



NTT Group CSR Report 2010

CSR reporting policy

We publish this report in both printed and Web versions according to the respective features of these media so as to better address the needs of our stakeholders.



During fiscal 2007, the NTT Group established the NTT Group CSR Charter to provide fundamental guidelines to enable better implementation of NTT Group CSR activities. We report on the various CSR activities that we are implementing under this Charter both on our website and in printed form.

Focus on new and important initiatives

We edit the printed report with the aim of presenting the highlights of our CSR activities in a way that will be easily readable to a wide audience.

Comprehensive presentation of diverse activities along with detailed data

We leverage the capacity and searchability of the Web as a medium to report on a wide range of activities in as much detail as possible.

Website



We regularly update our CSR website to provide the latest information on NTT Group CSR activities in a timely fashion. The latest information can be seen in the Topics section on the top page of the site.

http://www.ntt.co.jp/csr_e/

http://www.ntt.co.jp/csr_e/2010report/download/

activity examples than the printed version (which is available in Japanese only).

About the CSR website: The CSR website has been designed according to NTT official homepage guidelines and evaluated by NTT CLARUTY employees with visual and hearing impairments and other employees with disabilities. NTT CLARUTY applied its accessibility checklist to the design of the website to help ensure that it is accessible to elderly users and people with disabilities.

Reporting scope

Period: April 1, 2009 to March 31, 2010

Certain activities implemented after March 31, 2010 and outlook for the future are also included.

Organization: NTT and the NTT Group companies (536 companies)

- The figures given for the NTT Group in fiscal 2010 are tabulated from figures for NTT, NTT East, NTT West, NTT Communications, NTT DATA, NTT DOCOMO, and their group companies (536 companies).
 The scope of specific reports is noted in relevant areas.
- Organization names are current as of March 31, 2010. However, some organization names are from fiscal 2011.

Month published: December 2010

Previously published: November 2009

Next report: November 2011 (provisional)

Reference guidelines

This report has been created with reference to the GRI (Global Reporting Initiative) Sustainability Reporting Guidelines 2006 and the Ministry of the Environment's Environmental Reporting Guidelines FY2007 Version.

CSR Report 2010 (this PDF file)

Providing an easily readable PDF edition of the content of the CSR Report 2010

We publish this CSR Report 2010 (English version) as a PDF based on the content of the NTT Group CSR Report 2010 website (available in Japanese only) that provides a comprehensive account of our CSR activities.

This CSR Report 2010 (English version) contains more detailed information than the printed report (available in Japanese only), packaged in an easily readable PDF format. In addition to detailed environmental data, we have included as many examples of activities as possible.

The CSR Report 2010 website also carries a PDF version of the supplement introducing our initiatives for the conservation of biodiversity that we published as a separate pamphlet from the printed report.

Contents

CSR reporting policy Message from the President Dutline of the NTT Group NTT Group CSR	- 1 - 3 - 5 - 6
Special feature environment up to fiscal 2021	7
CSR management	17
Communication between people and their communitie Activities that contribute to the further evolution of ubiquitous communications 1 Activities that contribute to the further evolution of ubiquitous communications 2	25 28
Communication between people and the global environment Basic policies and management system Environmental impacts overview Results and assessments for goals in fiscal 2010 Mitigation of global warming 1: Green of ICT Mitigation of global warming 2: Green by ICT Waste reduction and reduction of paper consumption Conservation of biodiversity Environmental data	1t 32 33 34 36 40 46 49 52
Safe and secure communication Ensuring stable and reliable services as critical infrastructure Ensuring information security Team NTT communication	54 56
Activities that contribute to respect for diversity and equal opportunity Working as one on corporate citizenship activities	62 64
million party opinion / Our response	0/

About the contents

- In this report, NTT refers to NIPPON TELEGRAPH AND TELEPHONE CORPORATION, NTT Group refers to NTT and its group companies, and NTT [name] refers to individual companies within the NTT Group.
- Should any errors be found in this report after publication, a report and table of errata will be provided on our website.
- The contents of this report refer not only to past events, but also cover

future plans and forecasts at the time of publication. Such descriptions include assumptions and judgments based on information that was available at the time of printing. Please note that actual future activities and results may differ from those described herein.

• The names of services and products appearing in this report are the registered trademarks or trademarks of NTT and NTT Group companies.

We are working as one to fulfill

our corporate social responsibility and contribute to the sustainable growth of society as we drive our evolution into a Service Creation Business Group.

Satoshi Miura

Satoshi Miura President & CEO NIPPON TELEGRAPH AND TELEPHONE CORPORATION

Driving our evolution into a Service Creation Business Group

Under our "Road to Service Creation Business Group" Medium-Term Management Strategy announced in May 2008, we at the NTT Group are working to expand ubiquitous broadband services as a responsible member of the information and telecommunications industry.

Information and communication technology (ICT) is evolving at a breakneck pace, and the market is undergoing a paradigm shift as globalization intensifies alongside the spread of ubiquitous broadband services. Cloud computing, which enables the use of all kinds of information services anywhere at any time, is one such example, with both Japanese and overseas vendors now offering diverse content and applications. This evolution has been driven by the spread of fixed broadband access through fiber optic and other networks, and mobile broadband access through 3G mobile phones, wireless LAN, and other means.

As we continue to further expand these networks, which constitute the infrastructure for our services, we at the NTT Group will work with our many different partners and marshal our collective strengths to create new services and help to drive economic growth through innovation. We will also strive to contribute to the creation of a low carbon society — a top CSR priority — and to the resolution of many other social issues. We will continue to fulfill our corporate social responsibility by promoting the utilization of ICT to create a prosperous society and drive sustainable growth.

Leveraging ICT to address social issues

We are taking three approaches in our efforts to help create a low carbon society — Green of ICT, Green by ICT, and Green with Team NTT. Our Green of ICT approach entails reducing the environmental impacts of our own business activities and ICT utilization through developing more energyefficient data centers and telecommunications equipment. Green by ICT entails promoting the utilization of ICT for teleworking, videoconferencing, and other applications that help to reduce environmental impacts across society as a whole. Green with Team NTT refers to the efforts of NTT Group employees to reduce environmental impacts in their workplaces, homes, and local communities. In fiscal 2011, we have formulated THE GREEN VISION 2020, a new vision for the environment to guide and drive our efforts to further reduce environmental impacts up to fiscal 2021.

In addition to environmental issues, ICT can also help us to provide better medical treatment and nursing care, improve education, and address many different social issues such as those related to an aging and shrinking population. Other countries are almost certain to face similar problems, and we could make a valuable contribution to the world as a whole by leading efforts to develop solutions that could then be utilized to advantage in other countries.

Responding to the expectations of our stakeholders

In fiscal 2010, the whole NTT Group worked as one to enhance CSR activities in line with our NTT Group CSR Priority Activities, but the year was also marked by incidents involving the inappropriate handling of customer information. We take such issues very seriously, and are making every effort to strengthen our information management practices and compliance to ensure the appropriate execution of our business operations.

In fiscal 2011, Japan is hosting the tenth meeting of the Conference of the Parties on the Convention of Biological Diversity (COP10) and the ISO 26000 international standard for social responsibility is slated for release. We recognize that corporate social responsibility is an increasingly important imperative throughout the world, and we will maintain and enhance our ongoing efforts to conserve biodiversity, raise awareness concerning human rights, and otherwise fulfill our responsibilities with respect to society.

We place high value on engagement with our stakeholders, and we hope that you will not hesitate to offer your candid views and suggestions regarding our activities.

Outline of the NTT Group

Under our "Road to Service Creation Business Group" vision, we are creating and deploying customer-oriented ubiquitous broadband services on a full IP network infrastructure.



1. Percentage of the simple sum of all segments (Includes intersegment transactions) 2. Percentage of total NTT Group employees

1,117.7

2010

(Year ended March 31)

1,109.8

2009

Operating revenues Operating income (in billions of yen) (in billions of yen) 12,000 1.600 10 741 1 10,760.6 10,680.9 10,416.3 10,181.4 1,200 9,000 6,000 800 3.000 400

2008

2009 **2010** (Year ended March 31)

2009

Net income



In accordance with Accounting Principles Board ("APB") Opinion No. 18 "The Equity Method of Accounting for Investments in Common Stock", NTT has retroactively applied the equity method of accounting to prior years for an investment in an affiliate, following the acquisition by the NTT Group of additional shares of the affiliate during the fiscal year ended March 31, 2008. Accordingly, figures for the fiscal years ended March 31, 2006 to March 31, 2007 have been retroactively adjusted from previously announced figures.

13046

2008

1.190.7

2006

1,107.0

2007

2006

2007

NTT Group CSR

Guided by the NTT Group CSR Charter, NTT is committed to promoting CSR activities across the Group that meet the expectations and interests of its stakeholders.

NTT drew up the NTT Group CSR Charter in June 2006 as a basic guideline for the more active implementation of CSR activities by Group companies.

The NTT Group CSR Charter consists of a statement of our commitment to corporate social responsibility, and the four CSR goals that outline specific priority aspects of our CSR activities.



CSR Priority Activities

NTT Group CSR Charter

Our Commitment

As a leader of the information and telecommunications industry, the NTT Group is committed to providing reliable, high-quality services that contribute to the creation of a safe, secure and prosperous society through communications that serve people, communities, and the global environment.

Our CSR Goals

Communication between people and their communities	1. We shall strive to create a richer and more convenient communications environment, and utilize our technology to contribute to the resolution of the various issues faced by societies with aging and declining populations.	 Activities that contribute to the further evolution of ubiquitous communications pp. 25, 28
Communication between people and the global environment	2. We shall strive both to reduce our own environmental impacts and build environment- friendly forms of communications, and to provide information and communications services that help to reduce the impact of society as a whole on the global environment.	 Mitigation of global warming pp. 36, 40 Waste reduction p. 46 Reduction of paper consumption p. 46
Safe and secure communication	 While striving earnestly to ensure information security and resolve telecommunications- related social issues, we shall do our utmost to provide a safe and secure user environment and contribute to the creation and future development of communication culture. Fully recognizing the role that telecommunications plays as critical infrastructure supporting society and protecting our livelihoods, we shall strive to offer secure and reliable telecommunications services fortified to withstand disasters and capable of connecting people irrespective of time, location, and other circumstances. 	 Ensuring information security b p. 56 Ensuring stable and reliable services as critical infrastructure b p. 54
Team NTT communication	5. All of us on Team NTT pledge to perform our duties with pride and a keen sense of responsibility in compliance with the highest of ethical standards, striving to fulfill our mission to society by working both for our own development as professionals, and for the further development of a flourishing and vibrant community Team NTT comprises all NTT Group employees, including temporary employees, contract employees, employees of our corporate partners, and also former employees who endorse the NTT Group's CSR activities.	 Activities that contribute to respect for diversity and equal opportunity ▶ p. 62 Corporate citizenship activities ▶ p. 64

Special feature

The NTT Group's new vision for the environment up to fiscal 2021

The NTT Group has endeavored to protect the environment through the three priority activities of mitigating global warming, reducing waste, and reducing paper consumption. In November 2010, we added the conservation of biodiversity to these priorities, and drew up THE GREEN VISION 2020 as a new vision to guide our efforts for the environment up to fiscal 2021. Going forward, all group members will work as one to achieve the goals of this new vision.

NTT Group CSR Priority Activities http://www.ntt.co.jp/csr_e/csrmanagement01.html

THE GREEN VISION 2020 The three approaches of the NTT Group's vision for the environment up to 2020

The NTT Group will continue to leverage ICT and the combined talents of its workforce to contribute to the sustainable development of society. We intend to focus our efforts for the environment up to 2020 particularly on the three themes of creating a low carbon society, implementing closed loop recycling, and conserving biodiversity, and will drive those efforts through the three approaches of "Green of ICT", "Green by ICT", and "Green with Team NTT".

Timeline of the NTT Group's environmental initiatives

• 1987	Launched Save POWER campaign	The NTT Group established its NTT Global E	nvironment Charter in 1991, and has long
	as an initiative to reduce electricity consumption	worked to protect the environment. We late	er set targets to be achieved by fiscal
• 1991	Established the NTT Global Environment Charter Created a system for groupwide environmental protection efforts	2011 under our NTT Group Principal Activity Environmental Contribution. Now that we h added the conservation of biodiversity to th	y Plan Targets and NTT Group Vision for nave achieved all of those targets, we have ne basic policies of our NTT Group Global
• 1997	Launched Total Power Revolution (TPR) campaign Uniting group companies behind efforts to curb electricity consumption	Environmental Charter, and have drawn up activities up to fiscal 2021.	a new vision to guide our environmental
• 1999	Established the NTT Group Global Environmental Charter	NTT Group Global Environmental Cha	rter
	Established the NTT Group Principal Activity Plan Targets	Basic principle	
	(to be achieved by fiscal 2011)	To ensure the harmonious co-existence of	of people with nature and to achieve
	Reduction targets for: • Greenhouse gases related to telecommunications equipment electricity consumption	sustainable growth, we will do our utmos our corporate activities.	st to protect the global environment in all
	Waste generated in offices and through the construction/removal of	Basic policies	
	telecommunications equipment • Telephone directories and other paper resources	1. Compliance with laws and regulations and fulfillment of social responsibilities	4. Developing environmental technologies 5. Social contribution efforts
• 2006	Established the NTT Group Vision for Environmental Contribution	2. Reducing environmental loads	6. Disclosure of environmental information
	Launched initiatives to reduce the environmental impacts of customers and society as a whole through developing and deploying ICT services	3. Establishing and maintaining environmental management systems	7. Conservation of biodiversity (added in fiscal 2011)
• 2010	Established THE GREEN VISION 2020		
\downarrow			

The NTT Group's three themes for the environment

The three themes of our new vision for the environment specify the environmental issues on which we feel that we should put greatest priority, and set concrete targets. For example, where the theme of creating a low carbon society is concerned, we aim to reduce the CO₂ emissions of domestic group companies and to reduce the CO₂ emissions of society as a whole through the provision of ICT services. Similarly for the themes of implementing closed loop recycling and conserving biodiversity, we have set specific policies and quantitative targets, and aim to contribute to the sustainable development of society through achieving them.



Implementing three approaches

In THE GREEN VISION 2020, the NTT Group proposes the three approaches of "Green of ICT", "Green by ICT", and "Green with Team NTT". "Green of ICT" refers to efforts to reduce the environmental impacts of our own business activities. "Green by ICT" refers to our efforts to reduce CO₂ emissions across society through providing ICT services. "Green with Team NTT" refers to efforts by group employees and their families to work with local communities to help protect the environment.

0F

BY

WITH

Green **OF** ICT

Caring for the environment in our business activities

Green **BY** ICT

Reducing environmental impacts across society through products and services

Green WITH Team NTT Protecting the environment together with our employees, their families, and local communities

Green with Team NTT initiatives

Policy for environmental contribution activities

In addition to our business activity-based initiatives, we encourage all of our employees to reduce environmental impacts by participating in eco-friendly activities in their homes and local communities as well as workplaces.

Specific activities

- Promotion of Operation Clean Environment and other activities to help keep local communities clean and attractive
- Promotion of 3R activities such as bring-your-own-cup and plastic bottle cap recycling
- Promotion of household eco-accounting and energy saving to reduce household CO₂ emissions
- Use in private life of eco-driving techniques gained through company training

Theme

OF

BY

WITH

Creating a low carbon society

Reducing NTT Group CO₂ emissions **OF**

 Curb emissions by at least 2 million t-CO₂ from the projected 2020 level so as to reduce total emissions by at least 15% (600,000 t-CO₂) from the fiscal 2009 level.

Reducing CO₂ emissions across society

• Help to reduce emissions across society as a whole by over 20 million t-CO2 through providing ICT services.



Example: **Green NTT** initiative to deploy solar power systems throughout the group

The NTT Group is implementing Green NTT, an initiative for promoting the use of renewable, eco-friendly energy, and plans to expand its deployment of solar power systems to achieve a scale of 5 MW over the whole group by fiscal 2013.





Example: The **TPR campaign** to unite group companies behind efforts to reduce electricity consumption

As part of its efforts to reduce CO₂ emissions generated by its business activities, the NTT Group has since 1997 been striving to reduce office and telecommunications equipment electricity consumption under its groupwide Total Power Revolution (TPR) campaign.

Other initiatives

- Installation of energy-efficient devices based on the NTT Group **Energy Efficiency Guidelines**
- Construction of data centers that employ the latest energy conservation technologies
- Conservation of energy consumed by company vehicles and material distribution
- R&D focused on energy conservation technologies

Example: Reducing travel-related energy consumption by providing videoconferencing systems

The NTT group provides network services for the simultaneous connection of videoconferencing terminals at multiple locations. The spread of videoconferencing will help to reduce the environmental impacts of travel to attend meetings in person.



Other initiatives

- Expanded use of networks for electronic bidding and application submission
- Introduction of systems for the visualization of CO2 emission reduction benefits of ICT services
- Participation in international standardization of methods for objectively assessing CO₂ reduction benefits
- Use of ICT to reduce CO₂ emissions by optimizing control of distributed power sources, power grids, user devices, and other equipment

Example: Reducing household CO₂ emissions through encouraging household eco-accounting and energy conservation

We are encouraging NTT employees to reduce CO₂ emissions at home through encouraging the use of eco-accounting methods for measuring household CO2 emissions and other household energy conservation methods.



Other initiatives

Promotion of eco-driving

R&D for reducing CO2 emissions

NTT Group research laboratories are conducting research in many different areas aimed at developing technologies for reducing CO₂ emissions.

Creating more energy-efficient telecommunications networks

We are working on the development of technologies for curbing the electricity consumed by telecommunications and cooling equipment to create more energy-efficient telecommunications networks. We are also



conducting research on ways of further limiting the electricity consumed by networks in the future, including the use of hybrid optoelectronic routers to effect major reductions in electricity consumption by minimizing conversion from optical to electrical signals, and technologies for further boosting transmission speeds, capacity and efficiency of operations.

More efficient telecommunications in the office and home

Because telecommunications devices are in use around the clock, even small improvements can result in large energy savings, and so we are developing advanced energy-saving technologies to apply to optical network units (ONU) and home gateways for reducing the electricity consumed by telecommunications in the office and home.

Hybrid optoelectronic router

Internet



NTT telecommunications facility Office

Home

Saving energy in data centers and telecommunications facilities

We are conducting research on high voltage DC power supply systems for the more efficient supply of electricity to telecommunications devices used in NTT data centers, telecommunications facilities, and offices.

