Hitachi Group's Global Environmental Strategies

Manabu Hirano
Yasunori Nagaoka
Takeo Morimoto
Chiseki Haginoya, Dr. Eng.

TOWARD SUSTAINABLE DEVELOPMENT

Deepening Concepts of Sustainable Development

AN environmental perspective is essential to construct a society in which people can live their lives with confidence. The concept of "sustainable development" which is particularly important when considering growth from this perspective expresses the idea that the environment and development are able to coexist. This concept was expressed in 1980 by international conservation agencies such as the International Union for Conservation of Nature and Natural Resources (IUCN) and the United Nations Environment Programme (UNEP) in terms of our need to pass on to the next generation the same economic prosperity that we currently enjoy. Subsequently, the term "sustainable development" was referred to throughout the Rio Declaration[(a)] adopted by the 1992 United Nations Conference on Environment and Development (also known as the "Earth Summit") and the concept is now widely recognized around the world. Actions are being undertaken based on the United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biological Diversity (CBD) adopted at the Earth Summit.

In December 2010, the Copenhagen Accord was formally adopted at the 16th session of the Conference of the Parties (COP 16) to the United Nations Framework Convention on Climate Change held in Mexico (the Agreement stated a target of "holding the increase in global average temperature below 2°C" at the previous year's COP 15 conference, but it had got no further than the discussion stage at that time). To help meet this target, the Japanese government has notified the United Nations of its intention to cut emissions by 25% (relative to 1990) by 2020. With the achievement of this objective in mind, a review of basic energy policy was undertaken in 2010 with debate on the Basic Law for Prevention of Global Warming, including measures such as domestic emissions trading and a carbon tax. Meanwhile, the Nagoya Protocol and the long-term Aichi Targets[(b)] were adopted at the 10th Conference of the Parties (COP 10) to the Convention on Biological Diversity held in Nagoya in 2010. The Aichi Targets call on companies to act to fulfill a plan for sustainable production and consumption.

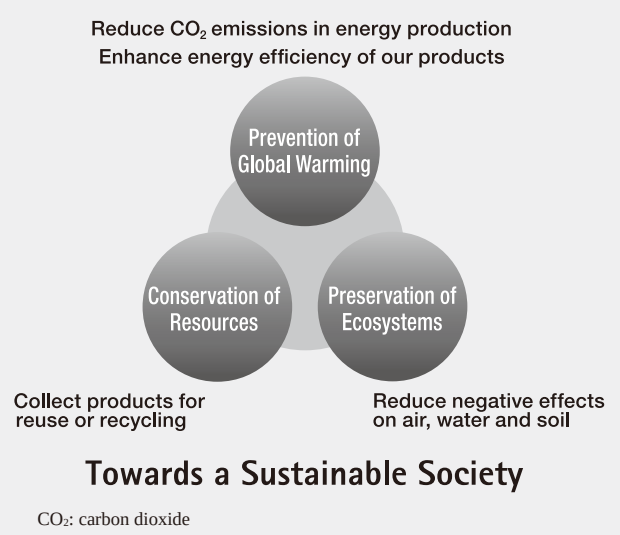
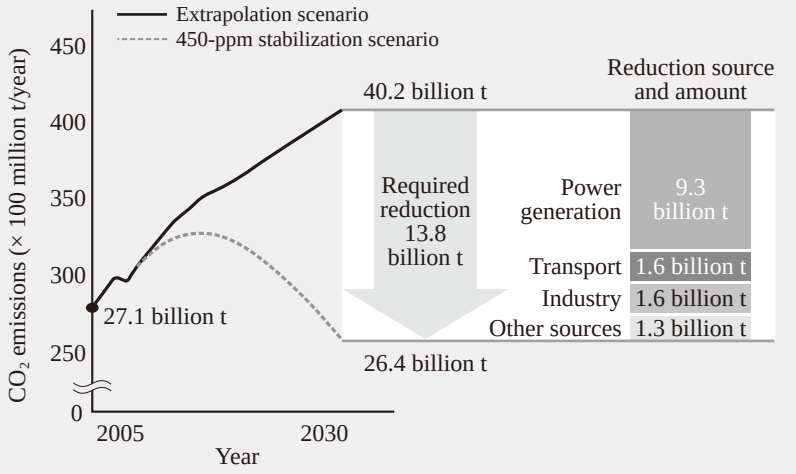


Fig. 1—The Hitachi Environmental Vision.
Based on the three pillars of its environmental vision, "Prevention of Global Warming," "Conservation of Resources," and "Preservation of Ecosystems," Hitachi intends to make a broad contribution to society through its products and other businesses.

