Environment

Achieving carbon neutrality for a green and sustainable future

Public expectations for environmental protection are growing along with the responsibilities of ICT companies for engaging in these activities. We are pursuing a multifaceted approach focused on the three themes of promoting a decarbonized society; developing a closed-loop society; and co-existing with nature, including the preservation of biodiversity. We therefore established and announced the Environmental Statement and Eco Strategy 2030.

In March 2021, we reviewed the Eco Strategy 2030 to respond to rapidly changing global and social conditions and set specific goals and initiatives for decarbonization. In addition to reducing the environmental impact of our own business activities, we will contribute to reducing the environmental impact of society as a whole while aiming to achieve both solutions to environmental problems and economic development.

Targeted SDGs

Priority Activities

Basic Philosophy and Vision

While emphasizing the philosophy in the NTT Group Global Sustainability Charter, established by the NTT Group, our environmental protection activities take shape as the NTT Communications Group Global Environmental Charter and Eco Strategy 2030, 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 Sustainability Charter to promote Groupwide consideration and actions relating to environmental protection from a global perspective. This policy forms 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/sustainability/policy/environment/details.html

Environmental Statement and Eco Strategy 2030

While closely monitoring global environmental trends, we reviewed the environmental activities of the NTT Communications Group in November 2016 and established the NTT Communications Group Environmental Statement and Eco Strategy 2030. In March 2021, we revised the Eco Strategy 2030 in response to increasing corporate roles and responsibilities regarding global climate change. Following the revision, we declared our intention to achieve carbon neutrality by fiscal 2030 (net-zero emissions)* based on the NTT Group's New Environment and Energy Vision, formulated in September 2021.

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.

*Targeted GHG Protocol: Scope 1 (direct emissions of greenhouse gases from our own sources) and Scope 2 (indirect emissions from the use of electricity, heat, and steam supplied by other companies)

The NTT Communications Group Environmental Statement

We are dedicated to global environmental management for a future in which people and the planet remain in harmony, and

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

Realizing a Decarbonized 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 Natural Harmony

We are contributing to the preservation of ecosystems.

Eco Strategy 2030

Under Eco Strategy 2030, we have set out specific initiatives*1 to help realize the three futures outlined in the Environmental Statement. In fiscal 2020, following the declaration of the NTT Group's Environment and Energy Vision in May 2020, we also added specific targets for our renewable energy usage rate, reducing CO_2 emissions, and converting our corporate fleet in Japan to EVs as a countermeasure to rapidly changing climate conditions.

To achieve carbon neutrality or net-zero emissions by fiscal 2030*2 to establish a decarbonized future, we intend to increase the rate of renewable energy use to at least 50% in fiscal 2030, including the amount used by customer equipment at the data centers, while further saving power through the use of advanced technologies. We plan to achieve this goal by, for example, increasing the rate of renewable energy use by the NTT Communications Group to 100%.

Three Futures We Are Targeting	Initiative	
Realizing a Decarbonized Future	Rate of renewable energy use in the Company*3	We will increase the rate of renewable energy use in the NTT Communications Group to 50% or more.
	Reducing CO_2 emissions from the Company (Scopes 1 and 2)	We will reduce CO_2 emissions in the NTT Communications Group by 50% compared to fiscal 2018*4.
	Reducing CO_2 emissions from the supply chain (Scope 3)	We will reduce CO_2 emissions from the supply chain by 15% compared to fiscal 2018.
	Conversion rate of our corporate fleet to EVs in Japan (%)	We will make EVs account for 100%*5 of our corporate fleet used in Japan.
	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.
	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	Landfill waste disposal ratio	We will set our target for increasing the landfill rate of the waste generated by the NTT Communications Group to at least 99%.
Planning a Future of Natural Harmony	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.

*1 Quantitative targets for fiscal 2030
*2 Targeted GHG Protocol: Scope 1 (direct emissions of greenhouse gases from our own sources) and Scope 2 (indirect emissions from the use of electricity, heat, and steam supplied by other companies)
*3 Including the amount used by customer equipment at the data centers
*4 Equivalent to 1.5°C SBT
*5 50% by fiscal 2024 (to begin with)

Environmental Management

Environmental Management

Promotion Framework for Reducing Environmental Impact

In order to continuously promote environmental protection initiatives in a Groupwide effort, we have established the Global Environmental Protection Subcommittee within the CSR Committee, headed by the executive vice president in charge of CSR, and also formed working groups for each related issue. The Global Environmental Protection Subcommittee formulates an overall plan that encompasses a wide range of issues, including the reduction of greenhouse gas emissions and waste, shares information on the results of actions taken, and promotes the horizontal deployment of various initiatives.

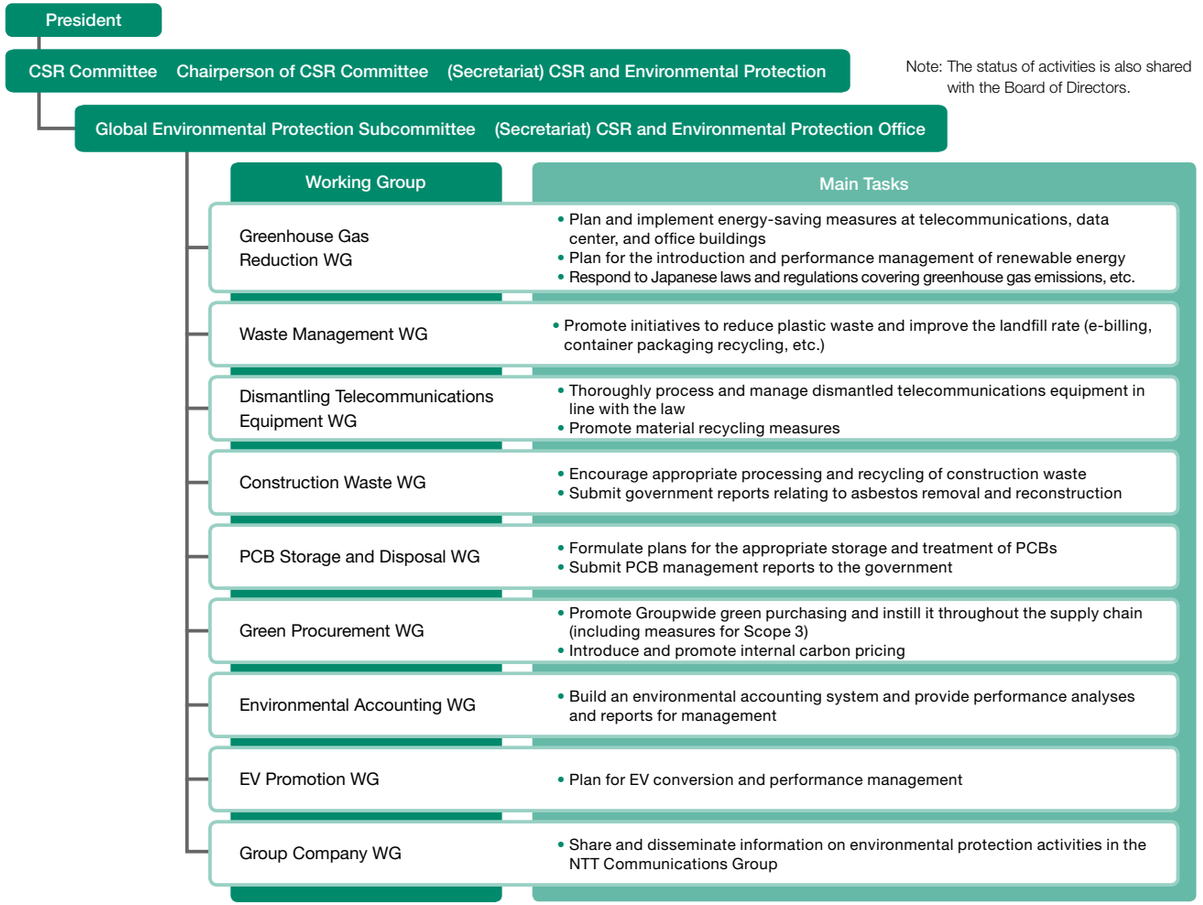
In fiscal 2020, we reviewed our environmental management structure in line with new targets added to our Eco Vision 2030, which includes the introduction of renewable energy, reduced greenhouse gas or CO_2 emissions, and having EVs account for 100% of our corporate fleet in Japan, and we have established a Groupwide system to promote environmental protection activities and associated initiatives.

