

An aerial, top-down view of a vibrant, stylized cityscape. The scene is composed of various geometric shapes in shades of blue, orange, and white, interspersed with green trees and small human figures. The figures are engaged in various activities: some are walking, some are on bicycles, and one is in a wheelchair. The overall aesthetic is clean, modern, and optimistic, representing a sustainable and inclusive urban environment.

# NTT Group Sustainability Report 2022



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## Editorial Policy

The composition of this Data Book closely corresponds with items in the NTT Group Sustainability Priority Activities in order to report comprehensively and in an easy to understand manner to stakeholders, including investors who value ESG. While the report covers the status of the NTT Group overall as much as possible, the scope of data is clearly noted when it is limited to a part of the Group.

For detailed information on the business strategies of NTT (hereinafter “the Company”) and operations, please refer to Annual Report 2022. For details on ongoing efforts related to sustainability and achievements at NTT Group companies, please refer to the Sustainability Report published separately by each company.

■ **NTT IR Site**  
<https://group.ntt/en/ir/>

■ **NTT Group Sustainability Site**  
<https://group.ntt/en/csr/>

**Reporting Period** April 1, 2021 to March 31, 2022 Certain activities implemented after March 31, 2022 and the outlook for the future are also included.

**Publication Date** November 23, 2021 (Previous report: December 2021; Next report (tentative): October 2023)

**Decision Making Process for Published Content** To determine the content requirements for the publication, the Board of Directors discussed sustainability and other basic policies in April 2022, and then the representative director and senior executive vice president acted on their authority under the organizational rules to confirm and approve the content.

**Reference Guidelines**

- GRI Sustainability Reporting Standards 2016/2018/2019
- Environmental Reporting Guidelines 2018, Japan Ministry of the Environment
- ISO 26000: Guidance on Social Responsibility

**Legend**

- Nippon Telegraph and Telephone Corporation is abbreviated as NTT, Nippon Telegraph and Telephone East Corporation as NTT East, and Nippon Telegraph and Telephone West Corporation as NTT West. Some group companies of the NTT Group are defined with “エヌ・テイ・テイ” for registration purposes, but in general use the NTT notation. In principle, notations for status of incorporation have been omitted from the names of NTT Group companies.
- Figures in the numerical tables have been rounded and therefore may not necessarily add up to the total figures.
- The names of companies, products and services are the registered trademarks or trademarks of each company.

**Third-Party Assurance** The NTT Group obtained third-party assurance from Sustainability Accounting Co., Ltd. with regard to indicators for the fiscal 2021 results of “Improving prosperity for all people and cultures” and “Maximizing well-being for all,” and for the indicators of CO<sub>2</sub> emission volumes (Scopes 1, 2, and 3), waste disposal volumes, and water intake (clean water) within the fiscal 2021 results of “Ensuring the positive coexisting of nature and humanity,” from the NTT Group CSR Priority Activities. (See page 170)

## Scope of Disclosure

The Data Book covers the NTT Group in its entirety. The scope of reporting for some sections are as follows.

**[A] Main companies:** NTT, NTT East, NTT West, NTT Communications, NTT DOCOMO, NTT DATA, NTT Facilities, NTT COMWARE, NTT Urban Solutions

**[B] Domestic Group companies: 282**

**[C] Domestic and overseas Group companies: 964**

**[D] Main companies + operating companies**

<Operating companies: 10> NTT East Group, 6 companies  
 (NTT EAST-HOKKAIDO, NTT EAST-TOHOKU, NTT EAST-KANSHINETSU, NTT EAST-MINAMIKANTO, NTT EAST SERVICE, NTT-ME),  
 NTT West Group, 4 companies  
 (NTT MARKETING ACT, NTT BUSINESS SOLUTIONS, NTT FIELDTECHNO, NTT BUSINESS ASSOCIE WEST)

**[E] Companies subject to NTT Group plans to double the number of female managers**

<[D] + the companies below: 23> NTT Urban Development, NTT FINANCE, NTT BUSINESS ASSOCIE, NTT BUSINESS ASSOCIE EAST, NTT Electronics, NTT Advanced Technology, NTT LOGISCO, NTT ADVERTISING, NTT TechnoCross, InfoCom Research, NTT LEARNING SYSTEMS, NTT TRAVEL SERVICE, NTT CLARUTY

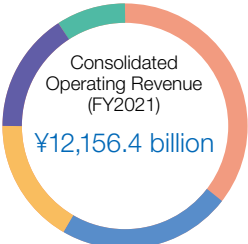
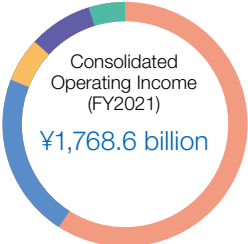
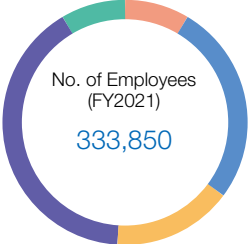
Note: Unless specifically stated otherwise, the scope of environmental performance statistics refers to domestic companies.

## Inquiries

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 TEL: 03-6838-5560 <https://group.ntt/en/csr/contact/>

# At a Glance NTT Group

The experience and advanced technologies developed by the NTT Group will be used to achieve a “paraconsistent”<sup>\*</sup> society, and contribute to resolving social issues faced by society as a whole.  
 (\*Where opposing concepts or matters are both achieved inclusively)

		Consolidated Operating Revenue Ratio (FY2021)	Consolidated Operating Income Ratio (FY2021)
 <p>Consolidated Operating Revenue (FY2021) ¥12,156.4 billion</p>	<p><b>Integrated ICT Business</b></p> <p>In addition to promoting sales of 5G services and “docomo Hikari,” etc., for corporate business, we promoted initiatives for “docomo Business,” a corporate business brand unifying NTT DOCOMO, NTT Communications, and NTT Comware, to support all corporate customers with one-stop service. In the smart life area, we are advancing collaboration with various businesses and worked to provide new added value.</p>	<p><b>41.7%</b> (¥5,870.2 billion)</p>	<p><b>59.7%</b> (¥1,072.5 billion)</p>
 <p>Consolidated Operating Income (FY2021) ¥1,768.6 billion</p>	<p><b>Regional communications</b></p> <p>Centered on the Hikari Collaboration Model provides wholesale fiber-optic access services to various service providers, and also strengthening the solutions business with the aim of revitalizing local communities and regional economies.</p>	<p><b>22.8%</b> (¥3,207.6 billion)</p>	<p><b>24.5%</b> (¥440.0 billion)</p>
 <p>No. of Employees (FY2021) 333,850</p>	<p><b>Global Solutions Business</b></p> <p>In the Global Solutions business, we worked to enhance our ability to provide services in growth areas, including the data center business and managed services, as well as expanding and providing various IT services in a reliable manner, such as digitization proposals and system integration in response to market changes.</p>	<p><b>25.7%</b> (¥3,615.2 billion)</p>	<p><b>11.7%</b> (¥210.5 billion)</p>
	<p><b>Others (Real Estate, Energy and Others)</b></p> <p>Provides services related to the real estate business, energy business, and other businesses.</p>	<p><b>9.9%</b> (¥1,396.0 billion)</p>	<p><b>4.0%</b> (¥72.5 billion)</p>

<sup>\*</sup> The percentage of each segment's simple total (including inter-segment transactions)

List of Memberships (as of November 2022) Keidanren (Japan Business Federation, general incorporated association; vice chair) Tokyo Employers' Association (honorary chairman, deputy chairman, president) Telecommunications Carriers Association (incorporated association; chairman, director) ITU Association of Japan (general incorporated association; director, council member, advisor) Association of Radio Industries and Businesses (general incorporated association; director, member of the management adviser) ICT Ecology Guideline Council Telecommunication Technology Committee (incorporated association; vice chairman)

# NTT Group's Roots

NTT Group has continued to develop a range of solutions as a partner that enables society and industry to move ahead.

It was some 70 years ago that the telephone and telegraph services provided by the Ministry of Communications and Ministry of Telecommunications were handed over to Nippon Telegraph and Telephone Public Corporation. With economic growth booming following the country's post-war recovery, the company began exploring a range of avenues to meet growing public demand for telephone services that connect in an instant.

After subsequently undergoing a name-change to NTT, the company expanded its businesses including the regional communications, long-distance and international communications, mobile communications, and global data communications sectors, based on its roots that aim to respond to the needs of customers and challenges faced by industry and society.

Focused on creating a better future for Japan and the world... Never losing sight of the goal as "Your Value Partner."

## Privatized in 1985.

### Our Dynamic Loop – The Heart of NTT

The single continuous curve represents the dynamism and our commitment for continuous innovation and delivering value to people and society.



A small inner loop at the top of the mark ensures that the voice of customers and society is always heard. This symbol represents NTT's vision and its commitment to developing a harmonious society through both business and cooperation.

## NTT Group's History

# NTT has contributed to lifestyles of people through its business activities.

Ever since being established as the Nippon Telegraph and Telephone Public Corporation in 1952, the NTT Group has developed a wide range of technologies and services, and has been delivering infrastructure for services like mobile phones, internet and cloud computing that could never have been imagined in the past. At the heart of these achievements is NTT's underlying commitment to working as a partner that supports society and industry as a whole.

### 1952

"Nippon Telegraph and Telephone Public Corporation" established



In 1952, the telephone and telegraph services delivered by the Ministry of Communications and Ministry of Telecommunications were handed over to Nippon Telegraph and Telephone Public Corporation. The company developed various technologies to meet growing public demand for telephone services that connect in an instant.

### 1980s

NTT Group born from telecommunications liberalization

Nippon Telegraph and Telephone Public Corporation was privatized in 1985 following liberalization of telecommunications services, resulting in the birth of "Nippon Telegraph and Telephone Corporation (NTT)."



#### 1987

Mobile telephone services Launched

#### 1988

NTT Data established  
World's first ISDN service Launched

### 1990s

Expanded telephone services with view of building an advanced telecommunications society



Phone services with a broad range of plans to suit customer usage scenarios were launched. The Open Computer Network (OCN) was launched with the view of expanding Internet use.

#### 1991

NTT DOCOMO established

#### 1996

OCN internet connection services launched

#### 1998

i-mode services launched

#### 1999

NTT Group transitioned to holding company structure

### 2000s

Full-scale roll-out of broadband ubiquitous services

NTT began offering the FLET'S ISDN always-on service as well as the B FLET'S optical fiber service, facilitating the widespread roll-out of high-speed, high-capacity communication services.



#### 2007

Hikari TV services Launched

#### 2008

Cloud services launched

#### 2009

Android OS smartphones Launched

#### 2000

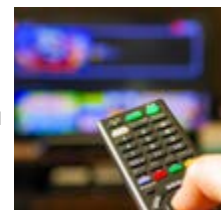
ISDN flat-rate services launched

#### 2001

Optical fiber services launched for general households

#### 2004

Osaifu-Keitai (Mobile Wallet) announced Hikari Denwa services launched



### 2010s

Global ICT services framework developed

NTT Group had primarily been operating in markets in Asia, Europe, and the US, and acquired Dimension Data and Keane in preparation for delivering total ICT services around the globe, including Australia, South America, Africa, and the Middle East.



#### 2010

Acquired Dimension Data  
LTE (Xi) services launched  
Acquired Keane (currently NTT DATA, Inc.)

#### 2013

iPhone launched

#### 2014

"Kake-hodai & Pake-Aeru" phone plans launched  
"Hikari Collaboration Model" launched  
"docomo Hikari" launched

#### 2016

Acquired Dell Services (currently NTT DATA, Inc.)

#### 2018

"Your Value Partner 2025" medium-term management strategy formulated

### 2020s

IOWN concept released

Framework involving devices, networks and information processing infrastructure built on optical and other innovative technologies, to deliver high-speed and high-capacity communications, and vast computing resources exceeding the limits of existing infrastructure. Specifications are planned to be finalized by 2024 for a 2030 roll-out.



#### 2020

5G services launched from March 25  
Communication speeds up to 4.1 Gbps downstream

#### 2021

Provided support for the Olympic and Paralympic Games Tokyo 2020 as a Gold Partner 2021 Green Innovation toward 2040 announced A new management style unveiled



# message

CEO Message



**Akira Shimada**

President and Chief Executive Officer,  
Representative Member of the Board

## NTT's Vision of a Sustainable Society

The NTT Group established its Global Sustainability Charter in Autumn when it restructured its medium-term management strategy. This new Charter encompasses three key themes.

**(1) Ensuring the positive coexistence of nature and humanity:**

Aiming to solve environmental issues as well as achieve economic growth

**(2) Improving prosperity for all people and cultures:**

Accepting diverse, inclusive cultures while aiming to build a better society and create value

**(3) Maximizing well-being for all:**

We aim to maximize the well-being of everyone by respecting human rights and encouraging diversity and inclusion.

Nine challenges and thirty business activities have been established under these three themes, to be implemented alongside business operations as part of our goal to achieve a sustainable society.

We have also developed a structured approach for our environmental vision, management style, and human rights policy based on this new Sustainability Charter.

## Three themes the NTT Group is pursuing

We will be continuing our efforts toward transformation undertaken thus far, while also creating a path forward by responding to changes, or, at times, pre-empting changes and transforming ourselves, in line with the NTT Group Global Sustainability Charter. To ensure that we continue to be a company that is chosen by our customers, we need to raise the quality of our products and services. We will be pursuing the following three initiatives to ensure that the NTT Group delivers new experiences and value to our customers.

The first of these initiatives is to create better customer experiences (CX) through improved employee experiences (EX). We will be taking the sense of excitement felt by each of our employees and using it as a source of inspiration for “creating new value, experiences, and excitement for our customers (meaning CX).”

From April 2023, we will be rolling out a new and revised specialization-based personnel compensation system for the main companies of the NTT Group. The source of motivation for creating new value for our customers is the potential of employees. This revision will help to inspire each and every employee to further increase their specializations and acquire, or maximize their skills, as part of our efforts to create added value across a broad range of fields.

I want to harness the potential of our employees to generate new value, and provide customers with a new sense of excitement.

The second initiative is to decarbonize through technology. The decarbonization of society is a matter of urgency. I believe it is the mission of those of us living in the present to ensure that our descendants can live sustainably on the planet. The NTT Group has set a goal of achieving carbon neutrality by 2040. In order to realize this goal we are working to drastically reduce our power consumption through the promotion of Innovative Optical & Wireless Networks (IOWN), and to develop and expand our use of renewable energy. An example is Green 5G provided by DOCOMO provided as part of its service aimed at achieving carbon neutrality. Initiatives like these illustrate just some of the ways that the NTT Group is helping to alleviate the impact that society as a whole has on the environment.

The third initiative is to maintain connectivity with infrastructure and critical IT systems even in the event of major disasters. We will be making efforts to enhance our preparations for more widespread and complex large-scale disasters like an earthquake directly underneath Tokyo or the Nankai Trough off Japan's southern coastline. In addition to wired-and-wireless networks and other services, the NTT Group is also involved in numerous national projects like systems that provide connectivity for financial institutions. It goes without saying that networks and critical systems like these are the very foundation of Japan and serve as an indispensable infrastructure. Preparation is the key to staying connected. We therefore need to continue taking into consideration all the possible risks that could occur.

## Mission and ideals of the NTT Group

When considering the NTT Group five years from now, moving ahead with these three initiatives provides an opportunity to contribute to the creation of a sustainable society, and also serves as a chance for the NTT Group to generate revenue. We need to contribute to society while simultaneously delivering organizational growth. An example that illustrates this is the way NTT DATA is working to digitize valuable materials held by the Vatican Library. We have built up a business model where donations provided by those who view digital archives of valuable documents and collections serve as the funds for future archiving work. Harnessing the capabilities of IT to preserve our historical assets and culture for future generations, making them available as training material to as many people as possible around the world, is a socially significant initiative that helps to maintain digital archiving efforts and contribute to global cultural and research activities.

We will be shifting our ideals from a company that “connects communications” to a company that “connects data to create new value for people, business and society.” We will be accelerating our growth as a group that provides services to make customer businesses and lifestyle even better by utilizing a broad range of data. I am confident that we will develop various solutions through close collaboration with our partners, by applying our technology and know-how across a broad range of fields. Creating new business sectors as part of these efforts will help to expand our business base, as we aim to develop into a customer-centric company.

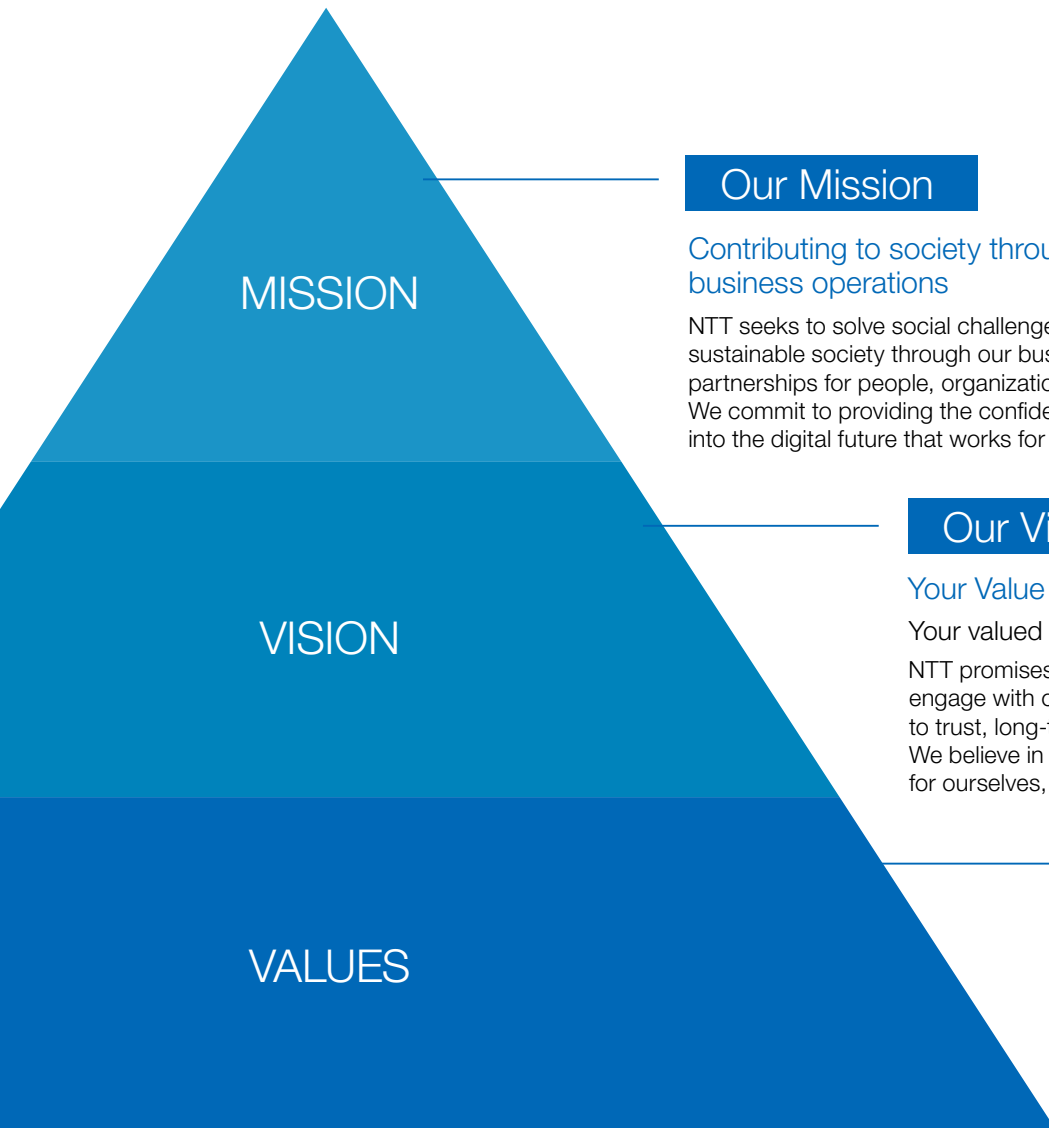
I would like to take this opportunity to ask for your continued support moving forward.



### Akira Shimada

President and Chief Executive Officer,  
Representative Member of the Board

# NTT's Mission, Vision, Values



## Our Mission

### Contributing to society through our business operations

NTT seeks to solve social challenges and create a sustainable society through our business operations and partnerships for people, organizations, and communities. We commit to providing the confidence needed to move into the digital future that works for all of us.

## Our Vision

### Your Value Partner

Your valued partner that is committed and can be trusted

NTT promises to always listen to our clients and the world at large. We engage with clients and society as a valued partner with a deep commitment to trust, long-term relationships and mutual success.

We believe in achieving transformative results through technology innovation for ourselves, our clients, and society.

## Our Values

### Connect Trust Integrity

Our shared values informs all our decision making

NTT's values are based on trust, integrity, and connecting. We always act with a moral and ethical code across our trusted relationships with clients, employees, partners, and society. We are a trustworthy company that believes in the value of diversity and inclusion in our people and the world.

## We are NTT.

NTT will continue to innovate through imagination and by challenging ourselves.

We always listen to our clients, employees, and the world at large. NTT's culture is based on our core belief of responding to the needs of our clients and society to help achieve their best future possible. This is NTT's vision and its commitment to developing a harmonious society through both business and co-operation.

# What Exactly is “Our Vision for a Sustainable Society”

## NTT’s Vision of a Sustainable Society



Global versus Local.

Environmental versus Economic.

Today versus the Future.

Many seemingly contradictory ideas, perceptions, and values exist around the world.

Yet a single phenomenon can be interpreted differently depending on perspective.

Instead of focusing only on one perspective, the NTT Group will be making them all a reality.

That is the sustainable society we are setting out to achieve.

The “Self as We” concept underpins the NTT Group’s efforts to achieve this goal.

“We” live our lives supported by the connections between diverse people, things, and technologies.

The well-being of everyone throughout society is maximized by seeking our own happiness along with the happiness of others.

Being sincere in accepting of others and building connections across the entire globe will achieve a greater harmony with nature and make culture flourish.

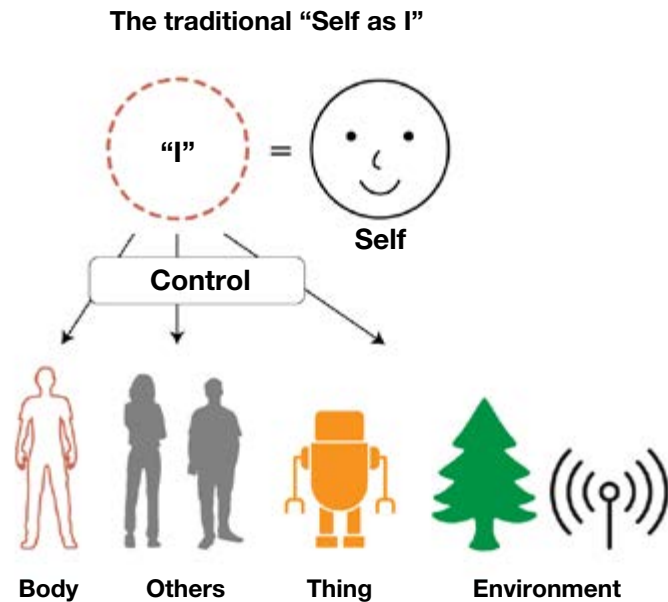
The NTT Group acts with high ethical standards in its commitment to achieving “sustainability” that helps to resolve social issues, while growing also as a company.

# The Self as We concept

Self as We is a concept where the individual 'self' is part of the whole 'We'.

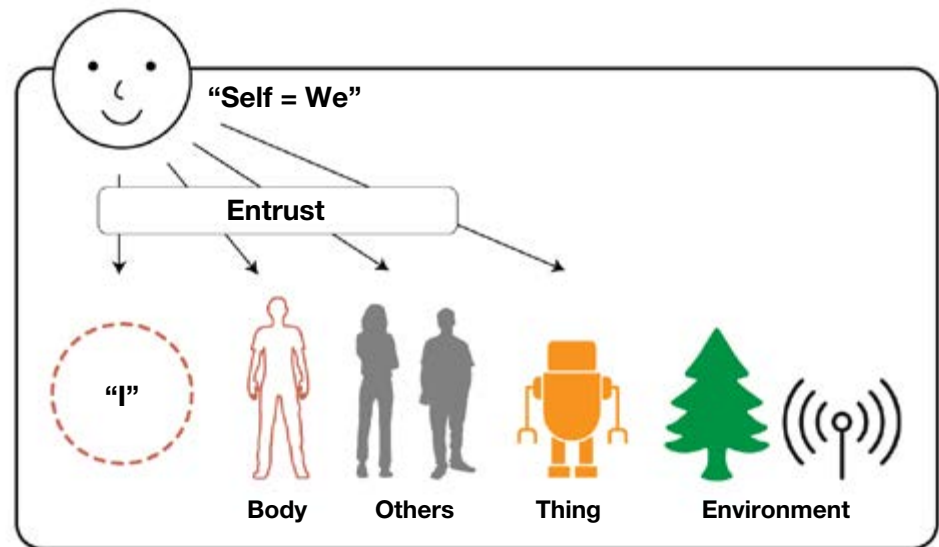
It extends beyond the individual level—it is also about making others happy at the same time, and achieving a broad range of policies backed with a sense of altruistic purpose.

## “Self as We”



“I” as an individual (self-centered, self-sustaining)  
A choice between being either active or passive

## “Self as We”



“I” as one of all the individuals (non-self-centered, non-self-sustaining)  
Collaboration with others in the same situation

# Three themes for achieving a sustainable society

To achieve the sustainable society that NTT is envisioning, we will be promoting initiatives for a “sustainable society” by achieving both “Growth as a company” and “Resolving social issues” as part of these three themes, by driving ahead with the IOWN concept based on NTT’s high ethical standards, advanced technology and innovation.

## Ensuring the positive coexistence of nature and humanity

Moving toward a decarbonized society

A commitment to a resource-recycling future

A future where people and nature are in harmony



Ensuring the positive coexistence of nature and humanity  
Contributing to solving environmental issues as well as achieving economic growth.

## Improving prosperity for all people and cultures

Establish shared ethical standards

Prepare for a new future with the power of technology

Moving towards a safe, secure, and resilient society



Improving prosperity for all people and cultures  
Accepting diverse, democratic cultures while contributing to a better society and creating value.

## Maximizing well-being for all

Respect for human rights

Diversity & Inclusion

Creating new work style models



Maximizing well-being for all  
Contribute to maximizing the well-being of everyone by respecting human rights and encouraging diversity and inclusion.

# The three themes cover nine challenges and thirty business activities

We are actively implementing these initiatives to contribute to the development of a sustainable society.  
A broad range of sustainability indicators have been defined.

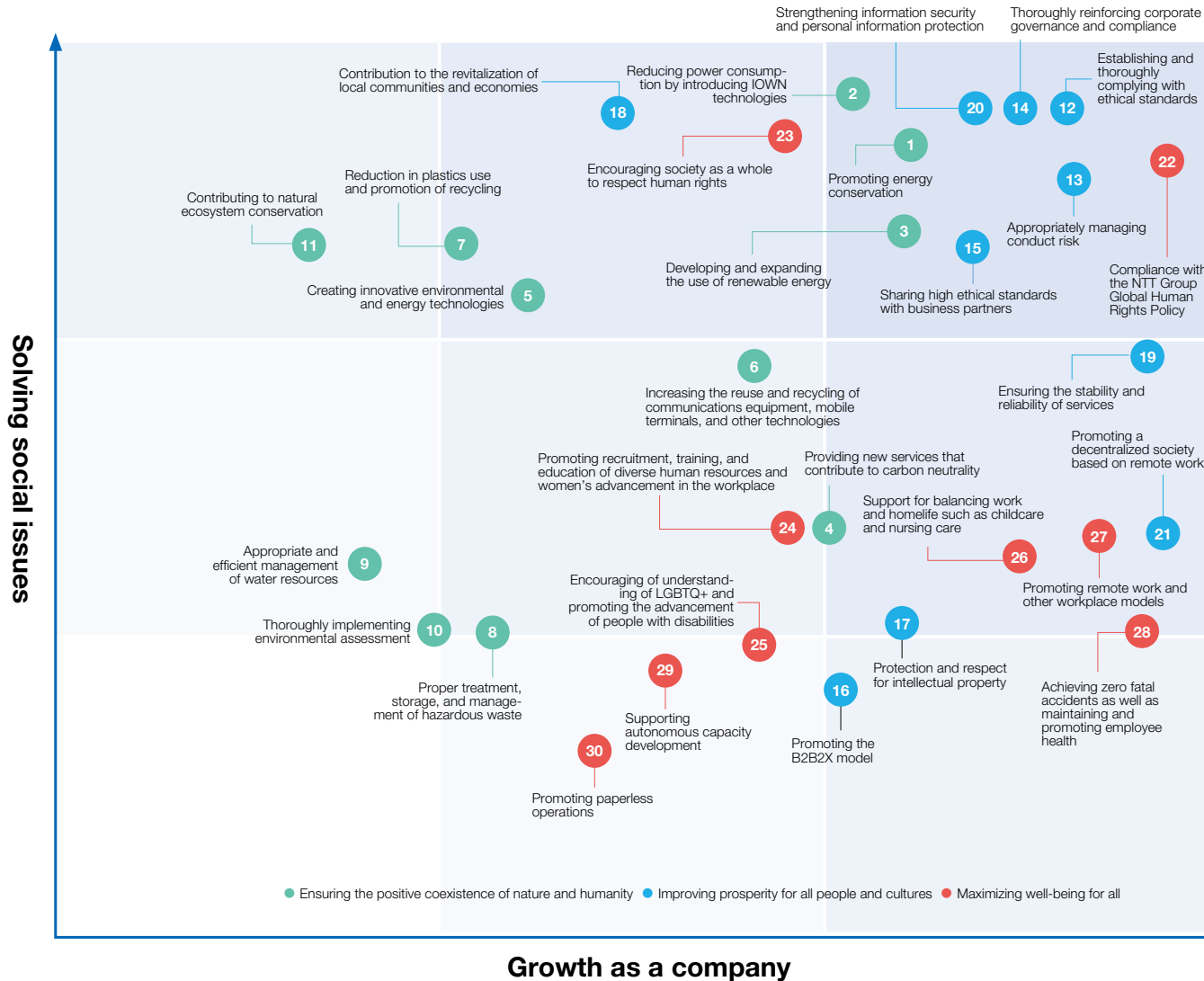
Of these, the following items have been added as key financial indicators, with compensation of members of the Board and audit & supervisory Board members linked accordingly:

- “Carbon neutrality” as an indicator for environmental issues
- “B2B2X earnings” as an indicator for resolving social issues
- “Ratio of women newly promoted to management positions” as an indicator for human rights, diversity and inclusion



# Process for Selecting Material Issues

Material issues (materiality) are selected using the following steps based on the GRI materiality standards and processes.



## STEP 1

### Identifying material issues

Using evaluation organizations like third party institutions, ISO26000 and GRI Standards, global trends, internal workshops, and materiality at other companies as a guide, we identify material issues through a comprehensive review of new problems related to sustainability, in order to discuss and select important issues that NTT should address on a global scale.



## STEP 2

### Setting priorities

NTT assesses the priorities to be addressed based on their impact on two aspects, "Growth as a company" and "Solving social issues." To achieve management that simultaneously helps resolve social issues while achieving business growth, NTT assesses priorities by incorporating the opinions of outside experts.



## STEP 3

### Confirming validity & approval

NTT also incorporates the opinions of third parties from a global perspective, which are then deliberated by the Sustainability Committee and approved by the Board of Directors.

\* These are reviewed regularly (once/year) and revised when necessary.

## Contributing to development of a sustainable society with medium-term strategies

NTT Group works together with its partners as “Your Value Partner” to resolve social issues through its business operations and respond to future changes in the operating environment, such as the advancement of digitization and DX. To guide us in this pursuit, we refined the NTT Group Medium-Term Management Strategy announced in November 2018 to accelerate our transformation into an open, global, and innovative new NTT.

### Background of the Re-Examination of the Medium-Term Management Strategy and New Strategic Frameworks Future Changes in the Operating Environment



### Directionality of NTT Group’s Transformation and New Strategic Frameworks

Social / Economic Directionality	NTT Group’s Directionality	New Strategic Frameworks	Initiatives to Achieve the Strategy
Society During COVID-19 and Post-COVID-19	A New Management Style Suitable for a Decentralized Network Society	Transformation to a New Management Style	<ul style="list-style-type: none"> <li>• New style based on remote work</li> </ul>
Advancement of Digitalization / DX	Enhance Domestic and Global Business	Enhance Domestic and Global Business	<ul style="list-style-type: none"> <li>• Growth and strengthening of the newly formed DOCOMO Group</li> <li>• Promotion of the IOWN development / rollout plan</li> <li>• Enhance competitiveness in global business</li> <li>• Promote the B2B2X model</li> <li>• Strengthening of new businesses</li> </ul>
Achieving well-being in society	Enhancement of Corporate Value through ESG Initiatives	Enhancement of Corporate Value	<ul style="list-style-type: none"> <li>• New Environmental and Energy Vision</li> <li>• Disaster countermeasures initiatives</li> <li>• Enhancement of returns to shareholders</li> </ul>

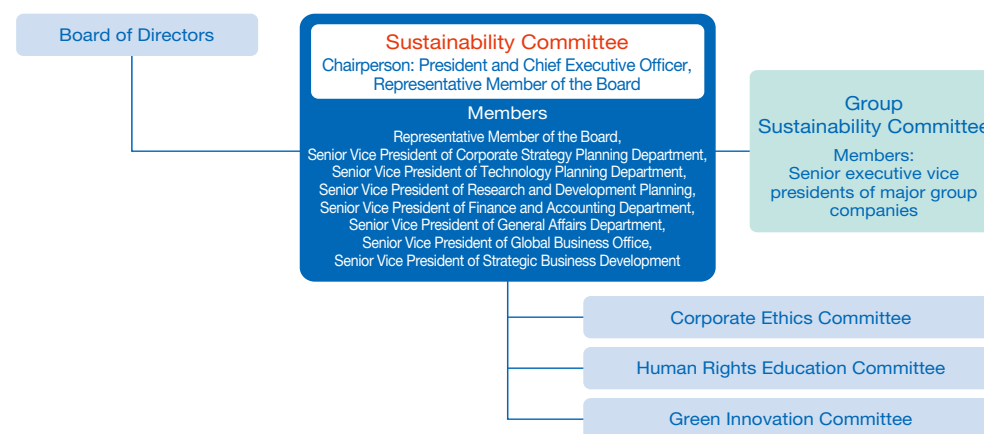
Contribute to Achieving a Sustainable Society

## Organization for Implementation

In November, the NTT Group moved to a new organizational structure by establishing the “Sustainability Committee” under the Board of Directors, chaired by the Chief Executive Officer. The committee reviews and discusses strategies concerning sustainability, the status of implementation of activities, and information disclosure, and implements relevant initiatives. The Sustainability Committee includes the Corporate Ethics Committee, Human Rights Committee, and Green Innovation Committee to handle the individual topics relevant to each sub-committee. Efforts toward sustainability throughout the entire group are also implemented by holding Group Sustainability Committee meetings (with senior executive vice presidents of major group companies). The meetings are for sharing common challenges and examples of success from each Group company, and for monitoring progress on sustainability implementation with respect to PDCA cycles and further promoting a sense of unity throughout the group.

- (1) Evaluation** The viability, effectiveness, and progress of measures are checked every year by employing the PDCA cycle to review and expand the focus of activities. Attainment levels are also linked to the evaluation standards of directors.
- (2) Disclosures** Internal conferences involving global group companies are held for reporting the results of efforts and facilitating dialogue, which are then disclosed on the website and in sustainability reports. The impact of climate change risks and revenue opportunities on business activities and revenue are disclosed in accordance with TCFD, an international framework created to develop such disclosures.
- (3) Dialogue with Third Parties** Each process involves dialogue with experts and other third parties, with a PDCA cycle used to obtain evaluations from third parties for reviewing and expanding the focus of activities as needed.

### Sustainability Promotion System (from November 10, 2021)



# Stakeholder Engagement

## The Fundamental Principle

The NTT Group provides products and services to diverse stakeholders around the world, and its value chain continues to expand globally and grow in complexity. Along with these changes, our stakeholders' needs and expectations are also becoming increasingly diverse, and we must accurately understand and reflect them in our business activities through stakeholder engagement. Stakeholder input, particularly on social and environmental issues, can help us to become more competitive and accountable while guaranteeing our public license to conduct operations in the various regions in which we conduct business. Stakeholder engagement forms the building blocks of trust-based, value-generating relationships. To properly develop these relationships, the NTT Group follows global guidelines based in part on the AA1000 Stakeholder Engagement Standard (AA1000SES) and AA1000 Account Ability Principles Standard (AA1000APS) and applies them to all of our worldwide operations. By having all Group companies apply the same principles to engaging with stakeholders, we intend to promote effective, efficient, and ultimately value-creating interactions between the NTT Group and its stakeholders. It goes without saying that all means of engagement shall be conducted according to relevant laws, regulations, and legal requirements.

### Benefits of Stakeholder Engagement

#### Benefits for the NTT Group

- Identify emerging environmental/social trends and reflect them in strategy formulation
- Identify potential risks and develop countermeasures
- More closely manage our brand reputation
- Identify opportunities for potential new businesses, collaboration, and innovation
- Improve community relations and support for operations, in particular by involving stakeholders in decisions to ensure their needs are taken into consideration
- Improve our understanding of sensitive issues and of stakeholders' opinions of us
- Make more sustainable business decisions based on stakeholder input

#### Benefits for Stakeholders

- Clearer understanding of the NTT Group strategy and projects
- provide relevant feedback in line with expectations

## Process of Stakeholder Engagement

### Step 1 Plan

#### Levels and Methods of Engagement

Level of engagement	Examples of engagement methods
Monitor	Tracking of media and one-way communications to the company
Inform	Provision of information from the company to stakeholders through letters, bulletins, websites, speeches, reports, etc., with no invitation to respond
Consult	Two-way exchange of information between the company and stakeholders through surveys, focus groups, workshops, etc., with an expectation of responses from both sides
Involve	Two-way exchange of information between the company and stakeholders, with stakeholders more actively involved in decision-making, through establishment of advisory panels or multi-stakeholder dialogues
Collaborate	Joint ventures and partnerships on specific projects

#### Potential Risks of Engagement with Specific Stakeholders

- Unwillingness to engage on the part of stakeholders
- Disruptive stakeholders
- Creation of unrealistic and unfulfillable expectations of the company on the part of stakeholders
- Inter-stakeholder conflicts and other issues could potentially result in criticism of the company and damage to the company's reputation

### Step 2 Do

While engaging with stakeholders, discussions should be held on mutual expectations regarding such engagement, and any necessary revisions to initial engagement plans should take into consideration stakeholder requests as well as the NTT Group's initial intentions.

#### Factors Requiring Consideration during Engagement

- Levels of contribution and a clear definition of participant roles
- Details of the process, including timelines and methods
- Timely provision of instructions and required materials for participation in and meaningful contribution to the engagement process
- Boundaries of disclosure of required information, including confidentiality requirements
- Communication of the results of the engagement

When holding events attended by multiple stakeholders, care must be taken to ensure balanced participation to minimize risk and maximize value.

### Step 3 Follow-up and Review

After concluding the engagement, results must be reported both internally and to participating stakeholders as well as externally to the wider public as necessary to conduct both an evaluation of the outcome of the engagement and a review of the engagement process itself and define KPIs for the assessment of results.

