementation and effects; therefore, scheme period must cover several years. One may think that it is helpful for scheme participants to make projections for their measures if rules on absolute emission reduction targets or setting emission limits, etc. are fixed for a certain period required for R&D and investment. From this standpoint, scheme period must be sufficiently long. On the other hand, there is opinion that scheme period set from 2013 through 2020 would be too long, and the period should be divided into two parts, then the first one being shorter, so that unforeseen problems that may occur despite of all comprehensive precautions can be addressed promptly.

However, enterprises cannot implement reduction measures systematically if the first scheme period is too short.

Though period required for enterprises to implement reduction measures systematically varies with industry sectors and types of business, investment payback period is not necessarily equal to depreciation period of facilities and equipment used for emission reduction. Investment horizon for global warming countermeasures is about 3 years[2].

All the above considered, the scheme period must be set to at least 3 years so as to make possible taking reduction measures systematically.

As for the scheme period from 2020 onward, 5-year setting seems reasonable considering periods of official plans and targets proposed by the government or its ministers, while consistency with international frameworks should be also taken into account.

There is also opinion that scheme period should correspond to industry-specific

[2] As for eligibility criteria of emission reduction projects, Offset Credits (J-VER) and other schemes stipulate their criteria for businesses that invest into energy saving without any credit earnings (financial barrier analysis). Based on business surveys, one of criteria is whether investment pays back within 3 years or not.

periods required for enterprises to implement reduction measures systematically. However, the concept of scheme period as a period of fixed regulations is hardly compatible with setting different scheme periods by industries. Therefore, industry-specific conditions should be considered in setting emission allowances within a scheme period common for all industries.

(3) Policies

Assuming that the tentative time horizon for domestic emissions trading scheme is set from 2013 through 2020, the initial scheme period is set to 3 years, and the rest is to be set as the following period.

After that, 5-year setting seems reasonable, while consistency with international frameworks should be also taken into account.

2. Covered Gases

(1) Issues

When implementing domestic emissions trading scheme, we must determine greenhouse gases covered by the scheme.

The Kyoto Protocol specifies six greenhouse gases. But in case of determination of gases covered by the scheme, further screening is needed in terms of reduction effects, monitoring accuracy, possibility for measurement of emission amounts, relationships with other policies and regulations, potential for emission reduction, etc.

(2) Considerations

① Basic approach

When selecting gases to be covered by the scheme, the basic criteria are if it has a big share in total emissions of greenhouse gases in Japan as well as simple accounting, reporting and verification.

Accounting, reporting and publication system stipulated in the Act on Promotion of Global Warming Countermeasures (Act No. 117 of 1998; below referred to as Global Warming Act) applies to all six greenhouse gases defined by the Kyoto Protocol, while accounting and reporting procedures are specified institutionally for every gas. However, every gas is different in monitoring accuracy, possibility for measurement of emission amounts, relationships with other policies and regulations, potential for emission reduction, etc. Thus, when implementing domestic emissions trading scheme,

gases covered by the scheme should be screened as necessary with regard to the above; individual types of gases are considered below.

② CO_2 from fuel combustion

Currently (as of 2008), CO_2 dominates about 95% of the total greenhouse gas emissions in Japan; the share of CO_2 from fuel combustion alone is about 89%.

Thus CO_2 from fuel combustion accounting for a large part of emissions in Japan must be covered by the scheme. In addition, there are established methods of accuracy control for accounting, verification and reporting of CO_2 from fuel combustion.

Table 1. Emission amounts of greenhouse gases

		Kyoto Protocol base year (share)	2007 (compared to base year)	Percentage change to previous year	2008 (compared to base year)	2008 share
Total		1,261 (100%)	1,369 (+8.5%)	→ <-6.4%> ←	1,282 (+1.6%)	100%
Carbon dioxide (Co_2)		1,144 (90.7%)	1,301 (+13.7%)	→ <-6.6%> ←	1,214 (+6.1%)	94.7%
	From fuel combustion	1,059 (84.0%)	1,218 (+15.1%)	→ <-6.6%> ←	1,138 (+7.5%)	88.8%
	From non-fuel combustion	85.1 (6.7%)	82.1 (-3.5%)	→ <-7.1%> ←	76.3 (-10.3%)	5.9%
Methane (CH_4)		33.4 (2.6%)	21.7 (-34.9%)	→ <-2.1%> ←	21.3 (-36.2%)	1.7%
Dinitrogen monoxide (N_2O)		32.6 (2.6%)	22.6 (-30.8%)	→ <-0.5%> ←	22.5 (-31.2%)	1.8%
Alternative Freon Gases		51.2 (4.1%)	24.1 (-52.9%)	→ <-1.9%> ←	23.6 (-53.8%)	1.8%
	Hydrofluorocarbons	20.2 (1.6%)	13.3 (-34.3%)	→ <+15.0%> ←	15.3 (-24.5%)	1.2%
	Perfluorocarbons	14.0 (1.1%)	6.4 (-54.3%)	→ <-28.0%> ←	4.6 (-67.1%)	0.4%
	Sulfur hexafluoride (SF_6)	16.9 (1.3%)	4.4 (-74.0%)	→ <-14.7%> ←	3.8 (-77.8%)	0.3%

(units: million t-CO_2 equivalent)

③ CO_2 from non-fuel combustion

CO_2 from non-fuel combustion makes up about 6% of the greenhouse gas emissions in Japan, which is a large share as compared to the other gases; besides, unlike the other gases, CO_2 from non-fuel combustion has neither high global

warming potential (GWP) nor difficulties in accuracy control. Therefore, covering this gas by the scheme seems reasonable. On the other hand, since JVETS verification only applies to some fields of CO_2 from non-fuel combustion, and since knowledge regarding measurement of CO_2 from non-fuel combustion is hardly adequate for all fields, any decisions about involvement of this gas in domestic emissions trading scheme should be made depending on the possibility of accuracy control.

If CO_2 from non-fuel combustion is to be covered by domestic emissions trading scheme, and when limit is to be set on its emission, then characteristics of its generation processes should also be taken into account.

The issues of ‘use for waste incineration or manufacturing products, or as waste fuel’ and ‘emission caused by incineration of plastics, waste oil, etc. at incineration plants’ considered by the Subcommittee are related to CO2 from non-fuel combustion.

As for waste, its quality is variable. And it is difficult to derive uniformed emission factors. In the accounting, reporting and publication system stipulated in the Global Warming Act and JVETS, default values are set for emission factors. In the case of JVETS, the appropriateness of, whether the default values can be applied, and whether accounting based on actual measurements are needed, has to be confirmed taking into account the composition of the waste and other such factors, and so making very accurate estimates is difficult. In addition, there is also an opinion that favorable measures for compliance are required to encourage the use of waste over fossil fuels.

④ Other gases

Regarding the five gases other than CO_2, reduction measures have been taken in Japan, and reduction above 20% against the base year has been achieved. In addition, these gases have very high global warming potentials (GWPs), and a slight difference of measurement accuracy has a strong effect on compliance with regulatory requirements. For example, GWPs of HFCs, PFCs and SF_6 are, respectively, 1,300, 6,500 and 23,900; the measurement error of 1 ton would result in difference of, respectively, 1,300, 6,500 and 23,900 tons in CO_2 equivalent, which has a large effect on evaluation of enterprise’s compliance with regulatory requirements, and on balance of emission allowances. Legal requirements for accuracy control and measurement accuracy for these gases (in CO_2 equivalent) are same as for CO_2; however, the gases have very high GWP, and meeting these requirements is either impossible or uneconomical for scheme participants. Therefore, it seems that the immediate need is to improve accuracy control for these gases, and to wait for this before making any

decisions on applying the scheme.

(3) Policies

Initially, the scheme should cover CO_2. However, inclusion of CO_2 from non-fuel combustion should be determined depending on the feasibility of accuracy control required by domestic emissions trading scheme.

The other gases are subject to future consideration with regard to development of accuracy control methods and other factors.

3. Entities Covered by Scheme: Approach and Determination

(1) Issues

Basic approach to participation in the scheme and determination procedures must be considered in terms of coverage, compatibility with existing regulations, feasibility of emission calculation, verification and reporting, etc.

(2) Considerations

①-1　Scope of emissions for which scheme participants are responsible

Subjects ruled by law are natural people or legal entities; therefore, obligation to surrender emission allowances is fulfilled by each business enterprise. Even so, there are two following interpretations of emission scope for which businesses are responsible.

i) Business enterprises with total emissions exceeding a certain threshold are responsible for their total emission amounts.

ii) Business's operating facilities with emissions exceeding a certain threshold are responsible for total emission amounts of such facilities.

The accounting, reporting and publication system for greenhouse gas emission amounts stipulated in the current Global Warming Act promotes voluntary reduction measures through visualization of enterprises' emissions. In doing so, business's operating facilities with emissions exceeding a threshold are obliged to calculate and report emissions of such facilities as in ii) above. At the same time, calculation and reporting of the business's overall emissions is required in some cases as in i) above. This is caused by necessity to encourage efforts toward emission reduction in sectors including commercial and business sectors with rapidly growing emissions in recent

years, aiming at involving of facilities belonging to such sectors into participation in the scheme.

On the other hand, domestic emissions trading scheme focuses on factories, buildings and other large-scale emission sources that have great influence on greenhouse gas emissions in Japan, and aims at obliging such businesses to reduce emissions steadily. Therefore, large emitters whose operators can implement emission reduction measures efficiently and easily should be involved in the scheme. If the above approach i) is adopted, business entities have to perform regular accounting, verification and reporting not only for large-emitting facilities but also for facilities with very little emission. This means putting an unreasonable burden on businesses, which is contradictory to the concept of the scheme that aims at obliging large-scale emission sources to reduce emissions steadily. In addition, one may expect for situations where businesses escape liabilities to domestic emissions trading scheme using corporate spin-offs or other means.

①-2　Considerations on demanding compliance with obligation to surrender emission allowances for every facility or installations

If the above approach ii) (see ①-1) is adopted, one may think of imposing every business facility or installation with obligation to surrender emission allowances. In this case, however, control of emission allowances is required at every business facility or installation; as the result, entities operating multiple facilities have to transfer emission allowances among their facilities. That imposes additional burden on scheme participants. Moreover, one may expect for additional administrative costs related to management of emission allowances and confirmation of compliance with regulatory requirements.

On the other hand, there is opinion that costs related to transfer of emission allowances within an entity can be taken into account in designing the scheme. Thus, the final choice between imposing obligations to surrender emission allowances on every entity or every facility should be made from such standpoints as encouragement of efforts by scheme participants and alleviation of burden on participants as long as the goals of the scheme are achievable.

In either case, accounting, verification and reporting of emission amounts should be performed for every facility so as to ensure accuracy of emission amounts.

①-3　Considerations on allowance-setting units

Considering that achievement of the ambitious mid- and long-term goals set by

Japan requires substantial efforts from all social entities, such requirements must be integrated in a framework to secure emission reduction by encouraging entities to reduce emissions according to more transparent and fair rules. Therefore, every business should fulfill its obligations.

Some industrial organizations have legal personalities; however, putting aside emission activities performed by the industrial organizations themselves, it would be difficult to hold an industrial organization legally responsible for emission activities performed by a member enterprise with a different personality to the industrial organization. The Bill for Basic Act on Global Warming Countermeasures defines domestic emissions trading scheme as 'a system that sets up limits on greenhouse gas emission for entities emitting greenhouse gases (hereinafter referred to as 'emitters' in this Article) for a certain period, and allows transactions in greenhouse gases emission amounts with other emitters to comply with the aforesaid limits.' This makes clear that accountability for emission belongs to entities performing the emission activities.

In case that the accountability belongs to an industrial organization, scope of obligations would change with affiliation of new members or withdrawal of old ones. Thus it would cause a problem of legal stability.

In addition, according to a report by Japan Fair Trade Commission[3], distribution of emission allowances via industrial organizations would pose some problems in terms of competition policy, namely '(1)industrial organizations would determine the emission amounts and consequently production volumes of individual member entities, (2) business activities of specific member entities could be restricted by discriminatory distribution of the emission allowances by the industrial organizations, and (3) business activities of member entities could be restricted by possible restriction on member entities regarding emission obligation achievement methods. It is considered therefore that emission allowance distribution through industrial organizations could highly possibly distort competition among member entities.' Besides, it is pointed out that if business entities in concert with others or industrial organizations determine supply volume of products and services of each business entity based on their obligations to reduce emission, some problems may arise in terms of the Act on Prohibition of Private Monopolization and Maintenance of Fair Trade (Act No. 54 of 1947), when the government introduces regulations imposing certain obligations on business entities regarding emission reduction

[3] Japan Fair Trade Commission. Issues on Competition Policies regarding Policies Using Market-Based Instruments as Measures against Global Warming: Discussion Points in the Japanese Emissions Trading

volume.

A framework is required to encourage every business entity to reduce emissions under transparent and fair rules. From this standpoint, imposing obligations on a group of enterprises (multiple business entities) with different legal personalities would result in lack of legal stability (it would be unclear where responsibility among the business entities resides). Although the Financial Instruments and Exchange Act (Act No. 25 of 1948) gives an example of considering a group of two or more enterprises being in parent-subsidiary relationship as a single organization obliged to report overall financial position through the preparation and disclosure of consolidated financial statements, this is intended to enforce a parent enterprise representing business group to fulfill its obligations to subsidiaries so as to protect interests of general investors, thus being different from imposing obligations on multiple business entities as a single unit.

Nevertheless, fulfillment of obligations by multiple business entities may be advantageous in better reflection of real situation, in case that multiple business entities are involved in joint production activities; there is also opinion that group efforts toward emission reduction would be more efficient than individual ones. As for obligations to surrender emission allowances by multiple business entities, further consideration is needed with regard to the cases mentioned above, experience of other countries, problems of competition policy and legal implications such as liability distribution.

② Definition (scope) of business facility (including facilities (buildings) shared by multiple businesses

Domestic emissions trading scheme focuses on factories, buildings and other business facilities that are large-scale emission sources, and aims at obliging such businesses to reduce emissions steadily. Thus one may regard owners of business facilities as the scheme participants. However, the owner of a business facility and the one who uses this facility for emission activities may be different persons, for example, when multiple enterprises are located in an office building. In such cases, it is necessary to consider what concrete criteria can identify who installs a business facility, from the viewpoint of the polluter-pays-principle, in order to clarify responsibilities for emission from the facility.

Thus, the Global Warming Act imposes responsibility for greenhouse gas emissions on ‘those who emits greenhouse gases.’

Scheme (Interim Report), (March 31, 2010)

Concretely, while the current Global Warming Act and the Act on the Rational Use of Energy (Act no. 49 of 1979; below referred to as Energy-Saving Act) do not provide clear indications how to deal with the multi-tenant buildings, in practice, the following rules are applied[4].

- Tenants are responsible for emissions produced within their areas.
- Owner is responsible for emissions beyond the scope of the tenants' titles to energy management (if (a) tenants have the right to install and modify equipment, and if (b) energy consumption can be determined by meters or in other way).

In case that the emissions trading scheme includes the same criteria as provided in the current accounting, reporting and publication system, one may expect for merits of using experience and interpretation accumulated by the current system regarding definition, boundaries (of business facilities), and past data on emissions, etc., thus of making introduction of the scheme less burdensome. However, with the current criteria, emission amounts are calculated and reported based on partial estimates, which complicates accuracy control. Some problems are also pointed out such as partial overlap of emission amounts in accounting and reporting by owner and tenants.

One may also think of defining boundaries of business facility in a different way by considering a building as one business facility, and using formal ownership based, for example, on the real property registration system. Such criteria would encourage emission reduction for entire multi-tenant building, besides providing clear and easy definition of business facility boundaries. On the other hand, consideration is needed to judge whether owners of the business facilities could be regarded as the best controllers of greenhouse gas emission.

Thus, further consideration, including improvement of the current system's criteria, is necessary, in view of the current situation of emission reduction efforts in multi-tenant buildings, and the one of who can actually control greenhouse gas emission, and from the standpoint of promoting measures for emission reductions in entire multi-tenant buildings.

③ Threshold

The scheme focuses on large-scale emission sources that have great influence on greenhouse gas emission in Japan, and that can precede emission reduction by

[4] Energy Efficiency and Conservation Div., Agency for Natural Resources and Energy. Q&A about 2008 Amendment to Energy-Saving Act 'Industrial and Business Facilities' (March 31, 2010)

business entities effectively. Therefore, scheme participants should be selected by the volume of emissions; in doing so, concrete criteria (threshold) must be set with regard to the share of emission from business facilities in the national inventory.

Besides, the number of business facilities covered by the scheme must be taken into account in terms of administrative costs required for the scheme implementation.

In the current accounting, reporting and publication system, the threshold is set to 3,000t-CO_2 (crude oil equivalent energy consumption: 1,500 kl). Considering that the emissions trading scheme burdens participants not only with accounting and reporting but also verification of emission amounts, surrender of emission allowances, and other obligations, setting the threshold at least higher than the current accounting, reporting and publication system seems reasonable in terms of the principle of proportionality (balance between goals and means of regulations).

Assuming that threshold is 10,000t-CO_2, the share of emission from covered facilities in the national inventory would not decrease significantly, no matter how electricity is treated. On the other hand, the number of participants would decrease significantly. Therefore, while threshold should be considered as equal to, or more than, 10,000t-CO_2, concrete value of threshold should be determined with regard to the aforementioned aspects.

As for the timing when the threshold is applied, emission amounts may vary strongly due to economic fluctuations and other factors; therefore, emission amount averaged for several consecutive years seems to be an appropriate base.

Table 2. Number of reports by emission size and coverage to national inventory in the accounting, reporting and publication system

Emission size	Electricity treated as indirect emission				Electricity treated as direct emission			
	Number of reports	CO_2 from fuel combustion (specified emitters)			Number of reports	CO_2 from fuel combustion (specified emitters)		
		Emission amount (t-CO_2)	Share of emission amount under the accounting system	Share in the national inventory		Emission amount (t-CO_2)	Share of emission amount under the accounting system	Share in the national inventory
3,000 t-CO_2	12,934	494.57 mln	99.3%	43.4%	4,632	716.76 mln	98.4%	63.0%
10,000 t-CO_2	4,251	447.98 mln	89.9%	39.3%	1,686	701.30 mln	96.3%	61.6%
25,000 t-CO_2	1,759	410.03 mln	82.3%	36.0%	909	689.52 mln	94.6%	60.6%
50,000 t-CO_2	976	382.68 mln	76.8%	33.6%	588	678.18 mln	93.0%	59.6%
100,000 t-CO_2	540	352.72 mln	70.8%	31.0%	409	665.50 mln	91.3%	58.5%

④ Chain businesses (franchise chains etc.) and specified transport emitters (transportation businesses etc.) in terms of Global Warming Act

The scheme focuses on large-scale emission sources that have great influence on greenhouse gas emission in Japan, and aims at obliging such businesses to reduce emission steadily. Therefore, scheme participants should be business facilities with large emission, where reduction measures can be taken efficiently and easily. If the scheme covers chain businesses and specified transportation businesses stipulated in the Global Warming Act, those entities with very small emission will be also obliged to perform accounting and verification of emission amount as well as surrender of emission allowances, meaning that this scheme puts an unreasonable burden on such businesses. That is contradictory to the concept of the scheme that aims at obliging large-scale emission sources to reduce emissions steadily. In addition, this is problematic in terms of fairness with businesses that are not covered in the scheme, though having facilities with the same emission amounts.

On the other hand, in case of franchise chains, the head office instructs and guides affiliated stores according to the franchise agreement, which includes instruction and advice concerning greenhouse emission reduction. There are opinions that franchise chains should be considered as entities in terms of emission reduction measures, and that imposing certain responsibilities on chain businesses and specified transportation businesses stipulated in the Global Warming Act is reasonable under certain conditions.

(3) Policies

Business entities operating business facilities with emission amounts exceeding a certain threshold are to be responsible for the total emissions of such business facilities. The problem of who is responsible for surrender of emission allowances, i.e. every business facility or business entity as a whole, should be solved with regard to encouragement of emission reduction by scheme participants and alleviation of their burdens. As for imposing obligations to surrender emission allowances on groups of multiple businesses, further consideration is needed with regard to the present business practices in Japan, experience of other countries, problems of competition policy and legal implications such as liability distribution.

As for definition (boundary) of business facility, criteria of the current accounting, reporting and publication system of the Global Warming Act are basically acceptable, including that of business facilities (buildings) shared by multiple businesses. However, the current criteria should not be adopted as they are; instead, appropriate amendments should be made to solve a number of problems.