In addition, we are proactively managing environmental risks by defining our approach to environmental issues as a key aspect of our business risk management.

We will continue to improve our management systems as necessary to more effectively respond to environmental trends.

For more information on our approach to business risk management, see the “Risk Management” section of the report.
P. 099

[Environmental Protection Framework]



Note: The status of activities is also shared with the Board of Directors.

(As of March 31, 2022)

Environmental Impact of Business Activities

Fiscal 2021 Material Flow

Environmental Impact of Business Activities

INPUT			Business Processes	OUTPUT		
Procurement	Items purchased through green procurement (non-office supplies + office supplies)	0.75 million (green procurement rate of 100%)	Procurement			
	Procurement systems assessed	2 companies				
Telecommunications Facilities (including data centers)	Power	0.44 TWh	Telecommunications Facilities	Telecommunications Facilities (including data centers)	Power	117 kt-CO_2
	Green power	0.16 TWh			Fuel	4 kt-CO_2
	Fuel	1.49 million ℓ			Gas	0.3 kt-CO_2
	Gas	0.13 million m³			Heat	0.1 kt-CO_2
	Heat	2.10 TJ			General waste generated	472 t
					General waste landfills	3 t
					Industrial waste generated	3,735 t
					Industrial waste landfills	17 t
Offices*	Power	0.03 TWh	Offices	Offices*	Greenhouse gases (power)	13 kt-CO_2
	Green power	3 GWh			Greenhouse gases (heat)	0.2 t
	Heat	37.30 TJ			General waste generated	358 t
	Water	0.1 million m³			Plastic waste generated	14 t
	Paper	30 t			General waste landfills	4 t
	Recycled paper and eco-friendly pulp	28 t			Industrial waste generated	118 t
					Plastic waste generated	60 t
					Industrial waste landfills	1 t
					Total wastewater volume	0.1 million m³
Sales	Paper (brochures)	10 t	Sales	Sale	Greenhouse gases (fuel)	0.1 kt-CO_2
	Invoices	125 t				
	Fuel (automobile)	41 kℓ				
			Reuse/ Recycle	Reuse	In-house reuse of dismantled telecommunications equipment	119 units
					Equipment and packaging	6,537 units
				Recycle	Collection of confidential documents	161 t

*We separate waste insofar as possible to improve the recycling rate.

Scope: NTT Communications Corporation and 14 Group companies

Calculation of CO_2 Emissions (Fiscal 2021 Results)

For Scope 3, we calculated 10 relevant categories out of 15 target categories by referring to unit emission databases and other materials produced through studies by the Ministry of the Environment and other government ministries and agencies.

CO_2 Emissions by Scope and Category

Category		Composition Ratio (%)	CO_2 Emissions ($kt\text{-}CO_2$)
Scope 1 (direct emissions of greenhouse gases from our own sources, such as fuel combustion)*1			7
Scope 2 (indirect emissions from the use of electricity, heat, and steam supplied by other companies)			132
Scope 3 (indirect emissions other than Scopes 1 and 2, such as emissions by others related to our activities)		100	2,086
	Category 1 (purchased goods and services)*2	36.2	756
	Category 2 (capital goods)*2	17.3	361
	Category 3 (fuel and energy activities not included in Scopes 1 or 2)	3.3	69
	Category 4 (upstream transportation and distribution)	0.4	8
	Category 5 (waste generated through business activities)	0.0*6	0.3
	Category 6 (business travel)*2	0.1	2
	Category 7 (employee commutations)*2	0.0*6	1
	Category 8 (upstream leased assets)*3	—	—
	Category 9 (downstream transportation and distribution)*4	—	—
	Category 10 (processing of products sold)*5	—	—
	Category 11 (use of products sold)*2	32.2	671
	Category 12 (disposal of products sold)	0.1	2
	Category 13 (downstream leased assets)	10.4	216
	Category 14 (franchise)*7	—	—
	Category 15 (investments)*7	—	—

Scope: NTT Communications Corporation and 14 Group companies
*1 Includes CO_2-equivalent emissions of greenhouse gases other than CO_2 (CFC substitutes, etc.)
*2 We revised the calculation method for categories 1, 2, 6, 7, and 11 of Scope 3 to improve accuracy from FY2021 results.
*3 Not included in the calculation (fuel and electricity used by leased assets are calculated under Scope 1 or 2)
*4 Not included in the calculation (mostly outsourced transportation calculated under category 4)
*5 Not included in the calculation (no intermediate product processing in main businesses)
*6 Less than 0.05
*7 Not applicable

Environmental Accounting in Fiscal 2021

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 2021 increased by approximately 760 million yen year on year to 2.6 billion yen, consisting of around 970 million yen in investments and about 1.62 billion yen in expenses. This was mainly due to an increase in global environmental conservation costs.

Meanwhile, the economic benefit derived from environmental conservation in fiscal 2021 decreased by approximately 160 million yen year on year to 1.52 billion yen, mainly due to reduced purchase costs resulting from the reuse of dismantled telecommunications equipment.

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

Category	Key Measures		Investment		Expenses*	
			FY2020	FY2021	FY2020	FY2021
(1) Business area cost			862	942	790	1,549
Breakdown	Pollution prevention costs	Oil tank facility for power generator use Management of items using PCBs	289	198	65	93
	Global environmental conservation costs	Measures to reduce CO_2 Emissions resulting from electricity use	573	744	180	600
	Resource circulation costs	Waste disposal and reuse expense	0	0	545	856
(2) Upstream/ downstream costs	Measures to recover, recycle, and reuse telecommunications equipment		42	32	1	1
(3) Administration costs	Environmental conservation management activities		0	0	117	70
(4) R&D costs	Allocated portion of the NTT Group's environmental R&D costs		0	0	23	0
(5) Social activity costs	Costs of supporting volunteer participation		0	0	2	2
(6) Environmental remediation costs			0	0	0	0
Total			904	974	931	1,622

Scope: NTT Communications Corporation and 14 Group companies
*FY2020 and FY2021 results do not include depreciation.

[Economic Benefits Associated with Environmental Conservation Activities (Real Financial Impact)]

(Millions of Yen)

Category	Key Measures	FY2020	FY2021
Revenue	Revenues from sales (cables, metal scrap, etc.)	315	374
Cost reductions	Reductions in expenses as a result of measures such as those related to reducing electricity use	490	401
	Reductions in purchase cost as a result of reusing dismantled telecommunications equipment	442	274
	Decrease in postal and paper costs due to increased use of Mypage (online account page)	433	470
	Others	0	1
Total		1,682	1,521

Period: April 1 to March 31 of each year
Scope: NTT Communications Corporation and 14 Group companies
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 Initiatives

Acquiring ISO 14001 Certification

Two companies in the NTT Communications Group have acquired ISO 14001 certification as of March 31, 2022. We have contracted outside environmental consultants to perform annual internal audits of the certified companies and departments 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.

