Advancement of Environmental Management and Use of Environmental Information

– Building Infrastructures to Promote Green Economy –

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Ministry of the Environment

Government of Japan

List of members of the Committee to Study Promotion of Use of Environmental Information

	Hiroshi Inanaga	CEO, Deloitte Tohmatsu Evaluation and Certification Organization Co., Ltd.
	Tatsuya Ono	Senior Manager, Environment, Safety & Health Office, Teijin Limited
	Katsuya Kikuchi	Senior Fund Manager, Equity Management Dept., Daiwa Asset Management Co., Ltd.
◎	Toshihiko Goto	Chair, Environmental Auditing Research Group
	Keisuke Takegahara	General Manager, CSR Promotion Office, Business Development Dept., Development Bank of Japan Inc.
	kenji Tomari	General Manager, Corporate Citizenship Dept., AEON Co., Ltd.
	Manabu Sakaue	Professor, Faculty of Business Administration, Hosei University
	Kiyoshi Sanehira	General Manager, Corporate Environment Management Division, Toshiba Corporation
	Masanori Shoji	Manager, Climate Change Policy Headquarters, City of Yokohama
	Kyoko Tajima	Assistant Manager,Strategicy Planning Department Division, Industrial & Social Infrastructure and Industrial Systems Company, Hitachi, Ltd.
	Takeshi Mizuguchi	Professor, Department of Economics, Takasaki City University of Economics

(Titles omitted; The double circle indicates the chairman of the Committee)

[Guest members]

Hiroki Uchida	Water CSR JAPAN
Michiyo Morisawa	Director, CDP Japan
Daisuke Ikadai	Director, XBRL Japan

[Observers]

Ministry of Economy, Trade and Industry	Environmental Industries Office, Environmental Policy Division, Industrial Science and Technology Policy and Environment Bureau
Financial Services Agency	Corporate Accounting and Disclosure Division, Planning and Coordination Bureau

[Working Group]

List of members of the Working Group on Sustainable Value Chain Management (VCM)

	Hideaki Utashima	Environment Management Department, FP Corporation
	Kazuhiro Etoh	Specialist, Strategy Group, Sustainable Environment Strategy Office, Corporate Environment Division, Ricoh Company, Ltd.
◎	Toshihiko Goto	Chair, Environmental Auditing Research Group
	Naoki Hattori	Head, Global Environmental Planning Office, Corporate Planning Dept., Nissan Motor Co., Ltd.
	Yumi Fujisaki	Senior Vice President, Corporate Banking Unit &Middle Market Banking Unit, Sumitomo Mitsui Banking Corporation
	Ken Morishita	Executive Director, Institute for Promoting Sustainable Societies
	Hidekazu Yamamoto	Hidekazu Yamamoto CPA & CPTA Office
	Yoshika Yamamoto	Associate Professor, Faculty of Business Administration, Setsunan University

(Titles omitted; The double circle indicates the chairman of the Working Group)

List of members of the Working Group to Promote Use of Environmental Information through ICT

	Reina Otsuka	President, Ecotwaza Co., Ltd.
	Mao Kurahashi	SRI Analyst, The Good Bankers Co., Ltd.
◎	Manabu Sakaue	Professor, Faculty of Business Administration, Hosei University
	Yasuyuki Sugiura	Analyst, Institute of Social System Research Laboratory of CSR Research, Nikko Financial Intelligence, Inc.
	Satoshi Terase	CSR Group Director, General Affairs Dept., Corporate Planning Division, Sato Holdings Corporation
	Kana Watanabe	Section Manager, Environmental Management Promotion Section, Environment Division, IBM Japan, Ltd.
	Yoshiaki Wada	Senior Manager, China Business Development Office, Global Business Development Department, Public and Financial IT Service Company, NTT DATA Corporation

(Titles omitted; The double circle indicates the chairman of the Working Group)

[Guest members]

Miho Kurosaki	EST Analyst, Global Data Division, Bloomberg L.P.

(All affiliations and titles indicate those reported when the working groups were launched.)

[Secretariat]

Environment and Economy Division, Environmental Policy Bureau, Ministry of the Environment

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Reference Materials

1. Guidelines for Green Procurement Promotion (Provisional Edition)
2. Environmental Management Assessment Checklist

* This report examines ways of building infrastructures that contribute to promotion of environmental management and use of environmental information, but measures based on regulatory methods are excluded from the major subjects it covers.

Report of the Committee to Study Promotion of Use of Environmental Information (Summary)

(Introduction)

○ Green economic systems naturally allow market mechanisms to evaluate corporate initiatives such as taking the environment into consideration and prompt businesses to choose environmentally superior economic actions based on economically reasonable decisions they make.

○ In order to make green economy, which is indispensable to form a sustainable society, stable and permanent, it is essential to build social infrastructures to promote green economy.

Chapter 1 Green Economy and Environmental Management/Environmental Reports

1. Promotion of Green Economy and Environmental Management

(1) Trends in Policy for Green Economy in Various Countries

○ Various policies related to green economy in various countries of the world aim on a nationwide scale to incorporate environmental perspectives into economic activities, thus achieving two goals – creating added value and reducing environmental impacts – at the same time.

(2) Promotion of Green Economy and Environmental Management

○ The development and proliferation of medium- to long-term strategic environmental management methods at businesses in a country lay the foundation for enhancing the competitiveness of the country in the international market, and this leads the country to achieve two goals – maximizing the creation of added value and reducing environmental impacts drastically – at the same time.

2. Current Status of and Challenges for Environmental Management and Environmental Reports

(1) Current Status of and Challenges for Environmental Management

○ Environmental management needs to be advanced further to promote a shift to green economy.

(2) Current Status of and Challenges for Environmental Reports

○ Japan is one of the leading countries in the world in terms of the number of environmental reports published and their quality level, but environmental reports in other countries have improved rapidly in recent years. Japan is urged to spread environmental reporting further.

3. Infrastructures to Promote Green Economy

(1) Environment-related Policy and Environmental Management in Japan

○ In order to steadily achieve economic growth and create employment opportunities with the environmental industry as a pillar, it is essential to establish through public-private partnership systems that enable all businesses, including small and medium enterprises, to implement environmental management on a society-wide scale in accordance with the national government's clear vision and integrated policy aiming at green growth.

(2) Direction of Environmental Management and Environmental Reports

○ Businesses assess the amounts of resources and energy used (inputs) and those of products and emissions that affect the environment (outputs) throughout their life cycle in order to reduce environmental impacts and efficiently create added value with minimum resources.

○ In terms of environmental information disclosure, too, various countries are promoting institutionalization of and discussions about disclosure methods as related to business opportunities and risks, comparisons and analyses using information and communication technology (ICT), and the integration and association of environmental, economic, and social information at the time of disclosure.

(3) Infrastructures to Promote Green Economy and Their Necessity

○ Two infrastructures are important to promote green economy as follows:

(a) Environmental management infrastructure aiming at sustainable resource and energy use in the entire value chain

(b) Information disclosure infrastructure to incorporate environmental, economic, and social perspectives into economic activities in an integrated manner

4. Roles of Client Companies, Financial Institutions, and Administrative Agencies

(1) Roles of Client Companies

○ By encouraging initiatives for value chain management (VCM) and establishing information gathering systems, client companies are expected to effectively evaluate and indirectly support environmental management at their suppliers and give incentives for environmental management to the managers and other personnel of their partner companies.

(2) Roles of Financial Institutions

○ By evaluating corporate clients in which they invest or to which they grant loans, including the environmental and social aspects of their operations, financial institutions are expected to contribute to raising the level of environmental management and improving its sustainability at the clients and furthermore play an important role in ensuring a smooth shift to green economy.

(3) Roles of Administrative Agencies

○ Administrative agencies are expected to play a leading role in encouraging superior environmental management and shifting to green economy by giving incentives for environmental management and effectively using environmental information.

Chapter 2 Infrastructures to Promote Environemntal Management in the Value Chain

1. Significance of Promoting Environmental Management in the Value Chain

(1) Recognition of Environmental Management at Large Corporations

○ In environmental management, large corporations recognize environmental issues such as resource and energy consumption and greenhouse gas emissions as managerial opportunities and risks and take strategic approaches to such issues.

(2) Objectives of Environmental Management in the Value Chain

○ The objectives of environmental management emphasizing the value chain are to (i) reduce and control the impact of products and services on the environment throughout their life cycle and (ii) enhance communication with business partners.

(3) Benefits of Environmental Management and the Significance of Promoting It

○ Environmental management through the value chain is an effective means of increasing the sustainability of businesses, but since there are many issues to be addressed in spreading such environmental management, it is highly significant to promote environmental management in an optimal way on a nationwide scale through public-private partnership.

2. Trends in and Challenges for Evaluations of Environmental Management at Suppliers

(1) Understanding of the Present Status of Evaluations of Environmental Management at Suppliers

○ At present, evaluations of environmental management at suppliers through green procurement cover only first-tier suppliers. Many businesses plan to expand the scope of evaluations of environmental management at suppliers to include upstream companies such as second- and third-tier suppliers in the future.

(2) Examples of Evaluations of Environmental Management at Suppliers

○ There are many cases in which manufacturers of electric or transport equipment require their suppliers to acquire EMS certification and meet other requirements as an essential condition to satisfy green procurement standards.

○ There are cases in which businesses make it a policy to view suppliers as their important partners and work with them to address environmental management and provide training and educational programs independently or on an industry-wide scale.

(3) Challenges for Evaluations of Environmental Management at Suppliers

○ In general, due to problems associated with human resources, evaluation know-how, funding, and information, it is often more difficult for businesses to communicate environmental policy, environmental requests, and other requirements to suppliers (such as second- and third-tier ones) other than those which they deal directly with, nor can they collect full information from such suppliers.

3. Emphasis on the Value Chain in Financial Services

○ A wider range of financial institutions are incorporating evaluations of environmental and social aspects of business operations into those of their corporate clients though they face challenges in doing so.

4. Direction of Infrastructures to Promote Environmental Management

○ Taking into account the current status of and challenges for evaluations of environmental management, it is important to overcome in a comprehensive manner issues with which businesses are faced when evaluating environmental management in terms of human resources, know-how, funding, and information.

○ In order to advance environmental management, it is indispensable that managers are motivated to bring green innovation and promote environmental initiatives actively. To that end, it is desirable to appropriately evaluate the status of environmental management using indicators and other yardsticks and ensure that the results of environmental efforts are reflected on inter-company dealings, financial transactions, purchasing by public institutions, and other business activities.

○ The public and private sectors are expected to work together to build environmental management promotion infrastructure and inforamtion disclosure infrastructure, linking them to each other.

Chapter 3 Environmental Information Infrastructure Using Information and Communication Technology (ICT)

1. Usefulness of Environmental Information and Challenges for Its Use

(1) Usefulness of Environmental Information

○ If they disclose useful and reliable information, environmental reports display their functions well in green economy.

(2) Challenges for Use of Environmental Information

○ It cannot be said positively that information disclosed by environmental reports adequately meet qualitative requirement for being useful environmental information.

2. Necessity of Environmental Information Infrastructure Using ICT

○ In order to ensure that environmental information is highly convenient (readily available and easy to analyze) and serves as a medium for economic systems, it is necessary to expand the tangible aspects of information disclosure infrastructure using ICT.

3. Matters to Be Considered with Respect to Environmental Information Infrastructure Using ICT

○ Environmental information infrastructure using ICT requires standardized questionnaires, calculation standards, and other formats for the major categories of environmental information and shared information platforms. They also require the high convenience of environmental information (readily available and easy to analyze).

○ Furthermore, it is important that incentives for environmental management should be given to businesses that disclose environmental information and that the additional burdens on those businesses should be alleviated. It is also important that environmental information disclosed by environmental reports should be consistent with the actual condition of environmental stewardship.

4. Direction of Establishment of Environmental Information Infrastructure Using ICT

(1) Matters Expected of Environmental Information Infrastructure Using ICT

○ The important function of ICT used in inter-company transactions is to contribute to reducing risks and enhancing competitiveness in the value chain.

○ The required function of ICT used for financial transactions is to ensure consistency with financial information disclosure systems.

○ There are two ways in which administrative agencies can use environmental information: (i) effectively using information disclosed by environmental reports or similar documents and (ii) effectively using environmental information provided or submitted to administrative agencies for the interests of local communities.

(2) Operation of Environmental Information Infrastructure Using ICT

○ There are two approaches to the operation of environmental information infrastructure using ICT: (i) the integrated approach of compiling new environmental reports using common formats and (ii) the status-quo approach of utilizing existing environmental reports as they are.

Chapter 4 Specific Proposals concerning Measures for Environmental Management and Environmental Reporting

Environmental management infrastructure aiming at sustainable resource and energy use in the entire value chain

(i) Human resources for and know-how in environmental management

(ii) Incentives for reduction in environmental impacts

(iii) Green purchasing and procurement

(iv) Promotion of environmental financing, etc.

