Background Paper 1

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Current Japanese Climate Policy from the Perspective of Using the Kyoto Mechanisms

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Japan is currently facing difficulty with achieving the emission reduction target for greenhouse gases (GHG) that it committed to under the 1997 Kyoto Protocol. By 2002, its emissions had already increased by 7.6 percent since 1990. Therefore, it has to reduce its emissions by at least 13.6 percent in order to achieve the 6 percent reduction target set in article 3.1 of the protocol.

This paper first examined the Japanese climate policy development process and the result of review of current policies and measures conducted in 2004.

The 2004 review revealed that Japan's emissions in 2010 are estimated to be at least 6 percent higher compared to the 1990 level, which will require a reduction of at least 12 percent to achieve its 6 percent reduction target. Based on the current estimation, even if all the policies and measures are implemented as scheduled, there will still be a 1.6 percent shortfall, which will therefore have to be purchased in the form of credits from abroad.

The paper will then proceed to examining preparations in Japan to utilize Kyoto mechanisms. It revealed that the current scheme cannot procure a sufficient amount of certificates to correspond to the envisaged 1.6 percent of its GHG emissions, and the government cannot utilize all the certificates acquired by Japanese entities for national compliance, since it currently has no means of drawing these certificates into its national account. As such, the paper highlights the urgent need to quickly identify and act on the best option for Japan to acquire certificates from abroad and to utilize the certificates for national compliance.

This is the first paper in a series of four papers commissioned by the Ministry of the Environment of Japan.

1 Introduction

Japan is currently facing difficulty with achieving the emission reduction target for greenhouse gases (GHG) that it committed to under the 1997 Kyoto Protocol. By 2002, its emissions had already increased by 7.6 percent since 1990. Therefore, it has to reduce its emissions by at least 13.6 percent in order to achieve the 6 percent reduction target set in article 3.1 of the protocol.

In light of this situation, it is highly likely that Japan will have to purchase emission reduction certificates from abroad in order to comply with its target. Therefore, it is crucial for Japan to examine and implement its best options to acquire credits by utilizing the Kyoto mechanisms at the earliest possible date.

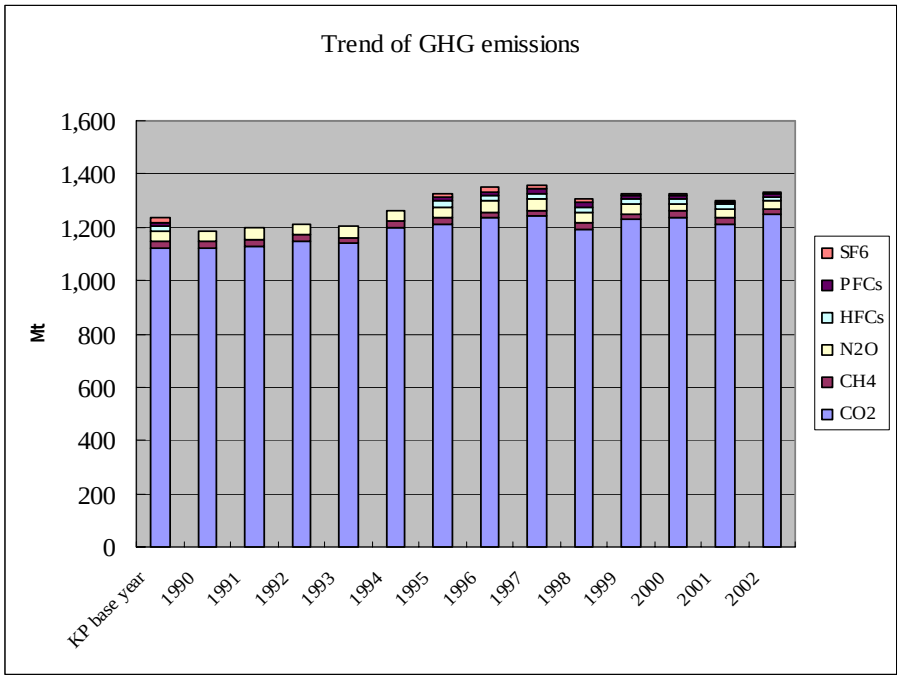

Figure 1: Japan's GHG emissions trend (1990–2002)

Note: SF_6 = sulphur hexafluoride; PFCs = perfluorocarbons; HFCs = hydrofluorocarbons; N_2O = nitrous oxide; CH_4 = methane; CO_2 = carbon dioxide

This paper examines Japan's current policies and measures to mitigate its GHG emissions in order to highlight the difficulties mentioned above and the necessity to prepare for acquiring credits from abroad.

2 Climate policy development in Japan

2.1 Pre-Kyoto

2.1.1 Conference of the Parties to the UNFCCC (up to 1992)

Global warming became a political issue in the late 1980s in the wake of international efforts to address stratospheric ozone depletion. In response to the first World Conference on the Changing Atmosphere, held in Toronto, Canada, in June 1988, the Dutch government convened an international ministerial conference on climate change in Noordwijk, Netherlands, in November 1989. At the conference, the Dutch government proposed that industrialized countries agree to stabilize carbon dioxide (CO_2) emissions at the latest by the year 2000 as a first step to combating global climate change.

Before the Dutch conference, on May 12, 1989, the Japanese government established the Ministerial Council on Global Environmental Protection in order to facilitate inter-ministerial coordination of internationally negotiated environmental policies. According to the Ministry of Environment's *White Paper on the Environment*, 1989 was the year that Japan and the world made a big first step towards protecting the global environment (MoE 1990). Despite this, Japan initially sided with the United States, which said that it recognized the CO_2 problem but believed that further study was necessary before binding controls could be proposed (Schreurs 2002). The director-general of Japan's Environment Agency, Mr. Setsu Shiga, announced that he agreed in principle to stabilization of GHG emissions but that setting concrete targets should wait until the Intergovernmental Panel on Climate Change (IPCC) made its report in the fall of 1990 (Schreurs 2002; Shiga 1991).

On October 23, 1990, Japan's Ministerial Council adopted the Action Plan to Arrest Global Warming in order to identify a basic position for Japan to contribute to discussions on an international framework for the prevention of global warming. The plan included the government's announcement that it would stabilize CO_2 emissions at the 1990 level by 2000 on a per capita basis. Then, in the midst of pervasive skepticism on taking action to address global warming, formal international negotiations on a climate change convention were launched in February 1991.

In June 1992, Japan signed the United Nations Framework Convention on Climate Change (UNFCCC), which entered into force in 1994. Article 4-2(a) of the convention states that each of the Parties "shall adopt national policies and take corresponding measures on the mitigation of climate change…These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification." After adoption of the UNFCCC, Japan reconfirmed its pledge in 1990 to stabilize its CO_2 emissions on a per capita basis at the 1990 level by 2000.[1]

1. Article 4.2 of the UNFCCC said that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the convention, recognizing that to stabilize their absolute GHG emissions at the 1990 level by 2000

Before signing the UNFCCC, Japan's government had already discussed the introduction of a carbon tax in the framework of the revision of its Basic Law for Environmental Protection Control. The Environmental Agency issued a report in May 1992 titled *An Appraisal of Instruments to Prevent Global Warming*. The report argued that it would be necessary to introduce a carbon tax in order to achieve the target of stabilizing CO_2 emissions at the 1990 level by 2000. Due to huge opposition from the Ministry of Industry, Transport and Import (MITI) and industries, however, the revision was watered down and the carbon tax was dropped (Schreurs 2002).

2.1.2 From Berlin to Kyoto (1992–1997)

In March 1995, the Parties to the UNFCCC agreed on adoption of the Berlin Mandate, which required them to negotiate a protocol or other legal instrument that would set quantified limitation and reduction objectives for the Annex 1 (developed) countries within specified time frames (2005, 2010, and 2020) for their anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, in order to be ready for agreement at the third Conference of the Parties (COP 3) in Kyoto (UNFCCC 1995). Against this background, the Environmental Agency and MITI, along with the Ministry of Foreign Affairs, started inter-ministerial discussions to formulate a Japanese position on a quantitative target and to examine the reduction potential and measures for providing a basis to form the position.

MITI examined potential domestic mitigation measures at its Industrial Structure Council (from April 1996 to March 1997) and at its General Energy Study Council (from September 1996 to November 1997), while the Environmental Agency examined them at its Central Environmental Council. The Industrial Structure Council made proposals on amending the Law Concerning Rational Use of Energy and submitted a proposal of the Law Concerning Special Measures for Promotion of New Energy Use (New Energy Law) to the Diet (parliament).[2] The law was enacted in April 1997 with the aim of accelerating the advancement of the introduction of new energy use and achieving Japan's target by 2010. While clarifying the role of each area for the overall advancement of new energy usage, the law also provides financial support measures for utilities that use new energy. Apart from the above, both ministries decided to consider other measures after COP 3.

MITI also requested industries to set voluntary emission reduction targets. In order to show a positive attitude towards climate protection and to avoid the introduction of drastic measures, Nippon Keidanren—the Japan Business Federation—unveiled its Voluntary Action Plan in June 1997 and announced that it would see to stabilization of its members' CO_2 emissions at the 1990 level by 2010 (Sawa and Kikukawa 2003).

would contribute to such modification, while Japan's target was to stabilize its CO_2 emissions on a per capita basis at the 1990 level by 2000.