As for the threshold, assuming that it is or more than 10,000t-CO_2, the share of covered emission in the national inventory would not decrease significantly, no matter how electricity is treated, while the number of participants would decrease considerably. Therefore, a threshold equal to or above 10,000t-CO_2 should be considered; in doing so, concrete value of threshold should be determined in compliance with the concept of the scheme, with regard to the share of covered emission amount in the national inventory, administrative costs required for the scheme implementation, and other factors. As for the timing when the threshold is applied, emission amount averaged for several consecutive years seems to be an appropriate base.

As for chain businesses and specified transportation businesses mentioned in the Global Warming Act, involvement of such businesses into the scheme is difficult at the moment.

In addition, further consideration is needed what modifications are required in association with the current accounting, reporting and publication system stipulated in the Global Warming Act.

4. Methods of Setting Emission Allowance

As for of methods to set emission limits (allowances) for scheme participants, free setting (benchmarking and grandfathering) and paid setting (auctioning) or intensity-based method were considered as well as particular issues such as electricity intensity. As mentioned above, three options combined with treatment of electricity were proposed and discussed (see Section IV).

4-1. Free setting

(1) Issues

Free setting of emission allowances can be divided into benchmarking based on desirable intensity levels, and grandfathering based on the past emission levels. Emission allowances must be set with regard to individual circumstances of scheme participants such as potential for emission reduction estimated based on the past efforts toward emission reduction, content and volume of technological innovations that can

be introduced in future, and other factors (below referred to as 'reduction potential').

With benchmarking approach (= activity level × intensity), when emission allowances are set for business entities by absolute-based method, a desirable intensity level such as 't-CO_2/production volume' (below referred to as 'benchmark') is applied to emission amount.

In case of absolute-based free setting with benchmarking, industries and products covered by benchmarking must be determined with regard to benchmarking applicability and other conditions, and benchmarks and activity levels must be set with regard to the content and volume of technological innovations that can be introduced in future.

On the other hand, grandfathering approach, when emission allowances are set among business entities by absolute-based method, uses the past emission levels as the base.

Emission allowance setting by grandfathering can be expressed as shown below.

Emission Allowance = Past Emission Level × (1－Reduction Rate)

In case of absolute-based free setting using grandfathering, the problem is how to select participants for grandfathering, and how to determine past emission levels, reduction rates, and other parameters. Regarding the latter problem, past emission levels and reduction rates must be set flexibly with regard to participant's reduction potential and other particular conditions. Another problem is how to effectively collect data underlying emission allowance setting.

In addition, setting method should be as simple as possible.

(2) Considerations

①-1　Objects of benchmarking

With benchmarking approach, emission allowances can be set with due regard to the past efforts of businesses toward emission reduction. In addition, since one may expect for encouragement of technological development and productivity improvement by setting the desirable levels, benchmarking is preferably applied to products and processes for which benchmarks can be set efficiently.

In benchmark setting, the scope of raw materials, products and production processes must be defined; besides, checkable data on production volumes (activity

levels) and greenhouse gas emission amounts must be acquired. For this purpose, benchmarking should be applied to products and processes that meet certain conditions such as (1) the classification of products can be defined using, for example, statistics so that products belonging to the same class are not much different in character from each other, (2) a production process subject to benchmarking does not produce other than the eligible product (does not produce various products), (3) verifiable statistical data on emission amounts and production volumes are available.

It is pointed out that benchmarking can be only applied to limited products and processes as long as such conditions are imposed. For example, it is difficult to apply benchmarking to processes in which a variety of products are manufactured. In such cases where benchmark setting is difficult, grandfathering and other methods must be employed.

①-2　Benchmark setting

For the purpose of benchmark setting, about how to determine content and volume of technologies that can be introduced in future, one may think generally of (1) comparison with existing equipment (based on past emission levels of X percent of most efficient equipment) or (2) best available technology (BAT). In case of benchmarking, since one may expect encouragement of technological development and productivity improvement by setting desirable levels, adoption of (2) BAT as the base seems reasonable. However, in case of industries where it is difficult to implement reduction measures in a short period because of their investment cycle, there can be an alternative to set a certain level in accordance with introduction of the latest equipment in the framework of equipment replacement schedule.

As for concrete benchmark setting, in cooperation with business entities, products and processes subject to benchmarking can be selected with reference to current intensity indicators provided by businesses; thus tentative benchmarks can be set and then discussed with businesses so as to reflect flexibly specific circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

①-3　Setting of activity levels for benchmarking

As for activity levels that are multiplied by benchmarks to set emission allowances for individual business entities, one can think of estimation based on indicators of each industrial macro-frame such as raw materials production volume or industrial output index. If such indicators are unavailable, estimation can be based on a period

of any several consecutive years from 2006 through the years immediately preceding initial setting of emission allowances during when data of the current accounting, reporting and publication system of the Global Warming Act can be utilized. In any event, it should be borne in mind that accurate estimation of future activity levels for individual business entities is difficult. In addition, some regard should be paid to possible increase of activity levels due to economic growth and other factors.

On the other hand, equipment capacity multiplied by utilization rate can be used as activity level instead of production volume provided that utilization rate can be determined with a verifiable and transparent method.

In case of new businesses, data on the past activity levels are limited; in this case, activity levels can be calculated by determining equipment capacity and utilization rate for each product and process using a verifiable and transparent method.

As for setting of concrete activity levels, with regard to the aforementioned issues, it is desirable that a tentative activity level can be set and then discussed with businesses so as to reflect flexibly specific circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

②-1　Objects of grandfathering and its combination with benchmarking

When emission allowances are set in mere proportion to the past emission levels by grandfathering, those who neglected emission reduction measures in the past get bigger allowances; hence that would lower efficiency and fairness as compared to benchmarking based on technological development. On the other hand, benchmarks can be set efficiently only for limited products and processes. Therefore, in absolute-based free setting, grandfathering should be employed where benchmark setting proves difficult. In doing so, emission allowances should not be set in mere proportion to the past emission levels; instead, past emission levels and reduction rates must be determined flexibly with regard to reduction potential and other specific conditions of scheme participants.

Besides, when different products are manufactured at same business facility, benchmarks should not be set uniformly. For example, emission allowances are allocated by benchmarking for production lines where benchmarks can be set; otherwise (production lines, air conditioning equipment, lighting equipment, etc. unsuitable for benchmark setting), grandfathering is used for emission allowance setting. Thus, benchmarking can be combined with grandfathering and other methods

for appropriate distribution of allowance to business facilities.

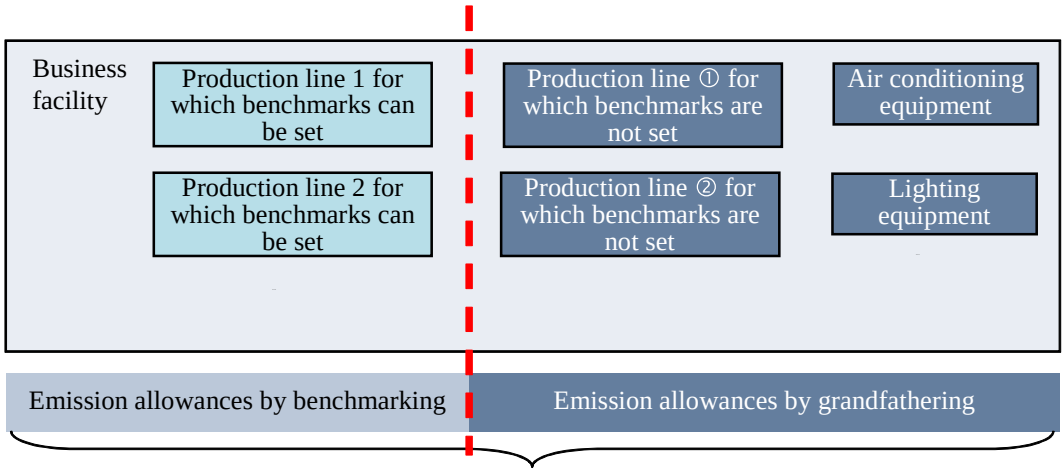


Fig. 1. Combination of benchmarking and grandfathering

②-2　Calculation of past emissions for grandfathering

Distributed emission allowances depend on timing of base year emission amounts. However, production volume and other factors vary strongly with economic fluctuations; impact of such factors should be alleviated. In this regard, emission amount averaged for several consecutive years seems to be an appropriate base.

Besides, providing participants with freedom to select the base year seems helpful to better reflect past efforts toward emission reduction.

As for timing of the past emission amounts as the base, the period from FY2006 when the current accounting, reporting and publication system of the Global Warming Act was introduced through the year immediately preceding initial distribution of emission allowances under domestic emissions trading scheme (FY2010, assuming that distribution of emission allowances is fixed in FY2012 to commence the scheme in FY2013) seems appropriate due to availability of data and uniformed accounting formula. However, drastic fluctuations such as those caused by a global financial crisis must be taken into account.

With grandfathering, emission allowances are set based on the past emission amounts; therefore, it has been suggested that, as a consequence of the timing of past emissions to be applied, businesses may be motivated to increase emissions so as to get bigger allowances. On this point, such concern for increased emissions is not likely for the first scheme period (expected to be FY2013-FY2015) because,

supposing that any several consecutive years between FY2006 and FY2010 are chosen, more than half of this period have already passed.

As for new businesses with emission amounts exceeding threshold, data on the past emissions are limited; in such cases, a standard emission amount set using a checkable and transparent method (with possible participation of third parties) can be employed as the base instead of past emission amounts.

②-3　Setting of reduction rates for grandfathering

If reduction rates are set uniformly for every business at X%, specific conditions such as early actions or replacement timing cannot be taken into consideration. Therefore, relaxation of reduction rates should be considered for emission reduction actions taken prior to implementation of the accounting, reporting and publication system in 2006, assuming that emission reduction effect beyond ordinary replacement equipment can be verified by a verification authority, though there are no data on emission amounts calculated by a uniformed method. Besides, changes in activity levels caused by new establishment or closure of facilities, economic growth, etc. should be reflected flexibly in reduction rates.

As for concrete reduction rate setting, tentative reduction rates can be set in cooperation with businesses, and then discussed so as to reflect flexibly potential for emission reduction and other specific circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

For example, several different reduction rates depending on reduction potential can be set tentatively, and discussed with businesses to incorporate any arrangements into such rates so as to reflect early reduction actions and other specific circumstances.

(3) Policies

In case of absolute-based free setting, benchmarking is applied to products and processes that meet certain conditions including (1) the classification of products can be defined using, for example, statistics so that products belonging to the same class are not much different in character from each other, (2) a production process subject to benchmarking does not produce other than the eligible product (does not produce various products), (3) verifiable statistical data on emission amounts and production volumes are available. Considering reduction potential and other parameters of scheme participants, emission allowances are to be set using the benchmarks and activity levels.

Benchmarks can be set based on BAT intensity with regard to content and volume of technological innovations that can be introduced in future and other particular conditions, while activity levels can be set based on the past production volumes and future projections.

Benchmarks and activity levels can be set tentatively for each selected product and process, and then discussed with businesses so as to reflect flexibly specific circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

In case of new entrants, activity levels can be calculated using a verifiable and transparent method; then emission allowances can be set by multiplying the levels by benchmarks.

Grandfathering is employed for absolute-based free setting in sectors where benchmark setting is difficult. Basically, emission allowances are set as shown below, while flexibly reflecting reduction potentials and other parameters of scheme participants.

$$\text{Emission Allowance} = \text{Past Emission Level} \times (1 - \text{Reduction Rate})$$

Past emission levels can be selected for any several consecutive years in the period from FY2006 through the year immediately preceding initial distribution of emission allowances.

As for concrete reduction rate setting, tentative reduction rates can be set in cooperation with businesses, and then discussed so as to reflect flexibly potential for emission reduction and other particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

4-2. Auctioning

(1) Issues

When auctioning is used for absolute-based distribution of emission allowances among businesses, auctions are held, and businesses bid for allowances they want. Holding of auctions promises efficient, fair and transparent emission allowance setting at low administrative costs; at the same time, there is concern about putting too heavy

burden on scheme participants (see Section IV).

When auctioning is used for emission allowance setting, auction system design must include eligibility requirements, frequency, amounts, usage as well as measures against making a corner and market manipulations, etc.

(2) Considerations

① Eligibility requirements for auction

As for eligibility requirements for auction participation, inclusion of scheme participants who fulfill obligation to surrender distributed allowances is beyond doubt; the problem is eligibility of non-scheme-participants. For scheme participants not knowledgeable about auctions, it may be easier to entrust procurement of emission allowances to a knowledgeable agent; therefore, other than scheme participants, under certain conditions, entities not distributed emission allowances, who participate in transactions by opening an account (bidders) may be admitted to participate in auctions. On the other hands, there is an opinion that non-scheme-participants need not be admitted.

② Auction implementation

Amount of emission allowances to put up for auction must be determined in advance but the problem is how to determine this amount.

As for frequency, auctions must be held at least once during a compliance period; however, considering the risk of unsuccessful tenders and prevention of speculative behavior, auctions should be held as frequently as possible, for example, half-yearly or quarterly. One can also think of implementation of electronic auctions based on appropriate bidding system.

Auction schemes can be categorized into sealed-bid auctions (single-bid auctions) and ascending-bid auctions (price setting through repetitive bidding). When holding auctions, it is important to clearly predefine auction scheme, bidding rules, scope of information disclosure and other issues with reference to foreign experience, thus increasing transparency.

③ Use of auction revenue

As for use of auction revenue, one can think of spending them to global warming countermeasures for further reduction of emission; it is also pointed out that using the revenue to cut corporate taxes would contribute to economic revitalization.

In case of implementing auctions, not only discussion about the nature and burden of taxes for global warming countermeasures,[5] but also discreet discussion about use of the revenue with reference to foreign experience is necessary.

④ Measures for fairness guarantee in auctions

As for auctions, since the whole allowances are traded from the initial setting, that raises concern about attracting inflow of speculative fund; transaction rules and market surveillance system must be established so as to prevent making a corner and market manipulations.

(3) Policies

In case of implementing auctions, one may think of admission for bidders other than scheme participants, while there is opinion that participation of such other bidders is not necessary. Auctions should be held at least once or more during a compliance period; electronic auctions are also possible. In this case, it is important to thoroughly predefine the related rules such as auction scheme, bidding rules, scope of information disclosure and other issues.

In addition, such issues as use of revenue, transaction rules and surveillance system must be determined prior to the implementation.

4-3. Intensity-Based Method

(1) Issues

With intensity-based method, emission limits for every business entity are set as greenhouse gas emission amount per unit of some measure such as production volume (intensity).

When adopting intensity-based method, the problems are how to set emission intensity targets based on realistic emission reduction, and how to ensure steady reduction of greenhouse gas emissions.

[5] There is opinion that auction-based emission cap settings implemented together with taxation would result in double burden; on the other hand, it is pointed out that demand for emissions allowances would decrease due to reduction effects through the taxation, which would result in price cut so that the burden would remain at the same level eventually. An example of the latter opinion is OECD (2008) “Environmentally Related Taxes and Tradable Permit Systems in Practice” (COM/ENV/EPOC/CTPA/CFA(2007)31/FINAL) 4.2.3.

(2) Considerations

① Setting of intensity targets

Setting of intensity targets are supposed to be based on content and volume of technologies that can be introduced in future; therefore, using BAT as the reference seems appropriate for encouragement of technological development and productivity improvement, just as with benchmark setting. However, in case of industries where it is difficult to implement reduction measures in a short period because of investment cycle, there are can be an alternative to set a certain level in accordance with introduction of the latest equipment in the framework of equipment replacement schedule.

Here, too, tentative intensity targets can be set in cooperation with businesses with regard to the aforementioned issues, and then discussed with businesses so as to reflect flexibly particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

However, just as with setting benchmarks, setting intensity targets will only be effective in stimulating improvement of emission intensity, such as through comparisons against other enterprises, in cases where certain conditions are met, including (1) the classification of products can be defined using, for example, statistics so that products belonging to same class are not much different in character from each other, (2) a production process subject to benchmarking does not produce other than the eligible product (does not produce various products), (3) verifiable statistical data on emission amounts and production volumes are available. Not all industries and products can meet these conditions. If such conditions are not met, there is the problem of comparability of the intensity targets because different indicators may be used as denominator. Thus impact on improvement of emission intensity for greenhouse gases may prove weak.

As for new participants, there are no past data on production volumes and greenhouse gas emission amounts but emission allowances can be calculated, for example, from standard intensity targets determined for every product and process using a verifiable and transparent method, which may include participation of third parties.

Coexistence of absolute-based and intensity-based methods is problematic not only in that the absolute emission reduction cannot be secured, but also in fairness among

scheme participants[6]. On the other hand, in case of electric power suppliers, consumers are obliged to reduce absolute emissions caused by power consumption, while emission intensity targets beyond consumers' control are to be revised; this is essentially different from the mere coexistence.

There are also concerns about costs, for both administration and businesses, required for estimation of production volumes and other activity volumes.

② Securing of absolute emission reduction

When emission allowances are set by intensity-based method, activity volumes are not restrained, thus one may assume that impact on maintenance of economic growth and employment stability is low with appropriate emission allowance distribution. The problem is how to align the setting with the concept of domestic emissions trading scheme aiming at steady reduction of absolute amount of greenhouse gas emission. In order to achieve absolute emission reduction with intensity-based setting, one may think, for example, of projecting a certain total amount reduction, and setting stringent emission intensity targets by way of back calculation with regard to participants' reduction potentials and possible increase of activity volumes.

One may assume that emission intensity is impaired by drop in equipment utilization rate due to economic recession or other reasons, and obligations cannot be fulfilled despite of decreased amount of greenhouse gas emissions. Actually, more than half of the participants setting intensity targets in the Trial Implementation in 2008 fell short of their targets. Imposing on stringent emission intensity targets in such a situation is difficult in terms of both environmental and economic policies considering that the environmental burden of greenhouse gas emissions is decreased, and that this imposing produces additional economic pressure during recession. In this context, it is pointed out that the problem of social acceptance amidst economic recession can be avoided by providing businesses with multiple choices, and that a bailout plan should be prepared for such cases so as to exempt businesses from obligations for total amount reduction.

Assuming the case that fulfillment of obligations by own efforts is difficult, and thus businesses look for compliance by transactions, with intensity-based method, emission allowances are distributed after confirmation of the past production data. Therefore, the total amount of allowances cannot be predicted in advance. Moreover, there is concern about whether transaction system is flexible enough to prevent

[6] There is also opinion that the problem of fairness among scheme participants may be disregarded if selection of intensity-based allocation is voluntary.

concentration of transactions in a short period immediately after allowance distribution, for example, due to violent fluctuation in prices[7]. It is pointed out that problems of this kind can be solved by borrowing.

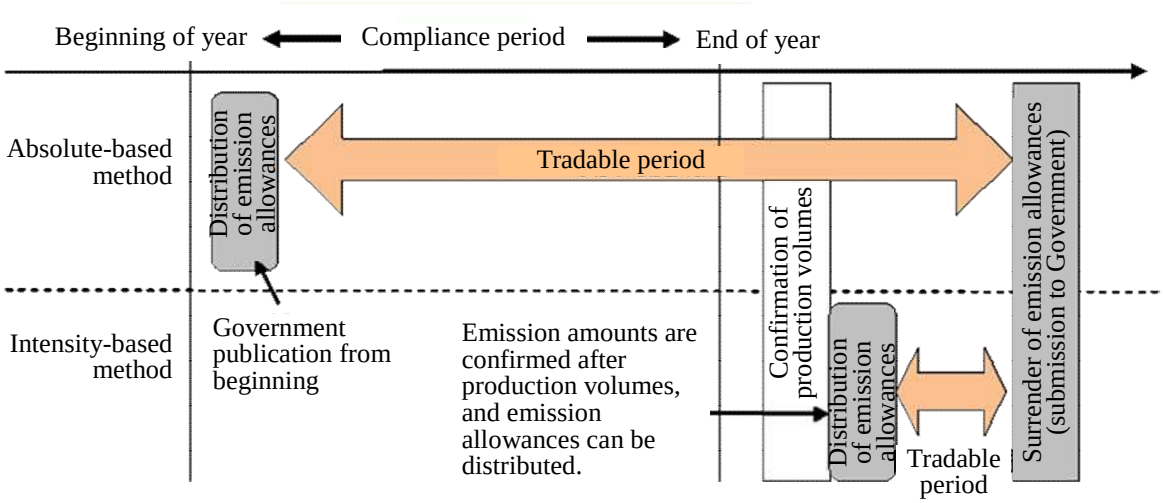


Fig. 2. Timing chart of emission allowance distribution and transactions

The only foreign example of mixture of absolute emission targets with intensity targets is the past UK-ETS (2002 – 2006). This system involves direct participants (absolute targets only) and agreement participants (absolute targets or intensity targets according to Climate Change Agreements concluded with the government). Intensity-based participants may sell their allowances to absolute-based participants. In doing so, certain regulations were established; for example, 'sector gateway' is set so that amount of allowances transferred from the intensity-based sector to the absolute-based sector does not exceed the reverse transfer. A report by the British Government points out that, while UK-ETS offered valuable lessons as the world-first scheme, a number of concerns existed about securing of absolute emission reduction. For example, while the gateway was established assuming the possibility of increase in emissions due to increase in production volume caused by intensity-based distribution, it did not be implemented because of emission allowance surplus. Besides, industrial sectors practically managed to set reduction targets by themselves. The major part of UK-ETS was terminated in 2006 with transition to EU-ETS.