Information disclosure infrastructure to incorporate environmental, economic, and social perspectives in economic activities in a comprehensive manner

(i) Environmental information infrastructure

(ii) Promotion of evaluations of environmental management

(Conclusion)

○ In order to achieve green growth, it is necessary for many businesses from large corporations to small and medium enterprises to advance environmental management in the entire value chain and thus enhance their competitiveness in the international market.

○ Information disclosure infrastructure must serve as a global system or platform for further promoting environmental management and environmental financing.

○ The Japanese government is expected to work with diverse stakeholders to push forward with effective measures on a nationwide scale in the future, thereby contributing to realization of a global sustainable society.

(Introduction)

The protection of the global environment is indispensable to the sustainable development of society. If human takes action without taking into consideration the needs of the environment, they may have irrecoverable impacts on the global environment, including its ecosystem. In order to avoid such a calamity, each economic entity needs to obtain a clear understanding of the effects of its economic activities on the environment in advance.

It is somewhat difficult, however, for all economic entities to identify the impact of its activities on the environment accurately. The reason is that in recent years, as the scope of economic activities continued to expand, entities and events involved in one economic activity have become multiple and diverse, making the impact of economic activities on the environmental more complicated.

In addition, as environmental problems become increasingly serious, various environmental impacts such as climate change, resource and energy problems, and the loss of biodiversity are becoming interrelated and affecting each other, and they are also becoming closely related to economic and social issues such as poverty. This, too, makes it even more difficult to identify the effects of economic activities on the environment in a comprehensive way.

In order to reduce these increasingly complicated environmental impacts steadily, it is effective to shift existing economic systems to green economy. Naturally, green economic systems allow market mechanisms to evaluate corporate initiatives such as taking the needs of the environment into consideration and prompt businesses to choose environmentally superior economic actions based on economically reasonable decisions they make.

In other words, economic acts such as the practice of environmental management, evaluations of its results, and consumption and finance that takes the needs of the environment into consideration are performed as they play their part in the market, and this helps efficiently overcome the difficulty of identifying environmental impacts and other effects accurately and effectively allocate funds to environmentally superior corporate initiatives. As a result, businesses active in taking the needs of the environment into consideration can obtain economic benefits.

And if economic entities incorporate environmental, economic, and social perspectives into their decision-making standards, economic activities such as consumption, production, and finance become more sustainable. In order to make green economy, which is indispensable to the formation of a sustainable society, stable and permanent, it is essential to build social infrastructures to promote green economy.

Based on the understanding described above, this report offers opinions about specific measures to build social infrastructures to promote green economy focusing on the need to encourage businesses to advance environmental management independently and effectively use environmental information disclosed in environmental reports.

(Definitions of terms used in this report)

The definitions of terms used in this report are as follows:

Terms	Definitions
Environmental management	"Environmental management" is a general term for an initiative of strategically addressing important environmental tasks (including related economic and social ones) with the entire value chain in mind, taking into consideration the effects of environmental impacts resulting from business activities on management.
Environmental reports	"Environmental reports" refer to documents that use environmental information obtained from business activities to report to the general public on the impacts of such activities on the environment and environmental initiatives such as taking the needs of the environment into consideration.
Environmental information	"Environmental information" refers to information on a company's business activities that covers the impacts of such activities on the environment and environmental initiatives such as taking the needs of the environment into consideration. In principle, environmental information as referred to in this report is based on information included in environmental reports.
Value chain	The "value chain" refers to a set of economic entities or economic activities involved in all processes related to a company's business activities from the creation of added value to consumption. It includes all acts and entities involved in such activities, such as the extraction of raw materials, procurement, production, sales, transport, use, and disposal.
Value chain management	"Value chain management" refers to the environmental management method aimed at maximizing added value and minimizing environmental impacts taking into consideration the effects of environmental impacts on management which result from the economic activities of customers and business partners in the value chain.
Environmental finance reports	Report entitled "Towards Green Finance, the New Role of the Finance Sector in Building a Low Carbon Society" (published by the "Expert Committee on Environment and Finance" under the Central Environmental Council in June 2010)
Environmental information disclosure (interim report)	Report entitled " Environmental Information Disclosure by Businesses – Environmental Information Disclosure for a Robust, Sustainable Society" (published by the Committee to Study Ideal Ways of Environmental Information Disclosure by Businesses in June 2011)
Key performance indicators (KPI)	"Key performance indicators" refer to factors that enable companies to effectively measure the progress, performance, and current status of their environmentally conscious actions and related business activities as they address important management issues. They usually relate to quantitative indicators, which reflect the important success factors of businesses and show the degree of achievement for individual goals. In general, they are called "major performance evaluation indicators."

Chapter 1 Green Economy and Environmetnal Management/Environmetnal Reports

1. Promotion of Green Economy and Environmental Management

(1) Trends in Policy for Green Economy in Various Countries

Economic policy focusing on green economy, green innovation and other environmental and energy initiatives is becoming one of the important policies that support economic recovery on a global scale. For example, there are many policies governments adopt to achieve economic growth such as investments in renewable energy and the construction of environmental cities. One of the important themes of the United Nations Conference on Sustainable Development (Rio+20), which will take place in June of this year, is a shift to green economy.

On the other hand, tightening of environmental regulations and creation of international frameworks for environmental regulations are under way. For example, businesses are required to comply more strictly with Europe's RoHS Directive[i], and REACH rules[ii] and other regulations on chemical substances used, as well as the EU Water Framework Directive[iii] and other regulations on water quality management. The Aichi Target and the Nagoya Protocol adopted at the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP10) constitute a new international framework for ensuring biological diversity. Furthermore, COP17, which was held in November and December of last year, decided to consider bringing a new legal framework for reducing greenhouse gas emissions into effect in 2020.

These can be interpreted as various countries intending to reduce environmental impacts that entail economic growth and resource use by combining various economic and regulatory policies and methods (policy mix). In short, these countries aim to bring environmental perspectives into economic activities through subsidies, regulations, and other measures to promote green innovation and environmental initiatives on a nationwide scale, thus achieving two goals at the same time: creating added value and reducing environmental impacts. The ultimate goal of these countries is considered to form a sustainable society, the environmental, economic, and social aspects of which are improved in an integrate manner with poverty eliminated from the world.

(2) Promotion of Green Economy and Environmental Management

Trends in policy related to green economy also affect corporate management. Businesses are more likely to capture business opportunities if they use environment-related subsidies and other sorts of support wisely, and they can avoid risks easily if they establish systems to comply with environmental regulations and other controls. Since government policy is often implemented to

address social issues and other challenges, it may serve as a guide for businesses aiming at management that meets the current of such policy to respond precisely to social needs and problems.

Furthermore, the reason environmental problems have arisen in recent years is that there is a limit to environmental capacity as the world population grows and economic activities expand. Given this, it is needless to mention the current of government policy, and business are forced to face such issues as limited environmental capacity and limited natural resources – as one of the business risks. As their economic activities become global and their stakeholders[1] become diversified, businesses are expected to cope with poverty problems on an international scale and work actively to solve them, and demand for such initiatives is likely to grow in the future.

For this reason, it is becomes necessary for corporate managers to address important management issues in a systematic way particularly with environmental and social ones in mind. If environmental and social issues are expected to have major effects on corporate management, the key to success is to tackle them strategically with a hard look at what things will be like three to five years later or even further ahead. Efficient and intensive allocation of managerial resources to priority issues enables development and sales of new environment-friendly products, services, and other offerings to seize profit opportunities, thus contributing to formation of a sustainable society.

The development and spread of medium- to long-term, strategic environmental management methods among businesses in a country lay the foundation for enhancing the international competitiveness of the country, leading the businesses to achieve two goals at the same time: maximizing the creation of added value and drastically reducing environmental impacts. As described above, pushing forward with environmental management to address environmental issues and related economic and social ones is one of the important measures to realize green economy.

2. Present Status of and Challenges for Environmental Management and Environmental Reports

(1) Present Status of and Challenges for Environmental Management

The 2010 version of the Survey of Environmentally Friendly Corporate Conduct, which is carried out by the Ministry of the Environment each year, indicated that around 80% of listed

[1] A company's stakeholders refer to individuals or groups that have interests in the company. They include business partners, consumers, shareholders, investors, financial institutions, employees, administrative agencies, local communities, NPOs/NGOs, academics and other experts, and students.

large corporations and a little more than 50% of unlisted large corporations with 500 employees or more had acquired certification under ISO14001 and other environmental management systems (EMS). About 60% of them had acquired EMS certification for all or part of their business sites.

By scale of sales, however, a smaller percentage of corporations had EMS certification as they posted smaller sales, and the percentage of corporations with annual sales of ¥5-10 billion that had EMS certification was only about 30-40%.

The number of companies that acquired certification for Eco Action 21 (EA21), an EMS that is easy even for small and medium enterprises to work on, had increased steadily since the EA21 certification system was launched in 2004, and it had reached some 7,000 by the end of December 2011. Most of the EA21-certified companies have less than 100 employees, indicating that environmental management is practiced by many small proactive enterprises.

If the progress in the acquisition of EMS certification among businesses is considered one of the indicators of the spread of environmental management, the current status of EMS certification compared with the number of businesses in each scale of sales shows that the degree of spread of environmental management is lower as sales become smaller. Therefore, in order to facilitate a shift to green economy, it is essential to further promote environmental management among all businesses, especially ones with smaller sales.

(2) Current Status of and Challenges for Environmental Reports

Environmental reports issued by a company serve as a tool to brief its stakeholders on the status of environmental management at the company. In Japan, the Law Concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc, by Facilitating Access to Environmental Information, and Other Measures[iv] stipulates that large corporations shall be required to make efforts to compile and publish environmental reports.

The Survey of Environmentally Friendly Corporate Conduct shows that during the past several years, the percentage of large corporations that compiled environmental reports (including CSR and similar reports) have remained almost at the same level, at about 35%. If classified according to whether they were a public company or not, a little less than 60% of listed companies have compiled environmental reports, and about 30% of unlisted ones have done so.

By scale of sales, while 80-90% of companies with annual sales of ¥100 billion or more have compiled environmental reports, an extremely low percentage of companies with annual sales of less than ¥100 billion did so, with the percentage of companies with annual sales of ¥5-50 billion which did so remaining at only around 10-20%.

One of the requirements for acquiring EA21 certification is to compile environmental reports, and EA21-certified companies publish an environmental report each year. Therefore, there is essentially no correlation between the compilation of environmental reports and the scale of businesses that publish these reports.

It is gathered from the foregoing that it is difficult that the percentage of companies that compile environmental reports reaches a certain level or exceeds it unless top managers and other executives are highly motivated or given substantial incentives to do so because in Japan large corporations are only required to make efforts to do so and because whether other companies compile environmental reports or not is basically left to their own discretion. Japan ranks among the most advanced countries in terms of the number of environmental reports published and the level of environmental information disclosure, but it is required that even more Japanese companies should publish environmental reports because businesses in other countries have rapidly improved their environmental reports both in quality and in quantity in recent years.

3. Inftrastructures to Promote Green Economy

(1) Environment-related Policy and Environmental Management in Japan

The New Growth Strategy, adopted by a Cabinet meeting on June 18, 2010, announced that Japan aimed at making itself the world's No. 1 "country built on environmental and energy technology" by spreading and promoting the world's highest-level environmental technology through promotion of green innovations and comprehensive policy package in order to make the most use of essential strengths it has in the environmental field. The Basic Strategies to Revitalize Japan, adopted by a Cabinet meeting on December 24, 2011, cites development of Green Growth Strategy (tentative name) as one of the government's priority policies to encourage entrepreneurship along with actively promoting creation of new growth industries through green innovations and other initiatives, enhancement of small and medium enterprises' potential and management capabilities, and utilization of information and communication technology.

As described above, promoting environmental industries is one of Japan's important policies, but in order to implement this policy, it is also important to take into consideration the current status of and challenges for environmental management in the country. The reason is that in order to facilitate development of innovative environmental technology, it is essential to have the perspective of encouraging businesses to contribute to reducing environmental impacts in the entire life cycle of their products and services by identifying the needs and expectations of their stakeholders as they implement environmental management on their own initiative.

In order to ensure that businesses implement environmental management on their own initiative, it is necessary that amidst the growing environmental awareness, each economic entity should prefer to consume or use environmentally friendly products and services (including financial transactions) and that as a result the businesses should make more money than they spend on green innovations, environmental management, and other efforts. To that end, environmental information must be useful enough to affect decisions made by economic entities and serve as an important medium for economic activities.

Furthermore, in order to ensure stable green growth, it is extremely important to establish in the value chain stable supply systems that withstand natural disasters, accidents, and other irregularities and information network systems that ensure close communication with business partners. In these systems, small and medium enterprises make a large contribution and also have the great potential to contribute to reducing environmental impacts.