#### Factors that Should Be Included in Reports and Information Disclosure

- The purpose, scope, method and participants of the engagement
- A summary of content, including issues and concerns raised during the process
- NTT Group response to the outcomes of the engagement

Regarding the review of the engagement process itself, an internal review should be conducted and feedback should be sought from participating stakeholders regarding how they felt about their involvement, and a plan for improvement should be developed based on the results of these.

## Identifying Stakeholders

Our stakeholders are organizations or individuals who have an interest, in one way or another, in the business activities or decision making of the NTT Group. Major stakeholders of the NTT Group include customers (corporations and individuals), shareholders and investors, employees (employees, their families and retired employees), local communities, business partners, ICT companies and industry associations, central government and administrative agencies.

The NTT Group will fulfill its responsibilities and the expectations of its various stakeholders related to these businesses.

### Customers (Individuals and Corporations)

All customers, both corporate and individual, who use services provided by the NTT Group

NTT's Approach	Methods of Engagement (examples)	Why We Engage
As we strive to be chosen as "Your Value Partner," each individual employee will strive for an even higher awareness of sustainability to provide safe, secure services that are high in quality and convenient from the customer's standpoint.	<ul style="list-style-type: none"> <li>■ Customer information service</li> <li>■ Customer satisfaction surveys</li> <li>■ Website, social media</li> </ul>	The NTT Group endeavors to enhance customer satisfaction and become "Your Value Partner" for our customers by understanding customer needs in order to provide higher quality services and products.

### Shareholders and Investors

Individual and institutional investors including the shareholders and creditors of the NTT Group

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will return profits to shareholders while maintaining a sound financial standing and enhance our corporate value. We will also endeavor to disclose information related to the Group in a timely, appropriate, and fair manner.	<ul style="list-style-type: none"> <li>■ General Meeting of Shareholders, earnings reports</li> <li>■ Explanatory presentation for individual investors</li> <li>■ Explanatory presentation for institutional investors</li> <li>■ Annual reports</li> </ul>	We endeavor to disclose information in a timely, appropriate, and fair manner to return profits to shareholders while maintaining a sound financial standing and enhancing our corporate value.

### Employees (Employees, Their Families, and Retired Employees)

Employees who work at the NTT Group and retired employees who support the NTT Group's sustainability ideals

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will pursue various employee initiatives to create safe and healthy workplaces in which everyone can realize their full potential and be rewarded in their work and daily lives. We will also value communication with retired employees.	<ul style="list-style-type: none"> <li>■ Employee satisfaction surveys</li> <li>■ Regular interviews</li> <li>■ Dialogue between labor and management</li> <li>■ Corporate ethics helplines</li> <li>■ Hold sustainability conferences</li> </ul>	We create safe and healthy workplaces for our employees and support their daily lives so that each individual employee can realize their full potential and carry out their work with a high sense of CSR.

### Local Communities

People in local communities who are connected to us through the businesses of NTT Group companies

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will support local communities through our ICT business and operations to support society and provide disaster recovery.	<ul style="list-style-type: none"> <li>■ Support and collaboration through social contribution activities</li> <li>■ Negotiations with local residents on construction work, system development, and other activities</li> <li>■ Support through donations and sponsorships</li> </ul>	We seek to contribute to the development of a flourishing and vibrant community and to understand and identify the issues faced by local communities in order to provide social contributions and disaster countermeasures through our ICT business.

## Business Partners

Business partners who support us in various ways in providing the NTT Group's services

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will seek to work together to create and implement services that help to solve a variety of social issues.	<ul style="list-style-type: none"> <li>■ Inquiry forms</li> <li>■ Disclosure of procurement policies and guidelines</li> <li>■ Questionnaires of suppliers</li> <li>■ Briefing for suppliers</li> </ul>	By procuring products with due consideration to the environment and human rights, and by forging partnerships based on fairness, we will fulfill our social responsibilities as a company and achieve sustainable growth alongside our business partners.

## ICT Companies and Industry Associations

Other ICT companies and people in industry associations who are striving to develop Japan's information and telecommunications

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will engage in discussions on the direction and initiatives for the information and telecommunications industry, not only in Japan but from a global perspective, and seek to address diverse social issues together.	<ul style="list-style-type: none"> <li>■ Participation in industry associations and related initiatives</li> <li>■ Participation in conferences</li> </ul>	We will engage in discussions on the direction and initiatives for the information and telecommunications industry. By doing this, we will invigorate the industry and contribute to society by promoting development and progress in information and telecommunications.

## Central Government and Administrative Agencies

Central and local governments and administrative agencies that make policy decisions on information and telecommunications, employment and the economy, the environment, and other issues

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will fulfill our responsibility as an information and telecommunications company by adhering to the policies of the central government, administrative agencies, and local governments.	<ul style="list-style-type: none"> <li>■ Response to laws and regulations</li> <li>■ Policy proposals</li> <li>■ Participation in joint projects between the government and private sector</li> </ul>	We will respond to and comply with central and local government and administrative agency policies. Therefore, we will carry out business activities in an appropriate manner and contribute to resolving social issues faced by the Japanese people and local governments.

## NGOs, NPOs, and Experts

NGOs, NPOs, and experts who are positioned within the NTT Group's domain of activities including sustainability

NTT's Approach	Methods of Engagement (examples)	Why We Engage
We will contribute to creating a sustainable society by sharing the expert knowledge and experience of NGOs, NPOs, and experts, and by incorporating them into the telecommunications industry.	<ul style="list-style-type: none"> <li>■ Participation and collaboration with study groups and activities of each organization</li> <li>■ Dialogues</li> <li>■ Collaborative projects</li> </ul>	The NTT Group provides services that extend beyond telecommunications to broader domains, and gaining the specialized perspectives of NGOs, NPOs, and experts allows the Group to appropriately and effectively develop business activities.

# message

Message from Management  
(Senior Executive Vice President)



**Takashi Hiroi**

Senior Executive Vice President CFO,  
Representative Member of the Board

## Achieving a sustainable society and profit growth

When we look at the various issues that plague society these days, there are simply too many to mention—the increasingly tense global situation, circumstances related to carbon neutrality, the rapid increase in traffic and network loads due to a spike in remote operations spurred by COVID-19, and soaring oil prices to name a few. The NTT Group aims to help achieve a sustainable society by promoting its own transformation in response to the direction of society and the economy and solving various social issues through its business operations. To ensure that the NTT Group keeps on track for sustainable growth, efforts have been made to grow and strengthen the new DOCOMO Group, coupled with significant restructuring of business segments from January 2022. In May 2022, we also announced reorganization of our global businesses. We are also aiming to boost corporate value through initiatives geared for ESGs, and in November 2021 we created and announced the NTT Group Global Sustainability Charter. In order to implement these initiatives, performance indicators for officer compensation was freshly updated covering aspects like amount of greenhouse gas emissions or ratio of women in management positions. Going forward, we will be making greater effort for the disclosure of non-financial information like utilization of human capital, while also preempting trends in social values likely to undergo significant changes such as environmental issues, in an attempt to achieve more advanced disclosure.

## Achieving carbon neutrality

To reach carbon neutrality, around half of efforts to reduce energy consumption will come from increasing the efficiency of electricity usage while the other half will be from innovations based on IOWN. In addition to ongoing efforts towards energy-efficiency, we will also be rolling out measures such as switching to renewable energy sources for our power consumption. We are also looking at highlighting use cases and other benefits of IOWN with an eye toward commercialization.

## Initiatives for human capital management

Human capital development is drawing a greater level of attention throughout society every year and is an area in which we will be placing a greater focus. Strategic investment into human capital is considered a key factor underpinning “sustainability management” that aims to achieve both sustainability for society as well as corporate growth and earning power—we are planning to make improvements with a focus on the following three areas.

The first will be “linking management strategy and human resources strategy.” In October 2021, NTT unveiled its “New Management Style.” We believe that promoting diverse work styles and increasing opportunities to harness the capabilities of people from diverse backgrounds will help to achieve a more open, global and innovative business management style. We are promoting the participation of women, foreign employees and outside personnel as part of these efforts and introduced a job-based personnel system last fiscal year to encourage self-guided career formation. We are moving ahead with a shift from company-driven career development to a system that allows employees to control the development of their own careers.

The second area is gaining an understanding (visualization) of the gap between available personnel and our human resources strategy, against the business model and management strategy we are striving to achieve. We aim to disclose various types of information required in response to trends in systems, laws and policies, and in response to requests like this from society. We are also looking at spurring effective investments toward human capital, by analyzing the gap in skills between the business model or management strategy that we are striving to achieve for the future, and the currently available personnel with their skills and specializations.

We consider “visualization of human capital” as an essential step for advancing both corporate and personnel growth to create value and subsequently a more prosperous society. Looking ahead, we will be engaging in discussion to develop a clear awareness and vision for investment into human capital, with efforts including defining our expectations of personnel that match our management strategy, implementing policies to facilitate securing and training, and establishing indicators and targets for monitoring the results.

The third area is establishing a corporate culture that encourages behavioral changes among individuals throughout the organization. We want to develop a culture that respects more open, flat and flexible communications, and diverse values, that also embrace the action of taking on challenges without fear of failure. To better visualize the way this culture is instilled, the NTT Group in fiscal 2021 revamped its existing Employee Satisfaction Survey, which focused on questions related to ease of working, and added questions related to job satisfaction. Approximately 130,000 Group employees in Japan responded.

By understanding current levels of engagement among NTT Group employees and the issues that need to be improved, and by taking action to make improvements, we hope to increase the number of highly engaged employees who identify with the company's and organization's policies and strategies, as well as feel pride and take initiative in their work.

The employee engagement rate has a major impact on labor productivity and is also directly related to business performance. This provided a clearer image of specific issues when viewed against domestic and international standards, and we will be investigating potential courses of action that can be taken to establish a corporate culture that encourages behavioral changes.

## Management strategy and sustainability

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Carbon neutrality and various policies related to human capital only make sense if they are tied to the management strategy and incorporated specifically within action plans. Initiatives aimed at achieving carbon neutrality can help to reduce the costs that society or companies would have to bear in the future and providing our initiatives as solutions could also result in potential business opportunities. We believe that advancing Diversity & Inclusion as part of the human resources strategy creates an open workplace environment and being able to harness the potential of diverse human resources in turn results in greater productivity. As work styles, unconstrained by location or time, become increasingly commonplace we introduced the Remote Standard from July 2022 to address the need for companies to provide flexible working arrangements. We will continue creating an environment where individual diversity can lead to dialogue, innovation and positive business outcomes.

The NTT Group will strive to become an innovative corporation spearheading societal transformation by inviting dialogue and communication with various market players and a broad range of stakeholders.



# Initiatives for human capital management

## New management style

In October 2021, the NTT Group unveiled its “New Management Style.” In addition to promoting the appointment of female managers (newly appointed managers in FY2021: 29% (target 30%)), introducing new work styles (from July 2022) based on remote work and expanding satellite offices (551 locations at the end of September 2022) for promoting work-in-life (health management) through the workplace-residence proximity, we began a trial at the holding company from October 2022 for decentralizing the organization in order to enhance resilience.

We believe that promoting diverse work styles and increasing opportunities to harness the capabilities of people from diverse backgrounds will help achieve a more open, global and innovative business. We are promoting the participation of women, foreign employees and outside personnel as part of these efforts to increase the choices for working time, place, and residence. The NTT Group has reviewed its personnel system to assign the right person to the right job at the right time regardless of their gender, years employed, or age. We are focusing on specialization, encouraging self-guided career formation, and also raising the starting salary of new recruits as part of efforts to revise the personnel system for general employees.

Promotion of participation of women, foreign employees and outside personnel	Target	Results
Promote the appointment of females as managers and Board members Enhance various support and training programs	Newly appointed managers: 30% every year	29%
	Managers: 15% in FY2025	8.7%
	Board members: 25% to 30% in FY2025	17.7%
Aggressively hire foreign employees and outside personnel	Mid-career hires*: 30% in FY2023	32.5%

\*Outside personnel

Introduction of new personnel system	Target	Results
Expand job-based personnel system to all management positions	-	Introduced in October 2021
Promote self-guiding career formation for general employees (revision to specialization-based personnel compensation system)		New system to be introduced in April 2023

Promotion of work-in-life (health management) through the workplace-residence proximity	Target	Results
Ensure remote work for employees, and provide them with the freedom to choose their place of work (no need for relocations and unaccompanied assignments, recruitment of remote-based employees, expansion of satellite offices, etc.)	FY2022 260 or more locations*	End of September, FY2022 551 locations*

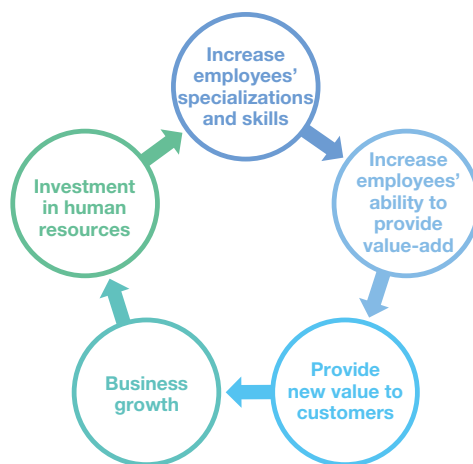
\*Satellite offices

Decentralization of the organization (including head office and back-office employees)	Target	Results
Decentralize organization from metropolitan areas to regional areas (core cities)	From FY2022	Began trial in October 2022
Further accelerate community-based regional revitalization businesses for primary or other industries in the region	From FY2021	

## Management where investment in human resources leads to value provided to customers

The NTT Group focuses on assigning the best-suited person to the work and post, regardless of age, and is moving ahead with self-guided career development that will result in better earnings for the company by boosting the motivation of employees to take on challenges and encouraging them to enhance their skills by acquiring specialized knowledge. To achieve this, we are implementing a system for posts with clearly defined roles that assigns the right person to the right job, while taking into account employees' career plans, in line with the job-based personnel system introduced in October 2021 for all management positions. We will also be rolling out a system for general employees from April 2023, built on a revised personnel compensation system with a greater focus on specialization so that employees can work on enhancing their professional areas of specialization and forge their own path forward.

Providing customers with a new sense of excitement only comes about due to having the motivation or taking action to create something new. In fact, each and every idea or product is created by a "person." We believe that employees creating added value helps to increase convenience throughout our customers' lifestyles and can even lead to the development of new social trends. All of these revisions have helped to inspire each and every employee to further increase their specializations and acquire or maximize their skills and have resulted in the creation of a working environment that allows them to create added value in a broad range of fields. Creating new value by reforming business and expanding into new business areas will provide the impetus for continued growth and development through the entire NTT Group.



## Introduction of job-based personnel system to all management positions (October 2021)

### Shift to assigning the right person to the right job for greater strategic capability

- Job definition and grading linked to management strategy and business strategy importance
- Assign the right person that suits the roles and tasks required of each job, regardless of number of years employed or age
- Framework where compensation is determined based on job assignment. Move to a working environment where special appointments or salary reductions are the norm
- Transform awareness for management positions and increase employee motivation to take on challenges, and promote self-guided career development

## Revision to specialization-based personnel compensation system (general employees, April 2023)

### Personnel compensation system that rewards specialization with promotions

- Framework that eliminates requirements for years employed or years served, and provides promotions and salary increases corresponding to acquired specialization or level of skills (set grade standards that clarifies the specializations or other skills required in 18 specialist fields)
- Formation of a new "Specialist Course" that provides high compensation for employees with a particularly high level of specialization (career diversification)

### Personnel system that supports self-guided career development

- Shift to personnel assignment and transfer policy to boost specialization
- Greater support for self-guided career development (enhanced training, better career consulting functions, etc.)

## Engagement Survey

In fiscal 2021, NTT Group revamped its existing Employee Satisfaction Survey, which focused on questions relating to ease of working, and added questions relating to job satisfaction as an indicator for defining culture. It also conducted a Group-wide Engagement Survey to quantify employees' attachment to and trust in the company to which they belong as an "engagement score." By understanding the issues that need to be improved for establishing corporate culture, and by taking action to make improvements, we hope to establish a corporate culture where employees identify with the company's and organization's policies and strategies, as well as feeling pride in their work.

### NTT Group's Four KPIs

#### Willingness to make voluntary contributions

- (1) I am motivated to contribute more than is required to get the job done at the company

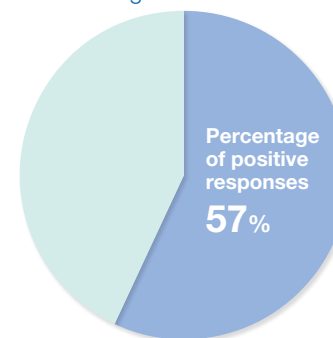
#### Attachment to and pride in the company

- (2) I am proud to work at this company
- (3) I would recommend our company as a great place to work to those I know

#### Job satisfaction

- (4) I gain a sense of personal accomplishment through my work

The Average of the Four KPIs



## Flexible work styles not bound by time and place

In September 2021, we declared our policy aimed at eliminating the pressures of job transfers or working away from their family, as part of efforts to create work styles throughout the entire NTT Group that are no longer constrained by location or time. In July 2022, we introduced a work system that generally allows employees to work anywhere as long as they reside in Japan, and successfully rolled out Remote Standard for 30,000 employees, around half of all of those working at the Group's main companies. We believe that flexible work styles encourage individual diversity, dialog and innovation, which will lead to a work environment that delivers positive business outcomes.

### Previous System Revisions (2020)

#### System revisions due to COVID-19

Work-from-home (with upper limit)	→	<b>Remote work</b> (no restrictions to frequency or location)
Commuting allowance (fixed payments)	→	<b>Commuting allowance</b> (payment corresponding to actual commuting)
No work-from-home stipends	→	<b>Remote work stipend</b> (equivalent to energy, water and communication costs)
Flex (with Core Times)	→	<b>Super flex-time system</b> (without core times, can be staggered)

**Achieved work styles not bound by time and place.  
To eliminate restrictions by place of residence...**

### New system "Remote Standard" (2022)

#### Past work style

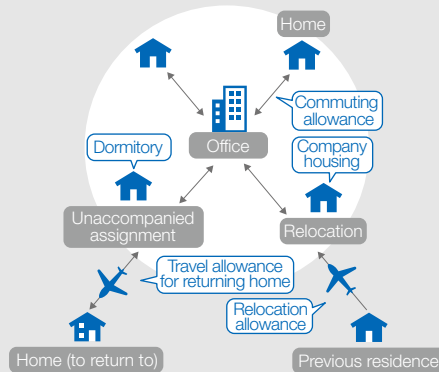
- Commuting to the office was the norm
- Reside within commuting distance to office
- Remote work required approval
- Commuting allowance paid when commuting to office

#### New work style (Remote Standard)

- Remote work is the norm (hybrid work with both remote work and commuting to the office)
- No restrictions to place of residence
- Travel allowance paid when commuting to office (processed as business trip, no upper limit)
- Initially available for approx. 30,000 employees, mainly office workers

### Past Work Style

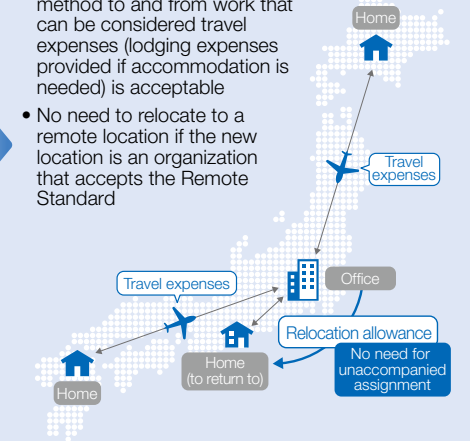
- In general, reside in a location within 2 hours commuting distance (one-way)
- Relocation or unaccompanied assignment if transferred to remote locations



### New Work Style

#### Remote Standard

- Any residence in Japan is acceptable
- Any reasonable transportation method to and from work that can be considered travel expenses (lodging expenses provided if accommodation is needed) is acceptable
- No need to relocate to a remote location if the new location is an organization that accepts the Remote Standard



### Decentralization of the Organization (Including Head Officers and Back-Offices)

The NTT Group began initiatives for decentralizing the organization from metropolitan areas to regional areas (core cities)

#### <Specific Initiatives>

- Trial run for dispersing the organization across regions to begin at the holding company (starting in October 2022)
- From the standpoint of resilience, we will aim for sustainable business operations by opening offices in Takasaki City and Kyoto City for promoting distributed offices  
The first step will involve a trial of certain organizations (with approx. 200 employees) of the holding company
- The trial will be used to test for issues or measures related to business operations and communications with distributed offices, with a view to applying it to actual operations
- Introduce a working style based on telework in which employees engage in head office operations while residing in a distant location
- Introduce a "hometown double work" program to contribute to the revitalization of local communities and areas associated with the Company while continuing current assignments

# message

Message from Management  
(Senior Executive Vice President)



**Katsuhiko Kawazoe**  
Senior Executive Vice President CTO,  
Representative Member of the Board

## Using Technology to Achieve Sustainability

The 21st century world that we all live in today is facing major challenges on the way to achieving a low-carbon and sustainable environmentally-oriented society. The NTT Group views resolving issues like climate change as one of its key corporate activities in its goal of building a sustainable society and implements various initiatives in line with its "Your Valued Partner" management philosophy. The NTT Group is aiming to achieve sustainability based on technology with a key focus on the Innovative Optical and Wireless Network (IOWN).

Providing customers with reliable telecommunications services is the most important role for NTT Group to fulfill. As IoT becomes more widely used and the services that are essential to our daily lives diversify, the amount of traffic continues to grow, and we are approaching various limits in terms of data volume, latency, and power consumption. While the NTT Group initially aimed for commercialization of IOWN around 2030, a number of social issues have emerged, including the aforementioned rapid increase of network load, the global situation regarding carbon neutrality, the expansion of traffic due to a spike in remote usage spurred by COVID-19, and soaring oil prices. For these reasons, the NTT Group will move its 2030 target forward and start offering IOWN services during fiscal 2022. We are introducing these services to users who have a need for advanced services and planning to introduce services for specific applications and areas while achieving further advancements with technological demonstrations. We are already running a proof-of-concept for the "Urban DTC®" (DTC: Digital Twin Computing) initiative aimed at increasing comfort in cities using data on buildings, urban spaces and behavior of people, at the "Urbannet Nagoya Nexta Building" next-generation advanced office that opened in June 2022. After putting some technologies to practical use during fiscal 2022, we will also gradually be installing equipment in facilities of the NTT Group. We plan to showcase the results of our IOWN-related efforts at the 2025 World Exposition to be held in Osaka, Kansai.

## The Value that IOWN Provides and Collaborating with Our Partners

In September 2021, we unveiled our new environment and energy vision, "NTT Green Innovation toward 2040" aimed at achieving zero environmental impact while continuing economic growth, by reducing the environmental impact of our business activities and creating breakthrough innovation. This vision was designed so that the NTT Group is able to achieve carbon neutrality in fiscal 2040 with IOWN, ten years before the 2050 goal for carbon neutrality set by the Japanese government.

Additional utilization of optical technology is important for implementing the IT infrastructure with both high performance and low power consumption that IOWN is aiming for. We will introduce optical technology, which can handle signals while using less power than electricity, not only for transmission, but also for processing. This will enable us to achieve advanced fusion of light and electricity (photoelectric merging technology), in which optical technology is applied in extremely close proximity to the parts where operations are performed. Incorporating this technology into semiconductors will fundamentally solve the aforementioned issues. Photoelectric merging technology is an area in which NTT excels, given the optical-related technologies it has amassed.

At present, Japanese companies possess significant technology and manufacturing capabilities in the semiconductor value chain. However, we have not yet achieved the kind of presence a global stakeholder should have. Our goal is for Japan to spearhead IOWN in collaboration with our global partners and become an indispensable global player in the semiconductor value chain. Established in the United States in 2020, the IOWN Global Forum has already attracted more than 100 members from Europe, the United States, and Asia. This forum is unique in that it is not limited to the IT and telecommunications industries, but also encompasses the automotive, plant, and financial industries, as well as academic institutions. We believe that we can work hand in hand with the members of the forum to create a value chain that utilizes IOWN in every industry.

## Investment in human capital is essential to continue producing research results

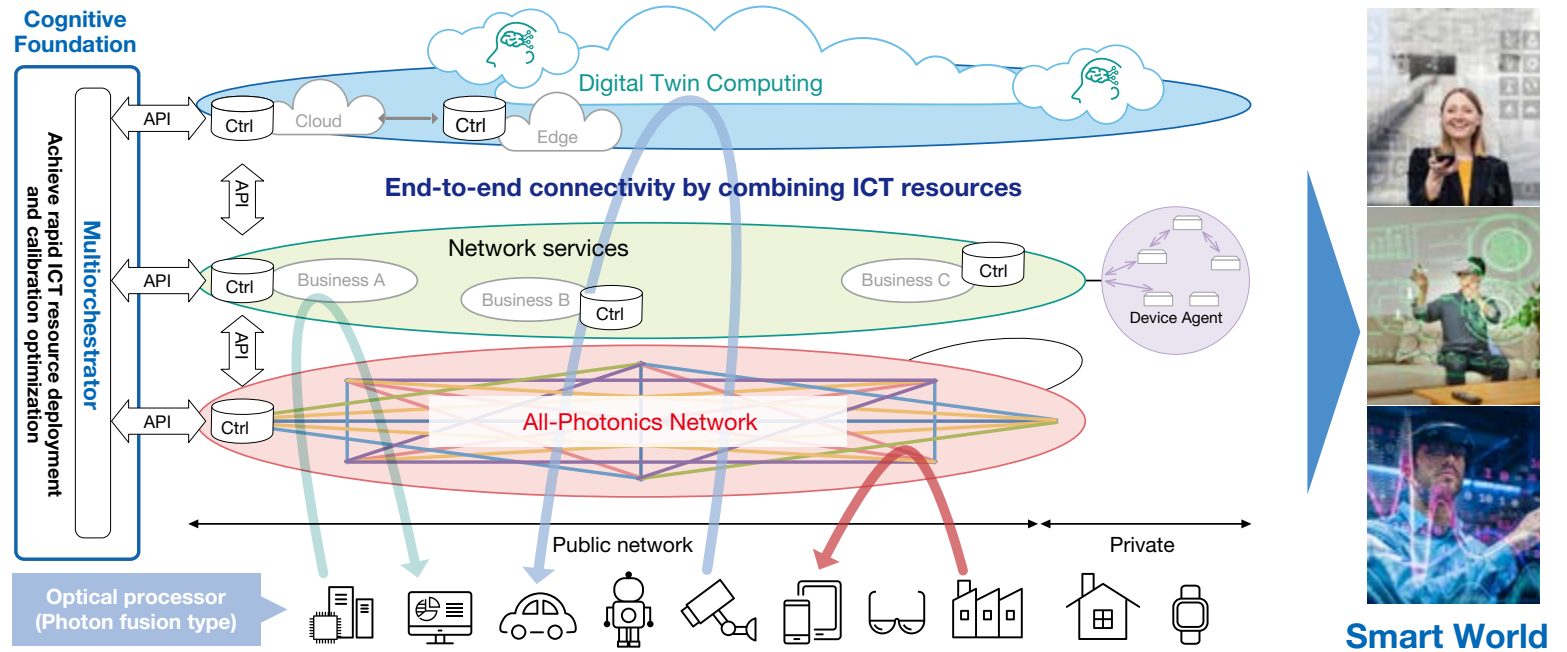
Research and development at NTT involves approximately 2,300 researchers conducting a broad, diverse range of research, from basic research to R&D that underpins business development at operating companies, based on the principle of creating world-leading technologies and services and contributing to the development of society, industry, and academia. We are creating competitive technologies as part of the research and development that forms the source of growth for the NTT Group, and will go on to create new value through open innovation and collaboration with various companies, universities and research institutions. It is vital to view each and every employee as an independent researcher with a high level of market value. To facilitate this, we are supporting diversity-rich career formation, from basic research to technology management, in line with each individual's career plan. With even more rapid changes occurring today, we are regularly reviewing training programs to ensure they are up to date and optimized for nurturing researchers with a high level of market value.

Going forward, we will need excellent researchers in a wide range of fields such as encryption technology energy. To this end, we will aim to make NTT Group more attractive, not only in terms of compensation, but also in terms of prestige, the research environment, and many other aspects so that people wish to work here.



# What is IOWN concept

An abbreviation for the Innovative Optical and Wireless Network (IOWN), this concept is a step for achieving a Smart World through the fusion of photonics-electronics convergence technology and three core elements—an All-Photonics Network, Digital Twin Computing, and Cognitive Foundation.



# All-photonics network (APN) for achieving the IOWN concept

This is the core concept that delivers a stable, high-capacity communications network with computing capacity that exceeds the performance of conventional computing technologies and networks, with lower power consumption and overcoming communication latency issues.

## Limits and reduces power consumption

- (1) Low power consumption
  - No conversion between light ↔ electricity
  - Integrated opto-electronic information processing

Power efficiency\*1  
**100 times higher**

## Capable of handling increasing traffic

- (2) High capacity and high quality
  - Allocate wavelength for each service
  - IP-independent

Transmission capacity\*2  
**125 times higher**

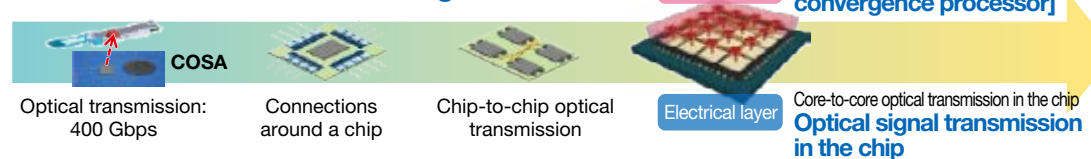
## Low-latency transmission backbone

- (3) Low latency
  - No data compression
  - No queueing

End-to-end delay\*3  
**1/200**

\*1 Target value of power efficiency of photonics technology-applied part. \*2 Target value of communication capacity per optical fiber. \*3 Target end-end delay for video traffic that does not require compression within the same prefecture.

## \* Photonics-electronics convergence device



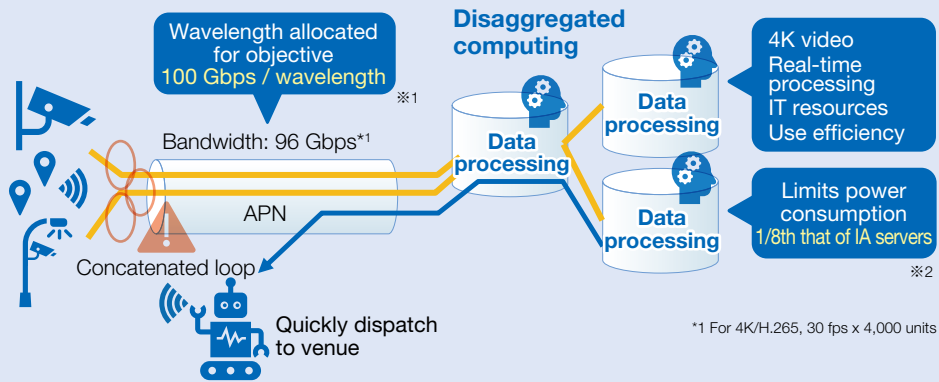
Increased information processing capability

# Future use cases achieved with IOWN

Going forward, the goal is to implement use cases raised at the IOWN Global Forum by demonstrating conceptual use cases among a wide range of companies and organizations.

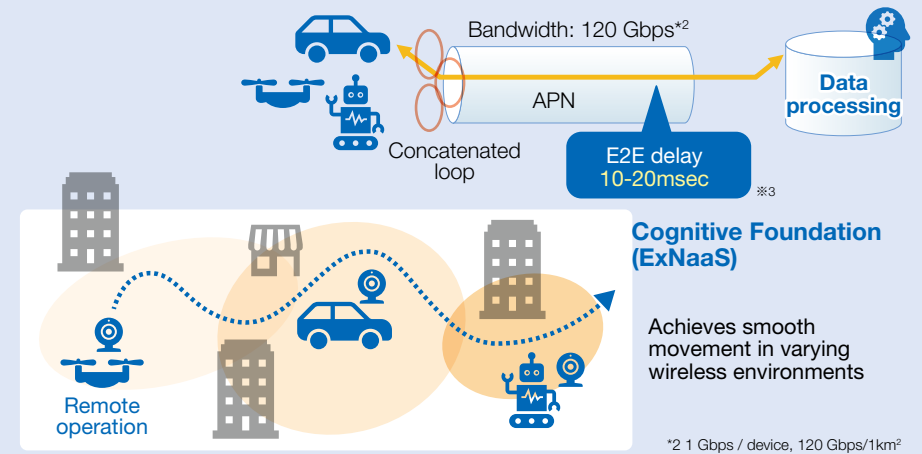
## Area management

Capable of high-speed processing of data generated from the large number of cameras and other sensors installed around the venue, together with low power consumption



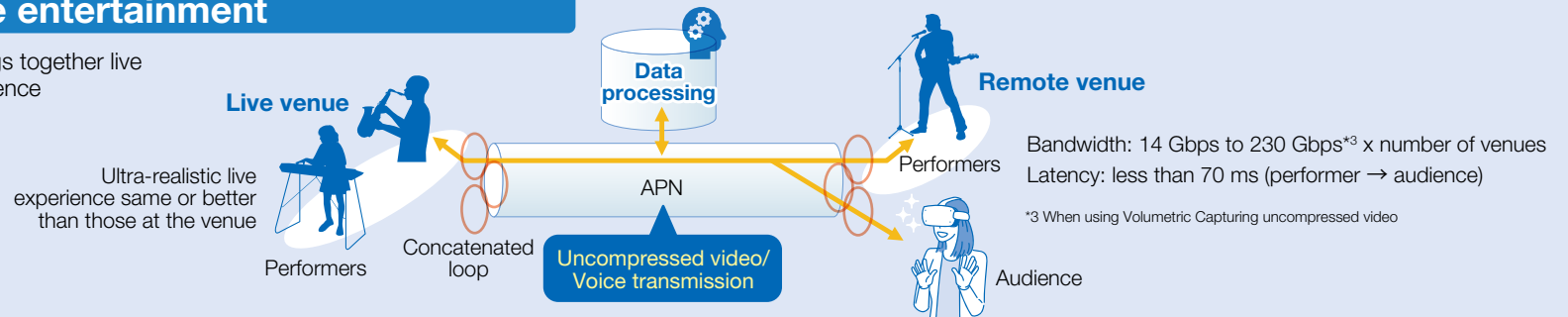
## Smart mobility

Automation of logistics within a venue by using automatically driven vehicles, transportation robots, drones, and more



## Live entertainment

Achieves live entertainment that brings together live venues, remote venues and the audience



※1 · 2 · 3: Target value of R&D

# 2021 highlights

Ensuring the positive coexistence of nature and humanity

GHG reduction  
(Scope1+2)

**38%** (compared to FY2013) **reduction**

Recycling rate

**97.8%**

Improving prosperity for all people and cultures

B2B2X earnings

**544.1 billion**

Ratio of remote work

**77.3%**

Maximizing well-being for all

Ratio of women newly promoted to management positions

**29.1%**

Ratio of direct dialogue with critical suppliers

**100%**

An aerial photograph of a dense, vibrant green forest. A paved road with a white center line curves through the trees, starting from the top left and moving towards the bottom right. The lighting is bright, creating a rich, textured appearance of the foliage.

# Ensuring the coexistence of nature and humanity

The NTT Group is contributing to resolve environmental issues while also delivering economic growth.

## Toward a future that ensures the positive coexistence of nature and humanity

Climate change and other environmental issues are increasing in severity every year causing greater social and economic damage as natural disasters become more frequent and widespread. The NTT Group is “moving toward a decarbonized society,” “implementing closed loop recycling” and achieving “a future where people and nature are in harmony” as part of its goals for “ensuring the positive coexistence of nature and humanity,” and is analyzing the underlying reasons behind each issue in order to take the required action.

Today

What should NTT be aiming for?

A future ensuring the positive coexistence of nature and humanity

	Potential Future and Underlying Reasons	Commitments	Action
Moving toward a decarbonized society	The NTT Group views finding solutions to climate change and other environmental issues that society faces as one of its core roles, and is continuing its existing activities aimed at reducing greenhouse gas emissions. Meanwhile, there is growing hope that environmental challenges can be resolved through the use of ICT. The NTT Group needs to focus on Group-wide efforts at promoting energy efficiency and increasing the use of renewable energy sources, given that 90% of the CO <sub>2</sub> emissions from its business activities arise from the electricity it consumes. Additionally, developing next-generation energy technologies and technologies to enable resilient environmental adaptation, and providing services that help to alleviate the impact that society as a whole has on the environment, will reduce the impact on the global environment and help prevent environmental destruction—these will open the door to a sustainable society in which humans can continue to live in harmony with the environment.	<b>Carbon Neutrality (2040)</b> The NTT Group is committed to initiatives that reduce greenhouse gas emissions throughout its business activities and society as a whole, by rolling out IOWN technology and increasing development and use of renewable energy sources.	<ul style="list-style-type: none"> <li>Promoting energy conservation</li> <li>Reduction of power consumption by introducing IOWN technologies</li> <li>Developing and expanding the use of renewable energy</li> <li>Providing new services that contribute to carbon neutrality</li> <li>Creation of innovative environmental energy technology</li> </ul>
Implementing closed loop recycling	Although our one-way society of mass production, mass consumption, and mass disposal has brought affluence and convenience to our lives, it has brought about various problems such as the creation of massive amounts of refuse, illegal dumping and concern about the depletion of natural resources. To resolve these issues we must first review how companies manage their businesses as well as our social and economic systems, and shift to a closed loop society. In an effort to realize a future with closed loop recycling, the NTT Group promotes the 3Rs (reduce, reuse, and recycle), working to reduce the amount of materials consumed by our business activities and reuse or recycle the resources that are consumed. We will shift from a one-time use consumption-oriented company to a recycling-oriented one. We will promote the effective use of resources throughout the entire life cycle of products and systems, from procurement to use and disposal.	<b>Recycling Rate of 99% or higher (2030)</b> To facilitate the shift from a one-time use consumption-oriented economy to a recycling-oriented one, we will promote the effective use of resources throughout the entire life cycle of our products and systems, from procurement to use and disposal.	<ul style="list-style-type: none"> <li>Increasing the reuse and recycling of communications equipment, mobile terminals, and other technologies</li> <li>Reduction in plastics use and promotion of recycling</li> <li>Proper treatment, storage, and management of hazardous waste</li> <li>Appropriate and efficient management of water resources</li> </ul>
A future where people and nature are in harmony	The telecommunication equipment essential to the NTT Group’s businesses have no small impact on ecosystems. Ecosystems full of biodiversity provide us with a bounty that is crucial for all forms of life on earth—we are focusing on proper conservation as a way of keeping nature the way it was meant to be for future generations.	Through our business and employee activities, we will promote initiatives related to conserving ecosystems within nature.	<ul style="list-style-type: none"> <li>Thoroughly implementing environmental assessment</li> <li>Contributing to natural ecosystem conservation</li> </ul>

## Basic Policy and Action Guidelines

### Basic Policy

The NTT Group is committed to achieving a new level of prosperity where humanity can co-exist and preserve nature for generations to come. To this end, we will work to balance solving ecological problems and improving economic development by reducing the environmental impact of our business activities and creating new technologies and innovations.

