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Environment

Contributions to the Global Environment

ICT companies are highly expected to engage in environmental protection activities. We have established the Green ICT Vision 2020, which focuses on the realization of a low-carbon society, the promotion of Closed-loop recycling, and the preservation of biodiversity. We are also promoting a multifaceted approach to these areas. In fiscal 2016, we implemented results-based enhancements and reforms and established the Environmental Statement and Eco Strategy 2030 as our new vision.

Moreover, we proactively promote these activities because they are necessary for the upgrading and strengthening of an environmental management framework. We will continue to strengthen our management framework Groupwide. To this end, we will aggressively pursue protection of the global environment in all processes pertaining to our business activities, ranging from reduced electricity use and improvements in efficiency and procurement to operations and waste disposal.

The Group, through its core businesses, will do what it can to establish a society that is friendly to the environment while ensuring that our planet remains healthy for future generations.

Our Ambition

A society in harmony with nature, preserving the planet's abundance

◆ A low-carbon society with a light environmental footprint that thoroughly recycles resources

◆ A society that respects biodiversity and protects abundant natural resources

Targeted SDGs

7 AFFORDABLE AND CLEAN ENERGY
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND

CSR Priority Activities

Realizing a Low-carbon Future

Implementing Closed-loop Recycling

Planning a Future of Co-existing with Nature

Fiscal 2018 Activity Results and Fiscal 2019 Targets

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Actions Implemented in Line with CSR KPIs

In line with the three underpinning themes of fiscal 2018: "Realizing a Low-carbon Future," "Implementing Closed-loop Recycling," and "Planning a Future of Co-existing with Nature," we worked to reduce the environmental impact associated with all our business activities. We were particularly aggressive in our efforts to reduce CO_2 emissions, improve our final waste disposal ratio, and raise awareness of biodiversity activities in Japan and around the world. Our accomplishments across Group companies include implementing new greenhouse gas reduction initiatives, improving our final waste disposal ratio, and organizing a biodiversity photo contest.

In fiscal 2019, we will continue pursuing various measures with a focus on activities that include reducing electricity consumption, promoting waste recycling, and preserving ecosystems in order to contribute to reducing the environmental impact of our Group as well as society as a whole.

◆ Fiscal 2018 Activity Results and Fiscal 2019 Targets

CSR Priority Activities	Initiatives	Medium-term Targets (Form We Want to Take in Five Years)	Fiscal 2018 Targets	Fiscal 2018 Activity Results			Fiscal 2019 Targets	Scope	SDGs
				Specific Activities	Quantitative Results	Self-assessment		Activities	
Realizing a Low-carbon Future	Cutting carbon emissions from businesses	We will raise power efficiency per data transmission in our telecommunications businesses, including data centers, by at least 10 times compared to fiscal 2013 levels (fiscal 2030 target).	Raise power efficiency per data transmission in our telecommunications businesses, including data centers, by at least 10 times in 2030 compared to fiscal 2013 levels (fiscal 2018 target was 3.3-fold higher) • Implement the following energy management measures to further reduce electricity use - Remove equipment that consumes large amounts of power and shut down surplus air-conditioners - Use Dash Board to visualize efficiency of air-conditioning and usage of power and air-conditioners - Improve airflows and promote air-conditioning controls that take into account external and internal temperatures through visualization - Install DASH (air-conditioning control system) at a data center • CO_2 emissions: 402,000 t-CO_2 (old calculation method) (CO_2 emission factor: 0.513 kg-CO_2/kWh) - Telecommunications buildings: 178,000 t-CO_2 - Data centers: 199,000 t-CO_2 - Office buildings: 24,000 t-CO_2	• Adjustment of telecommunications facility intake/exhaust directions, improvement of airflow, optimization of indoor temperature, and air-conditioning control by humidity sensors • Discontinuing unnecessary power usage	• Increase in power efficiency: 3.5 times • CO_2 emissions: 368,000 t-CO_2 (old calculation method) (CO_2 emission factor: 0.478 kg-CO_2/kWh) - Telecommunications buildings: 154,000 t-CO_2 - Data centers: 192,000 t-CO_2 - Office buildings: 22,000 t-CO_2 • CO_2 emissions: 242,000 t-CO_2 (new calculation method)	★★★	Raise power efficiency per data transmission in our telecommunications businesses, including data centers, by at least 10 times in 2030 compared to fiscal 2013 levels (fiscal 2018 target was 3.8-fold higher) • Implement the following energy management measures to further reduce electricity use - Remove equipment that consumes large amounts of power and shut down surplus air-conditioners - Use Dash Board to visualize efficiency of air-conditioning and usage of power and air-conditioners - Improve airflows and promote air-conditioning controls that take into account external and internal temperatures through visualization - Install DASH (air-conditioning control system) at a data center • CO_2 emissions: 240,000 t-CO_2 (new calculation method)	Within the organization	7 13
	Cutting society's carbon emissions through products and services	We will contribute to reducing CO_2 emissions across society by at least 10 times more than the NTT Com Group's own emissions (fiscal 2030 target).	Contribute to reducing CO_2 emissions across society by at least 10 times more than the NTT Com Group's own emissions in 2030 (fiscal 2018 target* is 14.2-fold higher) *Target has been revised in accordance with the new calculation method.	• Maintain and promote the sales of Environmental Solutions Label-certified services capable of contributing to reducing CO_2 in society	Contribution to reducing CO_2 emissions: 15.8 times	★★★	Expand the use of the Environmental Solutions Label System to contribute to reducing CO_2 emissions across society by at least 10 times more than the NTT Com Group's own emissions in 2030 (fiscal 2019 target is 14.4-fold higher)	Within/outside the organization	

Achievement levels based on self-assessment　★★★: Target achieved　★★: Target almost achieved　★: Target only partially achieved

Contributions to the Global Environment | Fiscal 2018 Activity Results and Fiscal 2019 Targets

CSR Priority Activities	Initiatives	Medium-term Targets (Form We Want to Take in Five Years)	Fiscal 2018 Targets	Fiscal 2018 Activity Results			Fiscal 2019 Targets	Scope Activities	SDGs
				Specific Activities	Quantitative Results	Self-assessment			
Implementing Closed-loop Recycling	Realizing a low environmental impact business model	Implementing a low environmental impact business model	• Building and maintaining a low environmental impact business model - Implementing measures to reduce electricity use - Installing energy-saving equipment - Appropriately managing hazardous substances	• Nationwide deployment of airflow control • Installation of energy-saving equipment • Appropriate management of PCB/asbestos hazardous substances	—	★★★	• Building and maintaining a low environmental impact business model - Implementing measures to reduce electricity use - Installing energy-saving equipment - Appropriately managing hazardous substances	Within the organization	12
	Thorough implementation of a 3R policy in businesses	• Thorough implementation of a 3R (reduce, reuse, and recycle) policy with regard to all resources relevant to our business activities - Improvement in the final waste disposal ratio: 1.5% or lower (fiscal 2030 target)	• Continue the implementation of a 3R (reduce, reuse, and recycle) policy with regard to all resources relevant to our business activities - Improvement in the final waste disposal ratio: 2.1% or lower • Strengthen measures at the level of individual organizations based on data on multifunction printer usage and promote a paperless working style that utilizes ICT equipment	• Enhance promotion of the 3R policy • Confirm waste process flow and method and promote thermal recycling to improve the final disposal ratio • Promote a paperless working style based on data on multifunction printer usage	Final disposal ratio: 2.0%	★★★	• Implement the 3R (reduce, reuse, and recycle) policy for all resources relevant to our business activities - Improvement in the final waste disposal ratio: 2.0% or lower • Strengthen measures at the level of individual organizations based on data on multifunction printer usage and promote a paperless working style that utilizes ICT equipment	Within the organization	
Planning a Future of Co-existing with Nature	Facilities that show consideration for biodiversity	• Facility construction, maintenance, and repair based on NTT Group building concepts • Compliance with action guidelines with regard to biodiversity conservation	• Facility construction, maintenance, and repair based on NTT Group building concepts • Compliance with action guidelines in regard to biodiversity conservation	• Facility maintenance based on NTT Group building concepts • Compliance with action guidelines in regard to biodiversity conservation	—	★★★	• Facility construction, maintenance, and repair based on NTT Group building concepts • Compliance with action guidelines in regard to biodiversity conservation	Within the organization	14 15
	Utilize ICT to contribute to biodiversity	Utilize ICT to contribute/respond to biodiversity	Utilize ICT to contribute/respond to biodiversity	• Expansion of Mimawari Rakutaro • Information dissemination and educational activities through the goo Green Label	—	★★★	Utilize ICT to contribute/respond to biodiversity	Within/outside the organization	

Achievement levels based on self-assessment ★★★: Target achieved ★★: Target almost achieved ★: Target only partially achieved

Basic Philosophy and Vision

While emphasizing the philosophy in the Global Environmental Charter, established by the NTT Group, our environmental protection activities take shape as the Environmental Statement, which applies the philosophy to the characteristics of our business. We set initiative goals and implement measures on an ongoing basis.

NTT Communications Group Global Environmental Charter

The NTT Group has established the NTT Group Global Environmental Charter to promote Groupwide consideration and actions relating to environmental protection from a global perspective. This philosophy and policy form the basis for the NTT Communications Group Global Environmental Charter, which is disseminated among employees of the Group as a set of guidelines for the implementation of environmental protection activities.

For more information on the NTT Communications Group Global Environmental Charter, see:

https://www.ntt.com/en/about-us/csr/eco/details.html

Environmental Statement and Eco Strategy 2030

The NTT Communications Group has formulated the NTT Communications Group Environmental Statement as its overarching policy for promoting environmental activities. In the statement, we have expressed how we should act as a company in order to fulfill our responsibilities toward the global environment in the future. We also established Eco Strategy 2030 as a means of identifying priority issues that should be addressed to realize the future outlined in the statement.