For this reason, in order to achieve economic growth and creation of employment opportunities[2] steadily with the environmental industry as a pillar, it is essential for the government to establish – through public-private partnership – systems that enable the entire society, including small and medium enterprises, to implement environmental management as mentioned above in accordance with its clear vision and integrated policy for green growth.

[2] The Ministry of the Environment's report "Changes in Market Size of Environmental Industries" estimates that in 2009, the environmental industry was worth about ¥72 trillion and employed some 1.85 million people. The New Growth Strategy, meanwhile, aims to create new markets worth over ¥50 trillion and create 1.4 million new jobs in the environmental sector by 2020.

(2) Direction of Environmental Management and Environmental Reports

Spreading and expanding environmental management and providing more useful environmental information are important issues to be addressed in pushing forward with green economy policy, but in order to ensure these efforts, the direction of environmental management at advanced businesses and trends in the disclosure of environmental information in various counties are instructive.

Environmental management at advanced businesses aims to use resources and energy in a sustainable way in the entire value chain from the procurement of raw materials to product use and disposal. This initiative involves reducing environmental impacts and efficiently creating added value with less resources by identifying the amounts of resource and energy used (inputs) and those of products and emissions that have environmental impacts (outputs) throughout the life cycle of products and services. In this initiative, some large corporations request businesses in upstream processes to provide environmental information on such matters as greenhouse gas (GHG) emissions and appropriate waste disposal and require them to acquire EMS certification as a condition for starting business relationships, thus reducing and controlling environmental impacts not only inside their business area but also outside it.

In terms of environmental information disclosure, the Carbon Disclosure Project (CDP) is trying new methods of disclosing GHG information as related to business opportunities and risks and comparing and analyzing disclosure levels using information and communication technology (ICT). Meanwhile, discussions[v] are under way about how to establish systems to integrate financial information and non-financial information, including environmental and social one, or link the two types of information when disclosing them, and how to disclose such information, in order to meet the informational needs of investors in particular. For example, moves to disclose environmental and social information in financial reports are found in stock exchanges' disclosure regulations[vi] and the voluntary disclosure practices of some advanced businesses.

In terms of social aspects, in the United States, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010[vii] was enacted to require listed companies to investigate and analyze disputes involved in minerals that are contained in materials they use and products they manufacture and disclose information on such materials. In addition, ISO26000, a set of international standards for social responsibility, was issued in 2010, and it is noticeable that it is coming into wide use.

These represent governments' and businesses' initiatives to overcome issues that society as a whole faces as it strives to form a sustainable society. All of them are expected to contribute to a shift to green economy.

(3) Infrastructures to Promote Green Economy and Their Necessity

Possible measures for facilitating a shift to green economy include subsidy systems for development of environment-related technology, systems to purchase electricity generated using renewable energy at fixed prices, and promotion of environmental education, but the two types of infrastructures described below are needed to promote environmental management at businesses.

(a) Environmental management infrastructure aiming at sustainable resource and energy use in the entire value chain

Promotion of environmental management with the entire value chain in mind enables businesses to identify business activities in the value chain that have environmental impacts, reduce such impacts efficiently and effectively on a society-wide scale, and ensure sustainable use of resources and energy. This also enables advanced environmental management concepts and environmental initiatives to spread among a wider range of businesses. Furthermore, establishment of closer relationships among businesses in the value chain lays the foundation for green innovations on a nationwide scale, and this is expected to be effective in enhancing the abilities of businesses to capture growth opportunities and respond to risks properly.

(b) Information disclosure infrastructure to incorporate environmental, social, and economic perspectives into economic activities in an integrated manner

In order to form a sustainable society, it is indispensable to build economic and social systems that make it possible to incorporate environmental, economic, and social perspectives into economic activities in an integrated manner. To that end, it is essential that three kinds of information – environmental, economic, and social – should be interrelated when they are used in these systems rather than separated and independent from one another. This enables businesses to enhance the added value of information as an important medium for economic activities and many stakeholders to evaluate the overall growth potential of the businesses, their ability to respond properly to risks, and the performance of their environmental and social responsibilities through market mechanisms.

Japan has experience in solving environmental pollution problems through public-private partnership. The public and private sectors also have a shared understanding that advance measures are important to prevent the occurrence of new environmental pollution. Know-how in environmental management, environmental reporting, and environmental policy-making has

been accumulated mainly in business firms and administrative agencies that have taken environmental measures. By building the above-mentioned infrastructures on a global perspective based on this experience and know-how, Japan can not only grow but also contribute greatly to realization of green world economy and for a sustainable society.

4. Roles of Client Companies, Financial Institutions, and Administrative Agencies

It is necessary that many stakeholders surrounding businesses should participate in the establishment of the two types of infrastructures described in the preceding section. The feasibility of green economy is enhanced by enabling many economic entities to evaluate environmental management at businesses in each of the infrastructures.

This report examines the direction of infrastructure development and other subjects focusing on three entities that can evaluate corporate environmental management on their own: client companies, financial institutions, and administrative agencies. The perspectives of these entities for environmental management evaluations and challenges they face in such evaluations are, however, considered to be shared by consumers, NPOs and NGOs, and other stakeholders as well.

In the shift to green economy, these three entities are expected to play the following roles:

(1) Roles of Client Companies

In particular, large corporations developing business on a global scale are likely to have greater environmental impact as the scope of their business activities expands. Since they are sometimes directly affected by the tightening of international regulations and other controls and the creation of international regulatory frameworks, they constantly pay attention to such regulations, stakeholder trends, and other factors when developing business. For this reason, they naturally accumulate within their organization the latest environmental knowledge and know-how in how to respond to important environmental issues.

In general, as part of their value chain management (VCM), through inter-company transactions, large corporations request upstream businesses to implement environmental initiatives such as taking the needs of the environment into account. There are cases in which large corporations engaged in advanced environmental initiatives send their personnel to their suppliers' business sites to consider collaborative activities and designs aimed at reducing environmental impacts. It is hoped that through these environmental initiatives in the value chain, client companies will establish relationships of guidance and cooperation in environmental management with their suppliers – a win-win relationship between the two.

In recent years, there has been growing interest in corporate initiatives in the value chain as exemplified by the participation by NGOs and other organizations in the development of ISO26000 standards, and it is becoming increasingly necessary for client companies to build systems to collect environmental information in value chain management according to the requests of various stakeholders and other demands.

Based on the foregoing, by promoting VCM initiatives and building environmental information gathering systems, client companies in particular are expected to evaluate environmental management at their suppliers and provide indirect support and at the same time effectively motivate the top managers and other personnel of their suppliers to implement environmental management mainly by giving priority to dealing with environmentally superior suppliers.

(2) Roles of Financial Institutions, Etc.

Responsible investments and financing based on environmental ratings, which have recently attracted public attention amidst the growing expectations for sounder financial transactions, involve using environmental, economic, social, and other sorts of information for analysis of investment and financing projects in a multifaceted way to determine corporate value, including social responsibility. As businesses are increasingly inclined to sustainable financial transactions, meanwhile, a growing number of businesses sign the United Nations Principles for Responsible Investment (PRI), the Principles for Financial Action towards a Sustainable Society (Principles for Financial Action for the 21st Century)[3] laid down by the Ministry of the Environment, and other guidelines.

One of financial institutions' roles is to efficiently allot funds to meet social needs through market mechanisms, and in order to fill the role appropriately, financial institutions need to be able to predict future cash flows and reliable returns by obtaining useful information and establishing proper analytical methods. Therefore, together with the spread of financial transactions that incorporate the environmental and social aspects of business activities into evaluations of business performance, non-financial information is gaining importance in relative terms.

As management issues with which businesses are faced become complicated and risk factors increase mainly due to the globalization of economic activities and the growth in environmental impacts caused by climate change and other factors, evaluations of businesses are expected to demonstrate their effectiveness by supplementing financial information with non-financial one. If financial and similar institutions try to maintain more appropriate profit opportunities and avoid risks by adding non-financial information, they will consequently contribute to increasing the sustainability of society as a whole.

Furthermore, as these financial transactions enhance their presence in the financial market, non-financial information is even more required than before to be of such a high quality that its

[3] In October 2011, the Principles for Financial Action Towards a Sustainable Society (Principles for Financial Action for the 21st Century) were formulated with voluntary participation of financial institutions.

comparability and reliability is guaranteed and so convenient that it can easily be obtained and analyzed.

As described above, through evaluations of businesses in which they invest or to which they grant loans, including the environmental and social aspects of their operations, financial and similar institutions are expected to help those businesses to raise the level of environmental management and increase its sustainability and furthermore play an important part in ensuring a smooth shift to green economy through the greening of the financial market.

(3) Roles of Administrative Agencies

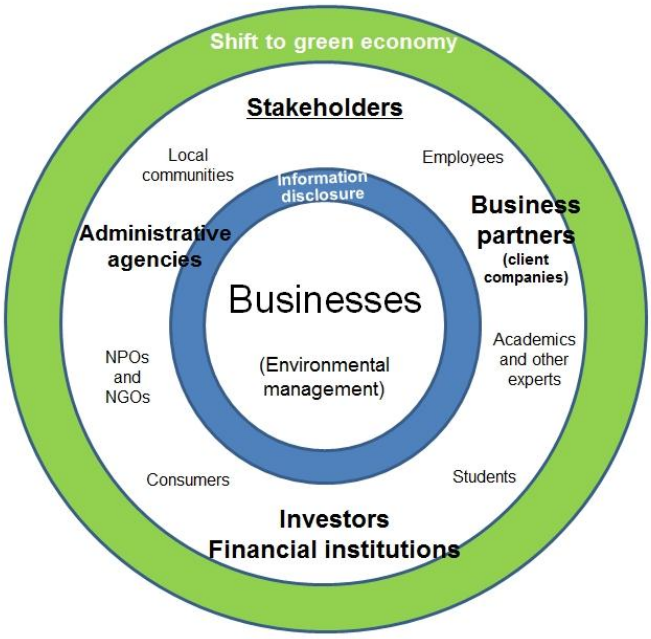
The administrative agencies of the state and local public entities establish environmental regulations and other guidelines and powerfully support advanced environmental initiatives such as taking the needs of the environment into consideration. They gather information on international discussions about green economy and trends in policy-making in various countries and play such roles as implementing environmental policy in the optimal way in the shift to green economy.

In particular, local public entities can be a driver of green economy in local communities that implements measures to promote environmental management in a way that keeps close ties with local communities. In fact, there are examples in which they subsidize costs for acquiring ISO14001, EA21, and other types of EMS certification or include EMS certification in the requirements for public procurement. There are also examples in which they announce the acquisition by small and medium enterprises and other businesses of EMS certification as one of the goals for their basic environmental plans, contributing actively to establishment of environmental management systems among businesses.

For their respective policy-making purposes, administrative agencies also collect corporate environmental information in various ways and use it mainly to grasp the current status of environmental management and develop environmental policy. By providing such information for citizens and encouraging them to participate in environmental policy-making, they may serve as an intermediary for establishing partnerships between businesses and local communities and other stakeholders. Moreover, one important role of administrative agencies collecting corporate environmental information is to give appropriate feedback to businesses that provide environmental information.

Based on the foregoing, administrative agencies are expected to play a leading role in promoting superior environmental management and facilitating a shift to green economy by giving incentives for environmental management and using environmental information effectively.

[Figure: Conceptual Diagram of Relationships between Green Economy and Evaluations of Environmental Management]



Chapter 2 Infrasturctures to Promote Environmental Management in the Value Chain

This chapter examines the current status of and challenges for evaluations of environmental management in the value chain, the direction which the government should take when it promotes environmental management, and other subjects with establishment of "Environmental management infrastructure aiming at sustainable resource and energy use in the entire value chain" as described in Chapter 1 in mind.

In order to examine these subjects, corporate managers from some 20 companies were interviewed about environmental management and a survey of environmental awareness was carried out. The environmental awareness survey covered large Nikkei 500 corporations mainly from the manufacturing industry, and replies were received from about 220 corporations (valid response rate: 49%).

1. Significance of Promoting Environmental Management in the Value Chain

(1) Recognition of Environmental Management at Large Corporations

In examining the significance of promoting environmental management in the value chain, it is necessary to first understand how large corporations, chosen as client companies in this report, view their own environmental management and what they consider important when practicing environmental management.

The results of the awareness survey indicated that about 90% of large corporations positioned response to environmental issues as their "social responsibility" and that about 70% also viewed it as a means of "reducing environmental risks" and a "growth factor for business."

Most of the corporations considered the "top managers' leadership" important, followed by "strategic response to important tasks," "establishment of systems to comply with relevant regulations," and "response to stakeholders" in the stated order. However, only a little over 60% regarded VCM as important, suggesting that replies were affected by differences in industry types, business scales, and other factors.

As important environmental issues, respondents cited "resources and energy," "greenhouse gases," "waste," and "chemical substances" in the stated order.