(a) Rio Declaration
Formally known as the Rio Declaration on Environment and Development, the Rio Declaration was agreed at the 1992 United Nations Conference on Environment and Development (also known as the "Earth Summit") held in Rio de Janeiro in Brazil. It consists of a preface and 27 principles with aims that include protecting the environment and reducing inequality of living standards based around the concept of sustainable development which seeks to balance the environment and development at a global level.

(b) Aichi Targets
A plan for protecting biodiversity from 2011 onwards based on the Convention on Biological Diversity. The targets were agreed at the 10th Conference of the Parties (COP 10) to the Convention on Biological Diversity held in Nagoya, Aichi Prefecture in October 2010 as successors to the 2010 Targets. With the aim of creating a world in which humanity is able to coexist with nature by 2050, the 20 targets call on the international community to take urgent practical action by 2020.



Source: Prepared by Hitachi based on International Energy Agency (IEA) World Energy Outlook 2009

Fig. 2—Forecast of Global Energy-related CO_2 Emissions and Emission Reduction Scenario. The scenario in which the concentration of greenhouse gases is stabilized at 450 ppm anticipates reductions from power generation, transport, and industry.

Further measures may also be proposed at the United Nations Conference on Sustainable Development (also known as the "Rio+20") which is to be held next year in 2012, the 20th anniversary of the Rio Declaration.

Flow-on Effects of Great East Japan Earthquake

The Great East Japan Earthquake which struck while the response to these global-scale environmental problems was being discussed and the subsequent accident at the Fukushima Daiichi Nuclear Power Station have influenced economic activity as well as policy on energy and the environment, not only in Japan but all over the world. The supply of electricity underpins the infrastructure of society and, in addition to bringing temporary power outages to more than eight million households, the effects of the power shortages in the immediate aftermath of the earthquake were widespread, extending into areas like transport and telecommunications. Emergency planned outages were subsequently introduced as the nation pulled together to put power saving measures in place to get through the peak power demands of summer and the country also embarked on a review of basic energy policy. Earthquake recovery and reconstruction are still just beginning.

In addition to measures intended to achieve the long-term aspects of sustainable development such as preventing global warming and protecting biodiversity, the world is also confronted with the serious challenge of putting in place measures that will strengthen social sustainability and business continuity in the face of natural disasters such as earthquakes or tsunamis, nowhere more so than in Japan.

HITACHI'S ENVIRONMENTAL STRATEGY

Action by Hitachi

To make progress in areas like preventing pollution and making effective use of resources, Hitachi, Ltd. set up an environment and disaster prevention center in 1985 (two years before the final report of the WCED(c) was issued) to act as a group-wide entity so that measures such as managing the quality of factory waste water and reducing industrial waste could be carried out efficiently. Hitachi also actively pursued action on the ISO 14001 international standard for environmental management systems, the formulation of which was triggered by the Earth Summit. It started working toward certification in July of 1995, with accreditation of all manufacturing sites being achieved during fiscal year 1999 and non-manufacturing sites during fiscal year 2002.

Progress on group consolidation in 2000 saw the formulation of action plans at five-year intervals. First Environmental Action Plan commenced in fiscal year 2001, the second in fiscal year 2006, and the third in fiscal year 2011.

Environmental Vision

Hitachi has published an Environmental Vision that seeks to work toward a sustainable society. The

(c) WCED
Abbreviation of World Commission on Environment and Development. The Commission was chaired by Gro Harlem Brundtland, former Prime Minister of Norway. Established by a resolution of the United Nations General Assembly in 1984. The Commission consisted of 21 government ministers from various countries who held discussions on regional environmental problems. It disbanded after issuing a final report at its eighth meeting in 1987 entitled "Our Common Future" which was presented to the United Nations General Assembly. This final report emphasized the concept of sustainable development.