Working in unison, each and every NTT Communications Group employee around the world will engage in environmental activities to realize a future in which people and the planet remain in harmony by providing technologies and services that pioneer eras.

The NTT Communications Group Environmental Statement

Dedicated to global environmental management for a future in which people and the planet remain in harmony

We will address three futures by providing technologies and services that pioneer eras.

Realizing a Low-carbon Future
We are contributing to the reduction of CO_2 emissions and facilitating adaptation to climate change risk.

Implementing Closed-loop Recycling
We are working toward more effective resource allocation.

Planning a Future of Co-existing with Nature
We are contributing to the preservation of ecosystems.

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Eco Strategy 2030

Under Eco Strategy 2030, we have set out specific initiatives to help realize the three futures outlined in the Environmental Statement. We also changed the names of the priority activities to accommodate the strategy.

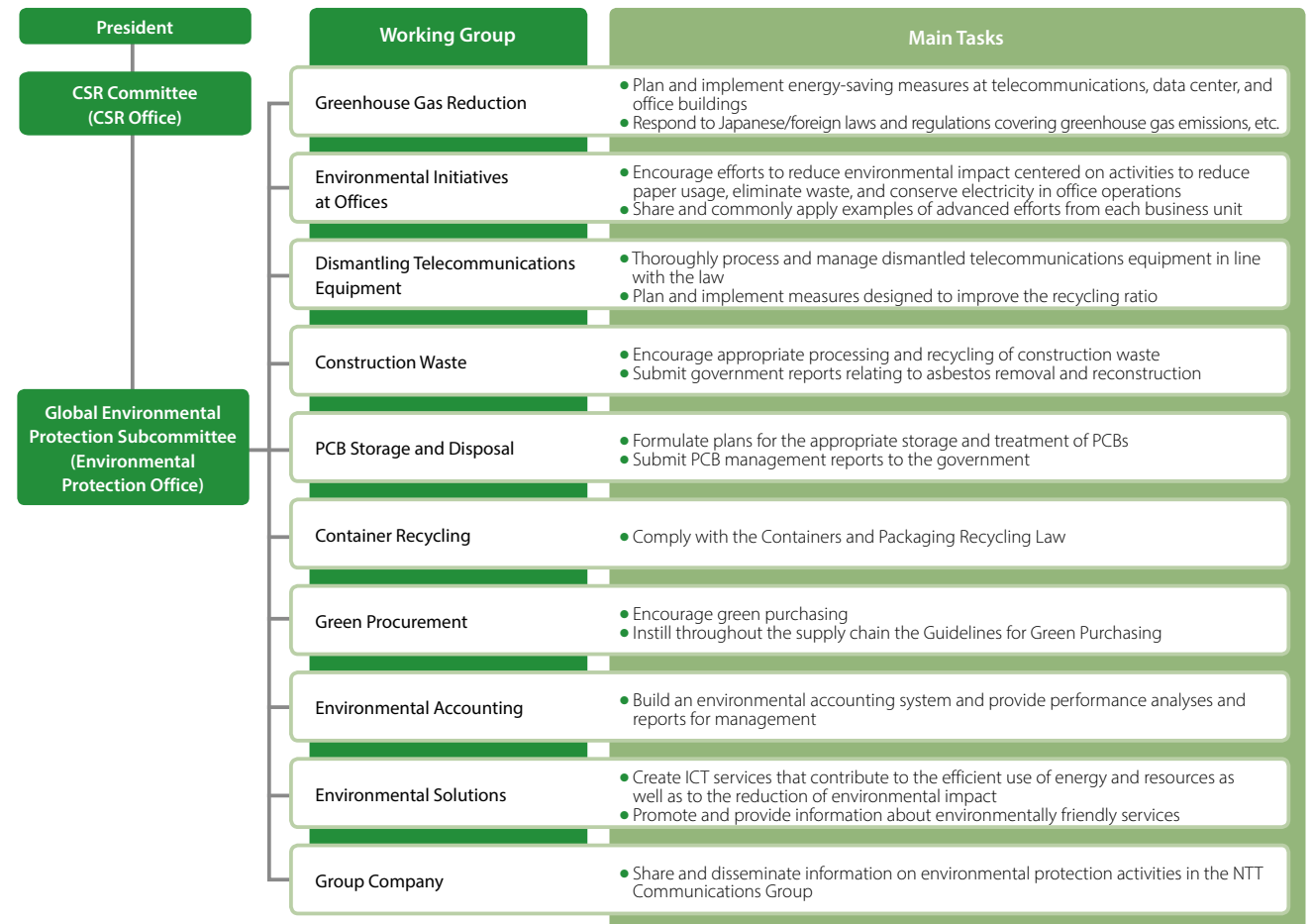| Three Futures We Are Targeting		Initiative
Realizing a Low-carbon Future	Contributing to the reduction of CO_2 emissions across society	We will contribute to reducing CO_2 emissions across society by at least 10 times more than the NTT Communications Group's own emissions.
	Raising power efficiency in our telecommunications businesses	We will raise power efficiency per data transmission in our telecommunications businesses by at least 10 times compared to fiscal 2013 levels.
	Adapting to climate change	We will play our part in adapting to climate change by actively promoting initiatives through all our activities and by collaborating with our stakeholders.
Implementing Closed-loop Recycling	Final waste disposal ratio	We will aim to keep the final disposal ratio of the waste generated by the NTT Communications Group at 1.5% or less.
Planning a Future of Co-existing with Nature	Preservation of ecosystems	We will play our part in preserving ecosystems by actively promoting initiatives through all our activities and by collaborating with our stakeholders.

Environmental Management

Promotion Framework for Reducing Environmental Impact

In order to continuously promote environmental protection initiatives in a Groupwide effort, we formed a working group for each relevant issue. Specifically, we hold Environmental Protection Subcommittee meetings at Group companies once a year to formulate an overall plan that encompasses a wide range of issues, including the reduction of greenhouse gas emissions and waste and the promotion of environmental solutions. Through these meetings, we also share information on the results of actions taken and promote the horizontal deployment of various initiatives.

Particularly in recent years, we have been making efforts to ascertain and curb environmental impact by means of Scope 3 at the supply chain level. Moreover, we have been promoting environmental protection activities since fiscal 2019 under a Groupwide environmental management structure. Looking ahead, we intend to pursue initiatives focused on saving energy and reducing energy use that will lead to further reductions in environmental impact.

◆ Environmental Protection Framework

President / CSR Committee (CSR Office) / Global Environmental Protection Subcommittee (Environmental Protection Office)	Working Group	Main Tasks
	Greenhouse Gas Reduction	• Plan and implement energy-saving measures at telecommunications, data center, and office buildings • Respond to Japanese/foreign laws and regulations covering greenhouse gas emissions, etc.
	Environmental Initiatives at Offices	• Encourage efforts to reduce environmental impact centered on activities to reduce paper usage, eliminate waste, and conserve electricity in office operations • Share and commonly apply examples of advanced efforts from each business unit
	Dismantling Telecommunications Equipment	• Thoroughly process and manage dismantled telecommunications equipment in line with the law • Plan and implement measures designed to improve the recycling ratio
	Construction Waste	• Encourage appropriate processing and recycling of construction waste • Submit government reports relating to asbestos removal and reconstruction
	PCB Storage and Disposal	• Formulate plans for the appropriate storage and treatment of PCBs • Submit PCB management reports to the government
	Container Recycling	• Comply with the Containers and Packaging Recycling Law
	Green Procurement	• Encourage green purchasing • Instill throughout the supply chain the Guidelines for Green Purchasing
	Environmental Accounting	• Build an environmental accounting system and provide performance analyses and reports for management
	Environmental Solutions	• Create ICT services that contribute to the efficient use of energy and resources as well as to the reduction of environmental impact • Promote and provide information about environmentally friendly services
	Group Company	• Share and disseminate information on environmental protection activities in the NTT Communications Group

(as of October 1, 2019)

Environmental Impact of Business Activities

Fiscal 2018 Material Flow

Customer (Environmental Impact Reductions from ICT Usage)

Input

Procurement

| Items purchased through green procurement | 2.04 million |
| Procurement systems assessed | 0 companies |

Telecommunications Facilities

Power	410 million kWh
Fuel	1.48 million l
Gas	290,000 m^3
Heat	2.53 million MJ

Offices

Power	40 million kWh
Water	160,000 m^3
Paper	218 t

Sales

Paper (brochures)	2,230 t
Invoices	138 t
Fuel (automobile)	130,000 l

Business Processes

Procurement

Telecommunications Facilities

Offices

Sales

Reuse Recycle

Output

Telecommunications Facilities

Power	217,000 t-CO_2
Fuel	4,000 t-CO_2
Gas	700 t-CO_2
Heat	100 t-CO_2
General waste generated	666 t
Industrial waste generated	4,770 t
General waste landfills	7 t
Industrial waste landfills	2 t

Offices

Greenhouse gases (power)	18,000 t-CO_2
General waste generated	914 t
Industrial waste generated	366 t
General waste landfills	16 t
Industrial waste landfills	7 t

Sales

| Fuel (greenhouse gases) | 300 t-CO_2 |

Reuse

In-house reuse of dismantled telecommunications equipment	112 units
Equipment and packaging	8,794 units
Collections of subscriber terminals	220,000 units
Amount of removed fiber-optic cable reused	2.2 km

Recycle

| Recycling of coaxial cables | 0.0 km |
| Collection of confidential documents | 305 t |

Estimates of Scope 3 Emissions

In performing these calculations, we have referred to unit emission databases and other materials produced through studies by the Ministry of the Environment and other government ministries and agencies and expanded the scope of target categories. Of the 15 target categories, our calculations include 11 that are relevant.