[Companies Certified under ISO 14001]

Companies Certified		Date Certified
NTT Communications Corp*	Procurement Promotion and Strategy, Procurement and Billing Department	October 1999
	Business Solution, Solution Services Department	March 2004
NTTPC Communications, Inc.		November 2003

As of March 31, 2022

*Percentage of employees of target organizations to total employees: 20%

Promoting Groupwide Environmental Management

Guided by its Global Environmental Charter, the NTT Communications Group shares PDCA and other reports at the Global Environmental Protection Subcommittee, an organization under the CSR Committee. These reports outline details of the various initiatives administered by the nine working groups that drive the Group's environmental protection efforts. 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 2021.

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

ESG management is a pillar of the NTT Group's medium-term management strategy. The NTT Group Environment and Energy Vision was formulated in May 2020 as part of this strategy, and the NTT Group was approved by the SBT initiative in October of that year. The NTT Group Green Procurement Standards were subsequently established in April 2022 by revising the NTT Group Green Procurement Guidelines to clarify the latest environmental policies and targets of the NTT Group, specific laws and standards that we require suppliers to refer to, and evaluation items for procurement.

In the Green Procurement Standards, NTT Communications clearly specifies factors in our 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. The standards also include a request for cooperation from our suppliers in reducing CO_2 emissions and state we will procure preferentially from suppliers taking action to reduce greenhouse gas emissions.

Through our efforts for green procurement (procuring products taking into account their impact on the environment) under the Green Procurement Standards, we will work to improve our environmental protection activities with our suppliers and seek to commit to further social contribution.

[Status of Green Procurement] (10,000 Units)

	FY2017	FY2018	FY2019	FY2020	FY2021
Green procurement of goods, excluding office supplies	154	204	257	330	75
Green procurement of office supplies	22	21	24	33	30

Introducing Internal Carbon Pricing

Internal carbon pricing (ICP) is a method companies use to assign their own in-house price for carbon use and factor this into their strategies and decision-making process. On September 1, 2022, NTT Communications introduced a new strategy for utilizing this ICP to evaluate prices at the time of product selection. This mechanism allows for a comprehensive evaluation of prices based on the results of converting CO_2 emissions into prices, rather than evaluating prices based on proposal prices alone, as in the past.

Sharing of Green Procurement Policies

NTT Communications holds individual briefing meetings with suppliers to mutually share our basic approach and requirements for them with regard to the procurement of environmentally sound parts and products. In July 2021, the NTT Group held a briefing session on promoting green procurement in the NTT Group and another session in February 2022 on building and maintaining a supply chain to realize a sustainable society.

We will continue to closely communicate with our suppliers and work together to promote green procurement.

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 sustainability efforts, extending the scope of participation to include not only employees but also their family members and our business partners.

In fiscal 2021, we conducted sustainability training targeted for all employees (94.0% of them attended) as well as lectures on the topic of SDGs and business activities to learn about domestic and international social trends such as the SDGs, ESG investment, decarbonization efforts, and global risks.

We are working to raise employee awareness by posting monthly reports on how much electricity and paper is used and how much waste is generated in each office.

In response to the growing urgency of co-existing with nature, we have conducted a range of environmental awareness and educational activities, including cleaning up around our offices and homes in ways that allow employees to easily participate, collecting PET bottle caps for donation, and preserving woodlands by maintaining trees and growing rice and vegetables. In fiscal 2022, we will continue to promote initiatives in which many employees can easily take part.

[Cleanup Day at Otemachi Place (head office building)]

[Chiyoda Ward Cleanup Day]

[Shirai Woodland Preservation Project]

Priority Activities

Promotion of a Decarbonized Society

Our Approach

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. We continue to reduce greenhouse gas emissions, recognizing our responsibility to contribute to addressing environmental problems, including climate change as one of the most pressing issues for realizing a sustainable future. We are also taking various initiatives to reduce CO_2 emissions in our supply chain as a whole. For example, we set “Realizing a Decarbonized Future” as one of the themes for our Environmental Statement to contribute to the realization of a decarbonized society, and we are reducing power consumption and improving the efficiency of our facilities as well as providing services that contribute to decarbonization and care for the environment. To promote a decarbonized society, we will further increase the use of renewable energy, replace our general fleet vehicles with EVs, and reduce CO_2 emissions from our Groupwide business activities toward achieving carbon neutrality by fiscal 2030.

Since electricity consumption accounts for more than 90% of total CO_2 emissions from business activities, we can particularly 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. In addition, we will continue to help society as a whole become carbon neutral by providing platforms, solutions, and services that lead to decarbonization.

Main Achievements in Fiscal 2021 and Goals for the Coming Years

In fiscal 2021, we continued our 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 4.7 fold (compared to fiscal 2013), making steady progress toward achieving the target of a 10-fold increase by fiscal 2030. 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 19.5 times the volume of our own CO_2 emissions, thereby exceeding our fiscal 2030 target of 10 times. Our introduction rate of renewable energy (including virtually renewable energy by using non-fossil fuel certificates) also increased from 8.4% in fiscal 2020 to about 35% in fiscal 2021.

In fiscal 2022, we will continue these efforts and strengthen services and solutions that contribute to the realization of a decarbonized society. In addition, we will further accelerate the introduction of renewable energy and the transition of our general fleet to EVs to achieve carbon neutrality* by fiscal 2030.

*Targeted GHG Protocol: Scope 1 (direct emissions of greenhouse gases from our own sources) and Scope 2 (indirect emissions from the use of electricity, heat, and steam supplied by other companies)

Reduction of Greenhouse Gases

Fiscal 2021 Result

CO_2 Emissions

FY2021 Target: 156 kt-CO_2 or lower

FY2021 Result: 139 kt-CO_2 (YoY −28.5%)

(FY2020 result: 195 kt-CO_2)

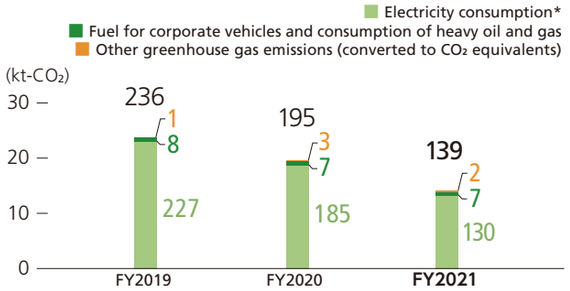
Includes CO_2-equivalent emissions of greenhouse gases other than CO_2 (CFC substitutes, etc.)

We were able to meet our CO_2 emissions target* for fiscal 2021, mainly by introducing renewable energy (including virtually renewable energy by using non-fossil fuel certificates), while further striving to save energy in telecommunications buildings such as data centers and promoting remote work, which resulted in a decrease in power consumption in offices. The CO_2 emissions per unit of sales were 0.13 t-CO_2 per millions of yen (FY2020 result: 0.18 t-CO_2 per millions of yen).

In fiscal 2022, the NTT Communications Group will work together to expand the introduction of renewable energy, continue its ongoing energy-saving activities, and utilize R&D technologies and new measures to reduce CO_2 emissions by 20% from the previous fiscal year. Through these efforts, we plan to become carbon neutral by fiscal 2030, with net-zero CO_2 emissions generated by our data centers, networks, and other facilities. Furthermore, we intend to continue providing energy-efficient data centers and cloud services to society, having customer servers and their peripheral equipment, including air-conditioning, UPS, and lighting, integrated at our data centers, consequently improving the efficiency of public power consumption.

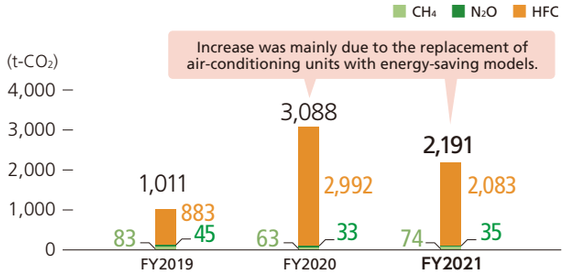
*CO_2 emissions were calculated using emission factors obtained from electric power companies.