### Action Guidelines

#### 1. Reducing greenhouse gas emissions

The NTT Group is committed to initiatives that reduce greenhouse gas emissions throughout its business activities and society as a whole, by rolling out IOWN technology, increasing development and use of renewable energy sources, and providing services that contribute to carbon neutrality.

#### 2. A commitment to resource recycling

We will shift from a one-time use consumption-oriented company to a recycling-oriented one. We will promote the effective use of resources throughout the entire life cycle of products and systems, from procurement to use and disposal.

#### 3. Conserving ecosystems

Through our business and employee activities, we will promote initiatives related to conserving ecosystems within nature.

#### 4. Compliance with laws and regulations and fulfillment of social responsibilities

We comply with the laws and regulations related to environmental issues in each country and region, and act with high ethical standards.

#### 5. Establishing and maintaining environmental management systems

We will establish the Green Innovation Committee chaired by the Representative Director and Senior Executive Vice President, and discuss basic strategies concerning environmental issues, the status of implementation of activities, and information disclosure, and implement relevant initiatives.

#### 6. Stakeholder engagement

We will engage with stakeholders throughout our entire value chain to help resolve environmental issues.

## Disseminating Environmental Activities Policies and Measures among Employees

NTT Group conducts environmental education to disseminate NTT Group policies and measures among employees and develop a shared understanding of Group-wide activities for promoting environmental protection. In fiscal 2021, we also provided training related to the Group's environmental activities for all employees, such as group training and e-learning. The NTT Environmental Protection Office organizes environmental education for staff in charge of environmental issues at each Group company and has been holding study sessions every year since fiscal 2001. Along with lectures for disseminating our environmental policies and sharing outstanding issues, we invite outside lecturers to speak on recent topics. These study sessions are intended for the NTT Group throughout Japan and are therefore offered via a teleconferencing system so that staff in remote areas can attend and ask questions through two-way connections. This paperless approach is also another way the NTT Group is helping to reduce greenhouse gas emissions resulting from holding meetings.

In fiscal 2021, we invited experts on environmental management and CSR to explain the SDGs and ESG and to speak about environmental management. Furthermore, related staff in Group companies introduced their environmental initiatives with the aim of promoting environmental activities at each Group company.

## Compliance with Environmental Laws and Regulations

The NTT Group complies with laws and regulations related to the environment and works to reduce its impacts on the environment. We have established a mechanism that can deal with cases of legal violations on a Group-wide basis by reporting to the Global Environmental Protection Promotion Committee. There were no legal violations nor payments of penalties in fiscal 2021, following the same result for fiscal 2020. As part of its environmental management measures, the Group also tracks the number of complaints related to the environment for each fiscal year. In fiscal 2021, no complaints related to environmental impact were submitted, handled or resolved through our systems for dealing with complaints. Going forward, we will maintain compliance with existing laws and regulations as well as set up a working group on environmental laws and regulations to help step up our preparations for complying with laws and regulations under review or scheduled to take effect.

## Social Challenge

# 1

## Moving toward a decarbonized society

### Business Activity

1. Promoting energy conservation
2. Reduction of power consumption by introducing IOWN technologies
3. Developing and expanding the use of renewable energy
4. Providing new services that contribute to carbon neutrality
5. Creation of innovative environmental energy technology



### Why it matters

The NTT Group views one of its core roles as helping to resolve environmental issues that society faces, and is continuing its existing activities aimed at reducing greenhouse gas emissions. There are increasingly high hopes that the ICT sector will be able to help resolve environmental issues, and this has been outlined in the Paris Agreement. The NTT Group remains committed to measures that utilize ICT services and cutting-edge technology to reduce greenhouse gas emissions.

### What can be accomplished

The NTT Group is committed to initiatives that reduce greenhouse gas emissions throughout its business activities and society as a whole, by rolling out IOWN technology and increasing development and use of renewable energy sources.

### Future vision

The NTT Group is pushing ahead with research and development aimed at curbing climate change, encouraging employees to take part in nature conservation activities, increasing awareness inside and outside the group of its activities that help improve the environment, and many other activities to contribute to a reduction in greenhouse gas emissions throughout society as a whole.



# Feature 1: Environment and Energy Vision

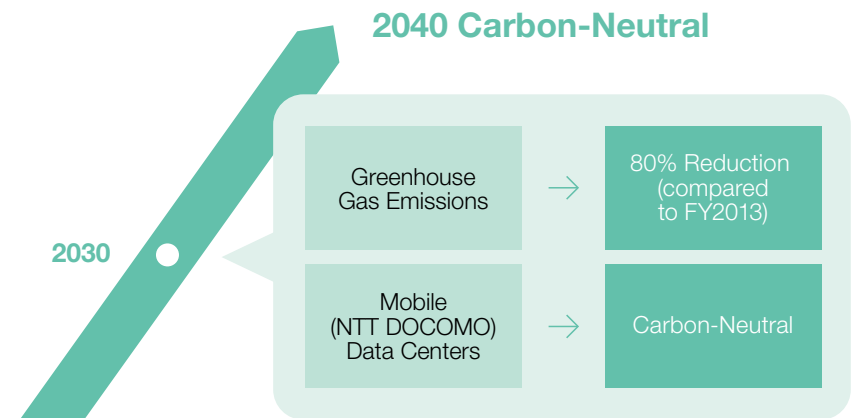
## Achieving carbon neutrality

In September 2021, the NTT Group unveiled its new environment and energy vision, “NTT Green Innovation toward 2040” for achieving “zero environmental impact” while continuing “economic growth” by reducing the environmental impact of its business activities and creating breakthrough innovation, with the aim of creating a well-being society and boosting corporate value through ESG initiatives. NTT will aim to achieve carbon neutrality by fiscal 2040 based on this vision.

NTT has set targets for groupwide carbon neutrality by fiscal 2040 on its way to achieving zero environmental impact. The mobility communications (NTT DOCOMO) and data center business will be the first within the NTT Group to achieve carbon neutrality, as targets have been set to reduce greenhouse gas emissions by 80% of fiscal 2013 levels, by the fiscal year ending March 31, 2031. This target was approved as the 1.5°C level by SBT in December 2021.



## New Environment and Energy Vision NTT Green Innovation toward 2040



\* Scope of reduction targets  
GHG protocol: Scope 1 (own direct emissions of GHG) and Scope 2 (indirect emissions from using electricity, heat and steam supplied by other companies) Mobile: 15 companies in NTT DOCOMO Group (as of September 28, 2021)

# Feature 1: Environment and Energy Vision

## Achieving carbon neutrality

### Key Initiatives Toward Carbon Neutrality

With the current situation, data traffic will increase significantly, leading to an increase in energy consumption and thus greater greenhouse gas emissions. In order to achieve carbon neutrality, IOWN will be rolled out to reduce energy consumption, increase the use of renewable energy sources, and cut down on greenhouse gas emissions.

### Illustration of NTT Group Greenhouse Gas Emission\*1 Reductions

- Increased use of renewable energy: Reduce greenhouse gas emissions by 45%\*2
- Lower energy consumption with IOWN technologies: Reduce greenhouse gas emissions by 45%\*3

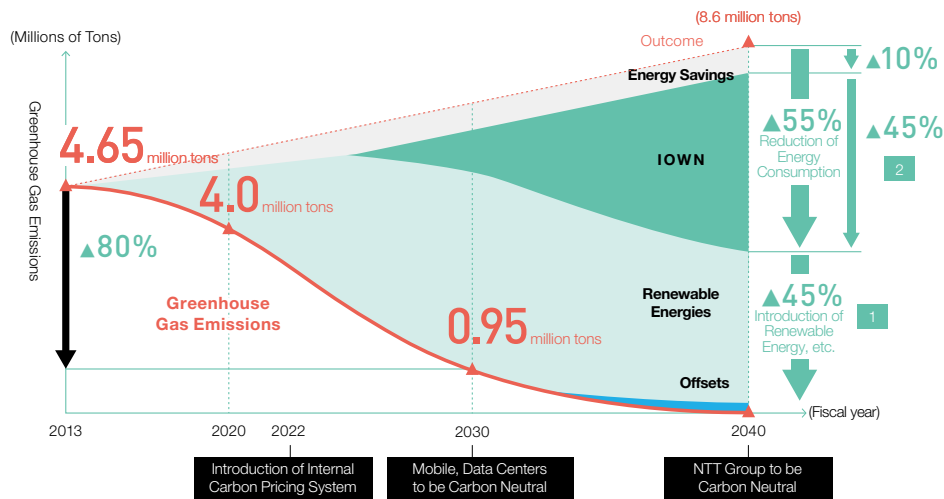


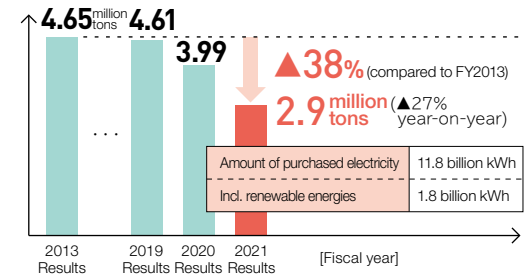
Illustration of NTT Group Greenhouse Gas Emission Reductions (Domestic + Overseas)

\*1 GHG Protocol: for Scope 1 and 2  
 \*2 Estimated Introduction of Renewable Energy (including actual renewable energy through Non-Fossil Fuel Certificates) → FY2020, 1.0 billion kWh; FY2030 to FY2040, around 7.0 billion kWh. The introduction of renewable energy will have the optimal types of energy determined on the basis of each country's energy composition, etc.  
 \*3 Estimated Reduction of Energy Consumption through the Introduction of IOWN (Comparison to Outcome).  
 → FY2030, (2.0) billion kWh ((15%); FY2040, (7.0) billion kWh ((45%)) Percentage of Introduction of IOWN (Photonics-electronics Convergence Technologies, etc.) out of Total Energy Volume  
 → FY2030, 15%; FY2040, 45%

### FY2021/2022 Initiative Highlights

#### NTT Group

Of the total power consumption during fiscal 2021, switching to renewable energy sources for more than 1.8 billion kWh (approx. 23% of power consumption, approx. 150% compared year-on-year) used by the entire Group resulted in greenhouse gas emissions of 2.90 million tons, a reduction of 38% compared to FY2013 levels.

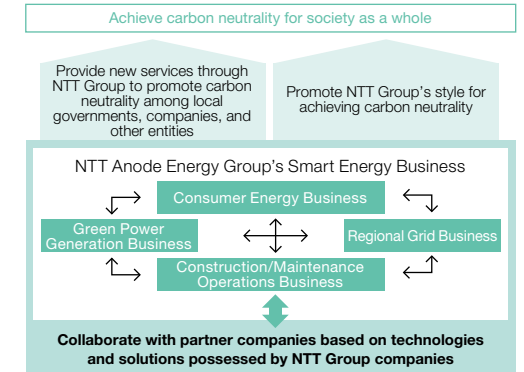


#### NTT Anode Energy

Integrating Power-related Operations to Accelerate Expansion of Smart Energy Business

In July 2022, NTT FACILITIES' power engineering and other power-related operations, primarily design and maintenance of solar power plants and power supply facilities for telecommunications, were transferred and integrated into NTT ANODE ENERGY. Through this integration of power-related operations, NTT Anode Energy will promote four businesses: the green power generation business, regional grid business, consumer energy business, and construction and maintenance operations business. By linking these four businesses into a single integrated value chain, the company will develop a smart energy business.

### Overview of NTT Anode Energy's Post-integration Smart Energy Business



- Green Power Generation Business: Development of renewable energy power plants
- Regional Grid Business: Promote expansion of the use of NTT Group's assets to enhance local production and consumption of renewable energy and resilience
- Customer Energy Business: Promote carbon neutrality among customers by offering decarbonization solutions
- Construction/Maintenance Operations Business: Aim to improve quality and efficiency by enhancing power engineering functions (construction, maintenance, and monitoring)

#### NTT Group

### NTT Group Introduction of Internal Carbon Pricing System

To achieve carbon neutrality, a resolution was passed at the Executive Committee meeting in May 2022 to gradually implement an "Internal Carbon Pricing System" within Group companies. This system encourages reducing our impact on the environment by virtually converting CO<sub>2</sub> emissions into costs.

### Overview of Internal Carbon Pricing System implemented by the NTT Group

Internal carbon price	¥6,500/t-CO <sub>2</sub>
Scope of application/Method	When it comes to decarbonization-related project decisions and procurement (product selection, etc.), decisions are made while taking CO <sub>2</sub> emission costs into consideration.

# Feature 1: Environment and Energy Vision

## Achieving carbon neutrality

In addition to the “Green of ICT,” which will curb the environmental impact of NTT Group by introducing IOWN technologies and increasing the use of renewable energy, we will also work on “Green by ICT,” which will contribute to reducing the environmental impact of society as a whole.

	Reduction of Environmental Impact through Business Activities	Creation of Breakthrough Innovation
<p><b>Green by ICT</b></p> <p>Contributions to Reducing Society's Environmental Impact</p>	<p><b>Reducing society's environmental impact</b></p> <ul style="list-style-type: none"> <li>Further acceleration of DX and promotion of Remote World</li> <li>Promotion of regional urban development and the introduction of new social infrastructure development</li> <li>Reduction of greenhouse gases across the entire supply chain</li> <li>Provision of new services that contribute to carbon neutrality</li> <li>Contribute to local production and consumption of energy, through smart grids based on battery farms</li> <li>Increase in green electricity retail</li> </ul>	<p><b>Creation of innovative environmental energy technology</b></p> <ul style="list-style-type: none"> <li>Use of 4D digital platform for future predictions / optimal use of urban assets*1</li> <li>Optimal operation of fusion reactors (ITER / QST)*2</li> <li>Lightning charging</li> <li>Applied genome-editing technology for “Green” (Collaboration)</li> </ul> <p>*1 Energy, transportation, logistics, etc. *2 ITER: International Thermonuclear Experimental Reactor QST: National Institutes for Quantum Science and Technology</p>
<p><b>Green of ICT</b></p> <p>Reducing NTT's Own Environmental Impact</p>	<p><b>Introduction of IOWN and Expansion of Renewable Energy</b></p> <ul style="list-style-type: none"> <li>Reducing power consumption by introducing IOWN technologies</li> <li>Developing and expanding the use of renewable energy</li> <li>Introduction of internal carbon pricing system</li> <li>Issuance of green bonds</li> </ul>	<p><b>Achievement of Ultra-Low Power Consumption</b></p> <ul style="list-style-type: none"> <li>Photonics-electronics Convergence Technologies (IOWN All-Photonic Network)</li> </ul> <p><b>Creation of Decentralized Technology</b></p> <ul style="list-style-type: none"> <li>Photonic disaggregated computing</li> <li>Space integrated computing network</li> </ul>

### FY2021/2022 Initiative Highlights



#### docomo Denki Green

A service lineup that began supplying “docomo Denki™” from March 2022 as a distributor harnessing its partnership with NTT Anode Energy. One of the plans, “docomo Denki Green,” makes full use of renewable energy sources\* for its supply, helping to achieve carbon neutrality throughout society as a whole.

**docomo Denki Green**

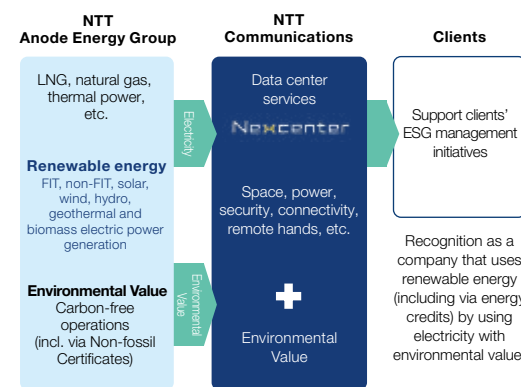
\* Renewable energy sources include the use of specified non-fossil fuel certificates.



NTT Communications is the first in Japan to offer\*1 a renewable energy menu that enables customers (subscribers who use cages or rooms) to select the electricity used by their ICT equipment\*2 for largescale commercial data centers utilizing renewable energy supplied by NTT Anode Energy. In addition, information on the power plant and the amount of electricity used will be provided on an individual basis as a type of “environmental value” utilizing non-fossil certificates\*3.

#### [Renewable Energy Menu for Customers] Actual renewable energy utilizing non-fossil fuel certificates

- Renewable energy that comes with a set of tracked non-fossil fuel certificate information indicating the location of the power plant and the power source type (not possible to specify the power source type or FIT/non-FIT\*\*)
- In addition to 1 above, customers can specify the power supply type\*5.
- In addition to 2 above, customers can specifically request non-FIT Renewable energy can be supplied from new power plants
- Off-Site PPA\*6 (NTT Anode Energy will provide power plants with additional to meet individual customer requests)



Target Data Centers (as of April 2022)  
Yokohama Data Center No. 1, Saitama Data Center No. 1, Tokyo Data Center No. 5, Tokyo Data Center No. 8, Tokyo Data Center No. 11

\*1: Results of a survey of publicly available information about providing a menu that enables customers to select the type of renewable energy, and the provision of “environmental value” using non-fossil fuel certificates according to the type of renewable energy, at large commercial data centers in Japan that receive extra-high voltage while providing renewable energy (survey conducted by NTT Communications/NTT Anode Energy, March 2022)

\*2: Provision of the service may entail equipment modification costs, such as power supply installation.

\*3: Certificates issued by separating the value from electricity originating from sources that do not emit CO<sub>2</sub>. This will achieve actually 100% renewable energy.

\*4: FIT electricity refers to electricity generated from renewable energy sources and purchased by electric utilities under the feed-in tariff system established by the government (the Amended FIT Act). Because FIT electricity is financed by contributions imposed on electricity users (the public), its environmental value already belongs to the public. By contrast, non-FIT electricity that does not rely on the FIT system is viewed favorably because it contributes to the expansion of renewable energy implementation while reducing the burden on the public.

\*5: Electricity generated from solar energy, geothermal energy, or biomass can be specified. (as of April 2022)

\*6: Off-site PPA (Power Purchase Agreement) is a scheme in which electricity users conclude contracts with power generation business operators to procure renewable energy over the long term. Off-site PPA, an abbreviation of Off-site Corporate PPA, involves the use of power generation facilities in locations removed from users to supply them with electricity through the power grid.

## Business Activity 1

# Promoting energy conservation

### Our commitment

The NTT Group is committed to improving the energy efficiency of its operations (EP100) \*1

### Our objective

## Two times

2025: Power efficiency (compared to FY2017)

### Background and Concepts

Electricity consumption accounts for over 90% of greenhouse gas emissions of NTT Group's business activities—the Group consumes the equivalent of 1% of the power generation throughout all of Japan. To combat this, the NTT Group has been working on Group-wide energy conservation activities dubbed the "TPR (Total Power Revolution) Campaign." By promoting efficient energy management at buildings owned by NTT and installing energy-efficient electrical power units, air conditioning systems and telecommunications equipment, we managed to continue to reduce electricity usage across the NTT Group by approximately 180 million kWh from projected levels in fiscal 2021.

Furthermore, the NTT Group is pushing for greater electricity usage efficiency with the aim of reducing the risk of business disruptions and helping to mitigate climate change. The fiscal 2025 target for power efficiency per data transmission in our telecommunications business, including data centers, has been set to double that of fiscal 2017. An efficiency of 1.9-times was achieved in fiscal 2021.

### Energy-Saving Data Centers

NTT Communications offers data centers with a PUE\*2 of less than 1.2, and NTT COMWARE offers data centers with a PUE of less than 1.1, which are at the top worldwide for energy efficiency. We are striving to enhance PUE for our other data centers as well, introducing five-star equipment with the highest level of energy efficiency in accordance with the NTT Group Energy Efficiency Guidelines. NTT FACILITIES has been developing technology for reducing the electricity consumption of data centers by incorporating higher efficiency technology for electrical power units and air conditioning systems as well as central air conditioning control systems.

### Pursuing Initiatives across the Industry for Energy-Efficient ICT Devices

NTT is a member of the Telecommunications Carrier Association (TCA) and in that capacity, participates in the ICT Ecology Guideline Council\*3, an organization that seeks to enhance the energy efficiency of telecommunications-related products. The council formulates guidelines on the criteria for evaluating the energy efficiency of telecommunications devices, and NTT has contributed to the technical aspect of this effort. The NTT Group's Energy Efficiency Guidelines are based on the guidelines created by this council. In August 2010, eight NTT Group companies\*4 acquired the Eco ICT Logo on submitting self-evaluations of their CO<sub>2</sub> emissions reduction efforts, including the establishment of Energy Efficiency Guidelines.

The Eco ICT Logo was created by the ICT Ecology Guideline Council to signify efforts by telecommunications service providers to reduce CO<sub>2</sub> emissions. We will continue to drive the development and procurement of energy-efficient equipment, and work with the ICT Ecology Guideline Council to help bring both vendors and carriers together to promote the industry-wide procurement of energy-efficient equipment. We will ensure that vendors are consistently provided with requirements for NTT Group specification processes, and include energy efficiency information disclosure and our corporate stance on energy efficiency in our criteria for selecting vendors.

### Business Activity

#### Reducing power consumption throughout the network

NTT DOCOMO is developing technology that lowers power consumption of communication networks and is rolling out equipment that reduces power consumption. It is achieving this with efforts like developing more advanced sleep functions for base stations and installing air-conditioning control systems equipped with self-learning functions and actively rolling out 5G power-saving devices. Additional approaches include consolidating base station equipment and using power supplied directly from high-voltage direct current equipment with lower transmission losses.



\*1 In October 2018, NTT was the first telecommunications carrier to become a member of the Climate Group's EP100 and EV100 initiatives. EV100 aims to achieve a 100% EV ratio for passenger vehicles by 2030.

\*2 Power Usage Effectiveness: PUE is calculated by dividing the total power consumption of a data center by the power consumption of the computing equipment it houses. It is a figure larger than 1, with higher efficiencies represented by values approaching 1.

\*3 ICT Ecology Guideline Council: An organization established jointly by the Telecommunications Carriers Association, Telecom Services Association, Japan Internet Providers Association, Communications and Information Network Association of Japan and ASP-SaaS-IoT Cloud Consortium to drive industry-wide efforts to address the issue of global warming.

ICT Ecology Guideline Council (Japanese only)  
<https://www.tca.or.jp/information/ecoict/index.html>

\*4 The eight NTT Group companies are NTT, NTT East, NTT West, NTT Communications, NTT DOCOMO, NTT DATA, NTT FACILITIES, and NTT COMWARE.

## Employee Interview

—Hope to protect the future global environment through energy conservation at data centers—



**Yoshihito Ito**  
NTT Network Innovation Center

The amount of annual energy consumption by the NTT Group is said to be some 1% of the total power consumption throughout all of Japan, and data centers use a significant ratio of this amount. To achieve improved level of energy conservation at data centers, the NTT Network Innovation Center is involved in R&D of PADAC, short for Power-Aware Dynamic Allocation Controllers. PADAC is a type of technology that helps to conserve energy use by employing software to control server resources at data centers. A simple way to illustrate this is that servers are much like any other household appliance—the newer it is, the more energy efficient.

In the past, half of the servers were modern units operating alongside old servers, but using each type for different purposes depending on particular usage situations is likely to bring energy savings. Actual conditions are naturally more complex, so we are seeking to control them using software to achieve the best balance of each parameter like compatibility between devices and applications, temperature, and utilization rate. When I joined the project, our first step was to gather all the technical theories available from throughout the company and examine them closely. Yet things are not likely to proceed smoothly if each project member were to simply bring together the type of technologies they

want, even if they featured the same topic of “software for controlling server resources.”

My research colleagues often had different opinions, but the project still went smoothly thanks to the common culture that all NTT researchers possess. Traditionally, the NTT Group never compromises when it comes to quality. Yet a key trait of NTT’s laboratories is that any topic being discussed is solidly based on by science. This means that no matter who you are talking to, you can have a true one-on-one discussion with any researcher here. This may seem obvious, but it is a very important point to note. If a supervisor suggests doing something a particular way, it is perfectly acceptable to say: “I

don’t think so.”

After much discussion and trial and error, we managed to come up with a pattern capable of controlling server resources at a high level of power efficiency. Right now we are finalizing the technology we have developed by filing patents and writing papers, and we are also moving ahead with running a prototype as a proof-of-concept model.

Technology developed at the center has no real social significance unless it is actually put to use. I hope to work with various NTT Group companies and outside affiliates to see PADAC in action in numerous situations in the future as a way of contributing to carbon neutrality.



## Business Activity 2

# Reduction of power consumption by introducing IOWN technologies

### Our commitment

The reduction in power consumption resulting from rolling out IOWN will help reduce greenhouse gas emissions throughout the NTT Group's its business activities and society as a whole

### Our objective

Reduce power consumption with the introduction of IOWN, and reduce the NTT Group's greenhouse gas emissions \*1 compared to outcome.

### Background and Concepts

There is urgent need to create a society that can cope with global environmental changes such as climate change, major disasters, and pandemics. Developing next-generation energy technologies and technologies to enable resilient environmental adaptation will reduce the burden placed on the global environment and thereby prevent environmental destruction, opening the door to a sustainable society in which humans can continue to live in harmony with the environment. The NTT Group is committed to initiatives that reduce power consumption emissions throughout its business activities and society as a whole, by rolling out IOWN technology and increasing development and use of renewable energy sources.

### Initiatives for Realizing the IOWN Concept

The development of ICT has dramatically increased the volume of information being transmitted through networks. Up to now, energy has been saved by enhancing power efficiency through the introduction and renewal of highly energy-efficient telecommunications equipment. However, the performance and efficiency of integrated circuit technology which has grown in line with Moore's law, is thought to be approaching its limits in terms of speed and energy consumption due to the restrictions of nanoscale fabrication and integration density. NTT Laboratories is advancing research and development that incorporates optical technology into signal processing with the aim of using photonics to realize a base for a new kind of computing. This has resulted in the development of a modulator with the lowest ever reported energy consumption and an optical transistor which transfers a high-speed optical signal to another light with gain (announced in April 2019).

The NTT Group is advancing the development of photonic technology and we have established the IOWN (Innovative Optical & Wireless Network) concept as one of the pillars of an all-photonic network that incorporates photonic-based technology throughout entire networks, including terminals. The target of this all-photonic network will be to realize power efficiency that is 100 times greater in areas where photonics technology is applied, and we expect it will radically reduce energy consumption. We are collaborating with global partners and specialists in a wide range of research and technological fields with the aim of realizing the IOWN concept.

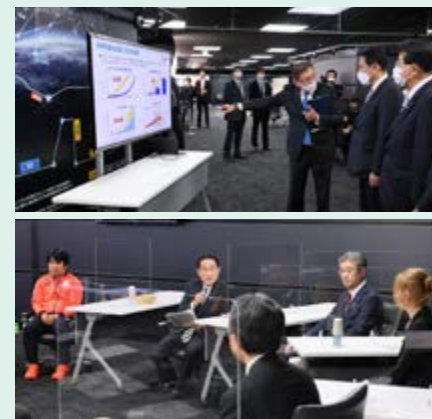
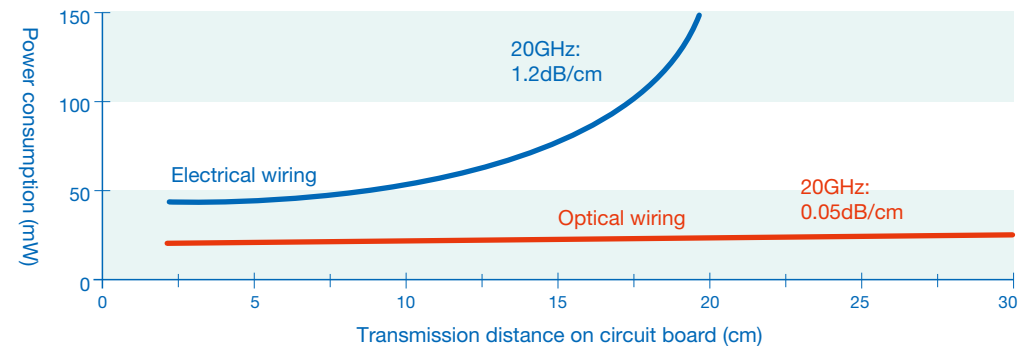
### Promoting Energy Conservation with IOWN

Conservation of the global environment and development of a sustainable society is the management theme of countless companies. The use of the NTT Group's next-generation communication platform "IOWN" for various ICT services used at customer companies not only helps to support these initiatives, but using IOWN extensively throughout NTT Communications' data centers, networks, and other infrastructure will lead to energy sav-

ings, paving the way to achieve carbon neutrality at data centers and networks by fiscal 2030.



### Higher efficiency and lower power consumption using light



### Business Activity

Highlighting the reduction in power consumption and other benefits of IOWN to the government

The NTT Group highlighted to the Japanese government the benefits of using its IOWN advanced technology, as a cutting edge communications infrastructure with major future potential for developing businesses in a wide range of fields. Rolling out IOWN to reduce power consumption and help achieve carbon neutrality provides Japan with a significant opportunity to lead the world in this sector.

\*1 GHG Protocol: for Scope 1 and 2

### Looking to the Future: IOWN

NTT R&D is envisaging the arrival of new smart societies that are not yet possible with today's Internet, with features such as mobility as a service (MaaS) for extreme fail-safe systems and entertainment services offering deep immersion. To realize such smart societies, we will require innovation that cannot be achieved merely by extending the trajectory of current technologies; we will need to realize ultra-low power consumption, high-speed signal processing, and the fusion of virtual worlds that can equal or surpass reality with sophisticated prediction technologies. The NTT Group has proposed the Innovative Optical and Wireless Network (IOWN) concept to realize new smart societies, and we are committed to realizing this concept. In January 2020, the IOWN Global Forum was established in the United States by industry leaders NTT, Intel Corporation, and Sony Corporation, all three of which have superior expertise in the technological areas that form the core of IOWN. Wide-ranging recruitment efforts began in March 2020, with many companies both in Japan and overseas signing up as members, and specific technological considerations commenced through the use of online video conferencing. Going forward, we will work with a variety of partners for the earliest possible implementation of the IOWN concept.

### Three Technological Layers that Constitute IOWN

#### Cognitive Foundation®

The Cognitive Foundation is a mechanism that centralizes management, operation, deployment, setting, and interlinking of ICT resources in different layers such as edge computers, network services, and user equipment, all from the cloud.

Technology development roadmap for realizing the IOWN concept  
<https://group.ntt/en/newsrelease/2020/04/16/200416a.html>  
 NTT proposes the "Digital Twin Computing Initiative"  
<https://group.ntt/en/newsrelease/2019/06/10/190610a.html>

#### All-Photonics Network

Photonics technology is applied not only to networks but also to information processing to achieve large-capacity, ultra-low power consumption and ultra-high-speed data transmission that had been difficult in the past. We can provide multiple functions that serve as the backbones of social infrastructure without mutual interference by assigning a function to each wavelength on a single optical fiber.

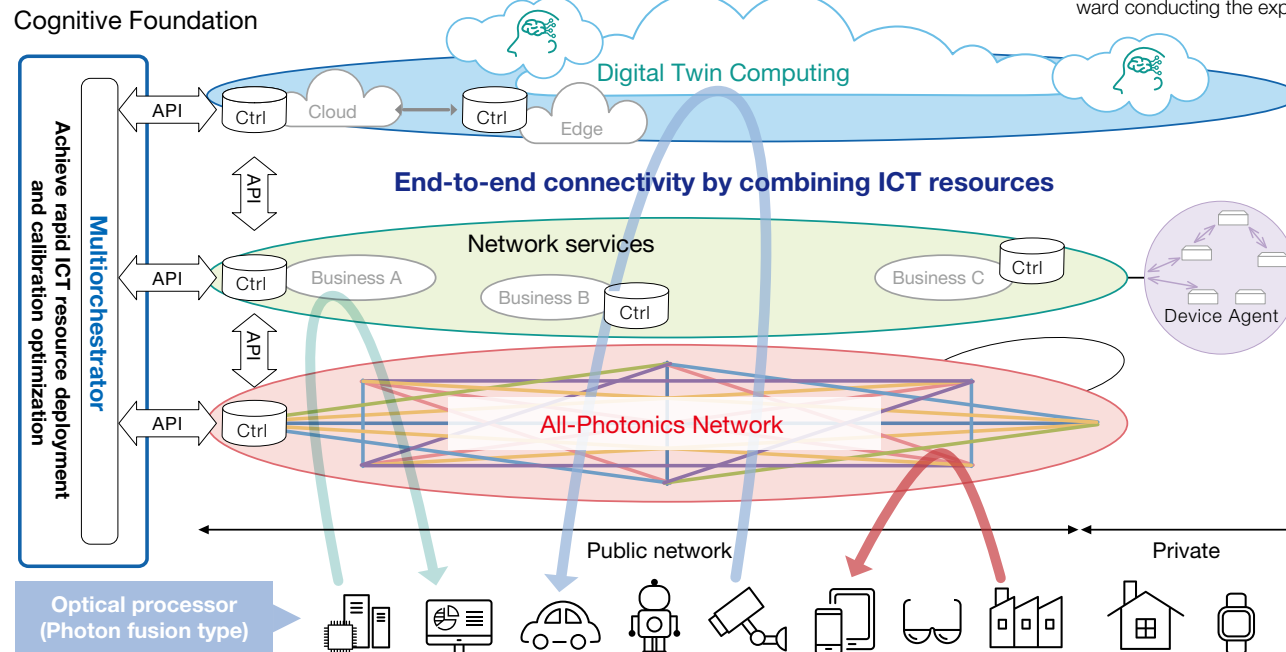
#### Digital Twin Computing

We combine highly precise digital information reflecting real-world objects, such as things, people and societies, to achieve large-scale, high-accuracy predictions and simulations of the future, and enable extremely advanced, real-time interactions between things and people in cyberspace.

### Research and Development to Support the IOWN Concept

By using light as a means for transmitting signals inside the processors that perform information processing and calculations inside a computer, we hope to create a hybrid opto-electrical processor that will solve problems that arise with electrical processing, such as power consumption and increase in heat emission, and realize ultra-low power consumption and high-performance information processing. We have realized ultra-compact photo-electric conversion elements such as an optical transistor that uses nano-photonics technology.

To conduct a comparative time experiment by connecting several optical lattice clocks that are more precise than atomic clocks, the current standard for measuring seconds, we used the optical fiber network of NTT East for an optical frequency transmission experiment with the University of Tokyo. As a result, the required frequency precision for the comparative experiment was achieved, representing a major step toward conducting the experiment.



### Increasing the Capacity of Optical Fiber Communication Networks

Increasing the capacity of mission-critical optical fiber communication networks has become an economic necessity. We have developed new proprietary technology for digital signal processing and ultra-wide area optical devices, increasing the channel capacity per wavelength to the point that transmission speeds achieve a level more than 10 times that of current commercial systems, and achieving a global first of 1 Tbps of capacity in long-distance wavelength-division multiplexed transmission trials. Furthermore, we also succeeded in developing an ultra-high-speed compact optical front-end module with integrated compact, wide-band InP optical modulator.

As another accomplishment, we realized high capacity wireless transmissions at approximately 10 times the speed of LTE and Wi-Fi, and five times that of 5G, by using the following two technologies.

The first one enables wireless transmissions at rates of 100 Gbps by using a method devised by NTT combining a principle called "OAM multiplexing" with MIMO technology. This generates multiple radio waves of different frequencies so that they can transmit simultaneously without interfering with the each other. The result is a dramatic increase in the volume of data that can be transmitted simultaneously, enabling large-capacity communications.

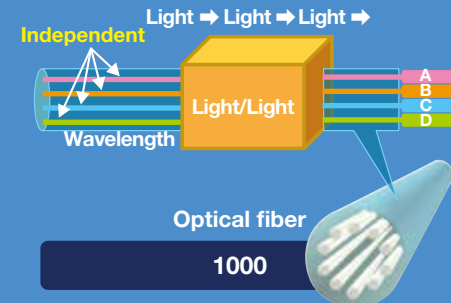
The second one, which was jointly developed with the National University Corporation Tokyo Institute of Technology, enables wireless transmissions of 100 Gbps in the 300 GHz band. It is easier to expand the transmission bandwidth or terahertz waves, including the 300 GHz band, although they require high-performance devices. We developed an ultra-high-speed integrated chip (IC) for wireless frontend devices, leading to the world's first 100 Gbps wireless transmission in the 300 GHz band.

### Optical Transistor Capable of High-Speed Operation with Ultra-low Power Consumption

As Moore's law approaches its limit in electronic circuits, there are expectations for a new, high-speed, energy-saving computing platform that incorporates optical technology. Achieving this requires technologies that have hitherto been considered difficult to achieve with low energy consumption, such as opto-electronic signal conversion and high-speed signal processing in the optical area. NTT has been develop-

ing a semiconductor nanostructure called photonic crystals with which to realize various tiny optical devices. In this work, we used our nanotechnology to realize a nano electro-optic modulator (E-O converter) and a nano photodetector (O-E converter) with extremely small capacitance and low energy consumption.

Moreover, through their integration, we also realized an O-E-O conversion optical transistor. These nano-optical technologies have opened the way to realizing high-speed, low-energy integrated opto-electronic information processing.

Low power consumption	High quality and high capacity	Low latency
<p><b>Power efficiency:</b> <b>100 times higher*1</b></p>	<p><b>Transmission capacity:</b> <b>125 times higher*2</b></p>	<p><b>End-to-end delay:</b> <b>1/200*3</b></p>
<p><b>Transmission media</b> Optical fiber cables</p> <p><b>Transmission systems</b> Light (wavelength) throughput</p> <p><b>Information processing platform</b> Photonics-electronics convergence devices</p>	<p>• Wavelength (optical signal)</p>  <p>Optical fiber 1000</p>	<ul style="list-style-type: none"> <li>• Transmission per wavelength</li> <li>• No queueing</li> <li>• No data compression</li> </ul> <p>Wavelength A: High-capacity video (uncompressed)</p> <p>Wavelength B: Speech</p> <p>No latency</p>
<p><b>Various information communication services are provided using 1/100th of power consumption</b></p>	<p><b>In an instant (0.3 sec), 10,000 two-hour movies can be downloaded (with 5G, one movie takes three seconds)</b></p>	<p><b>Video is transmitted in real-time without the latency experienced with digital TV or satellite broadcast</b></p>

\*1 Target power efficiency for portion where photonics technology is applied

\*2 Target communication capacity per optical fiber cable

\*3 Target latency in video traffic not requiring compression within the same prefecture

## Business Activity 3

# Developing and expanding the use of renewable energy

### Our commitment

Developing and promoting greater use of renewable energy

### Our objective

Increase the use of renewable energy, and reduce the NTT Group's greenhouse gas emissions\*1 compared to outcome\*2.

### Background and Concepts

The NTT Group is increasing its use of renewable energy\*3 as part of efforts to achieve its Environment and Energy Vision. The NTT Group is pushing ahead with development of renewable energy sources with the aim of generating around half of its renewable energy target from its own facilities by fiscal 2030.

### Use of Renewable Energy

During fiscal 2021, a total of 1.8 billion kWh of power consumed (or 23% of power consumption, around 150% year-on-year) throughout the entire NTT Group was switched over to renewable energy sources.

In 2020, the NTT Holdings head office and four facilities of NTT Laboratories made the switch to effectively 100% renewable energy\*4. As of April 2022, 132 buildings of the NTT East Group including the Hatsudai Building, 325 buildings of the NTT West Group, and 55 buildings of the NTT DOCOMO Group were among those that have already switched to renewable energy.



