

## ***JAPANESE FIRMS' PRACTICES FOR CLIMATE CHANGE: EMISSION TRADING SCHEMES AND OTHER INITIATIVES***<sup>1)</sup>

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### **1. INTRODUCTION**

In September 2009, the Democratic Party of Japan (DPJ), immediately after winning the majority in the lower house election, proposed the 25% reduction of greenhouse gas (GHG) emissions relative to the 1990 national level. To achieve this target, they proposed several policy instruments, one of which was a domestic emission trading scheme (ETS). The potential for a domestic ETS has been intensively discussed among policymakers and tested via several voluntary or experimental ETSs. Due to their voluntary nature, some Japanese firms have participated, while others have not. Given the public's increasing attention to voluntary programs as well as voluntary actions by firms, it is important to know to what extent and for what reasons Japanese firms have participated in these experimental ETSs.

In addition to ETSs, the Clean Development Mechanism (CDM) plays a key role in reducing GHG emissions. However, only a small number of Japanese firms have implemented CDM projects to date. To promote CDM projects, it is vital to identify the following: (1) which firms have been involved in the projects, (2) what are the incentives and disincentives for firms to implement the projects, and (3) whether firms intend to implement the projects in the future.

To address the first question, the databases constructed by the Institute for Global Environmental Strategies (IGES) may be helpful. The databases thoroughly document CDM projects, including the project types, starting dates, and the number of Certified Emission Reductions (CERs) issued. The databases, however, do not help answer the second or third question. To address the questions given the lack of data, the Center of the Environment and Trade Research (CETR) at Sophia University conducted a survey on corporate practices for climate change that focused mainly on ETS and CDM programs. The survey also asked Japanese firms about their behavior with regard to the purchase of CERs in secondary markets. In addition, the survey inquired about various regulatory pressures from the national and local governments that firms currently experience. The findings from the survey therefore provide an overall picture of the firms' perceptions about ETS, CDM, and CER, as well as the firms' current regulatory circumstances.

The structure of the paper is as follows. Section 2 summarizes the climate regulatory policy in Japan. Section 3 briefly describes the survey conducted by CETR and reports the results. Finally, Section 4 concludes the paper.

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## **2. CLIMATE REGULATIONS AND VOLUNTARY ACTIONS BY JAPANESE FIRMS**

### **2.1 ACT ON THE RATIONAL USE OF ENERGY (ARUE)**

Though the national government has not imposed a cap on GHG emission on each firm or facility, it has implemented various climate policies for different sectors of the Japanese economy. Numerous regulations have their basis in the Act on the Rational Use of Energy (ARUE). Established in 1979, the Act aimed to promote energy savings, mainly in the manufacturing sector. Manufacturing facilities were the regulation unit of this act, with each facility being required to meet the energy intensity target of a 1% annual reduction. The facilities subject to the regulation must appoint an energy manager, obey the standards of judgment prescribed in the act, and submit an annual report and medium- and long-term plans for achieving the targets for the rational use of energy. Later, the scope of the regulation expanded to cover the service sector. For example, the hotel industry became subject to the regulation.

The act was amended several times. The most recent amendment was introduced in 2008. With this amendment, the regulation is now implemented at a firm (or a business operator) level, rather than at a facility level. If the total energy consumption in all of its facilities for a given fiscal year exceeds 1,500 kiloliters of oil equivalents, the firm is designated as a Specified Business Operator (SBO). Moreover, a chain business operator also becomes subject to the regulation as a Specified Chain Business Operator (SCBO) if its total annual energy consumption exceeds 1,500 kiloliters of oil equivalents. This amendment drastically expanded the scope of the regulation. For example, logistics companies in the transportation sector or convenience store chains in the commercial sector are now subject to the regulation.

### **2.2 ACT ON PROMOTION OF GLOBAL WARMING COUNTERMEASURES (APGWC)**

The Act on Promotion of Global Warming Countermeasures (APGWC) was established in 1998 to reduce GHG emissions such as carbon dioxide (CO<sub>2</sub>) emissions. APGWC mandates that firms subject to this act monitor and report their GHG emissions per firm. It applies to firms if they are SBOs/SCBOs as defined by ARUE or if their GHG emissions are more than 3,000 tons of CO<sub>2</sub> equivalents per year. The emissions of each firm are made public to motivate firms to make an effort to reduce their GHG emissions.

### **2.3 VOLUNTARY ACTION PLAN (VAP)**

Most of the major Japanese firms are involved with Keidanren (Japanese Business Federation) Voluntary Action Plans (VAPs)<sup>2)</sup>, of which one has a main goal of reducing GHG emissions<sup>3)</sup>. That particular VAP was announced in 1997 before the Kyoto Protocol was signed and implemented in 1998. It consists of four phases. The first phase of the VAP involves setting targets<sup>4)</sup>. Specifically, each industrial or trade association sets numerical target levels for GHG emissions or energy consumption goals. Second, the firms make efforts to reduce their emissions. Third, the performance of each industrial or trade association is checked at the end of each year. Finally, the results are publicized. This process is repeated annually.

### **2.4 VOLUNTARY EMISSION TRADING SCHEMES AND OFFSET-SCHEMES**

Though there are no mandatory ETs in effect at the national level in Japan, the national government has introduced several voluntary or experimental ETs. J-VETS (Japan's Voluntary Emissions Trading Scheme),

launched in 2005 by the Japanese Ministry of the Environment, is a voluntary ETS that disseminates knowledge and experience on a domestic cap-and-trade ETS as well as on cost-effective and reliable ways to reduce GHG emissions.

There are three types of participants: type A participants, type B participants and trade participants. Type A participants are those who have an emission reduction target and that, by committing to it, receive permits and a subsidy for investment in facilities and equipment for the reduction of CO<sub>2</sub> emissions. Type B participants are those with an emission reduction target who receive permits while not receiving a subsidy. Trade participants are those who open an account with the J-VETS registry to trade permits.

During the early stage of the first Kyoto commitment period, there was heated discussion by policymakers about creating a domestic policy so that Japan could achieve a potential midterm target for the second Kyoto commitment period. This led the Japanese government to introduce the Experimental Emission Trading Scheme (EETS) in 2009, an experimental integrated domestic market for emissions trading. The objective of the EETS was to investigate, with the participation of many firms, an appropriate emission trading scheme for Japan by testing and evaluating options, such as the choice of absolute- or intensity-based emission caps. Participants were allowed to trade emission permits and credits generated through domestic CDM projects, thereby achieving their voluntary emissions reduction target (absolute- or intensity-based). If a participant belongs to a sector with the VAP target, the participant's targets must be consistent with the VAP. J-VETS was integrated into the EETS in 2008. However, the J-VETS participants obey the rules of J-VETS and not those of the EETS. For example, their target must be set according to the rule of J-VETS for type B participants.

In addition to these experimental ETSs, the national government has introduced offset schemes. In 2008, the Ministry of Economy, Trade and Industry led the launch of the Domestic Credit Scheme, also known as Domestic CDM (D-CDM), to reduce industry-wide GHG emissions. If a large firm provides financing or technologies for a GHG emissions reduction project undertaken by small and medium enterprises (SMEs), the large firm would be issued credits for the emissions reduction resulting from the project. Credits from D-CDM projects can be used to achieve other emissions reduction targets under the Kyoto Protocol such as those set by the VAP (Sugino and Arimura, 2011). Biofuel and renewable energy projects can also be implemented as domestic CDM projects.

Another offset scheme, called the J-VER (Japan Verified Emission Reduction Scheme), was introduced by the Ministry of the Environment in November 2008. It is a verification scheme for offset credits generated through the reduction or the removal of concentrations of GHGs in the following five types of domestic projects: forest management, agriculture and improvement of fertilizer, biofuel, renewable energy, and emissions reductions in SMEs. Local governments and firms can implement J-VER projects. J-VER credits can be freely traded, and the market liquidity for these credits is high. However, J-VER credits currently cannot be used to achieve targets under an emissions trading scheme or the Kyoto Protocol. Consequently, the J-VER is used only for corporate social contribution.

Despite these efforts, the national government has not been able to introduce a mandatory ETS. In contrast, the Tokyo prefectural government successfully introduced an ETS. Tokyo's Emission Trading Scheme (Tokyo-ETS), launched on April 1, 2010, is the first cap-and-trade ETS in Japan. In this scheme, large facilities and buildings (those that consume 1,500 kiloliters of oil equivalents per year or more) in Tokyo Prefecture must reduce their emissions. In this scheme, 3 types of domestic offset credits are offered: (1) small- and medium-sized installation credits within the Tokyo Area, (2) outside Tokyo Prefecture credits and (3) renewable energy

certificates. However, international credits cannot be used to offset GHG emissions in Tokyo Prefecture<sup>5)</sup>.