As for the aforementioned trial emissions trading scheme, the governmental follow-up performed in April this year pointed out arbitrary selection of intensity-based targets as a problem, and those participants who opted for

[7] There is also an opposite opinion that transactions will decrease, thus over-speculations will be prevented.

intensity-based setting should be obliged to submit data on projected activity volumes and CO_2 emission amounts.

From the above one can conclude that it is difficult to secure absolute emission reduction in case of mixture of absolute-based and intensity-based targets.

(3) Policies

In case that intensity-based method is adopted, intensity targets are to be set with regard to content and volume of technologies that can be introduced in future; the setting is based on BAT with regard to equipment replacement timing and other particular circumstances of business entities. In doing so, tentative targets can be set, and then discussed with businesses so as to reflect flexibly particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness. As for new participants, emission allowances should be set based on standard intensity targets determined using a checkable and transparent method

However, there are many difficult issues from the standpoint of securing absolute emission reduction; for example, intensity targets may prove too stringent under economic recession, while transactions do not necessarily work flexibly because of ex-post distribution of allowance. Discreet consideration is required to find out whether these problems can be solved.

4-4. Electricity Intensity

(1) Issues

In case of indirect treatment of electricity, electric power consumers cannot control electricity intensity; therefore, in addition to determination of electricity intensity levels used by electric power consumers covered by the scheme, electric power suppliers should be obliged to improve electricity intensity.

In this case, the problems are electricity intensity levels used by electric power consumers, and content of improvement measures for electricity intensity required of electric power suppliers.

(2) Considerations

① Electricity intensity levels used by electric power consumers

Under the current accounting, reporting and publication system stipulated in the Global Warming Act, business entities calculating CO_2 emission amounts caused by electric power consumption have to apply emission factors set officially for every electric power supplier (independent power producer, and power producer and supplier (PPS)). On the other hand, there is also nation-wide uniformed approach. Since either approach has advantages and disadvantages, further comprehensive study is required on electricity intensity levels used by electric power consumers.

Since electric power consumers cannot control electricity intensity, it must be fixed during the scheme period so as to reflect efforts of them.

On the other hand, there is opinion that, in order to promote global warming countermeasures of electric power consumers by emissions trading scheme, evaluation method for emission reduction effects by measures related to demand for bulk power system should be properly established, and be provided prior to the scheme implementation.

② Measures regarding electric power suppliers

As for setting of intensity targets, electric power suppliers are supposed to introduce BAT, just as the other emitters. In doing so, BAT can be considered for every power generation method; however, from the standpoint of energy security, BAT cannot be defined using low emission as an only criterion. In case that intensity targets are set based on BAT for every generation method, incentives for energy conversion do not work. Therefore, setting of intensity targets based on the electric power supply plans must be considered in order to promote a certain amount of energy conversion depending on generation mix of every electric power supplier.

Besides, it can be difficult for power plants to implement significant reduction measures in a short period because of investment cycle. In this case, there is an alternative to set the target in accordance with introduction of the latest equipment in the framework of equipment replacement schedule.

As for the setting process, tentative intensity targets can be set in cooperation with businesses using existing indicators, and then discussed so as to reflect flexibly their particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

Improvement of intensity targets can be achieved, for example, not only by efficiency improvement of thermal power plants, but also by better utilization rate of nuclear power plants. If business facilities are considered as compliance units, it may result in insufficient incentives for spread of renewable energy power plants since

renewable energy power plants would not fall under the business facilities. Therefore defining the scheme participants as business entities seems appropriate. On the other hand, there is opinion that the scheme should be implemented on multiple business entities as one compliance unit, considering that electric power suppliers are involved in cooperative efforts toward emission reduction, and accommodate each other with electric power on a nation-wide scale. As for the scope of electric power, one may think of considering only electric power supply to participants of domestic emissions trading scheme; however, it seems reasonable to cover the whole electric power, thus not limiting the scope of the scheme to the effect to the scheme participants.

As for transactions and cost containment measures, approaches similar to absolute-based method should be taken as the base; however, from the standpoint of securing of the scheme-total reduction amount, it would be problematic for one market to cover both absolute-based emissions trading and electricity intensity's scheme, and some restrictions should be considered.

(3) Policies

As for intensity levels used by electric power consumers, one approach suggests applying emission factors for every electric power suppliers as the current Global Warming Act, while the other approach is based on nation-wide uniformed factor; since either approach has advantages and disadvantages, further comprehensive study is required. Besides, there is opinion that prior to the scheme implementation, evaluation method should be established for emission reduction effects by measures related to demand for bulk power system.

As for setting of intensity targets for electric power suppliers, the scheme should cover those who supplies electric power to consumers, and setting factor should be considered with regard to the current generation mix and equipment utilization as well as future electric power supply plans and other factors.

As for the scheme coverage, business entities are to be defined as units, and the entire electric power is to be involved. Transactions, cost containment measures, and quantitative restrictions of those will be considered.

4-5. Treatment of Newly Established and Closed Facilities

(1) Issues

In case that a new facility is established after domestic emissions trading scheme has

commenced and emission allowances have been distributed among existing participants, or in case that a facility to which allowance has already received is closed, the problem is how to handle emission allowance setting, particularly, in terms of fairness assurance.

(2) Considerations

① Setting of emission allowances for new participants

In terms of fairness with existing businesses, it is reasonable to distribute emission allowances to those (new participants) who exceeds the emission threshold by starting business or increasing production volume after domestic emissions trading scheme has commenced and emission allowances have been distributed. For this purpose, certain amount of emission allowances should be reserved for new participants before the scheme period, and then distributed to new participants as necessary. Distribution of allowances from this reserve can be performed in the order of applications but consideration is required to determine how the national government will provide emission allowances if the reserve proves scarce.

In doing so, one can assume the same methods for setting allowance as applied to existing participants; as was explained above, certain conditions can be set for emission allowance distribution using each method.

② Loss of eligibility

In case that a scheme participant closes the whole business, or loses eligibility due to decrease of emission amount, return of remaining allowances to the government after the fulfillment of surrender obligations should be considered.

③ Setting of emission allowances in case that existing businesses establish new facilities or close existing ones

In case that a business entity covered by the scheme establishes a new facility or closes existing one, consideration should be given to scheme consistency.

In such cases that an existing business establishes a new facility, or that an existing facility exceeds the threshold due to increase in emission amount, increase of emission allowances or other measures are required from the standpoint of fairness with existing participants. In such cases that a business entity is closed, or emission amount drops below the threshold due to facility downsizing etc., there is no need to distribute emission allowances corresponding to the closed or downsized facility from the next compliance period onward.

On the other hand, on the principle that emission allowances are set in the scheme period based on projected production volumes, and fulfillment of obligations is required of a whole business entity, one may think that in case of new establishment or closure of facilities, there is no need to provide measures to increase or decrease allowances accordingly during the scheme period.

However, since allowance overage or shortage unpredictable at the moment of emission allowance setting may occur because of increase or decrease in production volume, natural calamities and other changes of circumstances, flexible response should be required regarding for new establishment of facilities. For this reason, measures for increase or decrease of emission allowances should be made during the scheme period in case those existing business entities establish or close facilities.

Considering that business entities are supposed to be able to fulfill obligations to surrender allowances with respect to multiple facilities during compliance period, and that increase or decrease of emission allowances involves administrative costs, there is no real need to provide measures for increase or decrease of emission allowances according to new establishment or closure of facilities during the period of emission allowance distribution.

There is also opinion that overseas transfers should be treated differently from ordinary closures; however, thorough consideration is needed on whether both cases can be clearly distinguished.

④ Change of facility owner

In case that a business facility covered by the scheme changes its owner, one can assume that instead of re-setting emission allowances, the old and new owners fulfill obligation to surrender emission allowances according to respective ownership periods, before and after the change. The same applies to the case that a new participant owns a facility covered by the scheme.

(3) Policies

We will consider providing a certain amount of new participants reserve to distribute allowances to the new business entities in the order of applications. Dealing with such cases as reserve shortage will be further considered.

In case that a scheme participant loses eligibility because of business closure or another reason, return of remaining allowances to the government after the fulfillment of surrender obligations will be considered.

As for new establishment and closure of business facilities or equipment change,

emission allowances can be re-set during the scheme period.

In case that the owner of a business facility changes, one can assume that instead of re-setting emission allowances, the old and new owners fulfill surrender obligations for emission allowance according to respective ownership periods, before and after the change.

4-6. Total Emission Amount

(1) Issues

Domestic emissions trading scheme is a system that sets emission allowances for greenhouse gases emitted by major emission sources to ensure reduction of emissions, thus aiming at steady implementation of greenhouse gas emission reduction. In doing so, emission allowance trading and other schemes are admitted as options to provide flexibility in fulfillment of obligations. In this case, estimation of the whole amount of emissions covered by domestic emissions trading scheme (below referred as to 'total emission amount') must be determined in terms of the characteristics of total emission amount and its setting method as well as compatibility with the mid- and long-term goals.

(2) Considerations

① Characteristics and setting method of total emission amount

As explained above, with disclosing setting method of emission allowances to every business entity, the setting method will be determined based on the past reduction efforts, content and volume of technologies that can be introduced in future (BAT etc.), and participant's emission reduction potential. In doing so, aside from the setting emission allowances for every individual business entity, total emission amount can be set based on estimated technological innovations in the whole country, and used as a criterion for decisions about necessity of additional measures beyond the scope of domestic emissions trading scheme aiming at achievement of the mid- and long-term goals.

Since the total emission amount is set based on estimated technological innovations in the whole country, one may assume that its value is close to the sum of individual emission allowances based on reduction potential of every business entity. In case that thus estimated total emission amount is significantly different from the

sum of individual emission allowances, one may assume that additional measures beyond the scope of domestic emissions trading scheme aiming at achievement of the mid- and long-term goals are necessary provided that the individual emission allowances are based on actual reduction potential of every business entity.

As for the total emission amount, there is also opinion that individual emission allowances should be set unilaterally based on emission targets for the whole country. However, in case that individual emission allowances are set unilaterally based on the total emission amount without regard to technological innovations, actual reduction potential cannot be reflected, and emission reduction costs become high for scheme participants, thus it is not reasonable.

② Content of total emission amount

Since the total emission amount used as a criterion for decisions about necessity of additional measures beyond the scope of domestic emissions trading scheme aiming at achievement of the mid- and long-term goals, it must be set for every scheme period.

In addition, total emission amount should be determined as much ahead as possible in order to encourage long-term investments and innovations.

(3) Policies

As for setting individual emission allowances, the setting method is determined based on the past reduction efforts, content and volume of future technologies, and participant's emission reduction potential. In doing so, the total emission amount is to be set based on estimated technological innovations in the whole country, and used as a criterion for decisions about necessity of additional measures beyond the scope of domestic emissions trading scheme aiming at achievement of the mid- and long-term goals.

Estimation of the total emission amount is to be based on all technologies that can be introduced in the whole country.

The total emission amount is to be set for every scheme period, and should be determined as much ahead as possible.

5. Procedures for Accounting, Verification, Reporting and Surrender

(1) Issues

Flow and schedule of a series of procedures in domestic emissions trading scheme, including accounting of emission amounts by participants, confirmation of the accounting results to ensure accuracy (verification), reporting results to the government, and submission to the government of emission allowances corresponding to the verified emission for every compliance period stipulated by the scheme (surrender), must be determined appropriately so as to ensure smooth operation.

(2) Considerations

① Determination of participants and distribution of emission allowances

In order to determine scheme participants who receive emission allowances and assume obligations for accounting, verification, reporting and surrender of emission allowances, the government defines scheme participants as those who emit greenhouse gas above a certain threshold. In addition, the government opens accounts to manage emission allowances for scheme participants in the registry system. And emission allowances corresponding to emission limits are distributed to respective accounts.

As for the timing of emission allowance distribution, it is performed in the beginning or end of the compliance period in case of absolute-based distribution. In case of intensity-based distribution, emission amounts are determined only after confirmation of production volumes; therefore, emission allowances are distributed in the end of compliance period.

If distribution is performed in the beginning of the compliance period, there is sufficient time for allowance transactions providing flexibility in fulfillment of obligations. If distribution is performed in the end of the compliance period, there is concern about whether transaction system works flexibly enough; violent fluctuation in prices[8] may occur due to concentration of transactions in a short period immediately after allowance distribution. Nevertheless, it is pointed out such a problem of this kind can be solved by borrowing.

② Compliance periods during scheme period

In domestic emissions trading scheme, compliance periods are set as unit periods for fulfillment of obligations during the scheme period within which the scheme remains basically unchanged.

In some cases, scheme periods coincide with compliance periods; in other cases,

the scheme period is set to several years, while compliance periods are set yearly.

Scheme periods can be set to 3, 5, 8 years etc. depending on the scheme conditions.

There are examples of setting compliance period to several years. However, the situation where results of fulfillment of obligations remain unclear for a long time is not desirable for both participants and scheme management; as for existing schemes, the longest period was for 5 years.

Single-year setting of compliance period is desirable from the standpoint of yearly check for fulfillment of obligations; however, there is opinion that compliance period should be set to several years, the same as the scheme period, considering actual conditions of equipment investment cycle and emission reduction efforts in industry. Eventually, decision should be made with regard to the burden on enterprises fulfilling obligations, method of emission amount estimation, and other relevant factors. Besides, in case that compliance period is set to several years, there are opinions that accurate verification is impossible once in several years, and that yearly verification is required to maintain the scheme stability, as well as from the standpoint of Carbon Disclosure. On the other hand, there is opinion that accurate verification is possible once in several years, and that verification performed once in compliance period will suffice to confirm fulfillment of obligations assuming that allowances are not traded. In existing emissions trading schemes implemented abroad and in Tokyo Metropolitan area, verification of emission is performed yearly, no matter whether compliance period is set to one year or several years; this should be taken into account when making a final decision.

③ Necessity of verification system for emission amounts

As for confirmation of compliance with domestic emissions trading scheme, accurate accounting and reporting of emission amounts using a transparent and fair method is necessary.

In this context, the antipollution laws and other legislation stipulate obligatory monitoring and recording of emission, and determine frequency of those; however, these laws have no provisions for regular verification of accuracy. This is because the antipollution laws and other legislation presume local pollution countermeasures, and because compliance with obligations can be assessed by other means. For example, regarding legislation on air pollution and water contamination, constant monitoring of ambient air and water by public administration is stipulated in each law. As a result, if areas exceeding environmental standards are found, pollution sources can be

[8] See Footnote 7.

identified by public administration through observation, on-site inspection or other means.

However, in case of greenhouse gas emission, a variety of sources contribute to CO_2 concentration in the atmosphere, and compliance with obligations can be hardly confirmed by constant monitoring of ambient air. Therefore, every scheme participant must account emission amounts, and report results to the government.

However, experience of EU-ETS, JVETS and the trial emissions trading scheme shows that unintended record errors, omissions and calculation errors occur with a number of scheme participants in the process of identifying emission sources and accounting energy utilization. In the accounting, reporting and publication system, penalties are imposed for non-reporting or false reporting, and there is opinion that such penalties can assure accuracy. However, such penalties do not pertain to unintended reporting errors. Therefore, penalties for false reports and other faults can hardly guarantee accuracy of accounting and reporting of emission amounts. In domestic emissions trading scheme, accuracy must be guaranteed when confirming compliance with obligations; therefore, some verification mechanism is required in addition to accounting and reporting performed by scheme participants themselves.

Furthermore, accurate verification of overage and shortage of emissions related to demand and supply is necessary to create a market in which everyone can participate comfortably. Existing emissions trading schemes implemented abroad and in Tokyo Metropolitan area, as well as Kyoto Mechanisms based on the Kyoto Protocol, admit trading of emission allowances and credits, while accurate verification of emission amounts and emission reduction effects is considered necessary. In other markets, too, provision of accurate information about traded commodities is indispensable to secure soundness of transactions, and every precaution is taken for this purpose.

Thus, there is necessity for identification of CO_2 emission sources within business facilities, verification of emission conditions, confirmation of accuracy of individual records, etc. However, a public committee or another institution has a limited capacity to require records from every business entity, and to put them to thorough verification. Therefore, the existing scheme is not sufficient to secure accurate accounting and reporting of emission amounts.

As for verification of emission amounts, capacity of public agencies are limited; on the other hand, some private audit corporations and ISO certification organizations have already participated in JVETS and the trial emissions trading scheme as third-party verifiers, and have accumulated expertise and knowhow of efficient verification procedures. In JVETS and trial emissions trading scheme, initial

verification is relatively expensive, but from the second verification onward, costs decrease substantially due to the learning effect. Such verification using experience of private institutions proves efficient. Thus, it is appropriate for the government to treat emission amounts obtained as accurate data through third-party verification by institutions meeting requirements set up by the government.

④ Improvement of accounting, verification and reporting of emission amounts

As for achieving accurate accounting, verification and reporting of emission amounts, preliminary clarification of procedures required from scheme participants would improve predictability of accounting procedures, thus contributing to better efficiency. Thus, basic rules should be established about recording methods and forms concerning calculation of emission amounts by scheme participants (identification of emission sources, identification of greenhouse gas emission activities and measurement of activity volumes, recording and management of measured values, conversion into CO_2 emission amount, aggregation of emission amounts of all sources) and reporting results; at the same time, common guidelines including necessary regulations should be adopted.

The common guidelines can be based on available materials, specifically, *Accounting and Reporting Manual* of the accounting, reporting and publication system as well as *Monitoring and Reporting Guidelines* for JVETS participants, and *Monitoring, Accounting and Reporting Guidelines for Non-participants in Voluntary Action Plan* of the trial emissions trading scheme. In the international context, there is ISO 14064-1 that defines basic principles and requirements, such as steps and report contents for quantification of greenhouse gas emission produced by organizations and enterprises (however, particular rules regarding monitoring methods, accuracy, etc. are to be defined by every scheme), and its Japanese version (JISQ 14064-1).

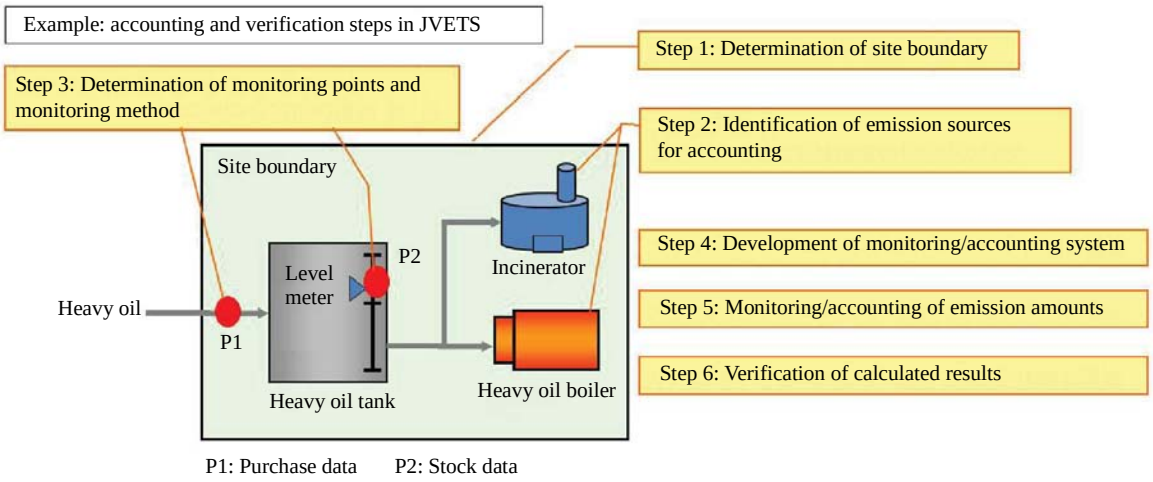


Fig. 3. Procedures for accounting and reporting (in case of JVETS)

As for establishment of basic rules and guidelines about accounting and reporting of emission amounts for participants in domestic emissions trading scheme, more clear and efficient procedures must be developed with reference to the aforementioned home and foreign examples, and with regard to participants' circumstances.

As for verification of emission amounts by private verification institutions, the process of making requests to such institutions imposes additional burden on scheme participants. Therefore, eligibility requirements and conduct regulations for verification institutions must be determined with reference to international practice. And appropriate measures such as disqualification or non-recognition of institutions that violate the requirements and regulations must be provided to ensure competence of verification institutions.