[CO_2 Emissions from Business Activities]



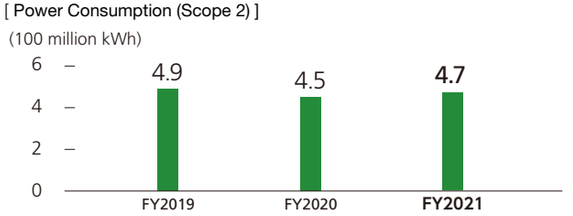
Scope: NTT Communications Corporation and 14 Group companies
*CO_2 emissions were calculated using emission factors obtained from electric power companies.

[Other Greenhouse Gas Emissions* (Converted to CO_2 Equivalents)]



Scope: NTT Communications Corporation and 14 Group companies
*Emissions from Company vehicles, telecommunications buildings (including data centers), and offices

[Power Consumption (Scope 2)]

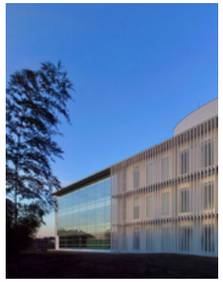


Scope: NTT Communications Corporation and 14 Group companies

Expanding the Use of Renewable Energy

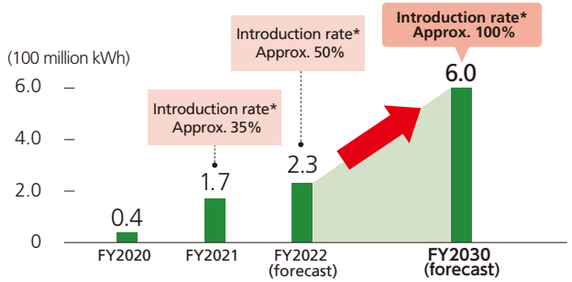
Since April 2020, we have been actively introducing and expanding the use of renewable energy, including virtually renewable energy by using non-fossil fuel certificates, and in fiscal 2021 achieved a 100% renewable energy rate in 31 of our 89 telecommunications buildings, including data centers. In fiscal 2022, we will expand the use of renewable energy by greening an additional ten buildings.

[Yokohama 1 Data Center (100% powered by renewable energy from fiscal 2022)]



[Saitama 1 Data Center (100% powered by renewable energy from fiscal 2022)]

[Rate of Renewable Energy Introduced (including virtually renewable energy by using non-fossil fuel certificates)]



Scope: NTT Communications Corporation and 14 Group companies
*Targeted GHG Protocol: Scope 2 emissions from business activities

Evaluation by National and Local Governments

In fiscal 2021, NTT Communications was evaluated as “S” class, the highest rank, as an outstanding energy-saving business that achieved its targets, under the business operator classification system implemented by the Agency for Natural Resources and Energy based on the Act on Rationalizing Energy Use (Energy Conservation Act).

We also received “S” ratings (Granpark Tower and Shiodome Building) from the Tokyo Metropolitan Government for our global warming countermeasure plans for specified tenant buildings*.

*Specified tenant buildings are those occupied by businesses that use at least 6 million kWh of electricity per year or lease at least 5,000m^2 of floor space.

Initiatives Related to Telecommunications Facilities Including Data Centers

FY2021 Results

CO_2 Emissions

FY2021 Target
144 kt-CO_2 or lower

FY2021 Result
124 kt-CO_2 YoY –30.9%
(FY2020 Result: 180 kt-CO_2)

Includes CO_2-equivalent emissions of greenhouse gases other than CO_2 (CFC substitutes, etc.)

In fiscal 2021, our CO_2 emissions decreased as a result of the increased use of renewable energy as well as the 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. Although there was a rise in demand for sales at data centers in Tokyo and Osaka as well as the installation of new cloud servers, we were nevertheless able to achieve our target.

CO_2 emissions are rising in fiscal 2022 due to ongoing robust data center and cloud service sales. However, we intend to meet our emissions target at a year-on-year reduction of 20% by expanding visualization of power usage, implementing newly developed technologies, improving airflow, and optimizing equipment for telecommunications services.

Building Cutting-edge Data Centers with Advanced Energy-saving Technologies

Operating data centers requires a constant supply of electric power. As an ICT company, we proactively introduce leading-edge equipment and technologies for reducing the carbon footprint of our data centers.

For example, our relatively new data centers are equipped with improved cooling efficiency and lower power consumption in their air-conditioning systems owing to the use of outside air for cooling IT equipment, precise automatic temperature measurement, and proactive AI-based air-conditioning control based on these measurements. In addition, we have installed an indirect evaporative cooling system for the new data center in Tokyo. This made us the industry's first to use the system, which is expected to reduce the annual energy cost by 60% compared to a conventional system.

In addition to cooling systems, we are working toward decarbonization by introducing a solar power generation system and an automatic motion sensor lighting system. We will accelerate the decarbonization of our data centers by introducing leading-edge equipment and technologies.

Comparison to a conventional air-conditioning system
60% reduction per year

Use of Renewable Energy in Data Centers

With the expansion of the digital society, demand for power in data centers is increasing year by year. The issue is that while it is possible to improve the energy consumption efficiency of data centers, it is not possible to eliminate power consumption itself.

In addition to our data centers located in telecommunications buildings that began using renewable energy in fiscal 2020, our new data center established in Tokyo in fiscal 2021 also relies on renewable energy. In fiscal 2022, we began featuring a wide range of renewable energy options to meet customer needs at our five data centers in the Tokyo metropolitan area. This enables our customers to comply with RE100* and other international environmental initiatives as well as to promote their ESG management toward decarbonization.

Going forward, we will expand our efforts to spread the use of renewable energy not only inside the Company but with our customers.

*A global initiative that brings together companies that intend to switch to 100% renewable energy sources for electricity used in their business activities.

Providing CO_2 Emissions Forecasting and Visualization Functions in Our Cloud Service

In our Smart Data Platform Cloud/Server service, which utilizes NTT Communications' data centers to provide cloud computing services, we have also set a goal of achieving carbon neutrality by introducing renewable energy to all our sites by the end of fiscal 2023. As of June 2022, we had completed the introduction of renewable energy to 50% of our service locations.

In addition, we are the first cloud service provider in Japan to provide simulation to forecast CO_2 emissions (from July 2022) and a dashboard to visualize emissions (from September 2022) free of charge to help customers further reduce their environmental impact.

[Screen image of the Carbon Footprint Simulation for forecasting CO_2 emissions]

[Screen image of the Carbon Footprint Dashboard for visualizing CO_2 emissions]

Ongoing Efforts to Cut Cooling Power Consumption at Telecoms Facilities

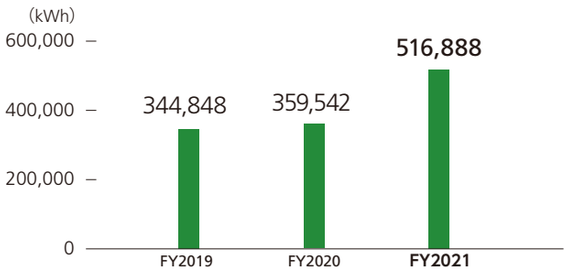
In past efforts to reduce power consumed by cooling, we have implemented a range of measures, including SmartDASH® an automated AI system that visualizes temperature zones in server rooms, detects areas that are too cold, and automatically controls air-conditioning, and Aisle Capping, a technique that physically separates the intake (low temperature) and exhaust (high temperature) air from IT equipment by placing sidewalls and ceilings 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 continue our work on more finely tuned air-conditioning power management. This includes calculating PUE (Power Usage Effectiveness*1) of each room to improve low-efficiency rooms by implementing thorough airflow improvement, temperature adjustments, and air-conditioning shutdown initiatives. These efforts led to a 15% reduction in power consumed by cooling in fiscal 2021 compared to business-as-usual (BAU*2) levels. To address the migration in ICT equipment from old models to highly efficient new ones, we will also seek to cut down on power consumed by ICT and air-conditioning systems through the timely discontinuation of use of the old models.