### 3. SURVEY RESULTS

#### 3.1 OVERVIEW OF THE SAMPLE

This section describes a survey that we recently conducted on corporate practices to address climate change. It is part of the research project, “Research on Economic Impacts of Linking Domestic ETS on Japanese Economy: a CGE Approach”, which was funded by the Ministry of the Environment.

The questionnaires<sup>6)</sup> were distributed to 2,676 firms that, as of August 2010, were listed in major Japanese stock markets (i.e., Tokyo 1st/2nd/Mothers, Osaka 1st/2nd, Nagoya 1st/2nd, Sapporo and Fukuoka). The population of this study consists of these firms. The number of employees among the responding firms averages 2,556. The minimum is 5, and the maximum is 70,355. The standard deviation is 5,606.

**TABLE 1: RESPONSE RATES BY INDUSTRY**

	By industry		
	# of firms in sample	# of responding firms	Response rate
Electricity & Gas	25	14	56.0%
Construction	143	47	32.9%
Manufacturing	1257	325	25.9%
Mining	8	2	25.0%
Commerce	473	90	19.0%
Finance & Insurance	158	30	19.0%
Transportation, Information & Communications	312	45	14.4%
Services	205	19	9.3%
Real Estate	89	7	7.9%
Agriculture, Forestry & Fisheries	6	0	0.0%

Our sample consists of the 579 firms that responded to the survey out of 2,676 firms that received the questionnaire. The 22% response rate is high relative to the typical response rate for firms in studies that use a survey of length comparable to ours. Table 1 provides response rates across industries. Electricity & Gas (56.0%) has the highest response rate, and Construction (32.9%), Manufacturing (25.9%), and Mining (25.0%) have the second, third, and fourth-highest response rates, respectively.

To check whether our sample represents the population, we compare the industry composition of the sample with that of the population (Figure 1). The share of the firms in the manufacturing industry appears to be significantly larger in the sample than in the population, suggesting that the manufacturing firms are over-represented. However, the industry composition of the sample is broadly representative of the population other than manufacturing.

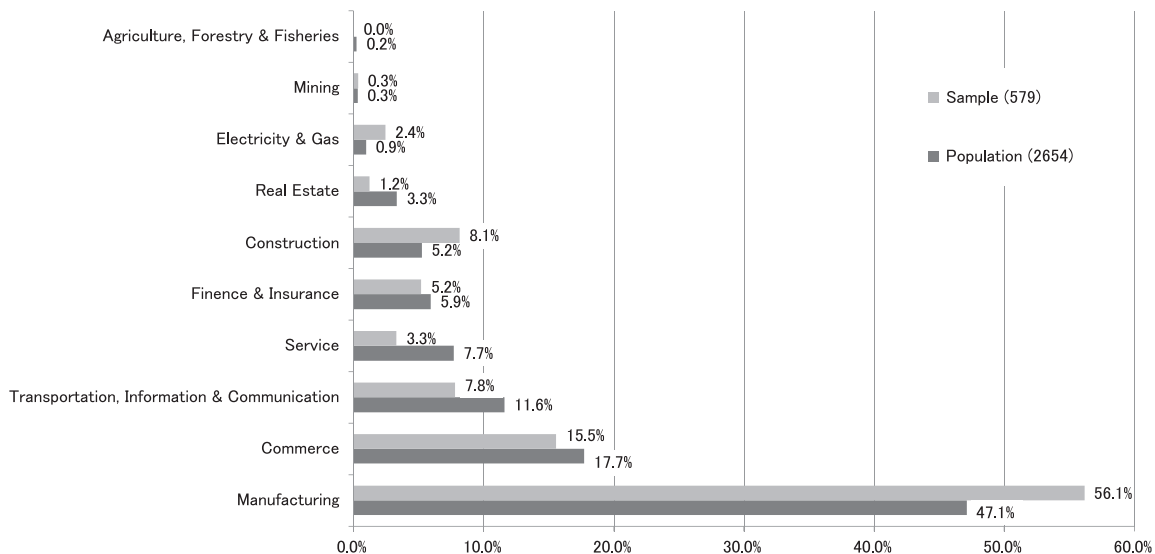


FIGURE 1: INDUSTRY COMPOSITIONS

Figure 2 compares the industry composition of the sample with that of the population *within* the manufacturing industry. They are broadly similar, except that the firms in Electrical machinery & equipment

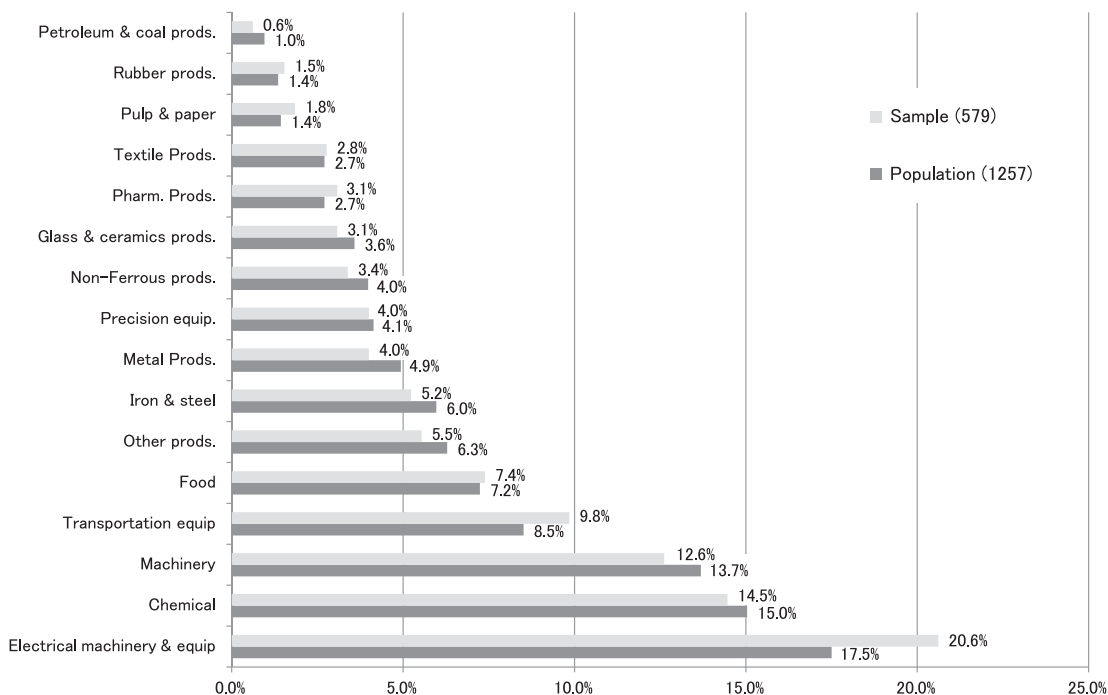


FIGURE 2: INDUSTRY COMPOSITIONS WITHIN THE MANUFACTURING INDUSTRY

and in Transportation equipment are somewhat over-represented. Overall, in terms of industry composition, the sample appears to represent the population reasonably well.

### 3.2 DOMESTIC OFFSETS, ETS AND JAPANESE FIRMS' PARTICIPATION

This subsection reports the survey results of the firms' practices toward and motivations for GHG emissions reduction and regulations that the firms are facing.

#### 3.2.1 MANDATORY POLICIES RELATED TO CLIMATE CHANGE

We first asked the firms whether they are subject to mandatory policies related to climate change; in particular, we asked (1) whether they are SBOs or SCBOs designated by ARUE and (2) whether they have any facilities or offices that are targeted by Tokyo-ETS. As shown in Table 2, 72.3% of the firms are SBOs/SCBOs, and 17.2% are subject to Tokyo-ETS<sup>7</sup>.

**TABLE 2: MANDATORY POLICIES ON CLIMATE CHANGE**

	Yes	No	Valid responses
Act on the Rational Use of Energy	72.3%	27.7%	577
Tokyo's Emission Trading Scheme	17.2%	82.8%	575

#### 3.2.2 VOLUNTARY PROGRAMS FOR CLIMATE CHANGE

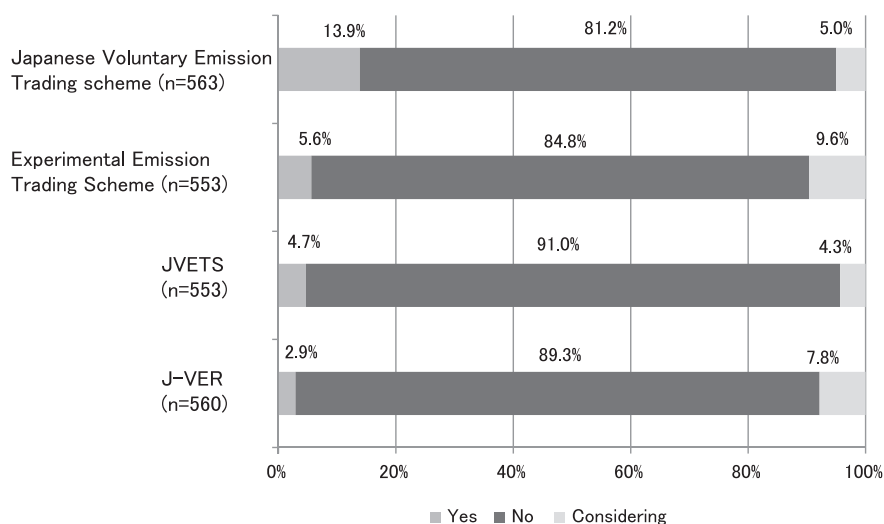
Besides the mandatory policies, there are voluntary programs for climate change in Japan: J-VETS, EETS, DCDM and J-VER. We asked the firms if they participate in these four programs. As shown in Figure 3, 13.9%, 5.6%, 4.7% and 2.9% of the firms participate in J-VETS, EETS, D-CDM and J-VER, respectively. Over 80% of the firms neither participate in nor consider participating in each of the programs, suggesting that most of the firms are not interested in the voluntary programs.