We are also developing energy management technologies for utilizing ICT to enable the visualization of electricity consumption and environmental impact reduction benefits.



Developing future groundbreaking technologies

We are studying revolutionary telecommunications device and optical component technologies for creating ultra-

energy-efficient telecommunications devices moving forward, including such cutting edge technologies as single electron devices capable of controlling the movements of single electrons, and logic devices composed of nanomechanical logic gates.



A single electron device

High voltage DC power supply system

Implementing closed loop recycling Theme

Waste reduction

- Reduce final disposal waste to 2% of total waste or less
- Continue to achieve zero emissions* for all removed telecommunications equipment
 - * A concept proposed by the United Nations University that calls for reusing all waste materials and by-products from industrial activity as resource inputs for other types of production in order to eliminate waste on a lifecycle basis. The NTT Group considers a final disposal rate of 1% or less to satisfy zero emissions conditions.



Paper resource reduction





Example: Reuse or recycling of **telephone poles**, **cables**, and other telecommunications equipment

The NTT Group needs to remove telephone poles, switching equipment, cables, and other communications equipment when it reaches the end of its service life or is replaced during system upgrades for new services and so forth. We promote the reuse and recycling of such removed communications equipment within the Group.



Other initiatives

- Intermediate processing of waste from construction sites to eliminate the direct disposal of waste in final disposal sites
- Closed-loop recycling of old telephone directories to manufacture paper for new directories

BY

WITH

0F

Example: Reducing paper consumption by providing ICT services and solutions

Increasing use of videoconferencing eliminates the need for so many printouts of meeting materials. Similarly, payment of public utility and other charges by direct debit eliminates the need for paper statements, etc. NTT helps to reduce paper consumption across society by providing such ICT services and solutions.



Other initiatives

- PC reuse and recycling program
- Elimination of unnecessary telephone directory disposal through asking customers beforehand if they need directories
- Expansion of electronic billing (e-billing service)

Example: Collection and recycling of mobile phones and other used equipment

Mobile phones contain gold, silver, copper, palladium, and other minerals that make them a valuable recycling resource. NTT DOCOMO collects used phones, battery packs, and chargers not only from its customers, but also from NTT Group employees and their families. These items are recycled together with the used phones of customers to recover resources.



Other initiatives

 Expansion of plastic bottle cap collection activities

Theme 3 Conserving biodiversity

The NTT Group's policy for biodiversity

Implementation based on business activities

Recognizing the close ties between human activities and biodiversity, we will monitor the scope and impact of our business activities both in Japan and overseas according to their features, and implement initiatives shown to benefit the conservation of biodiversity on a sustained basis.

Implementation based on social contribution

We will work with stakeholders to broadly implement initiatives for conserving biodiversity irrespective of their relevance to our business, and report the results of these efforts.

0F

BY

WITH

Example: Preserving ecosystems and reducing environmental impacts in the maintenance of wireless base stations

In the maintenance of its wireless base stations, the NTT Communications Group not only strictly adheres to relevant laws and regulations, but also uses its own environmental assessment methods to protect biodiversity, following original guidelines for site and access road surveys, planning, design, and construction stages to protect nesting areas and minimize disturbance of animal trails and vegetation.



Other initiatives

- Green procurement of paper and other resources required for our business
- Continued efforts to minimize use of water and other resources

Example: **Dissemination of information through** *Kankyo goo*, Wildlife Information Center, and other **websites**

The NTT Group endeavors to disseminate information on biodiversity. For example, NTT Resonant contributes to environmental protection through its *Kankyo goo* environmental portal, and NTT DATA has donated Wildlife Information Center, a website that it created to collect observations and other information on familiar wildlife from throughout Japan, to the Nature Conservation Society of Japan.



Other initiatives

 Leveraging original technologies and research findings to enhance initiatives through services

Example: Forest improvement activities with the cooperation of employees, their families, and former employees

NTT Group companies conduct a range of forest conservation activities, such as NTT DOCOMO's docomo Woods and NTT COMWARE's Company Forest NTT COMWARE (Ome). These initiatives, which bring NTT employees and their families together with members of local communities to carry out forest improvement activities, serve to protect and nurture forests and woodlands that support biodiversity.



Other initiatives

- Promotion of participation in Operation Clean Environment and other community cleanup activities
- Participation in Mt. Fuji cleanup activities
- Environmental education activities through terraced paddy field restoration project

Kaoru Kanazawa, Senior Executive Vice President talks with Professor Yoichi Kaya.

The future as reflected in the NTT Group's new vision for the environment

The NTT Group is on track to achieve the targets for reducing environmental impacts up to fiscal 2011 set forth in its Principal Activity Plan Targets, and has drawn up a new vision for the environment to guide its activities up to fiscal 2021. The new vision sets targets for fiscal 2021 in the three areas of creating a low carbon society, implementing closed loop recycling, and conserving biodiversity. NTT Vice President Kaoru Kanazawa talks here with Professor Yoichi Kaya, Senior Vice President of the Research Institute of Innovative Technology for the Earth, about how the NTT Group should endeavor to serve society through its business activities as it strives to meet its new environmental targets.

Green of ICT: Creating a low carbon society Achieving the fiscal 2011 global warming mitigation targets

Kaya: NTT set itself fairly stiff CO₂ emission reduction targets of 35% per subscriber for its telecommunications carriers and 25% per unit of sales for other group companies, but I hear that it is going to reach these targets in fiscal 2011. I think that's a tremendous achievement, and I'd like to know whether it was easy, or whether it's the result of some really serious toil. Kanazawa: We set our targets by adding some ambitious elements to what we considered to be achievable levels. We made it to where we are now as a result of our efforts in many different directions to reduce the amount of power consumed in our business activities. However, some elements have changed. For example we use the number of subscribers as the denominator for our telecommunications carriers, and in our base year of 1990, our mobile phone business had only just begun, whereas now we have over 50 million subscribers.

Kaya: So the individual subscriber is your basic unit for expressing CO₂ emissions?

Kanazawa: Yes. It's more usual to use something like production volume or revenues, but we felt that emissions per subscriber is an easier concept to grasp where telecommunications carriers are

concerned. However, we use sales as the denominator for nontelecommunications group companies like NTT DATA and NTT COMWARE.

Kaya: I see.

Aiming to reduce CO $_2$ emissions by at least 15% by fiscal 2021 under the new vision

Kaya: Under your new vision, you're aiming for a 15% reduction from the fiscal 2009 figure for total CO₂ emissions from your own business activities — your "Green of ICT" approach — by fiscal 2021. Is reducing electricity consumption the main component of



this effort?

Kanazawa: Yes. Electricity accounts for over 90% of the power consumed by NTT, and since we'll be building more data centers and other facilities in line with business expansion, we'll see

electricity consumption — in other words, CO₂ emissions — rise along with subscriber numbers unless we make conscious efforts to further reduce them.

Kaya: Yes, if your business expands, your electricity consumption is sure to rise considerably, which of course also means higher

CO₂ emissions. That's why you're aiming for a 15% reduction. But how does this square with the government's target of 25% reduction by fiscal 2021? The base year for that 25% is fiscal 1991, which works out at close to 30% compared with fiscal 2009, so isn't 15% a pretty easy target?



Kanazawa: We did all sorts of calculations, and decided that a 25% reduction was not a realistic target. We felt that if we were going to set a target, it needs to be one that is achievable if we make the effort.

Kaya: Governments tend to set the target up front, and then think about how to achieve it, while businesses tend to think first about how they can achieve reductions, and then set targets accordingly, and so I guess it's only natural that your respective targets differ. But this example brings home how high the government's target is.

Kanazawa: Going forward to fiscal 2021, we'll reduce CO₂ emissions through both our "Green of ICT" and "Green by ICT" approaches.

Green by ICT: Creating a low carbon society Achieving the fiscal 2011 reduction target of 10 million tons of CO₂

Kaya: And what about your "Green by ICT" approach? This concerns indirect reductions in energy consumption that you enable by, for example, providing videoconferencing systems to businesses and such like, as opposed to reduction of your own energy consumption. How exactly do you measure these reductions?

Kanazawa: Taking videoconferencing as an example, we compare the amount of energy required for travel to and from a meeting with the ICT energy consumed by a videoconference to calculate CO₂ emission reductions. We also estimated reductions from teleworking, remote healthcare, and other such applications, and set ourselves the target for fiscal 2011 of reducing CO₂ emissions across society by 10 million tons.

Kaya: Ten million tons is almost 1% of Japan's total CO₂ emissions. I really do think that ICT can have a big impact on reducing CO₂ emissions in the present age.

Helping to reduce CO₂ emissions by over 20 million tons by further expanding ICT utilization by fiscal 2021

Kaya: Looking ahead, what kind of things do you think could best help to save energy?

Kanazawa: Easy examples include electronic invoicing using the Internet, teleworking, videoconferencing, remote healthcare, and electronic application procedures. Ebooks, electronic publishing and such like also help reduce CO₂ emissions that would otherwise be generated in conjunction with printing and transport, since paper would no longer be necessary.

Kaya: I can see the potential, but when I think of the amount of paper that I use myself, I can't help feeling that ICT doesn't help that much. Don't you have any such concerns about the benefits of ICT use?

Kanazawa: Well, take videoconferencing. I've been told that it could actually increase travel, since people who've hit it off through videoconferencing will be more likely to want to meet face to face.



However, while I too had my doubts about ten years ago, the quality of the latest videoconferencing has improved to such an extent that you really do feel as if you're sharing the same space. **Kaya:** I must admit that the

videoconferences that I've taken part in at a company where I serve as an outside director felt very natural, and people's facial expressions came across very clearly. Is teleworking taking off? **Kanazawa:** I think it's becoming more and more common among people taking childcare leave and people with disabilities and such like. We too are promoting teleworking within the company to set an example for others.

Kaya: I'd like to see increasing use of teleworking and videoconferencing. Has any research been done on the extent to which they could replace more conventional work styles?
Kanazawa: We've identified occupations that would best be suited to teleworking. We're starting with job areas such as R&D sections where people have a relatively free hand in deciding how they work, and with female employees raising small children.
Kaya: I think that your fiscal 2021 target of a CO₂ reduction of 20 million tons across society through "Green by ICT" is pretty

ambitious. Do you really see increasing use of videoconferencing and teleworking leading to such CO₂ reductions?

Kanazawa: Yes, I do. Remember that use of various electronic media will also reduce paper and other energy consumption. Then there's the spread of smart grids, which will better enable both businesses and households to manage their energy consumption by making it more visible. In the healthcare field too, remote medical treatment, digital receipts, and such like will bring further reductions. Since we can't implement most of these applications on our own, we plan to forge alliances with other companies and organizations to make them a reality.

Implementing closed loop recycling

Kaya: Let's talk about your efforts to implement closed loop recycling now. Your target of reducing paper consumption by 30% or more from your fiscal 2009 level is ambitious and deserves praise, but I can't help feeling that it's unattainable unless you make some quite drastic changes in your business practices. Are you taking any measures to change the mindsets of your employees?

Kanazawa: One example is the way almost all the documents prepared for the weekly directors' meeting are in digital form. We have stopped printing them out, and display them now on our PC screens. It felt strange at first, but we're used to it now. By instituting paperless meetings from the top, we aim to expand the practice to all meetings.

Kaya: That's excellent. I don't think paper consumption can be reduced unless a company is prepared to take such bold steps.Kanazawa: Making one change involves all sorts of other changes, but I think we can do quite a lot if we set our minds to it.Kaya: I hope that you can implement a lot more paper-saving digitization moving forward.

Conserving biodiversity

Kaya: The third area that you're focusing on is conservation of biodiversity. What exactly are you doing in this respect?
Kanazawa: We don't have any numerical targets in this area. However, we have to erect relay station steel towers on top of mountains or in national parks as part of our business operations, and carrying out environmental assessments and monitoring is the least we can do to fulfill our responsibilities.

Our group companies are also involved in various activities that contribute to conserving biodiversity. For example, NTT East is making use of its expertise in overhead cable stringing to create wildlife pathways that bridge roads so that little animals like Japanese dormice can cross safely and avoid getting run over.

NTT Communications disseminates information on the environment through its *Kankyo goo* portal site, and NTT DOCOMO conserves woodlands through its docomo Woods program. **Kaya:** So in effect each of



you is leveraging the word "biodiversity" to express your commitment to protecting the environment as it relates to your respective businesses.

Kanazawa: Yes. You might think that the NTT Group's business doesn't really have that much direct connection to biodiversity, but if you look into the details, there are all sorts of connections,

and we want to actively contribute in those areas by leveraging our technology and other resources.

About "Green with Team NTT"

Kaya: In addition to the "of" and "by" in "Green of ICT" and "Green by ICT", your vision for the environment also uses "with" as a keyword. What does this entail?

Kanazawa: We use it in "Green with Team NTT". Whereas "of" and "by" are concerned with reducing CO₂ emissions in and through our business, "with Team NTT" refers to efforts to reduce CO₂ emissions and other environmental impacts through activities outside our business. Team NTT means our employees and their families, former employees, and everyone else connected in some way or other to NTT. All these people represent a tremendous amount of manpower that is involved in all sorts of community activities such as cleanups and afforestation.

Kaya: I've always thought that involving employees and their families in activities other than production or product-related activities is important to businesses. When you consider that the families of people who support industry are ordinary consumers, then we're all really the same people. If companies instill awareness of environmental issues in their employees, they in turn will pass that on to consumers, and I'm sure it could have a great impact. In that sense, I think the way NTT includes environmental contribution activities by its employees and their



Professor Yoichi Kaya, Doctor of Engineering Senior Vice President of Research Institute of Innovative Technology for the Earth (RITE) Graduated from The University of Tokyo in 1957 and served as a professor of Electrical Engineering until 1995. He moved to Keio University in 1995 and served as a professor of Graduate School. He assumed current position in 1998. Field of specialization: system engineering on energy and environment.

promoting telecommunications as a means of saving on the movement of people and goods, and implementing specific ideas and innovations too.

Kaya: ICT can have tremendous impact, and so I'd like to see NTT actively communicating its value and promoting its spread.

Kanazawa: We will. The technology has now reached a level that can satisfy most people, and so now we'll be focusing on getting more and more people to use it. Kaya: In academia too, the number of

families in its activities is very worthwhile.

Kanazawa: That's the whole point of our "Green with Team NTT" concept. Our employees and their families are involved in Operation Clean Environment community cleanup activities, recycling, and all sorts of other activities too.

Closing comments

Kaya: Since NTT is part of the information rather than manufacturing industry, people tend not to associate it with CO₂ emissions and the environment, but by talking with you, I realize now that you could have quite a large impact, especially by developing energy-efficient data centers and such like. Also there are probably many people who think that the videoconferencing that came up in our discussion of "Green by NTT" will never replace face-to-face meetings, but when you think about it, exchanging information and meeting directly to foster mutual understanding are two different things. I'd like to see you actively international conferences is increasing all the time, and I often think that it would be great if we could use videoconferencing and other ICT to hold them. I look forward to seeing the NTT Group implement many more great ideas moving forward.



CSR management structure

Managing PDCA cycles with group companies according to the NTT Group CSR Priority Activities

NTT created a CSR Committee chaired by a Senior Executive Vice President in June 2005 to ensure the sustained and appropriate implementation of NTT Group CSR activities under two internal committees — the Global Environmental Protection Promotion Committee and Social Contribution Promotion Committee. Group CSR Liaison Meetings are also held periodically for group companies to share information on their initiatives and coordinate CSR activities across the whole Group.

In fiscal 2009, we established our NTT Group CSR Priority Activities and drew up our Guidelines for NTT Group CSR Activities. We work with group companies to ensure that activities follow PDCA cycles based on these guidelines and further promote a sense of unity across the Group.

NTT Group CSR organization



Topic CSR lecture for the CSR leaders of group companies

In September 2009, NTT held a CSR lecture titled "The Latest ISO 26000 Trends: How CSR Changes Society".

After NTT Senior Executive Vice President Kaoru Kanazawa, who is chair of the CSR Committee, explained the nature of CSR and the relationship between CSR and the development of the NTT Group and society as a whole, Hiroji Tanaka, President and Professor at Tokyo College of Transport Studies and a member of Japanese Standards Association's Japanese National Committee for ISO Working Group on Social Responsibility, spoke about the ISO 26000 guidance on social responsibility published in November 2010, and organization building for the implementation of CSR.

The lecture was attended by about 70 CSR leaders of group companies and employees involved in ISO 26000-related work. This was the Group's first such event for group company CSR leaders, and the employees who participated listened keenly. The lecture was followed by a lively question session, and the event served as a valuable opportunity for promoting more unified CSR activities across the Group.



Lecture by Hiroji Tanaka



Employees at the lecture



Progress of NTT Group CSR Priority Activities

Continuing to implement the NTT Group CSR Priority Activities

	Activities that contribute to the further evolution of ubiquitous communications	Related pages					
Communication Detween people and their	• Leveraging ICT to address social issues including the aging and shrinking population and improvement of healthcare and education						
communities	• Developing new markets with the launch of services that include infrastructure and applications						
	Utilizing broadband network infrastructure to provide diverse services	▶ pp. 30-31					
	Mitigation of global warming						
ommunication etween people	 Improving year-on-year CO₂ emissions rates to achieve reduction targets in both telecommunications carriers and other group companies 						
nd the global nvironment	• Announcement in November 2009 of three policies to help create a low carbon society	▶ pp. 36, 40, 65					
	• Launch of solar power system operation at three sites in February 2010	▶ p. 37					
	Establishment of NTT Group Energy Efficiency Guidelines in April 2010	▶ p. 38					
	Launch of NTT Solution Environmental Label System An initiative to reduce waste generation and paper consumption	▶ p. 42					
	Waste reduction						
	• Amount of final disposal waste declined and reduction target was cleared.						
	Reduction of paper consumption						
	• The amount of virgin pulp used cleared our reduction targets for the year, and fell compared with the previous year	▶ pp. 34-35					
Communication between people and their communities	Ensuring stable and reliable services as critical infrastructure						
	• Addressing the disasters that struck in fiscal 2010	▶ p. 55					
ommunication	Ensuring information security						
between people and their communities Communication between people and the global environment Safe and secure communication En Communication	• Continuing safety classes for trouble-free Internet and mobile phone use by children	▶ p. 57					
	Continuing R&D for maintaining and improving information security	▶ pp. 58-60					
	Activities that contribute to respect for diversity and equal opportunity						
	• Further promoting groupwide initiatives	▶ p. 63					
ommunication	Raising percentage of employees with disabilities	▶ p. 63					
	Accepting increasing numbers of overseas researchers	▶ p. 63					
	Corporate citizenship activities						
	• Launch of activities to strengthen Group unity under the banner of Green with Team NTT	▶ pp. 64-65					
	Continued implementation of many different citizenship activities	Þpp. 65-66					

Corporate governance

The NTT Group constantly strives to earn the trust of its customers.

