Management Advisory Service and Research Committee Research Report No. 33

Disclosure in Japan of Investor-Oriented Information Concerning Climate-Change Risk:Current Circumstances and Issues

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Introduction

In 2005 the Kyoto Protocol came into effect, requiring Japan, for its part, to reduce emissions of greenhouse gases[1] by 6% compared with 1990 levels during the first commitment period from 2008 to 2012. However, actual emissions in fiscal 2005 were 8.1% higher than they were in 1990[2], and it will be difficult to meet the target through reductions in domestic emissions alone. In February 2007 the Intergovernmental Panel on Climate Change (IPCC) published the Working Group I Fourth Assessment Report, which stated that warming of the climate system is unequivocal, and that the increase in anthropogenic (man-made) greenhouse gases is very likely to be the cause. In April the same year the Working Group II Fourth Assessment Report was published, which showed that global warming is having a visible effect on the natural environment and ecosystems. In addition, "The Economics of Climate Change: the Stern Review," which contains the results of research commissioned by the British government and was published in October 2006, concluded that climate change constitutes an extremely serious global risk, and is highly likely to lead to major economic losses. Under such circumstances, the role played by corporations in tackling climate change risk is becoming more and more important. Furthermore, the effect that climate change risk is having on corporate activities is growing larger. Concern among investors is therefore increasing, and they are demanding greater disclosure from the companies in which they invest.

Even until now, many Japanese companies have been proactive in tackling environmental issues such as global warming. In addition, spurred by the publication in the 1990s of guidelines from the Ministry of Environment and the Ministry of Economy, Trade and Industry, they have stepped up voluntary disclosure in the form of environmental reports and CSR reports. However, disclosures of environmental information are not really adequate for investors. In relation to this issue, in 2006 the JICPA's Management Advisory Service and Research Committee published its 27th research report, entitled "Feasibility of Disclosures of Environmental Information as Investor Information" ("Research Report No. 27"). Following on from No. 27 for this research report we have focused on climate change risk, analyzed in a more concrete manner the current situation regarding disclosures in Japanese corporations, and examined future issues.

This research report is organized as follows: Chapter I provides an outline of Research Report

[1] Greenhouse gases are gases that are believed to affect global warming. The Kyoto Protocol defines six such gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and CFC alternatives (HFCs, PFCs, and SF_6).

[2] FY 2005 Greenhouse Gas Emissions in Japan (Provisional Data). Note that in this report "fiscal (year)" or "FY" refers to the year beginning April 1. For example, "fiscal 2005" refers to the year from April 1, 2005 to March 31, 2006.

No. 27, which was published in 2006 and formed the background to this research report, and summarizes studies that we have conducted and developments that have occurred overseas since its publication. Chapter II investigates current disclosure practices by Japanese corporations relating to climate change risk by examining voluntarily produced environmental and CSR reports, as well as securities reports, which are the main financial reports in Japan. Chapter III discusses and examines the findings of the above investigations, and explores future issues concerning the disclosure to investors of information relating to climate change risk. Finally, Chapter IV discusses what role accounting and auditing professionals should play in this field in the future.

I. Background

The following facts constitute the background to this research report: First, global warming and climate change risk are becoming serious. Second, climate change risk is gradually emerging as a business risk for corporations. Third, the need that investors have for information concerning such risk is increasing. Fourth, current levels of information disclosure are insufficient to satisfy this need. As mentioned earlier, the JICPA published Research Report No. 27 in relation to these points. Because Research Report No. 27 constitutes the premise on which this report is based, we will begin by providing the following summary of its main points.

1. Summary of Research Report No. 27

Chapter I of Research Report No. 27 looked at the growing need of investors for information relating to the environment and society. It introduced important manifestations of this phenomenon, such as the publication by the United Nations of its Principles for Responsible Investment, and the Carbon Disclosure Project, which addresses climate change risk.

Chapter II focused on the EU directive for modernizing and updating accounting rules, and moves in member states to comply with the directive, to show that there is a trend towards disclosing information relating to the environment and society in annual reports.

Chapter III analyzed the background to the above international trend, and concluded that it is caused by the following factors: First, companies have begun to recognize that the way they address environmental or social issues impacts upon their performance. Second, it is difficult to identify what companies are doing in this area using traditional financial data, and therefore non-financial data is becoming more important for assessing corporate value.

Chapter IV looked at the current situation regarding the disclosure of environmental information in Japan. While Japanese companies have voluntarily stepped up disclosure in the form of environmental reports and CSR reports, as long as these disclosures remain voluntary and unstandardized, there will be limits on their usefulness for making investment decisions. In addition, while securities reports currently contain sections with themes such as “Risks in Business, Etc.,” “Issues to Be Addressed,” and “Analysis of Our Financial Condition and Financial Performance,” there are no detailed guidelines on what information each section should contain. The chapter therefore concluded that concrete disclosure standards covering important matters common to many companies should be established, as this would make it possible to provide investors with information that is much more useful.

Finally, Chapter V used the example of climate change risk, which is the issue of most concern to investors, to study how environmental information should be incorporated into the regulatory framework governing disclosures to investors. It contained a proposed disclosure format for simultaneously presenting (1) the information that must be reported to the government under the Law Concerning the Promotion of the Measures to Cope with Global Warming (Law No. 117, October 9, 1998, the “Global Warming Law”), and (2) information on overseas operations bases and information on each segment. This is because under revisions to the Global Warming Law, companies exceeding certain standards are classified as specified emitters, and since April 1, 2006 have been obliged to calculate their emissions of greenhouse gases and report the figures to the government. However, it also highlighted the fact that there are many issues that still need to be studied, such as how overseas data, which is not covered by the Global Warming Law, should be handled; how information relating to emissions trading, if adopted, should be disclosed; and how subsidiaries that are not wholly owned should be consolidated.

2. The Situation since the Publication of Research Report No. 27

Since the publication of Research Report No. 27, new research in both science and economics has been published, and efforts by national governments and international organizations have developed significantly. To begin with, as mentioned earlier, the IPCC Working Group I Fourth Assessment Report concluded that the rise in average temperatures observed since the middle of the 20th century is highly likely (probability 90% or more) to be the result of increases in anthropogenic greenhouse gases, and more or less confirmed that global warming is real. It also concluded that if greenhouse gases

continue to be emitted at the current pace, it is highly likely (probability 90% or more) that temperatures will climb faster than they did in the 20th century, and that various effects will emerge during the 21st century. In addition, the Working Group II Fourth Assessment Report states that global warming is already having an impact on the natural environment and human society, and that this impact will probably increase in the future. It also pointed out that by combining measures to adapt to climate change and mitigate its effects, it will be possible to reduce the risks accompanying climate change. The Stern Review referred to earlier predicted that if nothing is done to address climate change, the economic loss will be worth 5-20% of global GDP, while it would only cost around 1% of global GDP to take emissions-reducing measures that would limit the concentration of greenhouse gases in the atmosphere between 500-550ppm of CO_2 equivalent.

In the background to such research progress, climate change was high on the agenda at the annual meeting of the World Economic Forum in January 2007 in Davos, and a joint statement was released acknowledging that climate change represents an impending crisis, and is an issue that every country in the world should take swift action to address. The climate-change issue will also be a major item on the agenda at the June 2007 G8 summit, just as it was at the 2005 summit. Moreover, debate began at the 12th Conference of the Parties to the Climate Change Convention (COP12) and the 2nd Meeting of the Parties to the Kyoto Protocol (COP/MOP2) on an international framework for the period in and after 2013, when the first commitment period under the Kyoto Protocol ends.

Across the world, new emissions reduction targets are being established and systems are being put in place to achieve them, especially in Europe and the United States. At the European Council (a summit for the leaders of the 27 EU member states) in March 2007, it was agreed to reduce CO_2 emissions by at least 20% compared with 1990 levels by 2020, and to up this to 30% if other developed countries follow suit. And the British government, in the same month, unveiled a bill to tackle global warming by reducing greenhouse-gas emissions by 60% from 1990 levels by 2050. This bill also tentatively calls for a 26-32% reduction by 2020. In addition, emissions trading under the EU Emission Trading Scheme (EU ETS), which was launched in January 2005 with the goal of reducing emissions from the industrial sector, is expanding thanks to the participation of private-sector companies, and the National Allocation Plans for its second phase, which begins in 2008, have already been determined. Following a directive from the European Commission, studies are underway to revise the scheme in and after 2013. Among the changes being considered are a new method for allocating emissions allowances, greater transparency, and an expansion

in the facilities and gases subject to the scheme.