#### 3.2.3 ATTRACTIVENESS OF J-VER AND D-CDM PROJECTS

We asked the firms what aspect of emissions reduction projects under J-VER is attractive. The firms were asked to assess, by checking the answers provided in the survey, the following five types of projects: "forest management", "agriculture and improvement of fertilizer", "biofuel", "renewable energy", and "emissions reductions in SMEs". The possible answers were "social reputation," "effects on emissions reduction," "cost-effectiveness," and "don't know because of not having considered participation in those projects." The firms could check as many answers as they desired.

Social reputation ranked first among all five types of projects, followed by emissions reduction and then cost-effectiveness. This suggests that social reputation is the significant factor that makes all of these projects attractive.

We also asked the same question with regard to the other offset scheme, D-CDM. The firms were asked to assess three types of projects: "biofuel", "renewable energy", and "emissions reductions in SMEs". Similar responses were obtained; "social reputation" received the highest percentage in all types of projects.



**FIGURE 3:** PARTICIPATION IN VOLUNTARY PROGRAMS RELATED TO CLIMATE CHANGE

An important result, as Tables 3 and 4 show, was that over 60% of firms “don’t know because of not having considered participation in those projects” for all types of J-VER and D-CDM projects. This suggests that more firms may become interested in J-VER and D-CDM projects if they know those projects better. Therefore, if a

**TABLE 3:** ATTRACTIVENESS OF J-VER PROJECTS (MULTIPLE CHOICES)

Projects	Social reputation	Emission reductions	Cost-effectiveness	Don't know
Forest management (n=559)	33.6%	14.0%	4.3%	60.5%
Agriculture & improvement of fertilizer (n=554)	10.5%	5.2%	3.8%	83.6%
Biofuel (n=553)	15.9%	13.7%	8.7%	70.2%
Renewable energy (n=559)	23.8%	18.1%	11.8%	59.0%
Emissions Reductions in small and medium sized enterprises (n=555)	13.2%	11.0%	11.0%	70.1%

**TABLE 4:** ATTRACTIVENESS OF DOMESTIC CDM PROJECTS (MULTIPLE CHOICES)

Projects	Social reputation	Emission reductions	Cost-effectiveness	Don't know
Biofuel (n=555)	16.6%	13.0%	9.5%	68.8%
Renewable energy (n=559)	25.0%	18.1%	11.9%	60.7%
Emissions Reductions in small and medium sized enterprises (n=559)	15.2%	11.1%	12.9%	67.8%

policymaker aims to increase the number of participants, he/she needs to provide firms with more information about J-VER and D-CDM.

### 3.2.4 ISSUES IN THE DOMESTIC EMISSION TRADING SCHEME

The discussion on the domestic cap-and-trade scheme was intense in 2010. We asked the firms what the important issues about the cap-and-trade scheme would be if it were to be introduced. We listed 15 issues based on the discussion under the central environmental council under the Ministry of the Environment and asked the firms how important each issue would be.

Figure 4 presents the results. All 15 issues are regarded as very or moderately important by more than 70% of the firms. Over 90% of the firms regard the following issues as very or moderately important: “allocation methods” (auctioning or grandfathering and total emission or emission per unit) (96.1%), “compliance period and rule” (96.0%), “aggregate cap” (94.6%), “monitoring, accounting, reporting, publicizing, and third-party verification” (94.5%), and “target for emission cap” (94.0%).

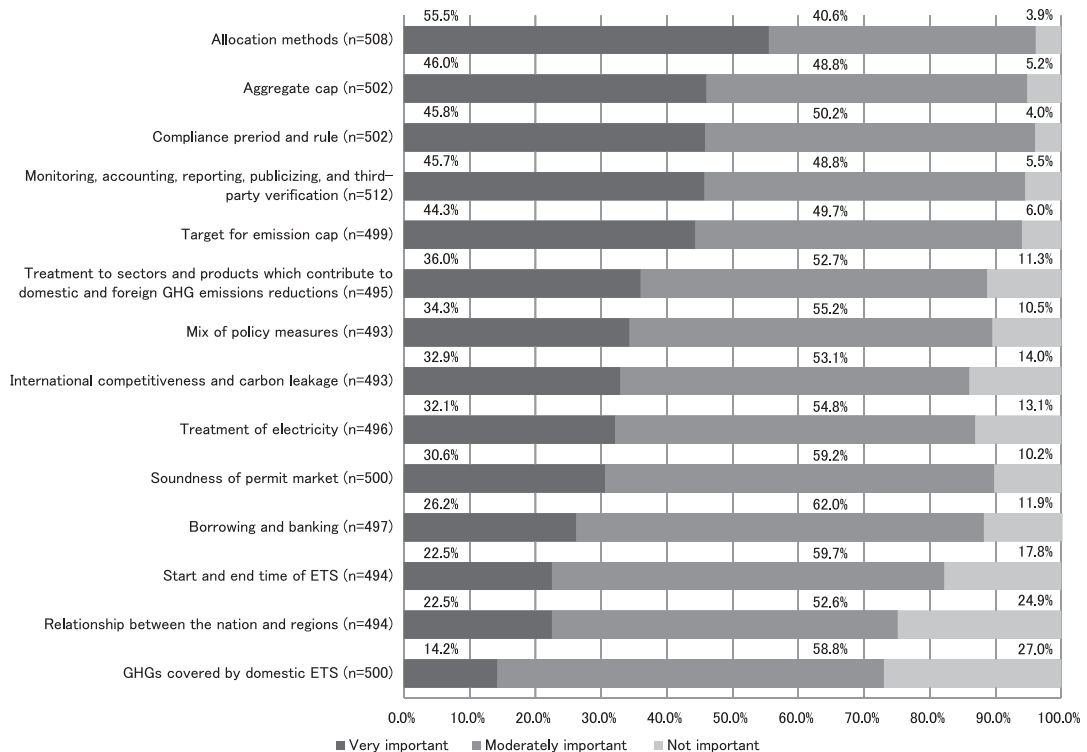


FIGURE 4: ISSUES IN DOMESTIC EMISSION TRADING SCHEME

Issues that a high proportion of the firms regard as not important are “GHGs covered by domestic ETS” (GHGs other than CO<sub>2</sub> should be included) (27.0%), “registry” (25.4%), and “relationship between the national and local ETS” (24.9%). Thus, firms take “monitoring, accounting, reporting, publicizing, and third-party verification” (MRV) as seriously as the cap level or the allocation method.



Further, we asked firms what is a desirable complement to the cap-and-trade scheme. The firms were asked to choose from three schemes: (1) a domestic CDM, (2) an international offset such as CDM or (3) an offset credit scheme such as J-VETS. The results are presented in Table 5: 93.6% of the firms think that J-VER and/or a domestic CDM scheme are desirable, while 31% of the firms think that an international CDM scheme is desirable. These results suggest that more firms prefer domestic schemes to international ones.

**TABLE 5: DESIRABLE COMPLEMENTARY SCHEMES (MULTIPLE CHOICES)**

Domestic CDM scheme	Complementary Schemes		
	International CDM scheme	Offsetting credit scheme	Other
54.6%	31.6%	39.0%	10.0%

### 3.2.5 ISSUES IN THE DOMESTIC EMISSION TRADING SCHEME

In addition to the questions on the domestic facilities, we asked questions on firms' production units overseas as well as their export activities, thereby examining whether other countries' climate policies affect Japanese firms. The firms' replies are summarized in Table 6. Specifically, we asked if the firms have production facilities in the European Union, New Zealand and the northeastern United States that already have domestic emissions trading schemes. A total of 21.5% of the firms are found to have facilities overseas, and 12.1% of those with facilities overseas are subject to an ETS in the region of operation. We also asked if the firms export to countries and areas that already have domestic ETSS. We found that 37.6% of the firms export to those regions. These findings indicate that some firms have already been subject to ETSS in other countries.