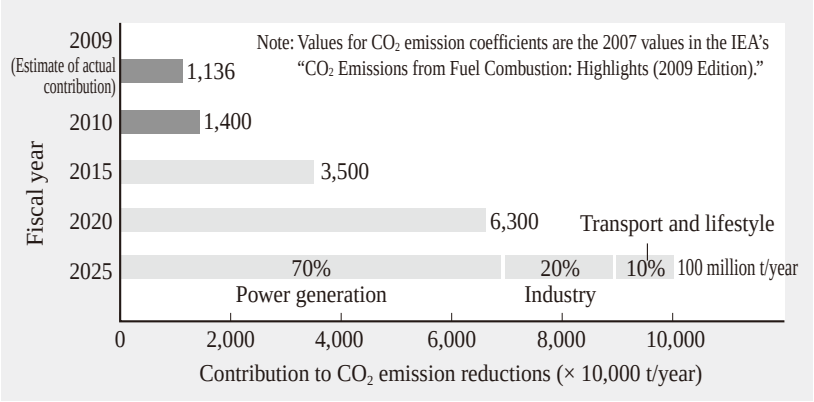


Fig. 3—Estimated Actual and Planned Contribution through Products to CO_2 Emission Reductions (Relative to Fiscal Year 2005). Hitachi aims to help reduce annual CO_2 emissions by 100 million t through its products by fiscal year 2025.

vision expresses Hitachi's stance of contributing through its business to the solution of environmental problems based on the three pillars of "Prevention of Global Warming," "Conservation of Resources," and "Preservation of Ecosystems" (see Fig. 1).

Environmental Vision 2025 Long-term Plan

The 2007 fourth report of the Intergovernmental Panel on Climate Change (IPCC), an international body made up of specialists, presented a number of scenarios(1) in which the concentration of greenhouse gases stabilized at different levels. The scenario with the smallest rise in air temperature assumed that the concentration of greenhouse gases would stabilize at 450 ppm and this required a reduction in greenhouse gases of 50 to 80% compared to 2005 levels by 2050. To achieve this, the International Energy Agency (IEA) formulated scenarios(2) showing which technologies and sectors have the potential to reduce CO_2 (carbon dioxide) emissions and allocated the reduction expected from each sector (see Fig. 2).

Given these trends, Hitachi has set a target of "helping reduce annual CO_2 emissions by 100 million tonnes by fiscal 2025 through Hitachi products and services" in its Environmental Vision 2025 long-term plan. Since 2008, Hitachi has been working on initiatives that seek to reduce the CO_2 emissions of its products through efficiency and other improvements to achieve an annual reduction of 100 million t in the CO_2 emissions associated with the use of its products relative to the reference year (fiscal year 2005) (see Fig. 3).

RESULTS OF SECOND ENVIRONMENTAL ACTION PLAN

The Second Environmental Action Plan which took effect from fiscal year 2006 involved work on activities such as reducing CO_2 emissions, expanding environmental governance, and strengthening environmental communication. Almost all of the performance indicators specified in the action plan achieved their target.

Working Toward Becoming Emission-neutral

Emission-neutrality relates to the concepts of "direct environmental load," which is defined as the environmental load that results from the refining, processing, production, and transport of materials,