The U.S has been singled out in the past for being slow to act on climate change, but interest in the issue there has been growing rapidly of late. The House of Representatives has established a special commission to discuss climate change and make policy recommendations, while in August 2006 the State of California passed a bill requiring greenhouse-gas emissions in the state to be reduced to 1990 levels by 2020. In addition, New York and six other northeastern states have agreed to launch an emissions-trading scheme called the Regional Greenhouse Gas Initiative (RGGI), while bills have been presented in California and other southwestern states to set up a similar framework there.

In Japan, with the Kyoto Protocol's 2008-2012 target period beginning next fiscal year, work is underway to revise a plan based on the Global Warming Law for meeting the targets under the Kyoto Protocol. Meanwhile, Nippon Keidanren (the Japan Business Federation), in line with its Voluntary Action Plan on the Environment[3], has been monitoring progress in each industry, and in fiscal 2006 raised targets for certain industries.

As a shared understanding of the seriousness of the climate-change issue spreads across the world, and nations and regions take steps to address it, investors are demanding the disclosure of more information relating to the climate-change issue. For example, the Carbon Disclosure Project, which was discussed in Research Report No. 27, has announced the results of its fourth survey, which covers a much larger number of companies, while the United Nations Environment Programme Finance Initiative (UNEP-FI) has also released a new report[4]. Meanwhile, in October 2006 the Climate Risk Disclosure Initiative (CRDI) proposed that an international framework for the disclosure of climate change risks be established[5]. The CRDI is a network of organizations with a shared interest in the issue, such as the Carbon Disclosure Project, the Global Reporting Initiative (GRI), and the Coalition for Environmentally Responsible Economies (CERES). In March 2007 the Investor Network on Climate Risk (INCR) and CERES put forward a proposal for the enactment of tough federal laws to prevent global warming. The proposal, which was signed by 65 leading companies and institutional investors with assets worth a total of $4

[3] A voluntary plan aimed at getting industry to take action on global warming. It calls for firms in the industrial and energy sectors to try to get their CO_2 emissions below fiscal 1990 levels by fiscal 2010.
[4] UNEP-FI, 'Adaptation and Vulnerability to Climate Change: The Role of the Finance Sector'
[5] Climate Risk Disclosure Initiative, 'Global Framework for Climate Risk Disclosure'

trillion[6], also called on the Securities and Exchange Commission (SEC) to provide guidance on what kind of climate-change-related information companies should include in their financial reports.

CPAs are also getting involved. For example, the Association of Chartered Certified Accountants (ACCA), a British accountancy body, has conducted an analysis of climate-change-related disclosure. ACCA has operated an award scheme for environmental reporting since 1990, and, as part of this initiative, in 2004 it began selecting one topic each year and publishing an analysis of disclosure trends relating to it. In 2006 the topic was climate change, and in February 2007 it published a report containing the results of its analysis of climate-change-related disclosure by British companies.

The JICPA, meanwhile, has used the publication of Research Report No. 27 as an opportunity to exchange opinions with interested parties in Japan[7]. As a result of these exchanges, we have confirmed that even in Japan realization is spreading that climate change may have a serious impact on corporate operations, and that environmental and social appraisals are already influencing investment behavior. While some consider that the environmental reports produced by Japanese companies are advanced, even by world standards, and that they are important sources of information, others see problems with the comparability of data contained in different reports.

Given the international trends and progress being made domestically described above, we determined that the current situation concerning the disclosure of information relating to climate change risk needed to be studied and researched more carefully, which is why we decided to publish this report.

II. The Current Situation Concerning Disclosures Relating to Climate-Change Risk

1. Objectives and Methods of the Study

The objectives of the study were to shed light on and explore issues relating to present

[6] Signatories included the California Public Employees' Retirement System (CalPERS) and Merrill Lynch.

[7] Since the publication of Research Report No. 27, the JICPA has exchanged views with the following individuals and organizations: the Committee for the promotion of CSR management of the Japan Association of Corporate Executives; Takejiro Sueyoshi, Special Advisor to the UNEP Initiatives in the Asia Pacific region; Tsukasa Kanai, Joint General Manager, Corporate Planning Department, Corporate Social Responsibility Office, The Sumitomo Trust and Banking Co., Ltd.; Hiromitsu Soma, Director Tokyo, Innovest Strategic Value Advisors, Inc; and Masao Seki, General Manager, Corporate Social Responsibility Office, Sompo Japan Insurance Inc.

disclosure practices by Japanese companies concerning information relating to climate change risk . Therefore, as mentioned earlier, we selected companies for the study, reviewed the latest editions of their environmental reports, CSR reports[8], and securities reports, and recorded the information contained in them using standardized forms we had prepared especially for this purpose.

The study covered three industries: electric power, steel, and automobiles. A total of 26 companies were studied: 10 power companies, 4 steel companies, and 12 automobile companies. The names of these companies are shown in Table 1. We chose these industries because they all play an important economic role in Japan, and because they are closely connected with climate change risk. Large quantities of greenhouse gases are emitted when power and steel are being produced and when automobiles are being used. All the companies in the power industry except for small power retailers were included in the study. Japan has many steel companies, but there are significant differences between them in terms of their size, their influence on the industry, their progress in addressing environmental issues and so on. We therefore limited our study of steel firms to four large integrated steel manufacturers. If component makers are included, the scope of the automobile industry is extremely broad. For this study, however, we only looked at manufacturers of finished vehicles, and all such manufacturers in Japan were covered.

The information we studied in the environmental and CSR reports was divided into three categories: qualitative information, quantitative information, and assurance-related information. Qualitative information included executives' policies and commitments, recognition of risks and opportunities, and management systems and measures. We looked at whether such information was present, and if so, what was stated. Regarding quantitative information, we examined whether data on greenhouse-gas emissions was included, and if it was, we looked at the types of greenhouse gases covered, the organizations for which data was collected (boundaries), and whether segment information was provided. Also in the quantitative information category, we examined whether appropriate information was provided given the characteristics of the industry concerned, whether information relating to emissions rights (allowances or credits) was provided, and whether an analysis of the financial impact was included. As for assurances, we looked at whether assurances had been obtained, and if so, what standards had been applied. All the companies we studied had produced some kind of environmental or CSR report.

[8] We also reviewed as much information on the Web as we could. Such reviews stopped on April 1, 2007.

With the securities reports, we examined the following sections: “Risks in Business, Etc.,” “Issues to Be Addressed,” and “Analysis of Our Financial Condition and Financial Performance,” “Corporate Governance,” and “R&D Activities.” We looked at what information relating to the global warming issue was included, and what kind of quantitative information was presented. One of the automobile companies was excluded from this part of the study because it is unlisted and therefore does not produce a securities report.

Table 1: Companies Subject to the Study

Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)
Tokyo Electric Power, Chubu Electric Power, Kansai Electric Power, Chugoku Electric Power, Hokuriku Electric Power, Tohoku Electric Power, Shikoku Electric Power, Kyushu Electric Power, Hokkaido Electric Power, Okinawa Electric Power	Nippon Steel, Sumitomo Metal Industries, Kobe Steel, JFE Holdings	Nissan Motor, Isuzu Motors, Toyota Motor, Hino Motors, Mitsubishi Motors, Mazda Motor, Daihatsu Motor, Honda Motor, Suzuki Motor, Fuji Heavy Industries, Nissan Diesel Motor, Mitsubishi Fuso Truck and Bus

(Companies are listed in no particular order. Elements such as “Co., Ltd.” or “Inc.” are omitted from the names.)

2. Disclosure of Qualitative Information in Environmental and CSR Reports

(1) Executives’ Policies and Commitments

As can be seen from Table 2, 16 of the 26 companies studied referred specifically to the global warming issue in their executives’ policy and commitment statements. In addition, seven companies clearly stated their policies in pages specifically set aside for the global warming issue, though their executives did not make any mention of the issue in their messages. Only three companies did neither of the above. This tells us that in the industries subject to the study, global warming is seen as a serious issue.