The foregoing indicates not only that large corporations unmistakably promote environmental management to fulfill their social responsibilities but also that they recognize environmental issues such as resources and energy and greenhouse gases as management opportunities or risks and are responding strategically to such issues under their managers' leadership.

(2) Objectives of Environmental Management in the Value Chain

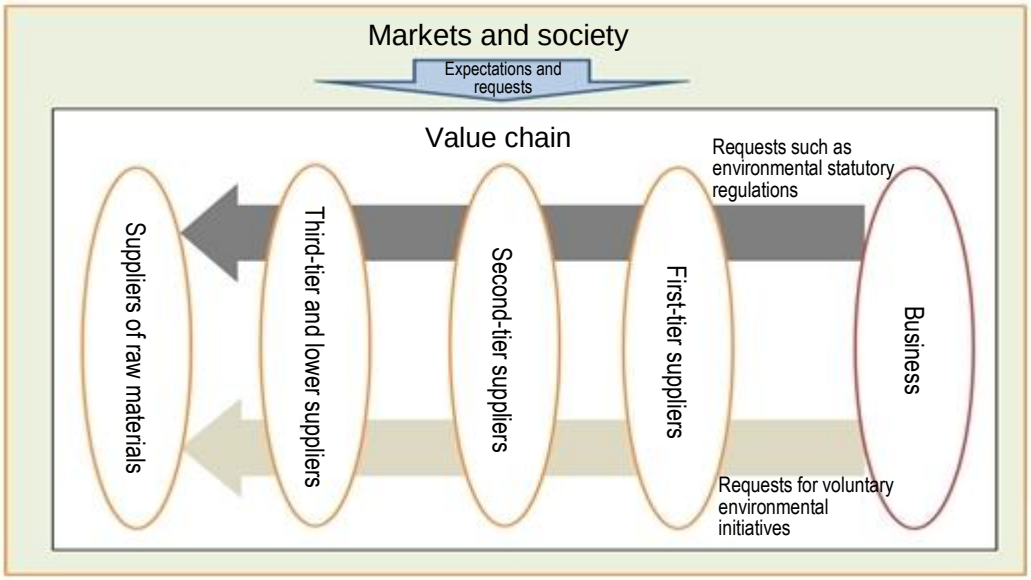
The objectives of implementing environmental management emphasizing the value chain are to (i) reduce and control the impacts of products and services on the environment throughout their life cycle and (ii) establish closer communication with business partners. This enables businesses to identify risks and opportunities appropriately, respond strategically to important issues, and build relationships of trust with business partners with the entire value chain in mind.

If environmental problems become even more serious in the future, markets and society are likely to place their greater expectations on and make stronger demands to businesses so that they take the needs of the environment into consideration, prompting governments to tighten environment-related statutory regulations and monitor corporate environmental management more closely. This will make the position of environmental issues even more important in corporate management and as a result urge suppliers in the value chain even more than before to take the needs of the environment into consideration.

For example, as large corporations manufacturing and selling finished products are urged to use chemical substances safely in the manufacturing and other processes, their suppliers are also required to establish systems to control chemical substances they use and collect accurate information on them. In addition, in order to avoid risks involved in environmental and resource restrictions, there are cases in which it is indispensable to take action in upstream processes such as environmentally friendly design by suppliers, and this is sometimes set as a condition of business transactions.

These initiatives, if strongly needed, will spread throughout the value chain in the end as suppliers make environmental requests and demands to their suppliers. Thus, it will become increasingly necessary to expand a chain of green procurement done as part of the VCM to cover upstream companies, so that many suppliers will take the needs of the environment into consideration in their business activities.

[Figure: Conceptual Diagram of Relationships between Demands to Businesses and Environmental Consideration]



(3) Benefits of Environmental Management and the Significance of Promoting It

As discussed above, working with business partners for environmental management in the entire value chain enables businesses to increase added value and reduce environmental impacts at the same time more efficiently and effectively than through their own initiatives alone. This is also beneficial to partners that work with the businesses, allowing these partners to, by responding to the environmental policy and strategy their client companies hold up, identify business opportunities and risks that would not been recognized as such if they worked by themselves and expand their business and avoid risks as a result.

In order to create new environmental industries and ensure efficient use of natural resources and drastic reduction in environmental impacts, it is important to establish appropriate indicators of green economy such as green innovations and sustainable resource and energy use for goal management. Key performance indicators (KPIs) for corporate environmental management should be established based on the policy of top managers in principle, but it is desirable that they should be consistent with indicators set by the national government, industry organizations, and similar entities as their goals for environmental management.

In order to achieve these goals without fail, it is also important to put in place organizational structures, including EMSs. Fragile organizational structures make continuous goal management using the PDCA cycle impossible and hinder full communication at all levels from top managers to field managers, preventing environmental awareness from spreading among rank-and-file employees.

Furthermore, the process of repeating trials and errors within one's own organization or with business partners is indispensable to develop innovative environmental technology and promote effective environmental initiatives. To that end, it is also effective to incorporate environmentally friendly designs and other initiatives using life cycle assessment (LCA) into ordinary development and management activities and make such designs and other initiatives as part of organizational management such as performance and personnel evaluations.

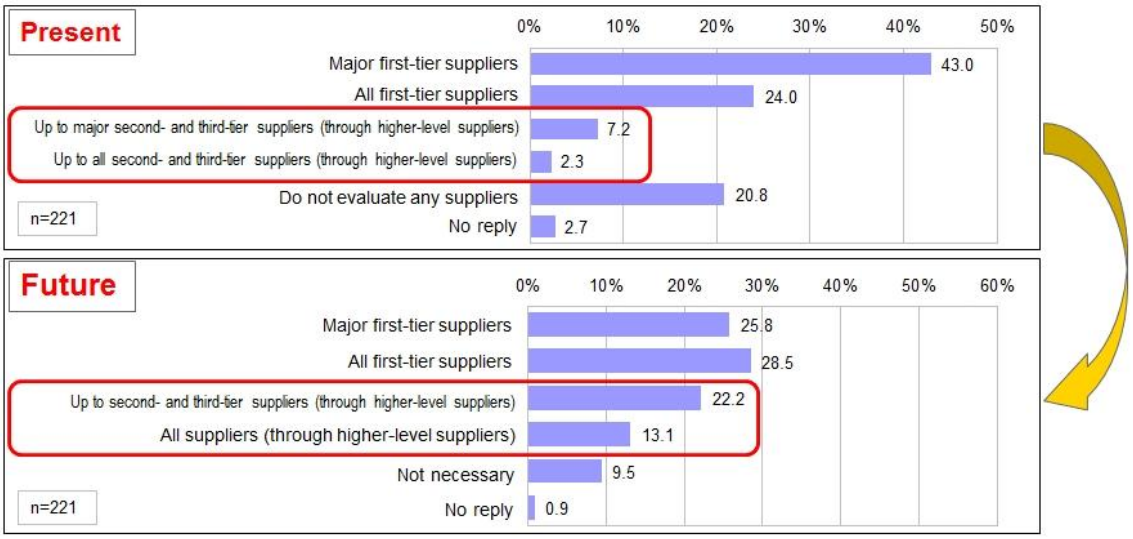
As described above, environmental management through the value chain provides an effective means of increasing the sustainability of businesses, but it is no easy matter to put into practice the most suitable method to attain the objective. Demand for environmental information and initiatives, which vary from one company to another, may place heavy burdens on businesses. Therefore, it is highly significant for the national government to promote environmental management in an optimal way in partnership with the private sector.

2. Trends in and Challenges for Evaluations of Environmental Management at Suppliers

(1) Understanding of the Present Status of Evaluations of Environmental Management at Suppliers

In addition to making environmental requests to suppliers for each product delivered through trade agreements, purchase order specifications, and other documents, an initiative of evaluating the overall environmental management of suppliers, including their organizational structures, by establishing green procurement standards, CSR procurement standards, and other guidelines is spreading in various industries.

According to the environmental awareness survey, asked how far evaluations of environmental management based on green procurement (including CSR procurement; this applies to the following paragraphs) covered the value chain, about 80% of large corporations replied that they covered "all first-tier suppliers" or "major first-tier supplier," and currently, they do not cover upstream companies beyond the first-tier suppliers. Many of them, however, plan to expand the scope of evaluations to include upstream companies such as second- and third-tier suppliers.



The results of the awareness survey indicate, meanwhile, that a majority of large corporations (over 70%) considered it necessary to evaluate environmental management at their suppliers from such viewpoints as "responding to statutory regulations" and "ensuring business continuity," but the percentage of those which considered it necessary to do so from the viewpoint of "management strategy" or "medium- to long-term financial impacts" was relatively small for the moment.

While the percentage of respondents which recognized “biodiversity” and “sustainable land use” as important environmental issues at suppliers was low, that of those which cited “chemical substances” and “waste,” which generally rank high in the manufacturing industry, as important environmental issues was high, at more than 80%.

These results indicate that the large corporations surveyed recognized important environmental issues at their suppliers, but that only a small number of them strategically conducted evaluations of environmental management at their suppliers in the value chain.

(2) Examples of Evaluations of Environmental Management at Suppliers

When evaluating environmental management at suppliers, large corporations usually applied green procurement standards to all suppliers, including existing ones, but there were cases in which they treated existing and new suppliers differently, expanding the scope of application gradually. In particular, the large corporations used such plans as obtaining consent to environmental initiatives when they started dealings with new suppliers.

In terms of evaluation items, many of the large corporations used the acquisition of EMS certification or the establishment of similar systems as essential requirements (including systems to comply with laws and ordinances, educational and training programs, environmental information disclosure, and so forth) for industries (such as manufacturers of electric equipment or transport equipment) covered by European chemical regulations. Irrespective of industry types, they also used environmentally conscious policy, planning, and other initiatives as optional evaluation items that could be added to basic procurement standards (such as quality, cost, and delivery deadlines). They sometimes sought quantitative information with respect to important environmental issues.

Noteworthy is the fact that as their business activities became increasingly globalized, many of the large corporations had a keener awareness of the need to evaluate environmental management at overseas suppliers as well. Due in part to the publication of ISO26000, there was growing need for CSR procurement, which includes the social aspects of business operations such as labor practices and human rights in addition to environmental issues, and in some cases, basic CSR policy was globally uniformed and applied to all business partners.

Some of the corporations conducted environmental audits and due diligence for the high-risk portion of operations at their suppliers in order to verify the reliability of information and the appropriateness of evaluations. There were many cases in which environmental points were added as part of the product quality audits or supplier accreditation reviews. In their environmental audits, overseas companies often point out problems with the protection of ecosystems and water resources, the social aspects of operations (labor practices and human

rights), and supply systems in the value chain, and Japanese companies are required to respond to these demands.

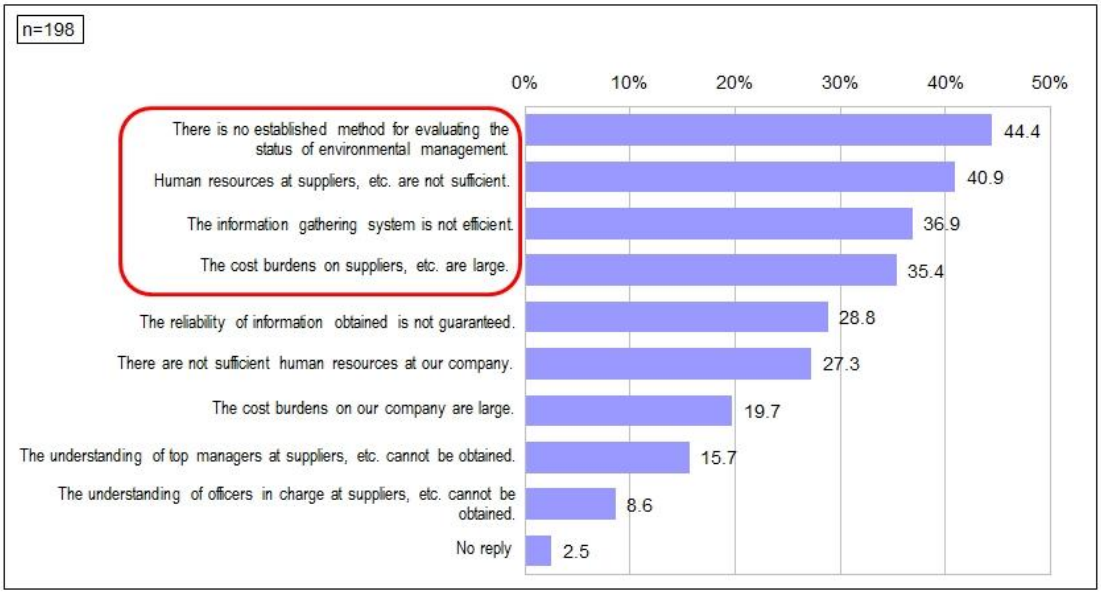
Furthermore, there were cases in which large corporations positioned suppliers as their important partners, adopted a policy of working with them for environmental management, and provided them with educational and training programs independently or as part of the industry's initiatives. These efforts covered a wide range of areas from providing training to sending personnel to suppliers for direct guidance. In addition, collaborative development of environmentally conscious products and similar projects were implemented in all industries, and one company had received so many suggestions for improvements from their suppliers that it could not respond to all of them.