### Development of Renewable Energies

Renewable energy like solar power, wind power, geothermal, and biomass do not generate greenhouse gases when producing power, an advantage that makes developing and expanding the use of renewable energy an essential part of initiatives aimed at achieving a decarbonized society. The NTT Group established NTT Anode Energy in June 2019 with the aim of delivering smart energy solutions that leverage the technology, expertise, and resources of the NTT Group. Focused on achieving a decarbonized society and the promotion of local energy production for local consumption, NTT Anode Energy operates on three core approaches: (1) Providing customers with green energy solutions; (2) Promoting NTT's own decarbonization efforts; and (3) Utilizing battery farms to increase use of renewable energy.

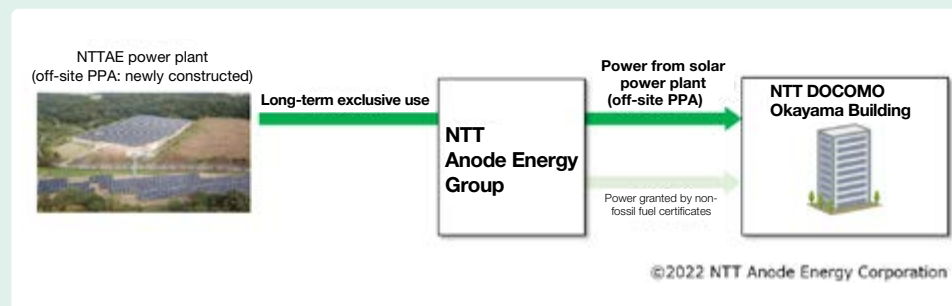
NTT Anode Energy is working together with various partners to develop renewable energy power plants in order to meet the green energy requirements of NTT Group companies. With a primary focus on sustainability, the company advancing development that takes into consideration ecosystems and living environments.

## Business Activity

### Initiatives rolled out at company buildings

By utilizing an off-site corporate PPA\*5 mechanism, power derived from renewable energy, procured from NTT Anode Energy's newly constructed solar power plant, is being supplied into the NTT DOCOMO Okayama Building, which houses network facilities.

Greenhouse gas emissions at the NTT DOCOMO Okayama Building, where the new system will be installed, are expected to be reduced by approximately 10,000 tons per year (including non-fossil fuel certificates).



\*1 GHG Protocol: for Scope 1 and 2

\*2 The introduction of effectively 100% renewable energy (including actual renewable energy through non-fossil fuel certificates) will have the optimal types of energy determined on the basis of each country's energy composition, etc. Approximately half of the domestic renewable energy usage is anticipated to be from energy sources owned by NTT (FY2030).

\*3 Includes actual renewable energy through non-fossil fuel certificates.

\*4 Refers to power generated from actual renewable energy that includes specified renewable energy through non-fossil fuel certificates.

\*5 Japan's first off-site corporate PPA scheme, which involves business operators building renewable energy power plants in locations removed from users for use exclusively by specified consumers, such as companies or municipalities, and supplying these users with electricity via the power grid over the long term.

## Expanding the Use of Renewable Energy

Together with the development of renewable energy sources, the NTT Group is also expanding its concept of local energy production for local consumption to stabilize the power grid, by charging and discharging its constructed battery farms.

There are some 7,300 NTT buildings located around Japan, housing around 4 million kWh of battery storage capacity that the NTT Group uses to maintain communications in the event of power outages. The group will develop battery farm operations around Japan by utilizing these battery farms to increase the use of renewable energy and help stabilize the power grid. With these businesses, NTT Anode Energy will partner with subsidiaries ENNET and NTT Smile Energy to help overcome various challenges on the way to developing a carbon-free environment for all of society.

This is achieved through a corporate PPA (Power Purchase Agreement), where customers use the electrical power generated from renewable energy power plants constructed on their sites or in remote locations.

Leading companies focus on the “Additionality” concept, where companies are encouraged to make investments in renewable energy projects as their selected source of financing, as a way of displacing the use of fossil fuels. NTT Anode Energy projects comply with the “Additionality” framework, so customers are able to use power generated from renewable energy via a corporate PPA.

### Business Activity



**NTT Anode Energy**  
Supplying 100% renewable energy to Seven & i Holdings stores and operations

In a joint project with Seven & i, NTT Anode Energy began powering 40 Seven-Eleven stores and the Ario Kameari shopping center completely with renewable energy. NTT Anode Energy supplies electricity via the power grid from two solar power plants established through an off-site corporate PPA\*1. The NTT Group’s green power plants are used to cover any shortfall in power supply.

### Business Activity



**NTT Anode Energy**  
Woody biomass power generation project in Ikoma City, Nara Prefecture

NTT Anode Energy is taking part in a woody biomass power generation project (Ikoma Project) operating in Ikoma City in Nara Prefecture, Japan. The Ikoma Project involves the construction

and operation of a 9,980 kW-scale power plant that uses around 100,000 tons of wood-derived fuel to generate 81 million kWh of power annually. The fuel used to generate power with this project is wood waste and unused wood collected from around the Kinki region, providing a supply of locally produced and local consumed power, including fuel for power generation, to customers in the Kinki region. Around 75% of the power generated is non-FIT that does not fall under FIT systems; the supply of carbon-zero electricity helps to create a carbon-free society.

### Business Activity

**NTT Anode Energy / NTT West**  
Supplying green electricity to regional exchange centers in Yamaguchi City as part of the “Smart Energy Utilization Project”



NTT Anode Energy and the Yamaguchi Branch of NTT West joined forces to begin supplying green electricity to the Hirakawa Regional Exchange Center and the Ootoshi Regional Exchange Center in Yamaguchi City via NTT Anode Energy. Renewable energy equipment—solar panels and battery storage systems—have been installed at both centers to supply power during normal conditions as well as for specific uses during power outages (such as lighting, wireless disaster warning systems, computers, and communication equipment), which helps to boost resiliency at evacuation facilities.

ICT is also in use for visualizing the characteristics like the amount of power generated, weather information, on-site usage ratio, battery level, and the amount of power generated and consumed on-site. This data is not only available at the site, but can also be viewed at the main government building and other remote locations. Efforts will continue to be made to resolve local issues through joint studies on the “Smart Energy Utilization Project” that makes use of renewable energy and ICT, as a part of the project to develop Yamaguchi City as a smart city.

\*1 Japan’s first off-site corporate PPA scheme, which involves business operators building renewable energy power plants in locations removed from users for use exclusively by specified consumers, such as companies or municipalities, and supplying these users with electricity via the power grid over the long term.

## Business Activity 4

# Providing new services that contribute to carbon neutrality

### Our commitment

Promoting the provision of new services that contribute to carbon neutrality

### Our objective

Provide new services designed with the environment in mind, such as the development of services that use renewable energy, and visualization of the reduction in greenhouse gas emissions.

### Background and Concepts

In addition to the Green of ICT, which will curb the environmental impact of NTT Group by introducing IOWN technologies and increasing the use of renewable energy, we will also work on Green by ICT, which will contribute to reducing the environmental impact of society as a whole.

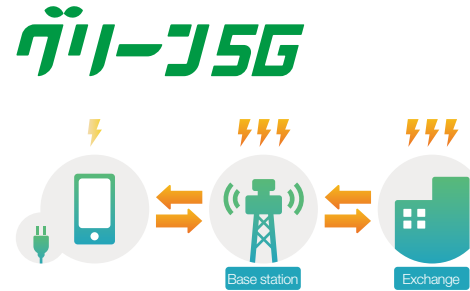
### NTT DOCOMO Green 5G

In September 2021, NTT DOCOMO announced “2030 Carbon Neutral Declaration,” committing to the reduction of the greenhouse gas emissions arising from its business activities effectively to zero by 2030. In addition to its own business activities, DOCOMO has devised the slogan “Saving Our Planet With You” to help achieve carbon neutrality throughout the whole of society, together with its customers and partner companies. DOCOMO provides Green 5G as part of its service aimed at achieving carbon neutrality.

While the power used to recharge smartphones and other mobile devices may be the first thing one thinks of when it comes to the power that these devices use, a significant amount of power is actually consumed by mobile network communications that operate base stations and exchanges.

The majority of electricity in Japan still uses fossil fuels for power generation, thus resulting in greenhouse gas emissions like CO<sub>2</sub> that is one of the causes of global warming. DOCOMO is making the switch to power sources free of greenhouse gas emissions, by using solar-powered green base stations and renewable energy (corporate PPA\*1) generated by solar panels installed specifically for DOCOMO.

The ratio of actual renewable energy\*2 out of DOCOMO’s total power consumption is higher than the ratio of 5G subscribers out of the total number of subscribers, which means the Green 5G service is provided effectively free of greenhouse gas emissions.

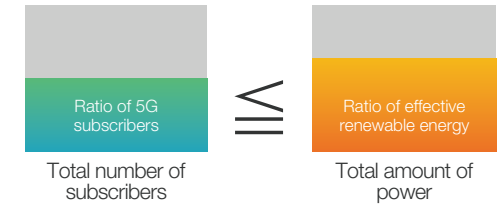


### NTT DATA's greenhouse gas emissions visualization platform, C-Turtle™

To achieve carbon neutrality throughout the whole society, NTT DATA has been providing C-Turtle™, its greenhouse gas emissions visualization platform.

In recent years, companies have been expected to visualize their greenhouse gas emissions, but with so many different calculation methods available, choosing the best method has proven to be a difficult task. The most common method that companies use to calculate their emissions uses the formula “Amount of activity (quantity and value of raw materials and products)” x “Emissions intensity (fixed emissions set for that product (industry average))”. The problem with this method is that the calculation results do not show any effects of reduction even when switching from older products to green products or services in order to reduce the amount of emissions. The provided platform offers a “visualization process construction method” that facilitates the creation of calculation methods suitable for each company based on its business characteristics and the data it possesses. It also offers a “supplier-specific calculation method” that incorporates the emissions reduction efforts of suppliers into the same reductions at procuring companies. This allows for efficient and effective visualization of emissions specific to each company.

DOCOMO's 5G service is Green 5G with effectively zero greenhouse gas emissions



Emissions data and sales figures provided by global non-governmental organization CDP are used to calculate emissions intensity for each company. NTT DATA is the only company in Japan licensed to use CDP’s corporate emissions data.

\*1: PPA, an abbreviation of Power Purchase Agreement, is a scheme in which electricity users (DOCOMO) conclude contracts with power generation business operators to procure renewable energy over the long term.

\*2 Achieves effectively 100% renewable energy, including non-fossil fuel certificates for specified renewable energy.

## Business Activity 5

# Creation of innovative environment and energy technologies

### Our commitment

Creation of innovative environmental energy technology for reducing global environmental impact

### Our objective

Promoting the creation of innovation with next-generation energy technologies.

### Background and Concepts

The NTT Group is creating innovative technologies aimed at addressing a range of issues related to the environment and energy such as climate change. In July 2020, we established the NTT Space Environment and Energy Laboratories for regenerating the global environment and achieving a sustainable and inclusive society. We will create technologies that will drive innovation in the field of smart energy, including next-generation energy, and for the future of the global environment.

### Energy network technologies

Indoor direct-current power supply technology—a field that the NTT Group excels at—is being developed for outdoor use with the aim of achieving a high-resilience, autonomous, decentralized, and coordinated energy network to link NTT buildings and consumers in the surrounding area with direct current supply, for a flexible and efficient power supply system that is also reliable when disasters strike. Research is being conducted into technology that simulates information on energy demand, generation and storage capacities in cyberspace in an integrated manner, and applies the optimal figures to control the actual grid and achieve an ideal balance between supply and demand. Another field of study is focusing on technology for the spatial and temporal reallocation of communications traffic between multiple regions or calculations and other information processing capabilities for more efficient use of renewable energy, which is prone to fluctuations due to weather conditions.

### Sustainable systems technologies

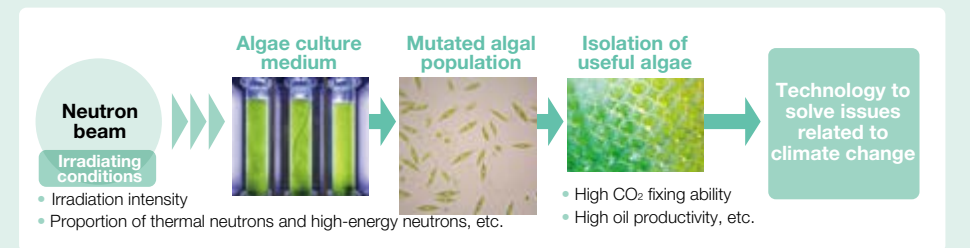
Practical applications of technology that reduces CO<sub>2</sub> in the atmosphere or water are being developed, covering artificial photosynthesis (based on an electrochemical approach) achieved with semiconductor technology and catalyst technology, as well as technology that maximizes the capabilities of plants and algae (based on a biological approach). The electrochemical approach utilizes materials informatics to test combinations of materials that would not have been possible to discover using traditional experimental techniques or existing concepts. The biological approach involves research using digital twins, where various cultivation environments are recreated in cyberspace to test the effects of genome editing or climate control, before applying them to the real world for additional testing.

### Proactive environmental adaptation technologies

We are focusing our efforts on research topics enabling society to take a proactive stance and adapt physically to extreme weather or environmental conditions. Lightning is an example of research being conducted on weather control. We have developed advanced technologies as a means of protecting communications facilities from lightning strikes, and we are now expanding our research in this field to develop lightning control and lightning charging technologies. More specifically, this research involves high-precision forecasting of areas prone to lightning strikes, employing lightning control technology so that drones trigger lightning strikes, and then lightning charging technology to store the energy from that lightning. The future goal is to develop floating lightning energy absorption systems that operate autonomously using natural energy including that from lightning strikes to absorb energy before the lightning strikes the ground.

### Business Activity

NTT has teamed up with Euglena Co., Ltd. to begin a proof-of-concept for seaweed growth technology aimed at resolving climate change-related challenges by using neutron beams\*1 to reduce greenhouse gases or create energy resources. The technology showcased with this proof-of-concept uses neutron beam irradiation to trigger genetic mutation\*3 for increasing the useful characteristics\*2 of algae, such as its CO<sub>2</sub> (carbon dioxide) absorption and fixation potential and ability to produce oils that form the raw material of biofuels. Neutron beams have a much higher level of permeability than other types of radiation, and can provide an effective and irregular form of energy required for living organisms growing in liquids, like algae. Selecting and irradiating with suitable thermal neutrons or high-energy neutrons enable various forms of genetic mutation to occur, which will make it possible to grow and produce algae that is more usable, and more suited to particular applications. And in addition to reducing greenhouse gases or producing energy resources, the technology is hoped to play a role addressing various other climate change-related issues, with solutions involving the creation of food sources or agricultural, forestry and fisheries-derived feed.



\*1: Neutron beam: A neutron is a particle that makes up an atomic nucleus. When a nucleus undergoes nuclear fission, neutrons are released from the nucleus along with kinetic energy. The unidirectional movement of this energy is called a neutron beam.

\*2: Morphological characteristics: Refers to the properties or characteristics of living organisms.

\*3: Genetic mutation: Refers to when the base sequence of DNA that makes up genes mutate from the original sequence. Genetic mutation modifies the functions of proteins that are made by genes.

## Other initiatives

### Reduction of environmental impact throughout the supply chain

The NTT Group has released the “NTT Group Guidelines for Sustainability in Supply Chain” outlining various areas that we require all parties throughout our supply chain to comply with, as part of efforts to develop and achieve a supply chain free from social problems like human rights violations, environmental concerns and safety issues. These guidelines contain the responsibilities that each company in the supply chain should be taking in order to achieve a sustainable society.

The “NTT Group Green Procurement Standards” has been released to cover environmental-related details outlined in the “NTT Group Guidelines for Sustainability in Supply Chain.” These standards provide an outline of the NTT Group’s environmental activities, and include areas and laws that suppliers must follow, reference and strive to achieve, as well as items covering procurement assessments for products and suppliers. This document applies to NTT Group companies, including those overseas.

We assess environmental and other risks by conducting the Supply Chain Sustainability Survey (SAQ) using the Supply Chain Sustainability Promotion Check Sheet to confirm the status of compliance with environmental and other guidelines and technical requirements. The survey targets all of the NTT Group’s critical suppliers that account for at least 90% of total procurement value, supplier of non-substitutable products and supplier of important products. From fiscal 2022, we have started holding “direct dialog” every year with 40 to 50 companies covered by the SAQ.

### Highest rating in 2021 Supplier Engagement Ratings by CDP

The NTT Group was praised for its efforts aimed at reducing CO<sub>2</sub> emissions throughout its entire supply chain, and has been selected as the highest “Supplier Engagement Leader” in the “Supplier Engagement Survey\*” run by CDP, an international non-governmental organization assessing environmental-related matters.

\* Supplier Engagement Survey: Assesses company supply chain activities that affect climate change. Companies assessed with the highest ratings are selected as “Supplier Engagement Leaders.”



### Technical Requirements listed in the NTT Group Guidelines for Sustainability in Supply Chain (Environment)

1. Obtain environmental permits and report to the government
2. Manage chemical substances contained in products
3. Manage chemical substances
4. Minimize environmental pollution (wastewater, sludge, exhaust, noise, vibration, etc.)
5. Reduce energy consumption and greenhouse gas emissions
6. Reduce environmental burden by implementing product assessment
7. Effectively use resources and manage waste
8. Conserve biodiversity
9. Implement environmental investigations in the supply chain

### Environmental risk assessments with the Supply Chain Sustainability Survey (SAQ)

In fiscal 2021, NTT ran a sustainability survey for around 130 suppliers with the aim of assessing and identifying environmental and other risks throughout the entire supply chain. The survey covers 25 environmental-related items such as regulation and administrative reporting, management methods, and energy-saving and decarbonization initiatives.

#### [Examples of survey items]

Tell us about your activities aimed at reducing greenhouse gas emissions.

(options)

1. We release our targets and results for greenhouse gas emissions (greenhouse gas emissions targets are equivalent or higher than NTT’s targets (\*))
2. We release our targets and results for greenhouse gas emissions (greenhouse gas emissions targets are lower than NTT’s targets (\*), but there are plans to revise them to the equivalent or higher than NTT’s targets within a year)
3. We release our targets and results for greenhouse gas emissions (greenhouse gas emissions targets are lower than NTT’s targets (\*), and there are no plans to revise them within a year)
4. We do not release our targets and results for greenhouse gas emissions

(\* Emissions in the supply chain related to business activities (Scope3): 15% reduction by FY2030 from a FY2018 base year (Reference) <https://group.ntt/en/newsrelease/2021/12/03/211203a.html>

### Procurement Through NTT Group Green Finance

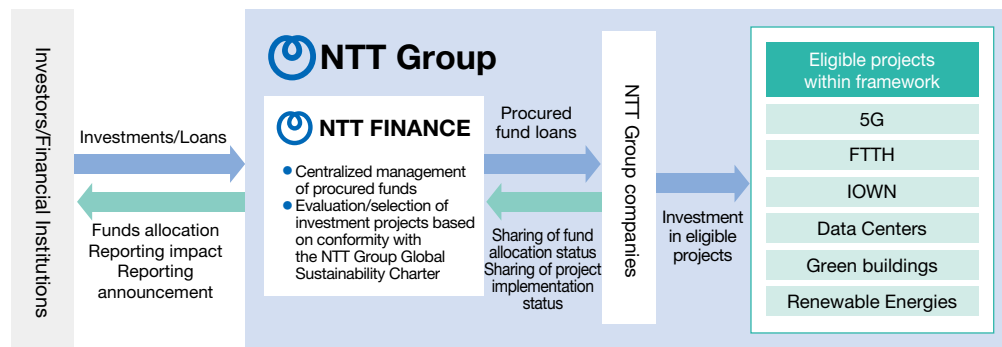
NTT Group has formulated the NTT Group Green Finance Framework with the goal of strengthening its commitment to Group-wide efforts to achieve a sustainable society and promoting them vigorously, including from a financial perspective. Since its establishment in June 2020 as the NTT Group Green Bond Framework, this framework has been revised in accordance with the Group's initiatives for making a sustainable society a reality.

NTT FINANCE, the Group's core financial company, will issue green bonds or procure funds through green loans in accordance with the Green Finance Framework.

The funds raised will be invested in projects that contribute to solving environmental issues at Group companies.

When raising funds, NTT FINANCE will evaluate and select investment projects based on conformity with the NTT Group Sustainability Charter. It will also centrally manage procured funds and confirm their appropriation for projects. The Group will report annually on the allocation of funds and the project's environmental impact. The Green Finance Framework as well as Fund Allocation Status Reporting and Impact Reporting are available on the NTT FINANCE website.

(<https://www.ntt-finance.co.jp/eng/ir/greenbonds/index.html>)



### Green Bond Issuance Status

June 2020 ¥40 billion in total	Eligible projects: Green buildings
October 2021 ¥300 billion in total	Eligible projects: 5G-related investments, FTTH-related investments, R&D for achieving the IOWN concept, and renewable energy
December 2021 EUR 1.5 billion in total	
July 2022 USD 1.5 billion in total	

### Green Finance Framework Target Projects

Eligible projects:	Specific projects	Impact reporting item
5G-related investments	Development and installation of energy-saving 5G base stations/installation of commercial base stations and development of base stations capable of conserving electricity by automatically switching to sleep mode, such as during the evenings and time of low traffic	• Number of 5G base stations installed
FTTH-related investments	Construct and operate optical fiber networks (FTTH) as foundation for a remote world, to help reduce amount of electricity used compared with the Company's conventional equipment	• Number of subscribers (households)
R&D to make IOWN a reality	Roll out/aim to commercialize by 2030 photonics-based connections between bases at endpoint devices, such as handsets and computers, R&D to make possible an optical disaggregated computing architecture that should sharply reduce electricity usage through the use of photonics connections (optics inside LSI) when transmitting signals between chips on circuit boards	• Desired effects • R&D progress
Highly efficient and power-conserving data centers	Construction, renovation, acquisition, and operation of new and existing data centers with a Power Usage Effectiveness (PUE) of less than 1.5	• CO <sub>2</sub> emissions (t-CO <sub>2</sub> )
Green buildings	Construction, renovation, and acquisition of various environment-related building certifications and evaluations for properties to be acquired	• Green building names, certification level, acquisition/re-acquisition period • CO <sub>2</sub> emissions (t-CO <sub>2</sub> )
Renewable Energies	Construction, renovation, acquisition, and operation of renewable energy projects (solar power, wind power, etc.) NTT Group is involved in	• Generation capacity/generated electricity (GWh) • Amount of CO <sub>2</sub> reduced (t-CO <sub>2</sub> )

## Social Challenge

# 2

## Implementing closed loop recycling

### Business Activity

6. Increasing the reuse and recycling of communications equipment, mobile terminals, and other technologies
7. Reduction in plastics use and promotion of recycling
8. Proper treatment, storage, and management of hazardous waste
9. Appropriate and efficient management of water resources



### Why it matters

Although our one-way society of mass production, mass consumption, and mass disposal has brought affluence and convenience to our lives, it has brought about various problems such as the creation of massive amounts of re-fuse, illegal dumping and concern about the depletion of natural resources. To resolve these issues we must first review how companies manage their businesses as well as our social and economic systems, and shift to a closed loop society.

### What can be accomplished

In an effort to realize a future with closed loop recycling, the NTT Group promotes the 3Rs (reduce, reuse, and recycle), working to reduce the amount of materials consumed by our business activities and reuse or recycle the resources that are consumed.

### Future vision

We will shift from a one-time use consumption-oriented company to a recycling-oriented one. We will promote the effective use of resources throughout the entire life cycle of products and systems, from procurement to use and disposal.



## Business Activity 6

# Increasing the reuse and recycling of communications equipment, mobile devices, and other technologies

### Our commitment

Promoting the 3Rs (reduce, reuse, and recycle), working to reduce the amount of materials consumed by our business activities and reuse or recycle the resources that are consumed

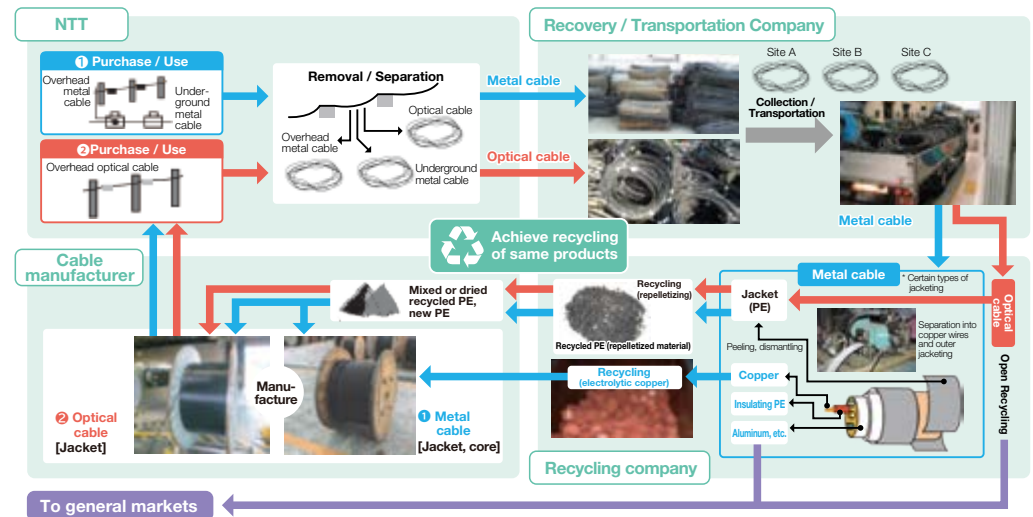
### Our objective

**99% or higher**

FY2030: Recycling ratio of disposed waste generated by the NTT Group

### Background and Concepts

The NTT Group has established a target for achieving a 99% or higher recycling ratio of disposed waste generated by the NTT Group by fiscal 2030. We require a large amount of resources in order to sustain our business operations and provide various services including information communication. This is why we have set a target to contribute to both the avoidance of business continuity risks and achievement of closed loop recycling. In fiscal 2021, the recycling ratio of disposed waste was 97.8%. We will continue to work hard to promote the 3Rs toward our goal of 99% or higher. Regarding decommissioned telecommunications equipment, we have achieved zero emissions (1% or lower final disposal ratio of waste) for 18 consecutive years since fiscal 2004.

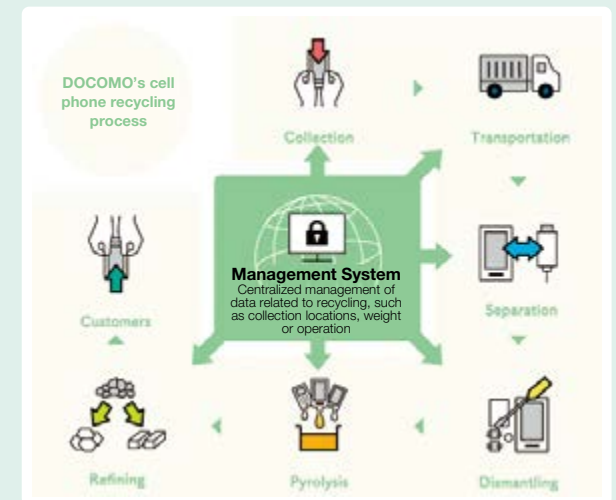


### Business Activity

#### NTT DOCOMO Recycling Process for Mobile Phones

Since 1998, NTT DOCOMO has collected used mobile phones from customers at its approximately 2,300 docomo shops throughout Japan, and through various events. Containing gold, silver, copper, palladium, and other metals, mobile phones could be regarded as a valuable recycling resource in Japan with its paucity of mineral resources.

- In fiscal 2021, we collected about 3.23 million\*1 mobile phones, bringing our cumulative total to 121.55 million units collected.
- In fiscal 2011, the company introduced a new recycling process for pyrolyzing any plastic used in mobile phones to turn it into oil for use as a fuel, after which gold, silver, and other metals are recovered from the residues of this process.



\*1 The number of units collected for reuse is included in the figure after fiscal 2015.

## Business Activity

### NTT Communications

#### Sustainable Systems Produced by Subsea Cable Recycling

The normal length of subsea cables installed in Japan's territorial waters is 20 to 30 km per cable run, but the cable managed by NTT Communications connecting Kagoshima Prefecture with Okinawa Prefecture is 250 km in length as it passes through various islands en route. The cable went out of service in 2018 and was expected to result in about 850 tons of waste, presenting a significant challenge in terms of environmental impact and disposal costs. Therefore, NTT Communications concluded an agreement with South Africa's Mertech Marine, the only operator in the world capable of completely disassembling subsea cables to the level of raw materials, to develop a new scheme for controlling both environmental impact and disposal costs by recycling 99% of the cable that requires disposal. It is also contributing to creating regional safety nets through Marine Mertech with the employment of unskilled workers and donations to non-profit organizations engaged in initiatives such as supporting impoverished families.

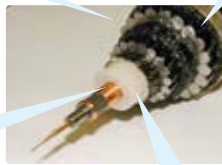
Coal tar coating for armor wire completely separated and pelletized



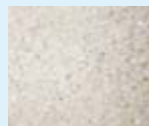
Outer armor wire properly coiled



Copper tape separated and pelletized



High-purity polyethylene used for outer cover can be sold at high price if completely separated and pelletized



**Currently, all components other than optic fibers are completely recycled (99% of total volume).**



## Business Activity 7-8

# Reduction in plastics use and promotion of recycling Proper treatment, storage, and management of hazardous waste

### Our commitment

Reduction in plastics use and promotion of recycling Proper treatment, storage, and management of hazardous waste

### Our objective

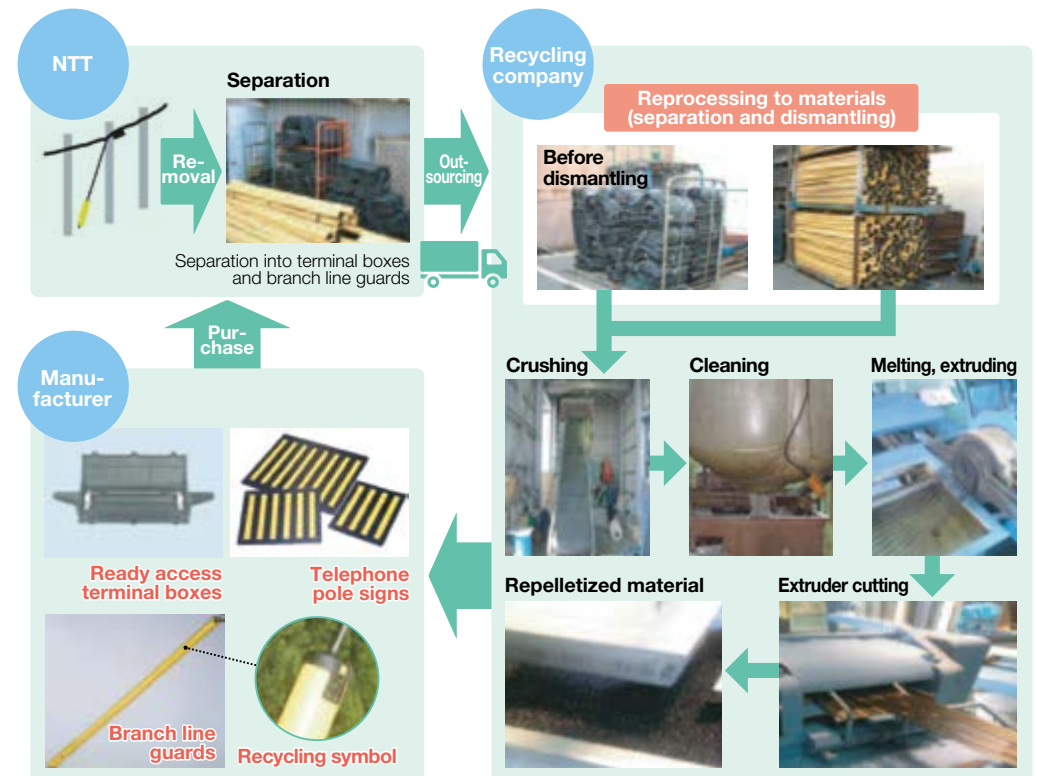
Reduction in plastics use and promotion of recycling of plastics including telecommunications equipment, hazardous waste disposed of in compliance with laws and regulations, and ensure proper storage, management, and disposal.

### Background and Concepts

The NTT Group is seeking to reduce the use of plastics and promoting recycling. For example, plastic parts of telecommunications equipment such as coverings for branch lines and ready access terminal boxes are used in a closed recycling system in which similar types of disposed covers are recycled into plastics to manufacture new products. We are also seeking to abolish the use of plastic packaging materials for devices used at customers' homes when connecting optical lines such as optical network units (ONU) and home gateway (HGW) units.

### Hazardous Waste

For NTT Group operations, hazardous waste as defined by law applies to asbestos contained in waste generated from construction work on relay stations, waste such as transformers and condensers containing PCBs, and lead batteries. These are disposed of appropriately and in compliance with the Waste Management and Public Cleansing Law (Waste Disposal Law) as well as other laws and regulations, and the NTT Group does not have a record of disposing of such waste in foreign countries. We also pay meticulous attention to the proper storage and management of equipment containing PCBs and PCB contaminated wastes, and dispose of them with safe and appropriate methods in conformity with the Law Concerning Special Measures Against PCB Waste.



## Business Activity 9

# Appropriate and efficient management of water resources

### Our commitment

Managing water usage and protecting valuable water resources

### Our objective

The NTT Group is Reducing its Consumption of Tap Water, and Implementing Thorough Measures Against Leakages of Chemical Substances into Wastewater.

### Background and Concepts

Due to the nature of the NTT Group's business, little water is consumed in our operations. In Japan, one-year domestic and industrial water consumption totaled 25.5 billion m<sup>3</sup>\*1, while the NTT Group's water consumption totaled 4.751 million m<sup>3</sup>, only about 0.02% of the total for all of Japan. Moreover, our water use is spread out across the country and so we believe our water intake does not have any significant impact on water sources. The NTT Group reduces its consumption of tap water by using recycled wastewater and rainwater. Research centers where we use chemical substances in our research activities implement individual measures against leakages of chemical substances into wastewater. For example, at the Atsugi R&D Center, which carries out research on the physical properties of materials, we have installed equipment to treat chemical-infused waste liquid discharged by the laboratories. Furthermore, we regularly monitor the quality of this wastewater to confirm that it is within legal regulation values. The NTT Group has not been involved in any significant spills.

### Business Activity

#### Providing People All Over the World with Clean, Safe Drinking Water

NTT DATA Italia has been researching smart water management systems that incorporate IoT since 2016. Through processes such as hackathons, in which various engineers from throughout the company meet to share opinions and ideas, it has developed origAMI (original Advanced Metering Infrastructure). In addition to enabling appropriate monitoring, such as reducing leakage rates by monitoring pipe networks in real time, this infrastructure also functions as a tool for the prevention of accidents by running simulations and accumulating measurement data for each region. Currently it is being used in public works in Italy and we plan to expand its use to other parts of Europe and then Asia.



### Business Activity

#### NTT DATA Services Water restoration project in Chennai

Waste and other forms of pollution have significantly affected the biodiversity of Lake Ka Nagar Nagar in Perambur, Chennai of Tamil Nadu, India. In light of these conditions, NTT DATA Services worked with the Environmentalist Foundation of India (E.F.I.) constructing recharge wells and removing waste and foreign plants, which helped to improve the environmental conditions of the lake.

\*1 From the Ministry of Land, Infrastructure, Transport and Tourism website. Actual water use in 2018 (water intake basis) was approximately 79.1 billion m<sup>3</sup> per year (domestic and commercial use of water: approximately 15.0 billion m<sup>3</sup>; water for industrial use: approximately 10.6 billion m<sup>3</sup>; water for agricultural use: approximately 53.5 billion m<sup>3</sup>).

## Other initiatives

### Business Activity



#### NTT BUSINESS SOLUTIONS

##### Providing resource recycling solutions for regional foods

Reducing food waste and developing food recycling programs are drawing increased attention around the world these days. One way to address these recycling problems like these is the resource recycling solution for regional foods provided by NTT Business Solutions. Compost created from leftover food is supplied to farms to help grow vegetables and achieve a recycling-oriented community.



Summit, Inc., which operates food supermarkets in the Tokyo area, implemented this scheme at its Setagaya-Funabashi store that it opened in April 2022. Vegetables scraps and other waste are processed at the back dock of the store, where the “Four Stars” is installed to ferment and break down the scraps as part of an efficient raw waste processing system. Building on the positive results achieved at the Setagaya-Funabashi store, Summit is planning to install the system at 20 other stores during fiscal 2022 (expanding to more stores the following years). Recycling scheme processes can remain obscure after the sorting and collection stage. Developing a system that processes waste at

stores helps to increase awareness amongst workers, and this scheme is anticipated to help resolve problems related to food recycling.

## Social Challenge

# 3

A future where people and nature are in harmony

### Business Activity

- 10. Thoroughly implementing environmental assessment
- 11. Contributing to natural ecosystem conservation



### Why it matters

The NTT Group's businesses have an impact on ecosystems. For example, the telecommunication equipment essential to our business operations, particularly telephone poles and communications cables, is installed in the natural environment. At the same time, we are sometimes affected by the ecosystem, for example cables are bit and damaged by squirrels or crows. Ecosystems full of biodiversity provide the bounty, such as water and food, which is critical to supporting all forms of life on earth, and thus require a proper approach for conservation.

### What can be accomplished

Through our business and employee activities, we will promote initiatives related to conserving ecosystems within nature, in order to ensure that nature is left untouched for future generations.

### Future vision

The NTT Group is working to preserve the ecosystems, which are the foundation of society's activities, while also conducting environmentally friendly business activities that take into consideration the mutual influence between ecosystems and the NTT Group.



## Business Activity 10

# Thoroughly implementing environmental assessment

### Our commitment

Implementing environmental assessments during the construction of data centers and other buildings

### Our objective

The NTT Group adheres to its Green Design Guideline for Buildings when constructing new data centers or other buildings, and endeavors to reflect the necessary aspects in the facility's design.

### Background and Concepts

Communications equipment, data centers and other buildings as well as solar panels required for the NTT Group's business activities present an impact on the environment. In light of this, facilities are designed to minimize impact on the ecology.

### Environmental Assessments during the Construction of Data Centers and Other Buildings

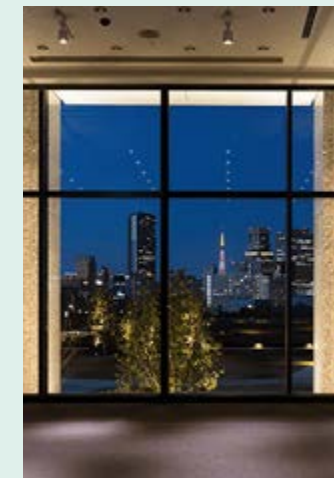
When planning to construct new data centers or other buildings, we research the historical, social, geographical, biological, and environmental attributes of the prospective building site and surrounding district based on our NTT Group Green Design Guideline for Buildings, and endeavor to reflect the necessary aspects in the facility's design. For example, we use native plant species as vegetation for greening our data centers, which have in recent times become the core components of ICT infrastructure.