Table 2: Executives’ Policies and Commitments

Policies/commitments	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Executives referred to the global warming issue in their messages	6 companies	1 company	9 companies	16 companies
Policies were clearly stated on pages relating to global warming	4 companies	3 companies	-	7 companies
Neither of the above	-	-	3 companies	3 companies

Note: The number of companies clearly stating their policies on pages relating to global warming only includes companies whose executives did not refer to the global warming issue in their introductory remarks.

(2) Recognition of Risks

Next we investigated whether the companies perceive climate change as a risk to their own companies by looking at whether they mentioned such a perception. We also looked at the kinds of risks they identified. Although we found hardly any clear statements recognizing risks, there were several descriptions of the impact of climate change on the business of the company concerned. Table 3 shows the number of references made to each type of risk. Among them, the "Other" category includes references to the Kyoto Protocol taking effect, general remarks about the need to do more to tackle global warming, and so on.

Considering that this study covered industries that are closely connected with climate change risk, not many companies stated their recognition of this risk. This is likely to be because most environmental and CSR reports are focused on reporting what the company is doing to address environmental or social issues, rather than analyzing or reporting the impact that these issues have on the company's business.

Table 3: Descriptions Concerning the Impact of Climate-Change Risk on the Company's Business

Matters mentioned	Power (10 Companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Fluctuations in energy prices	1 company	-	-	1 company
Impact of freak weather events on facilities and operations	-	2 companies	-	2 companies
Risks to suppliers	-	-	-	-
Introduction of emissions trading (emissions allowances) or environmental taxes	-	1 company	-	1 company
Differentiation risk in product markets	-	-	6 companies	6 companies
Risk of impairment of brand value	-	-	-	-
Other	4 companies	1 company	4 companies	9 companies

Note: The same company may be included in more than one category.

(3) Recognition of Opportunities

Climate change may not only present risks, but also business opportunities. We therefore examined whether the companies see climate change as offering opportunities by looking at whether they made mention of such opportunities. We also looked at the kinds of opportunities they perceived. Table 4 shows the number of references made to each type of opportunity.

To begin with, if companies provide products or services that help prevent global warming, they may be able to expand the market shares. For example, almost all the automobile companies described how they are working to enhance the fuel efficiency of their gasoline-powered vehicles, or how they are developing new products such as hybrid or hydrogen-powered vehicles. Steel companies, meanwhile, conscious that society may shift from carbon-based fuel to hydrogen in the future, described, for example, how they are studying ways of producing hydrogen from coke-oven gas. Many of the power companies, on the other hand, wrote about how they are developing ways of using natural energy such as sunlight and wind to generate electricity, or described global-warming-related businesses such as the sale of energy-saving water heaters, heat pumps, and other devices.

However, because the environmental reports did not contain sections with titles along the lines of “Recognition of Business Opportunities,” in which such opportunities could be presented, it was difficult to determine objectively the extent to which the projects described in the previous paragraph were being presented by the companies as business opportunities. In addition, there were significant differences in the nature of the information provided. While some of the companies described their global-warming-related businesses in relatively simple terms, others seemed to be thinking about how society is going to change in the future more seriously, devoting several pages to descriptions of their work in product fields. However, it was difficult to draw a line down the middle, so we decided to have just a single category for business-opportunity recognition: “Recognition of opportunities for differentiation in product markets or descriptions of global-warming-related businesses.”

Some steel companies described how they are using, or are planning to use, proprietary technology to pursue overseas projects under the Clean Development Mechanism (CDM). Such descriptions were classified as “Recognition of business opportunities relating to emissions rights.” Although descriptions of efforts by the company to offer

products and services that make less of a contribution to global warming or details of the company's performance in reducing greenhouse-gas emissions could be expected to enhance the company's reputation, none of the companies provided clear information in this regard. Overall, while there was a strong tendency for companies to describe their global-warming-related businesses in terms of their role in fighting global warming, they were far less likely to describe their benefits from a business perspective. In other words, they tended not to describe how they were positioning them as business opportunities, or how they were going to exploit them.

Table 4: Recognition of Opportunities

Category	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Recognition of opportunities for differentiation in product markets or descriptions of global-warming-related businesses	10 companies	4 companies	11 companies	25 companies
Recognition of business opportunities relating to emissions rights	-	2 companies	-	2 companies
Recognition of opportunities to enhance corporate image	-	-	-	-

Note: The same company may be included in more than one category.

(4) Information on Management Systems and Measures

Next we examined what kind of management systems have been established in relation to the global warming issue and climate change risk, and how these systems were described. If attention is focused on climate change risk, it is possible that a management system would be constructed that is designed especially to address climate change risk. This system would be based on a comprehensive understanding of business opportunities, regulatory risks, physical risks, and so on, and systematically combine measures such as product development, reductions in the company's emissions, and emissions trading. Sure enough, several companies described management systems much like this.

Many of the environmental reports, meanwhile, carried descriptions of the company's environmental management system (EMS). Because environmental management systems are based on the PDCA (plan, do, check, act) cycle, it is possible to incorporate

global-warming prevention measures into them. EMS measures to prevent global warming will likely overlap with the general management of climate change risk, so it is difficult to draw a clear borderline between them. At the very least, however, all the companies subject to the study included their measures to prevent global warming in their action plans or other plans. Table 5 shows this.

In addition, all the companies described the action they are currently taking to reduce emissions. Although the acquisition of emissions rights could be included in the action they could take in addition to their emission reduction efforts, this will be discussed in the section on quantitative information.

Table 5: Descriptions of Management Systems and Measures

Management systems/measures	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Tackling the global warming issue through the company's environmental management system	10 companies	4 companies	12 companies	26 companies
Description of the company's measures to reduce emissions	10 companies	4 companies	12 companies	26 companies

3. Disclosure of Quantitative Information in Environmental and CSR Reports

(1) Information on Greenhouse-Gas Emissions

All the companies in the study reported their total emissions of greenhouse gases. In addition to emissions per unit of production, total emissions and total energy usage are also important, not just because of their impact on global warming, but also because of the existence of regulatory risks such as the possibility of environmental taxes or emissions allowances being introduced in the future. It was therefore encouraging to see that all the companies had disclosed their total emissions.

However, this information was found in various locations and presented in various ways in the environmental reports. Regarding location, some companies reported inputs and outputs for the whole company on a mass-balance diagram, while others dedicated a page to the global warming issue and included it there. As for the method of presentation, some companies reported the figures for the fiscal year concerned on a flow diagram of their operating activities, whereas some other companies provided a graph showing changes in emissions over the years. There was also variation in the gases, operations, and business facilities/offices that the figures related to.

Table 6 shows the greenhouse gases that were included in the emissions data. Nine companies presented only CO_2 emissions, while 14 companies also reported emissions of gases such as SF_6 and N_2O. In addition, three companies did not explain whether their figures related only to CO_2 emissions. However, where companies did disclose their emissions of greenhouse gases other than CO_2, emissions of CO_2 as a proportion of all emissions was extremely high, and the impact of emissions of other greenhouse gases would be relatively small.

Table 6: Greenhouse Gases for Which Data Was Provided

Greenhouse gases	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Only CO_2	-	4 companies	5 companies	9 companies
CO_2 and other greenhouse gases	10 companies	-	4 companies	14 companies
Not stated (no explanation provided)	-	-	3 companies	3 companies

Table 7 shows operations for which emissions data was reported. Many companies presented emissions from production operations, while others also reported emissions resulting from their administrative or transport operations. Most numerous, however, were companies that did not report what activities were causing their emissions. In such cases, whether the emissions stemmed from only production operations or also arose from administrative operations was therefore not stated or not clearly stated.

In some cases, the text of the reports suggested that the emissions were related to production operations. However, where the descriptions were inadequate to confirm that this was the case, the sources of emissions were classified as “Not stated or not clearly stated.” In addition, some companies that reported emissions using mass-balance diagrams did so by including emissions figures in boxes accompanying diagrams of power-generation processes, while others included emissions figures next to illustrations of chimneys. Although this would suggest emissions from production operations, it is possible that the companies were just describing major locations for emissions, so the sources of these emissions were also classified as “Not stated or not clearly stated.”