Basic philosophy

As the holding company of the NTT Group, NTT believes that raising the effectiveness of corporate governance is an important management issue for maximizing corporate value and meeting the expectations of its various stakeholders.

Accordingly, NTT Group is working to strengthen corporate governance based on its fundamental policies of ensuring sound management, conducting appropriate decision-making and business activities, clarifying accountability, and maintaining thorough compliance.

Board of Directors and Board of Corporate Auditors

NTT maintains a Board of Directors with 12 members, including two outside directors. In principle, the Board of Directors meets once per month to make decisions and report on important management issues. NTT also maintains a Corporate Auditor system, including a Board of Corporate Auditors with five members, three of whom are outside corporate auditors.

Executive Officers Meeting and committees

In principle, important company matters are deliberated and decided by NTT's Executive Officers Meeting, which is made up of the President, Senior Executive Vice Presidents, directors with management responsibilities, and the heads of staff organizations. The Executive Officers Meeting members meet around once a week, and held 25 meetings in the year ended March 31, 2010. Under the Executive Officers Meeting, committees have been created to discuss specific issues related to the management strategies of NTT Group companies. In principle, each committee is chaired by either the President or a Senior Executive Vice President, with other directors and senior executives involved in relevant areas participating as occasion demands.

Audits by the corporate auditors

NTT's corporate auditors audit the performance of NTT's directors in the execution of their duties from the viewpoint of appropriateness. The corporate auditors work to bolster the audit system through regularly sharing information on audit plans and audit results with the Independent Auditor, in addition to conducting audits in partnership with the corporate auditors of group companies.

Internal control systems

NTT is working to strengthen the Group's internal control systems with the Board of Directors adopting a Basic Policy on the Maintenance of an Internal Control System to ensure the appropriate execution of duties within each group company.

In line with the U.S. Public Company Accounting Reform and Investor Protection Act (Sarbanes-Oxley Act) and Japan's Financial Instruments and Exchange Law, the NTT Group is working to document business processes and conducts repeated tests to confirm the effectiveness of its financial reporting internal control system.

NTT's Internal Control Office monitors the status and operating effectiveness of internal controls across the Group as a whole through such measures as conducting standardized audits that target all group companies and checking the work of internal auditors in each group company, as well as implementing improvements to the Group's internal control systems.

Defining accountability

NTT strives to maintain appropriate, timely, and fair information disclosure and is aware that obtaining proper corporate valuations in the market through such disclosure is essential. It accordingly holds meetings to announce financial results, discloses information promptly on its website, and otherwise does its utmost to address accountability.







Ensuring compliance

The NTT Group runs its businesses in compliance with its Corporate Ethics Charter.

Recognizing that it is imperative to conduct business in compliance with laws and regulations, and maintain the highest ethical standards in order to promote sound corporate activities, NTT drew up the NTT Group Corporate Ethics Charter in November 2002.

The Charter, which applies to all officers and employees of the NTT Group, lays out the basic principles of corporate ethics and provides specific guidelines for ethical behavior. To ensure that the Charter is effective, NTT strives to raise employee awareness of its goals by providing training in

Concerning the improper provision of information of other carriers to certain sales agents and measures to prevent recurrence

🕐 NTT WEST

In fiscal 2010, employees at NTT West Group sales subsidiaries (NTT West-Hyogo and NTT West-Hokuriku) were found to have been improperly providing certain NTT West sales agents with information regarding customers using other carriers.

The NTT West-Hyogo employee provided information on customer usage of NTT West ADSL service and the DSL services of other companies to some sales agents between August and October 2009. The NTT West-Hokuriku employee provided the same kind of information to some sales agents between March 2008 and November 2009. After discovery of these events, both companies issued apologies on their websites and in newspaper ads, and provided dedicated toll-free numbers for customers wishing to know further details. No evidence has been found that the sales agents involved used the information provided in their business activities.

The sales subsidiaries deeply regret these incidents, and took immediate steps to prevent their recurrence. They are doing their utmost to regain the trust of their customers and other concerned parties through re-educating employees on the protection of customer information and redoubling efforts to ensure the proper management of customer information.

With respect to this incident, NTT West was on February 4, 2010 issued by the Ministry of Internal Affairs and Communications (MIC) with a business practice improvement order under the Telecommunications Business Act, and on February 26 submitted a business practice improvement plan to MIC detailing a revision of its customer information management system and ten other items.

NTT West deeply regrets the handling of customer information in a way that runs counter to the appropriate protection of information and rules of fair competition, and is steadfastly implementing the measures detailed in its business practice improvement plan.

NTT West Group CSR Report 2010

http://www.ntt-west.co.jp/csr/2010contents.html (in Japanese only)

corporate ethics and conducting annual employee attitude surveys.

To prevent dishonesty and misconduct, each company has in place a system for employees to report and consult on ethical issues. The NTT Group has also established a groupwide Corporate Ethics Help Line to enable employees to go outside their company for help if required.

In line with Japan's Whistleblower Protection Act and other laws, the NTT Group also accepts reports from companies outside the Group that do business with the NTT Group.

Concerning the bribing of a Japan Patent Office employee by an NTT DATA employee



On June 22, 2010, an NTT DATA employee was arrested on suspicion of bribing an official at the Japan Patent Office (JPO). NTT DATA cooperated fully with the investigation by the responsible authorities, and on the following day, June 23, set up an internal investigation committee headed by the president to check facts and launch an internal investigation. On July 8, a separate review committee made up of outside experts was established to objectively review the findings of the internal investigation committee and its proposed measures to prevent recurrence.

As a result of these processes, it was discovered that the NTT DATA employee had over a period of several years up to the end of 2009 provided the JPO official with taxi fare tickets and entertainment at restaurants. The employee was also found to have intentionally manipulated administrative processes in contravention of company rules.

Based on these findings, NTT DATA drew up measures to prevent recurrence of such incidents, including intensified compliance education, elimination of posts that could lead to abuse if held over extended periods, reform of taxi fare tickets and entertainment expense-related processes and operations through the proactive deployment of IT, and strengthening of internal controls and internal audits. On July 13, NTT DATA also established a new committee to monitor and manage the implementation of measures to prevent recurrence, and is currently working on the early and assured implementation of these measures.

On September 6, NTT DATA issued a Declaration of Compliance that expressed its firm commitment to compliance.

NTT DATA deeply regrets this incident, and will do its utmost to regain the trust of its stakeholders as early as possible through implementing prevention measures to firmly bolster its corporate ethics, and thoroughly reviewing its internal systems and processes to prevent recurrence.

The reports of the internal investigation committee and the outside experts verification committee and other details are available on the NTT DATA Group CSR Report 2010 website.

NTT DATA Group CSR Report 2010 http://www.nttdata.co.jp/en/csr/report/

Risk management system

The NTT Group has a framework to prevent risks and to minimize the impact of any risks that do emerge.

Functioning as they do in a rapidly changing business climate marked by increasingly fierce competition in the fields of information and communications, NTT Group companies face a wide variety of business risks.

We make efforts to anticipate and prevent potential risks at hand and minimize the impact should they emerge. As part of these efforts, we have prepared a standard manual for distribution to all group companies to ensure a unified approach to risk management. Each group company also prepares its own manual or other mechanisms tailored to its specific business activities and environment to manage and mitigate business risks.

NTTグループ ビジネスリスクマネジメント マニュアル

Risk management manual

Human rights awareness

We make groupwide efforts to raise human rights awareness and create a corporate culture that respects human rights and is free of any discrimination or harassment.

The NTT Group considers the creation of a corporate culture free of prejudice and discrimination to be essential to the formation of a well-adjusted society where human rights are respected.

We also regard this as a prerequisite for fulfilling our corporate responsibility to all of our stakeholders, and we are accordingly tackling human rights issues on various fronts as an organization.

More specifically, we encourage employees to regard human rights as a personal issue, and work to deepen their awareness and understanding so that they show respect for human rights in their day-to-day business activities and take a firm stand against discrimination by others.

To this end, we provide a broad range of human rights education focused on such issues as prejudice against specific social groups, people with disabilities, the elderly, and foreign residents in Japan, sexual harassment, and power harassment, as well as on ISO 26000, systems for redressing human rights violations, and other developments in human rights standards and legislation in Japan and overseas.

Furthermore, all NTT Group companies provide workshops, e-learning courses, and other programs that enable employees to learn about these issues on a multifaceted continuing basis. Other activities to boost and establish awareness of human rights include soliciting slogans and ideas for posters promoting awareness of human rights from NTT employees and their families, the best of which are compiled into calendars and distributed around the workplace.

The NTT Group is also a member of the Industrial Federation for Human Rights, Tokyo*, an organization that provides basic knowledge and the latest information on human rights issues on its website to cultivate awareness of human rights. NTT edits, maintains, and manages the website.

*Industrial Federation for Human Rights, Tokyo

A voluntary organization made up of 120 companies (as of May 2010) headquartered in Tokyo. Since its founding in November 1979, it has worked for the resolution of a wide range of human rights issues.





Poster calling for submission of candidate slogans for a fiscal 2011 human rights awareness poster (NTT East)

Human rights awareness booklet

Industrial Federation for Human Rights, Tokyo website http://www.jinken-net.com/ (in Japanese only)





R&D efforts in basic technologies

NTT conducts basic technologies R&D activities in three laboratory groups while also developing practical applications with its group companies.

NTT has three laboratory groups: the Cyber Communications Laboratory Group, the Information Sharing Laboratory Group, and the Science and Core Technology Laboratory Group. These groups provide NTT with R&D muscle for the development of basic technologies that support the creation of safe, secure, and convenient ubiquitous broadband services and greater utilization of next generation networks. NTT's R&D results have steadily been put into practical use through the effective use of our "Comprehensive Commercialization Functions" in close collaboration with NTT Group companies.

Protection of intellectual property

NTT protects the results of its R&D to maintain its competitive edge, but at the same time makes its intellectual property available to a wider audience by licensing technologies that would contribute to the development of industries and businesses as well as standardized technologies that are already used in society.

We also examine the third party rights of technologies used in our business to prevent infringement of third party intellectual property rights, and otherwise strive to comply with intellectual property-related laws and regulations and mitigate potential business risks by sharing information with our group companies.

No. of patent and utility model applications in Japan and overseas

Fiscal 2006	Fiscal 2007	Fiscal 2008	Fiscal 2009	Fiscal 2010
2,500	1,800	2,000	2,100	2,200

No. of Japanese and overseas patents held (as of the end of each fiscal year)

Fiscal 2006	Fiscal 2007	Fiscal 2008	Fiscal 2009	Fiscal 2010
15,200	15,100	14,500	13,900	13,700



Communicating with our shareholders and investors

The NTT Group strives to improve management transparency through proactive disclosure and IR activities.

Basic philosophy

The NTT Group recognizes that enhancing its corporate value in the medium to long term and realizing appropriate returns to shareholders are crucial aspects of its business. At the same time, we are striving to improve the transparency of management through proactive disclosure and IR activities to enable our shareholders, investors, and other stakeholders to appropriately evaluate our business performance.

NTT stocks

As a result of six offerings of government-owned shares since NTT's privatization in 1985, NTT stocks are in the hands of approximately 1.23 million* shareholders as of the end of March 2010. *Including shareholders who own only shares representing less than one unit

NTT shareholders¹



1. Not including shares representing less than one unit

2. Treasury stock included under "Domestic individuals, etc." category

Returns to shareholders

NTT seeks to enhance returns to shareholders over the medium term. We determine the amount of dividends based on an overall consideration of factors such as business performance, financial position, and dividend pay-out ratio, focusing also on stability and sustainability. For the year ended March 31, 2010, NTT increased its yearly dividends from ¥110 to ¥120 per share. The yearly ordinary dividends for the year ended March 31, 2011 are expected to be ¥120.

Disclosure and IR activities

NTT has listed its shares on several domestic and foreign stock exchanges (Tokyo, Osaka, Nagoya, Fukuoka, Sapporo, New York, and London), and has issued domestic and foreign bonds to procure funds. We consider it important to establish and maintain relationships of trust with our shareholders and investors in both domestic and foreign capital markets, and accordingly disclose information in a timely, appropriate, and fair manner, fulfilling our accountability as a business corporation.

To help shareholders and investors to better understand our management strategy, we also actively conduct IR activities and create opportunities for our top management to directly communicate with our shareholders and investors by holding various events in addition to the General Meeting of Shareholders, such as IR road shows, briefings on specific themes, presentation of financial results, and presentations for corporate bond investors. We are also making efforts to enrich IR content on our corporate website.

In the year ended March 31, 2010, in addition to continuing financial results briefings for analysts, an overseas IR road show, and small group interviews in Japan, we expanded briefings for institutional investors, participated in conferences hosted by securities firms, and in February 2010 also held a briefing for individual investors.

To further enhance our dissemination of information, we extensively overhauled our IR website in October 2009, adding content for individual investors, improving search function operability, and implementing universal design for greater accessibility. We also drew up a Disclosure Policy to promote the disclosure of information to shareholders and investors and demonstrate our proactive stance on IR activities, posting the policy on our IR website on January 4, 2010.

Topic

Listed on Socially Responsible Investment (SRI) indexes in Japan and abroad

NTT has been highly rated by SRI evaluation organizations. As of April 1, 2010, we are listed on international SRI indexes such as Ethibel Sustainability Index (ESI) Excellence Global (Belgium), and Morningstar Socially Responsible Investment Index (Japan).





Prospering with our business partners

Working with our suppliers to equip society with ubiquitous broadband communications

To continue to provide customers with competitive, state-ofthe-art services at reasonable prices, the NTT Group considers it essential to introduce cost-effective new technologies and products on a timely basis. To that end, it has become increasingly important for us to accurately identify customer needs, establish good partnerships with suppliers, and work closely with them to equip society with ubiquitous broadband communications. Green procurement policies that encourage all relevant parties to consider the impact of procured products on the environment are also indispensable.

To build trust-based, open partnerships with our suppliers, we established and published our Basic Procurement Policy in 1999. For the benefit of suppliers, we also post procurement information on our website, and have procurement contact points in North America and Europe as well as in Japan for fielding inquiries and providing guidance on procurement.

Basic Procurement Policy

When procuring products, NTT will:

- 1. conduct its procurement in an open and transparent manner, taking into account its business needs;
- 2. provide non-discriminatory and competitive opportunities to both domestic and foreign suppliers; and
- 3. conduct global and market-driven procurement of competitive products that meet its business needs.

The NTT Group Guidelines for Green Procurement

These Guidelines represent the NTT Group's basic stance toward green procurement and set forth the general areas in which the NTT Group and its suppliers address environmental issues on a continuing basis.

International Procurement website http://www.ntt.co.jp/ontime/index-e.html

Drawing up CSR Procurement Guidelines and explaining them to business partners

döcomo

NTT DOCOMO endeavors to maintain healthy relationships with its suppliers through open and transparent procurement of competitive products that match its business needs, and provision of non-discriminatory and competitive opportunities to both domestic and foreign suppliers based on market principles. It also attaches importance to the fulfillment of social responsibilities — respect for human rights, compliance with labor codes, assurance of safety and hygiene, environmental protection, fair trade practices, assurance of product quality and safety, information security, and corporate citizenship — in the production processes of the products that it procures from suppliers, and in September 2009 established the NTT DOCOMO CSR Procurement Guidelines to promote socially responsible procurement. These guidelines conform with those created by the Japan Electronics and Information Technology Industries Association (JEITA) to address social

issues related to increasing market globalization.

Based on its fundamental stance of working with suppliers to ensure socially responsible procurement, NTT DOCOMO seeks to promote both its own CSR activities and those of its suppliers, and it held a meeting for its suppliers in August 2009 to explain this commitment to them. It also posted its CSR Procurement Guidelines on its website in October, and has asked its suppliers to submit a CSR Procurement Check Sheet once a year. In fiscal 2010, the first year of application of the guidelines, it conducted a survey of the status of implementation of the provisions of the guidelines.

In fiscal 2011, NTT DOCOMO will seek to implement routine monitoring of compliance with its CSR Procurement Guidelines and make further improvements based on its findings with the aim of establishing socially responsible procurement.

Communication between people and their communities

Activities that contribute to the further evolution of ubiquitous communications 1 Enriching everyday life through connecting people

Under our "Road to Service Creation Business Group" Medium-Term Management Strategy, we at the NTT Group are endeavoring to address and resolve social issues by utilizing ICT to improve the quality of healthcare and education, and by working with our partners to create new systems for supporting society. We will also seek to enrich everyday life through actively providing new ubiquitous and broadband services.



Topic 1

Leveraging ICT to deploy a remote health consultation system in Tono City, Iwate Prefecture

🕐 NTTEAST

Tono in Iwate Prefecture is a city of about 30,000 in which people aged 65 or more now make up about 30% of the population. Given the increasing age of its citizens, Tono faced an urgent need to implement initiatives that address their health concerns and promote health, and accordingly started in February 2008 to discuss the deployment of a system for maintaining and promoting health with healthcare facilities and citizen organizations.

NTT East suggested using a remote health consultation system that leverages ICT to enable health guidance and management from geographically distant locations, and installed B FLET'S fiber optic lines and FLET'S PHONE touchscreen videophones in seven community halls around the city. This system enables vital data (daily steps walked, blood pressure, body weight) to be shared with specialists at four city center medical facilities who can then give healthcare guidance through videophone. This project was also chosen in October 2008 as a Construction of Local Community Models through ICT Utilization/ Telemedicine Model project by the Ministry of Internal Affairs and Communications, and launched as a two-year pilot project.

NTT East will continue to develop and build systems for supporting local community healthcare into the future.

Topic 2

Hikari Signage, a digital signage solution that can be easily deployed and operated

🕑 NTT Group

Digital signage has grabbed attention in recent years as a new information medium for use with commercial and public buildings, but very little digital signage is network-enabled, limiting the information that it can communicate. It is also fairly costly to deploy and to create and update displayed content, and this has limited its uptake by businesses.

The NTT Group accordingly worked with various partners to develop a network-enabled digital signage solution whose low initial and content procurement costs make it easy to deploy and operate. Sales of this new solution, Hikari Signage, began on February 1, 2010.