The eligibility requirements can be based on available materials, specifically, *Requirements for Verification Institutions* of JVETS participants and *Application Information for Third-Party Verification Institutions* of the trial emissions trading scheme. In the international context, there is ISO 14065 that defines basic issues for scheme operators and certification organizations to examine and approve capacity of certification organizations. Besides, in July this year, Japan Accreditation Board (JAB) launched a certification program for third-party verifiers dealing with verification of greenhouse gas emission amounts.

The conduct regulations can be based on available materials, specifically, *Guidelines for Verification of Emission Amounts* of JVETS and *Guidelines for*

Verification of Emission Amounts by Third-Party Verification Institutions of the trial emissions trading scheme. In the international context, there is ISO 14064-3 that defines principles and basic requirements for the process of verification of greenhouse gas emission amounts.

As for verification organizations for domestic emissions trading scheme, eligibility requirements and conduct regulations must be determined with reference to aforementioned home and foreign examples; in doing so, precautions must be made so as not to impose excessive burden on scheme participants.

In addition, education of verification organizations and verifiers, with emphasis on preventing shortage of qualified workers in provincial areas, as performed by Offset Credits (J-VER) of the Ministry of the Environment, is important to cut verification costs.

⑤ Surrender procedure of emission allowances

Emission allowances surrendered by scheme participants to the government for compliance with obligations on emission reduction are allowances that were received initially from the government, and then increased or decreased via allowance transactions. Therefore, at the end of compliance period, some procedures are necessary to confirm whether participants possess emission allowances corresponding to emission amounts determined by accounting, verification and reporting.

Thus, using a registry based on the Kyoto Protocol National Registry, a system must be organized so that scheme participants surrender a part of their emission allowances corresponding to their emission amounts.

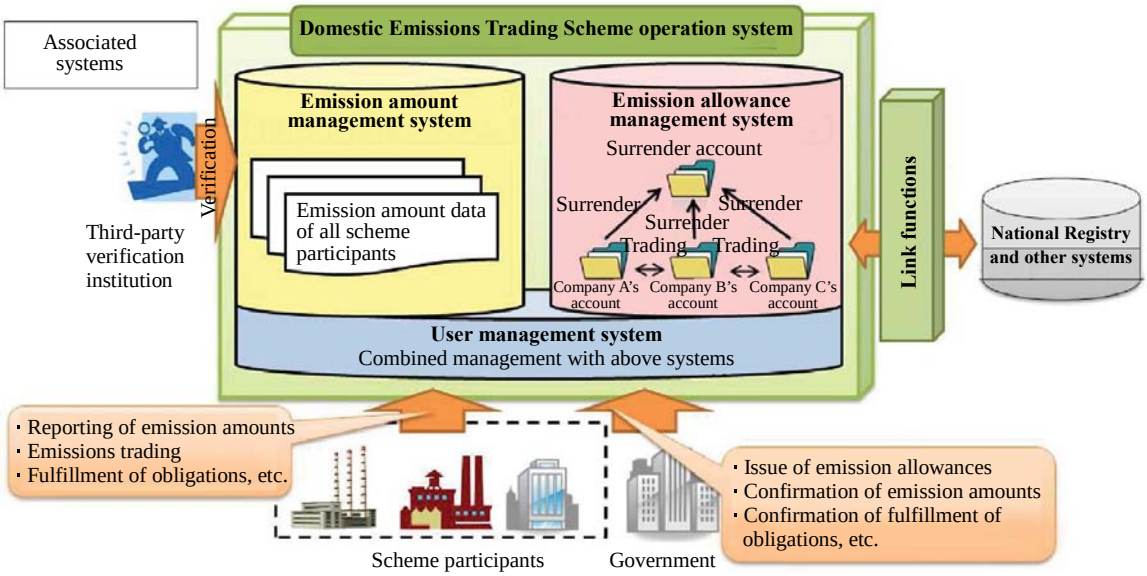


Fig. 4. Associated systems

⑥ Necessary Period required for accounting, verification and reporting of emission amounts, and surrender of emission allowances

A schedule for the aforementioned procedures must be set up so that scheme participants have sufficient time to deal with them.

In the trial emissions trading scheme, actual values of electricity emission factors available around September were used in 2008; therefore, one had to wait so long for accurate emission amounts related to electric power, and determination of emissions was planned until mid-October. In 2009, electricity emission factors were based on projected values of every power supplier, and determination of emissions was planned until the end of September.

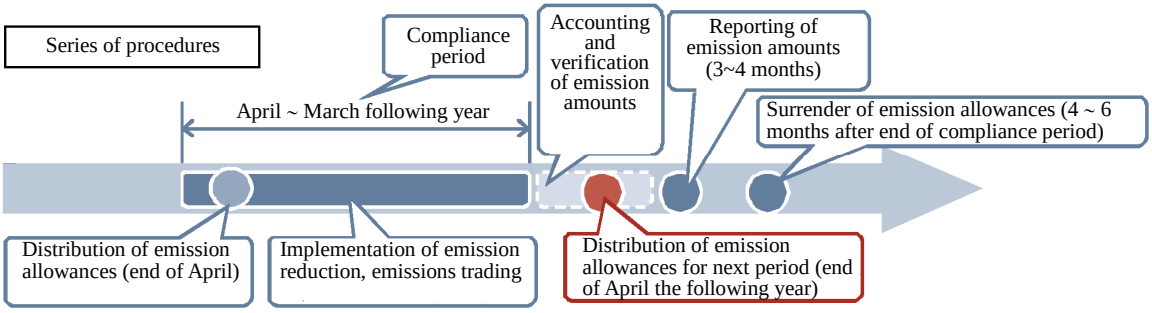
In JVETS, electricity emission factors are fixed in advance; compliance period is set from April through March the following year. In the following year, accounting is performed in April, and third-party verification is performed around June.

In foreign countries where direct treatment of electricity is adopted, accounting, verification and reporting of emission amounts is scheduled for about 3 months.

Thus, in case that emission factors required for accounting of emission amounts are known in advance, a period of 3 – 4 months is provided after the last day of every year for accounting, verification and reporting.

As for surrender of emission allowances corresponding to verified emission amounts, JVETS provides surrender period in the end of August; in other schemes, too, a grace period of 1 – 2 months is provided on termination of compliance period.

Referring to such examples, and taking into account actual amount of office work in Japan, respective periods required for accounting, verification and reporting of emission amounts, and for surrender of emission allowances, must be considered.



□ In case of one-year compliance period

Fig. 5. Series of procedures

⑦ Publication of reported emission amounts

In the accounting, reporting and publication system stipulated in the Global Warming Act, those who emit great amounts of greenhouse gases (specified emitters) are obliged to calculate their amounts of greenhouse gas emissions, and to report results to the government; the government aggregates reported data and publishes them. Emission amounts reported in the framework of domestic emissions trading scheme, too, should be published as necessary, including data for every business facility; in doing so, relationship with the existing accounting, reporting and publication system should be taken into account, and due regard should be paid to such issues as competitive position.

⑧ Obligations of participants, penalties, etc.

As for the aforementioned series of procedures, two main obligations of participants are formulated below; for each of them, penalties and other measures must be considered.

- Accounting emission amounts for every business entity and business facility covered by the scheme using a certain method, and reporting results to the government using a certain procedure (reporting obligation). Verification of emission amounts by a third-party institution meeting certain requirements (verification obligation).
- Keeping emission amounts within the set limits of greenhouse gas emission, acquisition of emission allowances from other entities if the above proves

impossible, and submission to the government of emission allowances equal or larger than reported emission amounts within the established deadline (surrender obligation).

In addition, in case that determination of participants implies that eligible business entities are obliged to report eligibility, penalties and other measures regarding non-fulfillment of this obligation must be considered.

(3) Policies

The government opens allowance accounts for scheme participants in the registry, and distributes emission allowances equal to the limits of emission amounts.

The government establishes common rules applied to all participants for accounting, verification and reporting of emission amounts. Such rules are worked out with reference to existing domestic analogs as well as ISO 14064, ISO 14065 and other international standards. Scheme participants calculate their emission amounts in the preceding year under the mentioned accounting rules within a certain period after the last day of every year, and report the accounted results to the government.

Besides, scheme participants get their accounted emission amounts verified by third-party verifiers, and report the results to the government. In case that compliance period is set to several years, there is opinion that verification should be performed yearly so as to maintain the scheme stability, as well as from the standpoint of Carbon Disclosure. On the other hand, there is opinion that accurate verification is possible once in several years, and that verification performed once in compliance period will suffice to confirm fulfillment of obligations, if allowances are not traded; thus, final decision will be made with reference to precedents and other factors.

The government establishes eligibility requirements and conduct regulations for third-party verifiers with reference to existing domestic analogs and international standards such as ISO 14065. The government will register candidates for third-party verifiers as eligible entities provided that they meet the requirements. Revocation of the registration and other measures will be provided in case that the requirements are not met.

After reporting to the government, scheme participants surrender their emission allowances corresponding to the verified emission amounts via registry within a certain period set after the last day of compliance period. From the standpoint of yearly check of fulfillment of obligations, yearly surrender is desirable; however, there is opinion that compliance period should be set equal to scheme period. The final decision will be

made with regard to scheme participants' burden and method of accounting emission amount.

In schemes adopted abroad, deadline for reporting of emission amounts is set to 3 – 4 months after the last of every year, deadline for surrender is set to 4 – 6 months after the end of compliance period; surrender period is within 1 month after the first day of compliance period if distribution of emission allowances is performed in the beginning of compliance period, and within 1 – 2 months after reporting deadline distribution of emission allowances is performed in the end of compliance period. Respective periods will be set based on these precedents.

Emission amounts reported in the framework of domestic emissions trading scheme should be published as necessary, including data for every business facility; in doing so, relationship with the existing accounting, reporting and publication system should be taken into account, and due regard should be paid to such issues as the participants' competitive position.

In this series of procedures, the main obligations imposed on scheme participants are reporting of emission amounts and surrender of emission allowances. Respective penalties and other measures are necessary in case of violation of these obligations. In addition, in case that determination of participants implies that business entities are obliged to report eligibility, penalties and other measures regarding non-fulfillment of this obligation must be considered.

6. Alleviation of Burden on Businesses

6-1. Cost Containment Measures

(1) Issues

Domestic emissions trading scheme is a system that sets emission allowances for greenhouse gases emitted by major emission sources to ensure reduction of emission, thus aiming at steady implementation of greenhouse gas emission reduction. In doing so, emission allowance trading and other schemes are admitted as options to provide flexibility in fulfillment of obligations.

In case that emission reduction as a whole did not reach initial expectations because of natural calamities or other unforeseen circumstances, there is concern that emission

allowance prices hover high because of supply-demand gap. In addition, drastic price fluctuation in a short period may occur because of short-lived factors such as weather or business sentiment. Thus, some measures must be considered to alleviate excessive burden on scheme participants in such cases.

However, assuming that the issues of international competitiveness and carbon leakages, as well as products contributing to environmental improvement, are topics for another discussion, we consider here the following 5 issues.

- Banking: measures that provide carrying over of surplus emission allowances to next compliance period, or beyond scheme period
- Borrowing: measures that provide early use of emission allowances of next compliance period, or beyond scheme period, as well as borrowing from the government
- External credits: measures that allow use of Kyoto Mechanism Credits and other foreign credits as well as credits given for efforts toward domestic reduction and sink
- International linkage: measures that provide linkage with foreign schemes and circulation of emission allowances
- Cost containment reserve: a certain amount of emission allowance reserved by the government to put on the market in case of price increase

(2) Considerations

① Banking and borrowing

In case that scheme period is split into several compliance periods, there is a spread in timing of investment and other actions within the scheme period, and overage or shortage of emission allowances is very likely to occur in every compliance period. Therefore, availability of banking and borrowing must be considered with regard to compliance periods so as to adjust compliance with obligations in compliance periods and in scheme period.

For example, RGGI confirms compliance with obligations in three-year period, while Tokyo Metropolitan scheme verifies progress yearly through five-year target period but compliance with obligations is confirmed for the whole target period. In case that compliance period coincides with scheme period, banking and borrowing can only be implemented between scheme periods. In Tokyo Metropolitan scheme, banking between scheme periods (called ‘target periods’ in Tokyo Metropolitan scheme) is allowed while borrowing is prohibited.

①-1　Banking and borrowing between compliance periods

For the sake of simplicity, we consider here banking and borrowing in case of single-year compliance period.

If emission allowances can be only consumed during a year, there is a risk that scheme participants would have to focus on achievement of short-term targets, not being able to make long-term investments in emission reduction. Besides, if surplus allowances have no value from the following year onward, there is a risk that big amounts of unused allowances would be put on the market around deadline of surrender, thus leading to price collapse and impairing investment prospects. On the contrary, if emission allowances can be carried over to next compliance period, one may expect for encouragement of early actions; thus, unrestrained banking of surplus allowances must be allowed.

On the other hand, in a single-year compliance period, there can be a case that an achievement of total emission reduction is possible through the whole scheme period by means of large-scale investment from the following year onward, even though such investment is not possible in the single-year. Therefore, an option for excess emission in a given year to be offset with emission reduction in the following years should be provided. In this case, there is concern about future non-compliance with obligations, but on the other hand, adjustment between compliance periods within scheme period can be done by allowing substantial borrowing when distribution of emission allowances is set before surrender deadline of the preceding year.

As for banking and borrowing in case of multi-year compliance period equal to scheme period, the following ①-2 applies.

①-2　Banking and borrowing between scheme periods

Now we consider banking and borrowing between scheme periods.

As for banking between scheme periods, banking between compliance periods should be allowed from the standpoint of encouragement of early actions. In the 1st phase of EU-ETS, banking between scheme periods was not allowed[9]; as a result, allowance prices collapsed in the end of scheme period. That could be prevented if banking were allowed.

As for borrowing between scheme periods, if emission allowances allocated for the following scheme period are allowed to be utilized to achieve goals of the preceding

[9] In the 1st phase of EU-ETS, emission allowances were set initially higher than emission amounts, and the surplus allowances were supposed to lose any value if banking was not allowed.

scheme period, available allowances will exceed to the level achievable by emission reduction in the target year; that means excessive emission allowances including those for the following scheme period is allowed to be utilized. Even though emission reduction is not achieved within a scheme period, allowances can be borrowed from the first year of the following scheme period; thus, it is concerned that the reduction targets will never be achieved. That may lead to failure of emission reduction by the whole scheme.

This means that borrowing goes beyond its function of cost containment for the purpose of compliance with emission reduction obligations, thus providing loopholes for compliance. Therefore, borrowing should not be allowed; other measures should be taken for providing flexibility and containing cost.

② Utilization of external credits

Even in case of natural calamities and other unforeseen circumstances, emission reduction can be achieved flexibly by means of adjustment among participants (trading) or measures taken by individual participants (banking, substantial borrowing).

In case that allowance prices rise so high that all aforementioned measures prove insufficient, allowing utilization of external credits may keep allowance prices down, while encouraging reduction and sink of emission beyond the scheme. Nevertheless, when considering utilization of external credits, one should bear in mind that some lead time is required prior to issuance of credits.

However, there is concern that unrestrained permission may hinder steady reduction of emissions, being the main purpose of domestic emissions trading scheme. On the other hand, there is opinion that no particular limitations are necessary from the standpoint of greenhouse gas emissions reduction on a global scale.

Proceeding from the above, qualitative and quantitative limitations on external credits were considered as follows.

②-1　Qualitative limitations on external credits

As for external credits, there is concern that they will not result in real reduction of emissions beyond domestic emissions trading scheme, in case that credits have no additional reduction effect because those are granted for achievement of other schemes and measures, or that accuracy of accounting, verification and reporting is not guaranteed.

In addition, domestic emissions trading scheme aims at steady reduction of

domestic emission amounts, and accuracy control is established through a certain series of procedures for accounting, verification and reporting. It is not desirable that there is a qualitative difference between emission allowances used for compliance with obligations and external credits available in such scheme.

Therefore, available credits must be limited to those leading to real reduction of emissions beyond the scheme, for example, to those based on international frameworks, or to those having a reliable monitoring, verification and reporting system based on international standards (ISO etc.). Besides, allowing utilization of external credits related to forest sink must be considered, based on position of forest sink within international framework from 2013 onwards, or avoidance of double count in part of utilization for achieving national targets and utilization as external credits in domestic emissions trading scheme.

As for external credits dealing with greenhouse gases other than the covered gases, no particular limitations are required as long as the aforementioned qualitative limitations are satisfied, and a means for accuracy control of accounting, verification and reporting, other than that of domestic emissions trading scheme, is provided.

②-2　Quantitative limitations on external credits

There is concern that easy utilization of external credits may hinder emission reduction by scheme participants. Besides, in CDM and other available credits, technological and financial contribution of Japan, particularly contribution to energy saving, is not properly appreciated, which may result in unnecessary capital outflow; therefore such credits should be only used as supplemental.

Thus, quantitative limits must be defined for every scheme participant so as to restrain external credits to supplemental utilization, with regard to historical emission changes for every industry and business entity, proportion between emission amounts and Kyoto credits, trends of new credit mechanisms etc.

③ International link

International link pertain to linkage with foreign schemes aiming at compliance with emission reduction obligations by scheme participants; for this purpose, the government allows using emission allowances and credits provided by emissions trading schemes in other countries and regions.

Discussion about utilization of emission allowances provided by other emissions trading schemes has much in common with discussion about utilization of external credits. For example, international link is helpful to keep prices of emission

allowances in Japan at international levels. However, there is concern about capital outflow to foreign emission allowance markets in case that the scheme participants continuously purchase surplus emission allowances abroad.

In addition to the aforementioned issues, further thorough consideration is required about feasibility of qualitative limitations regarding compatibility between different schemes (monitoring, verification and reporting, allowance setting methods, reduction target levels, etc.).

④ Cost containment reserve

Even though the aforementioned cost containment measures are provided and used by scheme participants, we cannot rule out the possibility that emission allowance prices rise due to unforeseen circumstances. In order to achieve the mid- and long-term targets of greenhouse gas emission reduction, all businesses make their best effort to achieve ambitious goals; in doing so, cost containment measures must be further enhanced to respond to the mentioned circumstances.

In this context, good solutions using market mechanisms may be obtained if the government reserves a certain amount of emission allowances to control supply so as to keep prices down. In foreign counties, there are examples that a certain part of the total emission quota is reserved in advance for the sole purpose of cost containment, or that allowance reserve provided for new participants is used for cost containment. However, consideration is required to determine how much emission allowances should be reserved in Japan.

As for distributing the reserved allowances, there are examples of criteria, such as preset price levels adjusted for inflation rate. Consideration is required to determine criteria for reserve usage in Japan.

There are also examples of distributing the reserved allowances through auctions. As for Japan, consideration is required about legal aspects of providing the allowances from the government to the market, as well as its concrete methods (e.g. use of trade exchange or open bidding).

As stated above, regarding enhancement of cost containment measures in case that prices of emission allowances rise due to unforeseen circumstances, there are also countermeasures other than reserve distribution, for example, relaxation of quantitative limitations on external credits mentioned in ②-2. Possibility of such measures must be clarified in advance to prevent scheme participants from unexpected detriments.

(3) Policies

In case that compliance period is different from scheme period, banking between compliance periods is to be allowed; besides, deadline of emission allowance distribution is to be set prior to surrender deadline of the preceding compliance period, thus substantial borrowing is allowed to make possible adjustment of emission allowances between any compliance periods within scheme period. On the other hand, there is opinion that compliance period should be set equal to scheme period.

Banking between scheme periods is to be allowed without any restriction. However, borrowing between scheme periods is not to be allowed.

Utilization of external credits is to be made possible; however, usable credits are to be defined on certain conditions, for example, credits based on international frameworks, or those having a reliable monitoring, verification and reporting system based on international standards (ISO etc.). In addition, certain limits must be imposed on the amount of usable external credits.

The issue of international linkage is to be considered in future.

Cost containment reserve is necessary from the standpoint of enhancement of cost containment measures for achievement of the mid- and long-term targets for greenhouse gas emission reduction. In doing so, the amount of reserve, requirements for its use, legal aspects and concrete methods of distributing the reserve, etc. must be considered. In addition, possibility of such measures as relaxation of quantitative limitations on reserve distribution and external credits must be clarified in advance to prevent scheme participants from unexpected detriments.

6-2. Products contributing to emission reduction

(1) Issues

Some believe that it is important to apply lifecycle assessment (LCA) to products that have high emission reduction effects at the stage of use, so that introduction of domestic emissions trading scheme will not impede manufacture of such products. For this purpose, consideration is required for manufacturers of products that contribute to emission reduction (solar panels, energy-saving appliances, eco-friendly cars, etc.).

Particularly, we must consider necessity of special consideration, designation of such products, and concrete measures.