In addition, some power companies reported the amount of CO_2 absorbed by forests, while some of the automobile companies provided estimates of the amount of CO_2 emitted by their vehicles when they are being driven, i.e. after they have been sold.

Table 7: Operations for Which Data Was Provided

Operations	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Only production operations	-	1 company	6 companies	7 companies
Production and transport operations presented separately	2 companies	1 company	3 companies	6 companies
Production, administrative, and transport operations presented separately	2 companies	-	2 companies	4 companies
Transport and other operations (whether administrative operations are included was not stated or not clearly stated)	2 companies	-	-	2 companies
Not stated or not clearly stated	4 companies	2 companies	1 company	7 companies

Table 8 shows the scope of the business facilities/offices for which emissions data was reported. Companies for which this information was not stated or not clearly stated were few in number. However, you will see that the scope of the business facilities/offices for which data was reported varied considerably from company to company. Moreover, about 30% of the companies only provided data for business facilities/offices owned by the parent company. In addition, even when emissions by consolidated subsidiaries was reported, the data often only covered some, not all, of the subsidiaries. While some companies made clear which subsidiaries were included, other companies did not, simply commenting that data was collected to the extent it was possible to do so, or making similar remarks. And with some companies, it was difficult even to determine whether all or only some of their subsidiaries were covered. Of the companies subject to the study, all except five power companies have overseas consolidated subsidiaries. Even so, many of them only included data for their domestic subsidiaries.

Some companies clearly stated that they had included all their overseas production facilities, but because sales units are unlikely to be included, such companies have been put in the “Some overseas consolidated subsidiaries” category in Table 8.

Table 8: Business Facilities/Offices for Which Data Was Provided

Business facilities/offices	Power (10 companies	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Only facilities/offices owned by the parent company	5 companies	-	4 companies	9 companies
Facilities/offices owned by the parent company and some domestic consolidated subsidiaries	3 companies	4 companies	2 companies	9 companies
Facilities/offices owned by the parent company and all domestic consolidated subsidiaries	1 company	-	1 company	2 companies
Facilities/offices owned by the parent company and some domestic and overseas consolidated subsidiaries	-	-	3 companies	3 companies
Facilities/offices owned by the parent company and all domestic and overseas consolidated subsidiaries	-	-	1 company	1 company
Not stated or not clearly stated whether the data relates to facilities/offices owned by all or some consolidated subsidiaries	1 company	-	-	1 company
Not stated or not clearly stated whether facilities/offices owned by subsidiaries are included	-	-	1 company	1 company

Note: Five of the power companies do not have any overseas subsidiaries.

We also examined whether emissions data was provided by segment. We found that three of the 26 companies provided data by operating segment, and that two did so by geographical segment. In addition, 11 of the 26 companies offered an explanation of conversion coefficients or some other kind of explanation of the methods and variables/defaults used to calculate emissions.

If a company is engaged in more than one business, carbon intensity[9] generally differs

[9] Like labor intensity, carbon intensity is a measure of the emissions required to generate one unit of a benefit such as sales or added value. Carbon intensity is the reciprocal of environmental efficiency.

for each operating segment. This means that unless emissions are reported for each operating segment, it is difficult to make proper comparisons between companies. In addition, if a company is operating overseas, emissions data for each geographical segment is essential to understand how the company is adapting to regulations and targets, since emissions regulations and voluntary targets normally differ from region to region. Financial data such as sales, operating income and assets is already disclosed for each segment, so comparing emissions with such financial data should enable more appropriate assessments to be made.

This study was not intended to compare or evaluate the companies' actual emissions per se. Furthermore, as was mentioned above, because the operations and business facilities/offices for which emissions were reported differ, it is impossible to make any meaningful comparisons at present. However, in order to determine, for the purposes of the study, how appropriate the figures reported are, we used the data that was disclosed to make estimates of eco-efficiency. Although there are a number of approaches to making such estimates, we decided to base the calculations on sales, as it is easy to get data on them. The calculation formula was as follows:

Eco-efficiency = sales (in yen) / actual CO_2 emissions (t-CO_2)

However, because the CO_2 emissions reported often do not relate to the entire company or corporate group, we were unable to use sales figures that corresponded exactly. As a result, the eco-efficiency figures we calculated are not precise, and should only be used for reference purposes. Tables 9 and 10 show the results of our calculations for each industry.

Because carbon intensity varies according to the characteristics of the industry, we cannot make simple comparisons of eco-efficiency in different industries. Furthermore, as Tables 9 and 10 show, there was considerable variation even within the same industry. However, there were no values that were so different from the others in the same industry that they struck us as abnormal.

There are several possible reasons why eco-efficiency figures varied within the same industry. First, as we mentioned earlier, in many cases the operations generating the sales we used for the calculations do not correspond exactly with the operations generating the CO_2 emissions. Second, there are likely to be differences in how much of

the supply chain is covered by the CO_2 emissions data. For example, if processes that consume a lot of energy are excluded, eco-efficiency will appear to be better than it really is. Such processes may be excluded because they are outsourced and therefore outside the scope of consolidation under current accounting rules, or because they are carried out by consolidated subsidiaries but the company has decided to exclude them anyway. In fact, if CO_2 emissions from overseas operations are excluded, this will likely affect the figures for eco-efficiency. Third, there may be differences in the nature of, say, production lines within the same industry. For example, in the power industry various forms of power generation are used (thermal, hydroelectric, nuclear, etc.), while manufacturers of finished vehicles differ in terms of the types of vehicles they produce (minivehicles, cars, trucks, etc.) Fourth, it is possible that the differences are a reflection of differences in the technological capabilities possessed by the companies or the efforts being made by them.

The first two reasons represent problems with the accuracy of the data or the method of calculation, while the third and fourth reflect conditions at companies. It therefore follows that eliminating or reducing the discrepancies caused by the first two reasons would make the information more useful.

Table 9: Estimates of Eco-Efficiency (Power and Steel)

Corresponding sales/revenues	Power (10 companies)	Steel (4 companies)
	Operating revenues from electricity business	Sales from steel business
50,000 - 59,999 yen / t-CO_2	-	1 company
40,000 - 49,999 yen / t-CO_2	4 companies	3 companies
30,000 - 39,999 yen / t-CO_2	4 companies	-
20,000 - 29,999 yen / t-CO_2	2 companies	-

Table 10: Estimates of Eco-Efficiency (Automobiles)

Corresponding sales/revenues	Automobiles (12 companies)	
	Non-consolidated	Consolidated
6,000,000 - 6,999,999 yen / t-CO_2	1 company	-
5,000,000 - 5,999,999 yen / t-CO_2	-	1 company
4,000,000 - 4,999,999 yen / t-CO_2	4 companies	1 company
3,000,000 - 3,999,999 yen / t-CO_2	3 companies	1 company
2,000,000 - 2,999,999 yen / t-CO_2	1 company	-

(2) Year-by-Year Analysis and Numerical Targets

It is important to have quantitative information not only on actual emissions for the year

to which the report relates, but also on how emissions levels have changed over the years. In addition, if numerical targets for future reductions have been set, they will play an important role in the formulation of future policies and strategies. As Table 11 shows, almost all of the companies reported such information. Such information also relates to qualitative information such as descriptions of management systems and measures to reduce emissions, and will be useful for interpreting current emissions levels and predicting future levels.

However, as we mentioned earlier, because the scope of operations for which data on actual emissions, which form the basis for these figures, differs depending on the company, the usefulness of the information is limited. There were also differences between companies in terms of how the information was presented. For example, some companies showed the changes in emissions using a graph with no numbers on it. Because targets are set voluntarily by the companies concerned, it is difficult to standardize the information presented. Even so, outside investors may wish to use the targets to assess the company's stance on global warming, future risks to the company, and so on. If this is the case, investors will find it easier to make decisions if they can determine whether the targets are conservative or ambitious. However, at the time of writing no methodology exists for achieving this, and this is something that needs to be looked at in the future.