2. According to the Law Concerning Special Measures for Promotion of the Use of New Energy, new energy and the use of new energy are stipulated as (1) an oil alternative energy for either manufacture, generation, or use; (2) there is no development of broadening economic restrictions; and (3) it particularly contributes to the promotion of an oil alternative energy for which necessary support measures aimed at promoting positive implementation are positioned (http://www.enecho.meti.go.jp/english/policy/new_energy/ definition.html#top#top). The target resources for the "Use of New Energy, etc.," as specified in the government ordinance of the New Energy Law includes photovoltaic power generation, wind power generation, solar thermal utilization, the use of temperature difference energy, waste power generation, thermal utilization of waste, waste fuel manufacturing, biomass power generation, thermal utilization of biomass, biomass fuel manufacturing, cool energy use for supply side and clean-energy motor vehicles, and natural gas co-generation and fuel cells for the demand side. Biomass power generation, thermal utilization of biomass, biomass fuel manufacturing, and cool energy use were included in the ordinance revision on January 25, 2002.

In the summer of 1997, the Joint Meeting of Relevant Councils was also established by an initiative taken by Prime Minister Ryutaro Hashimoto in order to coordinate the examination of policies implemented by different ministries from various perspectives.

2.2 After Kyoto (December 1997–June 1998)

In December 1997, the Parties to the UNFCCC agreed to adopt the Kyoto Protocol, which set differentiated quantitative emission reduction targets for the industrialized countries.

On December 19, 1997, immediately after the Kyoto conference, the Global Warming Prevention Headquarters (GWPH) was established under an initiative by Prime Minister Hashimoto and staff of the Cabinet Office, with the Joint Meeting of Relevant Councils as its advisory body (Hattori 1999).

In January 1998, the headquarters made an announcement titled "About Future Programs of Measures to Cope with Global Warming" and called for the development of comprehensive measures to do so, taking into account the result of the Kyoto conference (GWPH 1998a). Based on the headquarters' decision, relevant ministries submitted high-priority measures to be introduced to the joint meeting.

The headquarters adopted the Fundamental Guideline to Promote Measures to Cope with Global Warming on June 19, 1998 (GWPH 1998b), which set emission reduction targets for sources (table 1) and stated that the following measures should be taken:

- Comprehensive promotion of coping with global warming based on the Climate Change Policy Law
- Promotion of mitigation of CO_2 emissions, while taking the demand and supply of energy into account. This includes the Amended Law Concerning the Rational Use of Energy (ALRUE) (see below) and the Keidanren's Voluntary Action Plan.
- Promotion of controlling other GHG emissions
- Promotion of carbon sinks
- Research and development of innovative environment and energy technology
- Reinforcement of the global monitoring system
- Promotion of international cooperation
- Changes of the Japanese lifestyle

Source	Reduction target (%)
Energy source CO_2	0[a]
Non-energy source CO_2, methane, and carbon monoxide	–0.5
Further efforts of the general public/innovative technology development	–2.0
Alternatives to fluorine gas (HFCs, PHCs, and SF_6)	+2.0
Forestry sinks	–3.9
Others (Kyoto mechanisms)	–1.6
Total	–6.0

Table 1: Emission reduction targets for sources set by the Global Warming Prevention Headquarters

Source: GWPH 1998b.

[a]This figure is based on the targets set in a report of the Joint Meeting of Relevant Councils just before COP 3 (–7% for the industry sector, +17% for the transportation sector, and 0% for the household sector). However, these sector targets were not explicitly described in the guideline, since this is contrary to the voluntary target declared by the Keidanren, which is the stabilization of emissions at the 1990 level.

Based on its competence in energy policy, MITI proposed measures to cover the industry and energy sectors, including an amendment of the ALRUE to introduce a top-runner program (box 1), as well as intensifying energy-efficiency measures at factories. The Environmental Agency (EIA) drafted a new regulation, the Climate Change Policy Law (CCPL), and tried to include the obligation of companies to submit a plan to control their GHG emissions, based on its competence in environmental policy.

The top-runner scheme was introduced in the ALRUE, which was passed at the Diet in May 1998 and went into effect in April 1999.

The law was originally enacted in 1979 to promote energy efficiency in order to address the oil crisis at the time. It has been amended several times since then. The 1993 amendment introduced energy-efficiency standards as absolute targets for vehicles and certain types of electrical equipment. If manufacturers and equipment importers failed to comply with the standards, they were subject to recommendations by MITI.

In 1999, after the Kyoto Protocol was adopted, the law was amended with the aim of addressing the climate change issue, and the top-runner program was introduced to replace the energy-efficiency standards.

While the energy-efficiency standards had been set at a level slightly above the average energy efficiency of each product, under the top-runner program the best performing items in their category in the market set the minimum standard for a target year. The program originally covered 11 items, including cars, refrigerators, air conditioners, etc., and has since been extended to 18 items. If a company cannot achieve the target by a target year, then its name as well as the product name is made public, and it has to pay a fine. However, compliance is evaluated not based on each product but on products in the same category.

	Base year (fiscal year)	Target year (fiscal year)	Approximate improvement in efficiency (%)
Air-conditioners	1997	2004 for blower/wall type items <4kW 2007 for others	63 (for most types)
Space heaters	2000	2006	1.4 (gas) 3.8 (oil)
Refrigerators and freezers	1998	2004	30
Fluorescent lamps	1997	2005	17
Televisions	1997	2003	16
Video players	1997	2003	59
Magnetic disk devices	1997	2005	78
Copy machines	1997	2006	30
Computers	1997	2005	83
Gas cooking appliances	2000	2006	14
Water heaters	2000	2006	4.1 3.5
Electric toilet seats	2000	2006	10
Vending machines	2000	2005	34
Transformers	2000	2006 (oil-filled) 2007 (mold)	30
Passenger vehicles, gasoline	1995	2010	23
Passenger vehicles, diesel	1995	2005	15
Freight vehicles, gasoline	1995	2010	13
Freight vehicles, diesel	1995	2005	7

Box 1: Top-Runner Program

Source: Top Runner Program, Energy Conservation Center, Japan (http://www.eccj.or.jp/toprunner/pamph/04/).

The ALRUE was passed by the Diet on May 15, 1998. Then it passed the CCPL on October 6, 1998, in which, however, the EIA failed to have the obligation of companies included, due to huge opposition from industries who argued that it would cause double regulation in relation to the ALRUE. As a result, the CCPL became just a framework law.[3]

Based on the ALRUE, MITI developed policies and measures for the industry and energy sectors, set a top-runner standard for electric appliances and cars at its General Energy Study Council and conducted a review of the Voluntary Action Plan declared by the Keidanren at its Industrial structure Council.

Apart from the above, MITI as well as the EIA recognized that it was premature to introduce drastic measures immediately, since it was first necessary to agree on the operational details of the Kyoto Protocol at the international level in order to implement it, and international society aimed at having the protocol enter into force around the time of the World Summit on Sustainable Development in August/September 2002 in Johannesburg, South Africa. Both ministries, especially the EIA, who had failed to have the obligation of companies to submit a plan to control their GHG emissions included in the CCPL, had conducted detailed evaluations of the pros and cons of different policy instruments in preparation for strengthening policies and measures after the adoption of the operational details of the protocol at the international level.

2.3 Towards ratification of the Kyoto Protocol (up to June 2002)

Against the background of the core elements of the operational details of the Kyoto Protocol being adopted at COP 6, Part 2, held in Bonn in July 2001, the new Ministry of Environment (MoE)—which was elevated from the Environmental Agency during administrative restructuring in January 2001—started consultations at its Central Environmental Council in September 2001 to prepare for ratification of the protocol after COP 7.

In January 2002, the council issued "A Report Regarding a Domestic Scheme towards the Ratification of the Kyoto Protocol." The report said that Japan had implemented emissions reduction measures after the adoption of the Kyoto Protocol in 1997 but that it expected that, with existing policies and measures, GHG emissions in 2010 would have increased by around 8 percent relative to the 1990 level. Therefore, additional reduction efforts would be necessary (MoE 2002). As a domestic plan towards ratification of the protocol, it recommended the introduction of a review scheme, the use of the so-called step-by-step approach, and the introduction of policies and measures, such as an environmental tax, to ensure the achievement of the target set in the protocol.

Just before this, the Ministry of Economy, Trade and Industry (METI), formerly named the Ministry of International Trade and Industry, also presented an interim report by its Industrial Structure Council on December 28, 2001. This report provided the following three basic principles regarding measures: (1) they should avoid excessive burden on the economy, (2) maintain a balance of burden among sectors, and (3) use flexible measures which ensure a maximum climate protecting effect with minimum cost through the innovation of mitigation technologies (METI 2001). Based on these principles, it

3. Here "framework law" means that the law sets a framework for climate policymaking but does not include any concrete obligations for companies and the general public.

emphasized the importance of employing the step-by-step approach, the best mix between existing measures and new measures, and preparation for utilizing the Kyoto mechanisms. The step-by-step approach means that policies and measures will be implemented step by step, based on reviews of existing policies and measures conducted in 2004 and 2007. For the near future, it recommended the following:

1. Existing measures should be strengthened and energy and technology policies should be prioritized.
2. Measures for the industry sector should be based on voluntary approaches.
3. The effectiveness of voluntary approaches should be enhanced through improving and strengthening transparency and credibility.

Based on the reports of both ministries, the GWPH issued the "Future Guidance for the Ratification of the Kyoto Protocol," under the initiative of Prime Minister Junichiro Koizumi on February 13, 2002, which recommended that Japan ratify the protocol. Regarding the ratification schedule, it also recommended that the existing Guideline to Promote the Prevention of Global Warming be revised and a new one should be developed, and that the necessary domestic laws be passed at the regular meeting of the Diet in view of the fact that the protocol would likely enter into force at the World Summit on Sustainable Development in the fall of 2002 (GWPH 2002a).

On March 19, 2002, based on the above guidance, the headquarters issued the New Guideline to Promote the Prevention of Global Warming (GWPH 2002b).