(3) Challenges for Evaluations of Environmental Management at Suppliers

In general, it is difficult to communicate environmentally conscious policy, requests for taking the needs of the environment into consideration, and other requirements to suppliers (such as second- and third-tier ones) other than those which large corporations deal directly with, nor can they gather sufficient environmental information from such suppliers.

The challenges for expanding the scope of evaluations of environmental management in the value chain, which were revealed by the awareness survey and other studies, are as follows:

Major challenges the large corporations faced when evaluating their suppliers included "there is no established method for evaluating the status of environmental management," "lack of human resources at suppliers, etc.," "the information gathering system is not efficient," and "cost burdens on suppliers, etc." However, only a few of them cited "The understanding of top managers and officers in charge cannot be obtained."



In fact, interviews with personnel from businesses, which were suppliers of the large corporations (with annual sales of around ¥100 billion), indicated that they had not established green procurement standards and other guidelines, nor had they made the requests for EMS certification. There were cases in which, because it was difficult to apply client companies' diverse requirements directly to upstream businesses, suppliers requested only compliance with statutory regulations.

In terms of education and training, small corporations distributed materials and gave individual explanations to their suppliers, but did not go as far as to hold regular meetings to explain to suppliers taking into consideration their effects on corporate management. Some suppliers replied that they did not participate in study meetings hosted by client companies because they took much time.

The awareness survey revealed, meanwhile, that around 20-30% of client companies faced such problems as "lack of human resources at our company" and "large cost burdens on our company."

3. Emphasis on the Value Chain in Financial Services

For the readers' reference, the awareness of and trend in environmental management in the value chain at some financial institutions (Replies were received from 48 companies, and the valid response rate was 23%) are as follows:

First, about 80% of financial institutions viewed response to environmental issues as their "social responsibility," but the percentage of those which considered it a means of "reducing environmental risks" or a "growth factor for business" was low, at about 20%. While about 80% of them replied that "top managers' leadership" was important, only about half of them said that "strategic response to important issues," "response to stakeholders," or "establishment of systems to comply with regulations" was important. The percentage of those which stated that VCM was important was only a little over 10%.

Next, about 30% of financial institutions had already included in their evaluation points the environmental and social initiatives of businesses in which they invested or to which they granted loans, and the percentage of these financial institutions plus those which believed that the environmental and social initiatives could be included in their evaluation points in the medium to long run reached about 70%. About 40% of financial institutions had already formulated evaluation policy for the environmental and social aspects of operations, and the percentage of these financial institutions plus those which were considering doing so was about 50%.

Many of the financial institutions cited "effects on business continuity" or the "status of social responsibility being fulfilled" as important perspectives for evaluations of environment management. Major evaluation points included the "status of compliance with regulations" and the "status of conformity to EMS and its operation," but in the future, the "current status and future prospects of research and development and capital investments for environmentally friendly products and services," "top management's commitments," and "governance systems" will be added.

About 90% and 70% of financial institutions respectively cited "there is no established evaluation method" and "financial impacts are not clear" as challenges they faced when evaluating the environmental and social aspects of operations.

Based on replies from some financial institutions, the foregoing does not estimate the overall tendency in the financial services industry but suggests that efforts to incorporate environmental and social aspects into the evaluations of environmental management are spreading gradually though the financial institutions face some challenges.

4. Direction of Infrastructures to Promote Environmental Management

An analysis of the current status of and challenges for evaluations of environmental management indicates that it is important to overcome problems involved in evaluations of corporate environmental management such as human resources, know-how, funds, and information in a comprehensive way. The results of examination of the direction of infrastructures to promote environmental management based on such an analysis are as follows:

In order to advance environmental management, it is indispensable that top managers are motivated to work actively for green innovations and environmental initiatives. In order to motivate top managers to do so, it is desirable that the status of environmental management should be evaluated appropriately using indicators and other benchmarks and that the results of their efforts should be reflected on inter-company and financial transactions as well as public procurement and other dealings. It is also important to provide top managers with opportunities of presenting their environmental management systems and exchanging opinions with those of other companies. Furthermore, economic incentives such as preferential tax systems are extremely effective.

In advancing environmental management within the organization of a company, its top managers are required to do so at their own eye level and ensure that managers, who can view social and environmental issues from a global perspective, and many other personnel display their leadership according to their official positions. In order to train these personnel, opportunities of learning environmental management according to job levels and giving feedback to others within the organization on what is learned are needed. As a means of motivating personnel to learn, it is also useful to make the results of environmental management visible through systems to favorably evaluate those active in environmental management and schemes to examine and qualify personnel for knowledge and skills they have acquired.

Furthermore, it is desirable to effectively use environmental management experts in order to cope with lack of human resources. To that end, it is also effective for the public and private sectors to work together to establish systems to allow examiners for ISO14001, EA21, and other standards to display their functions as advisors for EMS establishment and operation. In addition, it is effective to install personnel in each region so that they can provide advice on green innovations and take active measures for encouraging more businesses to acquire EMS certification under the leadership of local governments and other organizations.

These issues are mainly associated with businesses with annual sales of less than ¥100 billion, but it is also necessary to pay attention to issues at businesses with annual sales of ¥100 billion or more such as lack of personnel and cost burdens.

In order to ensure that financial and similar institutions play the expected roles, on the other hand, it is important to establish systems that allow officers in charge of financial services to easily evaluate environmental management at businesses in which they invest or to which they grant loans mainly by providing them with proper training, helping establish evaluation methods, and developing information disclosure infrastructures such as financial impacts.

It is hoped that the public and private sectors will work together to build infrastructures to promote environmental management as described above by linking them to the information disclosure infrastructures discussed in the next chapter.

Chapter 3 Environmental Information Infrastructure Using Information and Communication Technology (ICT)

With establishment of "information disclosure infrastructure to incorporate environmental, economic, and social perspectives into economic activities in an integrated manner" as described in Chapter 1 in mind, this chapter, assuming a shift to green economy, discusses issues related to use of environmental information provided by environmental reports, environmental information disclosure infrastructure using ICT, and other subjects.

1. Usefulness of Environmental Information and Challenges for Its Use

(1) Usefulness of Environmental Information

In green economy, environmental information must not distort decisions made by economic entities. Only if environmental reports disclose useful and reliable information can they display their functions well in green economy. For this reason, the usefulness of environmental information is a prerequisite for information disclosure infrastructure to facilitate a shift to green economy.

As generally discussed, the qualitative characteristics of useful information disclosed are as follows:

Qualitative Characteristics of Useful Information Disclosed[4]

Fundamental qualitative characteristics	(a) Fitness for purpose	Suitable for the purpose for which users use the information
	(b) Faithfulness of expressions	Faithful descriptions of the event covered by the information
Supplementary qualitative characteristics	(c) Comparability	Allowing users to understand and identify the similarities and differences in the shared information
	(d) Ease of understanding	Clear and easy to understand
	(e) Verifiability	Allowing users to verify the reasonableness of data objectively
	(f) Timeliness	Disclosure of information without delay

The fundamental qualitative characteristics represent essential characteristics for disclosed information to be useful to its users. If such information also has supplementary qualitative characteristics, its usefulness is further increased.

[4] They are described referring to an interim report on environmental information disclosure. The 2012 version of the Environmental Reporting Guidelines is consulted to give specific details of each characteristic.

When they are applied to inter-company transactions involving client companies, financial transactions by financial and similar institutions, and evaluations by administrative agencies of environmental management according to their environmental policy, these qualitative characteristics can be explained as follows:

[Fundamental qualitative characteristics]

(a) Fitness for purpose

In order to ensure fitness for purpose, it is necessary to obtain a clear understanding of stakeholders' information needs. In general, for entities that evaluate environmental management, the principal purposes of using environmental information are as follows:

Evaluating entities (transactions, etc.)	Principal purposes of use
Client companies (inter-company transactions)	Confirm the status of compliance with statutory regulations as well as the status of environmental management systems being established and operated (evaluate in particular whether suppliers are making utmost efforts while implementing the PDCA cycle)
Financial and similar institutions (financial transactions)	Confirm information related to prospects of future cash flows, including response to business opportunities and risks (Evaluate response to financial impacts and planning in particular)
Administrative agencies (environmental policy)	Confirm the status of environmental impacts related to priority policy and of initiatives for taking the needs of the environment into consideration (Evaluate initiatives for environmental protection and economic policy in local communities as well as the effects of such initiatives in particular)

From the viewpoint of green innovations and sustainable resource and energy use, all kinds of information that show total environmental impacts and environmental efficiency per unit production constitute important qualitative information. Qualitative information that indicates corporate stances such as the policy of top managers is also considered important as one that is indispensable to understand the content of quantitative information properly.

(b) Faithfulness of expressions

The faithfulness of expressions is a qualitative characteristic necessary to ensure that users understand the actual condition of environmental management appropriately. In order to ensure the faithfulness of expressions, it is essential for businesses to appropriately determine the types of information that are indispensable to have users understand details of environmental impacts and environmental initiatives properly and avoid the arbitrary choice of information as well as

computational and other errors when disclosing them.

For example, various kinds of supplementary information are indispensable to ensure the proper understanding of the status of sustainable resource and energy use, and they include not only information on total resource and energy inputs but also information on environmental impacts by region and per unit production, calculation methods, coefficients, original data, and analyses and evaluations by top managers.

[Supplementary qualitative characteristics]

(c) Comparability

There are two types of comparison: chronological comparison and inter-company comparison. When the status of environmental management is compared, it is necessary that users should understand the boundary of information collected for comparison and differences in calculation methods and that they should be able to distinguish the effects of such differences. It is also important to unify methods for disclosing units of numerical information. For example, if information on greenhouse gas emissions is disclosed as CO_2 equivalents, it is not comparable unless it is stated that such emissions are converted into CO_2 equivalents and expressed in $CO_2e(t)$.

In particular, from the viewpoint of environmental management evaluation in green economy, the actual condition of environmental management must be conveyed to users in a comparable and appropriate way.

(d) Ease of understanding

It is necessary that businesses should tax their ingenuity in describing the status of environmental impacts arising and environmental initiatives being implemented, in order to ensure that users easily understand it. One way of doing so is, for example, to provide a summary of environmental management efforts, and another is to use graphs and other tools to visually express the status of environmental impacts arising.

It is also important to clearly show – by describing efforts to respond to important environmental issues in the form of lists and presenting disclosure guidelines and items described in a way that enables comparison – where readers can find important information or one that they want.

Furthermore, a clear distinction between items common to all companies and those added independently makes environmental reports easier to understand.

(e) Verifiability

In order to ensure the verifiability of information disclosed, it is necessary to disclose

information on the report compilation process such as prior conditions, the boundary of information gathered, calculation methods, and original data so that users can verify the appropriateness of results of compilation based chiefly on logical reasoning under the prior conditions and recalculations.

(f) Timeliness

It is necessary to disclose without delay what will have serious effects on the decision-making of users, including cases in which new important matters arise halfway through the fiscal year, or significant changes take place to issues that are recognized as important.

(2) Challenges for Use of Environmental Information

Currently, it cannot be said positively that environmental information disclosed by environmental reports fully meets requirements for these qualitative characteristics. For example, in terms of the fitness for purpose and the faithfulness of expressions, the disclosed information is limited to the portion of environmental efforts that environmental reports want to emphasize and does not always reflect the actual condition of environmental management. For comparability, users need to fully understand the background of information disclosed, but environmental reports often present only quantitative information such as GHG emissions for comparison, and this may lead users to wrong understandings because this way of presentations does not reflect industry characteristics and circumstances peculiar to particular companies.

Basic information needed to understand the status of environmental management is sometimes mixed with detailed information offered to explain it, making it difficult for users to identify which information is important. It is also difficult to access information users want because the information is disclosed using various media such as booklets and PDF documents. If information is disclosed in book form or via PDF documents, users need to manually collect the information they want before they analyze it. Even if information is disclosed in HTML format on the Web, users often need to collect from individual sources the information they want, presenting a problem in terms of the convenience of information. Furthermore, there are many cases in which the reliability of information is not objectively ensured.

It is inferred that these problems are caused for various reasons. One reason is that environmental reporting is not institutionalized in Japan and that reporting formats are left to the discretion of businesses that publish environmental reports. Another is that users do not fully understand how to read environmental reports. These problems are also affected by the intrinsic nature of environmental information, which makes it difficult to obtain a clear understanding of the effects of trade-offs between environmental impacts and the eventual impacts of GHG emissions, waste, and so forth on the environment.