Table 11: Year-by-Year Analysis and Numerical Targets

Information presented	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Changes in actual emissions from a base year	8 companies	4 companies	8 companies	20 companies
Changes in emissions per unit of production from a base year	10 companies	3 companies	6 companies	18 companies
Neither of the above	-	-	1 company	1 company
A total emissions target	1 company	4 companies	10 companies	15 companies
Numerical targets for emissions per unit of production	10 companies	-	6 companies	16 companies
Neither of the above targets	-	-	1 company	1 company

Note: The same company may be included in more than one category.

(3) Quantitative Information Relating to Industry Characteristics

In the steel and power sectors, actual emissions of greenhouse gases during production operations are most important. However, depending on the industry, other quantitative data may be important. In the power industry, for example, the method of power generation and the amount of electricity lost during transmission are closely related to CO_2 emissions. Although there were differences in the level of detail provided, all 10 power companies in the study provided both information on how they generate electricity and their transmission loss rates.

For automobile companies, however, information on fuel economy is important. This is because the CO_2 produced by vehicles when they are being used is higher than that produced during the manufacturing process. Moreover, if concern among consumers about climate change increases further, fuel-economy data may become an important factor in determining a company's position in the marketplace. In relation to this, Japan has, in accordance with the Act Concerning the Rational Use of Energy (Act No. 49 of June 22, 1979; hereinafter the "Energy Act"), designated as "specified devices" machinery and equipment for which enhancing energy efficiency is especially necessary, and passenger and goods vehicles are included. In addition, automobile manufacturers and importers must ensure that the average fuel economy[10] of their vehicles meets or exceeds certain benchmark values, which differ depending on the weight of the vehicle, by the target year. Therefore, all the companies have calculated average fuel economy, and all have used the same standard measurement method[11], which enhances comparability.

Of the 12 automobile companies subject to the study, seven reported the average fuel economy of vehicles sold domestically according to weight classification. In addition, seven companies disclosed information on how they are doing in meeting the benchmark fuel-economy targets for each weight classification. Some companies presented the benchmark fuel-economy target and average fuel economy for each weight classification side by side, while others reported models that meet the benchmarks for fuel economy as a percentage of all vehicles shipped. A few companies provided fuel-economy data for

[10] Average fuel economy is not a simple average, but a weighted average where the fuel economy of different models is weighted according to the number of such vehicles sold.

[11] Current standards use a measurement method called 10-15 mode, and benchmark targets are supposed to be met by 2010. However, in February 2007 new fuel-economy standards were set. These should be met by 2015, and will be applied from fiscal 2011. The method for measuring fuel economy will also be changed to a method called JC08, which better reflects actual driving conditions, but both 10-15 mode and JC08 mode differ from the methods used in Europe.

certain models such as high-fuel-efficiency vehicles, while several others gave sales figures for hybrid cars or fuel cell electric vehicles (FCEV). Such information is useful for understanding where each company is with regard to technology, and assessing the degree to which vehicles such as hybrid vehicles are contributing to corporate performance.

Overseas, however, various fuel-economy standards exist. Standards in the EU are based on the volume of CO_2 emitted while driving, and while in theory voluntary, in practice they constitute tough fuel-economy standards[12]. However, far fewer companies disclosed data on vehicles sold overseas than disclosed data on vehicles sold domestically. For example, three companies reported data on vehicles sold in Europe, while one did the same for for vehicles sold in the United States.

(4) Information Relating to Emissions Rights

Information on the acquisition of emissions rights (CERs or ERUs) through CDM or Joint Implementation (JI) projects is important as these rights can be put to various uses. They can be earmarked for meeting the company's own reduction targets, help ready the company for the establishment of a system of emissions allowances, or be sold in the future. As Table 12 shows, 11 companies provided descriptive information of some kind, while six companies gave data for the physical amount of emissions rights they have acquired or intend to acquire. In addition, seven companies provided information on monetary amounts, such as amounts invested in CDM/JI projects. Those companies that did not provide any specific information are likely either to be not involved in CDM or JI projects, or involved but just not disclosing their involvement. We suspect that not being involved in such projects is the more common reason, but we cannot know for sure.

[12] The standard for measuring fuel economy in Europe is different from that used in Japan. Japan uses the distance traveled on one liter of fuel, while the EU measures fuel economy performance using the amount of CO_2 emitted for every kilometer traveled. In addition, whereas Europe has no legislation or regulations governing fuel economy, European automakers have promised, under voluntary agreements, to reduce CO_2 emissions to 140g/km by 2008, and Japanese automakers must do the same by 2009.

Table 12: Information Relating to Emissions Rights

Type of information provided	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Descriptive information provided	10 companies	1 company	-	11 companies
Information provided on physical amounts	5 companies	1 company	-	6 companies
Information provided on monetary amounts	7 companies	-	-	7 companies
No specific information provided	-	3 companies	12 companies	15 companies

Note: The same company may be included in more than one category.

(5) Information on the Financial Impact of Climate Change

Because environmental accounting guidelines issued by the Ministry of the Environment are widely used in Japan, 25 of the 26 companies studied disclosed environmental protection costs in some form or another. Although investment in fighting global warming was often included under headings such as “global environmental protection costs,” more than half of the power companies presented their investment in tackling global warming separately.

However, none of the companies analyzed and reported the financial impact of climate change risk on their companies. Furthermore, none of the companies had conducted and reported financial assessments of the impact that business opportunities relating to climate change might have on their companies. This is likely to be because environmental or CSR reports are not really prepared with investors in mind, and methods have yet to be established for studying the financial impact of climate change.

4. Assurance of Environmental and CSR Reports

(1) Existence of Assurance

A key issue with environmental and CSR reports is how to ensure the credibility of the information on climate change risk contained in them. There are likely to be several ways of ensuring credibility, but here we studied the case of companies attempting to ensure credibility by obtaining third-party assurances. Among the companies subject to the study, none obtained assurances of the accuracy of their information on climate change risk alone[13]. However, a few of the companies obtained third-party opinions in relation to their entire environmental or CSR reports, which contain such information.

[13] Some companies in industries other than the ones covered in the study obtain assurances only in relation to their data on CO_2 emissions.

According to the Opinion Paper Concerning a Conceptual Framework for Assurance Engagements for Financial Reporting Etc., published on November 29, 2004 by the Business Accounting Council, an assurance engagement means “an engagement in which a practitioner reports as a conclusion the results of his/her decisions, in accordance with the criteria based on the evidence which the practitioner gathers concerning either (a) information expressing the outcome of an evaluation or measurement of the subject matter, which is performed from applying the criteria to the subject matter by the responsible party or (b) the subject matter itself, to enhance the degree of confidence of the intended users about (a) or (b).” At present it is often not easy for outsiders to determine whether a third-party opinion relating to an environmental or CSR report can strictly be described as being the result of an assurance engagement as defined above. We therefore divided the third-party opinions into those that at least seem to be the result of something similar to an assurance engagement as defined above, and those that are clearly “not the result of an assurance engagement.” We then totaled the number of each.

“Third-party opinions that are not the result of an assurance engagement” are comments carried in environmental or other reports from third parties such as NPOs, university faculty members, consultancies, or audit corporations. They are fundamentally different from assurance engagements because they involve the provision of third-party comments evaluations, or recommendations concerning the activities of the company concerned or the information contained in the environmental report.

Table 13 shows the results of our classification of the reports. A total of five reports carried third-party opinions by audit corporations that are the result of something similar to an assurance engagement. In addition, one report received a similar type of third-party opinion provided by an ISO 14001 certification body other than an audit corporation. On the other hand, 13 reports, the highest number of all, carried third-party opinions that were not the result of assurance engagements.

Table 13: Type of Assurances or Third-Party Opinions

Type of opinion	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Third-party opinions by audit corporations that are the result of something similar to an assurance engagement	4 companies	-	1 company	5 companies
Third-party opinions by parties other than audit corporations that are the result of something similar to an assurance engagement	-	-	1 company	1 company
Third-party opinions that were not the result of an assurance engagement	7 companies	3 companies	3 companies	13 companies

Note: "Audit corporations" include subsidiaries established by audit corporations.

The same company may be included in more than one category.

(2) Assurance Engagement Standards

Although the sample was small, we looked at whether the assurance engagement standards applied were clearly stated in the case of third-party opinions by audit corporations that are the result of something similar to an assurance engagement. A to E in Table 14 refer to the five reports that contained such opinions. Many of the companies applied ISAE3000, an international standard, along with other supplementary standards. In the case of third-party opinions provided by certification bodies other than audit corporations, the standards for the assurance engagement were not reported.