To make even more effective use of the features of digital signage, NTT Cyber Space Laboratories is developing technology that automatically measures viewership and advertising impact, and is now looking into the commercialization of this technology as a digital signage impact measurement solution.

NTT Cyber Space Laboratories is also working on the commercialization of a platform developed by NTT Cyber Communications Laboratory Group that uses metadata distribution management and integration technology.





interactive e-learning service

http://n-academy.jp/ (in Japanese only)

Leveraging ICT to support human health

Future Clinic 21 Warp on-demand digital medical record service for clinics

🕐 NTTEAST 🕐 NTTWEST

With the requirement in the near future for medical facilities to enable online access to healthcare receipts and the need for solid management and protection of medical records, demand is rising for less costly and more secure digital medical record management systems. To this end, NTT-ME of the NTT East Group started in April 2009 to offer Future Clinic 21 Warp, an ondemand digital medical record service for clinics. The service has the following four key features: (1) easily viewable examination records that can be displayed in yearly, monthly, or daily timeline form to show clinical history at a glance; (2) easy stylus-based input that enables pen and paper-style writing on on-screen images, etc.; (3) convenient integration with the Japan Medical Association's standard receipt software (ORCA) as a standard feature, enabling basic patient details entered into ORCA or examination information entered into digital medical records to be integrated; (4) low cost, high security: provision as an ondemand service enables considerable initial cost savings, with applications, etc. also managed centrally in a high-security data center, and secure backup of medical examination data.

Since the use of digital medical records is expected to spread to all medical facilities including neighborhood clinics in the near future, we will continue to develop safer and more convenient on-demand medical record services and assist in their deployment.

Trial for Special Ubiquitous Zone Project in Okinawa Prefecture

🕑 NTT 🕐 NTT WEST

Under the Ministry of Internal Affairs and Communications' Special Ubiquitous Zone¹ Project, NTT and NTT West verification tested technology for an active tag²-based ubiquitous healthcare project from February 3, 2009 to March 31, 2010, in Zamami Village in Okinawa Prefecture with the participation of about 85 village residents.

Since April 2008, the Japanese government has required people to receive medical checkups and health guidance focused on preventing metabolic syndrome, and this project is aimed at lightening the burden of those undergoing this health guidance. People categorized as needing active support are required to receive six months of guidance on improving health by changing their everyday habits and lifestyle. Active support subjects are expected to regularly record blood pressure, body weight, and other vital data on paper or PC, and so ensuring the continuity of such health guidance requires easier ICT-based data storage and management methods that alleviate the burden on subjects, many of whom are elderly and not used to handling PCs.

The trial tested the efficacy of an active tag-based ubiquitous healthcare support platform that enables networkbased automatic collection, storage, and management of vital data measured on a daily basis. The health checkup data of 160 people was also entered into the healthcare guidance support system to use in health guidance. This alleviated data input burdens of health guidance subjects equipped with active tags and improved the work efficiency of public health nurses. Moreover, the ICT-based system also enables the monitoring of blood pressure, body weight, and number of steps taken both before and after health guidance, thus boosting the efficacy of health guidance.

NTT and NTT West hope to apply the results of this project to help resolve various social issues faced by local communities.

1. Special Ubiquitous Zone

A Ministry of Internal Affairs and Communications project aimed at contributing to the quality of life of the Japanese people and leveraging Japan's lead in ubiquitous network technology to promote the development and testing of cutting edge services and establish new models capable of being applied internationally

2. Active tags

A type of RFID tag equipped with a battery to enable transmission of signals over a relatively long range of several dozen meters



Giving health guidance using a videophone



The active tag used in the trial was decorated with a whale motif.



The active tag when opened

Activities that contribute to the further evolution of ubiquitous communications 2 Technology for creating a business environment that enables sustainable growth

While ICT is finding increasingly broad use throughout society, the information system needs of enterprises too — information management, security, outsourcing, and other business streamlining — are growing more diverse all the time. This is stimulating keen interest in cloud computing, which enables the use of speedy and flexible ICT services in a high security data center-based environment. In the NTT Group, NTT Communications and NTT DATA are particularly active in cloud-related business, and aim to address customer expectations by working with diverse business partners to offer an increasingly wide range of convenient services.



Topic 1

Building data centers that are the backbone of cloud services

🕐 NTTEAST 🕐 NTTWEST

Data centers provide a rock-solid environment for secure and reliable housing of customer servers and other systems and provision of Internet access, maintenance, operation, management, and other services. Data centers relieve customers of the need to put aside space to house servers and lay cables for Internet access, and can protect customer data resources in the event of a disaster or system failure. NTT East, NTT West, and other NTT Group companies build data centers and offer related services. They provide 24/365 operation, maintenance, security, and other services that are protected by exhaustive safety measures including uninterruptible power supply, quakeproofing, and personnel entry and exit control.

In more recent years, NTT Group companies are building data centers as platforms for providing cloud services, operating both public clouds in which computing resources are shared by multiple companies, and private clouds which are used by single businesses whose various sections and systems share the cloud's resources.

Topic 2

Biz Mail cloud-based e-mail service for the enterprise

NTTCommunications

Biz Mail is a safe and convenient cloud-based e-mail service offered by NTT Communications that can be used at anytime from any location.

As an interface with customers, e-mail systems are now lifelines of everyday business activities, and more and more system administrators and users want to use systems that allow access irrespective of time or location and ensure that e-mail data will not be lost to a computer failure or some other contingency.

NTT Communications accordingly offers standard-size mailboxes of 2-10 GB using data centers located in Japan. Biz Mail comes with security (antivirus, spam filtering, and content filtering) provided as a standard feature, and all the usability of a general e-mail client, including folder management, shared and private address books, and advanced search.

Topic 3

BIZXAAS cloud service to support the rationalizing and strategic use of IT assets



NTT DATA has long been involved in business based on the cloud computing approach of sharing computing resources on networks, and offers many different shared-use systems for large enterprises, including its Integrated ATM Switching Service and Regional Bank Integrated Services Center.

BIZXAAS draws on the system provisioning expertise built up by NTT DATA Group over the years to provide a total cloud service that incorporates the latest cloud technology.

In addition to the provision of on-demand cloud services delivered from NTT Group data centers, NTT DATA offers a comprehensive range of cloud-related services including construction of clouds at customer premises, consulting on technology, services for migrating from existing to cloud-based systems, and the building of large-scale private clouds.

Topic 4

Release of new style Xperia smartphone

On April 1, 2010, NTT DOCOMO released its docomo Smartphone Xperia manufactured by Sony Ericsson Mobile Communications.

Xperia is a new style entertainment machine equipped with intuitive operability for more communication freedom. Pressing the Infinite button while listening to music, for example, enables easy searching of the Web for information and music video clips related to the artist. Xperia also features Timescape, an application that displays usage history in one view and enables one-touch access to frequently used functions. Tapping the Infinite button enables search and display of lists of all exchanges with friends including calls, e-mail, and SNS, making communication easy and pleasurable. Xperia's 8.1-megapixel camera is equipped with a face recognition and tagging feature, and the user can make phone calls or send e-mail messages to an individual by simply touching their tag in a photo — just one of many new communication experiences offered by Xperia.

Development of next-generation communications network technology for driving the evolution of business processes

RedTacton R&D and Firmo commercialization win Nikkei BP Technology Award

ONTT ONTTElectronics

In April 2008, NTT's Microsystem Integration Laboratories implemented RedTacton, a near-body electric-field communications technology, and in August of the same year, NTT Electronics launched full-scale sales of Firmo, a communications device that uses RedTacton technology.

RedTacton and Firmo make use of the weak electric field that extends over the human body to transmit data, enabling a person carrying a transmitter card with embedded identity data to be authenticated just by walking through an automatic ticket gate or touching a door knob, rather than by holding the card over a sensor. Making such contact sends a signal over the surface of the person's body through the transmitter card to a receiver to enable the desired authentication.

NTT and NTT Electronics won recognition for these research outcomes on April 6, 2009, with their selection for a Nikkei BP Technology Award in the information and communications category. Established by Nikkei BP in 1991 to contribute to the development of technology in Japan, this prestigious prize pays recognition once a year to outstanding technology that could have major impact on industry and society in the fields of electronics, information and communications, machine systems, construction, healthcare, biotechnology, and ecology.



Award ceremony held on April 6, 2009



application of RedTacton" and "Commercialization of Firmo, a data transfer system that uses the electrical field on the surface of the human body to transmit information in one direction at a speed of 230 kbps".

Providing services that support the elderly and people with disabilities

Portal site providing information useful to the elderly and people with disabilities

NTT CLARUTY CORPORATION

NTT CLARUTY launched the Yu Yu Yu portal site in April 2005 to provide information useful to the everyday lives of people with disabilities and elderly people, such as introductions to products with universal design features and user experience reports written from the perspective of CLARUTY employees who themselves have disabilities, cooking recipes that would be easy for elderly people and those with disabilities to make, accessible travel, and such like. The portal site also lists links to over 2,000 other useful websites, including accessible leisure spots, and welfare and support equipment.

To publicize the portal, NTT CLARUTY introduces it at public lectures and event exhibits, and distributes flyers at facilities frequented by the elderly and people with disabilities. Yu Yu Yu received about 250,000 page views in fiscal 2010, fewer than in fiscal 2009. This decrease is thought to have been caused by site renewal work that resulted in fewer information updates. Moving forward, NTT CLARUTY hopes to go beyond just posting articles to offer new services through the portal site.

In December 2009, it reorganized Yu Yu Yu content into categories that enables searching according to purpose. Its efforts for Web accessibility received recognition in March 2010 with a bronze award at the Web for Everyone Contest hosted by Harmony i, an NPO dedicated to the promotion of accessibility.

		#30#++P++P	
	1-1-	新じい扉を開こう!	来教徒
	mir O	「ゆうゆうゆう」の情報で	· CONTRACTOR
	0	THE STREET OF ALL THE	· Sectors
		0%C018C20C222	Bill Bill
	Fa 21.5 0	9401	\$8/17-O
Biological Control Co	Dare	and a state of the	OBUTUET
Martin Sara V. Sara	11-2-2-2-0-1E	ALCORD, MULT TO ALBOR	28-08-1-2
An and a second se	dente y an W	TO A SMITTHEORY CHERRY REALLY TWO TRANSPORT	
		Fugure Control of the Article of	· STLUNGS
Normal Personal Control Statistics Control Statiste Control Statistics Control Statistics Control Statisti	ログイン	単金に参加したいと思っている新聞のある方へ、主要要用の内心が見かせないや すいいていたははくんなわたのを見てみませんか?	· 8-974 Fel
	15-ma	* BANKER, WT. HT. HEREFLEY CONTAINED	984.0+7
	7-0-600余	Press of the local division of the local div	Barrer P
	(#2)	BHHEP2A	目前リンク集
	z-81	LBCREALANDIN BERNELENINGER-SKO	0218028-00
A vitage of the second	ALL MARK	W COUNTRY, COUNTRY CONTRACTOR OF A	読者招募コーナー
Construction C	34.471120	* 10010122	Attention
COPY OF COULT - MERCINE CONTRACTOR OF CONTRACTOR - MERCINE CONTRACTOR - MERCINE CONTRACTOR - MERCINE CONTRACTOR - MERCINE CONTRACTOR - MERCINE -	3445	BACH	MIN DEL V
ATTACAT TAT	202012012	 Multitute Untry-information 	· NAMES OF COLUMN
	2,63,633,6	* MIGERNARABIOMATRACI	· Include Annual Parts
ALLENGER D. d.Y. CO. CHILDREN CO.	Philip Rep	7/7/8602(9/84-2)-306660(2)(%84.00)	· Partilities
the second se	2.31875-018	that the children of the second	2997能作
- 10/10 · 10/10	Ch.(-Ran	* st2si	de manas
Index of the second sec	- THEOR	point-Colo	STATISTICS.
		1 Break States	

http://www.u-x3.jp/ (in Japanese only)

Firmo key

Start of Mobile Phone Safety Classes for elderly people

dõcomo

To address the rising age of its users, NTT DOCOMO started in April 2009 to hold Mobile Phone Safety Classes for senior citizens, and has so far held about 600 such classes that were attended by about 14,800 people.

The classes are divided into two sections. The first, titled How to Avoid Being Conned, explains how people can protect themselves from bank transfer scams and other crimes frequently targeting elderly people. The second, titled Protecting Yourself, introduces the i-mode Disaster Message Board Service, Area Mail Disaster Information Service, and other disaster response-related services, and explains what people should do if they misplace their mobile phone and so forth.



Mobile Phone Safety Classes for senior citizens

Efforts to bride digital divides

Successful testing of sensor data aggregation system



A sensor network links up multiple sensors in a way that combines the data that they produce to create even more useful information. Sensor networks that aggregate meteorological, hydrographic, earthquake, and other data from a wide area including mountains and oceans hold promise as key infrastructure for creating a safe and secure society through their use in applications such as disaster prediction and reconstruction.

Since fiscal 2007 NTT and NTT Communications have been building a sensor network that utilizes satellite communications through a Ministry of Internal Affairs and Communicationsfunded project titled "Research and Development of a Highly Efficient Frequency Utilization Technique for Communication Satellite Transponders¹". The two companies have developed a "hyper-multipoint data gathering satellite communication system" that enables the low-cost aggregation of various observation data streams from sensors located throughout Japan by efficient utilization of the limited bandwidths of existing satellite transponders. Field experiments using the KIKU No. 8 (Engineering Test Satellite VIII)² to collect sensor data from oceangoing vessels have been successfully concluded, and the two companies are now considering ways of developing new markets and businesses using satellite sensor networks.

1. Research and Development of a Highly Efficient Frequency Utilization Technique for Communication Satellite Transponders

This contracted research addresses expanding needs for satellite communications such as satellite support of sensor networks, and is also aimed at developing access control and channel spacing reduction technologies for enabling more effective frequency utilization.

2. KIKU No. 8 (Engineering Test Satellite VIII)

The 8th Engineering Test Satellite launched in 2006. KIKU No. 8 was developed by the Japan Aerospace Exploration Agency (JAXA), National Institute of Information and Communications Technology (NICT), and NTT to verify platform technologies for supporting future mobile satellite communications and positioning services.

Expanding service area to Mt. Fuji and other mountainous regions

döcomo

NTT DOCOMO continues to expand the FOMA service area in mountainous regions not covered up to now, for example installing base stations and boosters to bring FOMA availability to Mt. Fuji from the various trailheads up to 5th station level. It also deploys a booster on the summit during the climbing season.

In fiscal 2010, NTT DOCOMO conducted a survey of voice reception quality on the most popular mountains in Japan for climbing. It is carrying out tuning and other improvements in locations with poor reception, and aims to enable better voice communications on these mountains by the 2011 climbing season.

Basic policies and management system

Establishing a shared Group charter and vision

🕐 NTT Group

In 1999, the NTT Group drew up its NTT Group Global Environmental Charter to formally define basic principles and policies for protecting the environment. Based on the fundamental principle that our business activities need to be compatible with protecting the environment, this Environmental Charter emphasizes the importance of combating global warming and reducing waste and paper consumption, and establishes a set of NTT Group Principal Activity Plan Targets to be achieved by fiscal 2011.

In May 2006, the NTT Group announced its Vision for Environmental Contribution. This vision clarifies our basic concept for providing ICT services that will enable our customers as well as society as a whole to reduce environmental impacts. The vision also defines our CO₂ emission reduction target for fiscal 2011 and the activities we intend to undertake to achieve this target.

Formulation and operation of proprietary green guidelines

🕐 NTT Group

NTT Group operations have the following three key attributes: (1) procurement of a great many products; (2) in-house R&D facilities; (3) possession of many buildings. To promote the effective reduction of our environmental impacts, we have drafted green guidelines that address each of these three key attributes. NTT and its group companies apply these guidelines to their business activities.

Developing a groupwide structure for environmental management

NTT Group

In 2005, the NTT Group established a CSR Committee charged with overseeing group CSR activities, and the NTT Group Global Environmental Protection Promotion Committee, which drives group environmental protection activities, was brought under the CSR Committee's jurisdiction.

The Global Environmental Protection Promotion Committee oversees the Greenhouse Gases Reduction, Waste Disposal and Recycling, and Environment and ICT subcommittees, directs groupwide projects, formulates basic policies, manages targets, and addresses any issues that emerge.

NTT Group Global Environmental Charter

Basic principle

To ensure the harmonious co-existence of people with nature and to achieve sustainable growth, we will do our utmost to protect the global environment in all our corporate activities.

Basic policies

- Compliance with laws and regulations and fulfillment of social responsibilities
- Reducing environmental loads
 Establishing and maintaining environmental management systems
- Developing environmental technologies
- Social contribution efforts
- Disclosure of environmental information

NTT Group Vision for Environmental Contribution

The NTT Group is helping to reduce the environmental impacts of its customers and society as a whole by developing and disseminating ubiquitous broadband-based ICT services that promote positive changes in lifestyles and business models.

Reduction target for fiscal 2011

[Reductions in CO₂ emissions as a result of ICT services] – [CO₂ emissions from providing ICT services] = [10 million ton reduction in CO₂ emissions]

Activities for achieving our targets for fiscal 2011

- 1. Increase subscriber base for optical fiber services that enable lower impact lifestyles and business models.
- 2. Expand ubiquitous broadband services.
- 3. Reduce the environmental impacts of our business activities.
- 4. Reduce the electrical power required by customers' communications equipment.



Environmental impacts overview

At the NTT Group, we regularly quantify the environmental impacts of our various business activities, and are striving to reduce them by establishing concrete numerical targets for mitigating global warming, reducing waste, and reducing the consumption of paper resources based on the NTT Group Principal Activity Plan Targets.

Of the 4.01 million tons of CO₂ emissions generated by the NTT Group in fiscal 2010, 3.94 million tons (approximately 98%) were derived from business operation-related electricity consumption. Of the 790,000 tons of waste generated, 762,000 tons (approximately 96%) were recycled, and the remainder was incinerated, resulting in a reduction of 11,000 tons to leave 17,000 tons of final disposal waste.

Each year, the NTT Group issues 98.42 million telephone directories throughout Japan, which translates into 54,000 tons of paper, equivalent to approximately 0.2% of the total amount of paper used in Japan. Of those 54,000 tons, 11,000 tons are from virgin pulp.