◆ **Volumes of Scope 3 Emissions by Category**

	Category	Share	Emissions (t-CO_2)
1	Purchased goods and services	29.7%	1,520,833
2	Capital goods	14.2%	725,883
3	Fuel and energy activities not included in Scope 1 and Scope 2	1.9%	95,401
4	Upstream transportation and distribution	0.3%	14,157
5	Waste generated through business activities	0.0%	513
6	Business travel	0.3%	15,571
7	Employee commutations	0.3%	13,195
8	Upstream leased assets	0.0%	0
9	Downstream transportation and distribution	0.0%	0
10	Processing of products sold	0.0%	0
11	Use of products sold	47.2%	2,413,631
12	Disposal of products sold	1.8%	90,410
13	Downstream leased assets	4.2%	214,210
14	Franchise	0.2%	9,730
15	Investments	0.0%	0
	Total	100.00	5,113,533

› Environmental Accounting in Fiscal 2018

The NTT Communications Group tabulates its environmental conservation costs (categories corresponding to business activities) and the economic benefit derived from its environmental conservation activities (real financial impact) in line with the Environmental Accounting Guidelines 2005, issued by the Ministry of the Environment, and the NTT Group Environmental Accounting Guidelines.

The environmental conservation cost in fiscal 2018 declined by approximately 130 million yen year on year to 1.7 billion yen, consisting of around 0.6 billion yen in investments and about 1.1 billion yen in expenses. This was mainly due to a decrease in investments for environmental conservation. Meanwhile, the economic benefit derived from environmental conservation in fiscal 2018 was 1.74 billion yen, almost the same as in the previous fiscal year.

◆ Environmental Conservation Costs (Categories Corresponding to Business Activities) (Millions of Yen)

Category	Key Measures		Investment		Expenses	
			FY2017	FY2018	FY2017	FY2018
(1) Business area cost			603	593	739	976
Breakdown	Pollution prevention costs	Oil tank facility for power generator use Management of items using PCBs	73	142	72	80
	Global environmental conservation costs	Measures to reduce CO_2 emissions resulting from electricity use	530	450	205	577
	Resource circulation costs	Waste disposal and reuse expenses	1	0	462	319
(2) Upstream/downstream costs	Measures to recover, recycle, and reuse telecommunications equipment		79	14	315	52
(3) Administration costs	Environmental conservation management activities		0	0	66	63
(4) R&D costs	Allocated portion of the NTT Group's environmental R&D costs		0	0	32	10
(5) Social activity costs	Costs of supporting volunteer participation		0	0	5	0
(6) Environmental remediation costs			0	0	0	0
Total			683	607	1,156	1,101

◆ Economic Benefits Associated with Environmental Conservation Activities (Real Financial Impact) (Millions of Yen)

Category	Key Measures	FY2017	FY2018
Revenue	Revenues from sales (cables, metal scrap, etc.)	243	423
Cost reductions	Reductions in expenses as a result of measures such as those related to reducing electricity use	591	517
	Reductions in purchase cost as a result of reusing dismantled telecommunications equipment	404	380
	Decrease in postal and paper costs due to utilization of Mypage (online account page)	527	422
	Other	3	0
Total		1,768	1,742

Target period: April 1–March 31
Scope: NTT Communications Corporation and 13 Group companies in Japan
Tabulation and disclosure: Figures were tabulated in line with the Ministry of the Environment's Environmental Accounting Guidelines 2005 and the NTT Group Environmental Accounting Guidelines. Expenses include personnel expenses but exclude depreciation.

Environmental Management Structure

Acquiring ISO 14001 Certification

Three companies in the NTT Communications Group had acquired ISO 14001 certification as of March 31, 2019. We have contracted outside environmental consultants to perform internal audits once a year to certified departments and companies in order to ensure the appropriate implementation of environmental management and continual improvements that will allow for a steady reduction of the environmental impact of business activities. Regular reviews and renewal examinations are undertaken by an independent certification body as well. Outstanding issues are thus identified, and remedial measures are taken swiftly. Besides our initiatives centering on reductions of office paper and electricity use and the promotion of waste recycling, we encourage the adoption of measures aimed at creating an environmentally friendly society.

◆ **ISO 14001-certified Companies**

Company Certified		Date
NTT Communications Corp.	Procurement Dept.	October 1999
	Solution Services Dept.	March 2004
NTTPC Communications, Inc.		November 2003
NTT Plala Inc.		December 2011

As of March 31, 2019

Environmental Audits and Environmental Surveys

Guided by its Global Environmental Charter, the NTT Communications Group shares yearly PDCA and other reports at the Global Environmental Protection Subcommittee, an organization that comes under the CSR Committee. These reports outline details of the various activities administered by the 10 working groups that drive the Group's environmental protection activities. In addition to sharing information and calling for the further development of effective initiatives, we are promoting environmental management on a Groupwide basis.

Compliance with Environmental Legislation and Regulations

The NTT Communications Group is committed to ensuring legal compliance and proper risk management while liaising closely with the other NTT Group companies. All legislation, including environmental laws and regulations aimed at curtailing pollution, emissions standards, and the PRTR Law*, is fully communicated to related departments, and independent guidelines and enhanced compliance education have been established for in-house application. We were not involved in any litigation or legal violations pertaining to environment-related accidents, infringements, fines, or complaints in fiscal 2018. We will continue our Companywide efforts to prevent pollution and comply with related laws and regulations.

*Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof.

Promoting Green Procurement

NTT Communications issued its Guidelines for Green Purchasing in 1999. In 2010, we brought these guidelines into compliance with the Energy-Saving Performance Guidelines enacted by the NTT Group and added the perspective of ICT-related energy-saving that the Company recognized as an important issue. We also changed the name to the Guidelines for Green Procurement. Application of these guidelines drove NTT Communications to include new factors in its set of criteria applied when selecting suppliers, such as the supplier's actions toward environmental conservation and an environmental conservation element of the procured item. Through its green procurement initiatives, NTT Communications works to improve its environmental protection activities with its suppliers and seeks to commit to further social contribution.

◆ Status of Green Procurement and Green Purchasing (1,000 Units)

	FY2014	FY2015	FY2016	FY2017	FY2018
Green procurement of goods, excluding office supplies	1,200	1,050	900	1,540	2,040
Green procurement of office supplies	250	200	200	220	210

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Environmental Education Initiatives

We offer all employees environmental education with the intention of raising their awareness of environmental matters. We are also proactive in environmental awareness activities as part of our CSR efforts, extending the scope of participation to include not only employees but also their family members and our business partners.

In fiscal 2018, all-employee training sessions covered international trends such as the SDGs and ESG investments. Additionally, we undertook a range of environmental awareness and educational activities, including a cleanup of the areas around our offices and the seaside, promotion of the ecocap movement, and a biodiversity-related photo contest. Moreover, woodland conservation activities were carried out at NTT Com Solutions and NTT Com Marketing in a bid to deepen employee understanding of the importance of protecting the natural environment.

CSR Priority Activities

Realizing a Low-carbon Future

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Our Approach

Our range of approaches to reduce CO_2 emissions includes saving energy and improving the efficiency of our facilities as well as offering services that incorporate excellent Low-carbon features and engaging in environmental contribution activities. For our environmental initiatives in relation to Company facilities, we have set targets from three viewpoints: telecommunications facilities, offices, and overseas bases, and all of our employees are working together to reduce CO_2 emissions. Particularly, since electricity consumption accounts for more than 90% of total CO_2 emissions from business activities, we can expect great advantages as a result of saving energy and improving the energy efficiency of telecommunications equipment. We are thus making strong efforts in such respects as leading the industry in introducing cutting-edge technologies.

Primary Concept

While the advancement and spread of ICT has helped to bring about an affluent society and convenient lifestyles, the increase in power consumption from ICT-related equipment is placing enormous pressure on the environment. Against such a backdrop, SDGs 13 is urgently combating climate change. Reducing CO_2 emissions, the main cause of climate change, is a matter of utmost urgency not only for humans but also for the prosperity of all living creatures. As part of our initiative to contribute to the creation of a low carbon society, we set "Realizing a Low-carbon Future" as one of the themes for our Environmental Statement. In order to make our statement concrete, we will take on activities with a strong awareness of specific effects while continuing to strengthen our efforts from a global perspective and taking into account the expansion of our businesses' supply chains.

Main Achievements in Fiscal 2018 and Goals for the Coming Years

In fiscal 2018, we continued our ongoing efforts to raise power efficiency per data transmission in our telecommunications businesses. Our comprehensive activities to improve power efficiency included adjusting telecommunications facility intake/exhaust directions, using humidity sensors to improve airflow, optimizing the room temperature by controlling air-conditioning, and turning off unused equipment. As a result, power efficiency increased by 3.5 times, which exceeded the target of 3.3 times. In addition, when putting our solutions on the market, those assessed as having a certain level of environmental impact reduction benefits are given the NTT Group's Environmental Solutions Label to make visible their effects. Consequently, our contribution to reducing society's CO_2 emissions was 15.8 times the volume of our own CO_2 emissions, thereby exceeding our target of 14.2 times. Going forward, we will further develop these initiatives and commit to realizing a Low-carbon society.

Reduction of Greenhouse Gases

Fiscal 2018 Results and Fiscal 2019 Outlook

We provide facilities that other carriers and data center operators need in order to offer their own services, and we have been disclosing information on fuel and electricity used by these facilities as CO_2 emissions by the NTT Communications Group in accordance with the reporting method defined by Japan's Act on Promotion of Global Warming Countermeasures (dotted line column in the "CO_2 Emissions from Business Activities" graph for fiscal 2018).