Table 14: Assurance Engagement Standards

Assurance engagement standards and guidance	Issuing body	A	B	C	D	E
ISAE3000	IFAC	R	R			R
Proposed Standards for Reviewing Environmental Reports	Ministry of the Environment	R	R	A		R
Guidance for Reviewing Environmental Information	Japan Association of Assurance Organizations for Environmental Information	R	R	A		R
Exposure Draft of Guidance Concerning Assurance Engagements Etc. Other Than the Auditing of Financial Statements	JICPA			A	A	

Note: A = A statement was included saying that the standard or guidance had been applied.

R = A statement was included saying that the standard or guidance had been used as a reference.

5. Disclosures in Securities Reports

(1) Qualitative Statements

Next, we looked at what was written in securities reports about the global warming issue and climate change risk. If concern among investors about climate change risk is rising, and companies are conscious of the important risks and opportunities it presents, securities reports, which constitute disclosures to investors, may contain information on it. We looked at the following sections in the securities reports: “Risks in Business, Etc.,” “Issues to Be Addressed,” “Analysis of Our Financial Condition and Financial Performance,” “Corporate Governance,” and “R&D Activities.” We divided the reports into two categories and then added up the number of reports in each. The first category was for reports that referred directly to the global warming issue or climate change risk, while the second was for reports containing statements indirectly or effectively connected with the global warming issue, such as descriptions of efforts being made to save energy (indirect statements). However, reports featuring only vague mentions of things such as “global environmental issues,” “environmental regulations,” or “natural disasters” were classified as “Made no mention.” Table 15 shows the results of this categorization process.

In the “Issues to Be Addressed” section, many of the power companies gave clear and bold descriptions of the efforts they are making to reduce their CO_2 emissions or prevent global warming. One company made itself worthy of special mention with the inclusion of a “20% reduction in CO_2 emissions per unit of production” in its list of corporate targets. In addition, two companies stated that they took global environmental issues into account when choosing methods of generating electricity. The content of these descriptions suggested that they had measures to tackle global warming in mind, so these companies were classified as “Made indirect mention.” In the steel industry, one company included “responding to the global warming issue” as one of its issues to be addressed Another mentioned its efforts to develop an energy-conservation business, and was therefore put into the “Made indirect mention” category. None of the automobile companies referred directly to the global warming issue, and those that mentioned initiatives such as enhancing fuel economy or developing FCEVs were classed as “Made indirect mention.” Some other companies talked of things like “environmentally-friendly products” or “enhancing environmental performance,” but because it was unclear what

kind of environmental issues they had in mind, they were put into the “Made no mention” category.

In the “Risks in Business, Etc.” section, one steel company recognized that “business activities could be constrained if quantitative restrictions or environmental taxes are imposed on CO_2 emitters or consumers of fossil fuels.” Although the other three steel firms mentioned the possibility of tougher environmental regulations concerning waste, by-products, and hazardous substances, or the possibility of higher soil remediation costs, these reports were classified as “Made no mention” because such matters do not relate to the global warming issue. Many of the power companies mentioned that changes in climate or temperatures have an effect on electricity sales volumes, but we judged that such descriptions did not have climate change risk resulting from global warming in mind. While typhoons, natural disasters, and fluctuations in fuel prices are recognized as risks, such references are not linked to the global warming issue or climate change risk. In the automobile industry, we classified the five companies that mentioned fuel-economy regulations as “Made indirect mention.” In addition to these, four companies mentioned environmental regulations in general, but because it was not clear what kind of environmental regulations they were referring to, they were put in the “Made no mention” category.

In the “Analysis of Our Financial Condition and Financial Performance” section, one of the automobile companies, in a reference to its fuel-cell technology, cited fuel-economy regulations as an example of laws and regulations that affect earnings. Two automobile companies, meanwhile, referred to exhaust-gas regulations, but because this is separate from the global warming issue, they were classified as “Made no mention.” Besides these automobile companies, one of the power companies mentioned that global environmental issues need to be tackled, but there were no other direct or indirect mentions of the global warming issue or climate change risk.

In the “Corporate Governance” section, we found no direct references to global warming or climate change risk. However, a total of seven companies mentioned that they have environmental committees or are engaging in environmental risk management. Because one of the roles of these environmental committees and risk-management programs may be to deal with the global warming issue, we determined mentions of them as indirect references to climate change risk, and presented them separately in Table 15.

In the “R&D Activities” section, it was difficult to determine whether descriptions constituted direct or indirect references to the global warming issue, so we simply divided the companies into those making some kind of mention and those making no mention at all. This resulted in all the companies except two steel firms being classified as making some kind of mention. However, there were big differences in what was written. Whereas some companies just made general mention of “R&D to tackle global warming,” others gave more specific information. For example, power and steel companies mentioned things like CO_2 fixation technology, fuel cells, or generating power from biomass, while automakers talked about enhancing fuel economy, developing FECVs, and so on.

Table 15: References to the Global Warming Issue and Climate-change Risk in Securities Reports

Section	Power (10 companies)	Steel (4 companies)	Automobiles (12 companies)	Total (26 companies)
Issues to Be Addressed:				
Direct mention of climate change risk	5 companies	1 company	-	6 companies
Indirect mention of climate change risk	2 companies	1 company	2 companies	5 companies
No mention	3 companies	2 companies	9 companies	14 companies
Risks in Business, Etc.:				
Direct mention of climate change risk	-	1 company	-	1 company
Indirect mention of climate change risk	-	-	5 companies	5 companies
No mention	10 companies	3 companies	6 companies	19 companies
Analysis of Our Financial Condition and Financial Performance:				
Direct mention of climate change risk	-	-	-	-
Indirect mention of climate change risk	-	-	1 company	1 company
No mention	10 companies	4 companies	10 companies	24 companies
Corporate Governance:				
Mention of global warming and climate change risk	-	-	-	-
Mention of an environmental committee or environmental risk management	3 companies	1 company	3 companies	7 companies
No mention	7 companies	3 companies	8 companies	18 companies
R&D Activities				

Made mention	10 companies	2 companies	11 companies	23 companies
Made no mention	-	2 companies	-	2 companies

Note: Mitsubishi Fuso Bus & Truck was excluded because it is not a listed company.

(2) Quantitative Information

None of the companies provided actual data on their greenhouse-gas emissions in their securities reports. However, as mentioned in (1), one company included a "20% reduction in CO_2 emissions per unit of production" as an environmental target in a list of its corporate goals in the "Issues to Be Addressed" section, alongside targets for metrics such as consolidated ordinary income, consolidated ROA, and interest-bearing debt.

III. Consideration of Key Findings and Future Issues

This chapter describes and considers the major findings of the above study, and then goes on to explore future issues concerning disclosure to investors of information relating to climate change risk.

1. Consideration of Key Findings

(1) Progress in Disclosures in Environmental and CSR Reports

As described in Chapter II. 2, there are differences between companies in terms of the information relating to the global warming issue and climate change risk they disclose in their environmental or CSR reports. Even so, all the companies have incorporated measures to tackle global warming in their plans, and described action they are taking to reduce greenhouse-gas emissions in their reports. Some of them were particularly enthusiastic, devoting several pages to forecasts of future societal changes and detailed descriptions of the future direction of their operations or efforts they are making in the product arena. Such information is useful for giving investors insight into how the company is dealing with climate change risk, and where it is going in the future.

As we mentioned in Chapter I, with the publication of the IPCC's Fourth Assessment Report and the start of the first commitment period for the Kyoto Protocol close at hand, it is possible that the impact of climate change risk on corporate activities will increase further in the future. And in the case of companies in industries like those included in this study, which are closely connected with climate change risk, information on what they are doing about it may prove crucial for predicting their future financial performance and condition. It is therefore significant that such information is already included in some detail in several of the environmental and CSR reports.