*1 Power Usage Effectiveness: (Power consumption of the entire data center)/(Power consumption of ICT equipment in the data center). An indicator for measuring the energy efficiency of a data center; the closer the number approaches 1, the more efficient the data center.
*2 Business as usual: A situation in which no special measures are taken

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, and six system units are currently in operation.

[Overall Amounts of Power Generated by Solar Panels at Data Center]



Power Generated by Solar Power in Fiscal 2021

Approx. 520,000 kWh

Office Initiatives

Fiscal 2021 Results

CO_2 Emissions

FY2021 Target: 14 kt-CO_2 or lower

FY2021 Result: 15 kt-CO_2 (YoY Almost unchanged)

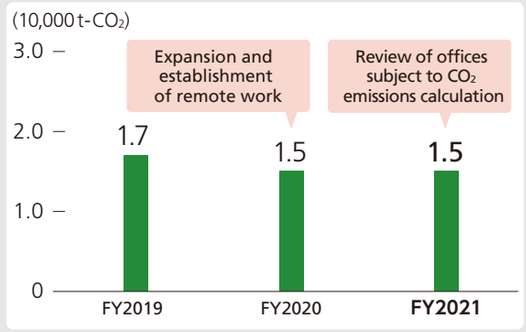
(FY2020 Result: 15 kt-CO_2)

Includes CO_2-equivalent emissions of greenhouse gases other than CO_2 (CFC substitutes, etc.)

In fiscal 2021, although we saw an increase in CO_2 emissions after reviewing the offices to be included in the calculation, we consolidated offices in the Tokyo metropolitan area and adopted a free seating system, assuming that the maximum employee attendance rate would be 30%, as remote work is becoming common practice. We also converted electricity used in offices to renewable energy sources, just as our head office in Otemachi Place achieved zero emissions for all electricity used in September 2021, and as a result, CO_2 emissions remained almost unchanged compared to fiscal 2020.

In fiscal 2022, we expect to see more employees back in the office due to changes in social demands with COVID-19, but we will further reduce electricity consumption in the office and expand the use of renewable energy for electricity consumption, and set a target for reducing CO_2 emissions by at least 5% compared to fiscal 2021.

[CO_2 Emissions* from Offices]



*Includes CO_2-equivalent emissions of greenhouse gases other than CO_2 (CFC substitutes, etc.)
Scope: NTT Communications Corporation and 14 Group companies

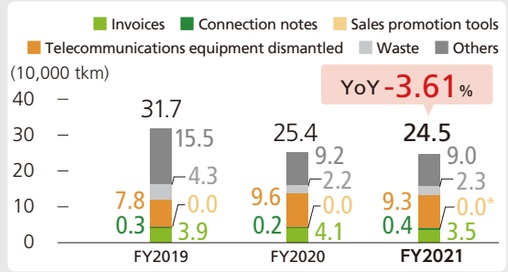
Transportation Initiatives

Fiscal 2021 Results

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, volume, and distance required for transport and by otherwise enhancing logistics

In fiscal 2021, we worked to reduce the amount of paper by expanding web-based applications, digitalizing sales tools, and promoting remote sales. As a result, total transportation volume was 245,000 tkm. In fiscal 2022, we will continue to reduce transportation volume by promoting the use of web-based application systems and digitalization.

[Goods Transportation Volume under the Revised Energy Conservation Law]



Scope: NTT Communications Corporation
*Less than 0.05

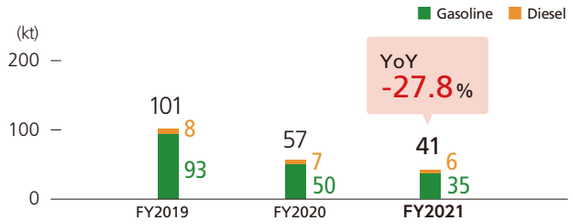
Reducing Fuel Use by Company Vehicles

To help solve pollution problems and contribute to the realization of a low-carbon society, we are working to have EVs account for 100% of our corporate fleet by fiscal 2030 under the EV100 initiative declared by the NTT Group in October 2018. We are also reviewing the number of our sales vehicles and steadily promoting eco-driving and other measures to reduce the volume of fuel used by Company vehicles across the entire Group.

In fiscal 2021, we continued our efforts to introduce EVs, replacing 8 vehicles with EVs and scrapping 22 vehicles with the expansion of remote sales. As a result, the number of Company vehicles was 175 (including 40 EVs) at the end of fiscal 2021, compared to 197 (32 EVs) at the end of fiscal 2020.

Gasoline and diesel consumption by Company vehicles in fiscal 2021 totaled 35,000 liters and 6,000 liters, respectively. The combined volume declined by 16,000 liters, or 27.8%, year on year.

[Fuel Consumption by Company Vehicles]



Scope: NTT Communications Corporation and 14 Group companies

For more information on EV100, see:
https://japan-clp.jp/en

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 (cable-laying ship Kizuna was fully equipped with LED lighting when it was first built).

*An electric propulsion system is a type of ship that turns a generator with its engines, drives motors with the electric 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

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 2021, we have a cumulative total of 10 solutions registered. Looking ahead, we aim to obtain more certifications for the Environmental Labeling System for Solutions.

(Unit: %)

Certified Solutions (Excerpt)	CO_2 Reduction Effect
Nexcenter	43
Enterprise Cloud	74
Arcstar IP Voice	30
Arcstar Universal One Mobiles	24

For more information on the Environmental Labeling System for Solutions, see:
https://group.ntt/en/environment/protect/lowcarbon/label/

Nexcenter, a Data Center that Combines Energy Efficiency and Performance

NTT Communications' data center (DC) service, the Nexcenter, offers leading-edge quality, safety, and security, among the highest standards in the industry.

The Nexcenter proved to be capable of operating nonstop, 24 hours a day, 365 days a year, with full disaster countermeasures and of reducing CO_2 emissions associated with maintenance, operation, and the use of ICT equipment in a DC by at least 50% per year compared to a conventional DC with the latest cooling system.

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 the ninth version was published in March 2021. We will continue to participate in this initiative and work to disseminate the guidelines throughout the Group on an ongoing basis.

*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-IoT Cloud Industry Consortium (designated nonprofit organization)

For more information on the Eco ICT Logo, see:
https://www.tca.or.jp/press_release/2010/0701_400.html
(in Japanese only)

For more information on the self-assessment checklist, see:
https://www.ntt.com/about-us/csr/eco/ecoict.html
(in Japanese only)

Climate Scenario Analysis and Initiatives

In May 2020, the NTT Group declared its support for the Task Force on Climate-Related Financial Disclosures (TCFD), established by the Financial Stability Board (FSB). Based on TCFD recommendations, the NTT Group adopted and analyzed two scenarios of climate-related risks and opportunities associated with the Group's operations: a scenario limiting the increase in global average temperature to 1.5°C above pre-industrial levels (1.5°C scenario), and a scenario in which warming will increase by almost 4°C with measures to combat global warming maintained at existing levels (4°C scenario).

The results of this analysis and a summary of the efforts made by the NTT Communications Group, a member of the NTT Group, are provided below.