When drawing up proposals for the construction of new data centers for customers, the NTT Group applies the Comprehensive Assessment System for Built Environment Efficiency (CASBEE<sup>\*1</sup>) and submits proposals designed to obtain the highest CASBEE rank of S. While paying due consideration to the environment in this way, we also take care to minimize noise and vibration and maintain the scenic appeal of the district during construction while endeavoring to ensure that exhaust heat and noise from the air conditioning outdoor units and emergency generators of functioning data centers will have minimal impact on neighboring areas.

<sup>\*1</sup> CASBEE: A system for the comprehensive assessment of the quality of a building from such perspectives as environmental performance, interior comfort, and scenic appeal

<sup>\*2</sup> ZEBs are defined as buildings using advanced architectural designs that aim to realize substantial energy savings while maintaining the indoor environment by (1) reducing the energy loads, (2) positively utilizing natural energy by applying passive technologies, and (3) introducing high efficiency equipment and systems. They additionally aim to achieve the highest degree of energy independence and reduce the annual primary energy balance to zero by (4) introducing renewable energy.

### Business Activity



### NTT Urban Development

#### Shinagawa Season Terrace acquires "ZEB Ready" certification

Compared to standard buildings, Shinagawa Season Terrace is able to reduce its annual primary energy consumption in its office areas by 51% (43% for the entire building), and acquired the top 5 star rating in the Building-Housing Energy-efficiency Labelling System (BELS) and ZEB<sup>\*2</sup> Ready" certification in December 2019 for the office area that is its main application. Featuring atriums filled with natural light and wind, a heat discharge system using cool external air, air-conditioning using a sewage heat recovery system, recycled water, and more, Shinagawa Season Terrace is one of the highest standard environmentally friendly office buildings in Japan, with eco designs and facilities offering excellent comfort and energy efficiency.

## Business Activity 11

# Contributing to natural ecosystem conservation

### Our commitment

Business activities that contribute to preservation of the Ecosystem

### Our objective

The NTT Group is working on activities that contribute to preservation of the ecosystem by harnessing our information dissemination capabilities.

### Background and Concepts

As a company providing ICT services, we are working on contribution activities that harness our information dissemination capabilities. The guidelines that apply to various business types and industries within the NTT Group outline the requirements for materials used for business activities. This applies to procurement and purchasing activities conducted at each business site within the NTT Group, as part of efforts to switch over to renewable energy sources and forest certified paper, which has a low environmental impact. Compared with the adverse effects on ecosystems caused by mining fossil fuels or global warming, renewable energy sources are deemed to have minimal negative impacts. The NTT Group operates services that supply both corporate and private customers with power from renewable energy sources, as it aims to run business activities that reduce the impact that society as a whole has on ecosystems.

### Business Activity

#### NTT DOCOMO Sea turtles returning the favor

As part of initiatives aimed at the conservation and restoration of biodiversity, NTT DOCOMO is involved in establishing and promoting world natural heritage site community initiatives aimed at environmental conservation and regional development around Amami and Okinawa. Together with regional government bodies and local universities as well as local companies, we are also involved in regional contribution and revitalization activities to take advantage of rare species and the natural environment, with the aim of registering world natural heritage sites and establishing a recirculation model for environmental conservation and regional development. Addressing the problem of marine debris is a key environmental conservation initiative in Okinawa Prefecture, and NTT DOCOMO is taking part in activities alongside local organizations. A marine debris collection drone was constructed as part of this initiative, as the collection of floating waste had the potential to assist with cleanup activities and reduce the impact on marine life.

The drone is operated using a smartphone, with a live video feed from a camera installed on the drone providing a more intuitive approach to debris collection. Plastic waste collected from local cleanup activities was recycled by pressing it into plastic sheets for use as the outer shell of the sea turtle.

A seagull-shaped drone has also been made to help search for marine debris from up in the air. A similar camera setup as the sea turtle-shaped marine debris drone provides a live video feed from the air direct to smartphones. This makes it much easier to search over wide areas along the coast that are difficult for people to access.



# NTT Group Disclosures in Line with TCFD Recommendations

In May 2020, the NTT Group declared its support for Task Force on Climate-Related Financial Disclosures (TCFD) established by the Financial Stability Board (FSB), and in its sustainability report of the same year, began disclosing information related to eleven items recommended in the TCFD declaration. The results of scenario analysis conducted on the impact that climate change will have on the NTT Group in the future revealed various risks, particularly those related to policies, regulations and social demand aimed at transitioning toward a decarbonized society. To address these risks, the NTT Group established the new environment and energy vision “NTT Green

Innovation toward 2040” with the aim of reducing emissions by 80% by 2030 and becoming carbon neutral by the year 2040, by increasing development and use of renewable energy sources and rolling out IOWN to significantly reduce power consumption and alleviate the impact of these risks. The NTT Group will be focusing on resilience linked to growing its own businesses, while also helping to resolve social issues caused by climate change and develop a sustainable society by providing services that contribute to carbon neutrality.

Item	Details																						
<p><b>Governance</b></p> <p>a. Supervision system for directors</p> <p>b. Role of executives</p>	<p>The NTT Group recognizes that environmental issues are one of the most important challenges for management, and items of particular importance such as creating environmental targets for the entire group are decided based on discussions held with directors. An example that highlights this is NTT’s environment and energy vision “NTT Green Innovation toward 2040” announced in September 2021—this was established following discussions with all directors, including outside directors, held three times throughout the fiscal year. The Board of Directors made the decision in November 2021 to include non-financial KPIs such as GHG emissions into the business plans of each group company, with those attainment levels to be reflected in the compensation of directors as critical indicators. The supervision system for directors consists of the Sustainability Committee (chaired by the President)</p> <p>established in November 2021 directly under the Board of Directors, with the Green Innovation Committee established as an internal unit under the Sustainability Committee. The Global Environmental Protection Promotion Committee had previously managed and implemented environmental activities policies and their progress across the entire group, but these functions will be transferred to the Green Innovation Committee moving forward, to create a system where policies related to sustainability (the Charter and creating and abolishing accompanying policies, particularly deciding critical indicators) will be decided by the Board of Directors via the Sustainability Committee, and other matters will be decided by the Executive Officers Meeting. The role of the senior executives is to identify environmental issues and risks, and promoting businesses while taking into consideration these situations.</p>																						
<p><b>Strategy</b></p> <p>a. Specific risks and opportunities</p> <p>b. Impact on businesses, strategy and financial planning</p> <p>c. Resilience of strategy</p>	<p>The NTT Group carried out scenario analysis based on its own processes for selecting key environmental issues. The results revealed various risks, particularly those related to policies, regulations and social demand aimed at transitioning toward a decarbonized society. To combat these risks, the medium-term management strategy was revised with a focus on addressing environmental issues as a key priority. These will be linked to businesses via activities such as “Enhancement of corporate value through ESG initiatives,” “Reducing power consumption with innovation such as IOWN,” and “Developing and expanding the use of renewable energy,” to help develop a sustainable society.</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Risks Identified with Scenario Analysis</b></p> <ul style="list-style-type: none"> <li>■ Increase in costs for decarbonization and renewable energy charges</li> <li>■ Criticism related to fewer efforts toward ESG</li> <li>■ Increase in natural disasters such as heavy rain and flooding</li> <li>■ Increases in air-conditioning and other electricity costs</li> </ul> <p><b>Response measures (Environment and Energy Vision “NTT Green Innovation toward 2040”)</b></p> <table border="1" style="width: 100%;"> <tr> <th style="background-color: #4CAF50; color: white;">Green Of ICT</th> <th style="background-color: #4CAF50; color: white;">Green By ICT</th> </tr> <tr> <td> <ul style="list-style-type: none"> <li>■ Reduction of power consumption by introducing IOWN technologies</li> <li>■ Developing and expanding the use of renewable energy, etc.</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>■ Acceleration of DX and promotion of Remote World</li> <li>■ New services that contribute to carbon neutrality</li> <li>■ Green electricity retail, etc.</li> </ul> </td> </tr> </table> <p style="text-align: right; font-size: small; color: #0070C0;">To business strategy opportunities</p> </div>	Green Of ICT	Green By ICT	<ul style="list-style-type: none"> <li>■ Reduction of power consumption by introducing IOWN technologies</li> <li>■ Developing and expanding the use of renewable energy, etc.</li> </ul>	<ul style="list-style-type: none"> <li>■ Acceleration of DX and promotion of Remote World</li> <li>■ New services that contribute to carbon neutrality</li> <li>■ Green electricity retail, etc.</li> </ul>																		
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<p><b>Risk Management</b></p> <p>a. Risk identification, assessment processes</p> <p>b. Risk management processes</p> <p>c. Integration into overall risk management</p>	<p>The NTT Group strives to minimize the impact of losses that could result from the materialization of risk by anticipating and preventing the occurrence of potential risks, and has established Risk Management Regulations with the aim of defining fundamental policies concerning risk management. The Business Risk Management Committee has also been established, chaired by the representative director and senior executive vice president. The Committee takes a 2-pronged approach by analyzing risks from their degree of influence on business operations and frequency of occurrence, and identifies risks with the potential to have the greatest impact as material risks. The degree of impact that climate change will have is also analyzed by the degree of influence on business operations and frequency of occurrence, and as such, measures to tackle climate change like reducing greenhouse gas emissions were identified as a material risk. Should the NTT Group’s efforts to tackle climate change or disclosure of related information be viewed as lacking, there is</p> <p>the possibility that it could affect business management due to an insufficient level of understanding amongst customers, partner shareholders, employees, the local community, and other stakeholders. Furthermore, there could also be an increase in costs if new laws and regulations are enacted or intensified, which has the possibility of impacting business performance and financial conditions. In light of such risks, the NTT Group responded by holding discussions three times throughout the fiscal year involving all directors, including outside directors, to establish the environment and energy vision “NTT Green Innovation toward 2040,” by announcing in September 2021 the NTT Group’s commitment to measures aimed at addressing environmental issues. Looking ahead, the Green Innovation Committee operating under the Sustainability Committee will manage related processes and progress, and coordinate with the Business Risk Management Committee to integrate efforts with overall risk management and operate a PDCA cycle.</p>																						
<p><b>Metrics and Targets</b></p> <p>a. Metrics</p> <p>b. Actual GHG emissions</p> <p>c. Targets and actual results</p>	<p>The NTT Group has set the target of an 80% reduction in Scope 1 + 2 by fiscal 2030 (compared to fiscal 2013 levels), with the aim of becoming carbon neutral by the year 2040. This target was subsequently approved as the 1.5°C level by SBT in December 2021. Switching over to 1.8 billion kWh of renewable energy throughout the entire Group during fiscal 2021 (around 23% of total power consumption, 150% year-on-year) resulted in Scope 1 + 2 emissions of 2.9 million tons, a 38% reduction compared to fiscal 2013.</p> <p>Scope 3 emissions in fiscal 2021 were 20.82 million t, a 7% reduction year-on-year<sup>1</sup>. Furthermore, in addition to these targets, various metrics like EP100 and EV100 were incorporated into group companies’ business plans, highlighting the commitment of the entire group for tackling climate change.</p> <p><sup>1</sup> Estimated based on the Ministry of the Environment’s “Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain.”</p> <div style="display: flex; justify-content: space-around;"> <div> <p><b>GHG emissions (Scope1,2)</b></p> <table border="1"> <caption>GHG emissions (Scope 1,2) - million tons</caption> <tr><th>Fiscal Year</th><th>Results</th></tr> <tr><td>2013</td><td>4.65</td></tr> <tr><td>2019</td><td>4.61</td></tr> <tr><td>2020</td><td>3.99</td></tr> <tr><td>2021</td><td>2.9</td></tr> <tr><td>2030 Target</td><td>0.9</td></tr> <tr><td>2040 Target</td><td>0</td></tr> </table> </div> <div> <p><b>GHG emissions (Scope3)</b></p> <table border="1"> <caption>GHG emissions (Scope 3) - ten thousand tons</caption> <tr><th>Fiscal Year</th><th>Results</th></tr> <tr><td>2019</td><td>2,350</td></tr> <tr><td>2020</td><td>2,223</td></tr> <tr><td>2021</td><td>2,082</td></tr> </table> </div> </div>	Fiscal Year	Results	2013	4.65	2019	4.61	2020	3.99	2021	2.9	2030 Target	0.9	2040 Target	0	Fiscal Year	Results	2019	2,350	2020	2,223	2021	2,082
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NTT Group Disclosures in Line with TCFD Recommendations

# Environmental Management

The NTT Group recognizes that environmental issues are one of the most important challenges for management, and items of particular importance are decided based on discussions held with directors. An example that highlights this is the new environment and energy vision “Green Innovation toward 2040” announced in September 2021 —this was established following a decision made by the Board of Directors involving discussions with all directors, including outside directors, held three times throughout the fiscal year.

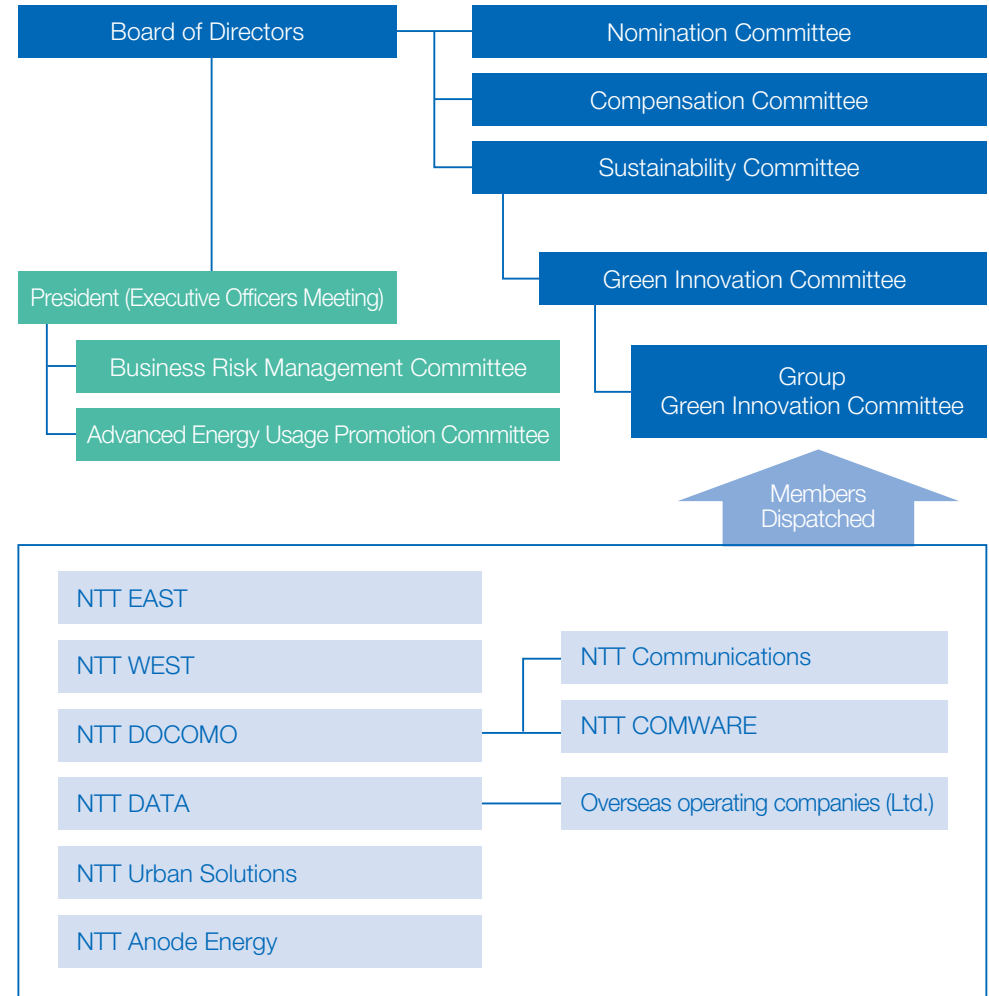
In addition to incorporating greenhouse gas emissions into the business plans of each group company, attainment levels will be reflected in the compensation of directors as critical indicators.

>> Non-financial KPI performance evaluations

The supervision system for directors also consists of the Sustainability Committee (chaired by the President) established in November 2021 directly under the Board of Directors, with the Green Innovation Committee established as an internal unit under the Sustainability Committee. The Global Environmental Protection Promotion Committee had previously managed and implemented environmental activities policies and their progress across the entire group, but these functions will be transferred to the Green Innovation Committee moving forward. Under this system, policies related to sustainability (the Charter and creating and abolishing accompanying policies, particularly deciding critical indicators) will be decided by the Board of Directors via the Sustainability Committee, and other matters deemed important will be decided by the Executive Officers Meeting. The role of the senior executives is to identify environmental issues and risks, and promoting businesses while taking into consideration these situations.

The NTT Group’s Green Innovation Committee covers initiatives aimed at addressing environmental problems across various Group companies, and is chaired by the Head of Research and Development Planning, with membership comprising the heads of the environmental departments at major Group companies. The Committee meets more than twice a year to raise suggestions for the basic policy related to environmental conservation such as developing the Environment and Energy Vision, as well as manage targets, monitor progress and promote further efforts. A decision was made at the Committee’s March 2022 meeting to set greenhouse gas reduction targets that have a direct impact on NTT Group executives’ performance evaluations.

As electricity usage accounts for more than 90% of the NTT Group’s greenhouse gas emissions, the committee also coordinates efforts with the Advanced Energy Usage Promotion Committee (chairperson: Vice President), responsible for managing the NTT Group’s energy conservation activities (Total Power Revolution [TPR] campaign), to develop plans for reducing electricity consumption as well as managing implementation and progress.



NTT Group Disclosures in Line with TCFD Recommendations

# Scenario Analysis

The NTT Group formulated the medium-term management plan “Your Value Partner 2025” to resolve social issues by advancing digital transformation through the Group’s business activities. Under the keywords “Your Value Partner,” we are working to achieve this plan by utilizing the Group’s management resources and capabilities, such as R&D, ICT infrastructure, and personnel as well as collaborating with partners. In accordance with TCFD recommendations, we used two scenarios to identify risks and opportunities involved in the Group’s operations based on climate change: the first scenario limiting the increase in average temperatures at below 2°C from before the industrial revolution (2°C Scenario); and the second scenario where temperatures will increase by almost 4°C with measures to combat global warming maintained at existing levels (4°C Scenario).

risks associated with policies, regulations, and social demand aimed at transitioning to a decarbonized society. The 4°C scenario is also likely to bring about physical risks including those required for responding to frequent or more intense heavy rain and flooding, as well as increasing electricity costs due to severe temperature increases. In contrast, increased demand for cutting greenhouse gas emissions and switching to renewable energy sources as society as a whole moves toward decarbonization is thought to present an opportunity for the NTT Group as it will be able to provide a range of ICT services that help achieve carbon neutrality. Details of each risk and the degree of impact they may have, as well as the results of analysis and assessment of the growth opportunities arising from addressing each of these risks are outlined below.

Applying NTT Group’s selection process for identifying key issues to the 2°C scenario revealed transition

[>> Key Issues Identification Process](#)

## STEP1 Scenario Definitions

Scenario	Overview	Reference Methodology for Scenario
Transition Risk Scenario	Scenario in which the decarbonization of society is achieved rapidly .....a future in which the target increase of below 2°C (1.5°C) has been attained	IEA World Energy Outlook 2021
Physical Risk Scenario	Scenario in which physical risks materialize .....a future in which the average temperature has risen by 4°C	IPCC Sixth Assessment Report, Summary for Policymakers (SPM): Climate Change 2021, 2021

## STEP2 Risks and Opportunities Identified with Scenario Analysis (Overview)

Overview	Scenario*1		Type	Timeframe*2	Response
	1.5°C	4°C			
Increase in costs for decarbonization and renewable energy charges	Loss ▼	—	Transition risk (policies, regulations)	Long-term	<ul style="list-style-type: none"> <li>Initiatives for realizing the IOWN concept</li> <li>Introducing and expanding the use of renewable energy</li> <li>Promotion of energy conservation, high-efficiency data centers</li> </ul>
Social criticism related to fewer efforts toward ESG (drop in market share)	▼	Minor	Transition risk (market, criticism)	Long-term	<ul style="list-style-type: none"> <li>Proactive disclosure of information on environmental initiatives</li> </ul>
Expanding sales of services that help reduce society’s environmental impact	▲ ▲	▲ Profit	Opportunity (products and services, energy)	Long-term	<ul style="list-style-type: none"> <li>Creating new services that contribute to carbon neutrality</li> <li>Increase in green electricity retail</li> </ul>
Achieve the IOWN concept	▲ ▲	▲	Opportunity (investment toward R&D)	Long-term	<ul style="list-style-type: none"> <li>Acceleration of DX and promotion of Remote World</li> <li>Reduction of greenhouse gases across the entire supply chain</li> </ul>
Disasters caused by heavy rain and typhoons	—	▼	Physical risk (acute)	Short-term	<ul style="list-style-type: none"> <li>Provide disaster response and disaster prevention training</li> </ul>
Increased air-conditioning costs due to increasing temperatures	—	▼	Physical risk (chronic)	Long-term	<ul style="list-style-type: none"> <li>Promoting energy conservation</li> </ul>

\*1 Degree of impact with 2°C scenario and 4°C scenario in FY2030 \*2 Timeframes refer to Short-term (less than 3 years), Medium-term (3-6 years), Long-term (6 years or more). Degree of impact expressed in 3 levels (▲, Low; ▲▲, Medium; ▲▲▲, High)

\*Estimated impact on annual profits:

- (1) ▲¥16 billion if carbon pricing introduced
- (2) Increased cost of renewable energy charges and implementation of renewable energy (approx.▲¥10 billion)
- (3) Disasters caused by heavy rain and typhoons (FY2019: approx. ▲¥8 billion, FY2020: approx. ▲¥5 billion, FY2021: approx. ▲¥0.2 billion)
- (4) Higher air conditioning costs as temperatures rise (▲¥0.6 billion if outdoor temperatures rise 1 degree)

[Assumptions and basis for calculations]

- (1) Carbon pricing (\$130/t-CO<sub>2</sub>) × FY2030 target emissions (reduction of 80% in FY2030 based on actual Scope 1 + 2 emissions of 4.65 million tons in FY2013)
- <Carbon pricing: Estimated unit price for FY2030 on IEA World Energy Outlook 2021, Advanced economics: USD 130->
- (2) Renewable energy charges in FY2030: ¥4.1/kWh, FY2021: ¥3.36/kWh, estimate assumes certificates cost ¥1.0/kWh
- (3) Estimated impact from repairs to damage caused by heavy rainfall and typhoons from FY2019 to FY2021
- (4) Estimated air conditioning costs increase based on domestic electricity consumption in FY2021

# Strategy

## STEP3 Response to Risks and Growth Opportunities (1.5°C Scenario)

<b>Risk Outline</b>	<b>Increase in costs for decarbonization and renewable energy charges</b>	
<b>Type</b>	Transition risk (policies, regulations)	
<b>Timeframe</b>	Long-term	
<b>Risk Details</b>	<p>The NTT Group uses more than 8 billion kWh of electricity each year to operate its telecommunications facilities in Japan, and this figure is expected to increase moving forward as data-driven society gains momentum. As society approaches decarbonization, renewable energy charges due to greater use of renewable energy and carbon tax systems will have a significant impact on the NTT Group's businesses. The Act on Special Measures concerning the Procurement of Renewable Electric Energy by Operators of Electric Utilities, which came into force in July 2012, stipulates that renewable energy charges due to the feed-in tariff will be recovered from users through a surcharge on electricity charges. Electricity prices were also raised in October of the same year on the use of all fossil fuels as part of measures to combat global warming. Carbon taxes aimed at achieving decarbonization of society as a whole are also already being introduced by governments in many countries and regions, and there are concerns about ever-increasing prices, as highlighted by the ten-fold increase in prices within the EU in five years.</p>	
<b>Response to Risks and Growth Opportunities</b>	<p>In September 2021, the NTT Group unveiled the new environment and energy vision, "NTT Green Innovation toward 2040" aimed at achieving zero environmental impact while continuing economic growth, by reducing the environmental impact of our business activities and creating breakthrough innovation. In accordance with this Vision, the following initiatives will be implemented with the aim of reducing emissions by 80% by 2030 and becoming carbon neutral by the year 2040*1, to alleviate the impact of carbon taxes and associated risks.</p> <p>Key initiatives toward becoming carbon neutral by 2040</p> <ul style="list-style-type: none"> <li>(1) Increase the use of renewable energy, to reduce greenhouse gas emissions by 45%</li> <li>(2) Lower energy consumption with IOWN technologies, to reduce greenhouse gas emissions by 45%</li> <li>(3) Reduce greenhouse gas emissions by 10% with ongoing energy conservation initiatives</li> </ul> <p>Meanwhile, increasing demand for switching to renewable energy sources as society as a whole moves toward decarbonization will present an opportunity for the NTT Group.</p> <p>In addition to reducing our own environmental impact (Green of ICT), the Environment and Energy Vision also covers initiatives to reduce the environmental impact of society (Green by ICT) by providing services that help to achieve carbon neutrality. An example that highlights this is the planned green electricity retail, where renewable energy sources developed by NTT Group are not only used within the company but also made available to customers. As companies seek to cut their greenhouse gas emissions, they will switch from on-site data centers to cloud-based data centers that have a higher energy efficiency. This is expected to increase demand for such services, and the increased use of high-efficiency data centers is another area that presents an opportunity for the NTT Group.</p>	<ul style="list-style-type: none"> <li>&gt;&gt; <a href="#">[Feature 1] Environment and Energy Vision NTT Green Innovation toward 2040</a></li> <li>&gt;&gt; <a href="#">Business Activity 3 Developing and expanding the use of renewable energy</a></li> <li>&gt;&gt; <a href="#">Business Activity 2 Reduction of power consumption by introducing IOWN technologies</a></li> <li>&gt;&gt; <a href="#">Business Activity 4 Providing new services that contribute to carbon neutrality</a></li> <li>&gt;&gt; <a href="#">Business Activity 1 Promoting energy conservation</a></li> </ul>

\*1 Compared to FY2013 (GHG Protocol: for Scope 1 and 2)

# Strategy

## STEP3 Response to Risks and Growth Opportunities (1.5°C Scenario)

<p><b>Risk Outline</b></p>	<p><b>Social criticism related to fewer efforts toward ESG (drop in market share)</b></p>							
<p><b>Type</b></p>	<p>Transition risk (market, criticism)</p>							
<p><b>Timeframe</b></p>	<p>Long-term</p>							
<p><b>Risk Details</b></p>	<p>The NTT Group provides a comprehensive range of ICT services, including NW services and data centers. It is focusing efforts on cutting greenhouse gas emissions through increased use of ICT services, such as accelerating efforts toward DX for business operations, promoting Remote World including TV conference systems, and other forms of energy management systems. As awareness of issues related to climate change increase and there societal preferences toward companies making efforts to tackle climate change, there is the risk of decreased revenue and profits due to a drop in market share if the company is seen as lagging behind its competitors with respect to climate-related awareness. And should greenhouse gas emissions increase as a result of expanding business faster than energy-efficiency initiatives can cut down those emissions, stakeholders may view the NTT Group as lacking in its motivation to cut emissions and negatively affect their valuation of the company. This presents a financial risk caused by lower revenue and falling share prices as customers move to other companies.</p>							
<p><b>Response to Risks and Growth Opportunities</b></p>	<p>NTT Group will help develop a sustainable society by implementing the following initiatives to achieve carbon neutrality by 2040:</p> <ol style="list-style-type: none"> <li>(1) Expanding the use of renewable energy</li> <li>(2) Reduction of power consumption by introducing IOWN technologies</li> <li>(3) Ongoing energy conservation initiatives</li> </ol> <p>The NTT Group is also proactive in disclosing information to stakeholders, with proactive disclosure of information on environmental initiatives and through general meetings of shareholders and engaging in dialogue with stakeholders. In fiscal 2020, the NTT Group acquired the highest A List rating by CDP, the Carbon Disclosure Project.</p> <p>It also announced its environment and energy vision, "NTT Green Innovation toward 2040" in September 2021, outlining a specific target for achieving carbon neutrality. Approval of that target as the 1.5°C level was received by SBT in December 2021.</p>	<p>NTT Group's greenhouse gas emissions reduction target based on 1.5°C level approved by Science Based Targets initiative</p> <div style="border: 1px solid black; padding: 5px;"> <p><b>Tokyo, Japan - December 3, 2021</b> - NTT Corporation (NTT) has revised its greenhouse gas (GHG) emissions reduction target in the new environment and energy vision "NTT Green Innovation toward 2040". The Science Based Targets (SBT)<sup>1</sup> initiative approves NTT Group's FY2030 GHG reduction target based on limiting global temperature rise to no more than 1.5°C.</p> </div> <p>The NTT Group formulated the new environment and energy vision "NTT Green Innovation toward 2040" on September 28, 2021. The NTT Group aims to reduce GHG emissions by 80% (carbon neutrality for mobile and data centers sectors) by FY2030 and to be carbon-neutral by FY2040.</p> <p>With respect to Scope 1 (direct emissions by businesses, such as fuel combustion) and Scope 2 (indirect emissions from the use of electricity, heat and steam supplied by other companies), we have raised the NTT Group's FY2030/31 GHG emissions reduction target from 30% (Well-below 2°C level, approved in 2020) to 80% (1.5°C level), and is approved by the SBT initiative.</p> <div> </div> <table border="1"> <thead> <tr> <th colspan="2">NTT Group's GHG emissions reduction targets</th> </tr> </thead> <tbody> <tr> <td>Scope 1 and 2</td> <td>80% reduction by FY2030/31 from a FY2018/19 base year (1.5°C level)</td> </tr> <tr> <td>Scope 3<sup>2</sup></td> <td>15% reduction by FY2030/31 from a FY2018/19 base year</td> </tr> </tbody> </table> <p>For the benefit of society, the NTT Group will step up its efforts to achieve carbon neutrality to society and contribute to the Japanese government's targets of reducing GHG emissions by 46% in FY2030 from FY2013 levels and achieving carbon neutrality by 2050.</p> <p><sup>1</sup> Scientifically based greenhouse gas emission reduction targets for corporates in accordance with the Paris Agreement. The SBT initiative, a climate change initiative led by the United Nations Global Compact (UNGC), the CDP (formerly the Carbon Disclosure Project), the World Resources Institute (WRI), and the World Wide Fund for Nature (WWF), designates the targets.</p> <p><sup>2</sup> NTT Group's New Environment and Energy Vision "NTT Green Innovation toward 2040" <a href="https://www.ntt.com/en/newsroom/2021/10/28/211028a.html">https://www.ntt.com/en/newsroom/2021/10/28/211028a.html</a></p> <p><sup>3</sup> Scope 3: Indirect emissions other than Scope 1 and Scope 2 (emissions in the supply chain related to business activities)</p>	NTT Group's GHG emissions reduction targets		Scope 1 and 2	80% reduction by FY2030/31 from a FY2018/19 base year (1.5°C level)	Scope 3 <sup>2</sup>	15% reduction by FY2030/31 from a FY2018/19 base year
NTT Group's GHG emissions reduction targets								
Scope 1 and 2	80% reduction by FY2030/31 from a FY2018/19 base year (1.5°C level)							
Scope 3 <sup>2</sup>	15% reduction by FY2030/31 from a FY2018/19 base year							

# Strategy

## STEP3 Response to Risks and Growth Opportunities (4°C Scenario)

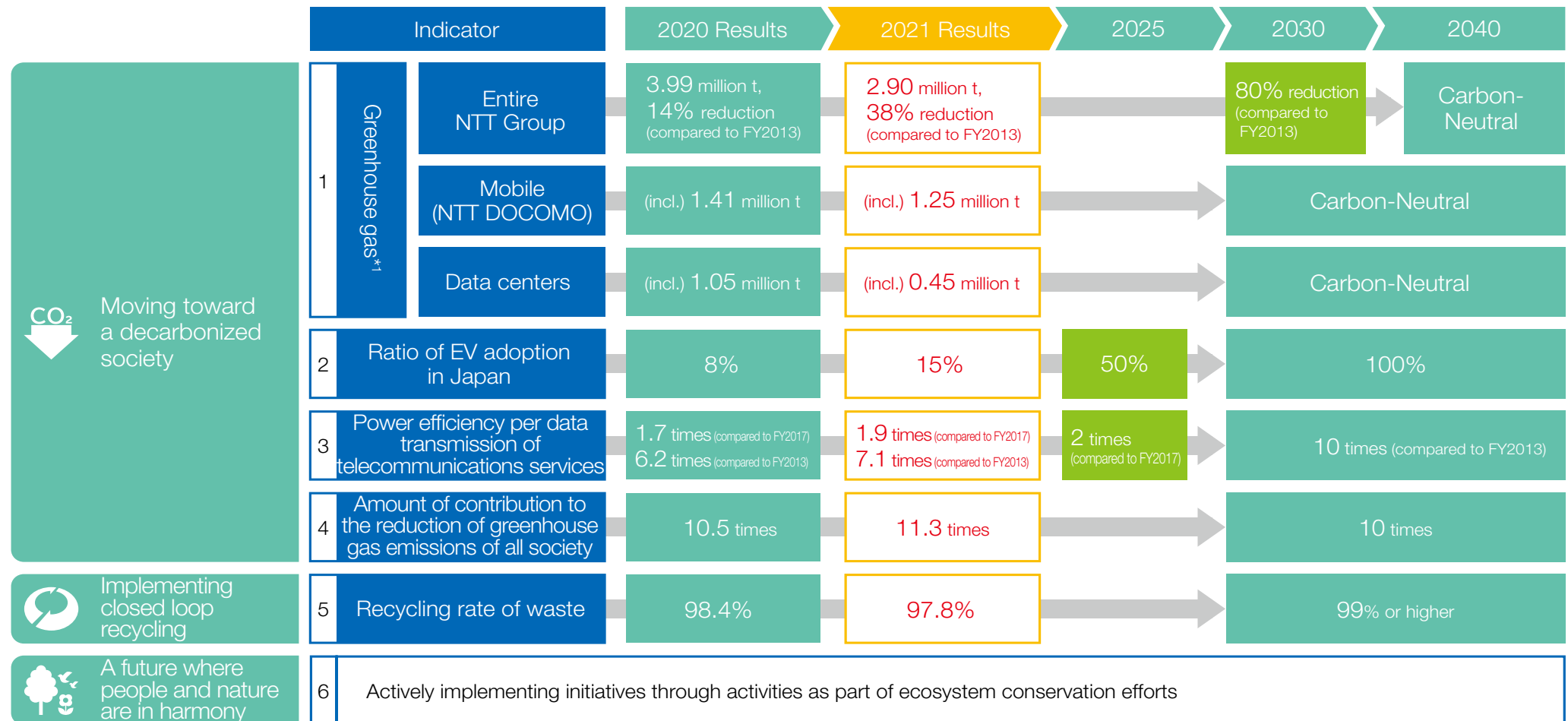
<b>Risk Outline</b>	<b>Disasters caused by heavy rain and typhoons</b>
<b>Type</b>	Physical risk (acute)
<b>Timeframe</b>	Short-term
<b>Risk Details</b>	The NTT Group supports society and business activities through its telecommunications networks and information systems. In addition, the NTT Group provides a multitude of services that serve as necessary lifelines that ensure people's safety in their everyday lives. Earthquakes, tsunamis, typhoons, floods, and other natural disasters may cause disruptions to business operations, and present a risk in providing reliable services. The NTT Group may also be held liable for related damages, potentially damaging the NTT Group's credibility and corporate image.
<b>Response to Risks and Growth Opportunities</b>	<p><b>Provide disaster response and disaster prevention training</b></p> <p>To reduce the risk of service interruptions due to natural disasters, the NTT Group is working to strengthen the resilience of our equipment and ensure early restoration of telecommunications services by expanding base stations equipped to deal with disasters, deploying and enhancing the functions of mobile power supply vehicles, portable satellite equipment, and other mobile equipment as well as participating in disaster drills held in the respective regions. NTT's telecommunications equipment and buildings are designed to withstand natural disasters. For example, our facilities are equipped with flood doors and other defenses according to their location to prevent the inundation of telecommunications equipment. Customers also face the same risk of natural disasters and system failures, and an increase in demand for BCP-related ICT services is expected as they also will seek appropriate contingencies. The NTT Group is focusing on the development of smart grids based on battery farms, to contribute to local production and consumption of energy.</p>

<b>Risk Outline</b>	<b>Increased air-conditioning costs due to increasing temperatures</b>
<b>Type</b>	Physical risk (chronic)
<b>Timeframe</b>	Long-term
<b>Risk Details</b>	The NTT Group owns a large number of communications buildings and data centers in Japan and abroad. The equipment used at our telecommunications facilities and data centers is set to operate within a specific range of temperatures. Those exceeding this range could cause equipment shutdowns and failures. For this reason, we maintain room temperatures within a certain range, including through the use of air conditioners. When ambient temperature rises, the energy efficiency of air conditioners declines and that in turn raises electricity consumption.
<b>Response to Risks and Growth Opportunities</b>	<p><b>Promoting energy conservation</b></p> <p>We have been pursuing measures for reducing electricity usage related to air conditioning equipment to minimize the increase in operating costs. Specifically, we operate air conditioner optimal control systems that save energy. We have installed wireless temperature sensor modules that automatically control the air conditioners in response to temperatures detected by the sensors. We also seek to conserve electricity by maintaining appropriate temperature settings for air conditioners, by installing diffusers and blank panels to release exhaust heat from equipment, and by efficiently laying out double flooring to improve airflow and prevent hotspots.</p> <p style="text-align: right;"><a href="#">&gt;&gt; Business Activity 1 Promoting energy conservation</a></p>

# Metrics and Targets

In accordance with the NTT Group's selection process for identifying key issues, key performance indicators (KPIs) have been established for verifying the practicality and effectiveness, and monitoring progress of initiatives covered by the three challenges of "Ensuring the positive coexistence of nature and humanity."

[>> Key Issues Identification Process](#)



Disclosure Boundary

Boundary [C]: Greenhouse gas (No. 1), Amount of contribution to the reduction of greenhouse gas emissions of all society (No. 4)

Boundary [B]: Ratio of EV adoption in Japan (No. 2), Resource recycling rate (No. 5)

The telecommunications businesses subject to the calculation for power efficiency per data transmission of telecommunications services are the six domestic businesses of the telecommunications business segment appearing in our Annual Report (NTT East, NTT West, NTT Communications, NTT DOCOMO, and NTT DATA)

\*1 GHG Protocol: for Scope 1 and 2

NTT Group Disclosures in Line with TCFD Recommendations

# Greenhouse Gas Emissions

The NTT Group's emissions across its entire supply chain in fiscal 2020 was 26.21 million tons, a reduction of 1.89 million tons (7%) compared to the previous year. More than 1.2 billion kWh of renewable energy (approx. 11% of purchased electricity) was made available during fiscal 2020, resulting in Scope 1 + 2 emissions of 3.99 million tons, a reduction of 6.2 million tons (13%) compared to the previous year. Scope 3 emissions for fiscal 2020 were 22.23 million tons, a reduction of 5% compared to the previous year (estimated based on the Ministry of the Environment's "Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain").

Due to the very nature of the NTT Group's businesses, greenhouse gas emissions arising from the supply chain (Scope 3) are much higher than direct emissions from the group's own activities (Scope 1+2), and measures will be implemented to reduce such emissions from across the entire supply chain. The NTT Group will revise its own Guidelines for Green Procurement to achieve more effective reductions through fiscal 2021.