Results and assessments for goals in fiscal 2010

Progress made on the NTT Group Principal Activity Plan Targets¹ (by fiscal 2011)

🕐 NTT Group



Environmental accounting

🕐 NTT Group

The NTT Group introduced environmental accounting in fiscal 2001 to boost the efficiency and effectiveness of its environmental conservation efforts by quantitatively determining both the cost of environmental conservation programs undertaken as part of its business activities and the returns gained. In fiscal 2010, our greater focus on energy conservation activities pushed up our environmental protection costs by about 70 million yen compared with fiscal 2009, but these efforts enabled us to boost our CO₂ emission reductions by nearly 43,000 tons. A cost saving of 4.88 billion yen was also achieved through reduced electricity consumption and other factors.

We are determined to further improve our environmental

management through quantitative measurement and analysis of our environmental activities.

1. Scope of data

The companies subject to consolidated environment accounting are NTT, NTT East, NTT West, NTT Communications, NTT DATA, NTT DOCOMO, and their group companies (174 companies in total).

2. Applicable period

Data for fiscal 2010 report is from April 1, 2009 to March 31, 2010.

Data for fiscal 2009 report is from April 1, 2008 to March 31, 2009.

3. Accounting method

Accounting is based on the NTT Group Environmental Accounting Guidelines. These
guidelines comply fully with the Environmental Accounting Guidelines 2005 issued
by the Ministry of the Environment.

- •Environmental conservation costs are expressed in monetary units and benefits in monetary units and physical quantity.
- •Environmental conservation costs are tabulated separately as environmental investments and environmental costs. From fiscal 2004, depreciation costs are included in environmental costs. Personnel costs are also included in environmental costs.
- Reductions in CO₂ emissions through energy conservation measures are calculated by subtracting actual emissions from projected emissions in the event that no such measures were taken.

Progress made on the NTT Group Principal Activity Plan Targets (by fiscal 2011)

NTTGroup

	Waste reduction	Reduction in paper use				
Goals	• Reduce amount of final disposal waste to no more than 15% of fiscal 1991 levels.	• Reduce consumption of virgin pulp to no more than 80% of fiscal 1991 levels.				
Specific activities	• Reduce the amount of final disposal waste through reduce, reuse, and recycling efforts (see p. 47).	• Reduce paper use by recycling telephone directories (see p. 47).				
	Amount of final disposal waste* declined and reduction target was cleared.	The amount of virgin pulp used cleared our reduction targets for the year, and fell compared with the previous year.				
hs)	As a result of improved recycling rate and a reduction in waste output of 38,000 tons from the previous year, final disposal waste declined to only 17,000 tons, enabling us to meet our waste reduction targets for the year.	The amount of virgin pulp used for telephone directory printing was reduced to 11,000 tons through efforts to reduce the net amount of paper used and increase the content of recycled paper. The total amount of virgin pulp used in all products was reduced to 19,000 tons, achieving our reduction target for the year.				
	Waste output and final disposal waste	Virgin pulp consumption				
	(in thousands of tons) (in thousands of tons)	(in thousands of tons)				
grap	500 479 1,000	120				
Results (in	400 668 679 782 790 800 400 668 679 668 679 600 82 900 600 600 82 600 82 600 82 100 Construction work 400 400 100	Telegrams Telegrams Telegrams Target for fiscal 2011 80 Telegrams Target for fiscal 2011 84 Telegrams Telegrams Target for fiscal 2011 Billing statements Office paper Telephone directories Telephone directories				
	*Waste disposed of in landfills	- In fiscal 2007 billing statements were also included in assessments of virgin pulp consumption.				

Environmental accounting

MOE Guidelines categories		Environmenta (in millio	al investments ns of yen)	Environmen (in millio	tal expenses ns of yen)	Economic benefits (in millions of yen)		Quantitative benefits (in thousands of tons)			
		FY 2010	FY 2009	FY 2010	FY 2009		FY 2010	FY 2009		FY 2010	FY 2009
(1) Business area costs		7,780	7,430	20,330	19,780						
	 Pollution prevention costs 	370	210	570	860						
	Global environmental conservation costs	7,200	6,990	4,140	4,070	Cost reductions through energy conservation	4,880	4,120	Reductions in CO2 emissions through energy conservation measures*	94	66
						Revenues from sale of recyclable waste	5,120	3,380	Recycled used communications equipment	269	301
						Cost reductions through reusing used communications equipment	25,980	21,600	Recycled construction waste	262	258
	Resource recycling costs	210	220	15,620	14,840	Cost reductions through reusing office waste materials	40	10	Recycled civil engineering works waste	178	180
									Recycled office waste	42	40
									Other recycled items	13	15
(2)	Upstream/downstream costs	0	10	5,640	5,320	Revenues from sale of recyclable waste	7,750	3,280	Number of communications devices collected from customers (in thousands)	14,920	12,620
				,	,	Cost reductions in postal expenses through computerization	4,230	3,830			
(3)	Administration costs	10	10	5,340	5,090						
(4)	R&D costs	5,650	5,990	11,980	11,620						
(5)	Citizenship activity costs	0	0	80	100						
(6)	Environmental remediation costs	0	0	0	0						
	Total	13,440	13,440	43,360	41,900		48,000	36,220			

*Coefficients used for calculating CO₂ emissions based on levels of power consumed are the emissions coefficients of respective power suppliers for each year.

Mitigation of global warming 1: Green of ICT

Green infrastructure to address the needs of future generations

In recent years, green ICT — which is ICT designed to have lower impacts on the environment — has become the focus of keen interest. The NTT Group is implementing green ICT using two approaches, Green of ICT and Green by ICT. Of these, Green of ICT refers to efforts to reduce the environmental impacts of our own business.

In addition to groupwide efforts to save energy and promote the deployment of solar power, individual companies are also conducting various activities to reduce their environmental impacts in line with their particular businesses.



Topic 1

Groupwide TPR campaign to reduce electricity consumption

🕐 NTT Group

Over 90% of the CO₂ emissions created by NTT Group business operations are attributable to office and communications equipment power consumption. The NTT Group accordingly created a groupwide energy conservation strategy called Total Power Revolution (TPR) in October 1997 to reduce its power consumption.

By promoting efficient energy management at buildings owned by NTT, installing energy-efficient electrical power units and air conditioning systems, switching to energy-saving DC power supply for broadband equipment, and other measures, we managed to reduce power consumption across the NTT Group by 215 million kWh in fiscal 2010 compared with fiscal 2009.

CO2 emissions reduction rates of telecommunications carriers* (base year: fiscal 1991)



CO2 emissions reduction rates of other group companies* (base year: fiscal 1991)



CO2 emissions from business operations



*Coefficients used for calculating CO₂ emissions based on levels of power consumed were 0.555 kg/kWh for fiscal 2006. For fiscal 2007-2008, the emissions coefficients of respective power suppliers were used. For fiscal 2009-2010, the CO₂ emissions reduction rate was 0.34 kg/kWh, and CO₂ emissions from business operations were calculated using the emissions coefficients of respective power suppliers.

Topic 2

Promoting Green NTT to expand solar power system deployment

🕐 NTT Group

The NTT Group has been implementing its Green NTT plan to promote the use of eco-friendly renewable energy since May 2008. The goal of the plan is to expand our use of solar power, which could be seen as a key symbol of the low carbon society. Our target is to deploy a total of 5 MW of solar power systems over the whole Group by fiscal 2013.

In August 2008, we established NTT-Green LLP, a limited liability partnership charged with the task of driving the Green NTT plan. NTT-Green LLP is pushing ahead with the efficient installation of solar power systems in premises owned by group companies, and by investing and participating in NTT-Green LLP, group companies can contribute to the spread of renewable energy use. NTT-Green LLP also issues Green Power Certificates according to the amount of power generated with the approval of the third party certification authority to investing companies in line with the amount invested.

In fiscal 2010, solar power systems capable of generating a total of 530 kW went into operation at three Group facilities. These combined with systems deployed by individual companies brought the total number of NTT Group systems in operation nationwide to about 140 as of the end of fiscal 2010, with a total generating capacity of about 3 MW. NTT-Green LLP plans to fit another three facilities with a total of 540 kW in fiscal 2011, and will aim to deploy a total of 2.1 MW in solar power systems by fiscal 2013.

Topic 3

Development and installation of wireless devices that reduce environmental impacts

döcomo

NTT DOCOMO has developed low environmental impact remote radio equipment (RRE) for the optical feeder base stations¹ to be used in the LTE² service that DOCOMO will launch in December 2010. RRE units not only use 26% less electricity than existing devices, but are also compact and lightweight, which means they will have lower impact on the environment also during transport to base stations.

By the time that LTE services are launched, about half of the base stations initially slated to provide these services will be equipped with RRE units.

1. Optical feeder base station

A base station consisting only of a slave station, which is connected by a fiber optic cable to a master station located elsewhere

2. LTE

Long Term Evolution, a mobile communications specification created by standardization organization 3rd Generation Partnership Project (3GPP)

Promoting Green NTT

Launching full operational testing of a pilot system that will decide the future of large-scale PV power generation systems

NTTFACILITIES

Under a project commissioned by the New Energy and Industrial Technology Development Organization (NEDO), NTT FACILITIES is conducting research aimed at verifying grid stabilization of large-scale solar power generation systems. The project involves the building and testing of a large-scale system with a generation capacity of 1.8 MW in Hokuto City, Yamanashi Prefecture, a location blessed with more sunlight on average than anywhere else in Japan. Aimed at demonstrating the feasibility of large-scale solar power generation, this is a project of national importance that will likely determine the future of large-scale solar power generation in Japan.

Solar power holds promise as a global warming countermeasure, but the fluctuating output inherent to solar power systems might affect the stability of power grids. There are also many different types of solar cells, and ascertaining their individual power generation properties is another important aspect of this research.

The pilot system consists of one of the largest power conditioners* in Japan, combined with the world's first multiple power system stabilizers and 24 types of solar modules (the world's largest number). An eco-friendly trestle was also developed to mount the modules so as to eliminate the need for conventional concrete foundations. This not only reduces CO₂ emissions connected with platform production, but also minimizes impacts on the soil and surrounding environment.

This project started in fiscal 2007, with the system going into full operation in December 2009. In the final year of the project, fiscal 2011, detailed assessments will be carried out.

*Power conditioner

A device that converts the direct current generated by solar cells into the alternating current required for the utility power grid, maximizes output according to weather conditions, and performs various grid interconnection protective function.

Air conditioners are used to cool equipment at communications facilities housing a large amount of communications equipment to ensure the provision of stable communications services.

Reducing CO₂ emissions generated by business activities

Establishing groupwide guidelines for ICT equipment energy conservation

🕐 NTT Group

Over 90% of the CO₂ emissions created by NTT Group business operations are attributable to office and communications equipment power consumption, and effectively reducing these CO₂ emissions depends in large part on the development or procurement of energy efficient equipment.

The NTT Group has accordingly drawn up the NTT Group Energy Efficiency Guidelines that set forth our basic approach to the development or purchase of routers, servers, and other ICT equipment, and set performance targets according to device.

These new guidelines, which went into effect on May 1, 2010, embody the energy saving provisions of the NTT Group Guidelines for Green Procurement and NTT Group Green R&D Guidelines with respect to ICT devices.

We will from now on develop or procure ICT devices for use within the NTT Group on the basis of energy conservation performance as well as functionality, performance, and cost.

Optimizing temperature environment in communications facilities to reduce electricity consumed by air conditioning **NTT**WEST

NTT West Group is developing means of improving air circulation control to boost the amount of cool air reaching heat producing areas and recover more waste heat from communications equipment to optimize the temperature environment within communications facility machine rooms.

In fiscal 2010, NTT West deployed aisle capping*, a new air conditioning technology developed by NTT FACILITIES, to measure its efficacy, and found that it enables an easing of temperature, airflow, and other settings that translate into electricity savings of about 10-20%.

These efforts help not only to maintain the stability of services, but also to reduce the energy consumption of air conditioning systems.

*Aisle capping

Airflow control technology that partitions aisles between racks with walls and roofs so as to physically separate cool air supply to IT devices from the warm air exiting them and create a more efficient air conditioning environment

Achieving highest level PUE in Japan with new data center

NTTCommunications

To address rapidly growing ICT outsourcing needs, NTT Communications is actively expanding its data centers both in Japan and overseas. In October 2009, it announced the construction of its Tokyo No.5 Data Center, with total floor space of over 10,000 m², in Bunkyo Ward and expansion of the floor space of its Yokohama No.1 Data Center by about 6,400 m² with the aim of starting operation in the fourth quarter of fiscal 2011.

Both data centers will be equipped with ICT equipment of the highest quality and reliability to address the diverse ICT outsourcing needs of enterprises, and will leverage the cutting edge technology and expertise of the NTT Group to promote green ICT. The Tokyo No.5 Data Center will be one of Japan's most energy efficient data centers, with a PUE* of 1.45 or less.

This is a level that will enable us to more than meet the energy reduction requirements of businesses that are likely to become mandatory in the future.

*PUE (Power Usage Effectiveness)

The ratio of total amount of power used by a computer data center facility to the power delivered to computing equipment. PUE was developed in 2007 by The Green Grid, an American industry organization promoting data center energy efficiency.

Using EVs as company vehicles

NTTFACILITIES

NTT FACILITIES has chosen the reduction of CO₂ emissions by company vehicles as one of the global warming measure to be implemented under its Action Program to Protect the Environment. It has set itself a target for fiscal 2011 of reducing its CO₂ emissions per unit of sales by 6% compared with fiscal 2005, and is converting its car fleet steadily into low-emission vehicles.

In February 2010, the company deployed an electric vehicle (EV) in one of its Tokyo premises, and while using it, is investigating the impact of EV use on its business activities with a view to deploying them nationwide.



The deployed EV

Installing LED ceiling lighting in tenant sections of commercial properties

NTT都市開発 NTT Urban Development Co.

As an environmental measure for its developer business, NTT Urban Development has been steadily deploying LED ceiling lighting and other eco-friendly equipment in its tenant buildings, but compared with shared use areas managed by NTT Urban Development, this equipment has yet to be sufficiently deployed in tenant sections.

NTT Urban Development feels that it is important to work with its tenants on environmental measures, and has encouraged them to cooperate in the deployment of eco-friendly equipment. As a result, in August 2009, the convenience store on the ground floor of its Urbannet Kotodai Building in Sendai City installed LED ceiling lighting. To promote deployment, NTT Urban Development set up a model room to test lighting levels, prepared deployment estimates, and discussed future maintenance details. These efforts won over the tenant, who is very satisfied with the results.

NTT Urban Development will continue with these efforts to enlist the cooperation of tenants in implementing environmental measures.



LED lighting



Urbannet Kotodai Building

Mitigation of global warming 2: Green by ICT

Leveraging ICT to develop greener businesses and lifestyles

The NTT Group's green ICT initiatives are made up of both Green of ICT and Green by ICT approaches. The latter refers to the leveraging of ICT to make various activities more efficient, and thus helps to reduce the environmental impacts of society as a whole. The NTT Group aims to promote ICT-driven reductions in environmental impacts across society through proposing ways of utilizing ICT to implement efficiencies in industry, government, and everyday life, and actively disseminating information about Green by ICT.



Topic 1

Proactive communication of NTT Group environmental initiatives

🕑 NTT Group

The NTT Group actively conducts environmental publicity and other environmental communication aimed at cultivating understanding of its environmental activities among its stakeholders both within and outside the Group.

We conduct environmental communication internally to raise employee awareness of environmental issues and involve the whole Group in activities that



nvironmental print ad

contribute to the environment, and we use environmental publicity as an effective means of cultivating awareness of the way in which our services can contribute to reducing environmental impacts across society.

Topic 2

International standardization of environmental assessment methods at ITU-T

🕑 NTT Group

ICT services hold great potential to reduce CO₂ emissions across society by increasing the efficiency of production processes and reducing the need to physically move people and materials. However, evaluation and comparison of the effectiveness of deploying ICT services on a per-service basis requires the calculation of standard units for evaluating ICT equipment energy consumption or different methods of transportation. These assessment methods need to enable comparisons not only in Japan, but worldwide, making standardization all the more important.

Based on this approach, ITU-T* has been working on the international standardization of assessment methods since May 2009, and the NTT Group has played an active role in these efforts. International standardization of assessment methods will enable the quantitative comparison of ICT-driven CO₂ emission reductions based on a common approach. This will in turn enable businesses to assess deployment of ICT-related products and services not only from the perspective of performance or cost, but also from the environmental management perspective of CO₂ emission reduction benefits.

*ITU-T (International Telecommunication Union Telecommunication Standardization Sector)

A department of the International Telecommunication Union (ITU), a United Nations agency that makes policy recommendations for developing international standards in telecommunications. Japan has participated in the ITU as a Council Member since 1959.

Topic 3

Working with 25 businesses and local governments on an EV recharging infrastructure service pilot study



Electric vehicles (EVs) are expected to play an increasingly important role as a means of transport in the low carbon society, but their uptake in society depends on the creation of a recharging infrastructure that enables drivers to use them with confidence.

NTT DATA accordingly conducted a pilot study in January– February 2010 on an EV recharging infrastructure service under an EV utilization environment pilot project implemented by the Ministry of Economy, Trade and Industry's Agency for Natural Resources and Energy. NTT DATA's study was aimed at linking the recharging equipment of private businesses and local governments into a network to create a sharable platform that drivers would be able to use seamlessly to recharge their EVs.

NTT DATA worked with 25 businesses and local governments to use 22 recharging points and 114 EVs in Tokyo, Kanagawa, and Osaka for the pilot study to develop a detailed understanding of various kinds of usage.

Topic 4

Helping to promote teleworking in industry by providing the necessary network environment

🕑 NTT Group

Teleworking — a work arrangement based on the use of ICT to create an environment that enables people to work from home or elsewhere through networks — has started to spread in recent years. Teleworking can enable employees to improve their work-life balance through more flexible work styles unrestricted by location or hours, and can also bring benefits to business owners by improving the productivity of their employees and reducing costs. Teleworking is also being promoted throughout society for the way it eliminates the need for commuting, and thus enables reductions in travel-related environmental impacts.

The NTT Group is helping to promote teleworking through creating a network environment equipped with high level information security. Major NTT companies are also setting an example by establishing their own teleworking programs.

Solutions for reducing CO₂ emissions of customers and society as a whole

Enhancing environmental consulting services

NTTFACILITIES

With the revision of Japan's Energy Conservation Law and enhancement of other environmental legislation, reducing environmental impacts is becoming an increasingly important aspect of corporate business strategy. The deepening economic downturn triggered by the global financial crisis is also creating an urgent demand for solutions that are both economical and environmentally sound.