In order to solve these problems, therefore, it is necessary to both raise the level of users' understanding of environmental information and make environmental information more useful mainly by requiring businesses to disclose key environmental performance indicators and other data according to certain standards. It is also necessary to require businesses to disclose supplementary information appropriately and ensure that not only quantitative information but qualitative one should be utilized in an integrated manner by linking the former to the latter.

In addition to these efforts, it is necessary that since environmental impacts vary according to industry, regional, and other characteristics, continuous research should be conducted as to how

business performance affects the environment and that the national government and other relevant organizations should consider guidelines to evaluate the effects of corporate performance on the environment. Another task for policymakers is how to ensure consistency between indicators of green economy such as green innovations and sustainable resource and energy use and other benchmarks and environmental information disclosed by businesses, thus promoting industry making the most use of informational methods.

2. Necessity of Environmental Information Infrastructure using ICT

As described in the preceding section, the prerequisite for effective information disclosure infrastructure is that disclosed environmental information has useful qualitative characteristics and is of high quality enough to contribute to proper evaluations of environmental impacts. The first step to meet this prerequisite is to improve the intangible aspects of environmental reporting at businesses, including establishment of systems to gather environmental information.

Furthermore, in addition to meeting the prerequisite, it is necessary to ensure that environmental information serves as a medium for economic systems as it increases its convenience by making it readily available and easy to analyze. This is made possible by improvement of information infrastructure using ICT, which enable innovative use of information – improvement of information disclosure infrastructure through the tangible aspects of environmental reporting.

This is indispensable to ensure that many economic entities participate in green economy and that each of them actually uses environmental information when making decisions for its economic activities. The reason is that less convenient information does not allow users to access, compare, and analyze important one in an instant through searches and determine whether the environmental initiatives in question are favorable or not, significantly hindering a shift to green economy.

In the future, the necessity of public investments in information infrastructure to ensure the convenience of environmental information is expected to increase as the needs of society for such information grows.

The convenience of environmental information can be increased by making the most use of the characteristics of ICT, as follows:

(a) Increased availability

The sharing of environmental information disclosure platforms through ICT makes it easy for many economic entities to have access to environmental information. The automatic linkage of major items of information disclosed by businesses to those included in environmental reporting guidelines, etc. and the ability to refer constantly to quantitative information and one that supplements it makes it easy for users to obtain information they intend to reach. Furthermore, disclosure of information immediately after the occurrence of serious environmental events through ICT enables users to use such information in a timely manner.

In addition, in response to globalization of economic activities, if ICT helps provide information in multiple languages, giving it international accessibility, the information becomes more easily available to members of the international community.

(b) Greater ease of analysis

ICT enables analysis of several data with the same function. For example, it makes it easy to compare the types and boundary of environmental information disclosed and identify differences in calculation methods and other tools. It also enables users to adjust the boundary of figures by counting backwards from, say, the capture rate for the scope of subjects reported and do difference calculations for calculation methods though these are additional functions.

Furthermore, ICT enables verification of the consistency of the same data and the appropriateness of the results of information processing. Examples of possible functions include providing direct accessibility to initial input data at the time of information processing and checking data to confirm whether there are abnormal figures when they are entered.

Moreover, flagging allows users to identify the degree of reliability for information. And if data for the past long years are kept, ICT makes chronological comparison for longer periods possible.

If ICT provides these functions, it is effective in maintaining the qualitative characteristics (particularly supplementary ones) of useful information. Use of ICT is also expected to have favorable effects on the intangible aspects of information disclosure infrastructure. One possible effect is that the convergence of information disclosed is ensured.

3. Matters to Be Considered with Respect to Environmental Information Infrastructure Using ICT

In examining environmental information infrastructure using ICT, it is necessary to take into consideration the use of means of information gathering and ICT, the benefits of disclosing businesses and users, and so forth.

(a) Inter-company transactions involving client companies

Use of means of information gathering and ICT	Suppliers respond individually to client companies' questionnaires concerning green procurement and other initiatives and provide relevant information via email and other media. In the electric machinery, automobile, and other industries, shared systems have already been established to provide information on chemical substances used in the value chain.
Challenges for information gathering, etc.	The content of questionnaires concerning green procurement and other initiatives varies from one company to another, and they place heavy burdens on disclosing businesses. Surveys conducted by overseas businesses have recently requested information on the social aspects of operations such as labor practices and human rights.
Benefits of ICT use for users	Establishment of shared environmental information disclosure infrastructure enables users to efficiently obtain environmental information of business partners and use it for such purposes as evaluating environmental management and choosing suppliers.
Benefits of ICT use for disclosing businesses	If there is information infrastructure using ICT and many businesses can use them, burdens on disclosing businesses are alleviated because they do not need to respond individually to common questions.

(b) Financial transactions by financial and similar institutions

Use of means of information gathering and ICT	Financial and similar institutions respond individually to questionnaires from SRI research firms, etc. and provides information via email and other media. Some private information vendors offer information on environmental reports and other documents compiled by listed companies through systems and databases they have developed on their own.
Challenges for information gathering, etc.	The content of questionnaires from SRI research firms, etc. varies from one firm to another, and they place burdens on disclosing businesses. Since respondents are usually requested to provide information on the social aspects of operations, they need to involve departments other than the environmental affairs one when responding to such questionnaires.
Benefits of ICT use for users	Establishment of shared environmental information disclosure infrastructure enables financial and similar institutions to efficiently obtain environmental information of businesses in which they invest

	and to which they grant loans and easily compare and analyze it, and this allows them to evaluate environmental management on a transaction-by-transaction basis according to the actual condition of such management at each business.
Benefits of ICT use for disclosing businesses	If there is information infrastructure using ICT and many businesses can use them, burdens on disclosing businesses are alleviated because they do not need to respond individually to common questions.

(c) Environmental policy implemented by administrative agencies

Use of means of information gathering and ICT	Administrative agencies request businesses by law to submit reports and notifications to them. In addition to reporting using print media, email, and other means, businesses can provide environmental information through ICT.
Challenges for information gathering, etc.	Environmental information is requested by administrative agencies at the national and local levels according to the respective objectives of these organizations. But businesses are requested to provide lots of information, and large work burdens are placed on disclosing ones.
Benefits of ICT use for users	Manually collected information can automatically be gathered and otherwise processed if ICT is used, and this enables effective use of information, achieves greater operational efficiency, and attain other goals.
Benefits of ICT use for disclosing businesses	If greater efficiency is achieved in the submission of notifications and reports by, for example, linking them to environmental reports and other documents, burdens on disclosing businesses can be reduced. (For the relationship between major notifications and reports and environmental reporting guidelines based on environment-related laws and ordinances, see Reference Material 4)

In addition to the foregoing matters, it is desirable to pay attention to the following points:

Viewpoints of disclosing businesses

- They cannot easily disclose information if information evaluation policy (such as comparison and conformity to standards) remains unclear.
- Information cannot be fairly compared unless the boundary of information disclosed and calculation standards are unified.
- If the type of information disclosed by a company is not consistent with that of information demanded by an overseas business, the disclosure of information may turn into an enormous waste of time.
- Additional work burdens (such as cost, personnel, and knowledge) hinder promotion of information disclosure.

- Some businesses do not want data they submit to administrative agencies to be opened to the public if, for example, the environmental information in question falls into confidential one. Therefore, it is necessary to pay attention to the independence of businesses.

Viewpoints of users

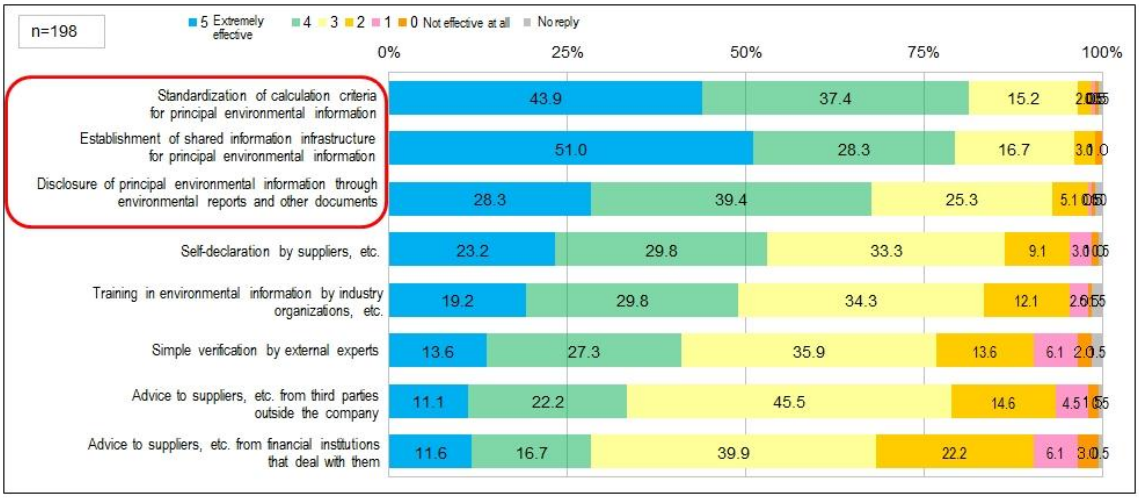
- If the convenience of information, which fits the purpose for which users use it and in which existing environmental information disclosure databases and other sources lack, is not added, the number of its users decreases.
- If conversion and other mistakes are made when data from environmental reports are entered manually for information processing and there are errors found in the disclosed information, the overall reliability of systems declines, causing systems not to be used widely.

If the foregoing viewpoints are taken into consideration, it is necessary that environmental information infrastructure using ICT should standardize questionnaire formats, calculation standards, etc. for major types of environmental information, provide shared information platforms, and ensure the convenience of information (availability and ease of analysis). Furthermore, other important requirements include giving incentives to disclosing businesses, reducing additional burdens on these businesses, and ensuring consistency with information disclosed through environmental reports.

(Reference)

In the awareness survey for large corporations , more than 80% of respondents cited the "status of EMS operation (including future visions and strategy)," "status of conformity to EMS," "goal setting for important environmental impacts and the status of improvement and progress (total emissions and those per unit production)," "status of compliance with regulations (including preventive action)," and "status of governance systems" as items of information requested by SRI research firms, etc.

Meanwhile, the percentage of businesses that cited "standardization of calculation criteria for major types of environmental information," "establishment of shared information infrastructure for major types of environmental information," and other institutional improvements as effective initiatives to obtain environmental information from suppliers was high, at around 80%. They were followed by many businesses that cited effective use of existing tools as a means of "disclosing principal environmental information through environmental reports and other documents."



The percentage of businesses that expected the national government and other agencies to "build systems to promote and expand green procurement," "establish formats to provide principal environmental information," or "develop information infrastructure to share environmental information" was relatively high, at a little over 60%.

In the survey of financial institutions' awareness , meanwhile, over 40% of financial institutions cited the "status of compliance with regulations (including preventive action)," "status of EMS operation (including future visions and strategy)," "financial risks involved in the environmental and social aspects of operations," "goal setting for important environmental impacts and the status of improvement and progress (total emissions)," and "goal setting for important social issues and the status of improvement and progress" as items for which standardization of disclosure methods, etc. is hoped to ensure the comparability of information on environmental and social issues.

In the same survey, in order to promote evaluations of environmental and social initiatives by businesses they financed, many financial institutions expected the national government and other agencies to "support environmentally conscious financing that took such evaluations into consideration," "establish evaluation manuals and provide training in evaluations," and "encourage businesses to disclose information on the environmental and social aspects of operations by institutionalizing such information disclosure.

4. Direction of Establishment of Environmental Information Infrastructure Using ICT

(1) Matters Expected of Environmental Information Infrastructure Using ICT

Based on the discussions up to the preceding section, the following is an analysis of matters expected of environmental information infrastructure using ICT in green economy.

(a) Inter-company transactions involving client companies

When it fulfills its functions, ICT needs to ensure consistency with the objectives of VCM. In other words, it is important that environmental information infrastructure using ICT should contribute to reducing risks and enhancing competitiveness in the value chain by helping (i) reduce and control the effects of products and services on the environment throughout their life cycle and (ii) establish closer communication with business partners.

One way to achieve this goal is to establish shared questionnaires, calculation standards, and so forth in a way that links them to indicators of green economy and other benchmarks such as green innovations and sustainable resource and energy use, enter information in certain formats using ICT, and disclose such information. It is desirable that such information enables users to easily determine whether suppliers satisfy environmental standards as required by client companies and clarifies whether they are making sufficient efforts.

Some of the suppliers disclosing information in the value chain are small in scale. They have not yet started to publish environmental reports. Therefore, it is desirable that the scope of basic information required for evaluations of environmental management is clearly defined with use by small and medium enterprises of ICT in mind and that a certain degree of freedom is given to ICT so that businesses can add supplementary information to the basic one at their own discretion.