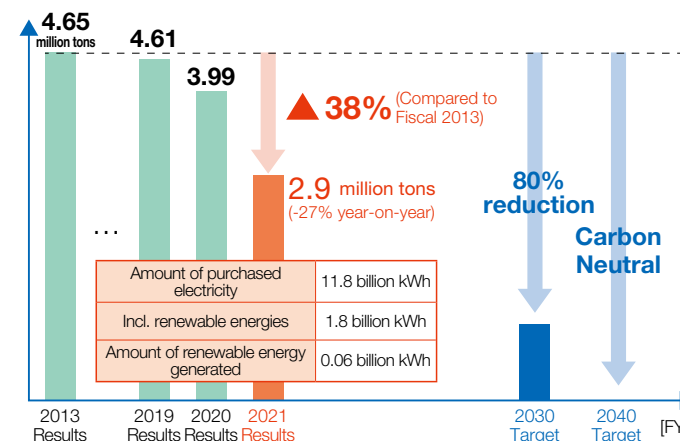
[>> Guidelines for Green Procurement](#)

### Amount of greenhouse gas from entire supply chain (Scope 1, 2, 3)

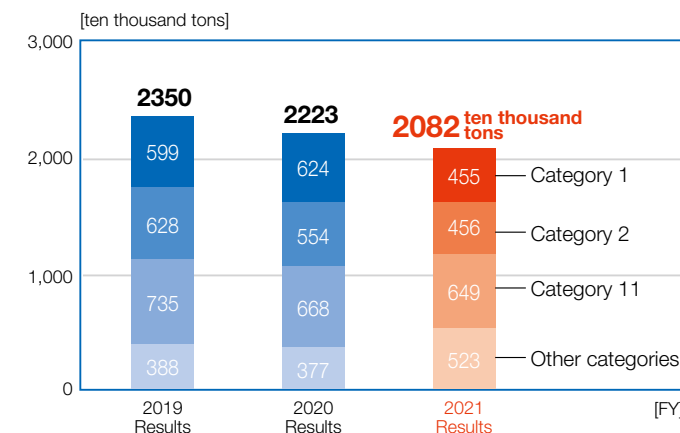
Scope, Category	Scope and method of calculation	Emissions (ten thousand tons)		
		Fiscal 2019	Fiscal 2020	Fiscal 2021
GHG emissions	—	2,811	2,622	2,372
Scope 1 (direct emissions)	—	25	24	14.1
Scope 2 (indirect emissions from energy use)	—	436	375	275.6
Scope 3 (indirect emissions from the value chain)	—	2,350	2,223	2,082
Category 1 Purchased goods and services	Calculation based on the number of units and monetary value of purchases of devices and services sold to customers	599	624	455
Category 2 Capital goods	Calculation based on capital investment costs on telecommunications and other equipment	628	554	456
Category 3 Fuel- and energy-related activities not included in Scope 1 or 2	Calculation based on annual consumption by energy type	60	61	63
Category 4 Upstream transportation and distribution	Calculation based on weight and distance, or number of devices with regard to the transport of devices sold to customers	5	8	8
Category 5 Waste generated in operations	Calculation based on volume of waste by type	1	1	1
Category 6 Business travel	Calculation based on paid expenses for business travel	19	4	3
Category 7 Employee commuting	Calculation based on paid expenses for employee commuting	7	3	4
Category 8 Upstream leased assets*1	Excluded from calculation*1	—	—	—
Category 9 Downstream transportation and distribution*2	Excluded from calculation*2	—	—	—
Category 10 Processing of sold products*3	Excluded from calculation*3	—	—	—
Category 11 Use of sold products	Calculation based on number of service subscriptions, number of devices and monetary value of telecommunications services and devices used by customers	735	668	649
Category 12 End-of-life treatment of sold products	Calculation based on number of service subscriptions, number of devices and monetary value of communications devices used by customers	5	4	4
Category 13 Downstream leased assets	Calculation based on amount of electricity consumption such as equipment by other businesses Calculation based on average use of leased assets	75	74	164
Category 14 Franchises	Calculation based on total floor area of sales franchises	9	8	8
Category 15 Investments	Calculation based on Scope 1 and 2 emissions of investees in proportion to shareholding	207	214	268

\*1 We have excluded Category 8 (upstream leased assets) from the calculation because the fuel and electricity used by leased assets is included in Scope 1 and 2 calculations.  
 \*2 We have excluded Category 9 (downstream transportation and distribution) from the calculation because these emissions are almost entirely from our own transportation and use in our own facilities (included in Scope 1 and 2) or from outsourced transportation (included in Category 4).  
 \*3 We have excluded Category 10 (processing of sold products) from the calculation because our main businesses involve no processing of intermediate products.

### Greenhouse Gas Emissions (Scope 1, 2)



### Greenhouse Gas Emissions (Scope 3)



**Change in calculation method**  
 Calculations for Category 1 and Category 2 in FY2019 used emission intensity defined by the Ministry of the Environment, but for FY2020 emission intensity of each company is used for some supplier (calculated from figures released by each company), to factor in reduction efforts by each supplier.

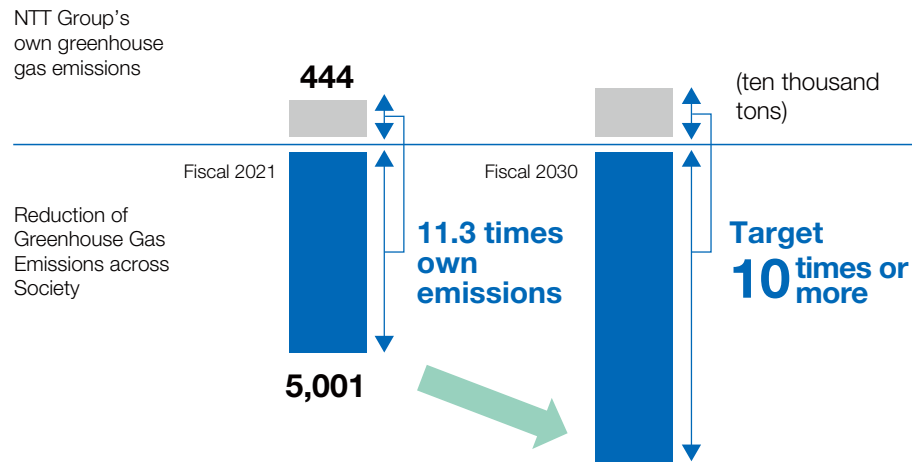
NTT Group Disclosures in Line with TCFD Recommendations

# Reduction of Greenhouse Gas Emissions across Society and Power Efficiency of the Telecommunications Business

## Reduction of Greenhouse Gas Emissions across Society

The NTT Group has established a target for fiscal 2030 calling for it to contribute to reducing greenhouse gas emissions of society as a whole by at least 10 times more than the NTT Group's own emissions through its services and technologies. This target is intended to contribute to the reduction of greenhouse gas emissions across society by providing ICT services and technologies while curbing greenhouse gas emission amounts from our own business activities. The use of information communication, which is expanding each year through the spread of smartphones and high-speed and large-capacity networks, requires energy. On the other hand, by improving efficiency and reduction of goods through digitalization, the use of information also contributes to the reduction of greenhouse gas emissions across society by reducing environmental load more than the energy consumption it requires.

\* The reduction of greenhouse gas emissions across society quantifies the energy savings effects obtained through ICT services using greenhouse gas volume. The energy saving effect is quantified with references to the Telecommunication Technology Committee (TTC) Standard "Methodology for the assessment of the environmental impact of information and communication technology goods, networks and services (JT-L1410)" and the calculation method specified by the "LCA of Information and Communication Technology (ICT) business organizations" research group of the Life Cycle Assessment Society of Japan.  
 \* The effects of energy savings obtained through the introduction of ICT services include, for example, reduced electricity usage by homes, companies and factories from energy management, alleviation of traffic congestion using analysis of congestion and operation information, and reduced electricity usage from the streamlining and optimization of transportation schedules.  
 \* The amount of greenhouse gas emissions for the NTT Group includes the emissions from facilities necessary for other telecommunication carriers and data centers to provide their services.



## Power Efficiency of the Telecommunications Business

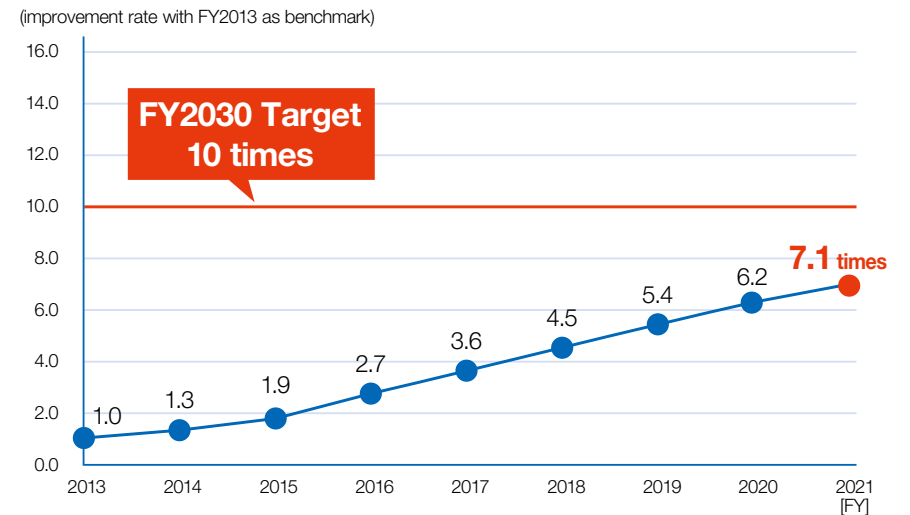
The NTT Group has established the target for fiscal 2030 to improve the power efficiency per data transmission in our telecommunications business to at least 10 times higher\*1 than in fiscal 2013\*1. Electricity is essential to the continuity of the telecommunications business and it also accounts for more than 90% of the NTT Group's greenhouse gas emissions. We set this target because improving the efficiency of using electricity both reduces the risk of business disruptions and helps mitigate climate change. We are introducing highly energy efficient equipment and improving the efficiency of network structures based on our Energy Efficiency Guidelines.

>> Green Procurement Standards

In October 2018, NTT became the first telecommunications carrier in Japan to join the EP100\*2 international initiative on energy efficiency led by The Climate Group. By participating in such an international initiative, we intend to publicly declare the NTT Group's commitment to the environment and express our stance on international environmental issues.

\*1 The telecommunications businesses subject to the calculation for power efficiency are the domestic businesses of the five telecommunications business segment appearing in our Annual Report (NTT East, NTT West, NTT Communications, NTT DOCOMO, and NTT DATA).  
 \*2 An international initiative comprising companies pledging to double the energy efficiency of their operations (improve energy efficiency by 50%) as participants.

## Power Efficiency of the Telecommunications Business



# Environmental Performance Data (Moving toward a decarbonized society)

		Unit	FY2017	FY2018	FY2019	FY2020	FY2021	
Status of ISO 14001 Certification Acquisition (employee coverage)		%	47.9	45.1	46.5	49.5	46.5	
		Unit	FY2017	FY2018	FY2019	FY2020	FY2021	
							Domestic	Including overseas*4
Direct Greenhouse Gas Emissions (Scope 1)		ten thousand tons of CO <sub>2</sub>	18.5	16.4	13.8	13.1	12.2	14.1
Indirect Greenhouse Gas Emissions (Scope 2)*2		ten thousand tons of CO <sub>2</sub>	421	329 (414)	306 (379)	287 (357)	236 (303)	276 (430)
CO <sub>2</sub> Emissions from Business Operations*1, *2	Total CO <sub>2</sub> emissions		438	344 (429)	319 (392)	298 (369)	247 (314)	289 (443)
	Breakdown	Use of electricity	418.3	325.9 (411.5)	303.1 (376.4)	283.9 (354.4)	233.3 (300.2)	272.8 (427.4)
		Use of gas and fuel	13.5	11.8	10.1	9.6	9.0	10.5
		Use of vehicle operation	3.3	3.1	2.7	2.1	2.0	2.4
		Use of heat	2.7	2.9	3	2.9	2.8	2.8
Greenhouse Gas Emissions other than CO <sub>2</sub> Emissions (CO <sub>2</sub> emissions-equivalent)	Total GHG emissions other than CO <sub>2</sub>		1.6	1.6	1.1	1.4	1.2	1.2
	Breakdown	CH <sub>4</sub> (methane)	0.3	0.2	0.2	0.2	0.2	0.2
		N <sub>2</sub> O (nitrous oxide)	0.2	0.2	0.2	0.1	0.1	0.1
		HFC	0.7	0.7	0.6	0.9	0.8	0.8
		PFC	0.3	0.4	0.05	0.1	0.1	0.1
		SF <sub>6</sub> (sulphur hexafluoride)	0.1	0.1	0.04	0.1	0.1	0.1
NF <sub>3</sub> (nitrogen trifluoride)	0	0	0	0	0.0	0.0		
Electric Power Consumption	Electricity purchased*2	hundred million kwh	82.3	65.4 (82.4)	65.9 (82)	66.7 (82.8)	68.6 (86.8)	79.8 (117.6)
	Renewable energy, new energy consumption	0.8	0.7	0.7	3.1	13.7	17.8	
Total amount of non-renewable energy used*2, *3		hundred million kwh	92	74.3 (91.3)	73.8 (89.8)	74.1 (90.1)	75.5 (93.7)	94.7 (114.2)

\*1 The CO<sub>2</sub> emissions from business operations exclude emissions of greenhouse gases other than CO<sub>2</sub>.

\*2 The NTT Group provides equipment and the like necessary for other telecommunications carriers and data center providers to carry out their businesses. To date, we have included the fuel and electricity required for this equipment in our disclosed emission and consumption volumes in accordance with reporting methods outlined by the Act on Promotion of Global Warming Countermeasures. However, as calculation methods have been established based on the Ministry of the Environment's Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain (Ver. 2.3), we have adopted these for calculating the above CO<sub>2</sub> emissions as Scope 3. Emission amounts calculated using the previous method have been placed within parentheses. Similarly, for amounts of electricity purchased and total amount of non-renewable energy, from fiscal 2018 onward we are excluding the amount consumed by other telecommunications carriers and data center providers, and values calculated using the previous method will be placed within parentheses, and we have adopted these for calculating the above CO<sub>2</sub> emissions as Scope3 from fiscal 2019.

\*3 For the total amount of non-renewable energy used, the volume of fuels such as gasoline and utility gas consumed have been converted into Wh values and added to the amount of electricity purchased.

\*4 Disclosure Boundary [C]

\* Disclosure Boundary: Boundary [B]

## Environmental Performance Data (Implementing Closed Loop Recycling)

			Unit	FY2017	FY2018	FY2019	FY2020	FY2021	
Waste and Final Disposal Waste	Total Waste		ten thousand tons	53.1	56.2	74.4	46.9	47.6	
	Recycling rate*1		%	98.6	98.9	98.7	98.4	97.8	
	Recycling	Total amount of recycling		ten thousand tons	52.4	55.6	73.5	46.2	46.5
		Breakdown	Recycled decommissioned telecommunications equipment	ten thousand tons	22.0	17.6	14.6	14.0	12.3
			Recycled construction works waste	ten thousand tons	13.3	22.3	32.5	18.5	18.4
			Recycled civil engineering works waste	ten thousand tons	12.9	11.5	22.8	10.6	13.0
			Recycled office waste	ten thousand tons	3.3	3.0	2.7	2.4	2.2
			Others	ten thousand tons	0.8	1.2	0.9	0.7	0.7
	Amount of waste reduced by incineration		ten thousand tons	0.1	0.1	0.1	0.1	0.1	
Amount of final disposal waste		ten thousand tons	0.6	0.5	0.8	0.6	1.0		
Final Disposal Ratio*2	All waste		%	1.18	0.91	1.13	1.38	2.02	
	Recycled decommissioned telecommunications equipment		%	0.07	0.05	0.06	0.19	0.12	
Asbestos Removed from NTT Group Facilities	Total amount of asbestos removed		t	19	6	52	73	33	
	Breakdown	Buildings	t	4	4	19	68	31	
		Bridges	t	15	2	32	6	2	
Use of Water Resources	Water Use*		ten thousand m <sup>3</sup>	1,259.1	1,206.6	1,104.4	993.8	926.4	
	Water Withdrawal (tap water)		ten thousand m <sup>3</sup>	—	627.5	583.4	514.2	475.1	
	Volume of recycled wastewater and rainwater	Reused	ten thousand m <sup>3</sup>	49.2	48.9	16.7	35.8	37.5	
		Reuse rate*3	%	3.9	7.2	2.8	6.5	7.3	
	Sewage		ten thousand m <sup>3</sup>	—	530.2	504.3	443.9	413.8	
Virgin Pulp Consumption	Total		ten thousand tons	1.7	1.4	1.2	0.8	0.6	
	Breakdown	Telephone directories	ten thousand tons	1.2	0.9	0.7	0.4	0.3	
		Telegrams	ten thousand tons	0.02	0.02	0.02	0.01	0.01	
		Office paper	ten thousand tons	0.2	0.2	0.2	0.1	0.1	
		Billing statements	ten thousand tons	0.3	0.3	0.3	0.3	0.2	
Paper Consumption Reductions from Web Billing Service	Number of users		ten thousand	3,536	3,371	3,364	3,201	2,841	
	Paper consumption reductions		t	3,216	3,082	2,981	2,871	2,527	

\*1 Recycling rate: Recycling/Total waste

\*2 Final disposal ratio: Amount of final disposal waste/Total waste

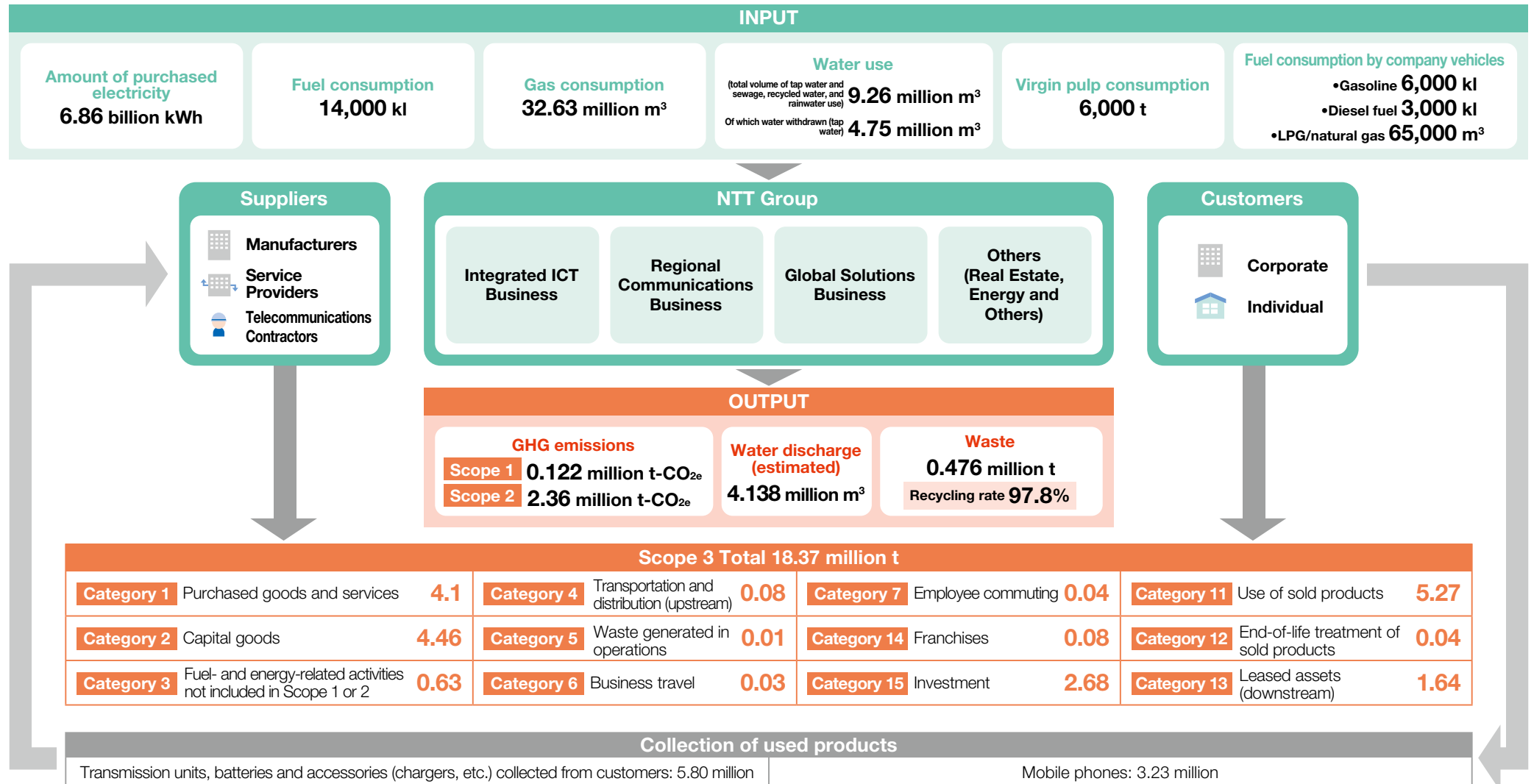
\*3 The reuse rate shown up to fiscal 2017 corresponds to the total volume of tap water and sewage, recycled water, and rainwater used, while the reuse rate from fiscal 2018 onward corresponds to the total volume of tap water, recycled water, and rainwater.

\* Disclosure Boundary: Boundary [B]

	Unit	FY2017	FY2018	FY2019	FY2020	FY2021
Expenditures on Biodiversity Preservation Projects	Million yen	421.4	544.7	558.0	332	311

# Material Balance of the NTT Group (Fiscal 2021) Relevant GRI standards: 301-1/302-1/303-3,4/305-1,2,3/306-1,2

To minimize the environmental impacts of our business activities, the NTT Group endeavors to gather and analyze information on the resources and energy that it consumes and the resulting environmental impacts.



\* Disclosure Boundary: Boundary [B]

## NTT Group Disclosures in Line with TCFD Recommendations

# Environmental Accounting

Relevant GRI standards: 102-18/103-2/307-1

The NTT Group introduced environmental accounting in fiscal 2000 to boost the efficiency and effectiveness of its environmental conservation efforts by quantitatively determining the costs of environmental conservation programs undertaken as part of its business activities as well as their effects (economic and material benefits). Moving forward, we aim to implement even more efficient and effective environmental management by continuously carrying out quantitative monitoring and analysis to understand the effects of our environmental activities, clarifying outstanding issues, and sharing information.

- **Scope of data**  
The companies subject to consolidated environment accounting are NTT, NTT East, NTT West, NTT Communications, NTT DATA, NTT DOCOMO and their group companies.
- **Applicable period**  
Data for fiscal 2020 is from April 1, 2020 to March 31, 2021.  
Data for fiscal 2021 is from April 1, 2021 to March 31, 2022.
- **Accounting method**  
Accounting is based on the NTT Group Environmental Accounting Guidelines. These guidelines comply fully with the Environmental Accounting Guidelines 2005 issued by the Ministry of the Environment.  
Environmental conservation costs are tabulated separately as environmental investments and environmental costs. Personnel costs and depreciation costs are also included in environmental costs.  
Reductions in CO<sub>2</sub> emissions through energy conservation measures are calculated by subtracting actual emissions from projected emissions in the event that no such measures were taken.

Category	Environmental investment (100 hundred yen)		Environmental costs (100 hundred yen)		Economic benefits (100 hundred yen)			Material benefits (thousands of tons)		
	FY2020	FY2021	FY2020	FY2021		FY2020	FY2021	FY2020	FY2021	
(1) Business area costs	71.3	28.6	225.2	289						
• Pollution prevention costs	2.9	2.5	32.4	25.5						
• Global environmental conservation costs	67.7	25.8	79.8	148.6	Cost reductions through energy conservation	54.2	31.5	Reductions in CO <sub>2</sub> emissions through energy conservation measures	10.2	6.2
• Resource recycling costs	0.7	0.3	113.0	115.0	Revenues from sale of recyclable waste (decommissioned telecommunications equipment, etc.)	59.6	71.1	Recycled decommissioned communications equipment	14.0	12.3
					Waste disposal cost reductions through recycling	1.9	1.1	Recycled construction waste	18.5	18.4
					Cost reductions through reuse of decommissioned telecommunications equipment	140.4	212.1	Recycled civil engineering works waste	10.6	13.0
					Cost reductions through reuse of telecommunications devices	112.1	133.3	Recycled office waste	2.4	2.2
					Cost reductions through reuse of office waste materials	0.0	0.0	Other recycled items	0.7	0.7
(2) Upstream/downstream costs	0.5	1.8	102.0	32.6	Revenues from sale of recyclable waste (subscriber communications devices, etc.)	7.1	12.8	Number of communications devices collected from customers (thousands)	581	580
					Cost reductions in postal expenses through computerization	119.0	275.1			
(3) Administrative costs	2.1	1.5	44.9	64.5						
(4) R&D costs	20	29.5	97.7	127.6						
(5) Social activity costs	0.0	0.1	0.4	0.5						
(6) Environmental remediation costs	0.0	0.0	0.0	0.0						
<b>Total</b>	<b>94.0</b>	<b>61.5</b>	<b>470.1</b>	<b>514.2</b>	<b>Total</b>	<b>494.3</b>	<b>736.9</b>			

An aerial night view of a city, showing illuminated buildings and streets. A large blue semi-transparent rectangle is overlaid on the top half of the image, containing the main title. Below the blue rectangle is a white semi-transparent rectangle containing a paragraph of text. The bottom of the image shows the city's lights and architecture in more detail.

# Improving prosperity for all people and cultures

The NTT Group is committed to contributing to the development of society by acknowledging diverse cultures.

# Improving prosperity for all people and cultures

Social problems are increasing in severity every year, posing a greater threat to social and economic prosperity. The NTT Group is delving into the potential future and underlying reasons, outlining its commitment, and taking concrete action with the aim of achieving prosperity for all people and cultures. There are three key themes when it comes to assessing NTT goals: Shared ethical standards with stakeholders; Preparing for a new future with the power of digital technologies; and Moving toward a safe, secure, and resilient society. The NTT Group is taking action in line with each of these themes.

## Prosperity for All People and Cultures

Today

What should NTT be aiming for?

	Potential Future and Underlying Reasons	Commitments	Action
Sharing ethical standards with stakeholders	The NTT Group will be reforming various systems with the aim of promoting DX to create an IT environment where anyone is able to work in any location, at any time. In addition to the introduction of a cloud-based system, we will digitize processes to facilitate automation and standardization while expanding sales approaches by applying digital marketing to implement these initiatives. Around a hundred automated processes will be rolled out under ten DX initiatives with the aim of increasing productivity with service provisioning 1.7-fold (in FY2025), to achieve cost reductions of more than ¥200.0 billion in fiscal 2023 (aggregate total of more than ¥1.0 trillion in cost reductions from FY2017).	<b>100%: participation rate of corporate ethics policy training (annual)</b> <b>Zero cases: illegal actions involving anti-competitive behavior or bribery</b> We set high ethical standards for ourselves and share them with our business partners.	Establishing and thoroughly complying with ethical standards Appropriately managing conduct risk Thoroughly reinforcing corporate governance and compliance Sharing high ethical standards with business partners
Prepare for a new future with the power of technology	The NTT Group will be promoting Work-in-Life (health management) by adopting a diversity-rich management style based on remote work that will enabling employees to work close to home. More specifically, employees residing further out but working at headquarters, and the organization itself (including headquarters and back-office functions) will be decentralized and spread among various regions to create hubs that serve to revitalize those regions, while regional decentralization will also contribute to BCP operations by ensuring functionality in the event of disasters. Office environments will also be re-examined to enhance space for idea creation and co-creation.	<b>¥600 billion: revenues from B2B2X business (FY2023)</b> <b>Increased from the previous fiscal year: numbers of patent applications</b> As a leader in digital transformation, we will act and contribute to helping resolve social issues unique to each country—like the aging population and declining birthrate, proper education, equitable healthcare, and regional economic development in Japan—to generate new value that will extend to future generations.	Promoting the B2B2X Model Protection and Respect for Intellectual Property Contribution to the Revitalization of Local Communities and Economies
Moving towards a safe, secure, and resilient society	To achieve the transformation to a New Management Style outlined in the medium-term management strategy revised in October 2021, the NTT Group is implementing security measures (introduction of zero-trust system and systemization of information security) capable of facilitating the shift to remote work styles. As a member of the global community building working to build a digital society, the NTT Group will contribute to solving social issues through our security business. As we progress through the era of Zero Trust and Net Zero Trust, the NTT Group will continue to investigate the value of security as we work to prevent and limit cyber risks.	<b>Zero cases: major accidents</b> <b>99.99%: stable service provision rate</b> <b>Zero cases: service suspensions due to cyber attacks</b> <b>Zero cases: major personal data leaks</b> As a company underpinning the vital infrastructure of a digitalized society, we will make full use of technology to keep people safe and secure from epidemics, natural disasters, digital disasters like cyber-attacks, and achieve a more resilient society.	Ensuring the stability and reliability of services Strengthening information security and personal information protection Contribution to the revitalization of local communities and economies

## Feature 2: Transformation to a New Management Style

### New style premised on remote work

These days there has been a growing need for increased spread and uptake of digital services (including deliveries and video streaming) as part of individual lifestyles. Companies have also had to face sudden changes in working styles toward remote work, and there is greater need for online access and digitalization of social infrastructure. As COVID-19 is now part of our lives, the time has come when society will be utilizing remote and online access technologies.

Under the approach of “Transformation to a New Management Style,” the NTT Group set a range of targets with the aim of transforming to a new style based on remote work.

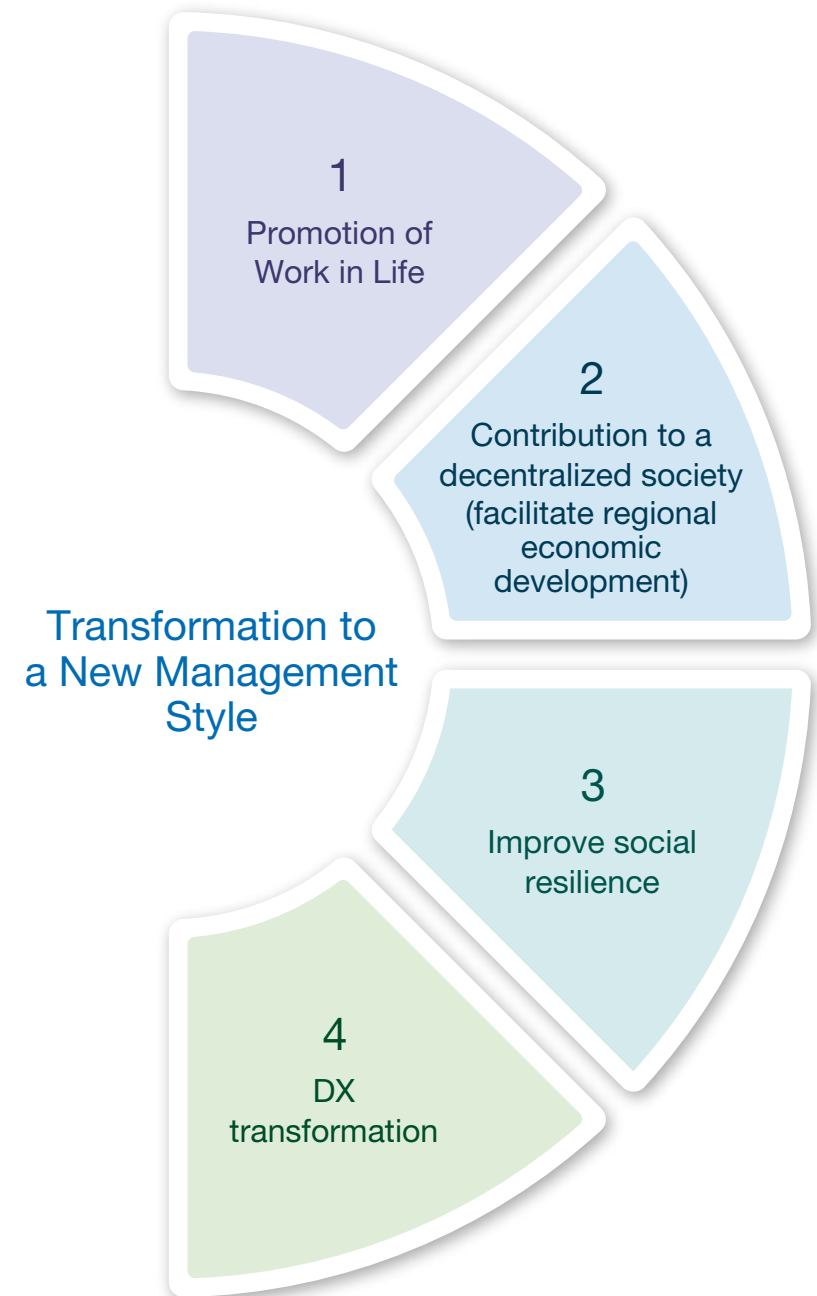
1. Promotion of Work in Life (Health management)
2. Contribution to a decentralized society (facilitate regional economic development)
3. Improve social resilience
4. DX transformation

The management style was a typical one based on office work—where employees commute to offices or job transfers—with regular working hours and personnel allocated by the company.

Looking ahead, the NTT Group will be working towards a diversity-rich management style based on remote work. This will allow employees to choose where they work and reside, freeing them from the pressures of job transfers or working away from their family, give them the option to choose their own working time away from regular working hours, and let them choose their own career path without the constraints of a seniority-based system.

The system of governance we are using will also be re-examined to take into consideration the implementation of zero trust systems and systemization of IT security that is appropriate for remote work, enhanced resilience against epidemics, natural disasters and cyber-terrorism, and conduct risks. Various systems will also be revised for promoting DX transformation, together with reforms to business operations and development of the right environments so that the office is enhanced as a space for creation and co-creation.

We will also contribute to DX to society as a whole, by expanding customer reach with digital marketing as well as providing customers with platforms harnessing our own DX. These initiatives will be used to promote Work in Life (health management) and achieve work processes that are more open, global, and innovative. The NTT Group will continue to take this approach as its core concept of “Improving prosperity for all people and cultures,” and strive to enhance CX.

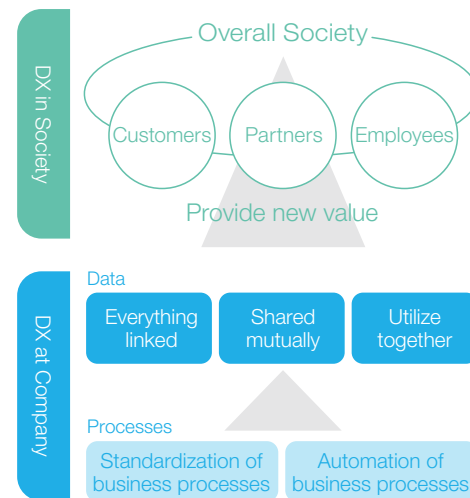




## Promotion of Work in Life

As work styles change, it is necessary to review work processes in order to accommodate diverse ways of working. Allowing diverse work styles leads to greater opportunities to employ people of diverse backgrounds, while improving their motivation to work and ease of working. This results in better employee engagement and sparks innovation. The NTT Group engages in a variety of initiatives to promote diverse work styles. In particular, we are changing work styles while focusing on better treatment and environments for mainly remote work. When changing work styles, it is important to ensure openness, globalization and innovative work management from a business perspective. From the standpoint of employees, we believe the first step is to promote healthy workstyle-in-daily life and their well-being.

## Overview of DX Transformation



## Promotion of DX

The NTT Group will be reforming various systems with the aim of promoting DX to create an IT environment where anyone is able to work in any location, at any time. In addition to the introduction of a cloud-based system, we will digitize processes to facilitate automation and standardization while expanding sales approaches by applying digital marketing to implement these initiatives. Some 100 automated processes will be rolled out under ten DX initiatives with the aim of increasing productivity of service provision operations 1.7-fold (in FY2025), to achieve cost reductions of more than ¥200.0 billion in fiscal 2023 (aggregate total of more than ¥1.0 trillion in cost reductions from FY2017).



Promote work-in-life (health management)  
Open, global, and innovative business management

## Achieving a decentralized society

The NTT Group will be promoting Work-in-Life (health management) by adopting a diversity-rich management style based on remote work that will enabling employees to work close to home.

More specifically, employees residing further out but working at headquarters, and the organization itself (including headquarters and back-office functions) will be decentralized and spread among various regions to create hubs that serve to revitalize those regions, while regional decentralization will also contribute to BCP operations by ensuring functionality in the event of disasters. Office environments will also be re-examined to enhance space for idea creation and co-creation.



## Improve social resilience

To achieve the transformation to a New Management Style outlined in the medium-term management strategy revised in October 2021, the NTT Group is implementing security measures (introduction of zero-trust system and systemization of information security) capable of facilitating the shift to remote work styles. As a member of the global community building working to build a digital society, the NTT Group will contribute to solving social issues through our security business. As we progress through the era of Zero Trust and Next Zero Trust, the NTT Group will continue to investigate the value of security as we confront never-ending cyber risks.

## Social Challenge

# 4

## Establish shared ethical standards

### Business Activity

12. Establishing and thoroughly complying with ethical standards
13. Appropriately managing conduct risk
14. Thoroughly reinforcing corporate governance and compliance
15. Sharing high ethical standards with business partners



### Why it matters

As maintaining high ethical standards with society and sharing those high ethical standards with business partners is an essential part of resolving social issues and ensuring sound corporate activities, a range of initiatives will be implemented for establishing and sharing such ethical standards.

### What can be accomplished

We set high ethical standards for ourselves and share them with our business partners.

### Future vision

The NTT Group is committed to contributing to the development of society by acknowledging diverse cultures, and thus we will contribute to solving social issues by connecting people, goods, and cultures, including communities, nations, and society, while promoting high ethical standards, diversity, and inclusion in fair and equitable ways, and work towards creating a better workplace through powerful and new digital technologies.



## Business Activity 12–13

# Establishing and thoroughly complying with ethical standards / appropriately managing conduct risk

### Our commitment

We set high ethical standards for ourselves and share them with our business partners

### Our objectives

100%

Participant rate of training of corporate ethics policy

0

Cases of legal actions for anti-competitive behavior, bribery

### Policies and Concepts

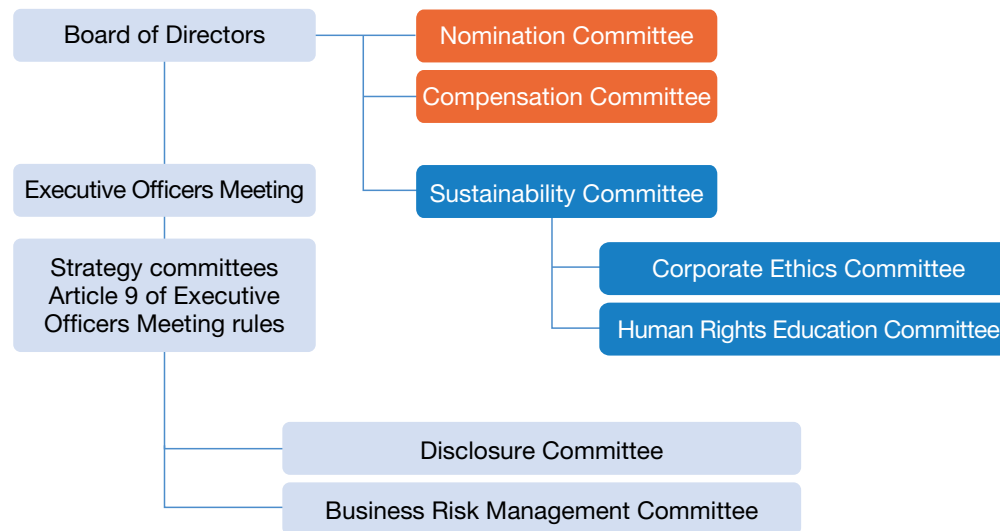
It is imperative to conduct business in compliance with laws and regulations in the jurisdictions where we operate, and maintain high ethical standards in order to promote sound corporate activities. Recognizing this, NTT established the “NTT Group Corporate Ethics Policy.”