(2) Considerations

① Necessity of consideration to products with high emission reduction effect

It is pointed out that setting of emission allowances in domestic emissions trading scheme would impede growth of new industries that manufacture products contributing to emission reduction. However, under the scheme intended for reduction of emission amounts, energy-saving products and other products with high emission reduction effect would be highly evaluated in the market, thus increasing sale profits, and recovering emission reduction costs (or emission allowance price in case that reduction cannot be achieved).

On the other hand, some products of this kind generate higher CO_2 emissions at the stage of manufacture than conventional products. Thus there are opinion that setting of emission allowances would make manufacture of such new products unprofitable, and that lifecycle assessment (LCA) should be applied to products that have high emission reduction effects at the stage of use so as to appreciate contribution of manufacturers.

Emissions trading schemes adopted in foreign countries do not pay special attention to such products contributing to emission reduction. In Japan, however, many products featuring high emission reduction effects have been developed and spread at home and abroad; therefore, continued encouragement of such efforts after introduction of domestic emissions trading scheme seems desirable in terms of both promoting emission reduction nationwide and lowering costs. In doing so, however, consideration is required about how to evaluate contribution to emission reduction, and how such contribution can be reflected in the framework of the scheme, prior to making final judgment.

② Designation of products with high emission reduction effect

Considering that the purpose of domestic emissions trading scheme is to guarantee steady reduction of domestic greenhouse has emission, products subject to special consideration must feature real emission reduction.

Since raw materials and intermediate products demonstrate their effects on emission reduction only when they are incorporated in final products and used by buyers, these effects should be evaluated at the stage of use. As for whether any product offering some emission reduction effect at the stage of use should be subject to special consideration, it seems that a reasonable approach is to limit the scope to products whose manufacture can be impeded by introduction of domestic emissions trading scheme. In this context, one may think of designating final products, which

feature substantially lower or effectively suppress emission at the stage of use as compared with functionally compatible products, as eligibility products. Possible examples are high-efficient home appliances and vehicles as well as high-performance solar panels.

③ Evaluation of emission reduction effect at stage of use

As for appreciation of contribution to emission reduction at the stage of use made by manufacturers of the designated products, one may think, for example, of quantifying reduction effect at the stage of use, and providing corresponding credits.

Normally, real reduction must be proven for crediting, which requires a number of procedures such as preparation of a design document about a project plan for promotion of the designated products, validation and registration of that project, monitoring and verification of reduction effect, etc. As for products for which per-unit reduction can be estimated in advance, crediting can be simplified through multiplying the contribution to emission reduction by production volume, and estimating total reduction amount at the stage of use.

However, when adopting such simplified estimation of reduction amount at the stage of use, as emission reduction effect of a final product occurs only when customers buy and use the product, it is problematic how to treat big differences of reduction effect, caused by usage pattern and evaluation period. As for Eco-Drive, in some cases, user's special treatment for driving management can enhance original emission reduction effect of cars; in other cases, however, without such treatment, reduction effect is not prevailed.

In addition to such technical problems, it is necessary to determine to whom emission reduction effect should be attributed. In the current concept of the emission inventory, when a fuel-efficient vehicle is employed in transportation sector, the emission reduction effect is attributed to transportation sector where the vehicle is used. Similarly, when a high-efficiency home appliance is used in a household, the emission reduction effect is attributed to residential sector. Furthermore, when one calculates emission reduction effects, domestic use must be distinguished from overseas use. Thus, we should be cautious about crediting the whole reduction effect to manufacturers of respective products, without maintaining consistency with contribution of customers who buy and use the product, reflection of emission reduction of the sector to which the customers belong, distinction between emission reduction at home and abroad, etc.

In order to reward manufacturers based on contribution at the stage of use, some practical approach with regard to the aforementioned problems is needed. For example, one may think of applying a certain discount factor to emission reduction amount at the stage of use of some product, and of providing thus discounted credit to the manufacturer, in order to find contribution to emission reduction achieved by the manufacturer, with considering contribution by consumer's usage pattern and reflection of that into the sector to which the consumer belongs.

Thus, when crediting emission reduction effects at the stage of use to manufacturers, individual treatment of estimating reduction amount and attribution of such credits causes a number of problems such as large uncertainties, from the viewpoints of fairness between schemes, and promotion of real emission reduction.

Besides, as for products with relatively small emissions at the stage of manufacture and strong emission reduction effect at the stage of use, there is concern that allowances distributed to manufacturers without sizeable discount may prove large enough to affect estimation of the whole emission amount of the scheme. In such case, it is very difficult to find consensus among concerned parties, and doubts may arise about essential compatibility with the scheme concept.

④ Difference in CO_2 emission amount at stage of manufacture and its evaluation

In case that a product features high reduction effect at the stage of use but generates higher CO_2 emission at the stage of manufacture than conventional products, the problem of manufacturer is that setting of emission allowances impedes production of the new models. In order to compensate for such adverse impact, one may think about designation of such products with high emission reduction effect, and distribution of additional emission allowances corresponding to the emission increase in the manufacturing stage as compared to conventional products.

Such approach may be helpful to solve many of the aforementioned issues related to crediting emission reduction that occurs at the stage of use.

However, when determining increase of emission amount at the stage of manufacture, there is the problem of the scope, that is, further consideration is necessary whether such increase should be limited to manufacture of final products, or should cover also manufacture of raw materials and intermediate products or not.

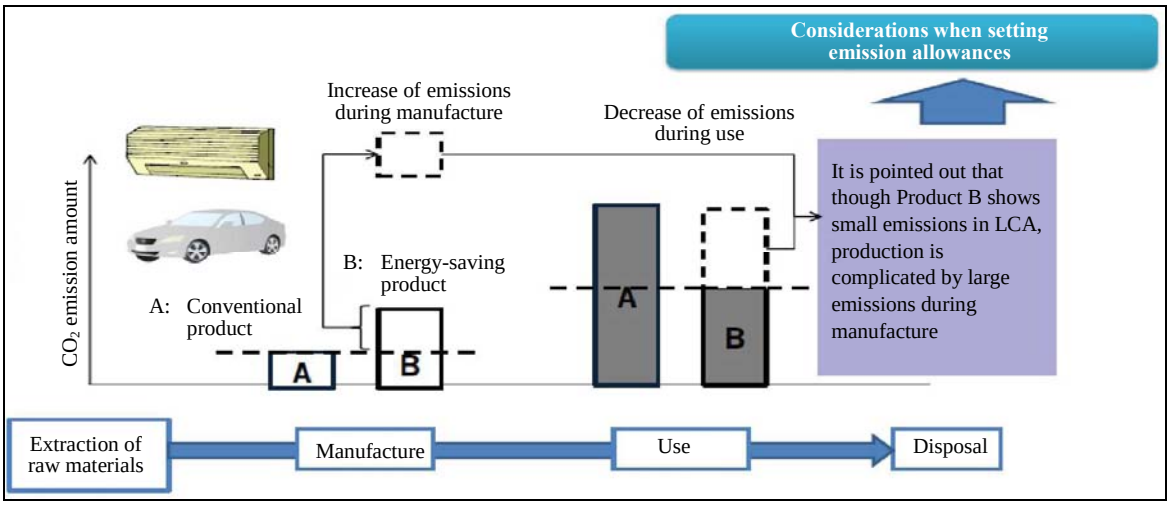


Fig. 6. Concept of LCA

(3) Policies

As for rewarding manufacturers of products contributing to emission reduction, final products, which feature substantially lower or effectively suppress emission at the stage of use as compared with functionally compatible products, are to be designated as eligible products. In case that manufacture of such products generates larger emission amounts as compared to conventional products, compensation through distribution of additional emission allowances corresponding to the difference is to be considered. In doing so, consideration is required about feasibility of accurate estimation of emission generated in manufacture of raw materials and intermediate products among the whole process of manufacturing final product.

6-3. Influence on international competitiveness and resulting carbon leakage

(1) Issues

In case that level of emission regulations for greenhouse gases varies strongly from country to country, difference in international competitiveness arises between industries in countries with more and less stricter regulations. As the result, in countries with strict regulations, production and investment might shrink, and emission might decrease. On the other hand, in countries with loose regulations, production and investment might grow, and emission might increase. In doing so, emission amounts do not decrease globally. That causes concern about so called carbon leakage.

Thus, in case that introduction of domestic emissions trading scheme affects

international competitiveness of scheme participants, necessity of some measures must be considered; if such measures are necessary, further consideration is required to determine affected businesses and appropriate measures.

(2) Considerations

Considering concerns that introduction of domestic emissions trading scheme may affect international competitiveness of participants, thus leading to carbon leakage, we first assume paid setting of allowances, which means that any emission involves some cost.

① Necessity of measures

In case of paid setting, one may assume that participants in the Japanese scheme would incur higher costs (including procurement costs for emission allowances) as compared to participants in other countries without the comparable scheme, even if the total emission amount is set with regard to total reduction potential of all participants.

Basically, some measures seem necessary if the burden on businesses becomes too heavy in case of paid setting, as can be seen from the example of EU-ETS (the 3rd phase, 2013 – 2020). Practically, it is important to determine the level of burden at which measures are necessary[10].

From the standpoint of influence on international competitiveness, judgment can be made with regard to size of two factors – exposure of businesses to international competition, and proportion of emission reduction costs in gross business costs. Decision can be based on appropriate indicators for each industry.

② Selection of businesses

As for selection criteria available at the moment and used abroad as well, exposure to international competition can be measured by trade intensity (ratio of import and export to total transaction volume), and proportion of emission reduction costs in gross business costs can be measured by carbon intensity (ratio of estimated procurement costs of emission allowance to business value). With EU and other precedents, trade intensity and carbon intensity are used to determine business sectors whose international competitiveness is affected.

[10] In case that the whole amount is auctioned in 3rd phase of EU-ETS, carbon leakage rate is below 2% for the whole range of industries covered by the scheme; however, there are research results that predict higher leakage in cement, steel and aluminum industries. E.g., Carbon Trust (2010). Tackling carbon leakage - Sector-specific solutions for a world of unequal carbon prices-

Practical selection is performed by combination of these indicators; in doing so, business sectors whose trade intensity and carbon intensity are above a certain level can be considered as those whose international competiveness is affected.

However, some measures seem also necessary for business sectors that have lower trade intensity, thus less exposed to international competition, but have considerably high carbon intensity; that means procurement cost for emission allowances is considerably high.

This is the basic approach. Concrete selection criteria must be set at appropriate levels with reference to foreign examples, and with regard to actual situation in Japanese industry.

Besides, when calculating carbon intensity and trade intensity for every business sector, officially available and verifiable data should be employed, such as the latest input-output tables and other official statistics, in order to ensure transparency and fairness.

Distribution chart of carbon intensity and trade intensity (190 business sectors)

■ Example of analysis

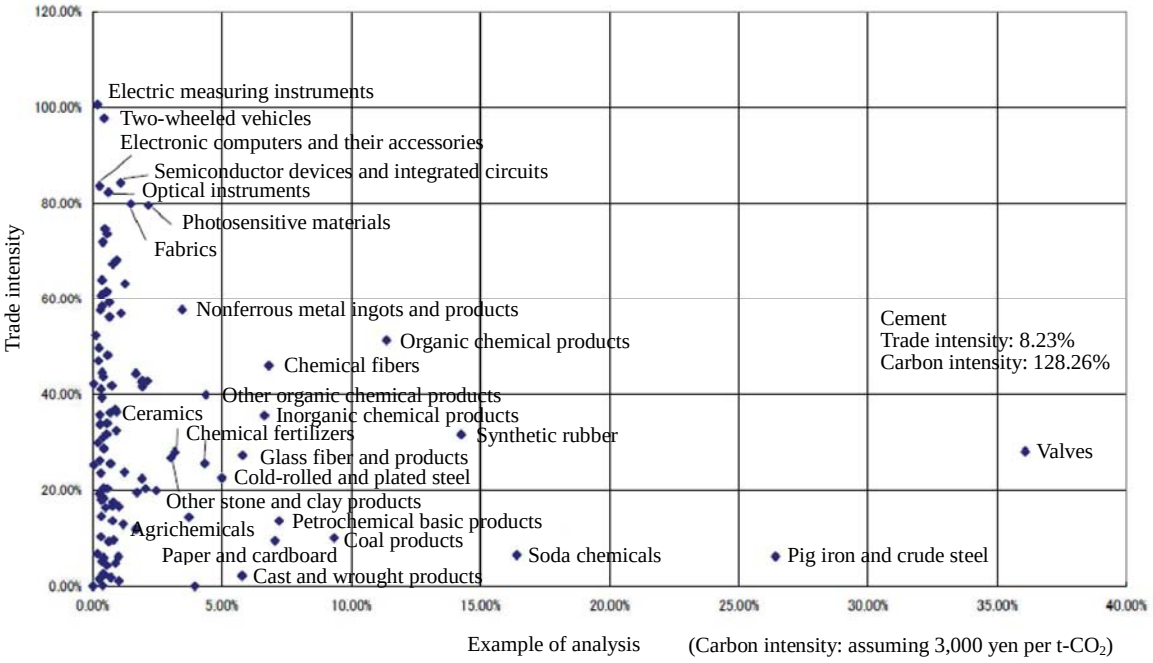


Fig. 7. Analysis based on carbon intensity and trade intensity[11]

③ Content and volume of measures

[11] In research by Dr. Arimura (Sophia University) using a method proposed in US, distribution for every type of business is shown in 190 input-output tables.

According to EU and other precedents, in case of paid allowance setting, free allowance allocation is supposed to be adopted to decrease procurement costs for exposed sectors significantly. For example, in the EU's 3rd phase (2013 – 2020), free allowance allocation in accordance with common EU-wide benchmarks is provided for exposed sectors. In New Zealand, allowances are allocated on a paid basis (flat-rate pricing). Free allocation is provided to emission-intensive and trade-exposed industrial sectors; 90% for sectors with especially high carbon intensity, and 60% for ones with comparatively high carbon intensity, respectively.

As for proportion of free allowance allocation, appropriate levels must be considered with respect to trade intensity and carbon intensity, while taking into account fairness with other businesses.

④ Measures in case of free setting

There are no foreign precedents of measures alleviating influence on international competitiveness in case of free setting; however, some measures seem desirable to be adopted in case that investment amount for emission reduction is originally estimated as large, or exceeds estimation, for the same business sectors as with paid setting.

Particularly, one can think of OBA (Output-Based Allocation) as a method to compensate for the exposed sectors' additional burden caused by difference in activity levels or emission amounts set for base year and their actual values. One can also think of another method to initially alleviate reduction obligations of the exposed sectors (emission reduction rate alleviation). Both approaches are considered below.

④-1　Specific measures: OBA method

OBA is a method to compensate for a part of increase in activity volumes; for example, when activity volumes in recent two years increased more than those in the base year, emission limit is to be revised with respect to this increase, and the gap from initial emission allowance is compensated. As distinct from paid setting, with free setting, scheme participants do not incur any allowance procurement costs as long as their emission amounts are kept within pre-determined limits, and therefore procurement costs can hardly affect international competitiveness. Thus, in case of free setting, special attention is needed in case that initially set emission allowances are not sufficient for emission amounts during compliance period, or in case that surrender obligations cannot be fulfilled without buying additional allowances or credits.

For example, one may multiply average activity volumes or emission amounts for

recent two years by the same benchmarks (or emission reduction rates in case of grandfathering) as were used for initial setting; if thus obtained amount exceeds the initial limit, then additional allowance is distributed with respect to the exceeding. In doing so, additional distribution can be performed from the beginning of a period using calculated exceeding in the past.

With this method, the same benchmarks (or emission reduction rates in case of grandfathering) as were used for initial setting can be applied; on the other hand, there may be concern that recent activity volumes or emission amounts could be increased aiming at larger additional allowances[12].

④-2　Specific measures: emission reduction rate alleviation

Emission reduction rate alleviation is a method to alleviate improvement rates in benchmarking or reduction rates in grandfathering when setting emission allowances for the exposed sectors. Concretely, improvement rate from actual values to benchmarks is alleviated in case of benchmarking, and reduction rate is alleviated in case of grandfathering.

With such an approach, compensated amount do not depend on whether actual emission amounts exceed initially set mission allowances or not; on the other hand, appropriate levels of alleviation for the exposed sectors must be determined. It is also pointed out that improvement rates in benchmarking or reduction rates in grandfathering must be set with reference to foreign peers.

(3) Policies

In case of paid allowance setting, measures are taken for businesses whose international competitiveness can be affected; that can cause carbon leakage. Such businesses are to be determined based on trade intensity and carbon intensity, and to be rewarded by free allowance distribution or in some other ways.

Reference values of trade intensity and carbon intensity are to be set with regard to foreign precedents and actual situation of industry in Japan; in doing so, the latest input-output tables and other official statistics are to be used in order to ensure transparency and fairness.

In case of free setting, exposed sectors are to be determined in the same way as with paid setting. OBA, emission reduction rate alleviation or other methods are to be used

[12] Some research suggests that using OBA can alleviate burden on domestic energy-intensive industries. E.g., Center for the Environment & Trade Research, Sophia University (2010). Design of Emissions Trading Scheme with regard to International Competitiveness and Leakage Issues: A Study on Emission Allowance Allocation based on Production Volumes using Applied General Equilibrium Analysis

for additional distribution of emission allowances.

7. Coordination between National and Local Authorities

(1) Issues

When domestic emissions trading scheme is introduced legally, there are problems regarding legal position of existing schemes of total emission reduction and emissions trading implemented by local authorities under local laws, and coordination between national and local authorities. In addition, respective duties must be clearly segregated so as to prevent excessive burden on scheme participants and other complications; at the same time, some measures should be considered to appreciate past efforts toward emission reduction made by businesses in the local framework.

(2) Considerations

① Relationship between national and local laws

According to the Constitution of Japan and Local Autonomy Law (Law No. 67, 1947), local public bodies can enact local laws and regulations within the confine of national law, insofar as not in conflict with national law. When judging whether a local law is in conflict with national law or not, we must compare not only respective subject matter and provisions but also purpose, objectives, contents and effects.

The Basic Environment Law (Law No. 91, 1993) says that the national government is responsible for enactment and implementation of fundamental and comprehensive measures and policies, while local authorities are responsible for enactment and implementation of measures and policies, following those by the national government, or with respect to local natural and social conditions.

Proceeding from the above, the current antipollution laws provide the following measures regarding relationship with local laws.

- Establishing concrete regulatory standards are committed to local governments.
- Regulations more stringent than the national law are allowed.
- Discretionary regulations for subjects not provided by the national law are allowed.

According to recent academic approaches, tightening regulations and discretionary regulations are distinguished; the latter are generally allowed, while the former are subject to consideration in terms of purpose and objectives of the national law unless

they are explicitly allowed by the national law.

In the field of global warming countermeasures, local authorities are assumed responsible for enactment and implementation of measures and policies with respect to local natural and social conditions, taking into account appropriate division of duty between the national and local authorities. Actually, more than 30 prefectures and designated cities have implemented local schemes which oblige businesses to prepare a plan about measures toward greenhouse gas emission reduction and to submit it to the governor, as well as other measures and policies; those have been implemented separately from the accounting, reporting and publication system based on the Global Warming Act, and some of them are often preceding this system. Besides, Mandatory Emission Reduction and Trading Scheme was launched by Tokyo Metropolitan Government in April 2010, while a similar scheme is to be launched in Saitama Prefecture from April 2011. As in other fields of environmental policies, such measures by local authorities can be appreciated as pioneering efforts. When considering domestic emissions trading scheme in national level, sufficient precautions must be taken so as not to destroy the existing efforts provided by the local laws.

② Involvement of national government in local activities

After the first phase of decentralization reform in 1999, the national government's involvement in local public bodies was legitimated in the Local Autonomy Law; at the same time, administrative functions imposed formerly on local governments were eliminated, and administrative duties of local governments were arranged as statutory entrusted functions or local authority functions other than the statutory entrusted functions.

Besides, the issues of revision of duties, expansion of legislative powers, and abolition of national government outposts are now considered based on the Devolution Strategy Outline (approved by the Cabinet in June 2010) and other resolutions.

The devolution strategy is underway but after the first phase of decentralization reform, division of power regarding environmental regulations can be summarized as follows.

(a) Duties administered by the national government on nation-wide scale (National government's direct functions)

(b) Duties related to essential functions of the national government, and defined by the law or ordinance as requiring special guarantees (statutory entrusted

functions)

(c) Other duties performed by local authorities with regard to local situation (local authority functions)

In case of that duties are segregated between national and local authorities within a single legal framework, normally, the national government administers duties on nation-wide scale, while local authorities perform their duties with regard to local situation. Concretely, as is often the case in nature protection laws, the national government performs duties that go beyond prefectures, while prefectural governments perform duties within their prefectures (local authority functions). In public property management laws, too, the national government deals with properties that require nation-wide management (first-class rivers, national roads, etc.), while local authorities deal with properties that can be managed within respective jurisdictions.