The new guideline set out four basic principles: (1) recognition of the co-existence of the environment and economy, (2) use of the step-by-step approach, (3) the promotion of participation of all stakeholders in implementing measures, and (4) international cooperation on global warming measures.

It included the same targets for sources as set in the old guideline, but it clearly described the targets for each sector and listed 115 policies and measures to assure achievement of the Kyoto target.

Burden sharing among sectors was one of the main discussion points at the time. The target was divided up into minus 7 percent for the industry sector, plus 17 percent for the transportation sector, and minus 2 percent for the household sector, as described in table 2.[4] However, industry was opposed to including the minus 7 percent target in the new guideline, because it was contrary to the target declared in the Keidanren's Voluntary Action Plan to stabilize CO_2 emissions at the 1990 level. In the end, the targets for each sector were included in the new guideline with a compromise that the target for industry would not be changed, but that the minus 7 percent target would be reached by measures taken by small- and medium-sized enterprises (SMEs) and by switching fuel from coal to nuclear and new energy (*Mainichi Shimbun*, March 20, 2002; GWPH 2002b).[5]

4. The stabilization target for energy-related CO_2 emissions that was set in the old guideline was based on the targets set in a report of the Joint Meeting of Relevant Councils published before COP 3. The target was divided up into minus 7% for the industry sector, plus 17% for the transportation sector, and 0% for the household sector.
5. The estimated figure of construction of new nuclear power plants was also contentious. The MoE argued for the use of a realistic estimation, considering the difficulty of finding new sites for nuclear power plants, while METI aimed to utilize the estimation reported in *About Future Energy Policy*, published by the General Energy Council (METI 2002). In the end, the MoE agreed on using the council's estimation, which meant an increase of the amount of energy from nuclear power plants by three times more than presently produced. The report estimated that the construction of 10 to 13 new nuclear power plants would be needed, which would result in an increase in production capacity of 13.63 to 17.52 million kilowatts.

Emission savings	Industry	Households	Transportation
Emission reduction target	462 million tonnes (–7%)	260 million tonnes (–2%)	250 million tonnes (+17%)
Energy conservation: 22 million tonnes	• Solid implementation and follow-up of voluntary action plans by industry (emissions in 2010: below 0% compared to the 1990 level) • Research and development (R&D) of high-efficiency boilers and lasers • Promotion of high-efficiency industrial furnaces	• Application of energy management systems in large commercial buildings, etc., based on the amendment of the Energy Efficiency Law • Scope expansion of top-runner programs in appliance manufacturing • Promotion of high-efficiency water heating • Promotion of home energy management systems (HEMS) and building energy management systems (BEMS)	• Accelerated introduction of vehicles achieving top-runner programs • Acceleration of R&D and dissemination of low-emission vehicles, including clean energy vehicles • Traffic flow management by promotion of intelligent transport systems (ITS), etc. • Promotion of efficient logistics systems, including shift of transport modes from trucking to shipping • Promotion of public transport utilization
New energy: 34 million tonnes	• Add biomass and snow and ice cryogenics to energy, which is promoted by the Law Concerning Promotion of the Use of New Energy • Proposal of the Bill Concerning the Use of New Energy by Electric Utilities • Subsidies to promote the introduction of photovoltaic power, solar thermal, wind power, waste power, biomass energy, etc. • Strengthen R&D and conduct demonstration testing on fuel cells, photovoltaic power, biomass energy, etc.		
Fuel switching: 18 million tonnes	• Assist a switch of fuel use from coal to natural gas for old power generators • Assist with fuel switching of industrial boilers • Develop safety standards on natural gas pipelines		
Nuclear energy promotion	• Promotion of nuclear power under assurance of safety • Assist economic development of municipalities hosting the nuclear fuel cycle		

Table 2: Emission reduction targets (in CO_2 equivalent) and measures for each sector

It must be noted that the new guideline also said that examination of the Kyoto mechanisms should be conducted by considering their supplementarity.

On March 29, 2002, the ministers agreed on submitting a draft amendment of the CCPL and a draft of ratification of the Kyoto Protocol, after getting the approval of the political parties in power at the time, namely, the Liberal Democratic Party (LDP, or *Jiyu-minshu to*); the New Conservative Party (NCP, or *Hoshu-shin-to*), which separated from the LDP in 1993 and then merged with the LDP in 2003; the Democratic Party of Japan; and the Club of Independents (DPJ, or *Minshu-to*). The NCP, in particular, whose main supporter is industry, agreed to adopt the decision on condition that the international regime would be reconsidered if it was difficult to get the United States to participate, that legally binding penalties would be opposed, and that the Keidanren's Voluntary Action Plan would continue to be used as a main instrument to control emissions from the industry and energy sector. The party also requested the ministers of the ministries of environment (MoE); economy, trade, and industry (METI); land, infrastructure, and transportation (MLIT); agriculture, fisheries, and forest (MAFF); and foreign affairs (MOFA) to promise in writing to take initiatives with the above conditions. The Cabinet office,

however, was against this. In the end, a head of the Cabinet office from the DPJ succeeded in persuading a head of the NCP to agree to withdraw the request (*Yomiuri Shimbun*, March 30, 2002).

On May 31, 2002, the amendments to the CCPL were passed by the Diet (see table 3 for a comparison of the CCPL versions). Key elements of the revised law are the Kyoto Target Achievement Plan, developed by the GWPH and adopted by Cabinet after the Kyoto Protocol's entry into force (article 8), and Follow-ups and Revision of the Plan (article 9). The plan stipulates emission reduction targets for sectors, the measures to achieve the targets, and central and local governments' policies to promote or enhance the above measures. It was to be comprehensively reviewed in 2004 and 2007 using the step-by-step approach, upon which the government would base revisions of the plan, where necessary, in order to ensure the achievement of Japan's 6 percent emissions reduction commitment.

The CCPL also gave legal status to the Global Warming Prevention Headquarters, which was made responsible for developing the plan (article 10).

Backed by the above domestic laws and others, including the Renewables Portfolio Standard Law (RPS Law), which was enacted June 7, 2002, the Diet ratified the Kyoto Protocol with unanimity in June 2002, six months after adoption of the operational details for the Kyoto Protocol/Marrakesh Accords at COP 7. Looking at the substantial policies and measures, however, most of them already existed.

	The first Law Concerning the Promotion to Prevent Global Warming (adopted October 1998)	The Revised Law Concerning the Promotion to Prevent Global Warming (adopted June 2002)
Status of the headquarters	Cabinet decision	Article 10 of the new law
Tasks of the headquarters		• Make a draft of the Kyoto Protocol Target Achievement Plan • Enhance its implementation (article 11)
Organization in charge of the above tasks	Cabinet office, MoE, and METI	Cabinet office (article 17)
Plan developed under the law	Fundamental guideline	Kyoto Protocol Target Achievement Plan
Organization in charge of development	Ministry of the Environment	Prime Minister

Table 3: Comparison on the differences between the first CCPL and the revised CCPL

Source: Table by Watanabe, based on the Law Concerning the Promotion to Prevent Global Warming and the Revised Law Concerning the Promotion to Prevent Global Warming.

As such, the government decided not to include any drastic measures to achieve its Kyoto target at the time of ratification. Considering the necessity to introduce drastic measures after the first review in 2004, however, the MoE published an interim report of an expert committee on environmental taxation under the Central Environmental Council on June 6, 2002, which said that an environmental tax should be introduced at the earliest possible date after 2005. Against this background, METI started discussions on reforming the existing energy tax system in the summer of 2002, with the objectives of removing distortions in inter-fuel competition between coal and other fuels and taking environmental considerations into account as one of the determinants for levying a tax. (The various energy taxes are shown in table 4.)

The tax on electricity is called the Electric Power Development Promotion Tax. Revenues from it are put into the Special Account on Electricity for use as subsidies to local governments to facilitate site approvals for power plants and to promote diversification away from oil use by encouraging the use of new energy and nuclear energy.

However, the demand for subsidies to facilitate site approvals for power plants has been gradually decreasing, due to the difficulty of finding appropriate sites for nuclear power plants. Considering this situation, METI proposed to gradually increase the tax rates on fossil fuels and place a levy on coal (Special Account on Oil), while reducing taxes on electricity (Special Account on Electricity) and therefore making the tax revision revenue-neutral. METI also proposed that the increased tax revenues in the Special Account on Oil would be divided between itself and the MoE, which could use the revenues for climate change mitigation projects.

Tax item	Fuel	Tax rate (yen)	Tax revenue (100 million yen)	Type of tax	Use of tax revenue
Crude Oil Tax	Imported oil	215/kl[a]	527	Custom tax	Encourage use of domestic coal
Oil Tax	• Crude oil • Imported oil products • Gas carbon hydro	2,040/kl 720/kl 670/kl	4,880	National tax	Oil and energy demand-side management
Liquefied Petroleum Tax	Gasoline	48,600/kl	28,365	National tax	Road construction by the national government
Local Road Tax	Gasoline	5,200/kl	3,035	National tax	Road construction by local governments
Oil-Gas Tax	Liquefied petroleum gas (LPG) for vehicles	17,500/kl	280	National tax	Road construction by the national and local governments
Light Oil Transaction Tax	Light oil	32,100/kl	12,472	Local tax	Road construction by local governments
Kerosene Tax	Jet fuel	26,000/kl	1,064	National tax	Airport construction/ noise reduction, etc.
Electric Power Development Promotion Tax	Electricity	445/1,000 kWh[b]	3,799	National tax	Promotion of electric power development

Table 4: Existing energy taxes in Japan (as of March 2005)

Note: Table by Watanabe, based on MoE 2001.
[a]kiloliters
[b]kilowatt-hours

The MoE was concerned about METI's intention to block the introduction of an environmental tax by offering to share authority over the Special Account on Oil. In the end, Minister of Economy, Trade and Industry Takeo Hiranuma and Minister of Environment Shunichi Suzuki concluded a written

agreement on November 15, 2002, stating that the tax revision was not considered as the introduction of an environmental tax and that such a tax would be considered in the 2004 review in the framework of employing the step-by-step approach. Table 5 shows the change in rates of existing energy-related tax.