We have recently established a new compilation method based on the Ministry of the Environment's Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (ver. 2.1). Therefore, we have decided to calculate the above CO_2 emissions under Category 13 of Scope 3 emissions and disclose the NTT Communications Group's CO_2 emissions under Scope 1 and Scope 2 (the solid line columns in the graph for fiscal 2018). Consequently, CO_2 emissions* from business activities for the NTT Communications Group totaled 242,000 t-CO_2. If we compare power consumption based on the old calculation method as an indicator of progress in our energy conservation efforts, actual power consumption in fiscal 2018 was 752.9 million kWh, up 0.4% due to a slight increase in telecommunications buildings and data centers but roughly in line with the target of 749.6 million kWh. CO_2 emissions per unit of sales were 0.17 t-CO_2/millions of yen.

As for buildings owned by the Company, we have sought to raise the operational efficiency of air-conditioners by visualizing the power usage of machinery rooms in our telecommunications buildings and server rooms in our data centers as measures for improving airflow. We also focused on curtailing the power used for air-conditioning by expanding

the installation of the SmartDASH® integrated air-conditioning control system. In offices, we conducted energy-saving activities while bearing in mind operational efficiency and year-round workplace comfort.

In fiscal 2019, the NTT Communications Group will work together and continue to reduce CO_2 emissions through ongoing energy-saving activities, research and development of technologies, and implementing new measures including energy saving rules. It has set a target for reducing CO_2 emissions by 1% from fiscal 2018 to 240,000 t-CO_2 or below.

Furthermore, we intend to continue providing energy-efficient data centers and cloud services to society, having customers' servers and their peripheral equipment including air-conditioning, UPS, and lighting integrated at our data center, consequently improving the efficiency of public power consumption.

*CO_2 emissions were calculated using emission factors obtained from electric power companies.

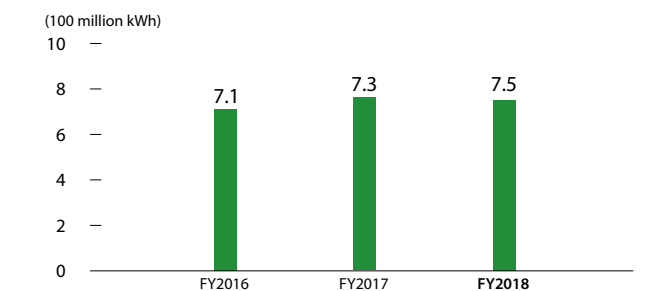◆ **CO_2 Emissions from Business Activities**
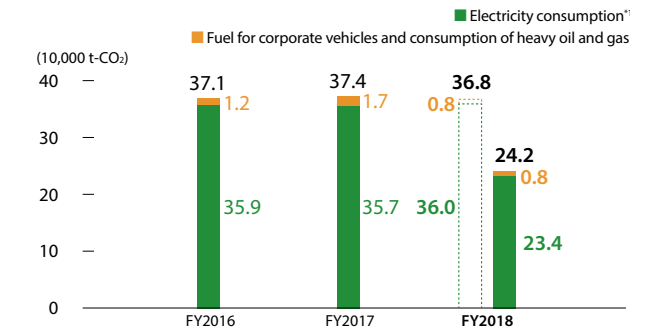
(Scope: NTT Communications Corporation and 13 Group companies in Japan)
*CO_2 emissions were calculated using emission factors obtained from electric power companies.

◆ **Other Greenhouse Gas Emissions (Converted to CO_2 Equivalents)**
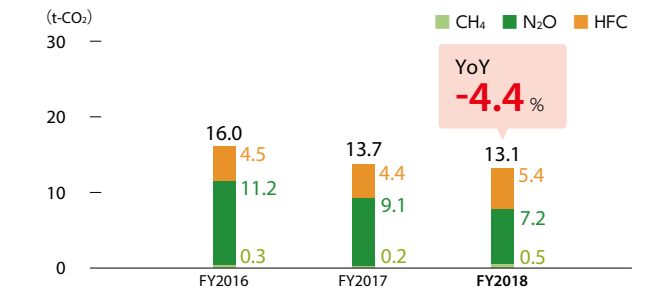
(Scope: NTT Communications Corporation and 13 Group companies in Japan)

◆ **Power Purchases**

(Scope: NTT Communications Corporation and 13 Group companies in Japan)

Initiatives Related to Telecommunications Facilities

Fiscal 2018 Results and Plans for Fiscal 2019

In fiscal 2018, CO_2 emissions were 221,000 t-CO_2 based on the new calculation method. Despite augmented and expanded measures, such as reducing electricity use in air-conditioning systems by making visible the power usage status of machinery and server rooms, emissions increased due to the rise in demand for sales at data centers in Tokyo and Osaka as well as the installation of new cloud servers. If we compare power consumption based on the old calculation method as an indicator of progress in our energy conservation efforts, actual power consumption by telecommunications facilities in fiscal 2018 was 711.2 million kWh, up 0.2% but roughly in line with the target of 709.1 million kWh.

We expect CO_2 emissions to continue the upward trend in fiscal 2019 due to ongoing robust data center and cloud service sales. However, we have set our emissions target at below 219,000 t-CO_2, or down 1% compared to fiscal 2018, which we aim to achieve through the expansion of ongoing visualization of power usage as well as by new measures that include implementation of newly developed technologies, improvement of airflow, and removal of extra equipment for the purpose of optimization of equipment for telecommunications services.

Building Cutting-edge Data Centers with Advanced Low-carbon Technologies

Data centers require a constant supply of electric power to operate. As an ICT company, we introduce the latest equipment and technologies with the aim of reducing the carbon footprint of our data centers.

For example, our newly opened data center features improved cooling efficiency and lower power consumption in its air-conditioning systems owing to the deployment of an indirect external air-cooling system that applies the cooler temperatures outside the building and an air circulation method that blows air from the walls. In addition, we will be installing an indirect evaporative air-conditioning system for data centers currently under development. This will make us the industry's first to use the system, which will reduce the annual energy cost by 60% compared to the average air-conditioning system.

We are accelerating efforts to reduce the carbon footprint of our data centers by continuing to introduce leading-edge equipment and technologies.

Ongoing Efforts to Cut Air-conditioner Power Consumption at Telecoms Facilities

In past efforts to reduce power consumed by air-conditioning, we have implemented a range of measures, including SmartDASH® an automated system that visualizes temperature zones in server rooms, detects areas that are too cold, and automatically controls air-conditioning, and Aisle Capping, a technique that physically separates the intake (low temperature) and exhaust (high temperature) air from IT equipment by placing sidewalls and ceilings around IT equipment in the aisles between rows of server racks.

As a further step, we are moving beyond ICT-driven

visualization of both temperature and power consumption to work on more finely tuned air-conditioning power management. This includes calculating the power usage effectiveness of each room to improve low-efficiency rooms by implementing thorough airflow improvement, temperature adjustments, and air-conditioning shutdown initiatives. We will also pursue air-conditioning controls that take into account outdoor and indoor temperatures that vary with each season and time of day, such as temporarily adjusting temperatures and shutting down air-conditioning at night and during winter as well as reducing daytime power consumption by using night-time electricity to cool the rooms.

Introducing Solar Power Generation Systems that Actively Use Renewable Energy

Since 2009, NTT Communications has been engaged in power generation using solar power generation systems at its communications and data centers in Tokyo. Now with four system units in operation, we generated approximately 367,000 kWh of electricity in fiscal 2018. The power generated is used to light the building's communal areas.

In the years to come, we will continue to promote the use of environmentally sound renewable energy.

◆ **Overall Amounts of Electricity Generated by Solar Panels at Data Centers**

（kWh）
400,000
377,689   372,069   367,108
300,000
200,000
100,000
0
FY2016   FY2017   FY2018
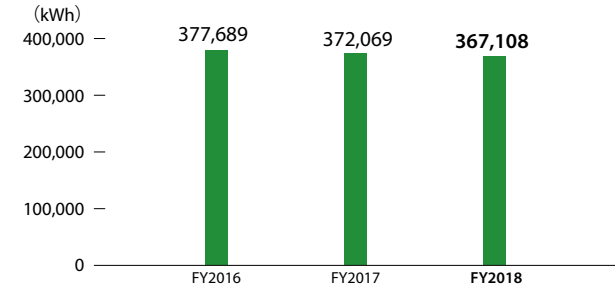
◆ **Solar panels installed at the Tokyo No. 5 Data Center**

Office Initiatives

Fiscal 2018 Results and Plans for Fiscal 2019

Drastic measures are being called for in the form of office initiatives to cut electricity use, while considerations are being made to place a limit on initiatives for communications facilities such as data centers and telecommunications buildings that require a certain amount of continuous power supply to provide their services.

In fiscal 2018, and based on our new calculation method, CO_2 emissions amounted to 21,000 t-CO_2 as a result of our energy-saving measures, which were not as tight as those implemented in the period following the Great East Japan Earthquake. If we compare power consumption based on the previous calculation method as an indicator of progress in our energy conservation efforts, compared to the target of 40.4 million kWh, actual power consumption by offices in fiscal 2018 was 41.7 million kWh, up 3.2%, which was mainly due to the heatwave that began in July 2018. From fiscal 2019 onward, we will implement energy-saving measures that take into account comfortable working environments as well as work efficiency. We are targeting emissions not exceeding 22,000 t-CO_2, by revising our energy saving rule and by expanding the use of thin-client computers.

Summer and Winter Energy-saving Measures

In addition to summer and winter energy-saving measures, the NTT Communications Group implements ongoing electricity-saving measures throughout the year, including the use of energy-saving settings on computers, reducing the number of lights in elevators and our operations, and adjusting air-conditioner settings, and we are striving to reduce our energy consumption in Japan.