**TABLE 6: ACTIVITIES IN COUNTRIES OR AREAS THAT ALREADY HAVE DOMESTIC ETSS**

	Yes	No	Valid responses
Production units in countries or areas with ETS?	21.5%	78.5%	576
The units subject to ETS?	12.1%	87.9%	116
Export to countries or areas with ETS?	37.6%	62.4%	569

## 3.3 ACTIONS FOR GHG EMISSION REDUCTION AND PRESSURES FROM STAKEHOLDERS

### 3.3.1 GOALS FOR GHG EMISSIONS REDUCTION

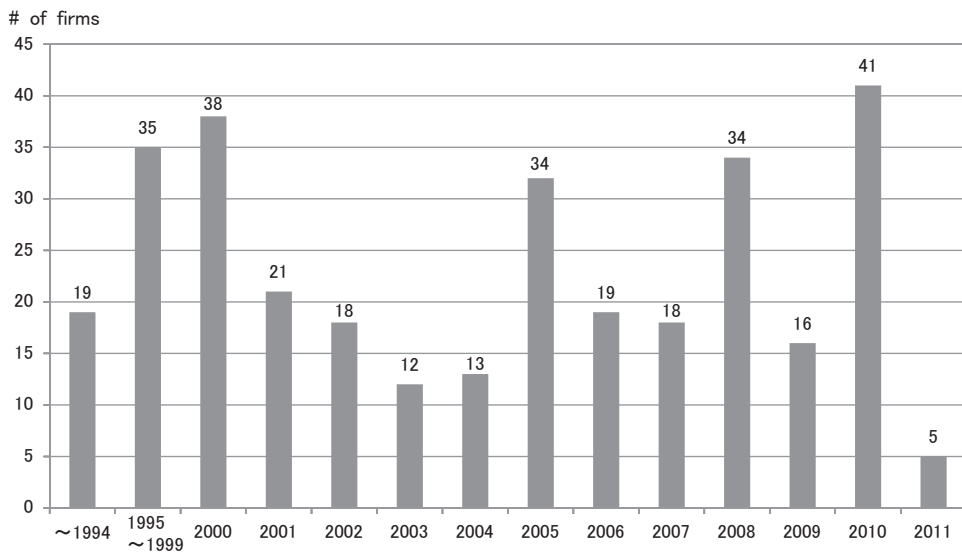
In this section, we explain the firms' responses to several questions on their goals for GHG emissions. Firms were first asked whether they set up goals for GHGs emissions. If they answered "yes" to this question, firms were asked when they first set goals, whether their goals have been verified by third parties, and whether their present goals are more ambitious than those established by their industry associations in the VAP.

A total of 72.7% of the firms were found to have set up goals for GHG emissions (see Table 7). For half of those, the initial year of setting a goal was 2005 and after (see Figure 5), the year when the Kyoto Protocol entered into force. Twenty percent of those are found to have used third-party verification. These findings indicate that, in a change from 10 years ago, setting a goal for GHG emissions is common among Japanese firms. However, third-party verification has not become a common practice.

It is also found that for 37% of firms that set up goals, their goals are more ambitious than those established by their industry associations; for 35.8% of firms, their goals are not more ambitious (See Table 7). In addition, 27.1% of the firms that set up goals could not answer which was more ambitious. We asked them to explain in their own words why they could not answer that question. Thirty firms answered that their industry associations do not share their goals, while 15 firms explained that it is difficult to compare firms' and industry associations' goals because of differences in periods, scopes, and/or base units.

**TABLE 7: GOAL FOR GHG EMISSIONS REDUCTION**

	Yes	No	Unable to answer	Valid responses
Is there a goal for the reduction in GHGs emissions?	72.7%	27.3%		568
Is the present goal more ambitious than the goal of industry associations?	37.1%	35.8%	27.1%	391
Has the goal been verified by a third party?	19.8%	80.2%		404



**FIGURE 5: INITIAL YEAR OF SETTING GOALS**

### 3.3.2 GHG EMISSIONS REPORTING

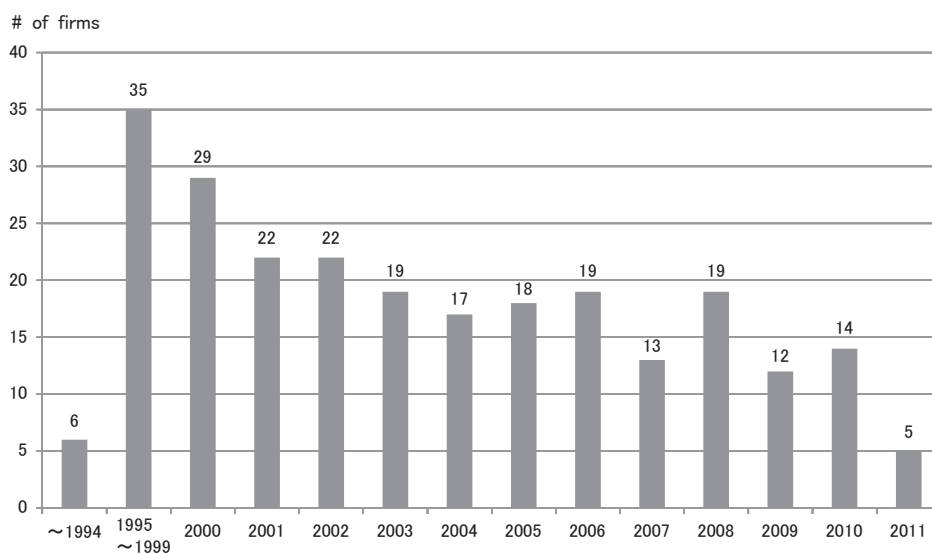
To examine the current status of firms' GHG emissions reporting, we asked the firms whether they report their GHGs emissions in their annual Corporate Social Responsibility (CSR) report, environmental report and/or websites. If they answered "yes" to this question, the firms were asked when the initial year of reporting was, as well as whether their emissions have been verified by third parties.

We find that 56.4% of firms issue some reports that do contain information on their GHG emissions, 29.1% issue some reports that do not, and 14.5% did not issue any reports (see Table 8).

For 60% of firms that issued reports, they began in 2004 or before (see Figure 6). We also observed that only 19% of reporting firms are subject to third-party verification. These results indicate that reporting GHG emissions is currently a popular practice and not just a recent trend, while third-party verification has not yet become common.

**TABLE 8: REPORTING GHGS EMISSIONS**

	Yes	No	Reports are not issued	Valid responses
Have reported the amount of emissions in annual reports or website?	56.4%	29.1%	14.5%	564
Have these emissions been verified by a third party?	19.3%	80.7%		311



**FIGURE 6: INITIAL YEAR OF REPORTING GHGS EMISSIONS: INITIAL YEAR OF SETTING GOALS**

### 3.3.3 ACTIONS FOR GHG EMISSIONS REDUCTIONS

Firms can take various actions to reduce GHG emissions. To identify what actions have been commonly taken by Japanese firms, our survey asked the firms to choose specific actions from a list we provided. The results are presented in Table 9.

**TABLE 9: ACTIONS FOR GHG EMISSIONS REDUCTION**

	Yes	No	Valid responses
Energy efficiency improvements	89.9%	10.1%	564
Investment in plant retrofits	62.9%	37.1%	536
Configuration of organizational bodies	55.2%	44.8%	542
Development of new products	53.3%	46.7%	538
Design for environmentally friendly products	48.8%	51.2%	529
Fuel switching	48.3%	51.7%	545
Adoption of clean technologies	47.2%	52.8%	530
Sourcing of renewable energy	38.5%	61.5%	538
Investment in new plants	38.4%	61.6%	526
Substitution, destruction, and withdrawal of HFC, PFC, and SF6	33.9%	66.1%	522
Forest sequestration (investment in reforestation)	22.8%	77.2%	535
Divestment from business activities with too much existing carbon exposure	7.0%	93.0%	516
Divestment from business activities with too much potential carbon exposure	5.5%	94.5%	510

Improvements in energy efficiency, investment in plant retrofits, the configuration of organizational bodies for climate change, and the development of new products are found to be the top four common actions. Design for environmentally friendly products, fuel switching, and adoption of clean technologies are also found to be major actions. In addition, investment in new plants is made less often than that in plant retrofits, and firms rarely disinvest from business activities with excessive existing/potential carbon exposure.

### 3.3.4 POLICIES/BUSINESS MOTIVATIONS FOR GHG EMISSIONS REDUCTION

In the previous subsection, we found that various actions are taken by the firms to reduce GHG emissions. Motivations for those actions are worth investigation. We asked the firms to assess how important each of the motivational factors is in a list we provided. For each factor, the firms were asked to choose from “very important,” “moderately important,” or “not important.”

The results are summarized in Figure 7. Fifty percent and 36% of the firms consider ARUE and APGWC (i.e., the two national laws related to climate change), respectively, to be “very important.” In addition, more than 30% of the firms consider energy price and CSR to be “very important.”