Furthermore, it is desirable that such incentives as public procurement, environmental financing, and preferential tax systems should be given to small and medium enterprises based on the information disclosed by them and that disclosure burdens on such enterprises should be reduced by linking information to be disclosed by them to one that has been compiled for industry organizations or administrative agencies.

In addition, given that global business development will further expand in the future, it is hoped that environmental information infrastructure using ICT will respond to questionnaires concerning the social aspects of operations and support information disclosure in multiple languages.

(b) Financial transactions by financial and similar institutions

When it fulfills its functions, ICT needs to ensure consistency with financial information disclosure systems. Evaluation methods for non-financial information in financial transactions are still being developed, but it is expected that there will be growing needs for using such information in combination with financial one in the future. For this reason, it is important that environmental, economic, and social information should be used on a global scale in combination with financial one. One example is that the same language as the one for financial information disclosure systems (for example, tagged languages such as XBRL) should be used, and another is that compatibility with international disclosure systems should be ensured.

In order to ensure that funds are allocated to green growth areas appropriately, it is required that important information such as KPIs for disclosing businesses and supplementary information is disclosed and analyzed in a way that indicates consistency with indicators of green economy used by the national government and other agencies. It is also necessary that reference should always be made to information on response to risks and opportunities and its financial impacts, the results of analysis of environmental performance indicators, and so on.

Furthermore, it is desirable that the relationship between items of information disclosed and guidelines that provide disclosure standards should be understood instantaneously; that information considered important by users is listed and can be viewed at first glance; and differences in the boundary of information disclosed and calculation methods between one business and others in the same industry can easily be recognized. These enable easy evaluations and analysis even if large corporations, which have already published environmental reports, disclose information on matters that are peculiar to them in a relatively free manner, or even if small and medium enterprises, which have not published environmental reports, disclose in a limited way information that constitutes the basic part of environmental management.

At the same time, the functions that allow addition of discretionary information, reduction in disclosure burdens, and the granting of incentives for information disclosure are also required.

(c) Environmental policy by administrative agencies

Administrative agencies can use environmental information from two viewpoints: (i) how they can effectively use information disclosed through corporate environmental reports and other documents for themselves and (ii) how they can effectively use environmental information provided to them in order to protect the local natural environment.

In Viewpoint (i), the boundary of information disclosed, calculation methods, and other rules of editing are not necessarily unified as exemplified by the fact, while environmental reports are in principle compiled on a consolidated basis, notifications and reports to administrative agencies provide information only on the companies that submit them. In Viewpoint (ii), there are cases in which what is notified or reported to administrative agencies is not suitable for

being opened to the public because it includes confidential information. These two need to be taken into consideration when administrative agencies intend to effectively use environmental information.

For this reason, in Viewpoint (i), it is important to ensure consistency with environmental reports by, for example, allowing businesses to provide information on a consolidated basis under the notification and reporting systems, and this is where there is greater room for giving incentives to disclosing businesses and reducing disclosure burdens by combining ICT as discussed in the sections for VCM and financial transactions.

As far as Viewpoint (ii) is concerned, it is effective to explore possibilities of utilizing information using ICT by limiting the boundary of disclosed information to disclosing businesses, particular areas or business sites, or other categories. For example, a tool to compile a simple environmental report using what is notified or reported to administrative agencies or a function of calculating CO_2 emissions automatically if information on electricity charges is entered will be beneficial to disclosing businesses, too.

Since establishing these ICT infrastructures is beneficial but costly, it is necessary to closely examine user needs, availability, the ease with which they can be transferred to other systems in the future, and so forth in order to prevent them from falling into disuse due to changes in the needs of society.

(2) How to Promote Environmental Information Infrastructure Using ICT

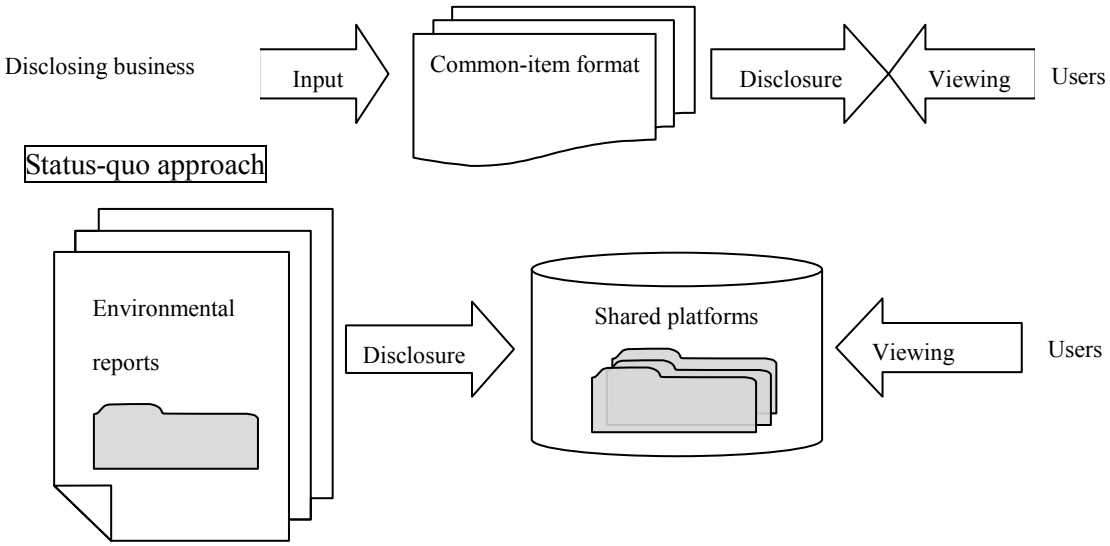
In order to enable "information disclosure infrastructure to incorporate environmental, economic, and social perspectives into economic activities in an integrated manner," it is necessary to ensure that environmental, economic, and social information is disclosed through the same medium or that information disclosed through several media can be used in an integrated manner.

ICT provides effective means of making integrated use of various kinds of information possible, and it is important to establish ICT with linking among environmental, economic, and social information in mind.

There are two possible approaches to determining the direction of environmental information infrastructure using ICT, as follows:

- Integrated approach of compiling new reports using a common-item format
- Status-quo approach of utilizing existing reports without changing them

Integrated approach



It is expected that the integrated approach will be taken particularly if businesses that have not published environmental reports compile such reports in a simple way. This approach is also effective if environmental reports are compiled in a simple way using what is reported or notified to administrative agencies.

It is expected, on the other hand, that the status-quo approach will be taken if, for example, businesses that are already publishing environmental reports based on their own system attempt to apply ICT to environmental reporting, though limited to certain important information. In such cases, cooperation with private organizations such as the Carbon Disclosure Project (CDP) and private information vendors such as Bloomberg is hoped for.

In the status-quo approach, one promising way of promoting environmental information infrastructure is to establish ICT in XBRL format.

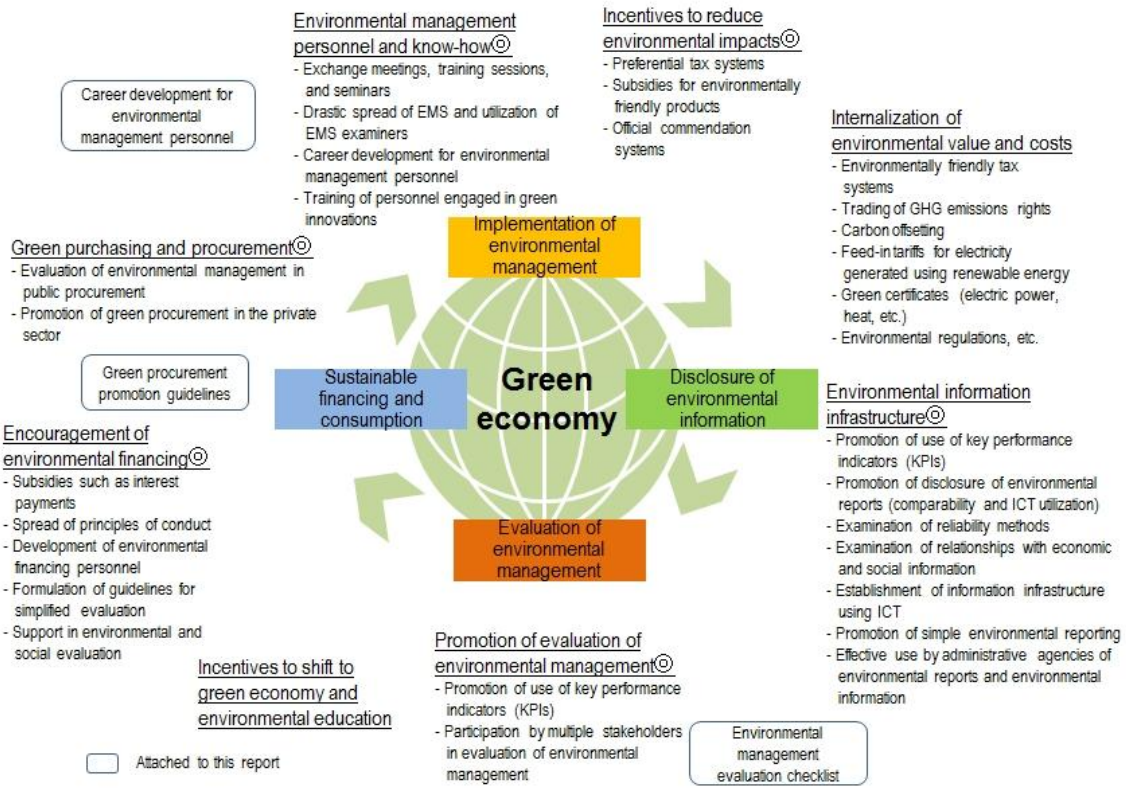
Taking these approaches into consideration, it is necessary to examine how information disclosure infrastructure required for green economy should be while paying attention to international trends in environmental information disclosure.

Chapter 4 Specific Proposals concerning Measures for Environmental Management and Environmental Reporting

As the two types of infrastructures are established to ensure a shift to green economy, it is hoped that issues associated with environmental management and environmental reporting such as human resources, know-how, funding, and information will be overcome and that sustainable financing and consumption will spread, becoming the mainstream of markets. To that end, it is important to ensure that specific measures aimed at promoting establishment of appropriate indicators, internalization of environmental costs and economic value, the granting of suitable incentives and so forth are implemented effectively using market mechanisms.

Based on the discussions in the preceding chapter, principal measures to promote a shift to green economy are summarized in the following conceptual diagram:

[Figure: Conceptual Diagram of Measures to Promote a Shift to Green Economy]



* The subjects covered by this report are marked with double circles in the diagram above.

Environmental management infrastructure aiming at sustainable resource and energy use in the entire value chain

This environmental management infrastructure should aim to ensure that all businesses that can afford to contribute to green innovations and reduction in environmental impacts demonstrate their abilities in these initiatives by implementing environmental management. In order to realize this vision, it is necessary to implement the measures listed below through public-private partnership.

(a) Environmental management personnel and know-how

- Exchange meetings, training sessions, and seminars

It is hoped that opportunities of making presentations and exchanging information on environmental management will be provided so that managers, supervisors, and other personnel can interchange with one another and acquire the latest environmental knowledge. It is also necessary for administrative agencies, industry organizations, and other entities to work together to continuously offer training in and seminars for VCM, environmental reporting, and other key environmental issues. This allows top managers and supervisors to obtain a clear understanding of other businesses' environmental management initiatives, organization, and trends in regulations and social needs. Participation by financial institutions, administrative agencies, and other entities in exchange meetings and other events contributes to support for environmental management.

In addition to financial institutions, outsiders who may be involved in businesses include small and medium enterprise management consultants, accountants, and tax accountants. It is essential to have more outsiders understand the benefits of environmental management through seminars and other events so that environmental management is promoted by a wider range of people.

- Drastic spread of EMS and utilization of EMS examiners

Environmental management requires such know-how as identification of environmental impacts in the entire value chain, decisions on important tasks according to opportunities and risks and their strategic implementation, establishment of organizational structures and governance systems, and response to stakeholders. When it comes to organizational structures, for example, it is necessary to build them so that the one and same department both supervises environmental stewardship and plans and controls corporate management by, for example,

placing the environmental management section under the corporate management planning unit directly controlled by top management.

In environmental management infrastructure, environmental management systems (EMS) are a basic means for businesses to acquire these kinds of know-how and implement environmental management continuously. Systems must be established that enable many businesses to utilize EMS examiners and other outsiders as advisors who provide know-how to integrate environmental initiatives and management systems from a managerial point of view.

- Career development for environmental management personnel and training of those engaged in green innovations

In order to advance environmental management, personnel that play their role as a promoter of environmental management in their company at the corporate managers' eye level are indispensable. In addition, in terms of human resource development, establishing a system that utilizes personnel enthusiastic for environmental initiatives within the organization and including environmental initiatives in employee performance evaluations are an effective way of motivation for managers and employees in charge. And there needs to be social systems that contribute to career development for environmental management personnel in order to develop managers and field officers who will play a leading role in environmental management.