To this end, NTT FACILITIES established a Green Consulting Team in April 2009 to provide consulting services to support the environmental management efforts of businesses. In July 2009, it also increased its stake in NTT-GP ECO communication, a specialist environmental consulting company, to make it a subsidiary, and plans to work with NTT-GP ECO communication to strengthen its environmental consulting services.

More specifically, NTT FACILITIES aims to offer optimum solutions for achieving reduction targets and boosting corporate environmental value through the comprehensive consideration of various factors related to corporate environmental management, including the scope of laws and regulations, visualization of environmental impacts, cost reduction benefits of energy saving measures, and potentially applicable environmental tax exemptions and grants.

Launching Solution Environmental Label System

🕐 NTT Group

After looking into the use of a proprietary environmental label* to promote the use of ICT to reduce environmental impacts, the NTT Group established and launched pilot operation of a Solution Environmental Label System in fiscal 2010.

Under this system, ICT solutions of group companies that reduce environmental impacts to a certain extent will be identified as eco-friendly solutions and given the label. The concrete criterion for awarding the label is 'a CO₂ emissions reduction of at least 15% by volume'.

In the third quarter of fiscal 2010, we solicited candidates for the label from group companies, and labeled any qualifying solution as an 'eco-friendly solution'. We introduced the NTT Group Solution Environmental Label System on our 'Connected. That's eco.' website to publicize it and set rules for using the label logo. We plan to bring the system into full operation once we have identified and resolved any issues related to its operation.

*Environmental Label

A label that displays quantitative environmental information for a product or service (or explains that such information will be provided if requested). Japan's Ministry of the Environment has drawn up its Guidelines for Eco-Labeling in accordance with the International Organization for Standardization (ISO).This system uses a selfdeclared environmental label (Type II) that is applied to products that meet the criteria established by the declaring party's own standards.



Providing a monitoring service to support the visualization of energy consumption **NTT**FACILITIES

Reducing CO₂ emissions and complying with Japan's revised Energy Conservation Law requires energy management at the individual operator level. As such, companies need to develop a detailed picture of their energy consumption, including that of their offices and outlets around the country.

NTT FACILITIES has provided Remoni, an energy monitoring service, since February 2009. Remoni, which was developed to support energy management in line with the revised Energy Conservation Law, enables the visualization of energy consumption at multiple locations.

Remoni is an application service provider (ASP)-based service* that collects data such as cumulative and spot power consumption, temperature, humidity, and CO₂ concentration from customer sites via the Internet. In addition to Remoni, NTT FACILITIES also offers comprehensive support for the analysis and appraisal of collected data and formulation of CO₂ emission reduction and energy saving policies.

In fiscal 2010, NTT FACILITIES added such features as menus for manned support for monitoring and application to Green NTT, and within the NTT Group, started providing the service to the NTT Musashino Research and Development Center. This has helped expand applicable areas and boosted awareness of the



Remoni screenshot

Remoni service, as a result of which a total of about 6,400 measurements, including test measurements, were being collected at about 400 buildings as of the end of fiscal 2010.

Looking ahead, NTT FACILITIES will endeavor to expand features and services in line with the needs of society, and expand business through service price rationalization.

*Remoni ASP service

A service offered through a server operated and managed by NTT FACILITIES that can be used by clients possessing an Internet connection, user name, and password. Providing applications as services eliminates client-side server investment and operation costs, enabling customers to economically monitor energy use even on a small scale by paying monthly service fees. However, measurement device cost and installation fees are not included in monthly service fees.

Eco-friendly, people-friendly, long-life, energyefficient GreenITy Buildings

NTTFACILITIES

NTT FACILITIES has integrated its uniquely systemized component technologies for safety, reliability, energy efficiency, flexibility, and the environment to develop long-life, low impact GreenITy Buildings that efficiently combine various environmental technologies to reduce CO₂ emissions by approximately 40% compared with conventional office buildings.

NTT FACILITIES is also actively employing CASBEE*, increasingly the standard for assessing the environmental performance of buildings. NTT FACILITIES boasts a squad of 336 CASBEE assessors (as of March 2010), among the highest number in Japan, and utilizes their rock-solid assessment capabilities in the design and construction of GreenITy buildings.

In fiscal 2010, NTT FACILITIES' outstanding environmental expertise won it orders for the Shibaura Water Reclamation Center, Tamachi Station East Exit redevelopment, and other large projects. Such activities have also led to its participation in the Ministry of Economy, Trade and Industry's Committee on the Development and Dissemination of Net-Zero Energy Buildings (ZEBs) launched in May 2009.

In fiscal 2011, NTT FACILITIES plans to focus on the renovation market with GreenITy Renewal, and on concerted efforts targeting the green office market through further development of original environmental component technology and other activities.

*CASBEE

Comprehensive Assessment System for Built Environment Efficiency, an assessment system developed by a committee established within the Institute for Building Environment and Energy Conservation (IBEC) in 2001 under the supervision of the Ministry of Land, Infrastructure, Transport and Tourism. IBEC provides training in CASBEE assessment and operates a CASBEE assessor accreditation system.



The GreenITy Building concept

R&D for energy conservation

First ever attojoule-scale optical switch with world's lowest energy consumption

🕐 NTT

Optical technology requires less energy than electrical technology to transmit information, and enables ultra-high-speed transmission. It is already being used for FTTH¹ and other purposes for this reason, but these properties are also likely to work to advantage in microprocessor circuits. However, because optical switches and other optical devices are larger than electronic devices, incorporating optical technology into microprocessors depends on the extent to which it can be integrated.

Leveraging the powerful light trapping properties of photonic crystals, NTT Basic Research Laboratories and NTT Photonics Laboratories have used optical cavities² that are not only much tinier than any previous technology could create, but can also be integrated, to create an optical switch that requires no more than attojoule³-scale energy to function.

NTT Basic Research Laboratories and NTT Photonics Laboratories are now seeking to reduce optical switch energy consumption even more by further reducing optical cavity size and boosting light-trapping capability. They will also use photonic crystals as their material for work on reducing the size and energy consumption of other optical devices such as optical memories, lasers, and photodetectors.

1. FTTH (Fiber To The Home)

Telecommunications network technology for deploying fiber optic cables to individual homes

2. Optical cavity/photonic crystal nanocavity

A device capable of spatially trapping light that is conventionally formed by surrounding the optical medium with mirrors. Miniaturization is difficult because it renders the use of conventional mirrors impossible. Optical cavities 10-100 times the wavelength of light in size are called optical microcavities, and those with a cavity volume approximately the same as the wavelength of light are known as photonic crystal nanocavities.

3. Attojoule

Denotes a factor of 10⁻¹⁸. The prefix nano- denotes 1 billionth (10⁻⁹), and attodenotes 1 billionth of a nano-. A joule is a unit of energy.

Development of hybrid optoelectronic routers that enable considerable power consumption reduction

🕐 NTT

The increase in Internet traffic brought about by the rapid growth of Internet services is driving demand for high-volume routers and lower network power consumption. Current routers use optical-electrical-optical switches, which convert optical signals to electrical signals for processing, and then back again to optical signals. An all-optical network would enable simpler internal structure, higher speeds, and lower power consumption.

NTT Photonics Laboratories is leveraging original optical device technology to develop hybrid optoelectronic

routers that combine the merits of both optical and electrical signals. Because such routers can reduce both power consumption and latency considerably by minimizing conversion between optical to electrical signals, they hold promise for application in the high-volume metro networks of the future.



Packet router

Development of high-volume Li-ion battery systems as ICT backup power supplies **NTT**FACILITIES

In cooperation with Shin-Kobe Electric Machinery Co., Ltd., NTT FACILITIES has been developing high volume Li-ion battery systems for use as backup power supplies for ICT devices during power failures. It had already developed a safe, long-life high volume Li-ion battery for the same purpose in March 2009, but combining it with a battery controller unit (BCU) developed in March 2010 enabled practical implementation as a backup power supply system.

Lead accumulators have been the mainstream backup power sources for ICT devices up to now, but securing the space for such equipment has in recent years become difficult particularly in urban environments, and people have been pinning their hopes on Li-ion batteries that take up much less space.

Indoor backup battery systems need to be safe (flameresistant, etc.) and long-lived to curb replacement costs. Unlike lead accumulators and other batteries utilizing water-soluble

electrolytes, Li-ion batteries also require the development of BCUs to equalize battery voltage.

The development efforts of both companies enabled these challenges to be surmounted, and NTT FACILITIES now plans to market the resulting Li-ion systems for city buildings with confined space where demand for compact backup battery systems is high.



Li-ion battery system

Research into technology for generating electricity from merely walking

🕐 NTT

NTT Energy and Environment Systems Laboratories is conducting research on walking power technologies designed to produce electricity from merely walking.

Walking power systems consist of liquid-filled tanks fitted to the bottom of a shoe, plus attached turbine and generator. Walking in such shoes puts pressure in turn on the tanks under the toes and heel, pumping the liquid in the tanks through the turbine to generate electricity. Converting human kinetic energy like this into electrical energy produces no CO₂ emissions and could generate enough electricity to keep a mobile phone battery charged while on the move, or serve as a power supply for functional shoes equipped with GPS, LED lights or foot heaters and such like.

In fiscal 2010, NTT Energy and Environment Systems Laboratories further reduced tank and turbine size and tested the system on real world shoes. The system proved capable of generating an average of 0.8 W, which is equivalent to the power consumption

of a mobile phone when talking with a caller. It has attracted tremendous media attention, winning coverage in many newspapers and magazines, and exhibits at trade shows.



Prototype shoe capable of generating electricity

Development of efficient fuel cell technology to help reduce CO₂ emissions

🕐 NTT

Fuel cells are attracting keen interest as a clean and highly efficient means of converting fuel energy into electricity.

Focusing on solid oxide fuel cells (SOFC), considered to be the most efficient fuel cell technology, NTT Energy and Environment Systems Laboratories is using proprietary materials and designs to develop cells (power generating elements) and cell stacks that rank among the world's most efficient and longlived fuel cells.

These fuel cells are being designed for use in the cogeneration of heat and electricity in schools and restaurants, and as highly efficient power supplies in communications facilities and office buildings, and NTT is aiming to develop systems capable of reducing CO₂ emissions by up to 10% compared to conventional commercial power sources.

In fiscal 2010, NTT Energy and Environment Systems Laboratories achieved a stable power supply using SOFC cells and established a method for production of 1.5 kW SOFC cellstacks, making eight stacks. It will continue to work on the development of large-scale SOFC systems for communications facilities and other applications.

SOFC cell, stack, and mock system



Developing original technology for compact and efficient solar cell systems

Using solar cells to power information devices requires ratcheting up the very low voltage of 0.3–0.4 V generated by silicon photovoltaic cells to the 5 V required by such devices. Voltage is usually raised by serially connecting multiple cells in panels, but a major weakness of such solar panels is that if they are partially shaded, soiled, or scratched, the amount of power they produce declines steeply.

NTT Energy and Environment Systems Laboratories has, however, developed a proprietary ultra-low voltage booster circuit that provides ample voltage from a single photovoltaic cell. Using this technology would enable a weak output to be boosted instantly to an ample level to power devices, eliminating the need for troublesome series connection of multiple cells. The resulting solar panels would also be able to steadily produce electricity even when partially shaded or scratched.

To test the efficacy of this ultra-low voltage booster circuit, in fiscal 2010 NTT Energy and Environment Systems Laboratories cooperated with Kyushu University to conduct an experiment on its use as a power source for information devices and LED lighting in a village in Bangladesh that lacks a power supply. NTT Electronics has also integrated this technology, which Seiko

Instruments Inc. (SII) then combined with a booting circuit to package into its FOMA Eco Solar Panel 01 solar mobile phone charger.



SII's FOMA Eco Solar Panel 01

Waste reduction and reduction of paper consumption Working with stakeholders to create a sustainable society

Products and services offered by NTT Group companies, along with supporting communications equipment, require periodical upgrading in line with technological advances, life cycle management considerations, and other factors. The NTT Group works with its customers and business partners to reuse or recycle communications devices and equipment that have been taken out of service. We also help to build a sustainable society through a range of activities including curbing the generation of waste from our business activities and utilizing ICT to reduce paper consumption.



Topic 1

Collecting and recycling mobile phones, personal computers, and telephone directories

🕐 NTT Group

The NTT Group collect mobile phones as well as compact rechargeable batteries (NiCd, Li-ion batteries) from used telephones and cordless phones, toner cartridges used in fax machines, and other materials to reuse as resources. To promote these activities throughout society, we encourage our customers to hand in used equipment, and collect such equipment from group employees and their families. We also help to reduce waste and recycle resources effectively through our IT Equipment Collection Service for collecting and reusing used IP communications equipment of customers and PCs no longer required by businesses.

We help to reduce customer waste output and paper consumption across society as a whole through the closed loop recycling of used telephone directories to manufacture telephone directory paper, and provision of Internet billing services that enable customers to check billing statements through Internet, e-mail, and mobile phones.

Waste output and final disposal waste*



*Waste disposed of in landfills

Virgin pulp consumption



Topic 2

Reusing and recycling waste from communications equipment installation/removal

O NTT Group

The NTT Group owns a variety of communications equipment including telephone poles, switching equipment, and communications cables. Such equipment needs to be removed and disposed off when it reaches the end of its service life or is replaced during system upgrades for new services and so forth. We promote the reuse and recycling of such removed communications equipment within the Group, and recycle whenever possible, for example recycling discarded concrete blocks as road building material.

For fiscal 2010, across the entire NTT Group, we recycled 197,000 tons of concrete telephone poles, 17,000 tons of switching equipment, and 22,000 tons of communications cables. These activities resulted in a recycling rate of 99.9% for all of our communications equipment, achieving zero emissions* for the sixth consecutive year.

*Zero emissions

A concept proposed by the United Nations University that calls for reusing all waste materials and by-products from industrial activity as resource inputs for other types of production in order to eliminate waste on a lifecycle basis. The NTT Group considers a final disposal rate of 1% or less to satisfy zero emissions conditions.

Topic 3

Reducing waste through the use of folding containers and confidential document collection boxes

🕐 NTT LOGISCO

NTT LOGISCO endeavors to reduce waste through using reusable Oricon folding containers instead of cardboard boxes for transport and storage purposes. Use of Oricon containers in fiscal 2010 reduced cardboard boxes used in goods transport and delivery by an



SS-BOX collection box for unneeded confidential documents

equivalent of 294,000 boxes, and those used in storage by an equivalent of 16,000 boxes.

NTT LOGISCO has also built a recycling system for the safe and easy collection and processing of large volumes of unneeded confidential documents generated by businesses. It places secure disposal boxes (SS-BOX) in the offices of NTT Group companies and other customers, and collects and pulps the disposed documents for recycling as cushioning material and toilet paper. Approximately 13,000 tons of such paper waste was collected for recycling in fiscal 2010.

Reducing waste, reusing, and recycling

Collecting used mobile phones from group company employees and their families

döcomo

NTT DOCOMO collects used mobile phones from both customers and group company employees and their families. In fiscal 2010, it enlisted the cooperation of group companies around the country and collected 4,832 handsets, 4,564 batteries, and 3,279 chargers. As with equipment collected from customers, these were all recycled to recover valuable resources.

NTT DOCOMO will continue this activity in fiscal 2011 too as it calls on its employees to actively participate environmental activities.

Making slimmer user instruction manuals

docomo

NTT DOCOMO is reducing the number of pages in its user instruction manuals to ensure wise use of paper resources. In the past, such manuals had as many as 500 pages, but by focusing on readability and comprehension, limiting information to the basics and using plentiful illustrations and diagrams, the company has cut manuals down to about 130 pages.

It also includes convenient usage guides in its mobile phones so as to enable users to check usage procedures from their phones. More detailed manuals are available on DOCOMO's website as PDF files.

As a result of such endeavors, DOCOMO reduced the amount of paper used for user instruction manuals in fiscal 2010 by about 1,000 tons. The decrease in weight also results in reduced CO₂ emissions related to transport of mobile phones to dealerships.

Reselling computers and other IT devices after deleting data

🕐 NTTEAST 🕐 NTTWEST

NTT East and NTT West have been offering an IT Equipment Collection Service since July 2002 to recycle PCs that companies no longer have need of. After completely deleting data stored on internal computer hard disks, the computers are purchased as used computers and reused as commercial products, helping to prevent information leaks, reduce waste, and cut disposal costs.

The tightest security measures are applied to data deletion, including smartcard-based data deletion center entry and exit management, and real-time video display of the data deletion process to customers through webcams located inside the centers.

In fiscal 2010, NTT East collected 40,000, and NTT West 71,000 PCs, making for a total of 111,000. In fiscal 2011, these services will be enhanced to enable deletion of data over networks, thus boosting service convenience and efficiency.

Cumulative total of 72.54 million mobile phones collected

Containing gold, silver copper, palladium and other metals, mobile phones could be regarded as a valuable recycling resource in Japan with its paucity of mineral resources.

NTT DOCOMO has collected and recycled used mobile phones since 1998, and in 2001 partnered with the Telecommunications Carriers Association to build the Mobile Recycle Network to collect mobile handsets irrespective of

carrier. In fiscal 2010 it collected 3.76 million handsets, making for a cumulative total of 72.54 million.

DOCOMO displays stickers promoting collection in docomo Shops, and advertises the service at events to further promote and enhance these efforts.

 Collection boxes are used at events in certain locations.



Collection box

Conservation of biodiversity Positive actions for protecting nature

The biodiversity that we human beings too depend upon in many different ways has come under threat in recent years, and its conservation is a global issue. The United Nations has declared 2010 to be the International Year of Biodiversity, and with the tenth meeting of the Conference of the Parties on the Convention of Biological Diversity (COP10) held in Nagoya in October, the Japanese people too are showing a growing interest in biodiversity. NTT Group companies are addressing the issue through a range of activities tailored to their respective businesses.



Urban design for beauty that grows over time

NTT都市開発

NTT Urban Development has teamed with four housing companies* to develop an estate of detached homes on land that used to be occupied by NTT company housing in Shingu Town, Kasuya District, Fukuoka Prefecture.

Named WELLITH Park Shingu Morinomiya, the project aims to create a community whose beauty grows over time. While allowing for individuality in home design, the project sets certain rules through construction and green space agreements and townscape guidelines that are designed to create a verdant and visually coordinated and attractive environment. The estate's public spaces will also be planted with as much vegetation as possible, bunched in a way that mimics mixed forests to attract an increasing variety of insect and bird life as the trees and bushes grow.