Tax	Energy source	Tax rate (in yen)			
		Current	October 2003	April 2005	April 2007
Oil and coal tax	Oil	2,400/kl	Same		
	LPG	670/t	800/t	940/t	1,080/t
	LNG	720/t	840/t	960/t	1,080/t
	Coal	No tax	230/t	460/t	700/t
Electric Power Development Promotion Tax (yen/1,000 kWh)	Electricity	445	425	400	375

Table 5: The change of tax rates in existing energy-related taxes (as of March 2005)

Note: Table by Watanabe, based on the law concerning oil and coal (sekiyu-sekitan hou).

3 Japan's current climate policy

As described above, Japan did not introduce drastic policies and measures along with its ratification of the Kyoto Protocol. As a result, it has so far failed to reduce its GHG emissions in line with reaching its Kyoto target, as shown in figure 1.

In the framework of the step-by-step approach, Japan conducted a review in 2004 of policies and measures to achieve its Kyoto target, with the aim of introducing additional measures from 2005 if the existing ones in the revised guideline are not sufficient to achieve the target. In the meantime, Russia ratified the Kyoto Protocol and it entered into force on February 16, 2005. This means that, according to article 8 of the Climate Change Policy Law (CCPL), the review will end not with a revision of the guideline but with drafting a Kyoto target achievement plan.

The review of all policies and measures was mainly conducted by the MoE's Central Environmental Council and METI's Industrial Structure Council. Both ministries launched discussions in January 2004.

Tables 6 and 7 describe the results of the review of current policies and measures, as published by METI's Industrial Structure Council and the MoE's Central Environmental Council.

Emission sources	Sector	Reduction target	Measure	Results and estimates from the 2004 review
Energy-related CO_2	Energy supply	—	New energy	• In the new guideline to promote measures to cope with global warming, adopted in 2002, the CO_2 emissions reduction goal by 2010 is about 34 million tonnes (Mt) through the introduction of 19.1 million kl of new energy. • As for the power generation sector, it is expected that the target will be achieved by the smooth implementation of the Renewables Portfolio Standard Law (RPS Law), which came into effect in April 2003, acceleration of technological development such as solar power generation technologies, and enhancement as well as reinforcement of the systematic networking of wind power generation and site regulation. • As for the heating sector, the target of 2.5 million kl will probably not be achieved without additional measures. • Estimation of the introduction of these new energies, power generation, and heat is 16.50 million kl. • Therefore, the introduction target of 19.1 million kl cannot be achieved by a shortfall of 2.5 million kl, and additional measures will be necessary to achieve the target.
			Nuclear power	• It will be difficult to achieve the target of increasing nuclear power generation by about 30% compared to FY2000, especially due to expected delays in construction of new nuclear plants. • As for CO_2 emissions intensity in the electric power sector, the target described in the Voluntary Action Plan by electricity enterprises is to decrease end-user CO_2 emissions intensity by about 20% in 2010 compared to FY1990. • Estimating the CO_2 emissions intensity in 2010 by taking into account the operation of an additional three nuclear plants under construction and the installation of facilities and operation plan by electric power companies, CO_2 emissions intensity will be improved by 0.36 kilograms of CO_2 per kWh, corresponding to 15% relative to the 1990 level.
	Industry sector	–7%	Keidanren's Voluntary Action Plan	Energy consumption per industrial activity in 2010 will be improved by 5.9% under the Keidanren Voluntary Action Plan compared to the case without measures.
			Promotion of the introduction of energy-efficient facilities and of the diffusion of energy-efficient technologies.	Energy consumption per industrial activity in 2010 will be improved by 0.5% due to promotion of the introduction of energy-efficient facilities and the diffusion of energy-efficient technology.

Table 6: Summary of the 2004 review of current policies and measures by METI's Industrial Structure Council

Table 6—Continued

Emission sources	Sector	Reduction target	Measure	Results and estimates from the 2004 review
Energy-related CO_2	Transportation	+17%	Accelerated introduction of vehicles achieving the standard set in top-runner programs	Energy consumption per transport volume in FY2010 will improve by 6.8% through the top-runner standard.
			Acceleration of R&D and dissemination of low-emission vehicles, including clean energy vehicles	Energy consumption per transport volume will be improved by 0.5% due to the diffusion of clean energy cars.
			Traffic flow management by promotion of ITS, etc.	Energy consumption per transport volume will be improved by 6.7% through the improvement of traffic systems.
	Services, etc.	–2%	Improvement of the efficiency of devices through the top-runner standard	Energy consumption per floor space of the commercial sector in FY2010 will be improved by 2.8% through the top-runner standard.
			Improvement of the energy efficiency and conservation performance of buildings based on the amendment of the Energy Efficiency Law	Energy consumption per floor space in 2010 will be improved by 7.2% through improvement of the thermal insulation efficiency of buildings compared to the case without current measures.
			Diffusion of high-efficiency water heaters	Energy consumption per floor space in the commercial sector in 2010 will be improved by 0.01% due to the diffusion of high-efficiency water heaters.

Table 6—Continued

Emission sources	Sector	Reduction target	Measure	Results and estimates from the 2004 review
Energy-related CO_2	Services, etc.	–2%	Diffusion of high-efficiency lights	Energy consumption per floor space in the commercial sector in 2010 will be improved by 0.5% due to the diffusion of high-efficiency lights.
			Diffusion of BEMS	Energy consumption per floor space in the business sector in 2010 will be improved by 2.3% due to the diffusion of BEMS.
	Households	–2%	Improvement of the efficiency of devices through application of the top-runner standard	Energy consumption per household in FY2010 will be improved by 3.5% through the top-runner standard compared to the case without measures.
			Application of energy management systems in new houses, etc., based on the amendment of the Energy Efficiency Law	Energy consumption per square meter in new houses will be improved by 4.3% through improvement of energy efficiency.
			Reduction of standby mode power consumption in devices	Energy consumption per household by 2010 will be improved by 0.6% through the reduction of power consumption of electric devices during the standby mode.
			Improvement of the efficiency of thermal insulation of houses	Energy consumption per household by 2010 will be improved by 4.3% through improvement of the thermal insulation efficiency of houses.
			Promotion of high-efficiency water heating	Energy consumption per household by 2010 will be improved by 1.7% due to the diffusion of high-efficiency water heating.

Table 6—Continued

Emission sources	Sector	Reduction target	Measure	Results and estimates from the 2004 review
Energy-related CO_2	Households	–2%	Diffusion of high-efficiency lights	Energy consumption per household by 2010 will be improved by 0.3% due to the diffusion of high-efficiency lights.
			Promotion of HEMS	Energy consumption per household in 2010 will be improved by 0.8% due to the diffusion of HEMS.
Non-energy-related CO_2			Diffusion of the use of mixed cement for cement production processes	It is estimated that CO_2 emissions from cement production can be reduced by about 4%, considering the past increasing ratio of the use of mixed cement.
			Installation of an N_2O decomposer in the adipic acid manufacturing process	Decomposers have been installed voluntarily by enterprises and are in operation, which has resulted in a substantial amount of emissions reduction compared to the base year. It is expected that more than 90% of N_2O emissions from the adipic acid production process can be reduced.
Promotion of R&D on environment and energy				• In the industry sector, reduction of 4.7 million tonnes of CO_2 equivalent per year ($MtCO_2e$/year) is expected through the promotion of 18 technologies, including efficiency improvement of the combustion process in steel production. • In the household sector, a CO_2 reduction of 0.93 $MtCO_2e$/year is expected through the promotion of four technologies. • In the commercial sector, a CO_2 reduction of 0.76 $MtCO_2e$/year is expected through the promotion of five technologies. • In the transport sector, a CO_2 reduction of 0.83 $MtCO_2e$/year is expected through the promotion of four technologies.
HFCs, PFCs, and SF_6				It is expected that emission intensity in 2010 compared to 1995 level will be improved substantially if current measures continue to be implemented.
Sinks				Not addressed
Kyoto mechanisms				Not addressed

Note: Table by Watanabe, based on METI 2005.

Emission source	Sector	Reduction target	Measure	Estimated results and recommendations
Energy-related CO_2	Energy supply	• The New Guideline to Promote Measures to Cope with Global Warming adopted in 2002 did not decide on the burden for energy suppliers and energy consumers. • Achieving the target seems difficult (see column to the far right).	New energy	The RPS law set a target to generate 1.13 kl/year from new energy sources; however, there is a gap between the target in the new guideline and actual production in terms of solar energy and wind energy. As for photovoltaics and waste heat utilization, it is difficult to reach the target set in the guideline. Therefore, the possibility of achieving the target for new energy is low.
			Fuel switching	Due to the liberalization of the electricity market, it is expected that coal combustion power plants will amount to over 50% of capacity; therefore, fuel switching is not progressing as planned in the guideline.
			Nuclear power	Construction of new nuclear power plants has been delayed from the schedule of the guideline. If the projected electricity demand is the same as it described, then an additional 20–30 Mt of CO_2 will be discharged. However, the energy supply plan was revised with the electricity demand reduced, therefore CO_2 emissions in 2010 will be almost the same.
			Keidanren Voluntary Action Plan	The power sector pledged to reduce its relative CO_2 emissions by 20% in its voluntary action plan.
	Industry sector	–7% A gap between the current situation and the target is small compared to other sectors.	Keidanren Voluntary Action Plan	Reductions based on the Keidanren Voluntary Action Plan are progressing well. In order to achieve the target as a whole it is necessary that each sector makes efforts to achieve its own target.
			Promotion of the introduction of energy-efficient facilities	Progressing and will continue to progress well.
			Promotion of the diffusion of energy-efficient technologies	Efficient boilers will be diffused. It will be difficult to achieve the target for the diffusion of more efficient lasers.
	Transportation	+17% (same growth rate as 1995)	Accelerated introduction of vehicles achieving the standard set in top-runner programs	More than 90% will achieve the target for 2010 in 2005.
			Acceleration of R&D and dissemination of low-emission vehicles, including clean energy vehicles	To achieve the target described in the plan, the diffusion of clean energy vehicles should be accelerated. Therefore, achievement of the target is presently uncertain.