For more information on related risk management initiatives, see the "Risk Management" section of the report.
P. 099

[Risks and Opportunities Identified with Scenario Analysis, and a Summary of the Group's Initiatives]

	1.5°C Scenario	4°C Scenario	Type	Timeframe	Countermeasures Taken by the NTT Group	Initiatives by the NTT Communications Group
Increase in costs for decarbonization and renewable energy charges	Loss ▼	—	Transition risk (policies, regulations)	Long-term	• Initiatives for realizing the IOWN concept • Introducing and expanding the use of renewable energy • Promoting energy conservation, high-efficiency data centers	• Promoting the introduction of renewable energy and energy conservation to achieve carbon neutrality by 2030 (Scopes 1 and 2) • Reducing greenhouse gas emissions in the supply chain through green procurement
Social criticism related to fewer efforts toward ESG (drop in market share)	▼	Minor	Transition risk (market, criticism)	Long-term	• Proactive disclosure of information on environmental initiatives	• Proactive disclosure and dissemination of information through the official website, sustainability reports, etc.
Expanding sales of services that help reduce society's environmental impact	▲▲	▲ Profit	Opportunity (products and services, energy)	Long-term	• Creating new services that contribute to carbon neutrality • Increase in green electricity retail	• Provision of remote work-related services, development of a recycling platform for recyclable resources, etc.
Achieve the IOWN concept	▲▲	▲	Opportunity (investment toward R&D)	Long-term	• Acceleration of DX and promotion of the remote world • Reduction of greenhouse gases across the entire supply chain	• Promotion of co-creation to achieve the IOWN concept as part of efforts to promote innovations that break through limits
Disasters associated with heavy rain and typhoons	—	▼	Physical risk (acute)	Short-term	• Provision of disaster response and disaster prevention training	• Enhancement of disaster-resistant, highly reliable, safe, and secure ICT services (vulnerability assessment and redundancy assurance/ enhancement, etc.)
Increased air-conditioning costs due to increasing temperatures	—	▼	Physical risk (chronic)	Long-term	• Promoting energy conservation	• Reduction of electricity used for air-conditioning through expansion of SmartDASH® and introduction of HMDC, etc., and promotion of the IOWN concept

Notes:
- Referenced scenarios: Transition – IEA World Energy Outlook 2021, Physical risk – IPCC Sixth Assessment Report, Climate Change 2021: The Physical Science Basis, The Summary for Policymakers (SPM)
- The degree of impact with the 1.5°C and 4°C scenarios is in FY2030.
- Timeframes refer to the short term (less than 3 years), medium-term (3–6 years), and long-term (6 years or more). The degree of impact is expressed in 3 levels (▲: Low, ▲▲: medium, and ▲▲▲: high).

Priority Activities

Development of a Closed-loop Society

Our Approach

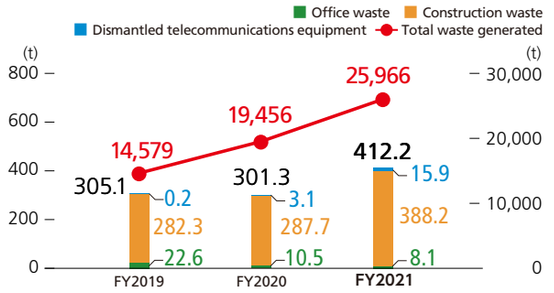
To contribute to the realization of a recycling-oriented society, the NTT Communications Group promotes the reduction and reuse of waste and improving recycling rates while building business models with low environmental impact. Waste and resource recycling is a rising public concern, and to fulfill our social responsibility, we organized working groups in the three areas of dismantled telecommunications equipment, construction waste, and office waste. In cooperation with other NTT Group companies, we are thoroughly implementing the 3Rs (reduce, reuse, and recycle) and promoting plastic recycling. We are committed to a greener future with the lowest possible landfill rate and most effective use of resources through proper waste management and promotion of reusing and recycling in our business activities.

Main Achievements in Fiscal 2021 and Goals for the Coming Years

In fiscal 2021, the landfill waste from dismantled telecommunications equipment amounted to 15.9 tonnes, construction waste to 388.2 tonnes, and office waste to 8.1 tonnes. The total volume of landfill waste increased by 110.9 tonnes, compared to the previous fiscal year, to 412.2 tonnes, while the total volume of waste generated increased by 6,510 tonnes to 25,966 tonnes due to increased construction work for disposing of concrete blocks, as in fiscal 2020. The landfill rate to total waste was 1.59%, a slight increase from the previous year (1.55%).

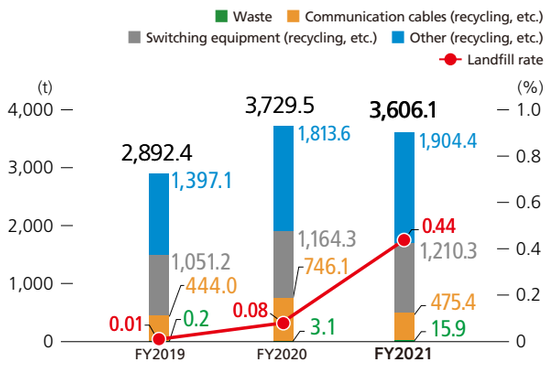
Going forward, we will shift to managing the recycling rate from the conventional landfill rate as part of our efforts to create a recycling-oriented society and ensure that the 3Rs are thoroughly implemented in our business activities.

[Landfill Waste and Total Waste Generated]



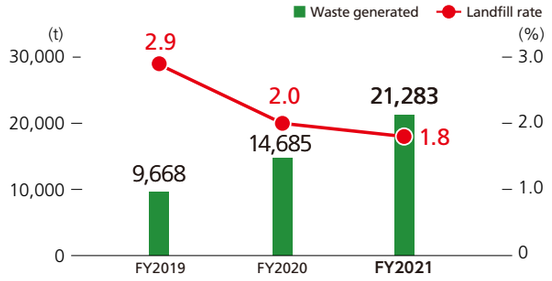
Scope: NTT Communications Corporation and 14 Group companies

[Total Volume and Landfill Rate of Dismantled Telecommunications Equipment]



Scope: NTT Communications Corporation and 14 Group companies

[Construction Waste Generation and Landfill Rate]



Scope: NTT Communications Corporation and 14 Group companies

Building Business Models with Low Environmental Impact

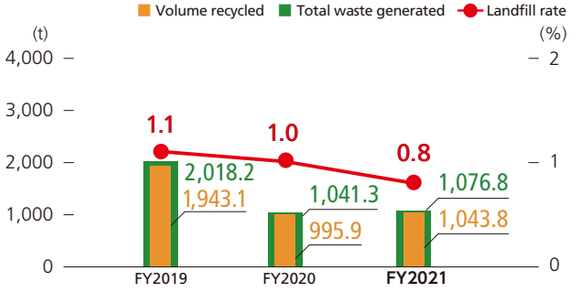
Effectively Using Water Resources

Water resources are indispensable for the survival of all living things, including humans, but the increasing world population and economic development have led to concerns over water shortages and pollution. We are striving to use water resources more effectively by recycling and reusing air-conditioning and cooling water in our data centers and switching to water-saving toilets in our major office buildings. We are also developing a water demand prediction system, as part of a social infrastructure that utilizes ICT, to contribute to addressing social issues related to water resources. The total water resource input (excluding data centers) for fiscal 2021 was 230,000 m³.

Initiatives to Improve the Landfill 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 rates. In selecting waste processors, we seek to ensure proper disposal and improve the recycling rate by screening candidates based on our criteria and consigning work to businesses that meet the qualifications. As a result, the landfill rate of office waste, which was 6.1% in fiscal 2013, has been reduced to 0.8%, as of fiscal 2021.

[Total Office Waste and Landfill Rate]



Scope: NTT Communications Corporation and 14 Group companies

Promoting the Reuse of Fixed Assets

From the perspective of promoting the efficient operation and reuse of fixed assets across the Company, including small assets and equipment, we are matching organizations that need assets with those that do not. Thanks in part to this effort, in fiscal 2021 we reused 119 items of dismantled equipment and 6,537 units of equipment and packages overall. In fiscal 2022, we will continue to promote the reuse of fixed assets and strive to reduce the amount of waste we generate.

Unfortunately, no optical cable was reused in fiscal 2021.