(2) All Companies in the Study Disclosed Actual Emissions Data

All of the companies subject to the study provided data on their actual emissions of greenhouse gases. Environmental and CSR reports in Japan are influenced by environmental reporting guidelines of the Ministry of the Environment and the GRI's Sustainability Reporting Guidelines, both of which require such disclosure. Although adherence to these guidelines is not compulsory, the fact that all the companies provided actual emissions data shows that they have accepted the need for such disclosure and are able to collect and publish the necessary data in practice.

If qualitative information on things like efforts to address climate change risk is combined with this kind of quantitative information, a more effective assessment is possible. Therefore quantitative information, along with the qualitative information described in (1), will likely be useful for investors.

(3) Disparities in the Locations and Methods for Displaying the Information

However, there are several problems with current disclosures in environmental and CSR reports. To begin with, it was difficult to find the location of the information, and the information was not presented in a uniform manner.

As an example, when we attempted to find information on how a company perceives climate change risk in terms of business opportunities and risks, we found it hard to confirm whether such information was included, and if it was, where it was located. Such information was not included in sections with titles to that effect, and its actual location varied from company to company. In addition, this information could not always be found in one place; it was offered scattered across various sections of the report. Moreover, where companies disclosed this information using both their Web sites and printed reports, the way they allocated information to each medium also differed from company to company. Furthermore, even when we were able to pinpoint the location, it was often difficult to judge if the information presented reflected the company's recognition of opportunities and risks.

There were also differences between companies in the location of quantitative information, such that in some cases this kind of information was scattered throughout the report, on pages containing mass-balance diagrams, pages related to global warming, and so on. The mode of presentation also differed. For example, some companies only

provided a mass-balance diagram showing that year's emissions, while others used graphs to show changes in emissions over the years.

There are several reasons for this variation in the locations and methods for presenting the information. First, companies produce environmental or CSR reports on a voluntary basis, and are therefore left to their own creative devices when deciding what information to include and how to present it. Second, the guidelines from the Ministry of the Environment and the GRI do not go as far as prescribing standardized formats for disclosures. Third, the reports cover a wide variety of issues, ranging from environmental problems to CSR, and climate change risk is just one of these issues, which makes it difficult to track down references to it.

All these reasons relate to the fundamental nature of environmental and CSR reports as they are at present, and it will be difficult to change things quickly. Moreover, it cannot be said that things even need to be changed. However, people wishing to compare reports from different companies for information on a specific topic, as we have done with climate change risk, will find that the information is cumbersome to use.

(4) Lack of Uniformity in Quantitative Information Boundaries

Another problem with the disclosures in environmental and CSR reports as they stand at present is that quantitative information boundaries are not uniform. Although all the companies disclosed their actual emissions, the scope of the emissions covered vary from company to company, which makes the information less useful.

For instance, whether the emissions relate to only production operations, or also encompass administrative operations depends on the company. And some of the companies did not make clear what their emissions data related to. There was also a lot of variation in the facilities/offices included in the emissions figures. Some companies only included those belonging to the parent company, while others also included those of domestic and overseas consolidated subsidiaries. And even if a company included consolidated subsidiaries, it sometimes only totted up the figures for some of them. We can appreciate that it is not easy to collect data on emissions by overseas subsidiaries, but information that includes only some subsidiaries will obviously be less useful.

As a result of the above problems, we found that it was difficult to make appropriate calculations of eco-efficiency using indicators such as sales, even though the companies

had gone to the trouble of providing data on their actual emissions. Moreover, it is impossible to make meaningful comparisons between companies in the same industry. The fundamental reason for this is that there are no uniform standards on where to draw the boundaries when collecting data on emissions. The key issue here is that this problem has not been resolved despite the existence of guidelines from the Ministry of the Environment and the GRI.

This suggests two things. First, when it comes to quantitative information, stringent, tightly-defined standards would serve better than guidelines in ensuring the usefulness of such information. Second, it will be difficult to harmonize standards as long as environmental and CSR reports continue to be based on voluntary disclosure.

(5) Insufficient Information from a Business Perspective

As we mentioned in (3), it was difficult to ascertain from environmental or CSR reports the extent to which companies recognized climate change risk in terms of business opportunities and risks. This also indicates that companies have little inclination to discuss things from a business perspective in environmental and CSR reports. As we pointed out in Chapter II. 2, this is likely to be because environmental and CSR reports are primarily intended to inform society of what the company is doing to tackle environmental issues.

(6) Possibilities for Diverse Quantitative Information

In addition to data on the company's actual emissions, some reports carried quantitative information that would be more meaningful if all companies had to disclose it. For example, information on emissions rights, which tended to be provided by power companies, is important because such rights can be used for various purposes. They can be used to achieve emissions reduction targets or sold, for example. Although a standard method of presenting information on emissions rights does not yet exist, standardization would probably be fairly easy to achieve.

In addition, seven automobile companies provided average fuel economy figures for each weight category of vehicles sold domestically. For automobile companies, fuel economy performance is no less important than actual emissions, because it affects global warming and impacts on corporate performance. Moreover, because fuel-economy standards are provided for under the Energy Conservation Law, weight classifications and methods of measuring fuel economy are unified, making it very easy

to compare data. However, the data would be even more useful if it included information such as fuel-economy data on vehicles sold overseas and the number of vehicles in each weight classification sold.

(7) Limited Disclosures in Securities Reports

There were not as many disclosures relating to the global warming issue or climate change risk in securities reports as there were in environmental or CSR reports. Although nearly all the companies included some kind of reference in the "R&D Activities" section, most of them made no mention whatsoever in any of the other sections. And even if they did, it was usually limited to just one or a few lines acknowledging global warming as one of their "Issues to Be Addressed" or "Risks in Business, Etc." In addition, aside from one company that gave targets for reducing its CO_2 emissions per unit of production, none of the companies provided any numerical data, and not one single company disclosed its actual emissions.

Of course, this lack of information is only to be expected under current disclosure rules. Because securities reports are designed to provide information, mainly of a financial nature, to investors, it is only natural that they contain less about climate change risk than environmental or CSR reports, which focus on environmental issues. The disclosures contained in securities reports are prescribed in the Cabinet Office Ordinance concerning Disclosure of Corporate Information etc. For example, "Issues to Be Addressed" should contain "concrete descriptions of operational or financial issues, and policies for tackling them, that have been recently recognized as needing to be addressed by group companies." The "Risks in Business, Etc." section, meanwhile, should "comprehensively, specifically, clearly, and concisely describe operational and accounting-related matters that may have a material influence on decisions by investors, such as unusual changes in financial condition, financial performance, and cash flow; dependence on specific customers, products, technologies, etc.; and legal restrictions, business customs, corporate policies, etc., … (partially omitted) that are unique to the company[14]." You will see that present practices concerning the presentation of climate change risk that we have described in this study is the result of the application of current disclosure rules such as these.

[14] The "Notes on Preparation" of Form 2 prescribed in the Cabinet Office Ordinance concerning Disclosure of Corporate Information Etc. Part of it is omitted to make it easier to read, though the meaninghas not been changed.

However, this suggests that under the current rules it may be impossible to respond to the new issue of climate change risk, which is expected to become increasingly important in the future, and to meet the new informational needs of investors. This is because the disclosures concerning climate change risk that are considered to be essential may not be compatible with current disclosure rules. In other words, the actual subsections and content presented in the "Issues to Be Addressed" and "Risks in Business, Etc." section differ according to the individual circumstances of each company, and each company is free to choose what to include. Climate change risk, on the other hand, affects every company, or at least every company in the industries subject to this study. It is therefore possible that the introduction of unified standards would make such disclosures more useful.

2. Issues for the Future

(1) Meeting New Investor Needs

What is most important is that investors have clearly declared that they require information on climate change risk. Moreover, with the IPCC's Fourth Assessment Report officially confirming that global warming is progressing because of human factors and that it is having an impact, information relating to climate change risk may become more and more important in the future. To meet these new investor needs, the fundamental task in the future will be to work out what kind of disclosure rules should be established, as voluntary, individual efforts by companies will not be sufficient.

International initiatives such as the Carbon Disclosure Project and the CRDI's Global Framework for Climate Risk Disclosure, both mentioned in Chapter I, represent examples of the kind of information investors typically require. Although the JICPA's stance on these initiatives is neutral, we will provide an outline of the CRDI's Global Framework to highlight the type of information for which investors have articulated a need[15].