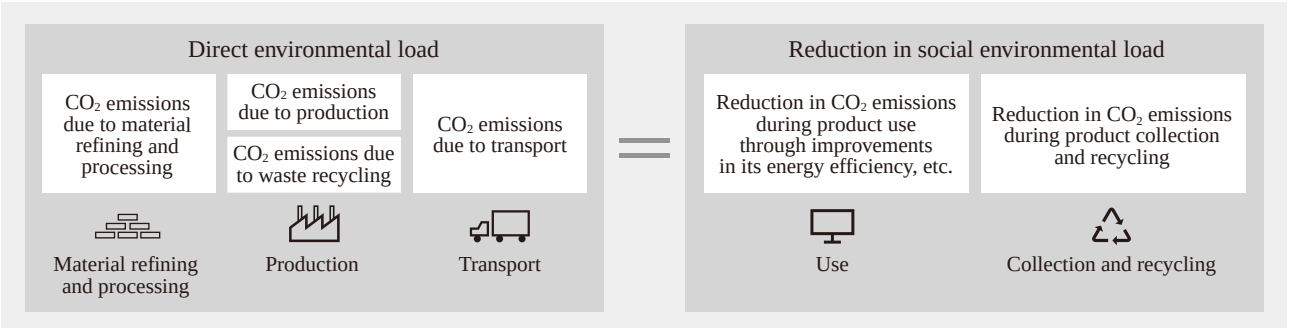


Fig. 4—Concept of Emission Neutrality.
Emission neutrality means achieving an equal balance between the direct environmental load and the reduction in social environmental load by reducing product CO_2 emissions.

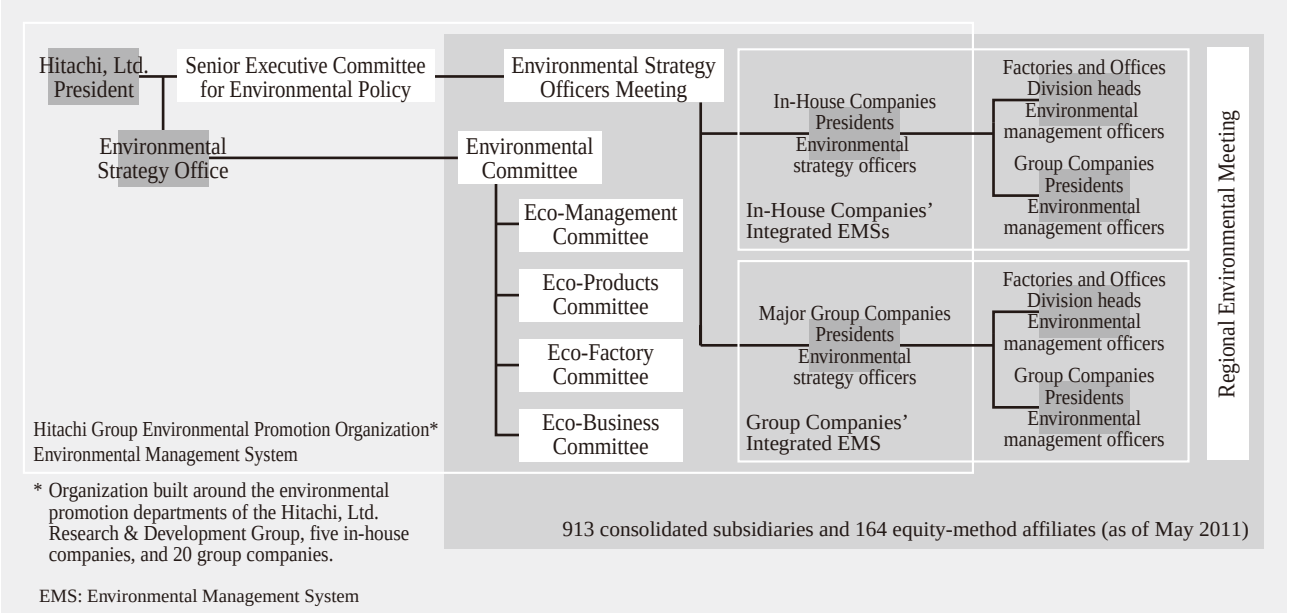


Fig. 5—Hitachi's Environmental Administration Structure and Management System.
Hitachi is establishing an environmental administration structure that includes all of the companies that make up the consolidated group.

and "reduction in social environmental load" which is defined as the reduction in the environmental load associated with the use, collection, and recycling of products compared to fiscal year 2005 through measures such as energy efficiency improvements and resource savings. Being emission-neutral means undertaking environmental activities that both reduce the load on the environment and increase the extent to which this load is minimized in order to achieve an equal balance between the "direct environmental load" and the "reduction in social environmental load" (see Fig. 4). The target year for becoming emission-neutral is fiscal year 2015 and good progress is being made toward this goal.