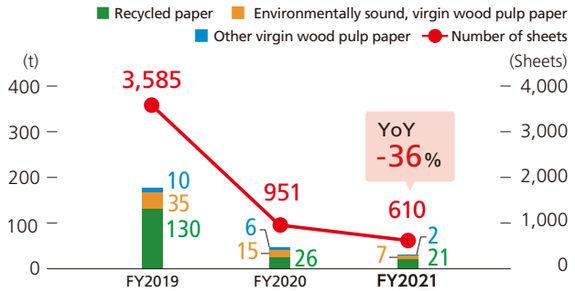
Thorough Implementation of the 3Rs in Office Buildings

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. Since then, we have been working to raise awareness among employees through various efforts such as curbing the use of paper and increasing the rate of double-sided printing by using printing log data from IC card multifunction printers, and collecting the initiative status data per individual and section and disclosing it to all employees on a monthly basis.

In fiscal 2021, we made significant progress in digitizing paper documents as part of our initiatives to promote remote work and work-life balance, resulting in 610 sheets of paper used per full-time employee (converted to A4-size office paper), a substantial decrease from fiscal 2019 (3,585 sheets).

[Total and Per-employee Office Paper Use]



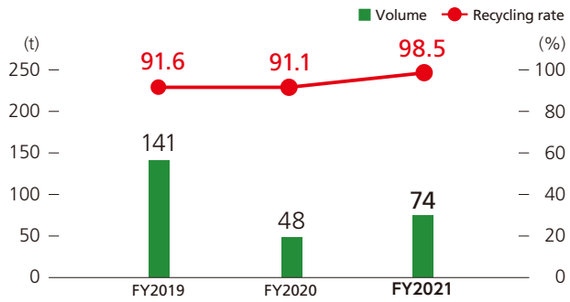
Scope: NTT Communications Corporation and 14 Group companies

Response to Plastics Pollution

Concern has been growing around the world over plastic waste, including the pollution of marine environments. NTT Communications upholds the implementation of closed-loop recycling as a CSR Priority and is working on reducing and promoting the recycling of plastic waste.

In fiscal 2021, although the volume of plastic waste generated increased due in part to the disposal of fixtures following office relocations, the rate of plastic recycling improved significantly. We will continue addressing plastic pollution through our business activities.

[Volume of Plastic Waste and Office Recycling Rate]



Scope: NTT Communications Corporation and 14 Group companies

Developing a New Recycling Scheme for Subsea Cables

While the typical length of subsea cables laid in Japan's territorial waters is 20 to 30 km per cable, the cable managed by NTT Communications connecting Kagoshima and Okinawa prefectures is approximately 260 km long, passing through many islands along the way. When the cable went out of service in 2018, approximately 850 tonnes of waste was expected to be generated, raising major issues in terms of environmental impact and disposal costs.

To address these issues, NTT Communications signed an agreement with South Africa's Mertech Marine, the only company in the world with the technology to recycle subsea cables to the level of raw materials, to develop a new scheme to recycle 99% of subsea cables to reduce both environmental impact and disposal costs. Additionally, the scheme is contributing to creating regional safety nets by actively employing unskilled workers at the recycling plant in South Africa through Mertech Marine, and donating 30% of the profits from this recycling initiative to charitable organizations that support the education of impoverished families in Africa and the Middle East.

Co-existing with Nature

Primary Concept

As advocated in the SDGs, the UN Decade for Ecosystem Recovery covering 2021 to 2030, and the Post-2020 Global Biodiversity framework with new global goals* which is currently under negotiation, there has been much discussion in recent years about the importance of biodiversity conservation and co-existence with nature, as well as the prevention of global warming, as key environmental issues for the realization of a sustainable society.

We place a high priority on conservation of biodiversity throughout our business operations, from the construction of facilities to their operation and dismantling, in addition to promoting preservation by inspecting the progress of initiatives, identifying problems, and making improvements. Moreover, we are implementing multifaceted environmental initiatives, including participation in local conservation efforts and the dissemination of information.

We have set “Planning a Future of Natural Harmony” as part of our environmental declaration and established the Biodiversity Action Plan. Going forward, we will continue to engage in Groupwide activities that are in line with this plan.

*Goal 14 Life Below Water, Goal 15 Life On Land

Biodiversity Action Plan

1. Basic Policy

- **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 2021 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 sound Green Building*, established by the NTT Group in addition to ongoing initiatives that leverage the features of ICT enterprises. We contributed to resolving environmental issues through our businesses, disseminated information, and raised awareness through the provision of ICT solutions for sustainable agriculture for increasing the number of wild ibis, and the provision of the “goo Green Label” on the “goo” web portal (users can participate in donating to environmental groups by setting their browser start page to the “goo Green Label” homepage).

In fiscal 2022, 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.

Promoting Biodiversity Conservation Initiatives

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.

Considerations for Building Construction

Biodiversity-conscious Guidelines

When constructing new buildings such as data centers, we strive to understand the historical, social, geographical, and biological environment characteristics of the building site and its surrounding areas in accordance with the NTT Group's Green Design Guidelines for Buildings, and we reflect that understanding into our designs insofar as possible. Along with these considerations, we ensure that construction is completed with consideration for minimal noise and vibration and with attention to community beautification during the work. Furthermore, our outdoor air-conditioning units and emergency power generators are designed to generate exhaust heat and noise levels that do not adversely affect the community.

For more information on the NTT Group's Green Design Guidelines for Buildings, see:
https://group.ntt/en/design/

Local Landscaping and Greening

We believe biodiversity should be considered in facility design toward contributing to local greenery in our surroundings. At the Tokyo No. 6 Data Center, one of the largest of such facilities in Tokyo, we have been working closely with the community to promote greening activities by applying a subsidy from the Tokyo Metropolitan Park Association's Urban Green Fund. The green spaces at the site have been divided 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.

Considerations for the Impact of Laying 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, we duly consider shallow areas for preserving marine environments and generally exclude coral reefs and other inhabited areas when designing cable routes, insofar as possible, or transplanting them outside the cable-laying area. 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 it 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 thus has 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.

Considerations for 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, so we emphasize consideration for biodiversity in their operations.

As of March 31, 2021, 8 of our 42 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.

[Watching the migration of Chinese sparrow hawks]

Contributing to Ecosystem Conservation Using ICT

Providing ICT Solutions for Sustainable Agriculture and Bringing Back the Crested Ibis

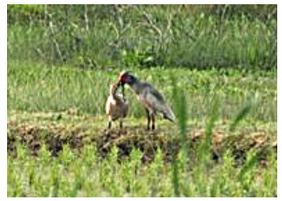
Since April 2022, we have been conducting a demonstration experiment in Niigata Prefecture's Sado City, a site designated as a Globally Important Agricultural Heritage System, to promote rice farming in rice terraces with reduced or no pesticides and chemical fertilizers by utilizing and verifying aerial drone photography, paddy weeding robots, and ICT-based advanced water management systems.

While Sado City's population of farmers is rapidly aging, and the use of agricultural chemicals and chemical fertilizers is increasing to improve agricultural productivity, one major challenge has been to preserve the ecosystem and live in harmony with wildlife, including the Japanese crested Ibis, designated as a special national treasure in Japan. To address this issue, we have introduced various agricultural ICT solutions applicable to rice terrace regions that will reduce costs and labor while increasing profits, thereby promoting farming with reduced or no agricultural chemicals and chemical fertilizers. By promoting and expanding farming practices that use less agricultural chemicals, we will help attract more wildlife to the rice terraces as well as more people to the region.

Note: This demonstration has been adopted by the Smart Agriculture Production Area Development Demonstration of the National Agriculture and Food Research Organization.

[Paddy weeding robot equipped with AI image recognition]

[Japanese crested ibis living in Sado City]



"goo Green Label" Activities

The "goo Green Label" portal is an initiative for donating a portion of the profits generated through the 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. Since its inception in August 2007, donations totaling 59.40 million yen have been made mostly to NPOs engaged in global environmental protection activities.