Table 7: Summary of the 2004 review of current policies and measures by the MoE's Central Environmental Council

Table 7—Continued

Emission source	Sector	Reduction target	Measure	Estimated results and recommendations
Energy-related CO_2	Transportation	+17% (same growth rate as 1995)	Traffic flow management by promotion of ITS, etc.	It is difficult to evaluate the effect of each measure due to the lack of data. Additional measures, including the improvement of data collection, are necessary.
			Promotion of efficiency logistics systems, including shift of transport modes from trucking to shipping	Due to the improvement of efficiency in the transportation sector, GHG emissions are stable/declining despite the increase in distance. Nevertheless, there is a possibility that CO_2 emissions from car transportation will increase due to an economic upturn.
			Promotion of public transport utilization	The infrastructure is being established; however, the data available to evaluate the shift from cars to public transportation is insufficient. Therefore, it is impossible to evaluate the effect. Additional measures, including the improvement of data collection, are necessary.
	Services, etc.	–2% Emissions from the service sector have mostly increased; therefore, it will be difficult to achieve the target.	Improvement of efficiency of devices by the top-runner standard	It is expected that the target will be achieved regarding energy consumption per floor space through the top-runner standard.
			Improvement of energy efficiency and conservation performance of buildings	There is a lack of data available to evaluate the effect of measures; however, certain progress is observed.
			Diffusion of high-efficiency lights	High-efficiency lights will be diffused in a couple of years; therefore, a certain amount of reduction is expected.
			Diffusion of BEMS	The diffusion rate is increasing in new, large buildings; therefore, the potential for reduction is high. However, it is necessary to accelerate diffusion, including the ESCO (Energy Service Companies), in order to achieve the target set in the guideline.
	Households	–2% Emissions from the household sector are the second most increased; therefore, it will be difficult to achieve the target.	Application of energy management systems in large commercial buildings, etc., based on the amendment of the Energy Efficiency Law	It is expected that the target will be achieved by the target year.
			Promotion of high-efficiency water heaters	Sales of efficient water heaters are increasing; however, diffusion should be accelerated in order to achieve the program target.

Table 7—Continued

Emission source	Sector	Reduction target	Measure	Estimated results and recommendations
			Promotion of HEMS and BEMS	The uncertainty of achieving the target is large, since HEMS are still under development.
Non-energy-related CO_2, methane, and carbon monoxide (CO)		–0.5% The measures whose effects are uncertain are included; however, it is almost certain that the –0.5% target will be achieved, reflecting the fact that activities have been decreasing more than expected.	Non-energy-related CO_2	Although emissions from waste incineration have increased, emissions from industrial processes have decreased. Therefore, it is highly expected that the target will be achieved.
			Methane	Methane emissions have been decreasing. It is highly likely that the target will be achieved.
			N_2O	N_2O emissions have been decreasing. It is highly likely that the target will be achieved.
HFCs, PFCs, and SF_6		+2.0%		It is highly likely that the targets set in the guideline will be achieved.
Sinks			Measures are being taken with the aim of utilizing the 3.9% of total emissions in 1990 allowed in the Bonn Agreement.	• The 3.9% is utilized when all the planted forests and a part of natural forests are counted to fulfill the requirement of forest management; however, the actual effect of forest management in the past five years is that only 70% of planted forest will fulfill the forest management requirement. Therefore, it is expected that sinks will be utilized for only 3.1%. • The budget for FY2004 is smaller than that in the past. If the budget is not increased, then the utilization of sinks is expected to be around 2.6%.
Kyoto mechanisms			Not explicitly described in the program.	The Japanese government has approved 16 CDM projects; however, the CDM Executive Board has not yet approved any of them as of March 2005, and it has not been decided how credits from the above project will be entered into the national account.

Note: Table by Watanabe, based on MoE 2005a, 2005b.

Although both ministries acknowledge the increase of GHG emissions and the necessity to enhance the use of the Kyoto mechanisms to achieve the Kyoto target, their opinions are divided in terms of domestic policies and measures. The main points of discussion are summarized as follows:

1. What amount of reductions is necessary to achieve the target?
2. What kind of additional policies and measures need to be introduced in order to achieve the reductions?

Regarding the amount of reductions, Japan's emissions had increased by 7.6 percent compared to the 1990 level as of 2002; therefore, a 13.6 percent reduction is necessary to achieve its Kyoto target. At the beginning, the MoE's Central Environmental Council estimated that the trend would not change. Therefore, a 7.6 to 8.1 percent reduction will be necessary in the first commitment period (2008–2012) (MoE 2004b). On the other hand, METI's Industrial Structure Council estimated that Japan's emissions will decrease from the current level to 3.7 to 5.5 percent higher than the 1990 level in 2010 without introducing additional policies and measures (table 8). The main reason for this difference was the different estimation of energy-related CO_2 emissions (table 9). In December 2004, the MoE revisited the estimation of emissions in 2010 after revising the rate of operation of nuclear power plants and the method used to estimate energy consumption in the industrial sector and the CO_2 emission rate for utilities. According to the revised estimation, energy-related CO_2 emissions will decrease from 7.1 to 5.4 percent higher than the 1990 level. As a result the total GHG emissions will decrease to 5.9 to 6.4 percent higher than the 1990 level. As such, the gap between the estimates of both ministries has shrunk, but nevertheless still remains (table 9). At the end, both ministries adjusted their estimations when METI's Industrial Structure Council and the MoE's Central Environmental Council submitted proposals for developing and implementing climate policies and measures in the second step (of the step-by-step approach) from 2005 to 2007 (table 10), in order for the headquarters to draft and adopt the Kyoto Target Achievement Plan (MoE 2005a, 2005b; METI 2005; GWPH 2005).

	Kyoto target	Existing measures
Domestic measures	–0.5	3.7 to 5.5
Energy related CO_2	–2.0	+2.2 to 4.0
HFCs, PFCs, and SF_6	+2.0	+1.9
Non-energy CO_2, methane, N_2O	–0.5	–0.5
Forest and sinks	–3.9	–3.1*
Kyoto mechanisms	–1.6	—
Total	–6.0	0.6 to 2.4

Table 8: METI's estimates on measures and reductions (%)

Source: METI 2004b.
*This figure is based on the estimate in the MoE's report "*Chikyu Ondanka Taisaku Suishin Taiko no hyoka/minaoshi ni kansuru chukan torimatom*" (MoE 2004b). It was revised to 2.6% in *Onshitsu koka gasu no shorai suikei* (MoE 2004c).

Emissions	Target set in the 2002 guideline	METI (2004.8)	MoE (2004.8)	MoE (2004.11)	MoE (2004.12)
Total GHG emissions	–0.5	+3.7 to 5.5	—	+7.6 to 8.1	+5.9 to 6.4
Energy-related CO_2	–2.0	+2.2 to 4.0	+7.1	+7.1	+5.4
HFCs, PFCs, and SF_6	–2.0	+1.9	Under examination	+1.4	+1.4
Non-energy-related CO_2, methane, N_2O	–0.5	–0.5	–0.9 to 0.4	–0.9 to 0.4	–0.9 to 0.4

Table 9: Comparison of estimates of Japan's GHG emissions in 2010 with current policies and measures (%)

Note: Table by Watanabe, based on GWPH 2002; METI 2004a; MoE 2004b; and MoE 2004c.

Emissions	Target set in the 2002 guideline	METI (2005.3)	MoE (2005.2)	MoE (2005.3)	GWPH (2005.3)
Total GHG emissions	–0.5	+6.0	+6.0	+6.0	+6.0
Energy-related CO_2	–2.0	+5.4	+5.4	+5.4	+5.4
HFCs, PFCs, and SF_6	–2.0	1.4	1.4	1.4	1.4
Non-energy-related CO_2, methane, N_2O	–0.5	–0.8	–0.8	–0.8	–0.8

Table 10: Estimates of Japan's energy-related CO2 emissions in 2010 with current policies and measures (%)

Note: Table by Watanabe, based on METI 2005; MoE 2005a; MoE 2005b; and GWPH 2005.

Regarding the question of what kind of additional policies and measures are necessary to be introduced to achieve the required reductions, the joint meeting of METI's two councils recommended that 5 percent should be reduced by using domestic policies and measures and that the ALRUE should be revised, along with the slogan "Compliance without a Tax Increase." They also recommended that 2 percent should be reduced from additional reductions in the use of HFCs, PFCs, and SF_6, and 1.6 percent through the Kyoto mechanisms.