These standards, which apply to all officers and employees of the NTT Group, lay out the basic principles of corporate ethics and provide specific guidelines for ethical behavior. These stipulations are intended to remind everyone of their duty as members of a corporate group that bears significant responsibility to society in terms of preventing dishonesty, misconduct, and the disclosure of corporate secrets, as well as refraining from exchanging excessive favors with customers and suppliers, and ensuring that they conduct themselves according to the highest ethical standards in both private and public activities.

### Organization for Implementation

NTT has a Corporate Ethics Committee with a senior executive vice president as chair. The committee meets twice a year with the aim of thoroughly promoting the NTT Group’s corporate ethics and maintaining discipline. It reports to the Board of Directors twice a year, particularly concerning the status of reports made to the Corporate Ethics Help Line, and the Board of Directors discusses reported matters when necessary.

The NTT Group has Corporate Ethics Committees and corporate ethics of officers at Group companies. We foster a corporate climate of observing laws and corporate ethics, investigate wrongful acts and scandals based on our Corporate Ethics Help Line operational rules, hold regular meetings for the compliance officers of Group companies, and work across the Group to promote compliance.



## NTT Group Corporate Ethics Policy

1. Recognizing the establishment of corporate ethics as one of its most important missions, top management shall exert its leadership to ensure that the spirit of these Standards is adopted throughout the Company, and shall assume full responsibility for solving any problems when any event inconsistent with that spirit occurs.
2. Every person with subordinate employees shall not only act in a self-disciplined manner, but shall also always provide guidance and assistance to his/her subordinate staff to ensure that their conduct is in conformity with our corporate ethics.
3. Every officer and employee of the NTT Group shall not only comply with all laws and regulations, social standards, and internal company rules whether in Japan or overseas, but officers and employees shall also hold the highest ethical philosophy within himself/herself both in public and in any private situations. Among other things, each officer and employee, as an officer or employee of a member of a Global Information Sharing Corporate Group, shall keep himself/herself fully aware that any disclosure of customer or other internal privileged information constitutes a materially wrongful act. Also, as a member of a group of companies which holds great social responsibilities, he/she shall strictly refrain from giving or receiving from customers, business partners, and other interested parties excessive gratuities. Furthermore, when interacting with public officials and politicians, officers and employees shall not commit bribery or commit any other acts that cause the other party to violate the National Public Service Ethics Act/Code of Ethics and the Ministerial Code, or that cause suspicion that such a violation has occurred.
4. Each NTT Group company, at the first opportunity, shall take initiatives to provide training programs in order to help its officers and employees enhance their awareness of our corporate ethics.
5. Every officer and employee of the NTT Group shall direct his/her efforts to prevent wrongful or scandalous acts which may potentially occur as specialization and advancement of our business proceeds. Each NTT Group company shall improve its system to prevent such acts, including, for instance, the re-assignment of contract representatives who have remained with the same customers for a long period of time, and the improvement of monitoring tools to protect customer and other information.
6. Any officer or employee who may come to know of the occurrence of any wrongful act or any scandal shall promptly report the wrongful act or scandal to his/her superior or other appropriate persons. If he/she is not able to make such a reporting, he/she may contact the Corporate Ethics Help Line (External Contact Point). It should be noted that every officer and employee who reports the occurrence of any wrongful act or scandal shall be protected so that the reporting party shall not suffer any negative consequences due to such reporting.
7. In the event of an occurrence of any wrongful act or scandal, each NTT Group company shall be committed to the settlement of the problem by taking appropriate steps through a speedy and accurate fact finding process, and responding in a timely, suitable, and transparent manner in order to fulfill its social accountability.

## Main Initiatives

### Prevention of Bribery

The NTT Group Corporate Ethics Policy mandates compliance with all laws and regulations, social standards, and internal company rules whether in Japan or overseas. With regard to the prevention of bribery, we have an Anti-Bribery Handbook containing important matters to be understood and complied with by our employees. The contents of this handbook are made known to all employees in Japan and overseas through emails and other means. In addition, NTT, NTT East, and NTT West stipulate that taking bribes is forbidden under the Act on Nippon Telegraph and Telephone Corporation, etc. (hereafter “the NTT ACT”) and that breaches are punishable by law. Following the Act on Prevention of Un-just Acts by Organized Crime Groups, contributions and other types of support are only given to charitable organizations deemed suitable by the NTT Group. We have a zero tolerance approach to corruption. In fiscal 2020 no illegal conduct associated with bribery or contribution/support was confirmed within the NTT Group.



### Political Contributions

As a holding company, and in compliance with Japan’s Political Funds Control Law, NTT does not make political contributions, while a few Group companies make political contributions at their own discretion and in accordance with the relevant laws and regulations as well as the companies’ respective codes of corporate ethics.

### Compliance with Anti-Monopoly Laws

The NTT Group has adhered to the Anti-Monopoly Act to ensure its business activities align with a fair and competitive business environment. These initiatives have been effective, as evidenced by the fact that continuing from the previous fiscal year, we were not fined for violation of anti-monopoly regulations in fiscal 2021.

### Request to Business Partners for Compliance and Risk Assessment

With the increased globalization and complexity of supply chains in recent years, responding appropriately to global issues, such as disasters/pandemics, environment, human rights, and security, has become an important issue. In light of this, we formulated the NTT Group Supply Chain Sustainability Promotion Guidelines in 2022 that contain detailed requirement items in the seven areas of human rights/labor, health/safety, the environment, fair trade/ethics, quality/safety, information security, and business continuity plans to guide our efforts as we work together with suppliers to create and maintain a safe and secure supply chain and achieve a sustainable society. The guidelines also clearly and directly lay out the responsibility for suppliers to communicate the guideline details with their upstream suppliers and encourage them to comply and verify their compliance status. In addition, we have also published the NTT Group Green Procurement Standards as a supplement to our environmental guidelines and are requesting that continued efforts be made to reduce greenhouse gas emissions throughout the supply chain. We have published these Guidelines in Japanese and English as a way of communicating to a broad range of the NTT Group’s suppliers both in Japan and overseas, and we have incorporated them into supplier contracts to ensure compliance. For our key suppliers in particular, we are conducting surveys on the status of sustainable procurement.

We checked activities concerning compliance in general, including their response to preventing corruption, illegal political contributions and antisocial forces, and also requested further improvements where necessary.

## Value Chain Management

### Policies and Concepts

In recent years, companies find themselves required to monitor the ESG risks and impact on sustainability, including consideration of human rights and mitigation of environmental impacts, of not only their own group companies but also throughout the entire value chain, from raw materials and supplies procurement to disposal and recycling. Also, we are seeking to expand the B2B2X model and global businesses under the medium-term management strategy “Your Value Partner 2025” that we established in 2018. We expect our value chain to expand further globally, requiring us to enhance our value chain management initiatives.

The NTT Group’s value chain management focuses on requiring suppliers to adhere to the various guidelines under the “Procurement Policies” established by NTT. For this reason, it is important for us to build partnerships of trust with all of our suppliers. In light of this, we formulated the NTT Group Supply Chain Sustainability Promotion Guidelines in 2022 to create and maintain a safe and secure supply chain and achieve a sustainable society together with our suppliers. In addition, we have also published the NTT Group Green Procurement Standards as a supplement to our environmental guidelines, and are requesting that efforts be made to reduce greenhouse gas emissions throughout the supply chain.

## Organization for Implementation

NTT’s Technology Planning Department has formulated the NTT Group Supply Chain Sustainability Promotion Guidelines as a guide for promoting sustainability in the supply chain throughout the Group. In coordination with procurement divisions at each NTT Group company, we ensure that a supplier’s compliance with key items within the guidelines is a basic condition of procurement and we regularly check that this condition is being met and follow-up with suppliers.

### NTT Group Supply Chain Sustainability Promotion Guidelines

A number of supply chain issues have recently come to light, including serious human rights violations such as forced labor and child labor, unlawful disposal of waste, response to stricter regulations on controlling chemical substances, bribery, and other examples of malpractice.

In light of this, we formulated the NTT Group Supply Chain Sustainability Promotion Guidelines in 2022 that contain detailed requirements for suppliers in the seven areas of human rights/labor, health/safety, the environment, fair trade/ethics, quality/safety, and information security to guide our efforts as we work together with suppliers in order to conduct procurement activities in a socially responsible manner.

We have published these Guidelines in Japanese and English as a way of communicating to a broad range of the NTT Group’s suppliers both in Japan and overseas, and we have incorporated them into supplier contracts to ensure compliance.

Procurement  
<https://group.ntt/en/procurement/>  
 NTT Group Supply Chain Sustainability Promotion Guidelines  
[https://group.ntt/en/procurement/supplier/pdf/NTT\\_Group\\_Guidelines\\_for\\_Sustainability\\_in\\_Supply\\_Chain.pdf](https://group.ntt/en/procurement/supplier/pdf/NTT_Group_Guidelines_for_Sustainability_in_Supply_Chain.pdf)

## NTT Group Basic Procurement Policy

The NTT Group has created the “NTT Group Global Sustainability Charter” and is promoting initiatives aimed at achieving a “sustainable society” with both “Growth as a company” and “resolving social issues.” With modern supply chains, advances in globalization mean there is a greater importance for dealing appropriately with issues such as human rights, ethics, the environment, disasters and pandemics, and security. To address issues like these, the NTT Group aims to take an independent and proactive stance in achieving a sustainable society, by enhancing mutual understanding and building relationships of trust with all suppliers that make up the supply chain, and working together with high ethical standards to develop and maintain a safe and secure supply chain that provides a range of assurances like the protection of human rights and conservation of the global environment.

To achieve this, we will conduct procurement in accordance with the following “NTT Group Basic Procurement Policy.”

1. NTT will strive to provide competitive opportunities with fairness to both domestic and foreign suppliers, and to build mutual trust and understanding.
2. NTT will conduct economically rational procurement of competitive goods and services that meet its business needs, deciding on suppliers based on quality, price, delivery times, and stable supply in a comprehensive manner.
3. NTT will conduct procurement in a manner that follows laws and regulations as well as social norms, and takes the environment, human rights, and other issues into account to contribute to society.

## Request to Business Partners for Compliance and Risk Assessment

The NTT Group Supply Chain Sustainability Promotion Guidelines, the operational guidelines we issue to our suppliers, clearly outlines fair trade practices and business ethics (seven articles). With respect to critical suppliers, we conducted a survey on the status of sustainability procurement. We checked activities concerning compliance in general, including their response to preventing corruption, illegal political contributions and antisocial forces, and also requested further improvements where necessary.

## ESG Education for Procurement Department Staff

The NTT Group implements training on ESG for staff in procurement departments to reduce the burden of procurement activities on the environment and ensure they persistently comply with the laws, regulations, and norms of society.

## VA Proposal System and Supplier Awards System

NTT East and NTT West engage in VA (Value Analysis) activities in which we invite our suppliers to submit proposals for enhancing quality, safety and workability, and for contributing to environmental protection, and then we incorporate their ideas in product specifications. We award suppliers that offer particularly outstanding proposals. In addition, we participate in improvement presentations held by suppliers and work with them to make improvements based on dialogue and cooperation.

Since fiscal 2006, we consolidated contact points for a simpler proposal system and established an environment for further developing improvement activities, including adding a new scheme for VE (Value Engineering) & VA proposals from telecommunications construction companies and suppliers. We will remain active on improving our products and services.

### Assessment of Social and Environmental Risks

We assess social and environmental risks by conducting the Supply Chain Sustainability Survey using the Supply Chain Sustainability Promotion Check Sheet to confirm the status of compliance with various guidelines and technical requirements. The survey targets all of the NTT Group’s critical suppliers that account for at least 90% of total procurement value, supplier of non-substitutable products and supplier of important products. The survey includes 161 items covering the seven areas of human rights and labor, health and safety, the environment, fair trade and ethics, quality and safety, information security, and social contributions. For example, in the area of human rights, we also conduct monitoring of child labor and forced labor as well as compliance with the freedom of association and collective bargaining rights. We assess the responses from suppliers, and designate those with a certain percentage of low-rated responses, or those with a low rating for specific items, as high sustainability risk suppliers. We visit these designated suppliers to perform additional checks, and when corrective action is necessary, we have them prepare an improvement plan and monitor its implementation. While the survey covers critical suppliers, we seek to assess risks that exist further upstream by also including items that check whether the supplier is making efforts to educate secondary suppliers about social responsibility. The goal of the survey is to request and receive responses from all critical suppliers.

#### Check points for the Supply Chain Sustainability Survey (161 items)

- (1) Sustainability promotion in general (4 items)
- (2) Human rights and labor (33 items)
- (3) Safety and hygiene (25 items)
- (4) Environment (25 items)
- (5) Fair trade and ethics (27 items)
- (6) Quality and safety (10 items)
- (7) Information security (15 items)
- (8) Business continuity plan (6 items)
- (9) Others (Conflict Minerals, Code of Conduct, Due Diligence, Complaint Processing Mechanism, etc.) (16 items)

### Requests to Suppliers on Environmental and Social Concerns

We have established the following guidelines as requirements under the NTT Group Supply Chain Sustainability Promotion Guidelines and seek compliance from suppliers. We also ask all suppliers that participate in procurement, whether they are a new supplier or not, to comply with our Notes Regarding Participation in the Procurement Process, including not having any past involvement with organized crime groups or demonstration of improper conduct related to procurement. We revised the NTT Group Guidelines for Green Procurement in April 2021, and added environmental-related requirements that suppliers should comply with. As part of environmental activities announced by the NTT Group such as the Environment and Energy Vision, this revision includes a declaration of environmentally friendly procurement (green procurement), and stipulates that all suppliers are requested to cooperate with the NTT Group’s environmental activities aimed at conservation of the global environment. In the past these guidelines applied to products procured by the NTT Group, however following this revision, these guidelines have been expanded to apply to products and services sourced by the NTT Group. It also specifies the requirements of initiatives for suppliers for reducing their environmental impact, such as reducing greenhouse gas emissions, their commitment to resource recycling, and the conservation of biodiversity. The NTT Group will continue to implement initiatives for reducing its environmental impact throughout the entire supply chain. The “NTT Group Guidelines for Green Procurement” has also been renamed to the “NTT Group Supply Chain Sustainability Promotion Guidelines” established in February 2022.

### Conducting Risk Assessment for the Supply Chain

We are assessing risks from a range of perspectives as part of sustainability-related initiatives taken toward each of our suppliers. To assess risks, we perform supplier engagement activities that involve direct dialogue with each of our suppliers, in line with results obtained from the “Supply Chain Sustainability Survey,” conducted to confirm the status of suppliers’ compliance with various guidelines. We will continue to scrutinize the survey method, survey content, and analysis method and use the findings of these questionnaires to provide feedback and continue discussions with suppliers in order to reduce risks across the value chain of the NTT Group.

### Communicating with Suppliers

The NTT Group strives to build better partnerships with each of its suppliers by mutually exchanging views and proposals through various modes of communication.

In July 2018, we started introducing a system that enables faster assessment of damage to suppliers following a major earthquake or other disaster. By exchanging information more quickly and accurately, we will continue to work with suppliers on the prompt restoration of telecommunications equipment. The NTT Group companies also engage in various forms of communication with their suppliers. Specifically, these companies inform their suppliers of their business environment and exchange views on how they can continually work together to provide a stable supply of high quality, competitive products.

NTT Group Basic Procurement Policy	Basic procurement activity policy to achieve a sustainable society
NTT Group Supply Chain Sustainability Promotion Guidelines	Requests to suppliers, based on the Basic Procurement Policy, regarding social issues
NTT Group Green Procurement Standards	NTT’s latest environmental policies, target figures, specific laws and standards suppliers must reference, procurement evaluation items, etc.
Technical Requirements	Specific technical requirements, including the reduction of environmental loads, for procuring products that pay due consideration to quality, safety, the environment and other aspects

### Initiatives to Promote Awareness of the NTT Group Corporate Ethics Policy

At NTT, top management demonstrates that compliance requires the NTT Group to comply with laws and conduct business with everyone having strong ethics. Also, the presidents of each NTT Group company have declared their commitment to identify risks related to illegal or illicit activities and never tolerate any form of impropriety. To ensure the effectiveness of the NTT Group Corporate Ethics Policy, we offer training sessions on corporate ethics to employees and, through a website for employees, we explain the declaration in detail and give examples of corporate ethics issues. Employees are reminded of the importance of ethics in June and December each year in an effort to raise their level of understanding. Furthermore, NTT conducts annual surveys of employees to measure their awareness, and the results are then used for awareness enhancement initiatives.

### Corporate Ethics and Compliance Training

Corporate ethics training is conducted as part of continuous educational activities for all officers and employees. This training is tailored to meet the specific compliance and corruption risks of each company throughout the NTT Group. Furthermore, training for officers is also conducted every year.

### Anti-Bribery Handbook

The Anti-Bribery Handbook is a revised version of the one we produced in 2015 mainly for the purpose of deepening understanding of regulations concerning the bribing of foreign public officials. In 2021 it came to light that senior NTT Group executives had dined out with persons connected to Japanese ministries and agencies, and reflecting on these incidents, we enhanced the contents and altered the format such as increasing the number of explanations using case studies.

### Competition Law Handbook

The NTT Group created a Competition Law Handbook Sustainability Report 2021 in fiscal 2019 as a tool for ensuring compliance with competition law among employees and it has been made known to all employees

at NTT Group companies inside and outside of Japan. The handbook contains the basics regarding compliance with competition law within a Q&A format, as well as specific examples that might be found within the Company's business activities, in order to instill correct knowledge and understanding of competition law compliance in employees.

### Check System for Penetration of Corporate Ethics

NTT conducts an annual survey that includes NTT Group companies in order to ascertain the extent to which employees are aware of compliance. At each NTT Group company, monitoring is performed under four different functions, comprising the departments in charge of business operations, compliance and internal auditing, as well as the Audit and Supervisory Board members, to ensure neutral and multifaceted checks are being performed.

NTT checks the status of compliance audit implementation at NTT Group companies with an internal auditing department and directly confirms the status of compliance initiatives inside NTT and at NTT Group companies without an internal auditing department.

### Establishment of Corporate Ethics Help Line Contact Point

To prevent illegal conduct or a scandal, each Group company has set up an internal consulting center to handle reports of improper activities. In addition, NTT has established the Corporate Ethics Help Line as an external contact point for NTT Group companies and outsources its operation to a law firm. The help line also handles consultations and reports related to human rights issues. The NTT Group Corporate Ethical Standards clearly state that people who file reports with these help lines will be protected from any disadvantage arising from the fact that they filed a report. The content of the consultations and reports are investigated and handled by the staff member in charge, and a report is submitted to the Corporate Ethics Committee of each Group company. All reports are collected at least once a year by NTT, where the response status is ascertained and reported to the Board of Directors.

In addition, since the contact point is independent

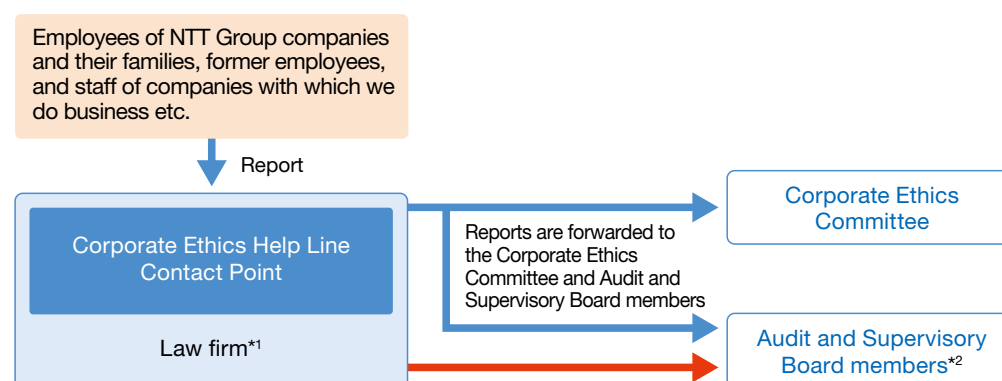
from management, there is an independent reporting route to Audit & Supervisory Board members. Reports made through our Corporate Ethics Help Line (external contact point) are in principle sent directly to Audit & Supervisory Board members at the same time; reporting only to Audit & Supervisory Board members is also possible.

Corporate ethics helplines  
<https://group.ntt/en/csr/governance/compliance.html>

### Number of Reports Received by the Corporate Ethics Help Line (External Contact Point)

We monitor the number of reports received by the Corporate Ethics Help Line, and publish this number in our Sustainability Report and on the NTT Group's Sustainability website. The Whistleblowing Mechanism Guidelines, revised in December 2016 by the Consumer Affairs Agency, recommend that neutral and fair third-party assessments be carried out. We had such an assessment carried out in May 2017 and received the comment that overall, a whistleblowing mechanism is in place and is being administered appropriately.

Reports to the corporate ethics help line by type of violation  
<https://group.ntt/en/csr/governance/compliance.html>



\*1 A help line has been set up within the law firm for the purpose of protecting the identity of the whistleblower. Attorneys at law do not provide direct consultation

Information may be provided solely to Audit and Supervisory Board members

\*2 Audit and Supervisory Board members are responsible for conducting audits to determine whether or not directors are executing their duties in accordance with the Articles of Incorporation and relevant laws and regulations.

### Details of assessment

- Investigation of the mechanism and operational status of the help line in order to verify its effectiveness in terms of utilization and reliability.
- Sample survey on the establishment of regulations and responses to whistleblowers, etc.
- Confirmation of compliance with the Whistleblowing Mechanism Guidelines.
- Interviews with administrators and discussion about operational issues

### Disciplinary Actions against Confirmed Violations

A compliance violation or breach of the NTT Group Corporate Ethical Standards is dealt with using the disciplinary measures taken in accordance with the disciplinary code established at each Group company. This includes pay cuts and work suspension, and may also be reflected in assessments (evaluations) and personnel transfers.

### Business Risk Management

The NTT Group faces a rapidly changing business environment, including intensified competition in the information and telecommunications sector. In this context, NTT Group companies are exposed to an increasing amount of business risk. The NTT Group strives to minimize the impact of losses that could result from the materialization of risk by anticipating and preventing the occurrence of potential risks. As part of these efforts, NTT has formulated the NTT Group Business Risk Management Manual and has distributed it to all Group companies so that the entire Group can work together to conduct risk management. This manual contains policies for addressing various forms of risk facing the NTT Group’s business operations and approaches to coordination among NTT Group companies.

In addition, each Group company has formulated its own manuals and other guidelines, which reflect its specific business operations, business environment, and other factors, and is using these materials to control business risks.

### Organization for Implementation

At NTT, Risk Management Regulations are in place, which define fundamental policies concerning in-house risk management for effective and efficient business operations. Risk management is carried out based on a continuous PDCA cycle under the leadership of the Business Risk Management Committee, chaired by the representative director and senior executive vice president, and comprised of heads of departments and offices as committee members. At the NTT Group, the representative director and senior executive vice president of NTT is assigned ultimate responsibility for risk management, while each executive officer serves as the risk officer for the business area they are placed in charge of.

### Identifying Material Risks

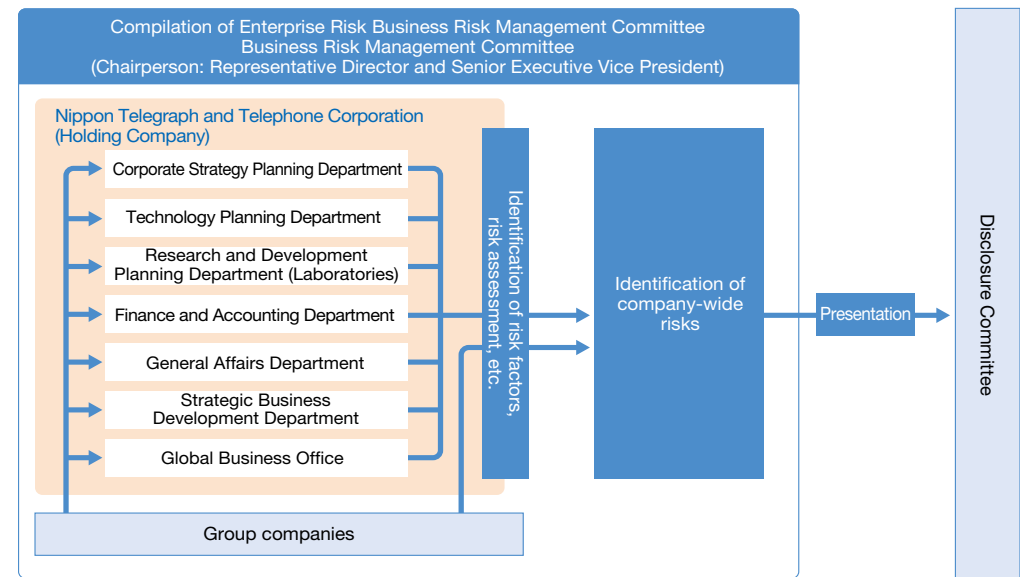
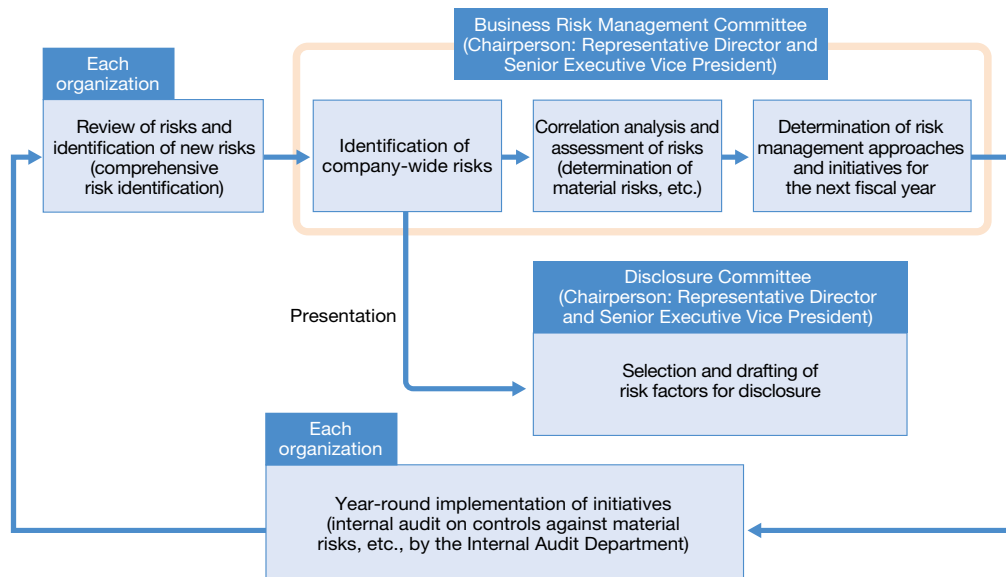
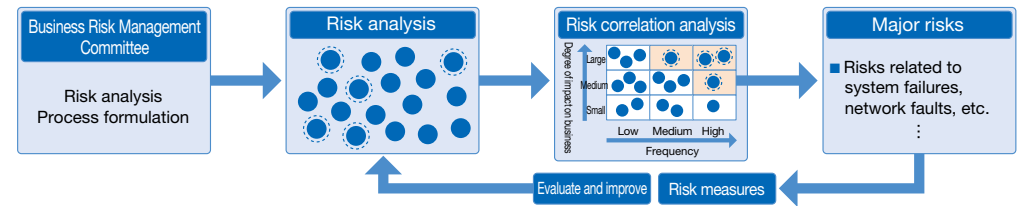
From time to time, NTT reviews assumed risks and management policies based on changes in the social environment.

In the identification of Companywide risks, the Business Risk Management Committee leads analysis processes for the risks faced by the NTT Group are formulated and periodically implements risk analyses in accordance with these processes. In addition, after a correlation analyses on these risks, it specifies those risks with the potential to have the greatest impact as material risks, and we decide on countermeasures.

Matters pertaining to risk management are discussed at meetings of the Business Risk Management

Committee. As part of risk monitoring, each department in charge reports on the status of monitoring and risk mitigation effects to the Business Risk Management Committee, while the Internal Audit Department conducts individual audits on the status of initiatives to address material risks and reports results to the Board of Directors in the subsequent fiscal year.

Among other things, risks are also identified by focusing on the perspective of conduct risk—where customers and other stakeholders suffer negative consequences as a result of actions taken by the NTT Group—by ensuring better planning and implementation of appropriate measures.



## Business Activity 14

# Thoroughly reinforcing corporate governance and compliance

### Our commitment

We set high ethical standards for ourselves and share them with our business partners

### Our objective

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Cases of legal actions for anti-competitive behavior, bribery

### Basic Policy

We believe that strengthening the system of corporate governance in accordance with the purposes of each principle of the “Corporate Governance Code” of the Tokyo Stock Exchange is an important management issue for maximizing corporate value while meeting the expectations of various stakeholders, including shareholders and other investors, as well as customers, business partners, and employees. Therefore, we are working to strengthen corporate governance based on our fundamental policies of ensuring sound management, executing appropriate decision-making and business activities, clarifying accountability, and maintaining thorough compliance.

NTT is implementing all the principles of the Corporate Governance Code it revised in June 2021

### Overview of Corporate Governance Structure

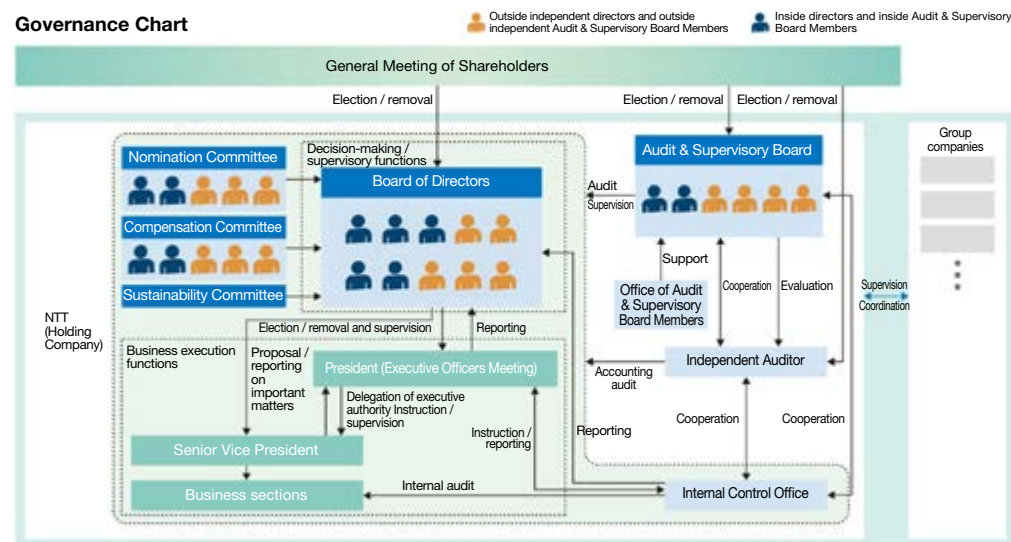
NTT believes that an auditing system based on Audit & Supervisory Board Members, including outside independent Audit & Supervisory Board Members, is an effective means of supervising management. Accordingly, we have adopted the model of being a company with a Board of Company Auditors (Audit & Supervisory Board). In addition, through the election of outside independent Members of the Board, NTT has strengthened the function of appropriately supervising business execution. Furthermore, through its adoption of an executive officer system, NTT intends to clearly separate management-related decision-making and supervisory functions from business execution functions and improve its management flexibility.

Additionally, NTT has voluntarily established a “Nomination Committee” and a “Compensation Committee,” each of which consists of five Members of the Board, including three outside independent Members of the Board, to further increase the objectivity and transparency of decisions relating to appointment and compensation. NTT has determined that governance functions based on a Board of Corporate Auditors (Audit & Supervisory Board) are sufficiently effective to achieve this purpose.

### Board Member Compensation Determination Policy and Process

Regarding the composition and level of compensation for Members of the Board of NTT under the Determination Policy, in order to secure objectivity and transparency, NTT es-

### Governance Chart



established the Compensation Committee, comprising five Members of the Board, including three Independent Outside Members of the Board. Moreover, decisions on the ratios and calculation methods for compensation for Members of the Board, and amounts of compensation for individual Members, are delegated from the Board of Directors to the Compensation Committee. The reason for delegating these authorities to the Compensation Committee is that such committee is composed of two Representative Members of the Board and three Outside Members of the Board, and we believe that it is able to make the appropriate judgements from an outside perspective while also taking a bird’s-eye view of the Company’s overall performance.

Compensation of individual Members of the Board (excluding outside Members of the Board) consists of a monthly salary (base salary) and a bonus (compensation related to performance over the short term), NTT stock purchase through Board Members Shareholding Association and stock compensation (compensation related to performance over the medium to long term). The composition ratio of compensation in a case where standard business results are achieved is roughly as follows: Fixed compensation: Short-term performance-linked compensation: Medium- to long-term performance-linked compensation = 50%: 30%: 20%.

### Bonus Performance Indicators (FY2022)

Category	Performance Indicators	Weight	Evaluation method
Financial indicators	EPS	35%	Year-on-year improvement
	Consolidated Operating Income	35%	
	Overseas operating profit	10%	
	ROIC	5%	
Sustainability indicators	Greenhouse Gas Emissions	5%	Achievement of targets
	B2B2X earnings	5%	
	Ratio of women newly promoted to management positions	5%	

### Clawbacks System

A performance-linked stock compensation system was adopted in fiscal 2021 for members of the board and officers of NTT and its major subsidiaries. A system has been established such that, in the event that an Eligible Member of the Board or Officer engages in significant illegal or inappropriate activity, or takes employment at another company in the same industry without the permission of the company, the system enables the revocation of rights to receive Company Shares under the Compensation System with respect to such person (malus clause) and the request for the return of funds corresponding to previously delivered Company Shares (clawback).

Committee name	Function
Board of Directors	<p>The Board of Directors has ten Members of the Board including five outside independent Members of the Board, which brings the total percentage of outside Members of the Board to 50%. In addition, the introduction of an executive officer system that clearly separates the management decision-making and oversight functions from the business execution function ensures closer supervision of execution and enhanced management flexibility. In principle, the ordinary meetings of the Board of Directors are held once per month, and extraordinary meetings are held as needed. The Board of Directors discusses the group management strategies and makes decisions on matters stipulated by laws and regulations and on important matters related to company management and group management. Moreover, through such means as periodic reports from Members of the Board and Executive Officers on the status of business execution, the Board of Directors supervises the business execution of Members of the Board and Executive Officers.</p> <p>With the objective of further strengthening the independence, objectivity, and accountability in decisions with respect to appointments and compensation of officers and related matters made by the Board of Directors, the Company has voluntarily established a Nomination Committee and Compensation Committee, each consisting of five Members of the Board, of which a majority (three) are outside independent Members of the Board, as preliminary review institutions of the Board of Directors, thereby increasing the effectiveness of governance.</p> <p>Moreover, in recognition of the fact that response to sustainability issues is an important management challenge, the Company has voluntarily established a Sustainability Committee that reports directly to the Board of Directors. The committee will work to further promote initiatives after important issues and indicators have been decided by resolution of the Board of Directors.</p>
Audit & Supervisory Board	<p>The Audit &amp; Supervisory Board comprises four outside independent Audit &amp; Supervisory Board Members (including one female member), who have experience and knowledge in a range of fields—as a lawyer, university professor, and Certified Public Accountant—and two internal Audit &amp; Supervisory Board Members (including one female member). NTT conducts effective audits by combining the independence of outside Audit &amp; Supervisory Board Members with the superior information collection capabilities of internal Audit &amp; Supervisory Board Members.</p>
Nomination Committee / Compensation Committee	<p>With the objective of further strengthening independence, objectivity, and accountability in decisions made by the Board of Directors with respect to appointments and compensation of the Members of the Board and officers, the Company has voluntarily established a Nomination Committee and a Compensation Committee, each consisting of five Members of the Board, of which a majority (three) are Independent Outside Members of the Board, as preliminary review institutions of the Board of Directors, thereby increasing the effectiveness of governance.</p>
Executive Officers Meeting	<p>Important corporate matters to be decided are, in principle and in advance, discussed at the Executive Officers Meeting, which is made up of senior vice presidents and others. The Executive Officers Meeting is held about once a week. To improve the transparency of management decision-making, one Audit &amp; Supervisory Board member participates in the Executive Officers Meeting.</p>
Various Committees	<p>A number of committees have been established below the Executive Officers Meeting to discuss specific important business execution-related matters. Major committees include the Technology Strategy Committee, which deliberates on the Group's R&amp;D vision and technology development strategy; the Investment Strategy Committee, which examines investment projects that are larger than a certain scale; and the Finance Strategy Committee, which discusses basic financial strategies and issues. These committees, which are held as necessary throughout the year, are in principle chaired by the president or a senior executive vice president and are attended by relevant senior vice presidents and other designated members.</p>

### A History of Strengthening Corporate Governance

2022–	<b>Strengthening of governance functions, diversification of members</b>	2022	<ul style="list-style-type: none"> <li>• Increase in number of Board Members: from 8 to 10 (5 from outside)</li> <li>• Increase in number of Audit &amp; Supervisory Board Members from 5 to 6, by adding 1 full-time outside corporate auditor in order to strengthen the corporate auditor system</li> <li>• Increase the ratio of female directors, Audit &amp; Supervisory Board Members, and executive officers to more than 30%</li> <li>• Reorganize the Internal Control Office into an Internal Audit Department under direct control of the President</li> </ul>
2021–	<b>Further strengthening of corporate governance</b>	2021	<ul style="list-style-type: none"> <li>• Transfer the Appointment and Compensation Committee into the separate Nomination Committee and Compensation Committee based on their applicable functions</li> <li>• Transfer the Sustainability Committee under the Executive Officers Meeting to a Committee reporting directly to the Board of Directors</li> </ul>
2020–	<b>Separation of the functions of managerial decision-making / supervision and business execution</b>	2021	<ul style="list-style-type: none"> <li>• Expanded ratio of performance-linked compensation: 30% → 50%</li> <li>• Increased number of outside directors on Nomination Committee and Compensation Committee: 2 → 3</li> <li>• Transfer the existing Appointment and Compensation Committee into the separate Nomination Committee and Compensation Committee based on their application functions</li> <li>• Disclosed skill matrix for Members of the Board and Audit &amp; Supervisory Board members</li> </ul>
		2020	<ul style="list-style-type: none"> <li>• Optimizing the size of the Board of Directors: 15 → 8</li> <li>• Ratio of outside directors: 27% → 50%</li> <li>• Adoption of executive officers system Separation of the functions of managerial decision-making / supervision and business execution</li> <li>• Disclosure of specific KPIs for officers' earnings-linked remuneration</li> </ul>
2018–	<b>Further reinforcement of oversight function by enhancing diversity, advancement of disclosure</b>	2019	<ul style="list-style-type: none"> <li>• Establishment of NTT, Inc. (strengthening of the governance of the global business), appointment of three foreign-national directors</li> <li>• Conducting of evaluation questionnaire on the effectiveness of the Board of Directors</li> <li>• Commencement of ESG information disclosure in notices of convocation</li> </ul>
		2018	<ul style="list-style-type: none"> <li>• Appointment of two female directors (one inside and one outside), a Company first</li> <li>• Increase in the number of outside Members of the Board: 2 → 4</li> <li>• Strengthening of the reflection of KPIs in performance-linked compensation</li> <li>• Expansion and improvement of statements regarding the compensation of directors, strategic shareholdings, succession plans, and evaluations of the effectiveness of the Board of Directors</li> </ul>
2011–	<b>Strengthening of information disclosure with an awareness of dialogue with stakeholders</b>	2017	<ul style="list-style-type: none"> <li>• Introduction of notices of convocation that are viewable via smartphones</li> </ul>
		2015	<ul style="list-style-type: none"> <li>• Response to Corporate Governance Code</li> <li>• Establishment of independence standards for independent Members of the Board and independent Audit &amp; Supervisory Board Members</li> <li>• Commencement of issuance of sustainability reports</li> <li>• Commencement of disclosure of the notices of convocation before they are sent (henceforth, 42–45 days before the date of the convening of the Ordinary General Meeting of Shareholders, in Japanese and English on the same date)</li> </ul>
2006–	<b>Strengthening of supervisory function and improvement of corporate governance transparency</b>	2006	<ul style="list-style-type: none"> <li>• Increase in number of outside Audit &amp; Supervisory Board Members: 2 → 3</li> <li>• Appointment of financial expert as Audit &amp; Supervisory Board Member</li> <li>• Commencement of disclosure of Corporate Governance Report</li> </ul>
		2005	<ul style="list-style-type: none"> <li>• Establishment of Disclosure Committee</li> <li>• Establishment of Nomination Committee and Compensation Committee</li> <li>• Commencement of issuance of CSR reports</li> </ul>
		2003	<ul style="list-style-type: none"> <li>• Increase in number of Audit &amp; Supervisory Board Members: 4 members (2 inside members, 2 outside members) → 5 members (3 inside members, 2 outside members)</li> </ul>
	<b>Establishment of a foundation for corporate governance</b>	1985	<ul style="list-style-type: none"> <li>• Appointment of multiple outside Members of the Board</li> </ul>

## Governance Reinforcement Policy

- (1) The number of directors will be increased from the current 8 to 10 (the number of independent directors will be increased to 5 to make up a majority).
- (2) To strengthen the corporate auditor structure, add one outside full-time corporate auditor and increase the number from five to six (four or more outside corporate auditors represent the majority).
- (3) Implementing a policy to increase the ratio of female directors, corporate auditors and executive officers to at least 30%.
- (4) The Internal Control Office was reorganized into the Internal Audit Department, an organization directly connected to the president.