During the summer months, the Group targeted a reduction of electricity consumption at its office buildings of 30% from the fiscal 2010 level. Some of the main initiatives taken by the Group to achieve that target were: maintaining higher air-conditioner settings (at 28℃ in the summer), cutting back on the number of lights used, reviewing the dress code, and switching off office equipment when leaving the office. Thanks largely to these endeavors, in fiscal 2018, the Group achieved a reduction in total electricity consumption of approximately 27.3% at its three principal buildings in Hibiya, Shiodome, and Tamachi. We also implemented similar energy-saving measures in winter such as setting air-conditioners to 20℃.

◆ **Average Electric Consumption in Office Buildings from June to September**
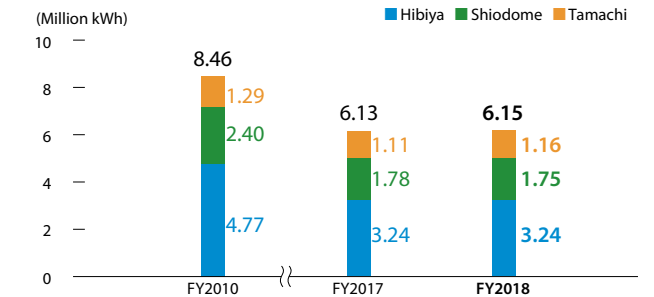
(Million kWh)   ■ Hibiya ■ Shiodome ■ Tamachi
10
8   8.46
                         1.29
6   2.40   6.13   6.15
                                       1.11   1.16
4   1.78   1.75
          4.77
2   3.24   3.24
0
        FY2010   FY2017   FY2018

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Promoting the Use of the Company's Internal Cloud

NTT Communications maintains many internal systems for delivering services to customers. Migrating and integrating these systems with internal ICT infrastructures through a private cloud using server virtualization brings down energy consumption and other environmental impacts. With these environmental considerations, we promote the use of an internal cloud platform and, as a result, over two-thirds of the internal system now operates on the internal ICT platform.

Looking ahead, we plan to continue migrating and integrating our internal ICT infrastructure and work on reducing environmental impact.

Transportation Initiatives

Fiscal 2018 Results and Fiscal 2019 Outlook

NTT Communications annually audits the amount of transportation for invoices, sales promotion tools, and office waste. Also, we voluntarily seek ways to streamline transportation such as by reducing the number of required trips, the volume transported, and the transportation distance and by otherwise enhancing logistics.

In fiscal 2018, we worked to reduce the amount of paper by digitalizing sales tools and manuals as well as by expanding web-based applications. Despite these efforts, transportation increased by 7.2% year on year to 386,000 tonne-kilometers.

In fiscal 2019, we will continue our efforts to reduce transportation volume by digitalizing internal tools and brochures as well as promoting the use of Web-based application systems.

◆ **Goods Transportation Volume under the Revised Energy Conservation Law**
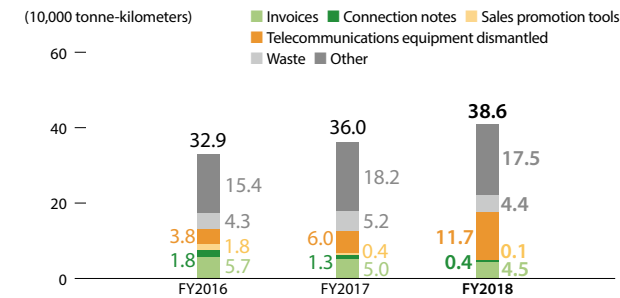
(Scope: NTT Communications Corporation)

Reducing Fuel Use by Company Vehicles

To help solve pollution problems and contribute to the realization of a low-carbon society, we have devised measures to introduce environmentally friendly vehicles and are seeking to reduce the amount of fuel used by Company vehicles across the entire Group.

We are currently reviewing the number of our sales vehicles and steadily promoting eco-driving and other measures. As a result, gasoline and diesel consumption by Company vehicles in fiscal 2018 totaled 121,000 liters and 8,000 liters, respectively. Compared to the previous fiscal year, these figures represent a decrease of about 54,000 liters (approximately 29.5%). We will continue to use environmentally friendly Company vehicles based on our Eco-car Introduction Policy.

◆ **Fuel Consumption by Company Vehicles**
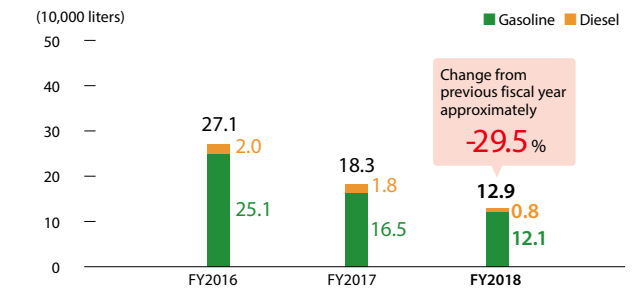
(Scope: NTT Communications Corporation and 13 Group companies in Japan)

Preventing Air Pollution and Promoting Energy Conservation through Electric Propulsion Ships

The subsea cable-laying vessels Kizuna and Subaru utilize an electric propulsion system* that optimizes the number of engines in operation in accordance with the load from the type of the subsea cable being laid and changes in the weather at sea. By controlling the number of engines in operation, we keep down the amount of heavy fuel oil A used while reducing emissions of, for example, CO_2, NOx, and SOx.

When in operation, we work to optimize fuel consumption by the most effective operating methods (including optimum route selection that takes into account the ship's speed, ocean currents, and weather conditions as well as other factors) in order to curtail the amount of CO_2 emitted based on a Ship Energy Efficiency Management Plan (SEEMP).

We are also carrying out the partial installation of LED energy-saving lighting for the ships.

*An electric propulsion system is a type of ship that turns a generator with its engines, drives motors with the electrical power obtained, and turns propellers and bow thrusters for propulsion.

◆ Cable-laying ship Kizuna
(8,598 tonnes)

◆ Cable-laying ship Subaru
(9,557 tonnes)

Reducing the Carbon Footprint of Society through Our Products and Services

Fiscal 2018 Results and Fiscal 2019 Outlook

We are aiming to contribute to realizing a low carbon society by reducing the Company's carbon footprint and expanding services that help reduce carbon emissions. To this end, we believe that developing technologies that are ahead of the times and providing state-of-the-art services that utilize such technologies are important factors. Following this idea as an ICT solutions company, we will continue to create services that reduce environmental impact and generate a host of technical innovations that contribute to a future in which people and the Earth exist in harmony. In fiscal 2018, we conducted an environmental assessment of Nexcenter facilities, expanded sales of cloud services and data center services, and contributed to a reduction in the environmental impact on society.

In fiscal 2019, we will continue to proactively develop solutions and services that effectively reduce our carbon footprint while seeking to raise the profile of the Environmental Solutions Label System so that we are recognized as a company which contributes to the reduction of CO_2 emissions.

Environmental Labeling System for Solutions

The NTT Group is exploring the idea of an Environmental Labeling System for Solutions for self-certification of environmentally friendly ICT solutions and services. To qualify, ICT solutions and services will have to achieve CO_2 reductions of at least 15%, as assessed through the objective evaluation of environmental impact reduction benefits. The entire NTT Group provides these environmentally friendly services to help reduce the environmental impact of society.

Although no service obtained the Environmental Labeling System for Solution in the NTT Communications Group in fiscal 2018, we have a cumulative total of 10 solutions registered. Looking ahead, we aim to obtain more certifications for the Environmental Labeling System for Solutions.

Web For more information on the Environmental Labeling system for Solutions, see:
http://www.ntt.co.jp/kankyo/e/protect/label/index.html

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> Acquisition of the Eco ICT Logo

We conducted a self-assessment of our CO_2 reduction measures and submitted an application in accordance with the ICT Ecology Guidelines created by the ICT Ecology Guideline Council* and acquired the eco-ICT Mark.

The council created and published guidelines for appropriate CO_2 reduction measures to be implemented by telecommunications carriers, clearly defining the standards for procuring systems and data center services from the viewpoint of reducing power consumption. These guidelines have been subsequently revised, and version 8.1 was published in January 2019. We will continue to participate in this initiative and work to disseminate the guidelines throughout the Group on an ongoing basis.

*A council established on June 26, 2009 by five industry organizations: The Telecommunications Carriers Association, the Telecom Services Association, the Japan Internet Providers Association, the Communications and Information Network Association of Japan, and the ASP-SaaS Industry Consortium (designated nonprofit organization).

> **Web** For more information on the Eco ICT Logo, see:
> **http://www.tca.or.jp/press_release/2010/0701_400. html** (Japanese Only)
>
> For more information on the self-assessment checklist, see:
> **https://www.ntt.com/about-us/csr/eco/ecoict.html** (Japanese Only)

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CSR Priority Activities

Implementing Closed-loop Recycling

Our Approach

As symbolized by SDG 12 "Responsible Consumption and Production," the thoroughness and extent of penetration of a recycling-oriented society continues to gain in importance as a problem shared by us all. To contribute to the realization of a recycling-oriented society, the NTT Communications Group works to improve reuse and recycling ratios on a daily basis while building business models with low environmental impact. Specifically, we are working to reduce the volume of waste in the three areas of dismantled telecommunications equipment, construction waste, and office waste while also promoting reuse and recycling in various aspects of our business.

Primary Concept

In order to contribute to the realization of a recycling-oriented society, we are pursuing the creation of a low environmental impact business model in addition to our daily efforts to improve the reuse and recycling ratios. Specifically, we organize working groups in the three areas of dismantled telecommunications equipment, construction waste, and office waste, and we are cooperating with other NTT Group companies in the promotion of waste reduction and reuse and recycling in various aspects of our business. In addition to our internal efforts, we are also leveraging our knowledge, technologies, and knowhow to contribute to the creation of a recycling-oriented society.