To reduce the direct environmental load, Hitachi has been implementing measures such as fuel conversion and installing energy-efficient plant and equipment through an ongoing five-year investment program which started in fiscal year 2006. To promote this program, Hitachi has been certifying those workplaces that achieve industry-leading levels of reduction in environmental load as "Super Eco-Factories & Offices." A total of 35 sites (12 overseas and 23 in Japan) were certified by fiscal year 2010. As a result, Hitachi has reduced the volume of CO_2 emissions from energy use in Japan from 2,805 kt-CO_2 in fiscal year 2006 to 2,600 kt-CO_2 in fiscal year 2009[3].

To increase the reduction in social environmental load, Hitachi is increasing the number of its "Eco-Products[(d)]." Hitachi has introduced a "DfE (Design for Environment) Assessment" program for the development and design of products and services and is focusing its efforts on creating Eco-Products that reduce the burden on the environment. The number of models certified as Eco-Products grew from 5,491 in fiscal year 2006 to 8,387 in fiscal year 2009. Hitachi has also incorporated its objective of making all Hitachi products and services Hitachi Eco-Products by fiscal 2025 into its business performance indicators to help achieve the targets specified in the long-term plan.

Integration of Environmental Management Systems

Hitachi operates the Hitachi Group Environmental Promotion Organization EMS (Environmental Management System) based on ISO14001 to promote a consistent approach to environmental management within the group while also allowing for the diversity of fields in which it is active. The management system handles governance of environmental activities across Hitachi and covers all internal and group companies (see Fig. 5).

(d) Eco-Products
Products that satisfy the eight criteria stipulated by the "DfE (Design for Environment) Assessment" scheme which Hitachi formulated for itself to assess the environmental burden imposed by a product at each stage of its lifecycle. The eight criteria are: volume reduction, longevity of use, resource recyclability, ease of degradation processing, protection of the environment, energy efficiency, availability of information, and packaging. The criteria are assessed against five levels and a product can be certified if it reaches level 2 or better (equivalent to models prior to full model change) and the average over the eight criteria is level 3 or better.

Outside Japan, Hitachi is building networks to support environmental activities and seeking to spread awareness and encourage understanding of action plans and other policy through regional environmental conferences while also working toward the resolution of local issues. Environmental representatives were appointed in China (Shanghai) and Europe (Belgium) in 2006 to promote globalization. Environmental conferences were held during fiscal year 2010 in China (Shanghai), Europe (Belgium), and Americas (San Francisco) to share information about the latest environmental regulations.

Globalization of Environmental Communication

With mutual communication with stakeholders as its aim, Hitachi runs exhibitions and eco-conferences and posts information about its environmental activities on web sites.

Hitachi was involved with a number of events in fiscal year 2010 using the "aim of achieving a more sustainable society" as a common concept in both Japan and elsewhere. In Japan, it exhibited at events such as Eco-Products 2010 (see Fig. 6) and Messe Nagoya 2010 which coincided with the COP 10 meeting. Overseas events included Hitachi Eco Conference 2010 (Singapore), a private event for Hitachi, as well as the 2010 International Greentech & Eco Products Exhibition & Conference (Malaysia) and the Eco-Products International Fair 2011 (India).

As part of this communication, Hitachi also submitted its environmental activities to objective assessment by external agencies and received feedback based on the assessment results. For example, Hitachi, Ltd. is included in the DJSI (Dow Jones Sustainability Indexes) World index, one of the world's leading socially responsible investment fund indices, and it repeated its 2009 achievement of receiving the top score in the environmental index. The index includes 318 companies from around the world including 30 from Japan.

Fig. 6—Eco-Products 2010 (Tokyo Exhibition). The theme of Hitachi's exhibit was, "Towards a sustainable society: contributing to environmental conservation through business." Hitachi won an "Eco and Design Booth Prize" excellence award in recognition of its environmentally conscious booth.

Hitachi won the Minister's Prize, the Ministry of Economy, Trade and Industry for its "environmentally conscious escalators and escalator upgrade methods" at the 7th Eco Products Awards in fiscal year 2010 and the Minister's Prize, the Ministry of Land, Infrastructure, Transport and Tourism for Hitachi's ballast water purification system. Meanwhile, six Hitachi workplaces were selected in the "Green Top 100 Companies Contributing to the Protection of Biodiversity."