*Four housing companies

Daiwa House Industry Co., Ltd., Toyota Home Inc., Sumitomo Forestry Co., Ltd., and Nishi-Nippon Railroad Co., Ltd.



WELLITH Park Shingu Morinomiya

Preserving ecosystems near wireless base stations

NTT Communications

NTT Communications had 22 wireless base stations as of the end of March 2010, ten of which are located within national parks. Because some areas in national parks lack road access, roads need to be constructed to perform regular base station maintenance. In addition to strict adherence to relevant laws and regulations, the company uses its own environmental assessment methods to protect biodiversity, surveying flora and fauna distribution prior to construction and planning construction in such a way that this distribution is not disturbed. Particularly if Red List species have been found, NTT Communications works with local governments, NPOs, and other organizations to ensure that construction has minimum impacts on local biodiversity.

Promoting environmental communication

Tanabata Light Down Campaign saves power equivalent to 5,900 homes

NTT Group

In an effort to promote individual action to counter global warming among Group employees in their daily lives, the NTT Group is an active member of the Light Down Campaign hosted by the Ministry of the Environment.

In fiscal 2011, the entire Group participated in the Tanabata Light Down held on July 7th to coincide with Cool Earth Day. At 971 locations throughout Japan, participants were asked to turn off indoor lighting and illuminated signs after 8:00 at night, an

act that resulted in estimated reductions of about 58,000 kWh of electricity, equivalent to the power used by 5,900 homes in one day.



NTT East head office building left: before right: after

Environmental/CSR Reporting Symposium

🕐 NTT Group

The NTT Group has since 2007 held an annual Environmental/ CSR Reporting Symposium with support from the Ministry of the Environment and Ministry of Economy, Trade and Industry.

This symposium surveys and analyzes reports from the reader perspective with the aim of closing gaps between author and reader and producing reports that address reader demands. Targeting personnel responsible for preparing environmental/ CSR reports, the symposium seeks to raise awareness of the issues that businesses need to think about to fulfill their corporate social responsibility, and the kind of information that they should communicate to readers.

The fiscal 2010 symposium, held on December 11 at the Eco-Products 2009 exhibition, featured a panel discussion on the theme of "What Innovations Can Reduce CO₂ Emissions by 80% by 2050? — Socioeconomic Systems and Low Carbon Scenarios" and a presentation of the results of an online opinion survey on environmental and CSR reporting conducted through NTT Resonant's goo Research service. The event drew an audience of about 420 people.

Environmental awareness and education activities including poetry, poster display, and Eco-Theater



The NTT Group uses new employee training sessions to conduct environmental education aimed at raising awareness of environmental issues. In addition to introducing the NTT Group's stance on environmental protection activities and details of such activities and their results, the training sessions seek to foster understanding by explaining the importance of developing technology that reduces environmental impacts, and the NTT Group's plans and targets in this area.

The NTT Group also enlightens and educates all group employees about environmental issues through activities such as the display of Cool Biz and Warm Biz posters throughout company buildings, sharing of environmental topics over the group intranet, distribution of eco-cards, and holding of environmental poetry and photo contests.

Nippon Information and Communication has since fiscal 2009 held twice-yearly Eco-Theater events to screen movies on environmental themes as part of its environmental

education program for NTT Group employees. Fiscal 2010's Eco-Theater, held in March 2010, screened a film on global warming and the environment that was attended by 20 employees.



Eco-Theater

Five group companies achieve top ranking in the 13th Nikkei Environmental Management Survey (Nikkei Inc.) **NTT**Group

NTT Group companies took five of the top ten slots in the communications services category of the 13th Nikkei Environmental Management Survey (Nikkei Inc.) announced in December 2009, with the Group as a whole also earning a high rating.

Nikkei Inc. started this annual survey in 1997 to rate companies according to their environmental policies, focusing on how well they balance business efficiencies with environmental measures such as reduction of greenhouse gases and waste.

Environmental data

Environmental management

Current status of NTT Group's ISO 14001 certification acquisition





Number of recycling boxes installed and

Participants in Operation Clean Environment



Mitigation of global warming

N20

·(H

(fiscal year)



Greenhouse gas emissions other than CO₂ emissions (CO₂ emissions - equivalent)





Clean energy generation



Mitigation of global warming

2009 2010

0

(units)

2006 2007 2008

Number of clean energy generators



Number of low-emission company vehicles



Fuel consumption by company vehicles



Waste reduction

Waste and excess fill from construction sites



Waste and excess fill from civil engineering works



Reduction of paper consumption

Amount and percentage of old telephone directories collected



Office waste



Waste reduction



Measures against environmental risk and ozone layer depletion

Amount of specified halon held for fire extinguishing equipment



Amount of specified chlorofluorocarbons used in air conditioning equipment



Measures against environmental risk and ozone layer depletion

Asbestos removed from NTT Group facilities



Number of centrifugal chillers (that use CFCs) and number of units removed



Safe and secure communication

Ensuring stable and reliable services as critical infrastructure

Providing peace of mind around the clock with telecommunications services robust enough to withstand disasters

Telecommunications services are an indispensable part of the infrastructure underpinning our everyday lives and society as a whole, and they play a particularly important role in supporting relief and rehabilitation work when disaster strikes.

The NTT Group does its utmost to provide peace of mind around the clock by constantly checking that its systems and services perform with the kind of stability and reliability expected of such vital infrastructure. We endeavor to provide communications services robust enough to withstand a wide range of anticipated contingencies, and when a disaster occurs, we do our best to keep lifeline communications services running, and to restore all affected services as soon as possible.



Topic 1

Communications network disaster preparedness based on three basic policies

NTT Group

The NTT Group makes constant efforts to provide security and peace of mind through disaster preparedness measures based on the following three basic policies.

Measures to improve communications network reliability

The NTT Group has learned many lessons from past disasters that it has applied to ensuring the continuity of communications services in the event of a disaster through such means as transmission line multirouting and distributed location of important communications centers fitted with transit switches. We also strive to secure and improve the ability of communications equipment housings, steel towers, and other facilities to withstand earthquakes, flooding, fire, and other contingencies in accordance with predetermined standards.

Securing critical communications

When a disaster strikes, the telephone system of the affected area is inundated with calls, causing network congestion. Under such conditions, we suppress ordinary phone traffic to secure critical communications services necessary to conduct emergency rescue and restoration operations and maintain public order, and to keep emergency number services such as 110, 119, and 118 going.

We also provide general customers with Disaster Emergency Message Dial (171) and other services as a means of checking on the safety of relatives and friends in affected areas, make our public telephones available free of charge, and provide specially installed public telephones at evacuation sites and other locations in affected areas for use by residents.

Prompt restoration of communications services

The NTT Group stations highly mobile disaster response equipment such as power supply vehicles, portable satellite equipment, and portable mobile base stations at locations throughout the country to aid in the prompt restoration of services and securing of critical communications in disaster-stricken areas. If communications services have been disrupted by a disaster or other causes, this equipment is used to restore services as rapidly as possible. In the event of a major disaster, a disaster management headquarters and other emergency structures are also immediately set up to implement service restoration operations. Depending on the scale of the disaster, a wide area support network encompassing group and other affiliated companies around the country is also created to assist in disaster response.



http://www.ntt.co.jp/saitai/ (in Japanese only)

Topic 2

Addressing the disasters that struck in fiscal 2010

NTT West

In August 2009, Tropical Storm Etau caused extensive flooding in western Japan, and when a fiber optic trunk cable was severed by a landslide in northwest Hyogo Prefecture, 1,291 telephone lines and 137 leased circuits were knocked out.

NTT West immediately established a disaster management headquarters in its Hyogo branch to supervise restoration work, and under its guidance, NTT-Neomeit's Kansai Branch Hyogo Network Operations Center conducted remote control fiber optic loss tests and field investigations to identify damage locations. It then strung new cables from both sides of the river and connected them to restore services. It took about six hours

of work on a bridge above the river to check and connect each line and provisionally restore communications, and about 53 hours from detection of the failure to fully restore all services.



The area damaged by the typhoon

NTT DOCOMO

Heavy rainfall in July and August 2009 in Yamaguchi and Hyogo Prefectures and Typhoon Melor in October caused widespread flooding and wind damage, but services in affected areas were soon restored with the help of mobile base stations and power supply vehicles, and signal support from surrounding base stations. While carrying out repairs of Typhoon Melor damage, NTT DOCOMO used new mobile base station vehicles equipped with satellite links for the first time.

NTT DOCOMO also supported local governments and Ground Self Defense Force personnel engaged in disaster relief activities by lending mobile phones and chargers for use at evacuation centers.

NTT Communications

NTT Plala, a member of the NTT Communications Group, used its HIKARI TV video service to aid victims of the January 2010 Haiti and February 2010 Chile earthquakes. It made all of its videos about natural disasters available for free to all of its subscribers from February 1 to 28 for the Haiti quake, and from March 5 to 31 for the Chile guake, and donated ¥50 for every subscriber viewing these videos to disaster relief work in Haiti and Chile through the Japanese Red Cross Society.

Ensuring information security

Protecting information with a secure ICT environment and protecting society with information

The NTT Group is actively implementing measures and developing technologies for maintaining and improving the security of ubiquitous broadband communications. We put the protection of information at the core of our business activities and spare no efforts to build information security structure.

As use of the Internet and mobile phones continues to spread, we are not only putting ICT to further use in protecting society, but also developing systems and conducting a wide range of educational activities aimed at creating a safe and secure communications environment for children as well as adults.



Topic 1

Operation of *occrue,* a convenient information leakage prevention solution

🕐 NTT Group

NTT handles a wide variety of important information on customers, equipment, and so forth during the course of its business operations. From January 2009, the NTT Group has been using *occrue*, a service that facilitates the safe transfer on its dedicated intra-group network of important or large-volume information between NTT Group companies without information leaking outside the NTT Group.

In the past, it was necessary to manually encrypt information when sending or receiving large numbers of files, but the *occrue* service automatically authenticates users sending or receiving files, encrypts data, restricts file distribution channel, and enables large volume of files of up to 5 GB to be sent or received. We will continue to promote the use of *occrue* as an intra-group IT platform service while also expanding its usage by offering it as a service to other businesses.

Topic 2

Safety workshops for trouble-free Internet and mobile phone use by children

NTTEAST docomo

NTT East visits schools to hold Internet Safety Workshops that educate children in communication skills, netiquette, and trouble-free utilization of ICT. Using anime (cartoons) and practical drills, these workshops teach children about use of face-to-face or e-mail dialog according to situation, and how to avoid trouble. In fiscal 2010, it held 469 workshops that were attended by 12,613 children nationwide.

NTT DOCOMO also holds Mobile Phone Safety Classes to educate children on mobile phone etiquette and how to avoid trouble. In fiscal 2010, it dispatched instructors to hold about 5,500 such classes in elementary, junior high and high schools, and local communities nationwide.

NTT DOCOMO has also created educational videos for

teachers to use as teaching aids when educating children in safe mobile phone use. In fiscal 2010, it distributed these videos free to about 31,500 elementary and junior high schools.



Internet Safety Workshop

Topic 3

NTT CERT: Supporting security across the NTT Group

🕐 NTT

A computer security incident response team (CSIRT) is an organization that gathers information on computer security threats, investigating them, and implementing appropriate response activities. NTT-CERT, operated by the NTT Information Sharing Platform Laboratories, is the CSIRT for the NTT Group.

NTT-CERT¹ provides a helpline to handle inquiries from group companies regarding information security threats, and provides information on security threats that it has gathered both internally and from other sources. It works with group company security managers, system administrators, and others to coordinate responses and provide technical support, and helps to minimize the damage caused by new threats, information leaks, and other security-related issues.

NTT-CERT has also focused on experiments, consulting, and other support activities to ensure the safe and secure operation of broadband services of group companies that use the next-generation network (NGN)² provided by NTT East and NTT West.

As an example of NTT-CERT activities, when the NTT Group handled the building and operation of the communications network for the G8 Hokkaido Toyako Summit held in 2008, NTT-CERT worked with group companies to assure information security by conducting pre-summit drills to counter cyber attacks and maintaining a high alert status throughout the summit.

In fiscal 2010, NTT-CERT was involved in a wide range of security management and educational support activities to maintain and improve NTT Group security, including the introduction of a program for building and operating CSIRTs overseas, establishment of work process guidelines and security operation standards, and provision of educational curricula for various security technologies.

NTT-CERT also helps to ensure the security of specific systems and resolve problems, including provision of support for diagnosing the security of the Web servers used by group companies to host their websites, and digital forensics³ support.

NTT-CERT contributes to improving the security level not only of the NTT Group, but also of Japan as a whole by helping to recruit members to the Nippon CSIRT Association⁴ and promoting its activities, including the introduction of a program for building and operating CSIRTs.

1. NTT-CERT

NTT-CERT has obtained ISO 27001 information security management system certification to use information provided through its helpline and other information that it has gathered itself to counter new security threats, minimize risks, and otherwise maintain security.

NTT-CERT http://www.ntt-cert.org/index-en.html

2. NGN

A next-generation telecommunications network combines the reliability and stability of conventional telephone networks with the flexibility and economy of high-speed, high-capacity IP networks. NTT has led the world in bringing NGN to fruition, and has launched commercial NGN services.

3. Digital forensics

Methods and technologies for the scientific investigation and analysis of electromagnetic records for detecting evidence of forgery or mutilation in relation to security threat incident responses, criminal investigations, and legal disputes

4. Nippon CSIRT Association

A Japanese CSIRT organization established in April 2007 by NTT-CERT, JPCERT/CC, and others

R&D for maintaining and improving information security

TOMOYO Linux officially adopted for mainline Linux kernel



TOMOYO Linux, a Linux security extension that NTT DATA has been developing since 2003, was on June 10, 2009 officially adopted for version 2.6.30 of the mainline Linux kernel¹. TOMOYO Linux joins SELinux (developed by the US government's National Security Agency [NSA]) and SMACK as the third mainline Linux security enhancement module (secure operating system extension) to be adopted, and is the second major Japanese contribution to Linux following IPv6. Since its official adoption for the mainline Linux kernel, TOMOYO Linux has started to be packaged into Linux distributions² such as Ubuntu and Debian.

NTT DATA has long been involved in promoting the development and spread of open source software (OSS). Linux is distributed as a free OSS operating system whose use in mobile phones, consumer electronic appliances, and other digital devices has expanded rapidly in recent years worldwide. In the increasingly important field of security, TOMOYO Linux is a notable Japanese contribution to OSS, and a valuable outcome of NTT DATA's R&D that has gained international recognition.

NTT DATA's TOMOYO Linux efforts were rewarded in December 2008 with the presentation of the Japan Network Security Association (JNSA) Prize for contributing broadly to society through active involvement in the improvement of information security. In September 2009, NTT DATA also received a letter of appreciation from the director general of the Ministry of Economy, Trade and Industry's Commerce and Information Policy Bureau for its 'contribution to the creation of a community of advanced specialists in Japan'.

Looking ahead, NTT DATA will continue to strengthen its ties with Linux developers worldwide, provide updates and user support, and endeavor to make further contributions to the creation of secure OSS-based systems.

1. Kernel

The central component of computer operating systems that provides basic functions such as the control of devices and launch of programs

2. Distribution

A software package containing kernel, applications, drivers, settings, etc. Linux is available as Red Hat, Ubuntu, and many other distributions.

Research on quantum cryptography, the ultimate security

🕐 NTT

Currently the most widely used encryption methods depend on the computational difficulty of integer factorization as the basis for their security, but with increasingly powerful computing, integer factorization may no longer constitute an impossible hurdle, and for this reason, quantum cryptography is being increasingly studied as an absolutely secure encryption method.

Quantum cryptography uses photons to transmit cryptographic key information. Any attempts by a third party to eavesdrop on a key will disturb the quantum properties of the photons, making eavesdropping detectable to the two communicating parties. This is why quantum cryptography is regarded as a theoretically eavesdrop-proof cryptographic system. Real-world application of quantum cryptography as the ultimate guarantee of security will require research on the development not only of generators and detectors of photons that are the medium of information transmission, but also of transmission lines that can transmit these exceedingly weak light signals without any loss, and transmission methods capable of easily detecting even the most ingenious eavesdropping.

As a step towards the practical implementation of quantum cryptography, in May 2007, NTT Basic Research Laboratories succeeded in using a single photon to distribute a cryptographic key over a 200 km optical fiber, a world record. In 2009, NTT furnished theoretical proof that its differential-phase shift quantum key distribution (DPS-QKD) protocol guarantees security at the single photon level. As another world-class achievement, it also attained secure key rates of over 1 Mbit/s for quantum key distribution and demonstrated the security of DPS-QKD using single photons.

In December 2007, NTT Communication Science Laboratories also proposed quantum digital signatures that collapse on authentication. Quantum digital signatures can be used to sign contracts and be authenticated using quantum calculators, and since they can be used only once, they are seen as a promising technology for software license management and other applications.

Setting a new world record for the integer factorization that underpins the security of public key cryptography **() NTT**

In joint research with Ecole Polytechnique Fédérale de Lausanne (Switzerland), Bonn University (Germany), Institut National de Recherche en Informatique et en Automatique (France), and Centrum Wiskunde & Informatica (Netherlands), NTT Information Sharing Platform Laboratories, which conducts research on new cryptographic techniques and tests current cryptography, set a new world record in January 2010 when it succeeded in factoring a 232-decimal digit composite integer with a length of 768 bits in terms of RSA cryptography. Currently the most commonly used public key encryption method, RSA cryptography depends on the computational difficulty of integer factorization as the basis for its security.

Integer factorization is the factoring of a composite number (an integer that is not a prime number) into its prime number factors. The higher the composite number, the more impractical its factoring becomes, since an increase of only a few bits requires exponentially longer computational time. The security of RSA public key encryption is based on the practical difficulties of such integer factorization.

However, with the rapid advances in computer power in recent years, conventional encryption technology is no longer as secure as it used to be, and so ensuring that security is maintained as ICT evolves requires quantitative analysis of the security of current integer factorization-based encryption technology.

The previous world record for integer factorization was 663 bits (200-decimal digit number). The setting of this new record enables current computing resources to be quantitatively assessed for their integer factorization capabilities, and provides more precise prediction of the status of RSA cryptography security deterioration.