Main Achievements in Fiscal 2018 and Goals for the Coming Years

In fiscal 2018, the final disposal of waste from dismantled telecommunications equipment amounted to 0.3 tonnes, construction waste to 187.1 tonnes, and office waste to 31.5 tonnes. The total volume of final waste disposal decreased by 2.0 tonnes, compared to the previous fiscal year, to 218.9 tonnes, while the total volume of waste generated decreased by 14,989.0 tonnes to 11,149.8 tonnes due to decreased construction work of wireless relay stations. Going forward, we will thoroughly implement the 3Rs (reduce, reuse, and recycle) in our business activities.

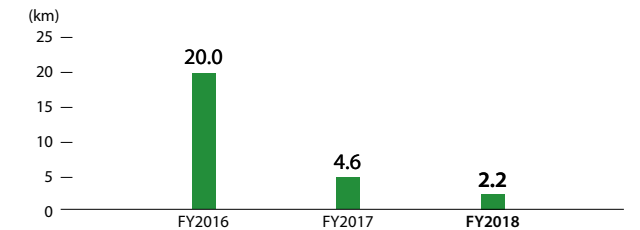◆ NTT Communications Group Final Waste Disposal and Total Waste Generation
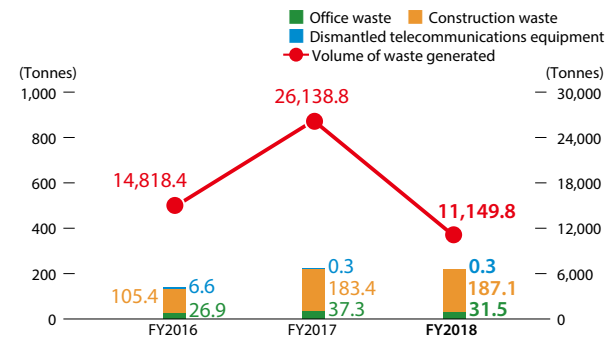
Scope: NTT Communications Corporation and 13 Group companies in Japan
Figures are adjusted retroactively to increase accuracy.

◆ Total Volume and Final Disposal Ratio of Dismantled Telecommunications Equipment
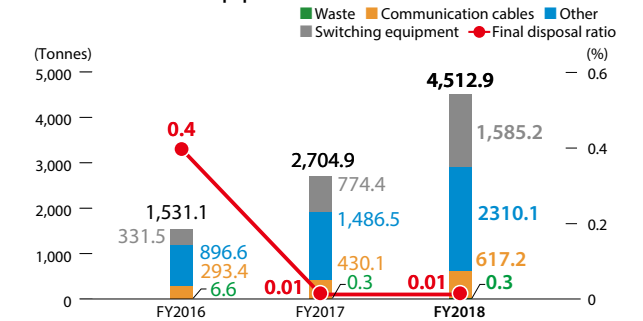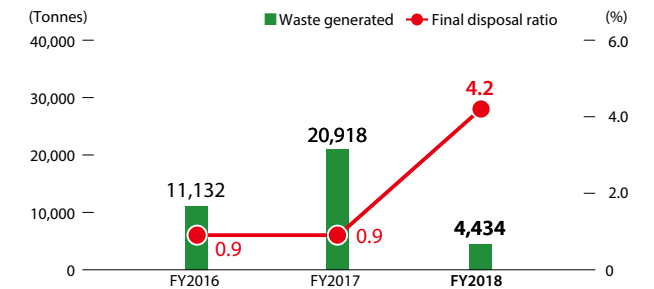

Scope: NTT Communications Corporation and 13 Group companies in Japan

◆ Volume of Reused Fiber-optic Cable

Scope: NTT Communications Corporation and 13 Group companies in Japan

◆ Construction Waste Generation and Final Disposal Ratio

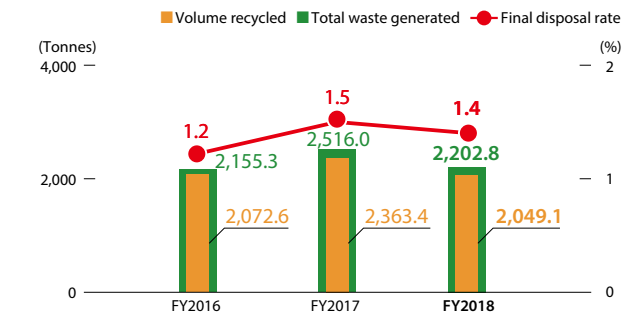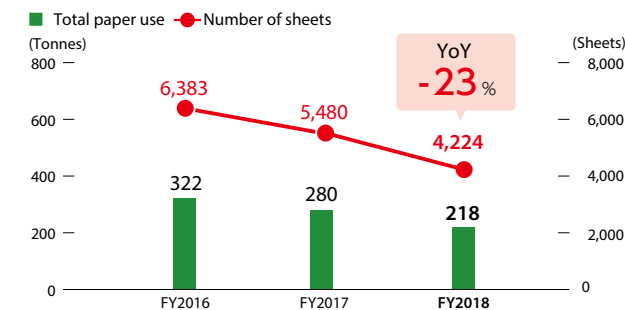Scope: NTT Communications Corporation and 13 Group companies in Japan

Building Business Models with Low Environmental Impact

Initiatives to Improve the Final Disposal Rate

We believe that one of our most important obligations as an ICT services provider is to create business models that emphasize recycling. We are therefore carefully selecting waste processors for data centers, telecommunications buildings, and office buildings based on their recycling ratios, and since fiscal 2013 we have been accelerating our efforts for the measures to improve the final disposal ratio.

We select seven or eight buildings each year to implement the measures and then conduct detailed on-site surveys including confirmation of the disposal workflows and interviews with the disposal companies. Based on this, we may change the disposal methods and the companies. As a result, the final office waste disposal ratio, which was 6.1% in fiscal 2013, has been reduced to 1.4%, as of fiscal 2018.

◆ **Total Office Waste and Final Disposal Ratio**

Scope: NTT Communications Corporation and 13 Group companies in Japan
Figures are adjusted retroactively to increase accuracy.

Thorough Implementation of the 3Rs in Office Buildings

Reduction in Paper Use for Business Purposes

NTT Communications is working to reduce its use of all kinds of paper for business purposes, including that for printing customer billing statements. In fiscal 2007, we established a paper use indicator per full-time employee in order to reduce the use of office paper.

Specifically, we encourage reduction efforts that include curbing the use of paper and increasing the rate of double-sided printing by using printing log data from IC card multifunction printers. Initiative status data per individual and section are collected and disclosed to all employees on a monthly basis. As a result of having continued to encourage the digitization of paper documents and paperless meetings that make use of projectors and tablets, in fiscal 2018 paper consumed per full-time employee (converted to A4-size office paper) was 4,224 sheets, which was less than the previous year.

◆ **Total and Per-employee Office Paper Use**

Scope: NTT Communications Corporation and 13 Group companies in Japan
Figures are adjusted retroactively to increase accuracy.

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CSR Priority Activities

Planning a Future of Co-existing with Nature

Our Approach

We place a high priority on conservation of biodiversity throughout our business activities, from the construction of facilities to their operation and dismantling, in addition to promoting preservation activities by inspecting the progress of initiatives, finding problems, and making improvements. Moreover, we will implement multifaceted initiatives for environmental contribution activities, including participation in local conservation activities and the dissemination of information.

Development of Activities in Line with Action Guidelines

Having formulated the Biodiversity Action Plan, we have been proactively developing our approaches. There is a growing awareness on a global scale for biodiversity conservation. In the years to come, we will promote progress check of efforts, identify issues, and promote improvements across the Group as a whole, including at overseas bases.

Primary Concept

As advocated in SDGs 14 and 15, conserving the biodiversity of life below water and on land, together with the prevention of global warming and the preservation of ecosystems, has recently developed into a major environmental challenge with regard to the creation of a sustainable society. NTT Communications has set "Planning a Future of Co-existing with Nature" as part of its environmental declaration and established a set of action guidelines with regard to biodiversity conservation in order to promote environmental preservation activities. The entire Group, including its overseas companies, will actively engage in activities that are in line with the Action Plan.

Biodiversity Action Plan

1. Basic Policy: in Compliance with the NTT Group Biodiversity "Approach Concept" Established by the NTT Group

- **Development Centered on Business Activities**
  The Group recognizes that all activity is inextricably linked to the planet and to biodiversity, understands that the scope and impact at home and overseas are related depending on the nature of a business, and promotes initiatives that are recognized as having a preservation effect.
- **Development Centered on Contribution to Society**
  In partnership with its stakeholders, the Group widely promotes initiatives toward the preservation of biodiversity, regardless of their relevance to its business.

2. Action Guidelines

- Implement actions that take into account the preservation of biodiversity in business activities.
- Contribute to the preservation of social biodiversity in business activities.
- Deepen understanding of biodiversity, promote nature conservation activities together with employees, their families, and the planet.

Main Achievements in Fiscal 2018 and Goals for the Coming Years

We engaged in building, maintaining, and repairing facilities in compliance with the Biodiversity Action Plan as well as the concept of the environmentally friendly Green Building*, established by the NTT Group in addition to ongoing initiatives that leverage the features of ICT enterprises. NTT Resonant disseminated information and raised awareness regarding environmental issues through the "goo Green Label," where users can make a donation to environmental preservation organizations by changing their "goo" web portal to "goo Green Label." In fiscal 2019, we will continue promoting initiatives by leveraging our capacity to serve society as an ICT enterprise.

*Environmentally friendly buildings with reduced waste emissions that make use of energy, water, and air-conditioning systems to reduce their consumption of natural resources.