The Framework calls for disclosures to comprise four elements: (i) data on greenhouse-gas emissions, (ii) strategic analysis of climate risk and emissions management, (iii) assessment of physical risks of climate change, and (iv) analysis of regulatory risk. Regarding (i), data on greenhouse-gas emissions, the Framework asks

[15] The CRDI, which put forward this framework, is an important initiative with a steering committee made up of representatives from powerful institutional investors, international organizations, and international projects. These include the California Public Employees' Retirement System (CalPERS), the UNEP-FI, the GRI, and the Carbon Disclosure Project.

companies to disclose data on emissions since 1990, emissions during the fiscal year to which the disclosure relates, and estimates of future emissions. The emissions should include all direct and indirect emissions of greenhouse gases resulting from the company's operations, purchased electricity, and products/services. Concerning (ii), strategic analysis of climate risk and emissions management, it urges companies to provide explanations of their current position and policies on climate change risk, actions they are taking to minimize their climate change risk and take advantage of opportunities, their corporate governance of climate change risk, and so on. The Framework does not envisage the production of new reports for disclosing this information. Rather, it assumes that the information will be included in existing reporting schemes such as financial reports or sustainability reports.

As we mentioned earlier, some of the environmental and CSR reports we looked at contain disclosures that are detailed enough to meet these needs, at least partially. However, although guidelines exist, it was clear that voluntary disclosure has its limits. On the other hand, though, current disclosure rules for securities reports are not adequate for meeting these new informational needs. It would therefore seem necessary for a debate to take place on what roles environmental and CSR reports and securities reports should each play in meeting these needs.

(2) Consideration of International Trends Concerning the Future of Annual and Business Reporting

When studying approaches to the disclosure of climate change risk, it is necessary to consider the global initiatives and trends shaping annual and business reporting. For example, as was mentioned in Chapter I, the EU directive for modernizing and updating accounting rules has triggered a debate concerning the disclosure of key performance indicators (KPIs), which include non-financial data, in annual reports. Meanwhile, in the United States, the Enhanced Business Reporting Consortium (EBR)[16] published a revised version of its EBR Framework in November 2006. This framework advocates a new business reporting model comprising four elements: (i) the business landscape, (ii) strategy, (iii) resources and processes, and (iv) performance.

There is therefore a global trend towards placing more emphasis on non-financial information in annual and business reporting, and this needs to be kept in mind when

[16] The EBR Consortium is a nonprofit network of "strategic partners" such as the American Institute of Certified Public Accountants (AICPA), NASDAQ, and the International Chamber of Commerce.

exploring future directions for disclosure.

(3) Harmonization with Existing Initiatives

Both in Japan and overseas, various initiatives are already underway to improve disclosure relating to climate change risk. Prominent among overseas initiatives are the aforementioned Carbon Disclosure Project and the CRDI's Global Framework. In addition, the World Business Council for Sustainable Development (WBCSD) has published standards for calculating and reporting emissions of greenhouse gases[17], and these standards have also been cited by the Carbon Disclosure Project and the CRDI's Global Framework. The third edition of the GRI's Sustainability Reporting Guidelines, which was released in 2006, is also influential internationally.

In addition to rules on the reporting of greenhouse-gas emissions that are based on the Global Warming Measures Law, other initiatives are also afoot in Japan. These include environmental reporting guidelines from the Ministry of the Environment and voluntary action plans to prevent global warming that are being promoted by various industry organizations. When exploring ways of improving disclosure relating to climate change risk, it will be necessary to achieve alignment and harmonization with these existing initiatives.

(4) Proper Use of Disclosure Vehicles

Another important task will be to determine the roles that environmental, CSR, and securities reports should play in meeting the needs of investors for information on climate change risk. With this task in mind, we have summarized the key findings described in Chapter III. 1 in Table 16. At present, environmental reports, which are voluntary and offer scope for companies to be creative,, offer the most detailed and in-depth disclosures. In contrast, the application of current disclosure rules means that the information contained in securities reports is limited.

However, with environmental and CSR reports, the current difficulty in harmonizing presentation methods and boundaries presents a problem. But with securities reports, while there are limits on the quantity of information that is contained in them, it may be fairly easy to standardize this information. Securities reports have been positioned as the official vehicle for disclosing information to investors, and it is possible that climate change risk will become increasingly important to them. Given all these circumstances,

[17] WBCSD, *GHG Protocol Corporate Standard*

it will be necessary to think about how disclosures should be assigned to each of the reports. In addition, because the disclosures that companies make are affected by disclosure rules, efforts by individual companies may need to be accompanied by the formulation of official policies.

Table 16: Current Disclosures Relating to Climate-Change Risk by the Companies Subject to the Study

		Environmental and CSR reports	Securities reports
Target readership		Various stakeholders	Investors
Basis for disclosure		Voluntary disclosure	Securities and Exchange Law
Qualitative information	Number of reports containing disclosures	Many	Fairly few
	Method and nature of disclosure	Disclosures are difficult to find because they are located in various places. Descriptions were sometimes detailed. It was difficult to judge whether descriptions constituted recognition of risks and opportunities.	Locations of disclosures are easy to find. General and abstract descriptions were common.
Quantitative information	Number of reports containing disclosures	Many	Only one report contained a CO_2 reduction target.
	Method and nature of disclosure	Disclosures are difficult to find because they are located in various places. Boundaries are varied or ill defined.	-

(5) Promoting the Standardization of Information

The results of our study suggest that more useful information could be provided if the methods of presentation and the content of the disclosures were standardized. However, there is no need to standardize all information. Unified standards for information that it is particularly useful for investors, and that all companies should disclose, will be enough.

However, this raises the questions of what information is particularly useful for investors and what information would be more meaningful if it were standardized. Although this kind of information may be included in qualitative information, the Carbon Disclosure

Project and the CRDI's Global Framework say that, at the very least, information on actual greenhouse-gas emissions is required, which is perhaps why all the companies in the study disclosed such information. In other words, such information constitutes information that investors have articulated a clear need for, and that companies are making an effort to provide in order to meet this need. Even so, as was mentioned in III. 1, because boundaries have yet to be harmonized, such information is not as useful as it could be. The standardization of emissions boundaries therefore represents a specific task for the future.

(6) Promoting International Harmonization

In the future, climate change risk will concern not only companies in Japan, the United States, and Europe, but also those in Asia and around the world. In addition, with financial and capital markets globalizing, investors are investing not just in their own countries, but in companies across the world. It will therefore not be enough for companies in Japan alone to enhance their disclosures relating to climate change risk. And to provide investors with useful information and enable companies from different countries to be assessed using a common information base, in the future it will be essential to formulate international standards to govern the content of disclosures. Although efforts are being made through the GRI and other initiatives to encourage the international use of voluntary guidelines, in the future it will be worth considering the adoption of tough standards for the kind of information, referred to in (5), that ought to be standardized.

IV. The Role of Accounting and Auditing Professionals

1. Contributing to the Realization of a "Low-Carbon Society" through the Promotion of Information Disclosure

With governments, corporations, and investors beginning to get serious about the global warming issue, accounting and auditing professionals will also be required to play a role.

As the existence of climate change risk becomes clear, more and more people are advocating that we should be striving to establish a "low-carbon society," a view exemplified in Britain's Stern Review. Efforts to achieve this objective are already being made. Environmental taxes and emissions-trading schemes are being introduced, especially in Europe, and many companies have started to cut their CO_2 emissions and launch global-warming-related businesses. These events provide the background to the new needs of investors for information. The promotion of proper disclosure concerning climate

change risk should, by helping investors make appropriate investment decisions, reinforce the move towards a low-carbon society as described above.

The promotion of disclosure to investors relating to climate change risk will require the agreement and cooperation of various parties such as investor groups (including institutional investors and asset-management companies), industry, and government organizations. However, accounting and auditing professionals should also be able to leverage their positions as experts to proactively express their views and help the process move forward.

2. Ensuring the Credibility of Information

If the need of investors for information on climate change risk is strong, it will be necessary to ensure that the credibility of the information is commensurately strong. In the future, if disclosure standards are harmonized and criteria concerning the scope of assurance engagements are put in place, accounting and auditing professionals may be expected to serve to ensure the credibility of the information.