OVERVIEW OF THIRD ENVIRONMENTAL ACTION PLAN

Hitachi's Third Environmental Action Plan which runs from fiscal year 2011 to fiscal year 2015 was formulated to build on the initiatives from the

TABLE 1. Hitachi's Third Environmental Action Plan (Summary)
In addition to raising the reduction targets for all of the activities in the environmental action plan, the plan also incorporates measures such as strengthening its global deployment.

Category	Action target	Measurement	Target for final year (2015)
Supply of next-generation products and services			
Promotion of eco-products	Contribution to 100-million-t reduction in CO_2 emissions by products	Reduction in annual CO_2 emissions by products	35 million t (100 million t by 2025)
	More Eco-Products	Eco-Products as a proportion of total sales	65%
Factories and offices with a high level of consideration for the environment			
Prevention of global warming	Reduction in CO_2 emissions	Reduction in CO_2 emissions (Japan domestic) (Relative to fiscal year 1990)	20%
	Improvement in unit CO_2 emissions	Total production CO_2 emissions Unit reduction (relative to fiscal year 2005) (global)	10%

second plan, strengthen its global deployment, and incorporate measures such as ecosystem preservation. The environmental burden reduction targets for all of the activities in the environmental action plan were also raised (see Table 1).

Strengthening of Global Environmental Business

As economic activity becomes more global, there is also a growing need for a more global approach to environmental problems.

Smart advanced urban development is an important field that aims to provide things like electricity distribution systems that bring us closer to a low-carbon society and environmentally conscious urban development that achieves optimal informational control of such systems. Hitachi is also working to improve the energy efficiency of products such as railways and vehicles, to develop energy-efficient solutions for industry and devices such as home electronics that realize "eco-life," and also to develop the advanced functional material that support these. Hitachi is also enhancing its environmental solutions for water which help protect the ecosystem.

Contribution to Ecosystem Protection

Two things that Hitachi is doing to protect the ecosystem are: (1) contributions through business, and (2) contributions to society through nature conservation. To facilitate these activities, Hitachi expressly referred to protection of the ecosystem in its Action Guidelines for Environmental Conservation in 2010 which specifies action guidelines for activities such as product development carried out by its staff. Specifically, this involves publishing and promoting an ecosystem protection handbook for the group.

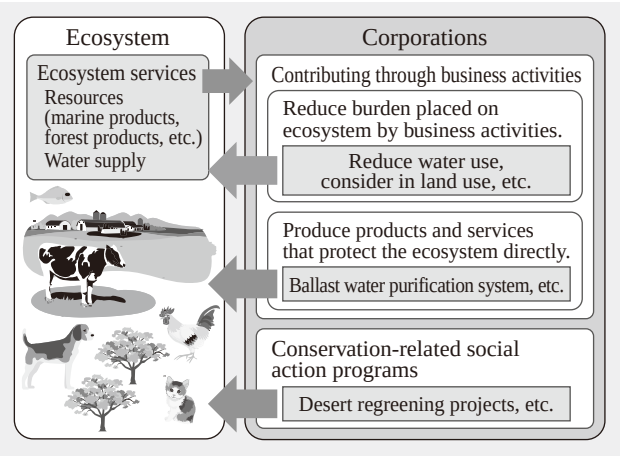


Fig. 7—Relationship between Ecosystem and Corporations. Production by corporations depends on ecosystem services from the ecosystem. Ways in which corporations can protect the ecosystem include taking account of and acting for the benefit of the ecosystem in their business and through social action programs.

Fig. 7 shows the relationship between corporations and the ecosystem. Corporations depend on ecosystem services and the benefits received from the ecosystem such as the water used in factories or the use of paper in the production process. One way in which corporations can contribute through their business activities is to reduce the burden that this activity places on the ecosystem through the life cycle of a product. They can also contribute by producing products and services that protect the ecosystem directly such that the functions of the products themselves have a positive influence on the ecosystem. Examples include products that purify water or clean the air.

In addition to these contributions that come about through a corporation's business activities, an example of a conservation-related social action program is volunteer conservation work such as tree planting by employees.