Considerations for Data Center Construction

Local Landscaping and Greening

We consider it is important to take into consideration for biodiversity in facility designs toward contributing to local greenery in our surroundings.

The Tokyo No. 6 Data Center, one of the largest of such facilities in Tokyo, received a subsidy from the Tokyo Metropolitan Park Association's Urban Green Fund and is working closely with the community to promote greening activities. The green spaces at the site have been separated into two zones, spring/summer and autumn/winter, and planted accordingly so that visitors can enjoy flowers there throughout the year. We seek to achieve harmony between the data center and the surrounding environment. For example, we simulated a wind environment around the building and planted evergreen trees in the southwest corner, which is exposed to wind.

◆ **Spring/summer zone**

◆ **Autumn/winter zone**

Laying Subsea Cables

In constructing its subsea communications cable network, NTT Communications' fundamental policy is to prevent marine pollution. We are signatories to treaties on the prevention of marine pollution and, in addition to complying with environmental legislation, undertake initiatives that place importance on coexistence with marine organisms and the fisheries industry. Group company NTT World Engineering Marine Inc., which handles the laying, burying, and maintenance of subsea cables, develops business with a strong awareness of the need to preserve marine environments.

Assessing Biodiversity

NTT Communications is committed to biodiversity conservation toward realizing a future of co-existing with nature. It operates biodiversity-friendly facilities and leverages ICT to minimize the impact on ecosystems, based on an understanding of the relationship between biodiversity and our business. We also strive to pass on abundant biodiversity to future generations through actions to protect ecosystems by cable-laying ships and by assessing the potential environmental impact from the construction and dismantling of relay stations, and we collaborate with stakeholders on these activities as well.

Reducing Environmental Impact from the Laying of Subsea Cables

Prior to subsea cable-laying and burying work, we conduct an environmental assessment and cooperate with related government authorities and municipalities in carefully designing cable routes and drawing up construction plans. For example, in shallow sea areas we give consideration to the preservation of the marine environment such as by deciding on cable-laying routes that avoid coral reefs and other inhabited areas.

There are also cases in which minesweeping operations are undertaken on the seabed prior to laying or burying the cables. We collect debris from the seabed, including fishing nets, rope, and wire pulled out by the minesweeping operations, and we properly process this as industrial waste after returning to port.

◆ **Cables laid on sand to avoid coral reefs**

◆ **Debris collected from the seabed**

Measures to Preserve Ecosystems Taken on Cable-laying Ships

There are concerns that the marine organisms that infest the ballast water used to maintain the stability of vessels will destroy ecosystems after being discharged into other parts of the ocean as vessels navigate from one area to another. In order to prevent the destruction of ecosystems by ballast water, the subsea cable-laying vessels Kizuna and Subaru are equipped with ballast water treatment equipment, in accordance with the Ballast Water Management Convention* set by the International Maritime Organization (IMO), so that they discharge water that does not contain marine organisms.

Furthermore, the ballast water treatment equipment installed on both of our cable-laying vessels is an ultraviolet sterilization system, which does not use chemical substances and is thus regarded as having low environmental impact. With regard to ship paints, we use those that are in compliance with the AFS Convention (International Convention on the Control of Harmful Anti-fouling Systems on Ships), which regulates the use of anti-fouling paint containing organic tin compounds on the bottom of hulls.

*Adopted by the IMO in 2004, the convention took effect on September 8, 2017 to prevent the movement of marine organisms across habitat boundaries from affecting the marine environment.

Upon the Construction and Dismantling of Relay Stations

Wireless relay stations, the backbone of data communication networks, are often in areas rich with nature such as on hills and islands. And so we emphasize consideration for biodiversity in their operations. As of March 31, 2019, 12 of our 51 wireless stations were in national parks or quasi-national parks. We build micro-roads if needed for the patrol and maintenance of these stations while strictly adhering to the law and our own environmental assessment standards. These assessments identify specific concerns associated with construction processes to enable the application of multifaceted approaches for preventing or minimizing impact on the ecosystem. In addition, when dismantling a wireless station, we strive to restore the environment to its original state by paying careful attention to the presence of rare animals and plants and using local soil for restoration while also consulting local environmental organizations and residents.

Moreover, we have been offering our stations to support wildlife conservation activities. For example, every year since September 2012, the Amami Ornithologists' Club, an NPO, has convened a meeting for observing the migration of Chinese sparrow hawks on the premises of our wireless relay station in Amami City, Kagoshima Prefecture. Although wireless relay stations are typically off limits, these events are held under the observation of employees in response to a request that identified this area as particularly well suited for monitoring the ecosystem.

◆ **Chinese sparrow hawk migration**

Contributing to Ecosystem Conservation Using ICT

Contributing through Products and Services

The damage to agriculture caused by wild boars and deer is becoming an increasing concern across Japan's farming and mountain communities, and traps are being set to minimize damage.

NTT PC Communications Inc. has developed "Mimawari Rakutaro" as one part of its "IOT service." This is a wildlife observation and alarm device that uses an outdoor sensor that transmits data. In this manner, the Company is contributing to countermeasures aimed at minimizing the damage caused by wildlife. Employing the communication services of NTT Docomo to transmit a message automatically to a designated mail address when a trap has been activated, the Mimawari Rakutaro device has brought about a significant reduction of the burden placed on patrols. As one version of Mimawari Rakutaro also comes equipped with a camera, the transmission of images further ensures an immediate response should a person be accidentally caught in a trap. Since first going on sale in July 2011, Mimawari Rakutaro has been used by more than 50 local governments across Japan and contributed to ecosystem conservation in woodlands. As a recent example of its use, Saga City is utilizing subsidies for a Ministry of Internal Affairs and Communications ICT project to realize more efficient countermeasures against wildlife damage.

◆ **Mimawari Rakutaro**

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Contribution through the Provision of Information

In response to growing public expectations that the ICT business provide useful information through Internet media, we will continue to proactively use a variety of online media to communicate the importance of biodiversity and encourage a diverse range of people to engage in ecosystem conservation.

> "goo Green Label" Activities

The "goo Green Label" portal is an initiative for donating a portion of the profits generated through use of the site to organizations engaged in environmental protection and social activities. All users can participate in this initiative simply by changing the top design version of the "goo" web portal to "goo Green Label" and using the search engine. A total of 59 companies, including those in the NTT Group, have signed up as "Corporate Partners," a program that has been recommended for in-house use within those companies. Since its inception in August 2007, donations totaling 57.12 million yen have been made to 46 organizations, the majority of which are NPOs engaged in global environmental protection activities.
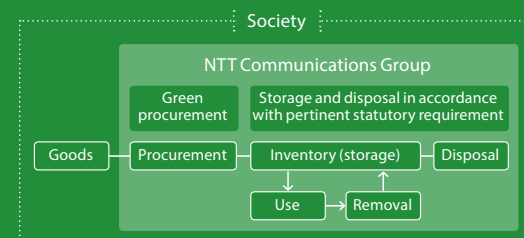
Preventing Environmental Pollution

Our Approach

We are seeking to minimize environmental risks associated with business activities, such as pollution and hazardous substance leaks, by formulating guidelines for introducing low-emission vehicles, improving equipment and operations, and bolstering management, education, and training.

Chemical substances are properly managed by our maintenance departments in accordance with the Waste Management and Public Cleansing Act, the Law Concerning Special Measures Against PCB Waste, and the Electricity Business Act, which include the assigning of managers. While conducting storage inspections on a regular basis, we maintain a robust system to ensure the rapid coordination of information among senior management and the president in the event of an earthquake or other disaster. We always keep abreast of the revisions to laws through training sessions, share information among environmental working groups, and optimize our operations in a timely manner.

◆ **Preventing Environmental Pollution at Each Business Stage**

Primary Concept

The fact that various effluents and wastes are being generated from production and consumption activities and are causing a rise in environmental pollution is a social issue. As symbolized by SDG 12 "Responsible Consumption and Production," NTT Communications is reducing wastes and effluents generated from its business activities and is managing and handling hazardous substances properly to prevent environmental pollution as well as to promote the realization of a safe and secure living environment.

Main Achievements in Fiscal 2018 and Goals for the Coming Years

In fiscal 2018, we continued our initiative to review the number of vehicles owned, introduced low-emission vehicles, and promoted eco-driving. As a result of reducing the number of cars by about 14% year on year, we succeeded in decreasing CO_2 emissions by 30%. These initiatives led to a remarkable achievement in reducing NOx emissions.

SOx emissions decreased by 41% as we expanded our efforts to reduce electricity consumption in air-conditioning and implement energy management at telecommunications and data center buildings. Going forward, we will plan new strategies to reduce electricity use and expand the implementation of our ongoing activities.

With regard to PCBs, we have disposed of low-concentration PCBs as planned. The remaining PCBs, in western Japan, will be properly stored until they are disposed of in fiscal 2019, scheduled in accordance with the operational status of the waste disposal facility.

Fiscal 2018 Results and Future Plans
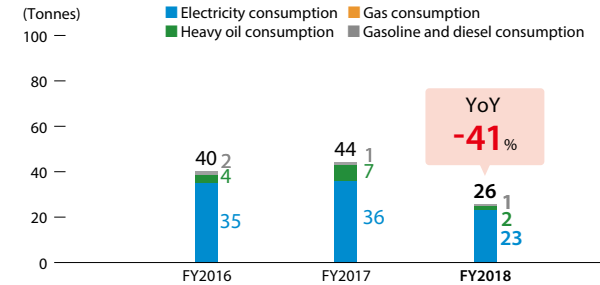
Preventing Air Pollution

Our business activities produce NOx and SOx emissions, which cause air pollution. 69% of the NOx emissions are attributable to the use of gasoline and diesel in our operational vehicles, while the remaining 31% are emitted as a result of electric power generation at communications buildings and other facilities. Most SOx (87%) is emitted during the generation of electricity that we use. In fiscal 2018, NOx and SOx emissions were 226 tonnes (a year-on-year decrease of 19%) and 26 tonnes (a year-on-year decrease of 41%), respectively, as a result of a decline in electricity use. We will continue to promote eco-driving and review our vehicle fleet numbers while making efforts to reduce electricity use in our operations toward contributing to the mitigation of global warming and prevention of air pollution.