In fiscal 2021, we donated 610,000 yen to the Nature Conservation Society of Japan, our 23rd contribution from this program. The donation will be used to protect and preserve Japan's beautiful nature for future generations, such as activities to protect the sea and sandy beaches, and to preserve biodiversity in Satoyama landscapes.

We will strive to maintain the "goo Green Label" as an easy way for more users to contribute to society.

Prevention of Environmental Pollution

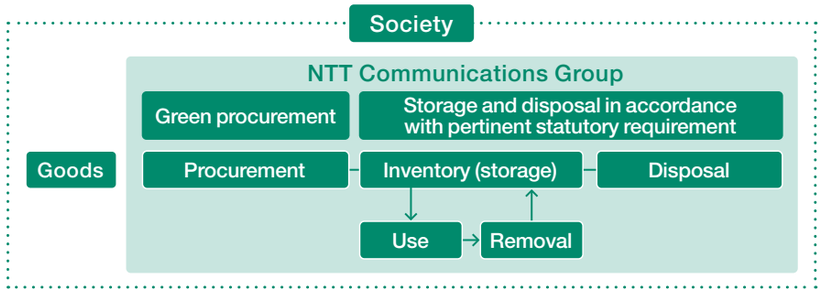
Primary Concept

Everyday production and consumption generating emissions and waste and increasing environmental pollution has long been a social issue.

We are working to reduce emissions and waste generated from our business activities and properly manage and dispose of hazardous substances to prevent environmental pollution and create a safe and secure social environment. In addition, we are seeking to minimize environmental risks associated with business activities, such as pollution and leaks of hazardous substances, by formulating guidelines for introducing low-emission vehicles, improving equipment and operations, bolstering management, and conducting thorough inventories.

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. In addition, we are striving to reduce the environmental impact of our supply chain by, for example, urging suppliers to reduce and thoroughly manage the use of hazardous materials based on our Green Procurement Standards.

[Prevention of Environmental Pollution at Each Business Stage]



Main Achievements in Fiscal 2021 and Goals for the Coming Years

We established our policy and set a target for having electric vehicles account for 100% of the corporate fleet by fiscal 2030. In practice, we reviewed the number of sales vehicles owned and promoted eco-driving to reduce the fuel consumption of Company vehicles across the Group.

In fiscal 2021, we continued to introduce EVs, and with the expansion of remote sales activities, we successfully achieved year-on-year reductions in the number of vehicles by 11%, CO_2 emissions from Company vehicles by 44%, and NOx and SOx emissions by 31% and 32%, respectively. We will continue to review the number of vehicles owned and promote the use of EVs.

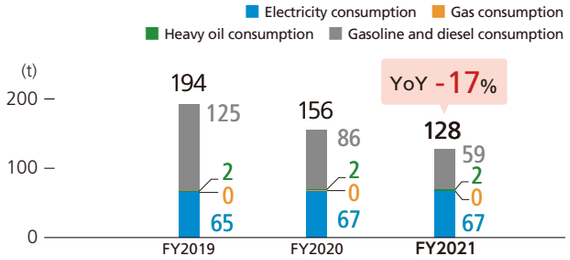
Initiatives to Address Environmental Pollutants

Preventing Air Pollution

Our business activities produce NOx and SOx emissions, which cause air pollution. Of the total NOx emissions, about half (52%) comes from electric power generation at communications buildings and other facilities, while the remaining half is generated by the use of gasoline and diesel in our operational vehicles. As for SOx, the majority (89%) is emitted during the generation of electricity that we use.

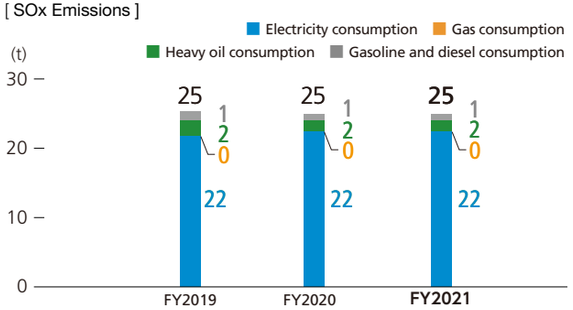
In fiscal 2021, NOx and SOx emissions were 128 tonnes (year-on-year decrease of 17%) and 25 tonnes (year-on-year decrease of 1%), respectively, as a result of a decline in the operation of commercial vehicles. We will continue to review our vehicle fleet numbers and promote the use of EVs toward contributing to the mitigation of global warming and prevention of air pollution.

[NOx Emissions]



Scope: NTT Communications Corporation and 14 Group companies

[SOx Emissions]



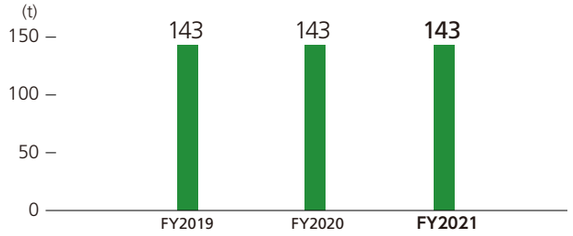
Scope: NTT Communications Corporation and 14 Group companies

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 2021 was approximately 143 tonnes, unchanged from the previous fiscal year.

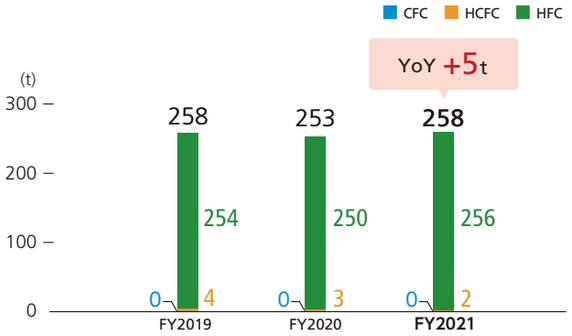
Meanwhile, the volume of specified chlorofluorocarbons (CFCs) used in our air-conditioning equipment in fiscal 2021 increased by around 5 tonnes from the preceding fiscal year to approximately 258 tonnes.

[Volume of Specified Halons Used in Fire-extinguishing Equipment]



Scope: NTT Communications Corporation and 14 Group companies

[Volume of Specified CFCs Used in Air-conditioning Systems]



Scope: NTT Communications Corporation and 14 Group companies

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, as revised in September 2006. In fiscal 2019, we conducted a survey targeting four buildings and confirmed that airborne emissions were below the statutory limit at all of the buildings subject to legal compliance.

We are currently removing asbestos from one of these buildings where it is possible. Looking ahead, 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.

Storage and Management of PCBs

NTT Communications appropriately manages devices that contain polychlorinated biphenyls (PCBs). 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.

Since fiscal 2021, we have been detoxifying equipment found to contain any PCBs based on the PCB inspection survey conducted in fiscal 2020.

[Number of Transformers Stored]

	FY2019	FY2020	FY2021
Number of Transformers Stored	0	6	0

Scope: NTT Communications Corporation and 14 Group companies

[Number of Capacitors Stored]

		FY2019	FY2020	FY2021
Number of Capacitors Stored	High-voltage capacitors	0	0	0
	Low-voltage capacitors	0	2	12

Scope: NTT Communications Corporation and 14 Group companies

[Number of Electric Ballasts Stored]

	FY2019	FY2020	FY2021
Number of Electric Ballasts Stored	123	363	276

Scope: NTT Communications Corporation and 14 Group companies

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 2021.

Transport, Import, and Export of Toxic Waste

We handle PCBs in accordance with the Act on Special Measures concerning Promotion of Proper Treatment of PCB Wastes and the PCB Waste Collection and Transport Guidelines issued by the Ministry of the Environment.