Development of clustering technology to boost database reliability and operability

O NTT

Corporate databases need to keep running stably not only during business hours, but also at night and over weekends and other holidays, and such needs are constantly growing. Roundthe-clock Internet banking or phone and other telecommunications services, for example, use information stored on databases, and if a computer failure prevents those databases from being used, such services stop functioning.

To prevent such failures, NTT Cyber Space Laboratories is conducting R&D aimed at improving the reliability and operability of the PostgreSQL open source database. In November 2008 it developed redundancy configuration (clustering) technology for PostgreSQL that replicates a database while it is in service, copying any changes in the source as they occur to the copy location so as to ensure continuity of the service in the event of source system failure. NTT Cyber Space Laboratories has also developed high-speed backup data verification, online maintenance and other technologies for further improving the operability of databases.

In fiscal 2010 NTT Cyber Space Laboratories developed system technology for packaging redundancy configuration (clustering) into PostgreSQL, and submitted it to the organization promoting PostgreSQL development. PostgreSQL 9.0, which was released at the end of August 2010, is equipped with a Streaming Replication feature that was developed as open source software from the source code for the redundancy configuration (clustering) technology that NTT Cyber Space Laboratories released in 2008.

Security solution using USB infrared human presence sensors

In October 2008, NTT Advanced Technology (NTT AT) released AT WATCH NET IR, a USB-based solution for crime prevention, energy saving, and other applications.

AT WATCH NET IR connects infrared human presence sensors, PCs, and cameras through simple USB connections, and connecting several sensors enables 360-degree detection through multi-directional monitoring of three-dimensional space. Because AT WATCH NET IR can be configured to sound an alarm and send an e-mail message to specified mobile phones or other devices when it detects a person, it can be used to prevent crime. It can also be used to save energy by configuring it to turn a PC monitor on or off according to its detection of human presence. It also holds promise for such applications as watching over elderly people or patients requiring constant care.

In March 2009, NTT AT released AT WATCH NET Still, a new version capable of sending images, and in August 2009, AT WATCH NET Movie, which can record video with sound, making it even more useful as a security solution. By the end of fiscal 2010, AT WATCH NET versions had been deployed by several hundred businesses and local authorities for use in various applications.

USB-based human presence sensor system AT WATCH NET IR



Pursuing customer satisfaction

Research on the safety of mobile phone radio waves

döcomo

Research on the effects of mobile phone radiofrequency radiation on human health has been conducted for over 50 years, and the Japanese government's Radio-Radiation Protection Guidelines and related laws and regulations are based on World Health Organization and Ministry of Internal Affairs and Communications findings. NTT DOCOMO operates its base stations in compliance with these guidelines, and checks that the radio waves emitted by its mobile phones are within the limits stipulated in the guidelines.

NTT DOCOMO also holds periodical lectures by experts both within and outside the company to ensure that its employees keep abreast of the latest Japanese and overseas research results and trends in regulation related to radiofrequency radiation protection.

Building a quality management framework and making quality improvements

Hosting a conference on international data communications quality improvement with 19 overseas carriers

NTTCommunications

To further improve the quality of its Arcstar Global Network Services, NTT Communications held Arcstar Carrier Forum 2010 in March 2010 in Tokyo to discuss means of improving Arcstar services with 19 major overseas carriers.

NTT Communications has held this annual forum since 2000 to gather frontline quality assurance managers from its Asian telecommunications partners under one roof to hold concrete discussions on improving network quality. This year's forum focused on quality and efficiency enhancements through measures such

as quality assurance, trusted infra-network designs, and quality improvement, and included discussion of personnel structure and operation processes. Participants agreed to implement measures aimed at infrastructure improvements.



Arcstar Carrier Forum 2010 participants

Promotion of universal design

Promoting the use of technology to support universal design for the Web

In May 2005, NTT established a Universal IT Design Center (renamed ICT Design Center from fiscal 2011) within its Cyber Solutions Laboratories to support the adoption of IT-related universal design technology across the NTT Group.

The Center uses e-zines and a website to feed information to NTT Group employees and promote awareness and adoption of universal design. As of the end of fiscal 2010, the Center boasted 417 subscribers.

In May 2009, the Center held a symposium for NTT Group employees on universal design for the Web that was attended by 235 employees. It has also been focusing on the development of website accessibility diagnosis and support technology tailored to the summer 2010 revision of Japan's JIS X8341-3 Web accessibility standard.

NTT also helped to establish the Japan Web Accessibility Consortium (JWAC) to promote Web accessibility with experts and other companies, and will use JWAC activities to help drive the adoption of universal design for the Web throughout society.

Team NTT communication

Activities that contribute to respect for diversity and equal opportunity Creating an environment for people to fulfill their potential

The NTT Group is committed to creating workplaces where all employees can grow and succeed irrespective of gender, age, race, nationality, disabilities, or other factors. NTT's Diversity Promotion Office and the Diversity Promotion Officers of group companies work together to help employees achieve a good work-life balance and develop careers for an increasingly diversified workforce. We share information on common issues across the Group, adopting outstanding initiatives for application across the whole Group.



Topic 1

Women's career promotion forum held jointly by nine group companies

NTT Group

Nine NTT Group companies held joint forums in January 2009 and 2010 to promote the careers of female employees through networking between managerial level female employees and providing motivation for the nurturing of juniors.

At these forums, the presidents of participating group companies spoke about the importance of diversity, and participants with different occupations and affiliations exchanged views. Participants rated the events highly, commenting, for example, that "it was stimulating to talk with

others, and I've made friends with whom I can share my worries" and "I feel more motivated now, having heard female executives in the Group speak of their experiences".



Joint forum by nine group companies

Employment in the NTT Group



The above data represents NTT and five core NTT Group companies: NTT East, NTT West, NTT Communications, NTT DATA, and NTT DOCOMO. 1. As of March 31, 2010 2. As of April 1, 2010

Topic 2

Expanding employment of people with disabilities ONTTGroup

The NTT Group actively recruits people with disabilities and endeavors to expand hiring opportunities for them. Following NTT's establishment of NTT CLARUTY and NTT DATA's of NTT DATA DAICHI, NTT West founded NTT WEST LUCENT in fiscal 2010 as the third special subsidiary within the NTT Group. In the same year, NTT CLARUTY launched a business card printing business, and NTT DATA DAICHI started ornamental plant rental and paper recycling businesses, with both companies expanding their workforces in line with this business diversification. In addition to the efforts of these special subsidiaries, in October 2009, call center operator NTT Solco opened the Saitama Shintoshin Center, a facility operated mainly by employees with disabilities.

Percentage of employees with disabilities (as of June 1 in each year)



Topic 3

Hosting researchers from around the world **NTT**Group

NTT Group laboratories employ researchers of many nationalities, and open their doors to researchers and interns from many different countries through visiting researcher and internship programs.

In fiscal 2010 NTT employed:

- 21 employees who are foreign nationals (NTT and NTT DOCOMO)
- 30 contract researchers who are foreign nationals (NTT) - Cumulative total for fiscal year
- 70 trainees accepted from foreign countries through internship programs (NTT)

Aiming to nurture people capable of handling international relations, NTT DATA has since 1998 offered eight-month internships to European students through the EU-Japan Centre for Industrial Cooperation. In fiscal 2010, the company welcomed an Italian university student to conduct research in automated software development.

EU-Japan Centre for Industrial Cooperation http://www.eu-japan.eu/



Interns from overseas receiving training

Working as one on corporate citizenship activities

Fulfilling our mission to work for the betterment of society

All NTT Group company personnel and their families as well as former NTT employees, and people from local communities actively participate on a sustained basis in our citizenship activities as members of Team NTT.

In line with the Team NTT Communication pledge set forth in our CSR Charter, we carry out citizenship activities in the following six areas: environmental conservation, education and cultural promotion, social welfare, local community development and dialog, international exchange activities, and sports promotion.



Topic 1

Environmental contribution activities under the Green with Team NTT banner

🕑 NTT Group

The NTT Group has since fiscal 2010 been focusing on environmental contribution activities under its "Green with Team NTT" banner.

Policy for environmental contribution activities

In addition to our business activity-based initiatives, we encourage all of our employees to reduce environmental impacts by participating in eco-friendly activities in their homes and local communities as well as workplaces.

Activity example (1)

Funding polio vaccinations and reducing CO₂ emissions through collecting plastic bottle caps

The Ecocap Movement is a non-profit organization that uses funds from the collection and sale of plastic bottle caps to recycling contractors to provide polio vaccinations for children around the world. Every 800 caps enables the purchase of one vaccination, and this activity also reduces CO₂ emissions by recycling caps instead of disposing of them as waste.

The NTT Group is participating in the Ecocap Movement, and as of February 26, 2010 had collected and donated a total of 35,489,722 caps since the Ecocap Movement started in February 2008. This is equivalent to vaccinations for 44,362 children, and an emissions reduction of 279.5 t-CO₂. In fiscal 2011, we will continue to raise awareness by reporting the number of collected caps on the Group intranet, and expanding collection to branches and offices not yet involved. In addition to such recycling activities, we are also implementing activities such as Bring-Your-Own-Cup to reduce waste.

Ecocap Movement http://ecocap007.com/aboutecocap.html



Collected caps (NTT COMWARE)



gourds and other plants on rooftops and vacant spaces to counter heat island effects that exacerbate global warming. The

Activity example (2)

companies are utilizing the Green Potato aero-hydroponic rooftop greening method developed and commercialized by NTT FACILITIES to implement effective greening.

Greening of company building rooftops and vacant spaces

NTT Group companies are growing sweet potatoes, bitter





Rooftop greening of NTT East's Hatsudai Building

Sweet potato seedling pack (NTT FACILITIES)

Activity example (3)

Operation Clean Environment cleanup activities with local residents nationwide

The NTT Group conducts Operation Clean Environment cleanup activities every year with local community residents throughout Japan. In fiscal 2010, 85,661 people including employees and their families as well as members of the Denyukai club for former employees participated in this volunteer activity, and in fiscal 2011, we aim to enlist 100,000 participants.

Operation Clean Environment activities





NTT COMWARE



Denyukai

NTT FACILITIES



NTT Urban Development

Citizenship activities

Denyukai activities

🕐 NTT Group

Denyukai, a club for former NTT Group employees, celebrated its 20th anniversary in 2009. About 20% of Denyukai's 90,000 members participate in citizenship activities aimed at the betterment of society, including visits to facilities to help with nursing care, braille transcription and reading aloud for people with visual impairment, local community support through giving classes and performances in Japanese flute, drumming, and other traditional performing arts, and youth sports coaching. Denyukai members also participate actively in tree planting and forest improvement projects, NTT East and NTT West Operation Clean Environment and, other activities to protect the environment.

In fiscal 2010, Denyukai launched an Energy Saving Eco Lifestyle campaign to get all of its members involved in measures to counter global warming in their everyday lives, and it is continuing this campaign as a pillar of its citizenship activities.

Denyukai pays recognition to individual members and groups who have involved themselves steadily over many years in citizenship activities through its annual President's Commendations. In fiscal 2010, the 19th year of the Commendations, 32 individuals and two groups were commended, bringing the total from the first year to 607 commendations.



Passing on hometown traditions to the next generation



Afforestation project (members of the Yokosuka Citizenship Committee's Thousand Year Forest Creation Club)



Forest improvement (clearing of forest thinnings and dead trees)



Serving as a guide at the Sannai-Maruyama Jomon Period Site

Participating in the TABLE FOR TWO project to provide children in developing countries with school lunches **ONTTGroup**

The NTT Group is participating in the TABLE FOR TWO program to eliminate the food imbalance between developed and developing countries. Under this program ¥20 is donated as the cost for one school meal in developing countries for every purchase of a designated TABLE FOR TWO meal or food item.

NTT, NTT Communications, NTT DATA, and NTT COMWARE are participating in TABLE FOR TWO by implementing the program in their employee dining halls, and in fiscal 2010 donated the equivalent of 16,033 school meals to children in developing countries.

TABLE FOR TWO International http://www.tablefor2.org/tft_usa/index.html



A TABLE FOR TWO set lunch offered at an NTT Communications employee dining hall



NTT Philharmonic Orchestra is an orchestra composed of current and former NTT Group employees and family members that puts on twice-yearly concerts and also performances at NTT Medical Center Tokyo and other facilities. The NTT Group is eager to have its employees contribute to its creative corporate culture through music, and has supported the orchestra since its inception in 1996.



NTT Philharmonic Orchestra



Third party opinion



Junichi Mizuo

Ph.D. (Business Administration); Professor, Faculty of Economics and Graduate School of Economics, Surugadai University; Lecturer (concurrent), Graduate School, Tokyo Institute of Technology; Vice President, Japan Association for Performance Excellence; Standing Director, Japan Society for Business Ethics Study; author of Seven Rules of Management to Weather Adversity (Asahi Shinsho), Enhancing Management Capabilities through CSR (Toyo Keizai Inc.), and other works

As a leader in the area of CSR, the NTT Group in 2010 drew up a new vision for the environment that is aimed at the sustainable growth of business and society. I have long advocated the integration of CSR theory and practice, both as a corporate employee overseeing the implementation of CSR activities and as a university researcher engaged in developing a theoretical framework for CSR. It is from this standpoint that I offer this third party opinion.

Aspects that deserve praise

1. Good presentation of activities as a frontrunner in the promotion of environmental protection

This year's report presents THE GREEN VISION 2020, the NTT Group's new vision for the environment, in a special feature, enabling the reader to appreciate the high level of NTT's environmental activities. The vision's three approaches of "Green of ICT", "Green by ICT", and "Green with Team NTT" also feature prominently throughout the report. The Team NTT activities to reduce CO₂ emissions warrant particular praise as an impressive initiative to expand the concept of social responsibility to encompass employees' families and other members of the public as global citizens. With biodiversity and climate change becoming increasingly pressing global issues, this new initiative could be seen as evidence of the way in which the NTT Group is fulfilling its responsibility as a leading member of the ICT industry not only in Japan, but throughout the world.

2. Introduction of CSR management activities that combine the defensive CSR of safety and security with strategically proactive CSR

The NTT Group protects itself through solid defensive CSR activities such as corporate governance (internal control systems, Corporate Ethics Charter) and risk management, and also contributes to safety and security in society at large through its safety workshops, research in quantum cryptography, and other initiatives. At the same time, NTT makes good use of its core competences to implement strategically proactive CSR in the form of its TPR campaign and other "Green of ICT" initiatives to reduce its own environmental impacts, and EV recharging infrastructure service pilot study, walking power research, and other "Green by ICT" initiatives aimed to help reduce the environmental impacts of society as a whole. This report provides a good overview of both the defensive and proactive CSR initiatives of the NTT Group.

Aspects that could be improved

I have high hopes for the NTT Group's further development and communication of its CSR strategy, including THE GREEN VISION 2020 and resolution of social issues through ICT-based services and innovation.

I look forward to NTT's reporting on issues to be tackled in the following year, and to hearing about the progress status of THE GREEN VISION 2020 as an example of progressive leadership in addressing environmental issues. I will also be eager to read about Team NTT activities — the way NTT implements its groupwide CSR strategies at the sectional level and shares them with its employees through training and education. This kind of PDCA management of CSR strategy should not only help to improve NTT's management, but also set an example to other companies and further bolster the reputation of the NTT brand.

Advances in ICT gives rise to many different innovations that can contribute to infrastructural improvements in developing countries and to the resolution of social issues related to an aging and shrinking population, healthcare, environment, and energy. NTT's "Green by ICT" approach and other strategically proactive CSR initiatives could help drive sustainable development not only in Japan, but also in developing countries worldwide, and I have high expectations for their further implementation, along with communication of achievements. This indeed could be regarded as NTT's social responsibility as a CSR frontrunner.

Our response

We have endeavored to make this NTT Group CSR Report 2010 as readable as possible for our stakeholders, using simple language and plentiful illustrations to aid understanding. We have devoted considerable space to a special feature on THE GREEN VISION 2020, our new vision for guiding our environmental initiatives up to fiscal 2021, and to our efforts to conserve biodiversity. We have also created a digest version (printed report available in Japanese only) that focuses mainly on the NTT Group CSR Priority Activities that we reported on last year.

Professor Mizuo endorsed the environmental protection activities set forth in THE GREEN VISION 2020, and gave our "Green with Team NTT" initiatives particularly high marks. His kind words will serve to encourage us as we press ahead with initiatives that leverage the many capabilities of our employees.

Professor Mizuo also pointed to three areas in which he hopes to see further improvements — firstly, our reporting on issues to be tackled in the following year, and progress status of THE GREEN VISION 2020 as an example of progressive leadership in addressing environmental issues; secondly, the way we implement groupwide CSR strategies at the sectional level, share them with our employees through training and education, and report on them as Team NTT activities; and lastly, our communication on global activities related to ICT-driven innovation and the resolution of social issues. We are grateful for Professor Mizuo's valuable opinions, and regard them as important pointers in the implementation of NTT Group CSR going forward. Since ensuring that groupwide CSR strategies are adopted and acted on at the sectional level is also vital to the achievement of the goals of our "Road to Service Creation Business Group" Medium-Term Management Strategy, we intend to encourage earnest discussion of the issue within the group.

We feel honored to be referred to as a "CSR frontrunner" by Professor Mizuo, and will do our utmost to fulfill our social responsibility and show ourselves to be worthy of such a moniker. We will continue to put priority on communication with our stakeholders and strive to contribute to the sustainable development of society.

> CSR Promotion Office NIPPON TELEGRAPH AND TELEPHONE CORPORATION

Tree planting event at the Umi-no-Mori (= Sea Forest) Project, April 10, 2010



Reader feedback

Results of NTT Group CSR Report 2009 questionnaire survey

We would like to thank all those who responded to our questionnaire regarding the NTT Group CSR Report 2009 issued last November. We received a number of invaluable comments from readers worldwide, both by post or fax, and via our website. We have done our best to incorporate your ideas into this year's CSR report, and will make use of them also in the planning and implementation of future CSR activities.



2. Understandability



3. Amount of information





http://www.ntt.co.jp/csr_e/

Detailed information pertaining to NTT Group CSR activities can be accessed via our website. We are grateful for any comments or suggestions that we receive through the website.

CSR Report 2010

Contact information CSR Promotion Office NIPPON TELEGRAPH AND TELEPHONE CORPORATION

3-1, Otemachi 2-chome, Chiyoda-ku, Tokyo 100-8116, Japan Fax: +81-3-5205-5579 E-mail: csr@ml.hco.ntt.co.jp

- Unauthorized use or reproduction of any materials contained in this publication is prohibited.