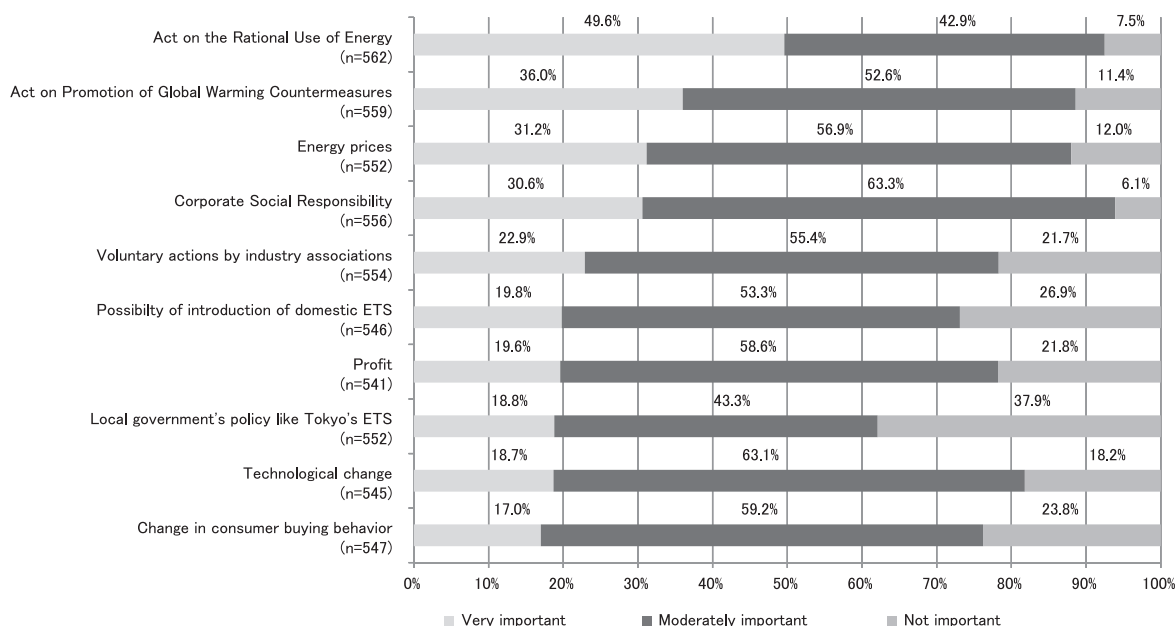


FIGURE 7: POLICIES AND BUSINESS MOTIVATIONS FOR GHG EMISSIONS REDUCTION

Local governments' policies do not appear to be as influential as the two national laws; less than 20% of the firms considered local governments' policies to be "very important," and more than 35% considered them "not important." However, the results are different when the firms have some facilities/offices targeted by Tokyo-ETS. As Table 10 shows, more than 50% of the affected firms consider local governments' policies to be "very important." This suggests that the extent to which local governments' policies influence firms' emissions reduction depends crucially on where their facilities/offices are located.

TABLE 10: DIFFERENCE IN EVALUATION OF LOCAL GOVERNMENTS' POLICIES BETWEEN FIRMS WITH AND WITHOUT INSTITUTIONS TARGETED BY TOKYOETS

	Local governments' policies like Tokyo's ETS as motive for GHG emissions reduction			Valid responses
	Very important	Moderately important	Not important	
Some facilities or offices targeted by Tokyo ETS	50.5%	46.3%	3.2%	95
No facilities or offices targeted by Tokyo ETS	12.4%	42.8%	44.8%	453

### 3.3.5 PRESSURES FROM STAKEHOLDERS

Firms are often requested by various stakeholders to take action toward the environment. To examine whether this is also the case with climate change, we asked the firms how often they receive requests from stakeholders to take action on climate change. For each of the stakeholders in a list we provide, the firms are asked to choose from “often,” “sometimes,” and “rarely.”

As Figure 8 shows, approximately 60% of the firms are often or sometimes requested to take action on climate change by public regulatory institutions, industry associations, and management employees; less than 30% of the firms are often or sometimes requested to take action on climate change by other stakeholders. This suggests that public regulatory institutions, industry associations, and management employees may be the most influential stakeholders in Japanese firms in terms of climate change issues.

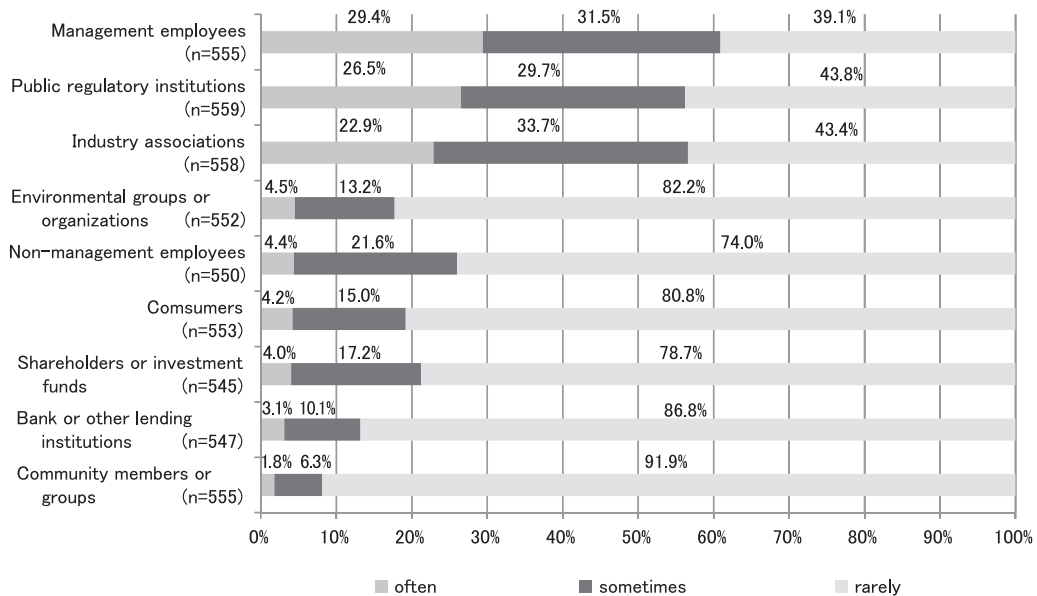


FIGURE 8: REQUEST FROM STAKEHOLDERS TO TAKE ACTIONS FOR CLIMATE CHANGE

## 3.4 INTERNATIONAL OFFSET SCHEMES : CDM AND CER

### 3.4.1 CDM PROJECTS

This subsection reports the results from questions on CDM<sup>8)</sup> and CER. First, we asked the firms if they have participated in CDM projects. As shown in Table 11, only 6.2% of the firms have participated in CDM projects.

Figure 9 shows the distribution of the number of CDM projects the firms have joined according to firm participation.

TABLE 11: CDM PROJECT PARTICIPATION

Yes	No
6.2%	93.8%
(36)	(542)

The total number of CDM projects is 239, and the largest number of CDM projects by a single firm is 64. Approximately half of the firms have joined only one project.

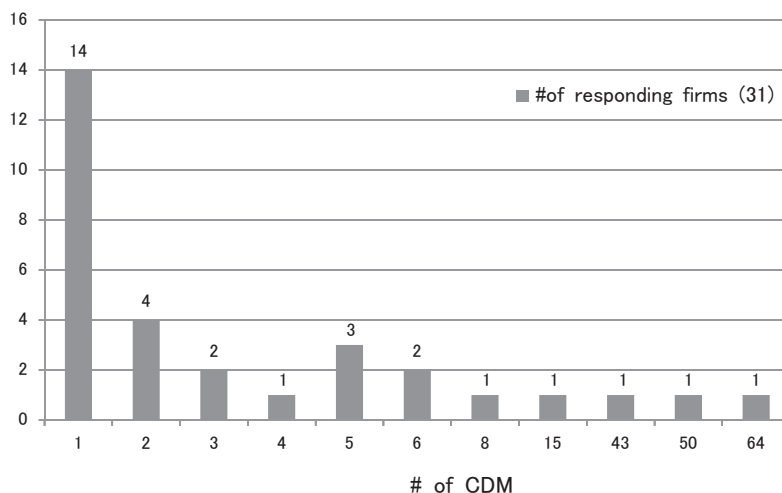


FIGURE 9: DISTRIBUTION OF THE NUMBER OF CDM PROJECTS BY FIRMS

Figure 10 shows the distribution of the amount of CERs that the firms obtained from their projects. The total amount of CERs is 54 million tons; this corresponds to approximately 4% of Japanese emissions, a non-