An example of how a task such as the research and development of IT (information technology) equipment can be incorporated into conservation work is the IT Eco Experimental Village nature restoration project launched in April 2011 as part of the GeoAction100(e) global environmental action plan of Hitachi's Information & Telecommunication Systems Company (see Fig. 8). The idea of the project involved a model site and the transformation of what was once disused farmland into a nature-rich "satoyama" (a wooded hill near a populated area) to demonstrate how natural environments could be reclaimed. The intention is to help protect the ecosystem by using IT for tasks such as monitoring when using human intervention to bring an ecosystem back to life.

In the field of ecosystem-related activities which it jointly chairs at the World Business Council for Sustainable Development (WBCSD), Hitachi also participated in the preparation of the Corporate Ecosystem Valuation (CEV) Guide, a quantitative assessment method for ecosystem protection in business activity. Hitachi intends to use this guide

(e) GeoAction100
A plan for contributing to the global environment by Hitachi's Information & Telecommunication Systems Company which was formulated to help implement Hitachi's Environmental Vision 2025 long-term plan. The plan lays out Hitachi's intentions for environmental activity in its information and telecommunications business including verifying the effectiveness of IT for presenting information about CO_2 emissions by IT products, strengthening product recycling schemes, and protecting the ecosystem. The key pillars of the plan are: "Prevention of Global Warming," "Conservation of Resources," and "Preservation of Ecosystems."

URL: http://www.hitachi.co.jp/environment/iteco/index.html

Fig. 8—Web Site for "IT Eco Experimental Village," a GeoAction100 Nature Restoration Project. Information about the IT (information technology) Eco Experimental Village project, which draws on the capabilities of IT to help restore the natural environment, is published on a web site in Japanese.

together with the earlier Corporate Ecosystem Services Review (ESR).

Strengthening Global Environmental Management Incorporating CO_2 "Visualization"

Regarding CO_2 "visualization," Hitachi plans to expand environmental information systems to meet demands from stakeholders to provide access to information about greenhouse gas emissions.

The certification criteria for the new "Eco-Products Select" certification system have been updated to include the achievement of a significant rate of CO_2 reduction by products. Certification levels have also been set for the "Eco-Factories and Offices Select" scheme with separate criteria adopted for factories and offices to reflect their different characteristics. Increasing the number of certified products and certified factories and offices will assist in further reducing the burden on the environment.

HELPING BUILD SUSTAINABLE SOCIETY

The recent earthquake has been a reminder of the importance of social infrastructure to people's lives. Hitachi will help to restore stability to life in Japan by supplying products and services in which social infrastructure plays a central role and undertaking initiatives such as rebuilding towns in which people can live with confidence.

Hitachi, which celebrated its 100th anniversary in 2010, has a Corporate Credo of contributing to society through the development of superior, original technology and products based on its founding spirits of "Harmony," "Sincerity," and "Pioneering Spirit." With 2011 being the foundation year for its next century, Hitachi has formulated its Third Environmental Action Plan (which commences in fiscal year 2011) and started work toward its goals. In addition to assisting with earthquake reconstruction, Hitachi will continue to help build a sustainable society through ongoing measures for dealing with global-scale environmental problems.

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ABOUT THE AUTHORS

Manabu Hirano
Joined Hitachi, Ltd. in 1977, and now works at the Environmental Strategy Office. He is currently engaged in helping develop strategic environmental policies for the Hitachi Group. Mr. Hirano is a member of The Institute of Life Cycle Assessment, Japan (ILCAJ).

Yasunori Nagaoka
Joined Hitachi, Ltd. in 1990, and now works at the Environmental Strategy Office. He is currently engaged in helping develop strategic environmental policies for the Hitachi Group and working for the preservation of the ecosystem.

Takeo Morimoto
Joined Hitachi, Ltd. in 1984, and now works at the Group Management Planning Office. He is currently engaged in planning of Hitachi Group strategy.

Chiseki Haginoya, Dr. Eng.
Joined Hitachi, Ltd. in 1994, and now works at the Energy & Environment Group, Second Research Department, Hitachi Research Institute. He is currently engaged in conducting societal and market trend surveys and developing strategic business plans relating to energy and environmental issues. Dr. Haginoya is a member of the American Economic Association (AEA) and The Japan Society of Applied Physics (JSAP).