Based on these recommendations, METI submitted a proposal to revise the ALRUE, along with a new law concerning promotion of more efficient logistics. Regarding the ALRUE, METI proposed to raise the standards of the top-runner scheme after 2010 for 11 out of 18 items currently regulated, considering that the current standards will have been achieved by 2010. The proposal expanded the scope of factories and sectors covered by the law. METI also recommended enhancing the transparency and credibility of the Keidanren Voluntary Action Plan. At the same time, it proposed a scheme to utilize the Kyoto mechanisms to achieve the targets set in the plan and the establishment of basic infrastructure to utilize the mechanisms. In terms of using them, METI proposed an increase of the government budget to be allocated to climate policies, which included the establishment of the Japan Global Warming Reduction Fund in 2004 with about 100 million US dollars (discussed later in this paper) (METI 2004a).

Contrary to METI, the MoE's Central Environmental Council's interim report on the evaluation and review of the Guideline to Promote the Prevention of Global Warming recommended the introduction of additional policies and measures to achieve the Kyoto target, including an environmental tax, the obligation of companies to report their GHG emissions, a voluntary emissions trading scheme, and

utilization of the Kyoto mechanisms. Apart from the Kyoto mechanisms, all of the measures, especially the environmental tax, were opposed by METI and industries (MoE 2004b).

3.1 Environmental tax

The introduction of an environmental tax, which had been discussed since the beginning of the 1990s in the framework of revising the Environmental Basic Law, generated the most controversy among stakeholders.

In the preparation process to ratify the Kyoto Protocol, the Central Environmental Council set up the Expert Committee on a Tax System to Combat Climate Change, in October 2001, as part of a series of studies on how to combat climate change. In December 2001, the committee published the *Study of a Tax System for Combating Climate Change in Japan* as a summary of the main points of debate regarding anti-climate change taxes. Then, in June 2002, the committee published *A Tax System for Combating Climate Change in Japan*, in response to the adoption of a new climate change policy program in March 2002.

As such, the MoE examined the introduction of an environmental tax with the aim of introducing it upon ratification of the Kyoto Protocol; however, it did not lead a consensus among stakeholders to submit a draft to the Diet.

As mentioned earlier, the existing energy taxes were "greened" at the beginning of 2003 by gradually increasing tax rates on fossil fuels and placing a levy on coal, while reducing taxes on electricity; nevertheless, the MoE and METI agreed that this revision was not considered the introduction of an environmental tax. In February 2003, Environmental Minister Suzuki sent the Expert Committee a request to publish a report by around the summer of that year. He did this in order to show the political will of the ministry to introduce the tax upon the revision of the New Guideline to Promote Measures to Cope with Global Warming and to allow enough time for sufficient debate before the 2004 review. The committee published its report, titled "Draft of a Climate Change Tax Proposal for a National Dialog Report," on August 29, 2003, saying that it is necessary to introduce a tax of 3,400 yen/CO in order to achieve Japan's 6 percent reduction target based on the modeling calculation (MoE 2003).

After the report was published, huge opposition was mounted by industries and METI. In the review in 2004, with the view that additional measures would be necessary to achieve the Kyoto target, the MoE put top priority on introducing the environmental tax. Reflecting the opposition expressed by industries, in the draft of the environmental tax that the MoE made public in November 2004, the tax rate was reduced by 20 to 50 percent for energy-intensive industries, including steel, in order to avoid a negative impact on the international competitiveness of these sectors. As a result, the revenue was estimated at 49 billion yen, half of what was originally expected (MoE 2004a).

The MoE proposed to use 34 billion of the 49 billion yen for measures to mitigate emissions and 15 million for social insurance deductions. According to its estimation, the environmental tax is expected to bring about a reduction of 52 million tonnes of CO_2e, which corresponds to a 4 percent reduction compared to the 1990 level.

While discussions continued at the Central Environmental Council, the MoE decided to send the revised proposal to the basic environmental issue study group of the Democratic Party at the beginning

of November, in order to have the proposal passed at the Diet in FY2004. Although some members supported the idea, most did not. Most said that it was too early to submit the proposal to the Democratic Party and that it still needed to be examined, including conducting a cost-benefit analysis comparing the environmental tax to the case of utilizing the Clean Development Mechanism (CDM). Several members also said that the introduction of the environmental tax should be discussed after a detailed examination of the existing 1,258 billion yen in expenditures for climate measures (*Denki Shimbun*, November 8, 2004; *Nihon Keizai Shimbun*, November 24, 2004).

Finally, the study group decided to submit the plan to the government's Tax Issue Study Committee, an advisory body to the prime minister. Reflecting the conflicts between opponents and proponents, the committee decided not to introduce the tax that fiscal year and to continue the discussion, considering the necessity to introduce additional measures to achieve the Kyoto target. As such, the introduction of the environmental tax was again postponed.

At the beginning of 2005, when the government started drafting the Kyoto Target Achievement Plan, which is based on the review, the environmental tax issue was again put on the agenda. The MoE's Central Environmental Council published an estimate at the beginning of March that revenues of 400 to 700 billion yen from the environmental tax are necessary to achieve the Kyoto target. Based on this estimate, the MoE tried to include the ongoing consideration of the environmental tax in the plan, while METI, reflecting the concern of industries, was again opposed to it. In the end, negotiations focused on the wording in the plan. The MoE tried to include the phrase "introduce as soon as possible," which METI opposed. In the end, they compromised on the wording and ended up with "examine the introduction of an environmental tax seriously and comprehensively," which could be interpreted several ways.

As such, the introduction of an environmental tax was set to be discussed in the framework of the revision of the whole tax system in the autumn of 2005.

3.2 Voluntary emissions trading scheme

Japanese industries argued that the Keidanren's Voluntary Action Plan is sufficient to achieve the target of stabilizing CO_2 emissions from the industry sector at the 1990 level and that additional measures are not necessary. In March 2000, however, the United Kingdom's Emissions Trading Group (ETG) presented a full set of proposals on emissions trading, and the EU Commission submitted a Green Paper on establishing a GHG emissions trading scheme within the European Community. Influenced by these countries and the EU region, awareness of emissions trading has continued to increase among Japanese industries.

Reflecting the growing awareness of stakeholders, the MoE conducted an examination of the design of emissions trading in a study group. In January 2003, the MoE undertook a simulation of emissions trading with Mie Prefecture with the following objectives: examine the scheme (which properly evaluates environmentally benign activities by industries); examine the possibility of giving credits for CO_2 absorbed by forest management activities and reduced by refuse-derived fuel (RDF) power generation; and propose a domestic emissions trading scheme based on the actual situation of industry (see box 2).

Thirty-five companies, along with one non-profit organization, located in the prefecture participated in the simulation.

Also in 2003, the MoE went on to operate the Prototype Project for Voluntary Domestic Emissions Trading. Its main objectives were to provide private companies with opportunities to build experience and technical skills regarding emissions trading procedures, demonstrate that a cross-sectoral emissions trading scheme is feasible in Japan, encourage participants to be aware of the importance of improved emissions management, and establish the infrastructure for domestic emissions trading. Sixty-three parties that participated in the project, including 13 observers, voluntarily set their corporate-wide GHG reduction targets for fiscal year 2003 at their discretion and tried to achieve their own targets.[6]

A simulation of emissions trading in Mie Prefecture was undertaken, focusing on CO_2 from 2005 to 2012, with the following five options:

1. An absolute target of a 7.9 percent reduction in total is set, no credits are given for reductions by RDF power-producing projects, and CO_2 absorptions from forest management can be used.
2. An absolute target of a 14 percent reduction is set, credits are given for reductions by RDF power-producing projects, and CO_2 absorptions from forest management can be used.
3. Based on the Keidanren's Voluntary Action Plan, the target is set as either an absolute target of a 14 percent reduction in total or a relative target, no credits for reductions in RDF power-producing projects are given, and CO_2 absorptions from forest management can be used
4. An absolute target is set with half by grandfathering and half by auction, credits are given for reductions by RDF power-producing projects, and CO_2 absorptions from forest management can be used.
5. An absolute target of a 19.9 percent reduction relative to 2001 is set, and credits for reductions by RDF power-producing projects and absorptions from forest management can be used.

The penalty for non-compliance was set at 100,000 yen. All options were effective in terms of achieving the targets; however, it revealed that there is a possibility that the target set in option 3 is not strict compared to the others. In terms of costs, options 1 and 5 cost more for penalties, and option 4 costs more for managing auctions, while options 2 and 3 cost less. As a result, issues identified for further consideration in establishing an emissions trading scheme were the level of target, the way to set it, capacity building in companies to reduce emissions, the way to treat credits reduced outside of a company, credits from forest management, credits from RDF projects, the expansion of participants, and the monitoring, verification, and registration of emissions.

Box 2: The simulation of emissions trading in Mie Prefecture

METI also conducted a pilot project to trade and transact credits. Within the framework of pilot projects, 29 projects were conducted. Credits coming from them were treated as certified emissions reduction credits (CERs), which companies can trade and transact. Originally, it aimed at conducting a pilot

6. Participants chose their reduction targets from the choices of absolute target, relative target, or absolute reduction target. An *absolute target* means that participants set absolute emission targets for FY2003. Participants received allowances matching their emissions cap from the start. They were free to sell their allowances if they wished, but they needed to ensure that they held enough to cover their actual verified emissions by the end of the reconciliation period (cap and trade). *Relative target* means that participants set an emissions target per unit of output (production or total floor space). Credits were issued to participants when they reduced their emissions below their targets (baseline and credit). *Absolute reduction target* means that participants declared a targeted reduction that would be realized by their emissions reduction efforts. Credits were issued to participants when they reduced emissions below their targets (baseline and credit). During the project, participants had four periods of trading to buy or sell their allowances or credits, with each period of trading lasting three days. In April and May, all participants calculated their emissions in 2003 and had their emissions verified by the project verifiers. After the final trading period in June, 27 participants had succeeded in meeting their voluntary targets, with 16 out of the 27 participants meeting their targets by purchasing allowances and credits from other participants. The total amount of allowances transacted was 2.4 $MtCO_2$.

project in which companies set voluntary targets based on the Keidanren's Voluntary Action Plan, with an incentive to subsidize half of the investments for the projects that would achieve their targets in advance or overachieve them. The Keidanren and industries opposed the idea, however, because they were concerned that the pilot project would be followed by a mandatory trading scheme.