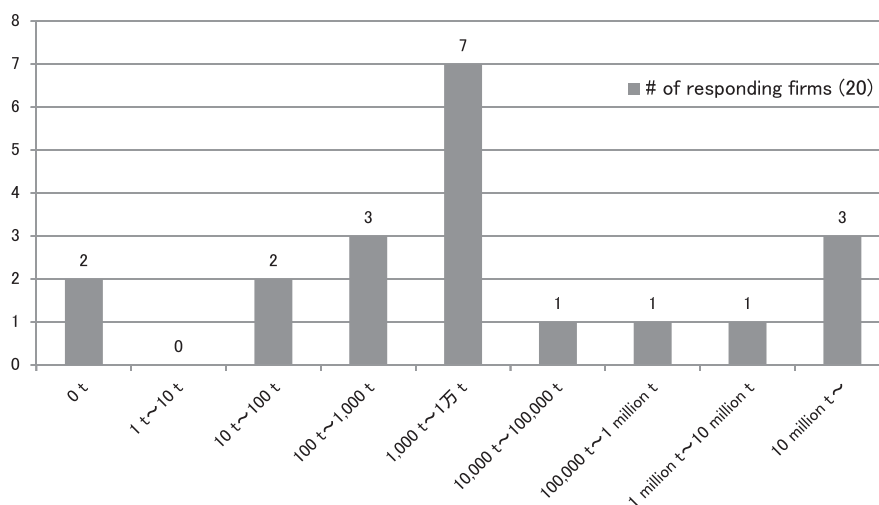


FIGURE 10: DISTRIBUTION OF THE AMOUNT OF CERs BY FIRMS

negligible portion. The firm with the largest amount of CERs has obtained 25 million tons. For CERs obtained by a firm, the mode is 1,000 to 10,000 tons (7 firms).

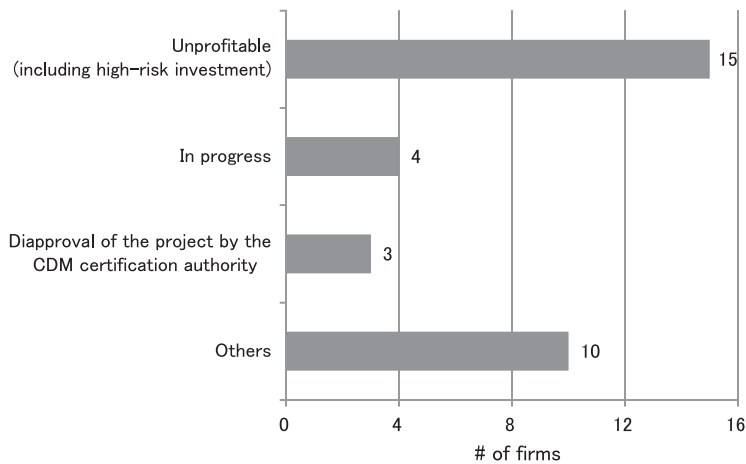
Next, we asked the firms without any experience with CDM projects if they have considered participating in a CDM project. If they answered “yes”, they were asked to identify the initial year when they considered participation. As shown in Table 12, 93.8% of the firms have not considered participation in CDM projects. The number of the firms that considered participation increased after 2005 when the Kyoto Protocol entered into force.

**TABLE 12: CONSIDERATION OF CDM PARTICIPATION  
(EXPERIENCE AND INITIAL YEAR)**

Yes	No	~ 2005	2005 ~
6.2%	93.8%	26.1%	73.9%
(32)	(481)	(6)	(17)

If they considered CDM participation (32 firms), the firms were asked why they have not participated in a CDM project. We asked them to choose their answer from the following four reasons: (1) unprofitable, (2) in progress, (3) disapproval of the project by the CDM certification authority, or (4) others.

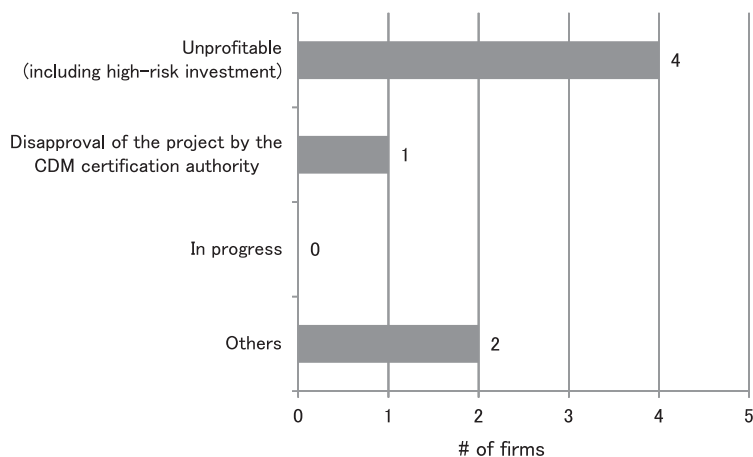
Figure 11 shows the results based on valid responses from 32 firms. Fifteen firms answered that the project would be unprofitable. Four firms answered that the projects were in progress. Three firms answered that the CDM certification authority disapproved the project. Four out of 10 firms answered “others” because they do not think that they need to participate in CDM projects because they can reduce GHG emissions by themselves.



**FIGURE 11: REASONS FOR NOT PARTICIPATING IN CDM PROJECTS (ALL RESPONDING FIRMS)**



Using information from a different question in the survey, we found that 7 out of the 32 firms have purchased CERs in a secondary market. Focusing on these firms, we present the results of the above question in Figure 12.



**Figure 12:** REASONS FOR NOT PARTICIPATING IN A CDM PROJECT (“CONSIDERING” AND “CER PURCHASING” FIRMS)

Four firms responded that the project would be unprofitable, whereas one firm answered that the CDM certification authority disapproved of the project. No firms answered that the project is in progress. Two firms chose “Others”, one of which specifically answered that the project was cancelled. Overall, these results suggest that when considering participation in a CDM project, many firms regard its profitability as an important factor.

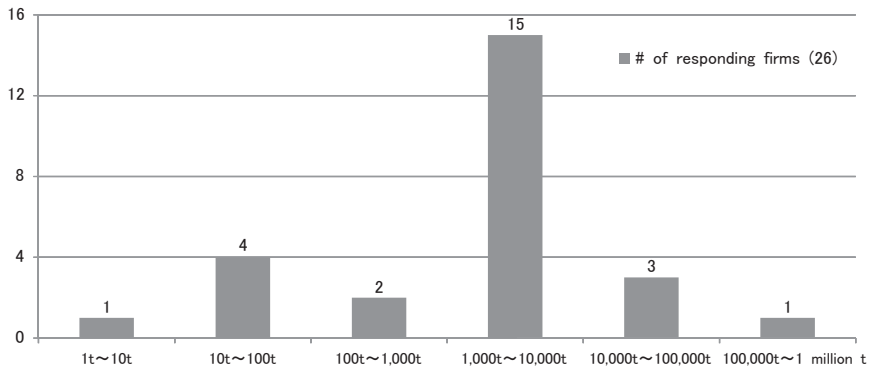
### 3.5 PURCHASING CERs IN SECONDARY MARKETS

Firms can purchase CERs in a secondary market even if they do not take part in CDM projects. It is, therefore, of interest to know whether firms have purchased CERs in a secondary market and to what extent. Table 13 shows the results for all firms, including firms that participated in CDM projects (hereafter referred to as “CDM participating firms”), firms that only considered participation in CDM projects (“CDM considering firms”), and firms that did not consider participation (“CDM not considering firms”). Two findings immediately emerge. First, only about 7% of the firms have purchased CERs, illustrating that the purchase of CERs is not a common practice among Japanese firms. Second, “CDM participating firms” are more likely to purchase CERs than both “CDM considering firms” and “CDM not considering firms.”

**TABLE 13:** EXPERIENCE IN CER PURCHASE IN A SECONDARY MARKET

	Yes	No
All responding firms	6.9% (40)	93.1% (537)
CDM participating firms	34.3% (12)	65.7% (23)
CDM considering firms	21.9% (7)	78.1% (25)
CDM not considering firms	4.2% (20)	95.8% (461)

Figure 13 shows the distribution of the amount of CERs purchased in a secondary market based on 26 valid responses. The total amount of CERs purchased is approximately 300,000 tons. One firm has purchased one ton, while another firm has purchased 200,000 tons. The range of the distribution is therefore quite large. The amount of CERs that most of the firms (15 out of 26 firms) have purchased is in the range of 1,000 to 10,000 tons.



**FIGURE 13:** DISTRIBUTION OF THE AMOUNT OF CERs PURCHASED

Table 14 presents descriptive statistics of CERs purchased by “CDM participating firms”, “CDM considering firms”, and “CDM not considering firms.” The results show that firms have purchased a significantly larger amount of CERs if they were “CDM participating firms.”