◆ NOx Emissions

(Tonnes)
Electricity consumption | Gas consumption
Heavy oil consumption | Gasoline and diesel consumption

FY2016: 350 (268, 4, 1, 78)
FY2017: 279 (200, 7, 1, 73)
FY2018: 226 (155, 2, 1, 68) — YoY -19%
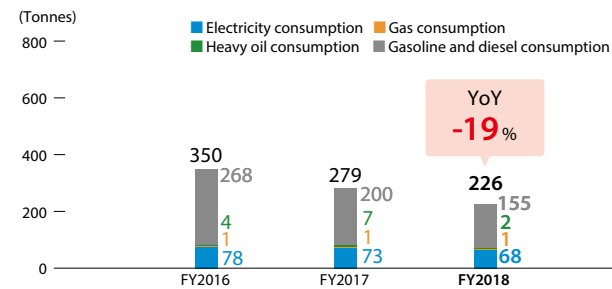
Scope: NTT Communications Corporation and 13 Group companies in Japan

◆ SOx Emissions

(Tonnes)
Electricity consumption | Gas consumption
Heavy oil consumption | Gasoline and diesel consumption

FY2016: 40 (2, 4, 35)
FY2017: 44 (1, 7, 36)
FY2018: 26 (1, 2, 23) — YoY -41%

Scope: NTT Communications Corporation and 13 Group companies in Japan

### Controlling Ozone-depleting Substances

We dispose of ozone-depleting substances in an appropriate manner. The volume of specified halons used in our fire extinguishing equipment in fiscal 2018 was approximately 143 tonnes, roughly the same as in the previous fiscal year. Meanwhile, the volume of specified chlorofluorocarbons (CFCs) used in our air-conditioning equipment in fiscal 2018 was up by around 6 tonnes from the preceding fiscal year, to approximately 283 tonnes.

◆ Volume of Specified Halons Used in Fire-extinguishing Equipment

(Tonnes)
FY2016: 143
FY2017: 143
FY2018: 143
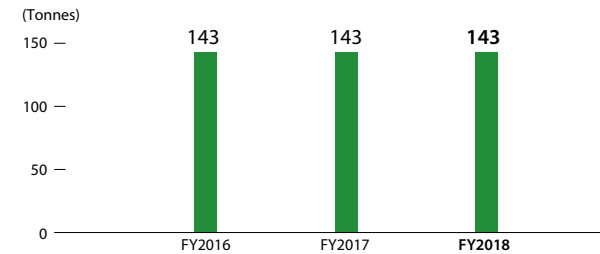
Scope: NTT Communications Corporation and 13 Group companies in Japan

◆ Volume of Specified CFCs Used in Air-conditioning Systems
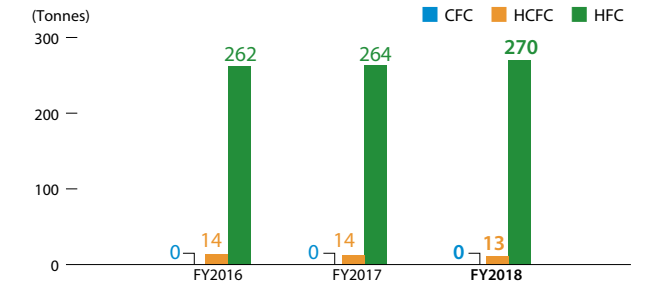
(Tonnes)
CFC | HCFC | HFC

FY2016: 0, 14, 262
FY2017: 0, 14, 264
FY2018: 0, 13, 270

Scope: NTT Communications Corporation and 13 Group companies in Japan

Addressing Asbestos Concerns

Asbestos remediation for buildings and offices involved the implementation of airborne asbestos surveys of buildings for which asbestos had been spray-applied in order to confirm that levels did not exceed statutory limits, revised in September 2006. There were no asbestos emissions in fiscal 2018. We will continue appropriate measures, such as the removal, containment, or enclosure of asbestos in buildings where it is present, in compliance with manuals issued by the Japan Construction Occupational Safety and Health Association and local authorities.

◆ **Asbestos Emissions**

(Tonnes)

|	FY2016	FY2017	FY2018
	0	0	0
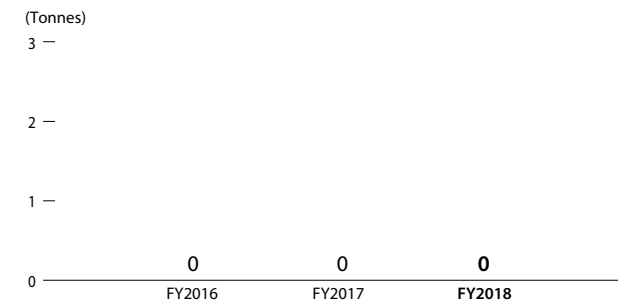
Scope: NTT Communications Corporation and 13 Group companies in Japan

Storage and Management of PCB

NTT Communications appropriately manages devices that contain polychlorinated biphenyl (PCB). Such devices were used in the past as insulators for electrical facilities. As a policy for PCB storage, we have established a set of guidelines prescribing early detoxification treatment as well as methods for ascertaining conditions and management when the use of equipment containing PCBs is to be continued.
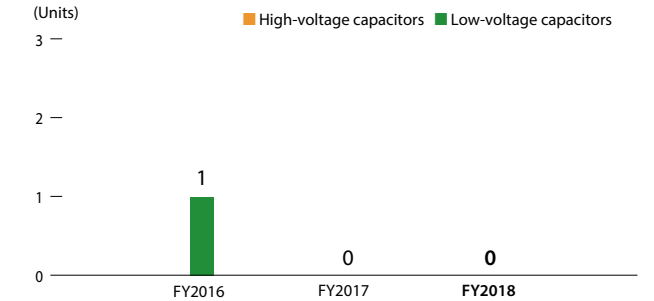
With regard to high-concentration PCB currently stored in Hyogo and Hiroshima prefectures, we are coordinating plans with waste disposal companies to commence detoxification processing in fiscal 2019.
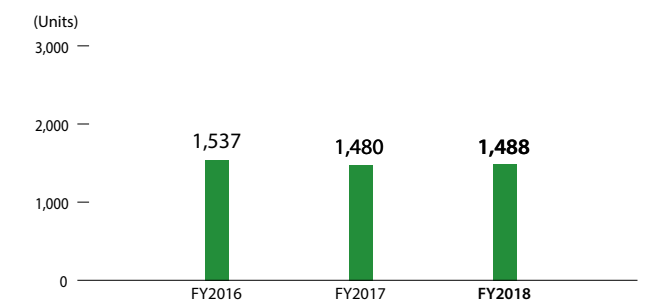
◆ **Number of Transformers Stored**

(Units)

	FY2016	FY2017	FY2018
	1	0	0
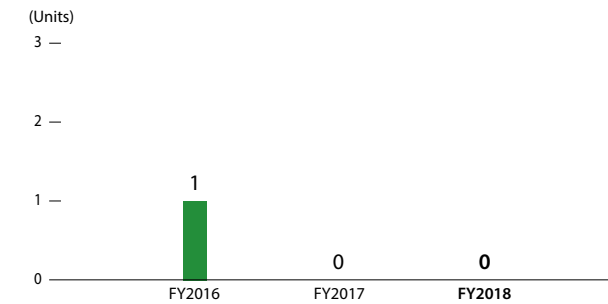
Scope: NTT Communications Corporation

◆ **Number of Capacitors Stored**

(Units)

High-voltage capacitors   Low-voltage capacitors

	FY2016	FY2017	FY2018
	1	0	0

Scope: NTT Communications Corporation

◆ **Number of Electric Ballasts Stored**

(Units)

	FY2016	FY2017	FY2018
	1,537	1,480	1,488

Scope: NTT Communications Corporation

NTT Communications
Corporation
CSR Report 2019

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Chemical Substance Management in Anticipation of Emergencies

Against a backdrop of natural disasters occurring frequently on a global scale, there is a growing public concern over the management systems for environmental pollutants in times of emergency. As an owner and operator of IT infrastructure, we have been thorough in establishing storage and management systems while also bearing in mind the possible occurrence of unlikely events. In the management of PCBs in particular, we have implemented a management system while taking into account factors such as earthquakes, fires, flood controls, lightning protection, puncture resistance, ventilation, and security. By carrying out periodic inspections, we are constantly confirming that such substances are properly managed. Moreover, we maintain a system for quickly confirming the secure storage of chemical substances and reliably ensuring operational readiness in the event of major earthquakes and other disasters in order to prevent damage when one strikes as well as in the occurrence of secondary disasters.

◆ **PCB storage location**

◆ **Storage of PCBs**
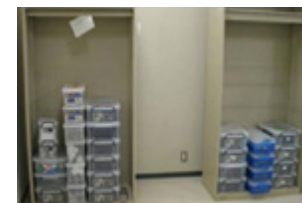
Cases of Major Leakage

There were no incidents involving major leakages in the NTT Communications Group in fiscal 2018.

Transport, Import, and Export of Toxic Waste

Under a disposal plan based on our policy of detoxifying PCBs at the earliest date, we processed waste stored in Kyushu and Hokkaido in fiscal 2014 and in Tokyo in fiscal 2016. The remaining waste in Osaka will be detoxified in fiscal 2019.