For example, it is effective to create a new career development system in cooperation with existing private examination and qualification systems while referring to the Conceptual Diagram of Career Development for Environmental Management Personnel (see Reference Material 5). Furthermore, cooperation with existing human resource development systems is hoped for (specifically, the Environmental Consortium for Leadership Development, chemical substances advisors, EA21 examiners, etc.).

In addition, it is necessary to consider – through public-private partnership – developing those who start eco-business and drive green innovations and creating green innovation advisor and other systems.

(b) Incentives to reduce environmental impacts

Implementation of environmental management requires incentives to reduce environmental impacts, and for businesses engaged in environmental initiatives such as making investments to reduce environmental impacts, acquiring EMS certification, and publishing environmental reports, systems must be established to give them preferential treatment in taxation, environmental financing, public procurement, and so forth.

For example, a sustainable system is hoped for in which eco-action points and other benefits will be granted to businesses that acquire EMS certification, seek advice from EMS examiners and other advisors, or contribute to reduction in environmental impacts. In this system, government subsidies and contributions from advanced companies will be allocated to businesses that obtain a certain number of points.

In order to encourage green innovations, meanwhile, it is necessary to develop methods to appropriately measure contributions to reduction in environmental impacts and grant subsidies and other benefits according to the amount of contributions made. Furthermore, it is effective for administrative agencies and other entities to recognize businesses for excellent environmental management through official commendation and other systems.

(c) Green purchasing and procurement

It is necessary that all organizations from large corporations to small and medium enterprises should further advance evaluations of environmental management through green procurement, a means of implementing environmental management efficiently.

Administrative agencies – the national government and local public entities – need to give preferential treatment in their public procurement (green purchasing) projects according to the results of environmental management evaluations while establishing cooperation with the national or local governments. For example, public procurement based on simplified evaluations using the Environmental Management Assessment Checklist (see Reference Material 2) is also effective.

There are also businesses that do not fully understand green procurement itself. For this reason, one possible way to promote green purchasing and procurement is for the national government to use a provisional edition of the Guidelines for Green Procurement Promotion (see Reference Material 6) to establish a Green Procurement Promotion Initiative (tentative name) and promote it continuously in cooperation with local governments so that green procurement, including evaluations of environmental management at suppliers and other contractors, is expanded by industry and other organizations.

(d) Encouragement of environmental financing

In order to encourage environmental financing, one way of sustainable financing, it is necessary to motivate financial and similar institutions to provide environmental financing and eliminate factors for restricting such financing (human resources, know-how, etc.). Motivations for financial and similar institutions include contributions to green innovations and reductions

by environmental industries in environmental impacts as well as opportunities to invest in or finance business areas expected to grow.

It is also effective to establish systems to develop personnel who will lead environmental financing and make evaluations by financial and similar institutions of environmental management easy through such initiatives as research aimed at making the relationships between environmental management and financial impacts visible, education through industry organizations, presentation of success examples, formulation of guidelines for simplified environmental management evaluations, and support for evaluations by financial and similar institutions of the environmental and social aspects of business operations.

Information disclosure infrastructure to incorporate environmental, economic, and social perspectives into economic activities in an integrated manner

This information disclosure infrastructure should aim to ensure that environmental information, together with economic and social information, is used to make decisions on economic activities and that businesses that contribute to green innovations and reduction in environmental impacts are properly evaluated by their multiple stakeholders and enjoy benefits that they deserve. In order to realize this vision, it is necessary to implement the measures listed below through public-private partnership.

(a) Environmental information infrastructure

- Promotion of use of key performance indicators (KPIs)

It is necessary to analyze indicators of green economy, examine the relationships between indicators the national government and other agencies aim to attain and those which industry organizations aim to do so and KPIs businesses aim to do so, and promote environmental administration and corporate environmental management effectively using such indicators.

It is also necessary for the national government and other agencies to classify KPIs into common and industry-specific ones and encourage businesses to use them for environmental management.

- Promotion of disclosure of environmental reports (comparability and ICT utilization)

It is necessary to launch an information disclosure initiative run mainly by businesses that excel in information disclosure through environmental reports and thus provide opportunities of continuously examining issues associated with the comparability of important information disclosed, measures to solve such issues, and other subjects. It is also desirable to use ICT on a trial basis and consider ICT utilization in a systematic way with future establishment of environmental information infrastructure using ICT in mind.

- Examination of reliability methods

It is necessary to examine methods actually used for self-evaluations by businesses and for reviews by third parties in order to put in place procedures to assure reliability. It is also hoped that based on the results of examinations, revision of "A Guide to Self-Evaluations to Increase the Reliability of Environmental Reports (Trial Version)" will be considered with the aim of improving the quality of reliability check.

Furthermore, the prerequisite for reliable information disclosure is to establish internal controls for information disclosure and information gathering systems within the organization of businesses. To that end, it is hoped that businesses will consider improving information disclosure control procedures, including information on the life cycle of products and services, and upgrading information gathering systems.

- Examination of relationships with economic and social information

Environmental reports disclose information focusing on environmental one, but in recent years, lively discussions have been held about how information disclosure – one that also covers the social and economic aspects of business activities – should be. Therefore, it is necessary to analyze and examine environmental information infrastructure with such trends in international discussions in mind.

One way of disclosing environmental impacts and financial information in a systematic way is environmental accounting, and it is necessary to continue examining ways of encouraging use of environmental accounting information.

- Establishment of information disclosure infrastructure using ICT

It is desirable to establish environmental information infrastructure so that it is publicly used as a shared disclosure platform with the cooperation of government offices. In this process, it is necessary to establish ICT using XBRL format with information use by financial and similar institutions in mind. However, XBRL is currently a leading ICT format, but partly because there are problems peculiar to environmental reports, it is desirable to design environmental information infrastructure using ICT taking into consideration the need to make a shift to other systems easy.

In order to reduce disclosure burdens and increase the convenience of information, it is also effective to use ICT to present in particular formats information related to indicators of green economy (KPIs) as well as environmental information generally requested by SRI research firms, CDP, etc. to disclose.

- Promotion of simple environmental reports

It is necessary to pay attention to small businesses in particular so that they can compile simple environmental reports using basic environmental information. To that end, establishing information infrastructure that enables such businesses to easily publish environmental reports mainly by developing guides to environmental reporting and providing simple environmental reporting tools using ICT is hoped for.

Offering simple evaluations of environmental management as an additional function leads to environmentally friendly dealings in financial transactions, public procurement, and so forth, and this is also expected to give certain incentives to businesses.

- Effective use by administrative agencies of environmental reports and environmental information

If effective use of information, already provided to the national and local governments as well as other related agencies in accordance with laws and regulations, is made possible by the intentions of businesses, this is effective in reducing burdens on businesses. To that end, administrative agencies need to consider using environmental information effectively. They should also consider effectively using information disclosed through environmental reports under their notification and reporting systems.

(b) Promotion of evaluation of environmental management

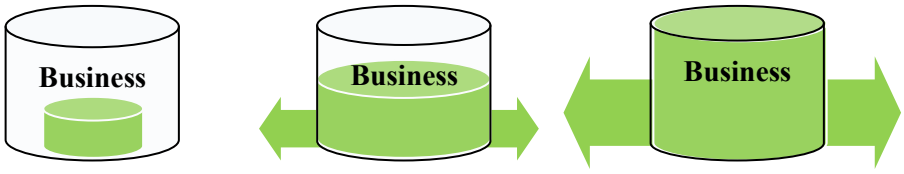
Playing up businesses engaged in advanced, innovative environmental management in mass media will focus public attention on such businesses, evoking a response from various stakeholders. Therefore, it is also effective to have third parties evaluate the direction of environmental management aimed at (see next page) and the use of indicators. For example, one possible way of doing this is to invite consumers, NPOs/NGOs, financial managers, researchers, students, and other stakeholders to participate in simple evaluation of environmental management in accordance with the environmental reports published and the Environmental Management Assessment Checklist (Reference Material 2).

Reference: Phased implementation of green procurement[5]

Some suppliers may not be able to meet green procurement requirements immediately due to personnel and cost restrictions. In such cases, it is necessary for client companies to make requests such as compliance, establishment of EMS, and collaboration in environmental initiatives in phases as part of the VCM initiatives in order to achieve environmental management they aim at.

Client companies are also expected to provide guidance and cooperation to their suppliers through business relationships within the possible range of their resources so that the latter can raise the level of its environmental management.

For the reader's reference, the following is a model of steps in the development of environmental management as seen from the perspectives of chronological changes, scope, and strategic level.



Level	I	II	III
Type	Implement essential business matters such as external requests	Ensure short-term, priority implementation within the limited range of operations	Achieve medium- to long-term strategic implementation in a wide range of operations
Details	Take environmentally friendly actions within the narrow range of its operations mainly due to the need for compliance with laws and ordinances governing water, air, chemicals, etc. and business partners' requests	Take environmentally friendly actions such as energy and resource conservation and waste reduction, from which short-term effects can easily be obtained, only at its business sites	Identify medium- to long-term important issues to be addressed in the entire value chain, include them in corporate strategy, and cope with them in cooperation with business partners

[5] This section consists of excerpts from "Environmental Information Disclosure" (interim report).

(Conclusion)

In order to realize green economy, it is hoped that various stakeholders such as financial institutions, investors, the national and local governments, consumers, and NPOs/NGOs will evaluate environmentally friendly actions of businesses appropriately. It is also necessary to establish systems to lead the results of appropriate evaluations to economic activities. To that end, it is required to build infrastructure that enables provision of environmental information in both its tangible and intangible aspects.

Disclosing non-financial information, including environmental one, is becoming a major trend in international discussions. Since it is advanced in environmental reporting, Japan can demonstrate leadership in the world by working actively on use of indicators of green economy and establishment of information disclosure infrastructure.

And in order to achieve green growth in Japan, many businesses from large corporations to small and medium enterprises need to advance environmental management in the entire value chain and thus enhance their competitiveness in the international market. In addition, information disclosure infrastructure must function as a global platform to further promote environmental management and environmental financing.

It is important to steadily advance initiatives for establishing specific infrastructure by, for example, limiting environmental tasks and environmental reporting to climate change or other particular subjects. As the Law concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures is bringing certain results in spreading environmental management and environmental reporting, it is necessary to use ingenuity for policy implementation based on the optimal policy mix in order to further spread environmental management and environmental reporting.

In the future, it is hoped that through cooperation with various stakeholders such as the governments of other countries, the United Nations, private enterprises, and private organizations, the Japanese government will implement effective measures to promote environmental management on a nationwide scale, thus contributing to realization of a sustainable society at the global level.

i Since July 1, 2006, the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive) has prohibited the sale in the EU market of electrical and electronic equipment that contains a certain amount of one of the six hazardous substances (mercury, cadmium, lead, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ether) or more.

ii Since June 1, 2007, the REACH rules have regulated the registration, evaluation, authorization, and restriction of chemicals in the EU market.

iii The Water Framework Directive was adopted by the EU in October 2000 to provide integrated water quality management to protect water resources (all ground and surface water: rivers, lakes, transitional waters, and coastal waters) in the EU area. Its specific objectives include prevention of water pollution, promotion of sustainable water use, protection of the water environment, improvement of ecosystems in waters, and mitigation of the effects of floods and droughts. The Directive is characterized by its implementation of purification and management initiatives not for each area but for each river. It aims to improve the quality of all waters to favorable levels by 2015.

iv The Law concerning the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures (Law No. 77 of 2004; enforced in April 2005) requests large corporations (excluding small and medium enterprises) to make efforts to disclose environmental information as their obligation.

v The International Integrated Reporting Committee (IIRC), which is working to establish an internationally agreed integrated reporting framework, issued a consultative document on integrated reporting, entitled "Towards Integrated Reporting, Communicating Value in the 21st Century," in September 2011. Integrated reporting refers to financial, environmental, social, and governance information provided by businesses in an integrated, clear, concise, and comparable manner.

vi Financial and non-financial information are disclosed together under certain systems mainly in Europe and North America. In 2010, as part of its regulations for listed companies, the Johannesburg Stock Exchange in South Africa made it mandatory to combine their financial and sustainability reports. In February 2010, the United States Securities Exchange Commission (SEC) issued a guidance document for the disclosure of information on climate change.

vii The Dodd-Frank Wall Street Reform and Consumer Protection Act was enacted in July 2010 to prevent disputed minerals used by businesses from becoming a source of funds in disputes that involve violence in the eastern part of the country. Article 1502 of the Act imposes the duty of reporting to SEC on businesses that use for products minerals (tantalum, tin, gold, and tungsten) produced in Congo, its neighbor Rwanda, and other areas that are involved in conflicts.