Considering the concern expressed by industries, METI explained that the pilot project aimed at establishing infrastructure and had no relevance to establishing a domestic emissions trading scheme.

Apart from the initiatives taken by the central and local governments, several companies—including Hitachi, Konica, Matsushita, and Cosmo—developed their own internal emissions trading schemes (box 3).

Cosmo

Cosmo's initiative was different from emissions trading. It conducted a campaign called "CO_2 Green Gasoline" in December 2002 and 2003. Customers paid more than the regular gasoline price to purchase credits from an afforestation project in Australia, conducted by Cosmo, to make up for the equivalent amount of CO_2 emissions produced by burning gasoline in their vehicles. Cosmo also retailed CO_2 credits from the project and issued a CO_2 sink certificate. The idea behind this activity was to absorb CO_2 emissions from its gasoline by afforestation and to balance total CO_2 emissions.

Matsushita Group

Matsushita launched group-wide emissions trading among 125 of its companies in July 2003, with the aim of achieving a 7 percent reduction target from 1990 to 2010—equivalent to 1.26 million tonnes of CO_2—set in its Green Plan published in 2001. This system sets the targets based on an energy-saving ratio instead of putting caps on each company. Using this method, the system does not prevent companies from expanding their business.

Konica

From April 2003, Konica started a cap-and-trade emissions trading system among four of its manufacturing divisions, with the aim of reducing the group-wide GHG emissions level by 6 percent from 1990 to 2010. The price of CO_2 was set at 10,000 yen per tonne; however, there was no money transacted in order to avoid paying taxes.

Box 3: Examples of initiatives by Japanese companies

Despite the experience gained by the government and private sector through the above activities, most companies still opposed the introduction of emissions trading with absolute caps. Nevertheless, they and other stakeholders recognized that domestic emissions trading schemes are/will be used as the main instrument to reduce industry sector emissions in other industrialized countries, such as the European Union, Norway, Switzerland, and Canada. Recognizing the importance of emissions trading as an instrument to control emissions from the industry and energy sector, the MoE decided to launch a voluntary emissions trading scheme in 2005, mainly based on its prototype project. The scheme is a combination of emissions trading with subsidies.

Private companies were invited to commit to their CO_2 emissions reduction targets in return for receiving subsidies to cover one-third of their costs spent on emissions reduction projects conducted during FY2005 to a maximum of 200 million yen. The MoE has budgeted 3 billion yen annually for subsidies. After it screened participants on the basis of "cost-efficiency" optimization, 34 companies

were selected as participants with targets in return for the subsidy of 2.6 billion yen to conduct projects in FY2005.

Participants are to report their emissions from 2002 to 2004—which must be verified by organizations appointed by the MoE—and register the estimated emissions reduction amount for 2006. The companies will get allowances corresponding to the difference between the average emissions from 2002 to 2004 and the estimated CO_2 emissions reduction in April 2006, and then trade allowances freely throughout FY2006. They are required to surrender the allowances of CERs corresponding to the actual emissions in FY2006, which will be verified in April/May 2007.

In the case of non-compliance, the subsidy must be returned to the MoE and the names of companies in non-compliance will be published.

3.3 GHG emissions reporting scheme

The MoE also tried to include an obligation in the CCPL for companies to monitor, report, and publish their GHG emissions. Up to that time, CO_2 emissions were to be calculated based on energy consumption data collected under the ALRUE. In order to effectively draft, implement, and review mitigation policies, it is critical to know the actual amount of CO_2 emissions as well as those of the other five GHGs as soon as possible.[7] Therefore, the MoE intended to include the obligation for installations that produce emissions above a certain level to report their emissions of all six GHGs.

Industries opposed the introduction of the scheme, while the government almost agreed to it. However, the MoE and METI again fought over authority. METI as well as industries argued that the reporting scheme must be established within the framework of the ALRUE, which would make it possible to utilize the existing process to collect information on energy consumption. Industries also claimed that establishing a new scheme to collect information on CO_2 emissions would cause double regulation (MoE 2004b, 2004d).

On the other hand, the MoE argued that at least the other gases that the ALRUE has not regulated can/should be regulated under the CCPL.

In the end, both ministries agreed to include the reporting scheme in the revised Climate Change Policy Law (article 21.1), which includes the provision that reporting under the ALRUE is regarded as fulfilling the reporting obligation under the revised CCPL (article 21.10), and that the ministers of environment, economic affairs, and ministers who have competencies to guide the sectors share the competence on the CCPL (article 31.2).

7. The other five GHGs under discussion are methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride.

3.4 Draft elements of the Kyoto Target Achievement Plan by the MoE and METI

Sector	Measures	Reduction targets (thousands of tonnes)
Industry	Keidanren's Voluntary Action Plan	4,240
	R&D on fuel switching of high-efficiency boilers and lasers	200
	Promotion of high-efficiency industrial furnaces	130
	Energy management as set out in the revised ALRUE	170
Households	Diffusion of efficient air conditioners for commercial buildings	60
	Improvement of energy efficiency at home	850
	Promotion to replace old electric appliances with more efficient ones	560
	Promotion of high-efficiency water heating	340
	Promotion of HEMS and BEMS	1,120
Transportation	Accelerated introduction of vehicles achieving top-runner programs	2,100
	Acceleration of R&D and dissemination of low-emission vehicles, including clean energy vehicles	300
	Promotion of efficiency logistics systems, including shift of transport modes from trucking to shipping	120
	Introduction of sulphur-free fuel and vehicles to use such a fuel	760
Energy supply	New energy	1,700
	Fuel switching and nuclear power	4,690

Table 11: The Kyoto Target Achievement Plan's measures for sectors and reduction targets (draft)

Source: GWPH 2005.

4 Dependence on the Kyoto mechanisms

As the above examination reveals, Japan has conducted discussions and reviewed climate policies and measures with the aim of introducing additional policies and measures from 2005, if the existing ones are not sufficient to achieve the 6 percent reduction target committed to in the Kyoto Protocol.

The review revealed that Japan's emissions in 2010 are estimated to be at least 6 percent higher compared to the 1990 level, which will require a reduction of at least 12 percent to achieve its 6 percent reduction target. Based on the current estimation, even if all the policies and measures are implemented as scheduled, there will still be a 1.6 percent shortfall, which will therefore have to be purchased in the form of credits from abroad (METI 2004; MoE 2005; GWPH 2005). Both ministries and the stakeholders share the view that there is an urgent need to prepare for the utilization of the Kyoto mechanisms for the following reasons: (1) the "low-hanging fruits" will be quickly picked by countries that have already established national purchasing schemes as well as emissions trading schemes linked with the Kyoto mechanisms; and (2) it will take three to five years to acquire the credits resulting from CDM/joint implementation (JI) projects, and only three years remain before the start of the first commitment period of the Kyoto Protocol in 2008.

An examination of preparations in Japan to utilize the CDM/JI is provided in the following section.

4.1 Preparations in Japan to utilize the CDM/JI

The Liaison Committee for Utilization of the Kyoto Mechanisms was established as an organization to issue national approval to CDM/JI projects in 2002, and it had already approved 12 projects as of March 2005—most of them CDM projects (table 12).

Approval date	JI/CDM	Applicant	Host country	Expected emissions reduction[a]
2002.12.12	JI	New Energy and Industrial Technology Development Organization (NEDO)	Kazakhstan	62,000
2002.12.12	CDM	Toyota Trading Co.	Brazil	1,130
2003.5.22	CDM	Dengen Kaihatsu Power Co.	Thailand	60
2003.7.15	CDM	Ions Chemical	Korea	1,400
2003.7.29	CDM	Kansai Electric Power Co.	Bhutan	0.5
2003.12.3	CDM	Japan-Vietnam Petroleum Co.	Vietnam	680
2004.5.19	CDM	Sumitomo Trading Co.	India	3,380
2004.6.29	CDM	Chubu Electric Power Co.	Thailand	84
2004.7.22	CDM	Dengen Kaihatsu Power Co.	Chile	14
2004.10.1	CDM	Tokyo Electric Power Co.	Chile	79
2004.10.1	CDM	Tokyo Electric Power Co.	Chile	84
2004.10.1	CDM	Tokyo Electric Power Co.	Chile	249

Table 12: Projects approved by the Liaison Committee for Utilization of the Kyoto Mechanisms

[a]In tonnes of CO_2 per year.