As for duties stipulated by the current Global Warming Act, implementation of the accounting, reporting and publication system is considered as a national government's direct function, without participation of governors; that is explained by such reasons as global impact of greenhouse gas emissions.

On the other hand, as mentioned above, with regard to local nature and social conditions, more than 30 prefectures and designated cities have implemented local schemes, which oblige businesses to prepare a plan about measures toward greenhouse gas emission reduction and to submit it to the governor, separately from the accounting, reporting and publication system based on the Global Warming Act and often preceding this system.

③ Legal position of emissions trading schemes ruled by local laws

In case of legal enactment of domestic emissions trading scheme, there is the issue of relationship with preceding local laws.

One may think that such schemes ruled by local laws are to be straightly incorporated to national laws, and that local authorities are to be treated as regulatory bodies. However, since the local rules for development and submissions of plans based on the current local laws do not cite stipulations of the Global Warming Act, necessity of legal regulations must be considered carefully. One may also think of defining implementation of such schemes as a national government's function, while considering local authorities as regulatory bodies with statutory entrusted functions. This, however, would be difficult because the first phase of decentralization reform assumes that new statutory entrusted functions should be assigned as little as possible.

Thus, the national legislation only deals with national government's duties; however, if relationship between national and local laws is not somehow coordinated, there would be concern that the local law's system may lose its stability (whether local laws determining emissions trading schemes are within the confine of law and not in conflict with law). Therefore, relationship between national and local laws should be coordinated, and stipulation of necessary provisions in local laws should be allowed explicitly.

In doing so, a discussion is possible about whether such coordination should only pertain to regulations not determined by the law (discretionary regulations), or include also regulations more stringent than the law (tightening regulations). For example, in case of the antipollution laws, both discretionary and tightening regulations are allowed because pollution conditions vary from region to region. On the other hand, the Environmental Impact Assessment Act allows local laws to set up regulations for businesses not covered by the procedures of the Act, but not allows imposing additional procedures on businesses covered by the Act.

There is opinion that domestic emissions trading scheme deals with greenhouse gases producing global effects, thus being different form antipollution laws that deal with local pollutions. National and local laws determining emissions trading should be harmonized as much as possible to prevent excessive burden and other complications on scheme participants.

As for establishing local regulations not covered by the national law (for example, regulations below national threshold levels), local authorities are supposed to enact and implement global warming countermeasures with respect to local natural and social conditions, and existing systems of mandatory planning are a part of such countermeasures. In addition, emissions trading schemes are implemented as more effective schemes; therefore, there is hardly any reason to prohibit implementing such local regulations not covered by the national law.

On the other hand, consideration on relationship between national and local laws is required in case that both laws' scheme participants overlap. If national and local laws impose same obligations on same subjects, one may think of uniformed application of the scheme based on national law so as to prevent excessive burden on scheme participants. However, in case that local participants in local schemes achieve emission reductions, as is the case in Tokyo Metropolitan area and Saitama Prefecture, precautions should be taken in design of national scheme so as not to destroy the existing achievements.

When aiming at coordination between domestic emissions trading scheme and

existing local laws, such as those in Tokyo Metropolitan area and Saitama Prefecture, approach may vary with scheme options. For example, overlap range of scheme subjects may vary depending on whether electricity is treated directly or indirectly. If the national government takes intensity-based method, there is also opinion that such overlap with Tokyo and Saitama local laws based on total amounts can be avoided.

In any event, overlap between subjects of national and local laws, scheme compatibility and other issues should be considered in designing national scheme. In doing so, national and local laws underlying emissions trading schemes should be harmonized as much as possible to prevent excessive burden and other complications on scheme participants.

Such coordination should be revised in future, if necessary, with the progress of Devolution Strategy Outline.

④ Coordination with existing local laws

As mentioned in ③, coordination between national and local laws may be different for every option, but careful coordination emission schemes based on existing local laws is necessary in any case.

For example, when businesses covered previously by local laws increase their emissions to become subject to national scheme, such businesses are treated by national law in the same way as any new participants. However, unless previous efforts under local schemes are appreciated in terms of setting emission allowances, businesses cannot comfortably make any efforts under local laws. Therefore, when setting emission allowances, some measures should be taken to reward participants for the previous reduction efforts made in local schemes.

In addition, relationship between national and local laws should be made clear so as to prevent complications when domestic emissions trading scheme and local laws are different in scope of scheme participants, methods of accounting emissions, and other aspects.

(3) Policies

National and local laws underlying emissions trading schemes should be harmonized as much as possible so as to prevent excessive burden and other complications on scheme participants; in doing so, previous reduction efforts made in local schemes should be properly appreciated.

As for local regulations not determined by the national law (for example, regulations below national threshold levels), there is hardly any reason to prohibit implementing

such regulations. When scheme subjects overlap, one may think of uniformed application of the scheme based on national law if some obligations are imposed on same subjects. Nevertheless, precautions should be taken so as not to destroy achievements under existing local laws; overlap between subjects of national and local laws, scheme compatibility and other issues should be considered in designing national scheme. Proceeding from the above, legal provision of a national law about harmonization with local laws is to be provided.

Besides, further consideration is required so as not to destroy businesses' efforts under existing local schemes; that includes some rewards in terms of setting emission allowances. In addition, relationship between national and local schemes will be made clear so as to prevent complications caused by differences in scope of scheme participants, methods of accounting emission, and other aspects.

8. Domestic Emissions Trading Scheme in Context of Other Policies

(1) Issues

The Bill for Basic Act on Global Warming Countermeasures, decided by the Cabinet and submitted to the extraordinary session of the Diet in October 2010, stipulates, in addition to the mid- and long-term goals, basic principles concerning global warming countermeasures, obligations of national and local public agencies, businesses and citizens as well as a number of concrete measures such as establishment of domestic emissions trading scheme, consideration of global warming tax, and development of feed-in tariff scheme for renewable energy.

The Bill for Basic Act on Global Warming Countermeasures aims at implementing all possible measures and policies; however, such measures and policies must be implemented with maximum possible efficiency with regard to their individual effects and impacts. The Subcommittee is to sum up expert considerations and opinions regarding domestic emissions trading scheme, thus contributing to future scheme design. In doing so, the Subcommittee considers other two policies stipulated by the Bill for Basic Act on Global Warming Countermeasures together with this scheme to make clear division of roles, to check for issues that should be taken into account in domestic emissions trading scheme, and how such issues, if any, should be treated.

(2) Considerations

① Division of roles among three main policies

Based on provisions of the Bill for Basic Act on Global Warming Countermeasures, the roles of three main polices can be formulated in the following way.

(Domestic emissions trading scheme)

This is a system that sets up limits (as a formula of absolute amount in principle, while intensity-based setting is considered as well) on greenhouse gas emissions for large emitters of greenhouse gases for a certain period, thus aiming at steady reduction of greenhouse gas emissions to achieve Japan's mid- and long-term targets, and allows the emitters to trade the allowance of greenhouse gases emission among them and to utilize other flexible measures for fulfillment of obligations.

(Global warming tax)

Imposing tax burden on all CO_2 emitters (fossil energy users), this policy aims at emission reduction by means of taxation, which also covers expenses required for global warming countermeasures.

(Feed-in tariff scheme for renewable energy)

This is a system that mandates electric power suppliers to procure the whole amount of renewable electricity at affixed price, during certain period and under certain conditions, thus promotes the use of renewable energy. The expenses are charged by electric power suppliers to consumers together with electricity fees.

The following can be concluded about the aforementioned three policies from the standpoint of their roles. Domestic emissions trading scheme is theoretically advantageous in that expenses required to achieve certain reduction targets can be minimized, even when investment amount for future reduction measures cannot be predicted completely; hence a big potential role for reliable achievement of the mid-term goals is expected. Scheme participants are limited to large-scale businesses because large plants, buildings and other facilities are the main emission sources, and because their emission reduction measures can be effectively implemented. On the other hand, global warming tax offers superb economic efficiency, though tax system design can not guarantee a certain level of emission reduction. Thus, as explained in ②, taxation of upstream businesses (importers and producers of crude oil, etc.) that utilizes existing tax collection system offers emission reduction effect in a wide range of sectors such as small businesses, residential sector, and transportation sector, which

are difficult to cover by domestic emissions trading scheme. Furthermore, utilization of tax revenues for global warming countermeasures promises further emission reduction effect as well as lesser burden on emitters for additional investment. Feed-in tariff scheme is a system established specially for promotion of renewable energy use for power generation, being a high-priority objective.

As explained above, domestic emissions trading scheme that cap the emissions of large emitters, global warming tax that imposes burden on wide range of CO_2 emitters, thus encouraging emission reduction, while promising revenue sources, and feed-in tariff scheme that promotes the use of renewable energy are essentially different in terms of goals, subjects and means. Appropriate combination of these policies can produce mutually complementary effects. In doing so, large emitters may prove subject to all the three policies; in this case, their burden is adjusted as explained in ②.

These three policies can be combined effectively with other measures such as promotion of voluntary approaches by businesses, development of campaign for people, various regulations, subsidies, tax benefits and so forth. As for subsidies and other supportive measures requiring financial expenses, global warming tax is thought to be appropriate for raising the financial resources from the standpoint of easing additional burdens of emitters.

② Burdens involved in domestic emissions trading scheme

Even if global warming tax and feed-in tariff scheme have been introduced, when limits of emission amounts (allowances) are distributed free of charge based on the potential emission reduction of participants in domestic emissions trading scheme, considering extent of reduction efforts made by every business in the past, content and volume of technologies that can be introduced in future and other factors, no additional investments are required above those related to such efforts. In addition, from the society-wide viewpoint, no duplication of burden with the other two policies occurs, and excessive investments are not needed[13].

The same applies to the case of paid allowance setting if the whole purchase cost is refunded to scheme participants; otherwise, special attention is needed to prevent businesses from excessive burdens[14].

The global warming tax proposed by the Ministry of the Environment covers a

[13] However, duplication of purchase cost of allowances and tax burden may occur for individual businesses for allowances beyond the range of free allocation.
[14] See Footnote 5.

wide range of sectors including households, and implies easy and consistent implementation; taxation of upstream businesses (such as importers and producers of crude oil) is considered as a practical way to introduce the new tax from FY2011. Therefore, coordination with the taxation system is difficult technically in case of downstream businesses (consumers of fossil fuels) participating in domestic emissions trading scheme. In addition, many European countries adopt tax exemptions with regard to influence on international competitiveness but only limited numbers of countries apply exemptions to participants of EU-ETS.

③ Investments of scheme participants to achieve their mid-term targets

As stated above, even though limits of emission amounts (allowances) are distributed free of charge considering potential emission reduction of scheme participants, implementation of potential reduction requires certain investments, and some measures are taken to encourage such investments; domestic emissions trading scheme, however, require no additional investments exceeding such investments.

Considering total expenses to be borne by scheme participants in terms of not only domestic emissions trading scheme but also global warming tax, feed-in tariff scheme, and others, we should take into account investment needed to achieve potential emission reduction as well as costs and effects related to introduction of the other two policies, even though domestic emissions trading scheme itself does not require additional investments.

At the moment, however, the necessary design and estimation on global warming tax and feed-in tariff scheme for renewable energy have not been completed with accuracy enough for the aforementioned analysis yet, and so, the cost burdens cannot be calculated reliably; therefore, projected investment amount required for achievement of the mid-term targets set up by Japan are used as an approximation of cost burdens put on scheme participants. This investment amount required at initial stage from all subjects for emission reduction measures to achieve the mid-term goals (below referred to as 'investment amount'[15]) is now calculated by the Mid- and Long-Term Roadmap Subcommittee of Central Environment Council. This calculation is used below to estimated scheme participants' investments required for reduction measures; considering the above assumptions and other issues, the following should be borne in mind

[15] Study by the Mid- and Long-Term Roadmap Subcommittee deals with 'additional investment' defined as 'sum of the difference in initial cost between respective low-carbon technologies and conventional technologies multiplied by introduction amount'. In this report, the term 'investment amount' is used for clear distinction between investment based on reduction potential, and additional investment.

- The scheme provides flexible implementation of emission reduction measures by businesses through allowance transaction; thus it is considered as a system to minimize investments of the whole investment of businesses and citizens to the utmost extent

- Low-carbon investments made for achievement of the mid-term targets are supported by a number of policies aiming at saving initial investment by businesses, while boosting private investments. Therefore, the investment amount combines public and private investments, while actual burdens put on businesses is supposed to fall below this amount.

- As explained in ④-2, this investment amount does not include expenses recovered through saving energy costs. Initial investments are recovered through saving energy costs (energy-saving benefits). Besides, low carbon investment could be considered as a mid-term investment to strengthen industry against future risks of energy price fluctuations. On the other hand, this investment amount does not include some expenses required from scheme participants for fulfillment of their obligations, for example, verification by third-party institutions.

- In addition to the aforementioned merits, there is contribution to domestic employment and demand as well as encouragement of low-carbon innovations in mid- and long-term perspectives and other benefits that cannot be expressed in figures. Considering that low-carbon industries are expected to grow greatly throughout the world, and that numerous countries make large-scale investments in this field, due regard should be given to securing mid- and long-term international competitiveness of low-carbon industries. On the other hand, careful scheme design is necessary to avoid the adverse influence of the scheme on international competitiveness and carbon leakage risks.

- Low-carbon investments are necessary to alleviate social influence of climate change caused by greenhouse gas emissions produced by business activities (external diseconomy); therefore, effects on climate change must be taken into account when evaluating the investment amount.

④-1 Investment amount of scheme participants from industrial and commercial sector

With regard to aforementioned issues, investment amount of scheme participants is considered.

The Mid- and Long-Term Roadmap Subcommittee estimates the investment amount in 10 years from 2011 through 2020 as 57.2 ~ 96.8 trillion yen in case that domestic greenhouse gas emission is reduced by 15% ~ 25% from 1990 levels[16] (materials of the Mid- and Long-Term Roadmap Subcommittee of Central Environment Council dated December 21, 2010).

Below we use investment amounts in industrial and commercial sector estimated by the Mid- and Long-Term Roadmap Subcommittee as an example of investment of businesses covered by domestic emissions trading scheme. Since domestic emissions trading scheme is combined with other policies such as global warming tax and feed-in tariff scheme for renewable energy, it should be borne in mind that these amounts are not attributed directly to domestic emissions trading scheme, because these amounts include financial resources and reduction effects provided by the other policies.

Considering the aforementioned 10-year investment amount by sectors, industrial sector accounts for 3.0 ~ 3.3 trillion yen (about 5 ~ 3% of total investments), and commercial sector accounts for 6.0 ~ 11.2 trillion yen (about 12 ~ 10%). For example, assuming the threshold is 10,000 t-CO_2, the ratio of businesses reaching the threshold is 100% in energy-intensive industries[17], 62% in other industries, and 6% in commercial sector. If investment amount is merely proportional to the ratio, the amount in industrial and commercial sector would be 2.5 ~ 2.7 trillion yen and 0.4 ~ 0.7 trillion yen, respectively. In this case, simple average annual investment (without regard to discount rate) is 250 ~ 270 billion yen in industrial sector, and 40 ~ 70 billion yen in commercial sector.

The above amounts make up about 4% and 10%, against yearly energy costs in respective sectors (about 7 trillion yen in industrial sector, about 0.5 trillion yen in commercial sector[18]), and even less if energy-saving benefits are taken into account (to be explained later). In addition, as stated above, the low-carbon investments are made not only by private efforts but supported by subsidies and other incentive measures. That is, these amounts combine public and private investments, and burdens put on businesses fall below these amounts. For example, these burdens can

[16] This is additional investment for global warming countermeasures and energy-saving technologies as compared to 'technology-frozen case' assuming that the present conditions of technology introduction and energy efficiency (as for 2005) continue unchanged into future. Energy-saving effect is not included.

[17] Steel, cement, chemical and pulp industries.

[18] These values are obtained as energy consumption in each sector in 2008 (source: *Overall Energy Statistics*) multiplied by average unit price for every energy source (source: *Explanations to Overall Energy Statistics "On Estimation of Final Energy Consumption in Nonmanufacturing and Service Industries using Input-Output Tables"*).

be alleviated through governmental subsidies using financial resources from global warming tax.

④-2 Estimation of investment amount with energy-saving benefits and other factors

As explained in ③, the investment amounts considered in ④-1 are initial investment amounts without including energy cost-saving effects due to technology introduction (energy-saving benefits). For example, according to the Mid- and Long-Term Roadmap, Japan-wide investment amount can be recovered by half by 2020 due to energy-saving benefits, and almost in full by 2030 considering service life of equipment.

Emission reduction costs vary greatly with assumed investment payback period. Let us first consider long-term evaluation when investments are made assuming long-term energy-saving benefits (using social discount rate rather than subjective discount rate). Assuming that the threshold is set to 10,000 t-CO_2, the ratio of businesses reaching the threshold is 90% in industrial sector and 6% in commercial sector. If investment amount is merely proportional to the ratio, the average yearly cost with energy saving effect would be about 70 ~ 80 billion yen in industrial sector, and -40 ~ -70 billion yen in commercial sector; that is, yearly costs decrease significantly in industrial sector, while saving (payback) exceeds investment in commercial sector. On the other hand, in case that the subjects set a short payback period (assuming equipment replacement every 3 ~ 9 years, which is shorter than service life) because of various risks, short-period limitation of energy-saving benefits, etc. (subjective discount rate), yearly cost is about 230 ~ 270 billion yen in industrial sector, and 200 ~ 400 billion yen in commercial sector. In case of rise of energy prices, the saving (payback) increases, energy-saving benefits grow further, and some industries may even obtain profit saving (payback). However, in terms of individual enterprises, in order to identify and remove any barriers to suppress voluntary investment for efficient use of funds on hand, measures for alleviation of initial cost burdens must be arranged so that businesses and other subjects can make low-carbon investment with long-term viewpoint.

Thus, businesses and other subjects in some sectors may enjoy long-term energy-saving benefits; on the other hand, energy saving contributes to domestic employment and demand in the short term, and to robustness of the industry against risks of energy price fluctuations in the medium term. Besides, one may expect for promotion of mid- and long-term innovations in low-carbon fields. Thus, low-carbon investments can be considered not merely in terms of burden and cost but as

investments for the future. In addition, foreign countries also promote both public and private investments in low-carbon industries for these reasons, and investment amounts in Japan must be determined with regard to securing international competitiveness in low-carbon industries, and with reference to foreign efforts.

Besides, with domestic emissions trading scheme, pricing of CO_2 emissions through allowance trading contributes to clear prices for various emission reduction measures so that not only scheme participants but many other subjects can choose less expensive options; as a result, inexpensive measures may be revealed that were latent in society. This would encourage taking a series of emission reduction measures starting from less expensive ones, thus cutting investment amounts for achievement of reduction targets on the national scale. It is also pointed out that numerous analyses show that the total burden decreased due to introduction of emissions trading schemes in Europe and the U.S.

Low-carbon investments considered above are necessary to alleviate social influence of climate change caused by greenhouse gas emissions generated from business activities (external diseconomy). Climate changes have long-term effects, and amounts of low-carbon investments must be evaluated in terms of alleviation of burden on future generations, with regard to expenses related to adverse effects of climate change on society in case that no investments are made[19] or expenses related to import of fossil fuels[20] (though such expenses cannot be compared directly to investment amounts through 2020) as well as benefits for energy security due to higher energy self-sufficiency ratio.

⑤ Fields when some burden relief measures are necessary

As explained above, investment amounts required for participants in domestic emissions trading scheme to achieve the mid- and long-term targets are not likely to be excessive on the national scale, while also contributing to industry strengthening due to low-carbon investments. On the other hand, we must consider whether excessive burden on certain businesses can occur, and how such excessive burden can be alleviated appropriately in the framework of the scheme.

The burdens discussed above are not distributed uniformly among businesses, and

[19] E.g., in the Stern Review on the Economics on Climate Change that summed up results of a study carried out under authority of UK finance minister, the total damage caused by climate change in case that no special measures are taken against global warming is estimated as 5 ~ 20% decrease in terms of per-capita consumption (*Annual Report on the Environment, the Sound Material-Cycle Society and the Biodiversity 2009*, p. 38).

[20] As of 2008, about 23 trillion yen, which makes for about 30% of total imports and about 5% of GDP.

fields with relatively high burdens may exist. When identifying such fields and considering measures for burden relief, a verifiable and transparent method based on official data and other sources should be employed in order to ensure transparency and fairness of the scheme. Below we assume some examples of fields with relatively high burden put on participants in domestic emissions trading scheme.

(a) Carbon-intensive industries

In industries that produce large carbon emission due to high energy consumption, there is high risk that actual burden will be different from expectations because of increase and decrease of production volumes and other consequences of economic fluctuations. As for a method to determine such carbon-intensive industries, one may think of using proportion of CO_2 related costs in business value (carbon intensity) in case that carbon is priced.