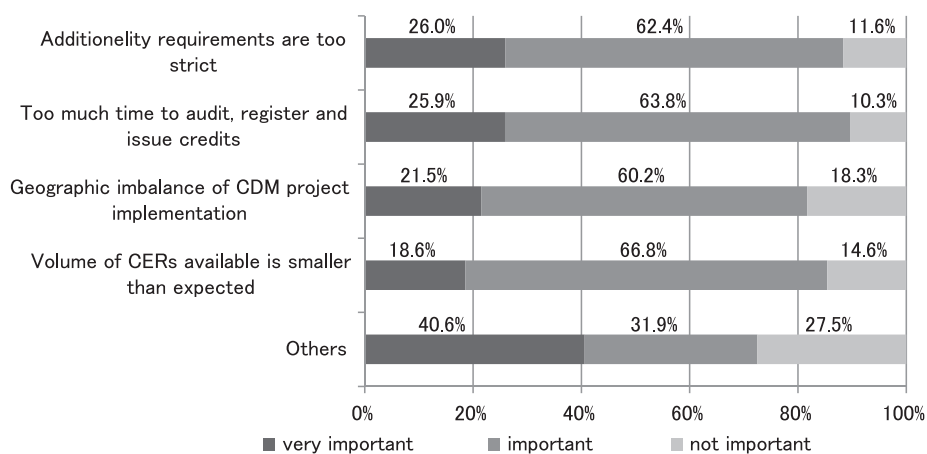
**TABLE 14:** DESCRIPTIVE STATISTICS OF CERs PURCHASED BY CDM PARTICIPATING FIRMS, CDM CONSIDERING FIRMS, AND CDM NOT CONSIDERING FIRMS

CDM participating firms (3 firms)		CDM considering firms (4 firms)		CDM not considering firms (19 firms)	
Amount of CERs purchased (t)		Amount of CERs purchased (t)		Amount of CERs purchased (t)	
Sum	206,810	Sum	33,273	Sum	56,780
Average	68,936.7	Average	8,318.3	Average	2,988.4
Max	200,000	Max	27,500	Max	20,000
Min	10	Min	1773	Min	1
S.D.	113554.94	S.D.	12788.28	S.D.	4965.40

### 3.6 FIRMS' PERCEPTIONS ABOUT THE CDM

Previous studies including Arimura et al. (2011) identified various factors that may lessen firms' incentives to participate in CDM projects. For example, as CDM projects are usually hosted and implemented in developing countries, there are country risks, including political instability. There are also problems in the CDM scheme itself. Such problems may include (1) the additionality requirements are too strict (additionality); (2) too much time to audit, register and issue credits (lengthy process); (3) geographic imbalances; (4) smaller volume of CERs than expected (CER volumes); and, (5) other problems (others). For each of the problems, we ask firms to assess its importance and choose their answers from "very important," "moderately important", and "not important." Figure 14 presents the results.

Except for "others", "additionality" ranks the highest (26.0%), in terms of the share of "very important." "Lengthy process" ranks the second (25.9%), "geographic imbalance" the third (21.5%), and "CER volumes" the lowest (18.6%). Among many of the firms which answered "others" as important, they answered so because they do not know the concept of CERs or do not have enough information.



**FIGURE 14: IMPORTANCE OF PROBLEMS IN CDM SCHEME (ALL RESPONDING FIRMS)**

Figures 15 to 18 show the results for "CDM participating firms" (36 firms), "CDM considering firms" (32 firms), "CER purchasing firms" (40 firms), and "firms not considering CDM but purchasing CER" (20 firms), respectively. These figures suggest that all groups, other than a group of "firms not considering CDM but purchasing CER," have a similar tendency. Firms that have been involved in CDM are the most likely to regard a lengthy process as "very important". Additionality is the next most likely to be regarded as "very important". "CER Volume" is the least likely. This implies that firms are likely to take opportunity cost seriously when deciding to participate in projects.

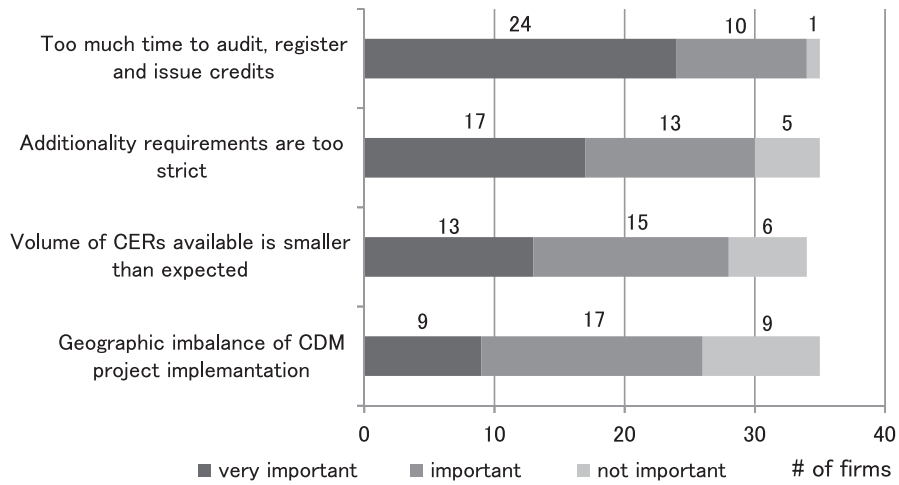


FIGURE 15: IMPORTANCE OF PROBLEMS IN CDM SCHEME (CDM PARTICIPATING FIRMS)

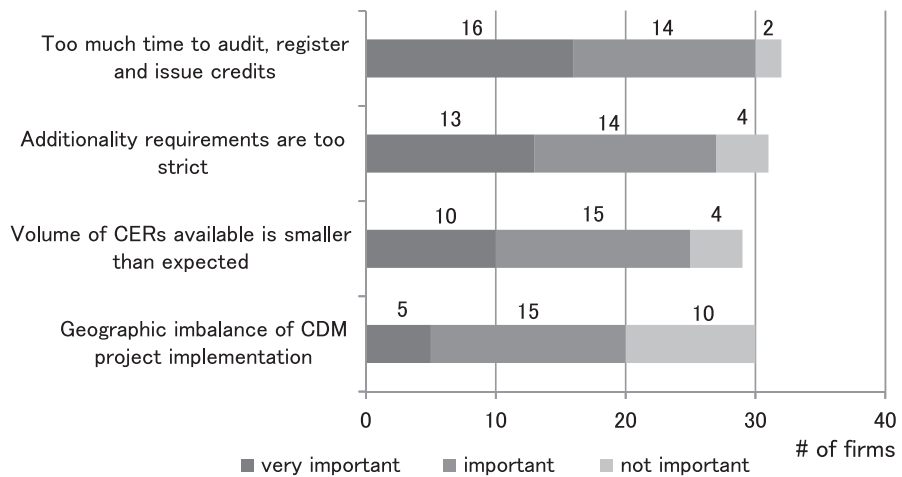


FIGURE 16: IMPORTANCE OF PROBLEMS IN CDM SCHEME (CDM CONSIDERING FIRMS)

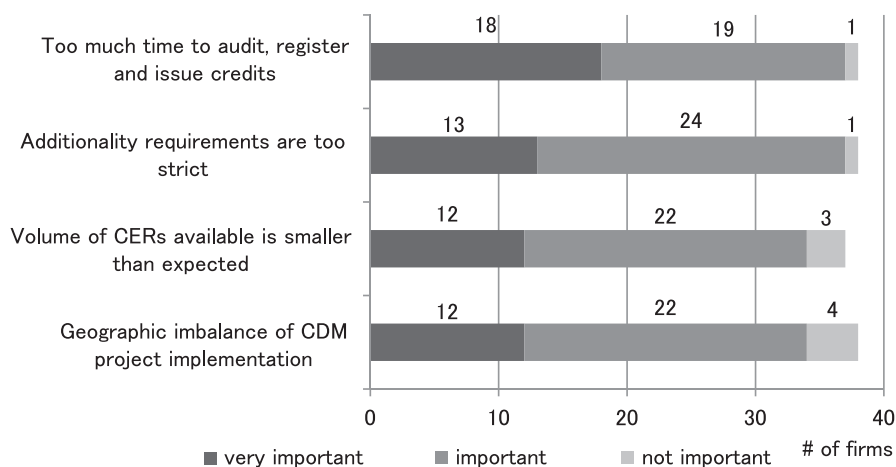


FIGURE 17: IMPORTANCE OF PROBLEMS IN CDM SCHEME (CER PURCHASING FIRMS)