The reasons that most of the approved projects are under the CDM are assumed to be as follows:

- While CERs could be issued from 2000 (Decision 17/CP7 of the Marrakesh Accords), emission reduction units (ERUs) will be issued from 2008.
- As demonstrated in the intervention by the Japanese government on linking directive discussions in November 2003, both the government and companies believe that the European Union Emission Trading Scheme (EU ETS) will absorb most JI potential in new EU member states (METI 2003). Some also argue that it is difficult to compete with the EU 15 in acquiring credits from Central and Eastern European countries, due to the existing geographical and political relationships between the EU 15 and those countries.
- Although Russia and the Ukraine have large potential for JI projects as well as international emissions trading, it is not yet clear whether or not they will fulfill the eligibility requirement to utilize the Kyoto mechanisms.[8]

Both METI and the MoE have conducted CDM/JI assistance projects. In 2005, they collectively secured 5.7 billion yen for the projects—the MoE with 2.0 billion yen (0.6 billion yen in 2004) and METI with 3.7 billion yen (2.4 billion yen in 2004). Nevertheless, CDM/JI assistance projects will have a limited contribution to acquiring credits for Japanese compliance with the Kyoto Protocol, especially considering that credits corresponding to 20 $MtCO_2$/year have to be acquired from abroad in order to achieve the 1.6 percent target by utilizing the Kyoto mechanisms and that the amount pro-

8. Paragraph 5 of Draft decision-/CMP.1: (Mechanisms), principles, nature, and scope of the mechanisms pursuant to articles 6, 12, and 17 of the Kyoto Protocol, paragraph 22 of ANNEX of Draft decision-/CMP.1 (Article 6) , paragraph 3 of ANNEX of Draft decision-/CMP.1(Article 17)

vided by CDM/JI assistance projects will only be 8.3 $MtCO_2$/year, even if the whole 5.7 billion yen is utilized.[9] In order to enhance project development, the MoE and METI decided to use part of their budgets for upfront payment instead of paying on delivery.

4.2 The Japan GHG Reduction Fund

In recognition of the necessity to establish a fund to systematically purchase carbon credits from abroad, the Japanese government, especially METI and the Ministry of Foreign Affairs (MOFA), requested the Japan Bank for International Commerce (JBIC) and the Development Bank of Japan (DBJ) to take the initiative to establish a carbon fund with other private companies, following the lead of the World Bank's Prototype Carbon Fund (PCF). The Ministry of Finance (MOF) also supported the idea in order to avoid having to find a source to purchase credits from abroad to comply with the Kyoto target.

On December 1, 2004, 31 private Japanese companies, the JBIC, and the DBJ established the Japan GHG Reduction Fund (JGRF) with 14.8 billion yen ($141.5 million)[10] (table 13).

The way the fund functions, the Japan Carbon Finance Co. (JCF) first purchases credits from the market or invest in CDM/JI projects at a certain price (figure 2). Then the JGRF calls on member companies to deliver money, with the amount based on their investment ratio. Then it transfers the money to the JCF and the JCF transfers money to project developers or credit sellers. The JCF will transfer credits to the JGRF, and then the JGRF distributes the acquired credits to member companies based on their investment ratio. The incentives for participation in the fund are avoiding complicated administrative procedures and shortening the number of years needed to acquire credits. It is reported that some companies are considering using the acquired credits to achieve the target set within the framework of the Keidanren Voluntary Action Plan and implicitly prepare for the case that an emissions cap will be introduced (*Nihon Keizai Shinbun*, Nov. 26, 2004).

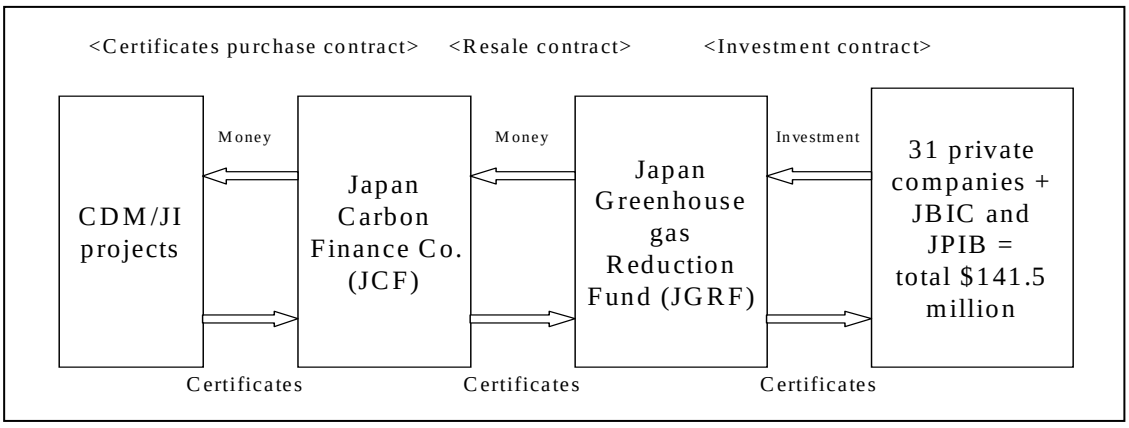

Figure 2: The mechanism of the Japan Carbon Finance Co.

Note: JPIB = Japan Policy Investment Bank.

9. For example, only one CDM/JI assistance project under the MoE budget has been approved, which would bring only 20,000 tonnes of CO_2e into the national account.
10. 1 US dollar = 105 yen.

Sector	Companies		Total contribution (millions of dollars)
Electricity/ gas/heat/water	• Chubu Electric Power Co. • Tokyo Electric Power Co. • Tohoku Electric Power Co. • Kansai Electric Power Co. • Kyushu Electric Power Co. • Shikoku Electric Power Co.	• Dengen Kaihatsu Power Co. • Hokuriku Electric Power Co. • Hokkaido Electric Power Co. • Okinawa Electric Power Co. • Tokyo Gas Co.	55
Manufacturing	• Shin Nippon (oil producing co.) • Idemitsu • Kyushu Oil • Japan Energy • Sony • Toshiba	• Sharp • Fuji Xerox • Japan Steel Federation • Pacific Cement • Toyota • Terumo	33.5
Wholesales/retail	• Mitsui Trading Co. • Mitsubishi Trading Co. • Sumitomo Trading Co.	• Itochu Trading Co. • Marubeni • Sounichi	32
Construction	Nikki		1
Public	JBIC Japan Policy Investment Bank		20

Table 13: Companies investing in the Japan Carbon Finance Co.

The fund will be operated until 2014 with the aim of acquiring the credits that will be issued in 2012, the last year of the protocol's first commitment period. It aims to acquire 10 to 20 million tonnes worth of credits during the whole period.

Companies will acquire credits from abroad under this scheme; however, there is no scheme to get the credits acquired by Japanese entities transferred into the national account. Therefore, credits from this scheme will not be used for Japan's compliance with the protocol.

After the protocol entered into force in February 2005, the government recognized the need to establish a scheme to acquire credits from abroad with a view to use them for national compliance, and they are currently considering establishing a national purchasing scheme to purchase credits from abroad after 2007.

5 Conclusion

As discussed in this paper, Japan's GHG emissions have been increasing since 1990, and this trend will not change drastically under existing measures; therefore, Japan faces difficulty in achieving its Kyoto target. As well, effective policies and measures were not introduced after the review in 2004. Therefore, employing the Kyoto mechanisms is crucial to achieving Japan's Kyoto target, not just the 1.6 percent target, if the difficulties in reducing 5.6 percent through domestic policies and measures and fully utilizing the 3.9 percent from sinks are considered. Stakeholders also realize this and have started investing in CDM/JI projects by themselves as well as establishing the JCF to purchase credits from abroad.

So far, activities have been focused on the CDM, apart from some initiatives conducted by companies, but interest in acquiring ERUs as well as assigned amount units (AAUs) has been increasing. Interest

in acquiring credits from Central and Eastern European countries, especially, is increasing for the following reasons:

- The CDM Executive Board's slow process of approving CDM methodologies is recognized as a risk to conducting CDM projects.[11] Considering that only four projects had been approved by the board as of March 2005, governmental as well as industry stakeholders recognize the necessity to diversify options. In addition, the associated costs for CDM projects are expensive.
- As described above, it is not yet clear whether or not Russia and the Ukraine can fulfill the eligibility requirements for utilizing the Kyoto mechanisms. Even when this becomes clear, it is still risky to rely on credits solely from these countries, since they can easily control prices in such a case. Therefore, diversification of trading partners is necessary. Also, it is not desirable from the perspective of reducing global emissions and stabilizing GHG concentrations in the atmosphere to purchase a huge amount of "hot air," which is not backed by actual reductions of GHG emissions.
- The associated costs for JI projects are expected to be the same as the CDM and will reduce the appetite for JI. If projects can be developed under the so-called JI track 1, however, then trading partners can decide for themselves which modalities to apply to transfer reduction units. This reduces regulatory risks and transaction costs.

It is also true, however, that there is skepticism about the possibility of acquiring credits from Central and Eastern European countries, due to the impact of these countries becoming EU member states in May 2004 and the application of *acquis communitaire* (the whole body of EU law)—which includes EU environmental regulations, the EU Emissions Trading Directive, and the Linking Directive—as well as the political and economic relations between these countries and Western European countries.

Despite recognition of the necessity to acquire credits from Central and Eastern European countries and the prevailing skepticism about the acquisition, detailed examination of the actual impacts of emissions trading and linking directives has not yet been conducted.

In order to consider options for acquiring credits from abroad in the future for Japan to achieve its Kyoto target, especially from Central and Eastern European countries, we will conduct a detailed examination of the impacts of emissions trading and linking directive in paper 2 (*The EU Linking Directive and its Impact on the Potential for JI Projects in the EU Accession Countries*) and potentials of credits in paper 3 (*Demand and Supply on the Global Market for Emission Certificates*). Based on these three papers, we will propose options to acquire credits from abroad in the conclusion paper 4 (*Comparison of Options Available to Japan for Acquiring Emission Reduction Certificates*).

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11. Point Carbon reported that the process of approving CDM methodologies by the board is turning out to be a real risk. For example, the Netherlands announced last year that it had selected projects for 16 million CERs, but due to a different interpretation of additionality by the board this was reduced to about 8 million—and still not one of their carefully selected projects has been registered.

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