As for energy-intensive industries, ex-post distribution of additional allowances and other measures for burden relief seem reasonable considering influence on domestic employment. Burden on carbon-intensive industries can be alleviated in combination with free setting of emission allowances with respect to potential emission reduction.

(b) Industries with strong influence on international competitiveness

Industries exposed to international competition, even though less carbon-intensive than the industries mentioned in (a), duffer from relatively big burden because it is difficult to impose investment on costs. Possibility of cost pass-through can be estimated by indexing exposure to international competition (trade intensity). Therefore, industries with trade intensity and carbon intensity exceeding certain levels can be considered as ones with strong effect on international competitiveness, thus being subject to some burden relief.

(3) Policies

Domestic emissions trading scheme, global warming tax and feed-in tariff scheme for renewable energy are essentially different in respective goals, subjects and means; therefore, appropriate combination of these policies can produce mutually complementary effects. Even if global warming tax and feed-in tariff scheme have been introduced, when limits of emission amounts (allowances) are distributed free of charge considering potential emission reduction of participants in domestic emissions trading

scheme, such as the extent of reduction efforts made by every business in the past, content and volume of technologies that can be introduced in future, and other factors, no additional investments are required above those related to such efforts. In addition, from the society-wide viewpoint, no duplication of burden with the other two policies occurs, and excessive investments are not needed.

Investment amounts required to achieve the mid-term targets of industries and businesses assumed as participants in domestic emissions trading scheme are not excessive on the national scale, and can be considered as investments for the future to mitigate the impact of climate change, while we can expect for industry robustness against the surge of energy price due to energy-saving benefits, as well as employment and innovations encouraged by low-carbon investments. On the other hand, in terms of individual enterprises, certain relief measures should be considered for carbon-intensive industries where relatively big investments are required or industries exposed to international competition; necessity of such relief measures should be considered with regard to influence on international competitiveness and possible carbon leakage.

9. Other Issues (Registry, Appropriate Market Infrastructure)

As for particular issues of designing domestic emissions trading scheme such as registry and appropriate market infrastructure, the Experts Panel on Legal Aspects of Domestic Emissions Trading Scheme (Chairperson: Prof. T. Otsuka) has been involved in accumulation of knowledge and experience as well as expert discussions about existing legislation and experimental approaches. Points of concern regarding the present state and future consideration are summed up below.

(1) Registry System

① Consideration of system specifications and design of registry system and data management system

In order to attain smooth transaction and surrender of emission allowances in domestic emissions trading scheme, a registry system for emission allowances must be established with reference to the Kyoto Protocol. In addition, a data management system is necessary to monitor real emission amounts and compliance with obligations for efficient operation of the scheme. Therefore, consideration of system

specifications and design of these systems are underway.

In Japan, systems of this kind are already operated (National Registry System under Kyoto Protocol, JVETS Registry System, and Target Achievement Control System of Trial Emissions Trading Scheme), and some knowledge and experience have been accumulated.

In the Subcommittee, there is opinion that a cost-benefit analysis is required for development of the registry system and data management system by the government, and for financial management of emission allowances by enterprises.

On the other hand, there is opinion that the registry system and data management system would not require substantial expense because existing systems could be utilized.

In future, a study toward more concrete specifications and design of the emission allowances registry system and emission data management system is needed with reference to knowledge and experience obtained with existing systems, and with regard to convenience of scheme participants and others as well as cost-performance of the data management system for emission amounts and other data.

② Legal nature and basic rules about emission allowances

In order to provide legal implications to electronic registration in the registry, and to maintain stable circulation of emission allowances, legal nature of emission allowances must be prescribed; legal nature and basic rules about emission allowances were considered by the Experts Panel on Legal Aspects of Domestic Emissions Trading Scheme in FY2009.

The Experts Panel concluded that, with regard to actual conditions of the registry system and other elements mentioned in ①, some legal provisions are needed for conditions for effectuation of assignment and transfer of emission allowances, presumption of legal possession, and bona fide acquisition. In addition, for issues which the above provisions could not cover, special provisions are to be considered.

In future, a more concrete consideration on legal nature and basic rules about emission allowances is needed.

(2) Appropriate Market Infrastructure

① Rules on trade (who can trade, what transactions are to be regulated, etc.)

In order to provide flexible compliance with obligations under domestic emissions trading scheme and to achieve expected efficiency, the Experts Panel on Legal

Aspects of Domestic Emissions Trading Scheme is considering rules on trade in terms of appropriate market infrastructure presuming smooth emissions trading.

Discussions have been held on the scope of transaction types and participants (transaction agents), necessity of entry regulations and regulations regarding brokers and traders as participants, regulations regarding unfair trading, and other issues.

In the Subcommittee, there is opinion that, since speculative buyouts, price manipulations and other so called money games (violent price fluctuations or continued high prices caused by over-speculations) must be excluded, no brokers and traders are necessary.

On the other hand, there is opinion that participation of brokers and traders other than scheme participants should be allowed because otherwise transaction costs would increase, and flexibility of compliance with obligations would be lost.

In future, further consideration by the Experts Panel is needed aiming at concrete rules on trading with regard to securing appropriate operation of transaction participants, and prevention of speculative buyouts, price manipulations and other unfair practices.

② Government's role in the market (appropriate disclosure of information, prevention of price increase, etc.)

In order to ensure soundness of emissions trading, accurate information about demand and supply of emission allowances must be disseminated; thus, the Experts Panel on Legal Aspects of Domestic Emissions Trading Scheme is discussing present state and trends of statistical information about emission allowances provided by the government as well as demand and supply of emission allowances.

In the Subcommittee, there is opinion that transparency in emissions trading is necessary, including information about emission allowances possessed by enterprises.

On the other hand, there is opinion that the registry system must be made as transparent as possible, while it is disputable whether trading conditions and emissions allowances of individual enterprises should be always disclosed.

In future, further consideration of information disclosure is necessary in terms of existing official statistics on energy and other issues as well as timely and appropriate dissemination of information on demand and supply of emission allowances. However, re-consideration will be required when scheme design is materialized.

In addition, the Experts Panel is discussing legal regulations on an allowance exchange as an element of emissions trading infrastructure.

In future, regulations required to secure trading discipline and fairness must be

considered with regard to position of an allowance exchange in terms of rules on emissions trading.

③ Treatment of emission allowances in terms of accounting and tax

Treatment of emission allowances in terms of accounting and tax should be adjusted when design of domestic emissions trading scheme is materialized. For example, as for accounting, the Accounting Standards Board of Japan (ASBJ) publishes practical solution reports on accounting Kyoto Credits and emission allowances of the trial emissions trading scheme (including JVETS emission allowances); as for tax, the National Tax Agency publishes answers to questions regarding treatment of Kyoto credits and domestic credits in terms of corporate tax and consumption tax.

After materialization of domestic emissions trading scheme design, further consideration of treatment of emission allowances in terms of accounting and tax may prove necessary.

IV. Evaluation of Scheme Options

(1) Scheme options

The Subcommittee proceeded with consideration of individual issues regarding design of domestic emissions trading scheme with regard to hearing from concerned stakeholders as well as domestic and foreign precedents. In doing so, in order to find direction toward consensus about particularly controversial issues of treatment of electricity and allowance setting methods (combination of setting methods, intensity-based setting), three following options were proposed from the viewpoint of environment protection and economic impact.

Option A: Direct treatment of electricity + Absolute-based method (paid setting)
[Emission allowances are set by absolute-based method (paid) for all direct emitters of greenhouse gases including electric power suppliers]

Option B: Indirect treatment of electricity + Absolute-based method (free setting) + Intensity target for electricity
[Emission allowances (including emissions caused by electric power) are set by absolute-based method (paid) for scheme participants except for electric power suppliers, while electric power suppliers are obliged to improve emission intensity]

Option C: Indirect treatment of electricity + Intensity-based method
[All direct emitters of greenhouse gases including electric power suppliers (emissions caused by electric power are implied for power consumers) are obliged to improve emission intensity; ex-post allowances are allocated for excessive reduction after confirmation of emission amounts]

One may also think of free and paid setting for Option A and Option B, respectively, but the above three options were considered aiming at clearer discussion.

(2) Evaluation of scheme options

The aforementioned three options were evaluated with regard to previous deliberations by the Subcommittee and the basic approach to the scheme development.

＜Evaluation of scheme options＞

	Option A Direct treatment of electricity + Absolute-based method (paid setting)	Option B Indirect treatment of electricity + Absolute-based method (free setting) + Intensity target for electricity	Option C Indirect treatment of electricity + Intensity-based method
①Securing of total amount reduction	・Due to emission allowance setting by absolute-based method, total amount reduction can be guaranteed.	・Due to emission allowance setting by absolute-based method, total amount reduction can be guaranteed on electricity demand side.	・Total amount reduction cannot be guaranteed because of increase of production volumes and other factors.
	・As for strictness of criteria for emission allowance setting, there is concern of increase in emissions on global scale because of shifting production facilities overseas motivated by cost burdens on scheme participants. On the other hand, this effect can be alleviated by providing supportive measures for international competitiveness.		
②Promotion of efficient reduction[21]	・ Coverage expands as compared to indirect approach, but electric power suppliers get direct incentives for reduction, while reduction incentives for power consumers can hardly work directly.	・Coverage shrinks as compared to direct approach but electricity consumers (including commercial sector) get direct incentives for reduction; that is recommendable in terms of promotion of reduction measures and technological development through wide efforts of power consumers. Coverage can be also improved by regulations on electricity intensity.	
	・It is pointed out that proliferation of low-carbon products is impeded by very high cost burden	・It is pointed out that proliferation of low-carbon products and demand growth are restrained; on the	・There is opinion that proliferation of low-carbon products is not impeded; on the other hand,

[21] It was pointed out that improvement of productivity is encouraged by any option, while benchmarking and intensity-based method are especially efficient to persuade manufacturers into technological development and productivity improvement.

	imposed on scheme participants; on the other hand, this problem can be solved by support for products contributing to emission reduction. ・Scheme participants procure as much emission allowances as necessary via auctions, which promises lower costs on national scale.	other hand, this problem can be solved by support for products contributing to emission reduction. ・Life extension of old equipment and stagnation of countermeasure technologies occur inevitably because of free setting of emission allowances.	impediment may occur if intensity worsens significantly due to modification of manufacture process.
③Securing of fairness	・Due to auctioning, one can expect for high fairness of emission allowance setting supported by market mechanisms. However, the total amount is traded at initial setting of emission allowances, which requires establishment of rules and surveillance system to deal with speculative buyouts and manipulations. ・It is pointed out that arbitrariness occurs in case of exemption from	・With benchmarking, past reduction efforts can be reflected. There is a problem of fair estimation of activity levels but it is pointed out that certain fairness can be guaranteed by using verifiable and transparent methods, including third-party involvement. There is also the problem that fairness among different industries cannot be guaranteed. ・With pure grandfathering, big emission allowances are allocated to those who neglected	・It is difficult to apply intensity-based setting to all businesses and products but it is pointed out that intensity-based method can reflect past efforts toward productivity improvement, thus guaranteeing certain fairness. ・Fairness among different industries cannot be guaranteed

	paid setting.	emission reduction in the past; however, it is pointed out that certain fairness can be guaranteed by taking into account potential emission reduction in every particular case based on reduction rates, etc. ・It is pointed out that transparency improves by third-party involvement but the problem of fairness remains. ・It is also pointed out that all businesses covered by domestic emissions trading scheme work on emission reduction so that "free-riding" can be prevented.	
④Securing of transparency	・Due to auctioning, one can expect for higher transparency.	・As for benchmark setting and reduction rate setting for grandfathering, there are concerns that competition among scheme participants causes lobbying and arbitrariness; however, a certain level of transparency can be guaranteed by using verifiable and transparent methods, including third-party involvement.	

⑤Social acceptability[22]	・If in case of auctioning, costs of emission allowances cannot be passed on prices[23], it is pointed out that burden on scheme participants increases, which affects economic growth and employment stability.[24]	・It is pointed out that growth of new industries would be impeded. On the other hand, a number of cost containment measures can be provided with regard to influence on international competitiveness, and contribution of products to emission reduction home and abroad.	・Since activity volumes are not restricted, influence on securing of economic growth and employment stability is supposed to be low if emission allowances are set appropriately.
	・It may be difficult for electric power suppliers to fulfill obligations solely by their own efforts because of relation to power supply duties.	・Indirect treatment of electricity is compatible with power supply duties and energy security.	
	・Burdens on participants grow if costs of emission allowances purchased via auctions cannot be passed on prices.	・Due to free setting, direct burden on scheme participants for procurement of emission allowances is low.	・When equipment utilization drops due to economic recession or other reasons, intensity lowers, and there is concern that obligations cannot be fulfilled despite of decreased amount of

[22] With any option, strictness of standards has a strong effect.

[23] Normally, purchase costs of emission allowances can be appropriately passed on prices; however, this may prove difficult in some cases, for example, when scheme participants are exposed to international competition.

[24] It is also pointed out that utilization of auction revenues for corporate tax reduction contributes to economic revitalization.

			greenhouse gas emissions. In this context, bailout measures may prove necessary.
	・If costs of emission allowances purchased via auctions cannot be passed on prices, international competitiveness may be affected; this also applies to effects of product price increase when costs can be passed on.	・It is pointed out that international competitiveness of new industries may be impaired.	
	・These effects can be relaxed to some extent by supportive measures for international competitiveness, but sufficiency of such measures should be considered.		
	・Flexibility can be ensured easier if emission allowances are distributed at the beginning of period.		・There is opinion that trading period is shortened due to ex-post distribution of emission allowances, which complicates prognosis and may result in violent fluctuations; on the contrary, over-speculations are less likely to occur with fewer transactions.
	・It is pointed out that since the whole amount is traded at the initial setting of emission allowances, there is concern about speculative buyouts and manipulations.	・There is opinion that trading period is shortened in case of ex-post distribution of emission allowances, which complicates prognosis and may result in violent fluctuations; on the contrary, over-speculations are less likely to occur with fewer transactions.	

⑥Comprehensibility and absence of complex procedures	・Scheme participants are fewer as compared to indirect treatment of electricity. ・Auction schemes, disposition of revenues and other elements must be determined. ・Low administrative costs are required for allowance setting itself	・Scheme involves more participants as compared to direct treatment of electricity. ・There is concern about high administrative and participants' costs required for emission allowance setting.	・There is concern about high administrative and participants' costs required for intensity target setting. ・There is concern about high administrative and participants' costs required for additional evaluation of activity volumes.

(3) Results of evaluation

Proceeding from the above evaluation, the following can be concluded about each option.

1） Option A

This option can be evaluated as good in securing of total amount reduction (①), and particularly advantageous in terms of efficient reduction (②), fairness (③), transparency (④) and comprehensibility (⑥). Nevertheless, considering the burden on scheme participants caused by purchase of emission allowances via auctions and effects of increase in product prices, this option can hardly be evaluated highly in terms of social acceptability (⑤) as long as the concerns about economic growth and employment stability are not dispelled.

On the other hand, it is pointed out that, due to concerns about carbon leakage and impediment to spread of low-carbon products caused by cost burdens imposed on scheme participants by auctioning, this option is no worth evaluating with respect to securing of total amount reduction, that distribution of the total allowance amount at initial setting is concerned to encourage speculative buyouts, manipulations and other money games, and that inevitable exemption from paid setting would impair fairness.

2） Option B

This option can be evaluated securing of total amount reduction (①), and offering certain levels of efficient reduction (②), fairness (③), transparency (④) and comprehensibility (⑥). It is pointed out that in terms of economic growth and employment stability (⑤), absolute-based method impedes growth of new industries. In this context, one may think of a number of cost containment measures provided with regard to influence on international competitiveness, and contribution of products to emission reduction at home and abroad.

On the other hand, it is pointed out that, due to concerns about carbon leakage and impediment to spread of low-carbon products caused by cost burdens imposed on scheme participants, challenge securing of total amount reduction is left, that transactions may involve money games, and that particularly serious problems are related to securing of fairness and transparency in setting allowances.

3） Option C

There is opinion that intensity-based method is appropriate from the standpoint of securing of economic growth and employment stability (⑤). Certain evaluation can

be given in terms of efficiency (②), fairness (③) and transparency (④), while careful attention must be paid to additional administrative costs and scheme participants' costs required for estimation of activity volumes (⑥). In addition, setting stringent intensity targets for securing of total amount reduction (①) causes concerns about strict regulations in case of economic recession, and insufficient flexibility of trading because of ex-post distribution of emission allowances. It is also pointed out that the problem of social acceptance under economic recession can be solved by providing businesses with multiple choices, or by a bailout plan to exempt businesses from obligations for achieved reduction of total emission amounts. Option C based solely on intensity-based method is problematic from the standpoint of securing of total amount reduction.

In addition, it is pointed out that Option C has problems of fairness and transparency, just as Option B.

4） Summary evaluation of options

As explained above, each option has its merits and demerits. As for concrete scheme design, the Subcommittee considers Option B as the base for further discussion because full adoption of Options A and C involves numerous problems; in doing so, possibility of combining respective advantages will be considered.

Besides, it is pointed out that Option A should be considered as an advantageous future option in long-term scheme design. From this standpoint, it is also pointed out that absolute-based method and free setting are appropriate at the initial stage of scheme introduction; as for treatment of electricity, regulations on both demand and supply sides are necessary, no matter whether electricity is treated directly or indirectly.

Regarding combination of absolute-based approach as in Option B and intensity-based approach as in Option C, thorough consideration is necessary to determine possibility of s securing of total amount reduction, fairness, and other issues.

V. Conclusion

(1) Outline of considerations

In course of consideration of individual issues of domestic emissions trading scheme design, the Subcommittee evaluated three options that combine particularly controversial points in terms of environment protection and economic impact. The main points produced by the consideration are given below, though the discussion has not yet been converged.

① Scheme period

Assuming that the tentative time horizon for domestic emissions trading scheme is set from 2013 through 2020, the initial scheme period is to be set to 3 years, and the rest is to be set as the next scheme period.

After that, 5-year setting seems reasonable, while consistency with international frameworks should be also taken into account.

② Covered gases

Initially, the scheme should cover CO_2. However, inclusion of CO_2 from non-fuel combustion should be determined depending on the feasibility of accuracy control required by domestic emissions trading scheme. The other gases are subject to future consideration with regard to development of accuracy control methods and other factors.

③ Entities covered by scheme: approach and determination

Business entities operating business facilities with emission amounts exceeding a certain threshold are to be responsible for the total emission of such business facilities. The problem of who is responsible to surrender emission allowances, i.e. every business facility or business entity as a whole, should be solved with regard to encouragement of emission reduction by scheme participants and alleviation of their burdens. As for imposing obligations to surrender emission allowances on groups of multiple businesses, further consideration is needed with regard to the present business practices in Japan, experience of other countries, problems of competition policy and legal implications such as liability distribution.

As for definition (boundary) of business facility, criteria of the current accounting, reporting and publication system of the Global Warming Act are basically acceptable, including that of business facilities (buildings) shared by multiple businesses.

However, the current criteria should not be adopted as they are; instead, appropriate amendments should be made to solve a number of problems.

As for the threshold, assuming that it is or more than 10,000t-CO_2, the share of covered emission in the national inventory would not decrease significantly, no matter how electricity is treated, while the number of participants would decrease considerably. Therefore, a threshold equal to or above 10,000t-CO_2 should be considered; in doing so, concrete value of threshold should be determined in compliance with the concept of the scheme, with regard to the share of covered emission amount in the national inventory, administrative costs required for the scheme implementation, and other factors. As for the timing when the threshold is applied, emission amount averaged for several consecutive years seems to be an appropriate base.

As for chain businesses and specified transportation businesses mentioned in the Global Warming Act, involvement of such businesses into the scheme is difficult at the moment.

In addition, further consideration is needed what modifications are required in association with the current accounting, reporting and publication system stipulated in the Global Warming Act.

④ Treatment of electricity and emission allowance setting

Setting of individual emission allowances will be performed using a definite method based on potential for emission reduction estimated based on the past efforts toward emission reduction, and content and volume of technologies that can be introduced in future (reduction potential).

Treatment of electricity (whether CO_2 emitted by power generation should be attributed to power companies who emit it directly, or to power consumers who emit it indirectly by consumption) and emission allowance setting (free setting(benchmarking, grandfathering) or paid setting, absolute emission caps or intensity targets) proved particularly controversial. These issues were combined into 3 options from the viewpoint of environment protection and economic impact.

As a result, the Subcommittee considers Option B (Indirect treatment of electricity + Absolute-based method (free setting) + Intensity target for electricity) as the base for further discussion, while examining possibility of combining respective advantages of Options A (Direct treatment of electricity + Absolute-based method (paid setting)) and C (Indirect treatment of electricity + Intensity-based method).