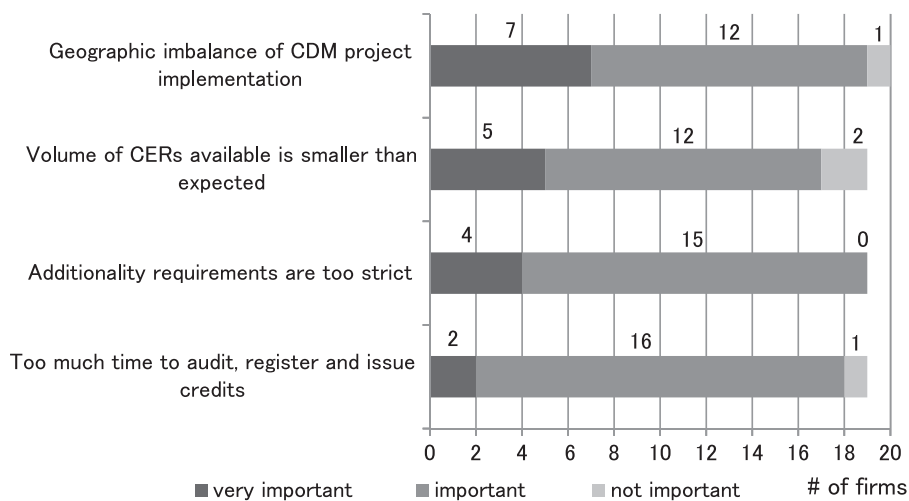


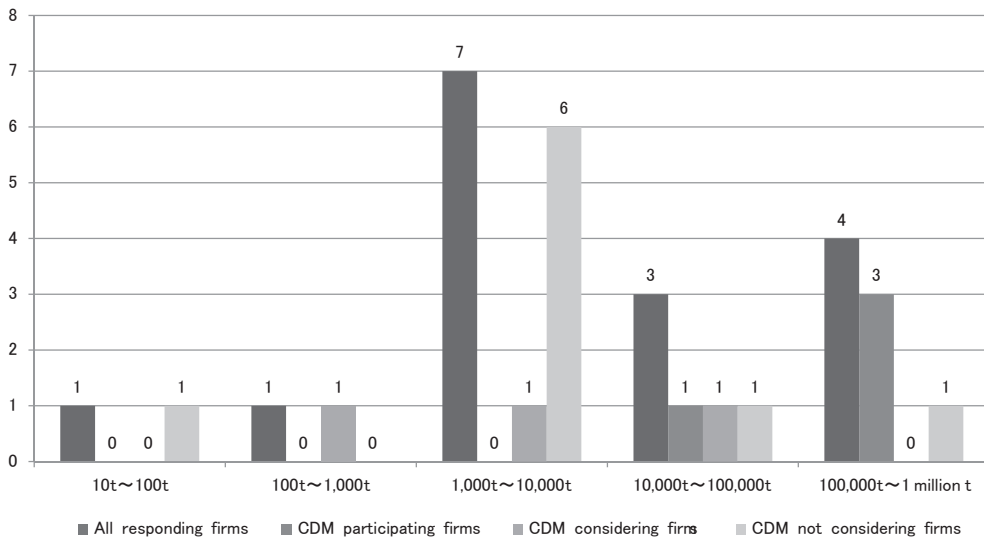
FIGURE 18: IMPORTANCE OF PROBLEMS IN CDM SCHEME (CDM "NOT CONSIDERING" BUT CER PURCHASING FIRMS)

### 3.7 FIRMS' CER PURCHASE PLAN

Under the Kyoto Protocol, Japan has committed to reducing GHG emissions by 6% from the 1990 level during 2008-2012. Therefore, firms might use international offset schemes in the near future. To examine this possibility, we asked the firms if they plan to purchase CERs by 2012 or after 2012. Table 15 summarizes the responses from all responding firms and three groups (CDM participating firms, CDM considering firms and CDM not considering firms). Most firms are not likely to use CERs. When we compare the three groups, the CDM participating firms are more likely to use CERs than the other groups.

**TABLE 15: CER PURCHASE PLAN**

	~ 2012		2012 ~	
	Yes	No	Yes	No
All responding firms	5.5%	94.5%	3.9%	96.1%
	(31)	(534)	(21)	(523)
CDM participating firms	38.7%	61.3%	22.2%	77.8%
	(12)	(19)	(6)	(21)
CDM considering firms	21.9%	78.1%	23.3%	76.7%
	(7)	(25)	(7)	(23)
Not considering firms	2.3%	97.7%	1.7%	98.3%
	(11)	(464)	(8)	(453)



**FIGURE 19: AMOUNT OF CER THAT FIRMS PLAN TO PURCHASE BY 2012**

If the firms were planning to purchase CERs, firms were asked how many CERs they were planning to purchase during each period. Figure 19 and 20 present the results of replies from all responding firms and the three groups (CDM participating firms, CDM considering firms and CDM not considering firms). The total amount of CERs that all responding firms plan to purchase by 2012 (1,171,580 tons) is approximately 5 times as large as that after 2012 (227,363 tons). This result may suggest that firms do not take a positive attitude toward purchasing CERs because the international scheme of climate policy after 2012 was not yet determined.

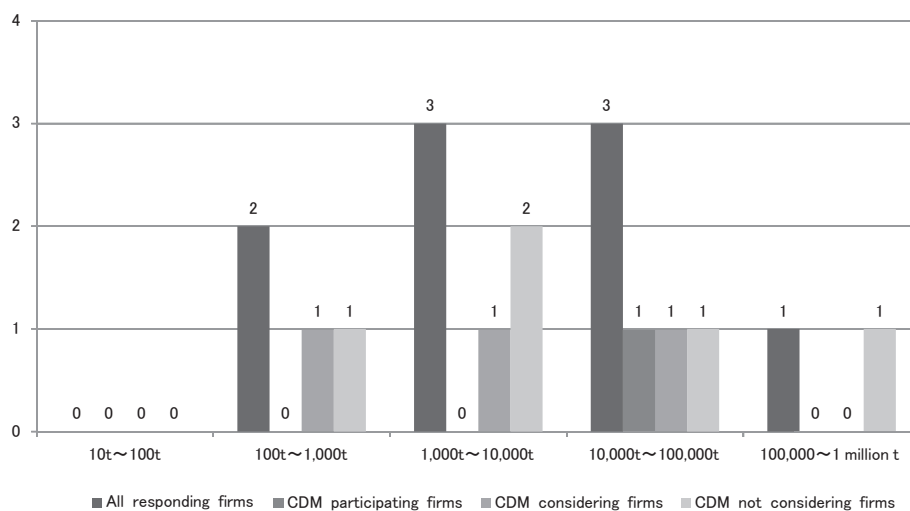


FIGURE 20: AMOUNT OF CERs THAT FIRMS PLAN TO PURCHASE AFTER 2012

#### 4. CONCLUSION

The Japanese corporate survey by CETR revealed that only a small portion of Japanese firms have participated in CDM projects or purchased CERs in a secondary market. It also revealed that domestic offset schemes, such as J-VER and Domestic CDM, have not been well recognized. Thus, to promote these schemes, dissemination and educational activities are necessary.

The results from the survey also show that the length of time needed for project approval is an important obstacle for firms that consider investment in CDM projects. Moreover, the additionality requirement of GHG emissions reduction is another obstacle. These problems, therefore, must be resolved for CDM to be used more often in the post-Kyoto period.

The results also show that numerous Japanese firms have their own GHG emission targets despite the lack of a mandatory GHG emission cap. Some of them even go through a third-party verification. Regulatory pressure seems to have played an important role in influencing these voluntary actions; In particular, mandatory policies seemed to have stimulated these activities. The relationship between regulatory pressures and voluntary corporate action merits future research.

**NOTES**

- 1) This survey was conducted as a part of the project, “The Impacts of Linking Domestic ETS on Japanese Economy: A CGE Approach.” We are grateful to the financial support from Japanese Ministry of the Environment. Toshi H. Arimura appreciates the financial support from Mitsui & Co., Ltd. Environment Fund for this version of the paper. We also appreciate comments from Nicole Darnall, Younsung Kim, and Yoshinao Kozuma.
- 2) The description of the VAP is based on Sugino and Arimura (2010).
- 3) Though this paper focuses on GHG emissions, it should be mentioned that the target on solid waste generation was announced as well.
- 4) The targets become more aggressive if the results from the previous year satisfy the prior targets. However, if the targets were not reached, those from the previous year remain the same.
- 5) Tokyo Prefecture is a member of the International Carbon Action Partnership (ICAP). Therefore, it is worth paying attention to how Tokyo’s scheme links with international markets in the future.
- 6) Before the distribution of the survey, we conducted pretests with 6 listed firms from November 2009 to October 2010. We constructed the survey questionnaire by incorporating feedback in the interviews and pretests, distributed it to firms on November 8, 2010, and set the response deadline as November 24. Reminders were sent to non-responding firms.
- 7) It should be noted that more firms might be affected by Tokyo-ETS. The figure in Table 2 shows the portion of firms that have a legal obligation to the Tokyo-ETS (i.e., the owners of office buildings). The firms that rent office spaces without owning office buildings may be affected by Tokyo-ETS but do not have legal obligations to the Tokyo-ETS.
- 8) The overall picture of CDM projects can be found in Arimura et al. (2011)

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