Elements of which every option is composed are explained below.

(a)Absolute-based method / free setting

In case of absolute-based free setting, benchmarking is applied to products and processes that meet certain conditions; emission allowances are calculated from benchmarks and activity levels with regard to scheme participants' reduction potentials and other factors.

Benchmarks can be set based on BAT intensity with regard to content and volume of technological innovations that can be introduced in future and other particular conditions, while activity levels can be set based on the past production volumes and future projections.

In doing so, benchmarks and activity levels can be set tentatively for each selected product and process, and then discussed with businesses so as to reflect flexibly specific circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness

Grandfathering is employed for absolute-based free setting in sectors where benchmark setting is difficult. Basically, emission allowances are set as shown below, while flexibly reflecting reduction potentials and other parameters of scheme participants.

$$\text{Emission Allowance} = \text{Past Emission Level} \times (1 - \text{Reduction Rate})$$

Past emission levels can be selected for several consecutive years in the period from FY2006 through the year immediately preceding initial distribution of emission allowances.

As for reduction rates, tentative reduction rates can be set in cooperation with businesses, and then discussed so as to reflect flexibly potential for emission reduction and other particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

(b)Absolute-based method / paid setting (auctioning)

In case of implementing auctions, one may think of admission for bidders other than scheme participants, while there is opinion that participation of such other bidders is not necessary. Auctions should be held once or more during

compliance period; electronic auctions are also possible. In this case, it is important to thoroughly predefine auction scheme, bidding rules, scope of information disclosure and other issues.

In addition, such issues as use of revenue, transaction rules and surveillance system must be determined prior to the implementation.

(c)Intensity-based method

In case that intensity-based method is adopted, intensity targets are to be set with regard to content and volume of technologies that can be introduced in future; the setting is based on BAT with regard to equipment replacement timing and other particular circumstances of business entities. In doing so, tentative targets can be set, and then discussed with businesses so as to reflect flexibly particular circumstances. In this case, inclusion of third-party in evaluation and verification can ensure objectivity by paying due regard to transparency and fairness.

(d)Measures regarding electricity intensity

As for intensity levels used by electric power consumers, one approach suggests applying emission factors for every electric power suppliers as the current Global Warming Act, while the other approach is based on nation-wide uniformed factor; since either approach has advantages and disadvantages, further comprehensive study is required.

As for setting of intensity targets for electric power suppliers, the scheme should cover those who supplies electric power to consumers, and setting factor should be considered with regard to the current generation mix and equipment utilization as well as future electric power supply plans and other factors.

As for the scheme coverage, business entities are to be defined as units, and the entire electric power is to be involved. Transactions, cost containment measures, and quantitative restrictions of those will be thoroughly considered.

(e)Treatment of newly established and closed facilities

We will consider providing a certain amount of new participants reserve to distribute allowances to new business entities in the order of applications. Dealing with such cases as reserve shortage will be further considered.

In case that a scheme participants loses eligibility because of business closure or another reason, return of remaining allowances to the government after

fulfillment of surrender obligations will be considered.

As for new establishment and closure of business facilities or equipment change, emission allowances can be re-set during the scheme period.

In case that the owner of a business facility changes, one can assume that instead of re-setting emission allowances, the old and new owners fulfill surrender obligations for emission allowance according to respective ownership periods, before and after the change.

(f) Total emission amount

The total emission amount is to be set based on estimated technological innovations in the whole country, and used as a criterion for decisions about necessity of additional measures beyond the scope of domestic emissions trading scheme aiming at achievement of the mid- and long-term goals.

⑤ Compliance with obligations

The government establishes common rules applied to all participants for accounting, verification and reporting of emission amounts. Scheme participants calculate their emission amounts in the preceding year under the mentioned accounting rules within a certain period after the last day of every year, and report the accounted results to the government.

Scheme participants get their accounted emission amounts verified by third-party verifiers, and report the results to the government. In case that compliance period is set to several years, there is opinion that verification should be performed yearly so as to maintain the scheme stability, as well as from the standpoint of Carbon Disclosure. On the other hand, there is opinion that accurate verification is possible once in several years, and that verification performed once in compliance period will suffice to confirm fulfillment of obligations, if allowances are not traded; thus, final decision will be made with reference to precedents and other factors.

After reporting to the government, scheme participants surrender their emission allowances corresponding to the verified emission amounts via registry within a certain period set after the last day of compliance period. From the standpoint of yearly check of fulfillment of obligations, yearly surrender is desirable; however, there is opinion that compliance period should be set equal to scheme period. The final decision will be made with regard to scheme participants' burden and method of accounting emission amount.

Emission amounts reported in the framework of domestic emissions trading

scheme should be published as necessary, including data for every business facility; in doing so, relationship with the existing accounting, reporting and publication system should be taken into account, and due regard should be paid to such issues as the participants' competitive position.

In this series of procedures, the main obligations imposed on scheme participants are reporting of emission amounts and surrender of emission allowances. Respective penalties and other measures are necessary in case of violation of these obligations. In addition, in case that determination of participants implies that business entities are obliged to report eligibility, penalties and other measures regarding non-fulfillment of this obligation must be considered.

⑥ Alleviation of burden on businesses

(a) Cost containment measures

Banking (carrying over of surplus emission allowances to next compliance period, or scheme period) between compliance periods is to be allowed; besides, deadline of emission allowance distribution is to be set prior to surrender deadline of the preceding compliance period; and substantial borrowing is allowed to make possible adjustment of emission allowances between any compliance periods within scheme period. On the other hand, there is opinion that compliance period should be set equal to scheme period.

Banking between scheme periods is to be allowed without any restriction. However, borrowing between scheme periods is not to be allowed.

Utilization of external credits is to be made possible; however, usable credits are to be defined on certain conditions, for example, credits based on international frameworks, or those having a reliable monitoring, verification and reporting system based on international standards (ISO etc.). In addition, certain limits must be imposed on amount of usable external credits.

Cost containment reserve (securing supply of emission allowances in case of a sudden price increase) is necessary from the standpoint of enhancement of cost containment measures for achievement of the mid- and long-term targets for greenhouse gas emission reduction. In doing so, the amount of reserve, requirements for its use, legal aspects and concrete methods of distributing the reserve, etc. must be considered. In addition, possibility of such measures as relaxation of quantitative limitations on reserve distribution and external credits must be clarified in advance to prevent scheme participants from unexpected detriments.

(b) Products contributing to emission reduction

As for rewarding manufacturers of products contributing to emission reduction, final products, which feature substantially lower or effectively suppress emissions at the stage of use as compared to functionally compatible products, are to be designated as eligible products. In case that manufacture of such products generates larger emission amounts as compared to conventional products, compensation through distribution of additional emission allowances corresponding to the difference is to be considered. In doing so, consideration is required about feasibility of accurate estimation of emission generated in manufacture of raw materials and intermediate products among the whole process of manufacturing final product.

(c) Influence on international competitiveness and resulting carbon leakage

In case of paid allowance setting, measures are taken for businesses whose international competitiveness can be affected; that can cause carbon leakage. Such businesses are to be determined by trade intensity and carbon intensity, and rewarded by free allowance distribution or in some other way.

Reference values of trade intensity and carbon intensity are to be set with regard to foreign precedents and actual situation of industry in Japan; in doing so, the latest input-output tables and other official statistics are to be used in order to ensure transparency and fairness.

In case of free setting, exposed businesses are to be determined in the same way as with paid setting. OBA, emission reduction rate alleviation, or other methods are to be used for additional distribution of emission allowances.

⑦ Coordination between national and local authorities

National and local laws underlying emissions trading schemes should be harmonized as much as possible so as to prevent excessive burden and other complications on scheme participants; in doing so, previous reduction efforts made in local schemes should be properly appreciated.

As for local regulations not determined by the national law (for example, regulations below threshold levels), there is hardly any reason to prohibit implementing such regulations. When scheme subjects overlap, one may think of uniformed application of the scheme based on national law if some obligations are imposed on same subjects. Nevertheless, precautions should be taken so as not to

destroy achievements under existing local laws; overlap between subjects of national and local laws, scheme compatibility and other issues should be considered in designing national scheme. Proceeding from the above, legal provision of a national law about harmonization with local laws is to be provided.

Besides, further consideration is required so as not to destroy businesses' efforts under existing local schemes; that includes some rewards in terms of setting emission allowances. In addition, relationship between national and local schemes will be made clear so as to prevent complications caused by differences in scope of scheme participants, methods of accounting emission, and other aspects.

⑧ Domestic emissions trading scheme in context of other Policies

Domestic emissions trading scheme, global warming tax and feed-in tariff scheme for renewable energy are essentially different in respective goals, subjects and means; therefore, appropriate combination of these policies can produce mutually complementary effects. Even if global warming tax and feed-in tariff scheme have been introduced, when limits of emission amounts (allowances) are distributed free of charge considering potential emission reduction of scheme participants in domestic emissions trading scheme, such as the extent of reduction efforts made by every business in the past, content and volume of technologies that can be introduced in future, and other factors, no additional investments are required above those related to such efforts. In addition, from the society-wide viewpoint, no duplication of burden with the other two policies occurs, and excessive investments are not needed.

Investments amounts required to achieve the mid-term targets of industries and businesses assumed as participants in domestic emissions trading scheme are not excessive on the national scale, and can be considered as investment for the future to mitigate the impact of possible climate change, while one can expect for industry robustness against the surge of energy price due to energy-saving benefits, as well as employment and innovations encouraged by low-carbon investments. On the other hand, in terms of individual enterprises, certain relief measures should be considered for carbon-intensive industries where relatively big investments are required or industries exposed to international competition; necessity of such relief measures should be considered with regard to influence on international competitiveness and possible carbon leakage.

⑨ Other issues (registry, appropriate market infrastructure)

Expert consideration is required for such issues as registry system for management

of emission allowances, and rules for securing a sound market with appropriate flexibility.

(2) Assessment of consideration results

Assuming that Option B (Indirect treatment of electricity + Absolute-based method (free setting) + Intensity target for electricity) is taken as the base for further consideration,

① Securing of total amount reduction

Due to emission allowance setting by indirect treatment of electricity combined with absolute-based method, total amount reduction can be guaranteed on electricity demand side. Besides, depending on strictness of target criteria, one may expect for increase in emission on global scale because of shifting production facilities overseas.

As for alleviation of burden on businesses, borrowing from following scheme period is not allowed, while qualitative and quantitative limitations are imposed on utilization of external credits, which can contribute to securing of total amount reduction. On the other hand, there is opinion that utilization of external credits should not be restricted.

② Promotion of efficient reduction

As for scheme subjects, large-scale factories and buildings produce much more emissions than small emission sources; scheme participants defined by 10,000t-CO_2 and 100,000t-CO_2 make up about 39% and 31% of the entire CO_2 emissions in Japan. Besides, applying the scheme to large emission sources seems advantageous in terms of easy and efficient implementation as compared to small-scale sources. Coverage shrinks as compared to direct treatment of electricity but electricity consumers (including commercial sector) get direct incentives for reduction, which is promising in terms of promotion of reduction measures and technological development through wide efforts of electricity consumers. Coverage can be also improved by regulations on electricity intensity. It is pointed out that spread of low-carbon products and demand growth is restrained; on the other hand, this problem can be solved by support for products contributing to emission reduction.

In addition, there are opinions that applying the scheme to groups of multiple businesses could better reflect aggregate production activities, and that group efforts toward emission reduction would be more fruitful than individual ones.

As for compliance with obligations, one can expect for reduction of social costs

due to emissions trading and other flexibility measures. However, free setting of emission allowances causes extension of old equipment and stagnation of countermeasure technologies; that cannot be avoided completely.

Besides, establishment of registry system and appropriate market infrastructure is necessary to attain maximum efficiency

③ Secure of fairness

With benchmarking, past reduction efforts can be reflected. However, there is a problem of fair estimation of activity levels. It is pointed out that certain fairness can be guaranteed by using verifiable and transparent methods, including third-party involvement. There is also the problem that fairness among different industries cannot be guaranteed. As for grandfathering, large amount of emission allowances are distributed to those who neglected emission reduction in the past if pure grandfathering is applied; however, it is pointed out that certain fairness can be guaranteed by taking into account potential emission reduction in every particular case based on reduction rates, etc. On the other hand, it is pointed out that transparency improves by third-party involvement in setting of benchmarks and activity levels in case of benchmarking, and setting of reduction rates in case of grandfathering; the problem of fairness, however, remains.

Fairness between scheme participants and non-participants can be secured by appropriate covering of large-scale businesses with large amount of emission, and sharing consistent efforts toward emission reduction according to emission potentials of every business.

In addition, appropriate accounting, verification and reporting of emission amounts can prevent unfair allowance setting, thus secure sound trading.

As for alleviation of burden on businesses, there is opinion that due regard should be paid to influence on international competitiveness, and to products contributing to emission reduction; there is, however, another opinion that such measures may prove insufficient to secure substantial fairness.

It is also pointed out that all businesses covered by domestic emissions trading scheme work on emission reduction so that “free-riding” can be prevented, thus contribute to fairness.

④ Secure of transparency

As for setting of benchmarks and activity levels in case of benchmarking, and setting of reduction rates in case of grandfathering, there are concerns that

competition among scheme participants causes lobbying and arbitrariness; however, certain transparency can be guaranteed by using verifiable and transparent methods, including third-party involvement.

As for alleviation of burdens on businesses, establishment of clear rules and other measures should be taken to secure transparency.

⑤ Social acceptability

As for compliance with obligations, flexibility of fulfillment can be provided by using trading and banking.

It is pointed out that growth of new industries would be impeded in case of absolute-based method. On the other hand, a number of cost containment measures can be provided with regard to influence on international competitiveness, and contribution of products to emission reduction; however, further consideration of concrete measures is required. Indirect treatment of electricity, as well as setting of electricity intensity targets based on electric power supply plans, is compatible with power supply duties of power suppliers and energy security.

As for burdens imposed on scheme participants with free allowance setting, direct costs of emission allowance procurement are low as compared to paid setting, while there are no additional investments except for those required for emission reduction according to reduction potential[25].

Besides, market turmoil caused by money games (violent price fluctuations or continued high prices caused by over-speculations) can be prevented by establishing appropriate market infrastructure, and distributing emission allowances at the beginning of period to avoid complications related to short trading periods[26].

⑥ Comprehensibility and absence of complex procedures

As compared to direct treatment of electricity, indirect treatment results in more scheme participants; besides, it is pointed out that high administrative costs may be required depending on the threshold setting. Continued consideration is necessary with regard to fairness with non-participants.

Cooperation process is required for emission allowance setting, and is concerned about high administrative and scheme participants' costs.

Considering that the scheme may be complicated by allowance setting method and

[25] It was pointed out that social acceptability cannot be determined without specifying amount of investment required for emission reduction according to reduction potential.

[26] It was also pointed out that, in case of ex-post distribution, on the contrary, over-speculations are less likely to occur with fewer transactions.

numerous cost containment measures, special regard must be paid to clear prioritization of scheme principles and securing of comprehensibility of the scheme

As for mixed use of Option A (Direct treatment of electricity + Absolute-based method (paid setting)), though being advantageous in terms of efficiency, fairness, transparency and comprehensibility, this option can be hardly recognized as socially acceptable as long as the concerns about economic growth and employment stability are not dispelled.

As for mixed use of Option C (Indirect treatment of electricity + Intensity-based method), there is opinion that this option is appropriate from the standpoint of securing of economic growth and employment stability. However, this option implies additional administrative costs and scheme participants' costs for estimation of activity volumes, while being problematic in terms of securing of total amount reduction; serious consideration is required on possibility of solving these issues.

Regarding these results of consideration and evaluation, there still remain some points for discussion; differences in priority issues in evaluation, or priority approaches to sustainable economic growth, have resulted in divergence of opinions during consideration and evaluation of the scheme.

Specifically, considering that the scheme aims at steady reduction of greenhouse gas emissions, the emphasis on evaluation is on ① securing of total amount reduction; besides, the emphasis is on ⑤ social acceptability from the standpoint of global warming countermeasures with regard to securing of economic growth and employment stability. In addition, results of consideration and evaluation have diverged in approaches to realization of sustainable economic growth through promotion of new lifestyles and technological innovations; namely, it is a problem to which priority should be given, to policies for social system reformation toward achievement of the mid- and long-term goals, or rather to effects on economy and employment assuming that technological innovations are possible irrespective of the said policies.

Such judgments may vary with definition of the role of domestic emissions trading scheme among concrete policies and measures that should be taken for Japan to become an international leader in development of a society capable of maximum possible reduction of greenhouse gas emissions, securing and strengthening of absorptive ability, and adaptation to global warming.

The Subcommittee analyzed and summarized key features of domestic emissions

trading scheme proceeding from the Bill for Basic Act on Global Warming Countermeasures, and worked out the aforementioned fundamental approach to promotion of domestic emissions trading scheme; in doing so, three scheme options were evaluated in addition to consideration of particular issues of scheme design. It should be noted, however, that there are opinions that concerns about domestic emissions trading scheme itself are not dispelled, because there remain many problems in terms of the 6 evaluation criteria mentioned in II. Basic Approach to Scheme Consideration in many concrete issues, as well as any of the presented options; for example, there are opinions that it may affect economic growth and cause increase of emissions on a global scale, and that emission allowance setting by the government or other authorities may undermine autonomy of business management..

Afterword

This report is an interim report to summarize scheme design of domestic emissions trading scheme as a result of expert consideration and discussion, based on the current social and economic situation, aiming at future scheme design.

It is appropriate for the government to continue more profound and detailed consideration based on this interim report. It should be noted, however, that that there is opinion that concerns about domestic emissions trading scheme itself are not dispelled, thus further discussion on whether domestic emissions trading scheme should be introduced or not is required in terms of comparison with other policies.

Central Environment Council · Global Environment Committee
Domestic Emissions Trading Subcommittee

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Central Environment Council · Global Environment Committee
Domestic Emissions Trading Subcommittee
Timeline of Committee Sessions

- April 23, 2010 1st Session
  (1) On Domestic Emissions Trading Subcommittee
  (2) On current situation with domestic emissions trading scheme
  (3) On directions of consideration

- May 13, 2010 2nd Session
  Hearings from concerned industries and organizations (Kiko Network, Greenhouse Gas Assurance Association of Japan, Kochi Prefecture)

- May 21, 2010 3rd Session
  Hearings from concerned industries and organizations (Japan Iron and Steel Federation, Japan Automobile Manufacturers Association, Electrical and Electronics Global Warming Association (8 organizations of electrical and electronic industries), Japan Association of Corporate Executives, Japanese Trade Union Confederation, WWF Japan)

- May 25, 2010 4th Session
  Hearings from concerned industries and organizations (Japan Cement Association, Japan Paper Association, Real Estate Companies Association of Japan, Federation of Electric Power Companies of Japan, Japan Climate Leaders' Partnership, Nippon Keidanren)

- June 1, 2010 5th Session
  Hearings from concerned industries and organizations (Japan Chemical Industry Association, Petroleum Association of Japan, Japan Gas Association, Japan Chamber of Commerce and Industry, National Federation of Regional Women's Organizations, Tokyo Metropolitan Government)

- June 8, 2010 6th Session
  Results of hearings

- June 14, 2010 7th Session
  Presentations by climate policy officials from Europe and U.S., exchange of views

- June 25, 2010 8th Session
  Discussion on individual issues ①

- July 9, 2010 9th Session
  Discussion on individual issues ②

- July 23, 2010 10th Session
  Discussion on individual issues ③
- August 31, 2010 11th Session
  Proposal of scheme options ①
- September 10, 2010 12th Session
  Proposal of scheme options ②
- October 18, 2010 13th Session
  (1) Evaluation of scheme options
  (2) Policy mix
  (3) Covered gases
  (4) Scheme period
  (5) Procedures of accounting, verification, reporting and surrender
- November 1, 2010 14th Session
  (1) Cost containment measures
  (2) Determination of scheme participants
  (3) Methods of setting emission allowance
  (4) Total emission amount
- November 9, 2010 15th Session
  (1) Products contributing to emission reduction
  (2) Influence on international competitiveness and resulting carbon leakage
  (3) Coordination between national and local authorities
- November 16, 2010 16th Session
  (1) Domestic emissions trading scheme and policy mix
  (2) Registry (report of Experts Panel on Legal Aspects of Domestic Emissions Trading Scheme, Ministry of the Environment)
  (3) Appropriate market infrastructure (report of Experts Panel on Legal Aspects of Domestic Emissions Trading Scheme, Ministry of the Environment)
  (4) Summary (evaluation of scheme options)
- November 29, 2010 17th Session
  Discussion on draft of this report
- December 6, 2010 18th Session
  Discussion on draft of this report