We are anticipating outside directors to provide a wide range of management perspectives and expert opinions, and we internal and external directors are appointed by actively considering the promotion of diversity (Gender, race, or ethnicity (Ethnicity)). As a result, more than 30% of executives are women, and we are actively promoting diversity. In addition, Article 10 (Directors and Audit & Supervisory Board Members) of the Act on Nippon Telegraph and Telephone Corporation, etc., provides that “Any person who does not have Japanese nationality may not be appointed as a director or an auditor for the Company or the Regional Companies.” and therefore nationality cannot be included in the policy. Accordingly, we cannot invite foreign directors under the NTT Act. However, eight foreign directors and three foreign directors of Data and Ltd are invited as directors of the intermediate holding company (global business).

## Tax Policy

### Basic Policy

All directors and employees of NTT Group have declared their commitment to complying with all laws and regulations (including their spirits), social standards, and internal company rules, whether in Japan or overseas, and acting in accordance with the highest ethical standards in both private and public activities. In tax-related operations, we also strive to maintain and enhance tax compliance by setting up guidelines and educating our employees.

### Governance Structure

NTT has established a basic policy of internal control systems for NTT Group to deal with various risks including tax risks which has been approved by NTT’s board. We define each company’s roles in tax-related operations as shown below, to the left.

#### 1. NTT

NTT establishes the basic policy and guidelines of tax-related operations and promotes appropriate measures in cooperation with its consolidated subsidiaries. NTT strives to gather information regarding regulations, notifies subsidiaries of any changes to regulations, and supervises subsidiaries.

#### 2. NTT’s Consolidated Subsidiaries

NTT’s consolidated subsidiaries fulfill their tax duties including preparing and filing tax returns, making tax payments, and dealing with tax audits appropriately in accordance with the basic policy and guidelines. NTT’s consolidated subsidiaries report information and submit relevant documents to NTT as necessary.

## Optimizing Tax costs

NTT and its consolidated subsidiaries should strive to utilize appropriately and effectively the tax relief measures with a view to maximizing shareholder value of NTT Group. NTT and its consolidated subsidiaries shall not implement any measures which may be considered or interpreted as tax evasion by regulators.

### Tax Risks

When undertaking international transactions, NTT and its consolidated subsidiaries should ensure such transactions are given due consideration in advance of execution. NTT and its consolidated subsidiaries should consult with tax advisors and seek advice as necessary. Furthermore, we have laid out the following measures regarding transfer pricing taxation and controlled foreign companies rules.

#### Transfer Pricing Taxation

- Prices that are applied to NTT Group’s international transactions will be calculated in accordance with the laws and regulations of each country or region and the Transfer Pricing Guidelines published by the OECD and also in accordance with the “arm’s length principle.”
- In cases where the documentation of the price calculation method is obligatory, or where such documentation is necessary due to factors such as transaction size and potential taxation risks, we will generate the documents in an appropriate manner.

#### Controlled Foreign Companies Rules

- NTT and its consolidated subsidiaries shall not use a low-tax country for tax avoidance. When investing in a low-tax country for business reasons, we will make appropriate tax payments in accordance with the laws and regulations of the relevant country or region.

## Relationship with Tax Authorities

NTT Group aims to maintain good relationships with tax authorities through communication with them. All explanations given to tax authorities should be based on facts. NTT and its consolidated subsidiaries should work with them in a sincere and appropriate manner. If tax authorities were to notify NTT and its consolidated subsidiaries of tax adjustments, NTT and its consolidated subsidiaries should determine the cause of such issue(s) immediately, and take appropriate measures to prevent similar recurrences, unless NTT and its consolidated subsidiaries file a petition of objection or tax lawsuit.

### Revenues (FY2020)

Revenues (billions of yen)	Approx. 12,559.9	
	Japan Approx.	10,451.0
	U.S.A. Approx.	736.4
	Germany Approx.	220.4
	Others Approx.	1,152.0

### Profit before Income Tax (FY2020)

Profit before Income Tax (billions of yen)	Approx. 1,695.2	
	Japan Approx.	1,651.0
	Overseas Approx.	44.2

### Taxes Incurred (FY2020)

Taxes Incurred (billions of yen)	Approx. 487.3	
	Japan Approx.	452.9
	Overseas Approx.	34.4

### Income Taxes Paid (FY2020)

Income Taxes Paid (billions of yen)	Approx. 455.7	
	Japan Approx.	441.4
	Overseas Approx.	14.3

The above amounts are based on “Country-by-Country Report” submitted to Japanese Tax Authorities, and not directly related to the Consolidated Financial Statements.

## Business Activity 15

# Sharing high ethical standards with business partners

### Our commitment

We set high ethical standards for ourselves and share them with our business partners

### Our objective

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Cases of legal actions for anti-competitive behavior, bribery

### Prevention of Bribery

Understanding that it is essential to comply with laws and regulations and to operate its business with high ethical standards, NTT Group prohibits all forms of corruption, including bribery, improper benefits and facilitation payments\*1. In particular, with respect to the prevention of bribery, NTT Group has created a “Anti-Bribery Handbook” and distributed it to employees of Group companies, including its overseas subsidiaries, and has also posted the handbook on its internal website to ensure thorough awareness. Furthermore, for NTT, NTT East, and NTT West, bribery is prohibited pursuant to the NTT Act, and any violations are subject to legal penalties.

### Began holding “NTT Group Sustainability Conferences”

In order to share superior sustainability initiatives across the NTT Group, we have held the NTT Group Sustainability Conference for the entire Group every year since fiscal 2013. This initiative takes the form of a conference setting where operating companies present their achievements of various measures implemented in line with nine challenges and 30 activities based on three themes. The best measures are commended by the President as “superior sustainability measures” at the conference. The FY2021 Sustainability Conference was the first to be held under the “NTT Group Global Sustainability Charter” established in November 2021, but as COVID-19 infections continued to spread around the world, it was held online in the same way as the previous year.

There were 98 submissions by group companies in Japan and overseas, with the Grand Prize going to six of those initiatives. A People’s Choice Award was created specifically for this online conference, where employees could offer their direct support of initiatives

submitted by each company. The People’s Choice Award was eventually given to four initiatives as a result of voting. The voting system was particularly valuable for increasing employee awareness as it allowed them to better understand each particular initiative before submitting their vote. The award ceremony was held in June 2022 in person for the first time in two years, and proved to be extremely popular. In addition to holding the conference in the next fiscal year and beyond, we also aim to further build on sustainability awareness among employees by improving the content of initiatives and enhancing measures that involve employee participation. Details of successful examples are also released outside the company so that they can be viewed by business partners.

NTT Group Sustainability Conferences  
[https://group.ntt/en/csr/management/management\\_system/conferences\\_8th.html](https://group.ntt/en/csr/management/management_system/conferences_8th.html)  
 NTT Group activities around the world  
[https://group.ntt/en/csr/sustainability\\_action/](https://group.ntt/en/csr/sustainability_action/)



\*1 Facilitation payments: Small payments used only for the purpose of ensuring ordinary administrative services are processed smoothly



## Business Activity

### Examples at the 9th Sustainability Conference Award



#### Revitalization of rural areas with AI-operated buses

The decreasing birthrate and aging population is leading to a social problem where there is a lack of transportation for the elderly. In light of this background, this initiative contributes to regional revitalization by providing AI-operated buses for more than 500,000 people in more than 50 areas around the country.



#### Smart fisheries industry (ICT Buoy)

We worked with fishermen in the Tohoku region to develop the "ICT Buoy" as part of reconstruction efforts in the wake of the Great East Japan earthquake, contributing to the revival of the fisheries industry with the aim of creating sustainable communities.



#### Supporting the treatment of stroke in Thailand by utilizing mobile services

We harnessed our technology to provide remote treatment inside emergency vehicles as a way of addressing issues in certain regions prone to traffic congestion in Bangkok, Thailand.



#### AI-based tuberculosis image diagnosis for 100,000 people in India

We provided image diagnoses for residents of local communities without easy access to hospitals in India (Chennai), a country with the highest number of tuberculosis patients in the world. This initiative has already helped to prevent tuberculosis in more than 100,000 people.



#### OriHime x sports x community development

In addition to opportunities for tuning in to sports events, we are helping to create a new way to promote corporate sports for addressing regional social issues, with initiatives like dietary education and eating together virtually with rugby players.



#### Development of smart city in Nagai City, Yamagata Prefecture

To address issues like aging populations and decreasing birthrates in regional areas, we combined our group-wide resources and technologies to provide a range of services like child protection systems, e-sports, and digital currencies for regional communities.

## Social Challenge

# 5

## Prepare for a new future with the power of technology

### Business Activity

- 16. Promoting the B2B2X Model
- 17. Protection and Respect for Intellectual Property
- 18. Contribution to the Revitalization of Local Communities and Economies



### Why it matters

In recent years, various social issues have come to the fore: rapid increase in the global population, growing severity of natural disasters, worsening of food supply and environmental problems, and in Japan, low birthrates and an aging population are leading to a rapid shrinking of the working-age population and shortage of labor. To solve these problems, significant social and economic transformations are being demanded in every society and economy, and the advancement of digital transformation utilizing ICT (Information and Communications Technology) is required in every situation.

### What can be accomplished

As a leader in digital transformation, we will act and contribute to helping resolve the social challenges unique to each country. For example, the declining birthrate and aging population, proper education, equitable healthcare, regional economic development, and long-term value through technology for the next generations.

### Future vision

The NTT Group is committed to contributing to the development of society by acknowledging diverse cultures, and thus we will contribute to solving social issues by connecting people, goods, and cultures, including communities, nations, and society, while promoting high ethical standards, diversity, and inclusion in fair and equitable ways, and work towards creating a better workplace through powerful and new digital technologies.



## Business Activity 16

# Promoting the B2B2X Model

### Our commitment

As a leader in digital transformation, we will act and contribute to helping resolve the social challenges unique to each country

For example, the declining birthrate and aging population, proper education, equitable healthcare, regional economic development, and long-term value through technology for the next generations

### Our objective

Generate ¥600 billion in B2B2X revenue by 2023

### Policies and Concepts

In recent years, various social issues have come to the fore: rapid increase in the global population, growing severity of natural disasters, worsening of food supply and environmental problems, and in Japan, low birth-rates and an aging population are leading to a rapid shrinking of the working-age population and shortage of labor. To solve these problems, significant social and economic transformations are being demanded in every society and economy, and the advancement of digital transformation utilizing ICT (Information and Communications Technology) is required in every situation.

Collaborating with companies in different industries and local governments as Your Value Partner, the NTT Group has been applying its management resources and capabilities, including human resources, research and development, and the ICT base to promote digital transformation and resolve social issues.

Going forward, we will seek to make a greater contribution to society based on our awareness that promoting the B2B2X business model that constitutes one of the pillars of our medium-term management strategy will be particularly effective.

### Organization for Implementation

The NTT Group has made promotion of the B2B2X business model one of the pillars of our medium-term management strategy and has been taking action by establishing a B2B2X Strategy Committee with the president as chairman to facilitate Group collaboration while expanding projects.

We are also deepening discussion about future deployment of the B2B2X business model at regularly held Board of Directors meetings and reporting on progress at general meetings of shareholders.

### What is the B2B2X model?

B2B2X is a business model aimed at resolving social issues by creating new value through collaboration with various partners.

This business model aims to provide our partner's customers (users) with new value by combining the industry expertise and customer platforms of our partners with the NTT Group's "data services" and "data management technology."

### Development of B2B2X business

The model is being developed as an All NTT Group initiative in areas like (1) Advancing industry value chains (2) Providing better customer service (3) Utilization of mobile data (4) Community-based service and urban development.

### Examples of value created with the B2B2X model

**(1) Advancing industry value chains in sectors like agriculture, forestry and fisheries, manufacturing and construction, and logistics**

**Example 1** Digitalization of agricultural growth and cultivation process management

**Example 2** Digitalization of manufacturing processes and machine tool management

**(2) Providing better customer service in logistics, services, and financial sectors**

**Example 3** Digital integration into a unified channel for bank customer contacts

**Example 4** Logistics branch reform utilizing digital payment and purchasing data

**(3) Utilization of mobile data x company owned data (mobile cross data)**

**Example 5** Support for financial services credit

**Example 6** Attracting more customers by harnessing data from sports teams

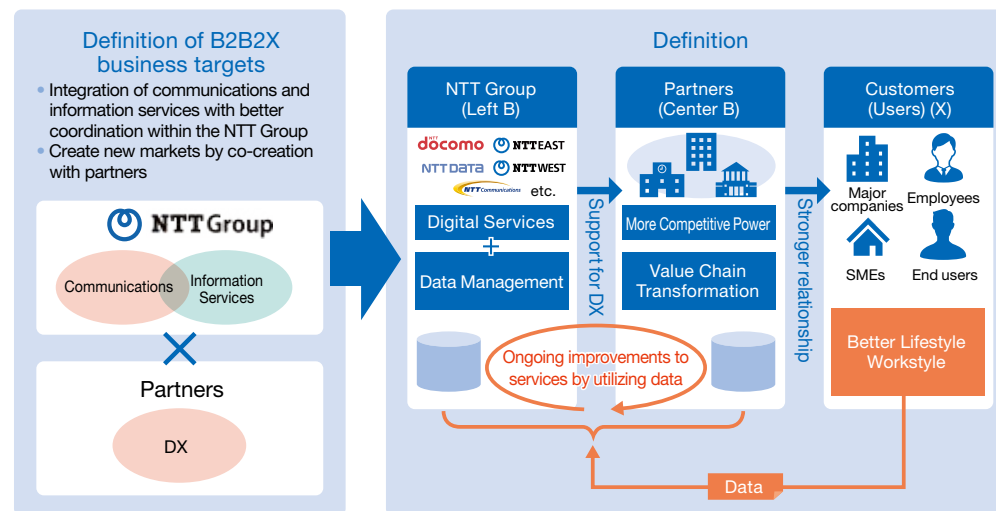
**Example 7** On-demand type ride sharing services

**(4) Community-based service and urban development**

**Example 8** Increasing business opportunities for local businesses by analyzing tourist patterns

**Example 9** More efficient budgeting, transportation and logistics in communities with digitalization of snow removal work

**Example 10** Using sensor data to quickly detect accidents or other incidents and minimize damage



### Facilitating collaboration with partners

- Entered into a business alliance with Mitsubishi Corporation in December 2019 to transform industrial value chains and to generate new value through digital transformation (DX), and in July 2021 established the joint venture company “Industry One” for providing DX services.
- Agreed to form a multi-year strategic alliance with Microsoft Corporation in December 2019 to promote the creation of a Global Digital Fabric, development of digital enterprise solutions, and co-innovation of next-generation technologies to deliver secure, reliable solutions that help enterprise customers accelerate their digital transformation.
- Entered into a business and capital alliance with Toyota Motor Corporation in March 2020 to establish a long-term, ongoing cooperative relationship that enables the commercialization of businesses to realize smart cities that continue to evolve in accordance with resident needs.
- The entire NTT Group is implementing initiatives aimed at achieving regional growth and developing smart cities by working with municipalities around Japan, with examples including a Community Development Partnership Agreement, concluded with Sapporo City (2015), a Comprehensive Partnership Agreement related to joint regional initiatives concluded with Fukuoka City (2015), an Agreement for Comprehensive Collaboration for developing a super-smart society by utilizing public and private data concluded with Yokohama City and Yokohama City University (2018), and a Comprehensive Partnership Agreement for future urban development concluded with Chiba City (2019).

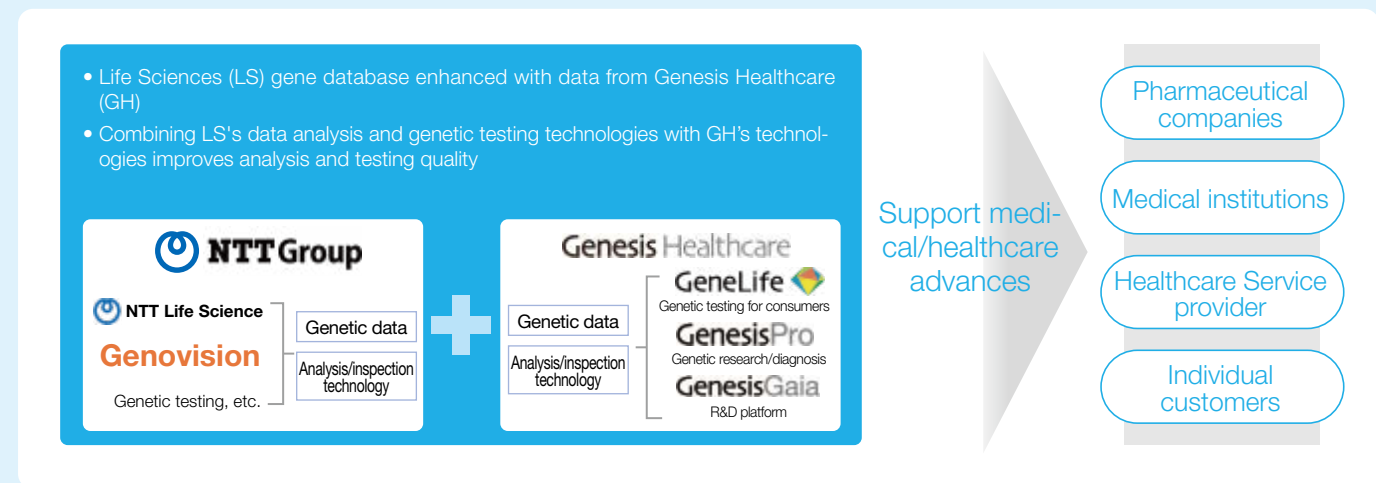
### Business Activity

#### Capital alliance formed with Genesis Healthcare Co.

In the healthcare and medical business domain, the NTT Group is working to achieve Smart Healthcare that leads to a well-being society by promoting comprehensive DX, from healthcare to medical care, through the use of data for individual consumers, as well as by supporting the advancement of medical care in a data-driven manner. Genesis Healthcare is a pioneer in genetic testing and research in Japan. In addition to “GeneLife,” a genetic test for general consumers, the Company offers “GenesisPro,” a genetic analysis service commissioned by medical institutions, and “GenesisGaia,” a bioinformatics and data science (genome AI) service for pharma-

ceutical companies and research institutions.

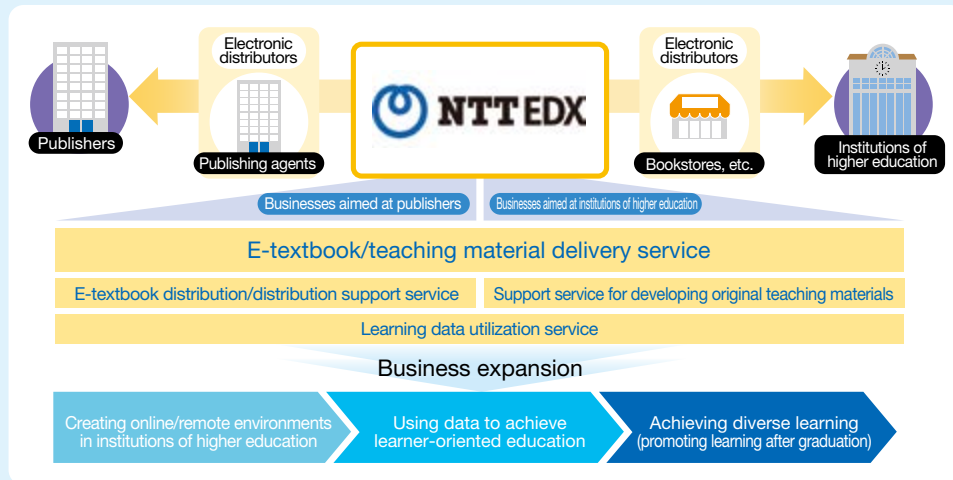
The two companies agreed to enter into a capital and business partnership with the aim of accelerating the acquisition, analysis, utilization, and distribution of medical and healthcare data, including genetic data, by leveraging and complementing each other’s broad knowledge base and expertise. They also aim to contribute to the creation of a healthy society that respects humanity and recognizes diversity rooted in genetics, as well as one where each person can benefit from personalized, optimized precision services.



\*1 Industry One, Inc.: Company providing cross-industry DX solutions, established as joint venture with Mitsubishi

<https://industry-one.com/>

### Business Activity



### Established NTT EDX, a company working to advance higher education

NTT West, DNP, and NTT East have been working together to accumulate know-how in the digitization of education using ICT, with the aim of enhancing cooperation with publishers of textbooks and teaching materials and expanding the effectiveness of their collaborative efforts.

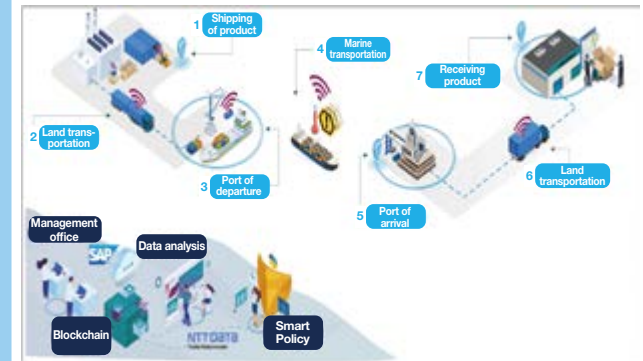
For previous efforts, we provided solutions individually to institutions of higher education, but we deemed it necessary to provide this service as a platform service so that we can provide more advanced functions at a reasonable price, and to expand the service to institutions of higher education nationwide as soon as possible. In addition, a number of institutions of higher education, publishers of textbooks and teaching materials, and bookstores that have sold textbooks for many years have requested that we commercialize this service in order to make students' education more convenient and resolve issues related to textbooks and teaching materials. We established our joint venture to address these requests.

### Cargo tracking and simplified insurance procedures across the entire supply chain

Visualization of the entire supply chain (End-to-End monitoring of transit status)

Clarification of the scope of responsibilities between stakeholders (easier management of transportation insurance)

Automatically apply insurance policy if product cannot be transported under pre-defined conditions



<Description of utilization for reducing costs throughout entire ecosystem>

### Development of new solutions together with SAP

NTT DATA and SAP have jointly developed the "Connected Product" solution for tracking transportation of fragile cargo with IoT sensors and making insurance procedures smoother. These initiatives help simplify cargo tracking and insurance procedures throughout the entire supply chain, with plans in place to cover actual business with international insurance and logistics companies.

### Research and Development to Promote the B2B2X Model

Promoting the B2B2X business model is a central pillar of the NTT Group's initiatives contributing to the realization of a smart society. In the B2B2X model, instead of providing services to customers directly, the NTT Group supports service providers by offering ICT tools such as AI and IoT, to which various values are added before being delivered to customers. In addition, the NTT Group has been working to create B2B2X models with many partner companies and local governments. We will further develop them and advance a model that uses digital services and data management.

#### Example of initiatives

##### NTT and Tokyo Century Corporation working together for data center business operation in India

With demand in the data center market growing on a global scale, NTT established NTTGDC as a company in charge of investments and asset holding related to data center construction, with the aim of supporting the core infrastructure that is the foundation of the NTT Group's full-stack global strategy. In the data center business, where demand will continue to grow worldwide, NTT aims to provide high-quality services to global companies by maximizing investment efficiency and accelerating data center business investments. Tokyo Century is focusing efforts on promoting business strategies that integrate the three spheres of "Finance x Services x Business Expertise" by cooperating with good business partners. As an operating company with financial functions, Tokyo Century will be able to create unique financing and service opportunities for helping to address social issues, develop a solid business portfolio and expand global businesses in areas where growth is anticipated. NTTGDC and Tokyo Century have agreed that blending the core strengths of both companies and working together for the operation and promotion of data centers will help to boost corporate value. Partnering with NTTGDC marked Tokyo Century's first data center business that involves external capital.



##### NTT and Macquarie Asset Management enter into strategic partnership for data center businesses in Europe and North America

NTT and Macquarie Asset Management agreed to enter into a strategic partnership covering NTT's data centers in Europe and North America.

This strategic real estate partnership will give Macquarie Asset Management the opportunity to invest real estate capital alongside NTT, while also providing NTT with the opportunity to further build on its businesses in Europe

and North America, two key regions for its data center business. NTT is also aiming to provide high-quality services to global companies by maximizing investment efficiency and making further growth investments in the data center business in the globally expanding DX market.

## Business Activity

### Establishment of New Company, NTT DX Partner

In January 2022, NTT East established a new company, NTT DX Partner, which will provide support for business reform centered on DX consulting, create and provide a cloud-based digital platform, and analyze customers' various operations and client data. NTT DX Partner will also utilize NTT East Group's DX promotion know-how and assets to provide one-stop support, ranging from DX consulting to implementation and promotion of digital platforms, in a collaborative, joint development style. This will contribute to customers' success and address local and social issues that arise as well.



### QUINTBRIDGE Opens

In March 2022, NTT West opened QUINTBRIDGE, a co-creation space originating in Kyobashi, Osaka, to promote open innovation and help revitalize the overall market.

QUINTBRIDGE will support business co-creation and human resource development and aims to become a place where companies, startups, local governments, universities, and others can "learn, connect, gather, and create with one another." In business co-creation, we do not stop at formulating ideas, but work with partners to help these business ideas take shape and implement them in local communities, as well as provide various programs (interactive pitch programs, acceleration programs, etc.) to support this effort.

### Launch of XR Service Brand "NTT XR," collaborative creation with partners



With the XR market slated to grow as a new type of lifestyle infrastructure, the NTT Group launched a new service brand called "NTT XR" in March 2022, allowing customers to select optimum services that suit their requirements. The new XR service brand will provide a full range of services, from those catering to both corporate and individual users through to XR technical platforms and devices common to group companies.

Together with content providers and other partners, we will provide an extensive range of services including entertainment, tourism, education, industry, commerce and many more to meet diverse needs of corporate and individual customers.

A range of services will be provided by group companies to customers in Japan and around the world in line with its vision of "Going beyond the limits of reality to share and enjoy dreams and experiences." For the consumer market, NTT QONOO has already released the multi-device metaverse platform "XR World" and is expanding on features within the platform covering a wide range of areas including music, cartoons, dance events and more. Services available for corporate customers include remote conferences, on-site support, training, and marketing-related services. In addition, we will develop services in the educational and tourism sectors. To accommodate the increase in traffic and amount of data as XR continues to grow, "NTT XR" services are developed extensively on photonics-electronics convergence devices, cloud rendering and other IOWN-related technologies designed to provide a smooth, high-quality XR experience.



<https://group.ntt.jp/nttxr/>

## Business Activity

### Launched SmartPRO®, a Data Collection Service that Improves the Accuracy of Clinical Trial Evaluations

SmartPRO® (hereinafter “the Service”), which increases the accuracy of clinical trial evaluations conducted by pharmaceutical companies and research institutions, was launched on May 20, 2022. This service is an ePRO\*2 that digitizes subjective evaluations (hereinafter “PRO”\*) obtained directly from subjects or patients, and allows subjects or patients to relay their condition, such as “pain” or “feeling ill,” from their own smartphones. Pharmaceutical companies and research institutions can view and download patient and subject PROs on the Service. In addition, a logbook function that allows subjects and patients to record all health-related data after the clinical trial as well will be provided as part of the Service by the end of FY2022. We will also consider new healthcare services that contribute to improving subjects’ and patients’ quality of life by safely and securely utilizing the data collected by the Service. Through the Service, we will strive to achieve Smart Healthcare that uses digital technology to contribute to the development of healthcare.

\*1 A PRO (Patient Reported Outcome) is a subjective evaluation of the course and symptoms of the disease obtained directly from subjects or patients during clinical trials.

\*2 An ePRO (electric patient-reported-outcome) is a PRO that is filled out and collected electronically.

### 2025 World Exposition - Japan Pavilion

NTT will take the opportunity at the Expo 2025 Osaka Kansai to showcase its efforts for achieving a sustainable society through its vision for society, by harnessing its various management resources and capabilities, such as its advanced R&D like the new IOWN communications and social infrastructure platform powered by optical technology, ICT platforms, and personnel. And for children growing up in an uncertain world, NTT will give them hope for the future, making for a truly memorable pavilion for visitors to the world expo.



NTT Pavilion 2025 NATURAL - Between Life and IT



### Strengthening operations for guidance with VR spatial platform “DOOR”

A guidance service was launched in February 2022 within a DOOR virtual salon, provided by OriHime-D avatars piloted by handicapped people or others with difficulties going outside. DOOR users can interact with the OriHime-D avatar and ask them questions about piloting the avatar or acquire information they need. New advances include an AI avatar providing reception duties for the DOOR virtual salon. The AI avatar developed by the NTT Group on the basis of NTT R&D technology uses automated responses to provide information outlining content available in the virtual salon, and also applies federated learning to non-verbal cues like audio data, facial expressions and intonations in voice, to give users an interactive experience.



## Business Activity 17

# Protection and respect for intellectual property

### Our commitment

As a leader in digital transformation, we will act and contribute to helping resolve the social challenges unique to each country

For example, the declining birthrate and aging population, proper education, equitable healthcare, regional economic development, and long-term value through technology for the next generations

### Our objective

More than in the previous fiscal year

Number of patent applications per employee

### Intellectual Property Management Our Approach to Intellectual Property

The business activities of the NTT Group are sustained by products and services derived from the results of our aggressive R&D. For this reason, we believe that appropriate protection and utilization of intellectual property generated by R&D is vital for the NTT Group to achieve continuous growth, which in turn will enable us to continue contributing to our customers and society at large. We strive to protect the intellectual property of the NTT Group and promote activities that respect the intellectual property of others in every aspect of our business activities.

### System of Intellectual Property Management

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

Under the leadership of the NTT Intellectual Property Center, NTT has established policies for intellectual property activities involving the entire NTT Group and also provides support and coordination for the use and management of intellectual properties, aggregates the opinions within the Group on the intellectual property system and disseminates information outside the Group.

### Protection of Third Party Intellectual Property

In order to prevent the infringement of domestic and overseas third party rights, NTT examines the third party rights of technologies used in our business at every step from the early stage of research and development up to the provision of the developed technologies to Group companies. NTT also strives to enhance the Group's compliance with intellectual property laws and regulations in Japan and abroad and mitigate potential business risks by sharing among the Group companies information on system amendments, and trends concerning intellectual property including disputes and court cases.

NTT Intellectual Property Center  
<https://www.rd.ntt/e/chizai/index.html>

### External Utilization of R&D Outcomes

Since its founding, NTT has promoted cutting edge technological development as a leading company in the information communication industry. For this reason, we own a vast number of patents.

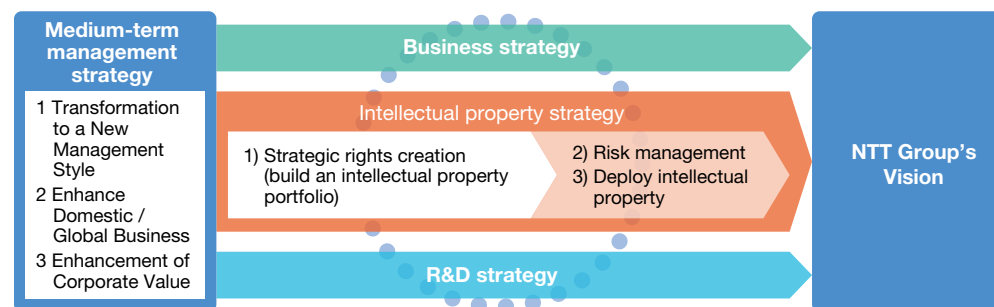
NTT licenses its proprietary technologies so that they can be used broadly by all for the benefit of the telecommunications market as well as other markets. For example, as part of our initiatives for standardization, we efficiently promote the spread of technology by licensing patents on standardizations to many companies through various patent pools.



### IP Open Access Declaration Against COVID-19

Recognizing the need to contain the spread of COVID-19, the NTT Group expressed its consistent support for the IP Open Access Declaration Against COVID-19 in May 2020 and declared that it will "not assert any patent, utility model, design or copyright (hereinafter referred to as the "Intellectual Property Rights") against any individual or other entity during the period starting with the date of this declaration and ending on the date on which the World Health Organization declares that the COVID-19 outbreak no longer constitutes a Public Health Emergency of International Concern, with respect to activities whose sole purpose is stopping the spread of COVID-19, such as diagnosis, prevention, containment, and treatment of COVID-19." NTT discloses its licensing policy and procedures along with detailed information on its R&D activities and technological licenses.

R&D Activity  
<https://www.rd.ntt/e/>  
 NTT Technology Licensing Site  
<https://www.rd.ntt/e/ntt-tec/>  
 Licensing policies and procedure  
<https://www.rd.ntt/e/ntt-tec/procedure/index.html>  
 Participation in the "IP Open Access Declaration Against COVID-19" (Japanese only)  
<https://group.ntt.jp/topics/2020/05/29/oacvd19/>



### NTT Intellectual Property Center Activity Policy

NTT Group, which engages in research and development, from basic to applied, in a wide range of technological fields, has accumulated intellectual property investments (R&D investments) over the years as a telecommunications operator that are unparalleled around the globe.

The NTT Intellectual Property Center has established an Activity Policy to provide security and safety to NTT Group's businesses, which is on the verge of expanding globally under the slogan of "Your Value Partner," and to support its growth. The Center formulates intellectual property strategies, provides appropriate protection for the results obtained through intellectual property investments, and promotes the use of intellectual property while respecting that of others.

IOWN, which is generating significant expectations and interest both at home and abroad, is not something that NTT Group can achieve on its own. Through an array of activities in line with our Activity Policy, we will support collaboration with our partners to address various social issues from a global perspective.

### Formulating and Advancing Our Intellectual Property Strategy

The NTT Intellectual Property Center is NTT Group's core organization for managing intellectual property. The Center aims to secure competitive advantages by proactively and appropriately protecting and managing intellectual property rights (i.e., patents), or internal expertise, from the results of R&D, the source of all business activities.

NTT aims to share the benefits of its R&D by broadly licensing out its technologies that help advance industry, as well as technologies that have been

standardized and can be used throughout society. When deploying the results of R&D in their operations, each company in NTT Group respects the intellectual property rights of other companies.

Our intellectual property strategy forms the basis of these activities, and together with our business strategy and R&D strategy, we are aiming to achieve the NTT Group's vision by taking a three-pronged approach to formulating and advancing our medium-term business strategy: (1) developing strategic intellectual property rights, (2) managing risks, and (3) utilizing our intellectual property.

(1) Strengthening our competitiveness with strategic rights creation (build an intellectual property portfolio)	<ul style="list-style-type: none"> <li>Build an intellectual property portfolio through the strategic development of intellectual property rights from fruits of R&amp;D activities, based on technologies and anticipated business models</li> </ul>
(2) Risk management that protects our intellectual property rights and respects the rights of others	<ul style="list-style-type: none"> <li>When Group companies deploy the results of R&amp;D in their operations, we examine the intellectual property rights of others inside and outside Japan up until the stage where R&amp;D results are applied in order to avoid infringing on the rights of third parties</li> <li>Reduce business risk and comply with laws and regulations related to intellectual property rights, by sharing among Group companies information about intellectual property trends and their impact, such as revisions to systems around the world, cases of conflict and court decisions</li> </ul>
(3) Develop business and partners through broad deployment of intellectual property rights	<ul style="list-style-type: none"> <li>Deploy intellectual property in business to contribute to our customers and society, and to secure competitive advantages in business</li> <li>Proactively engage in activities to standardize intellectual property</li> </ul>

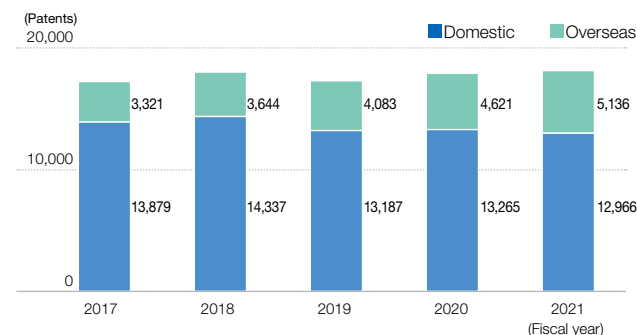
### Intellectual Property Portfolio

The results of R&D, which plays a major role in the creation of intellectual property for NTT Group, has translated into ownership of approximately 18,000 patents around the world.

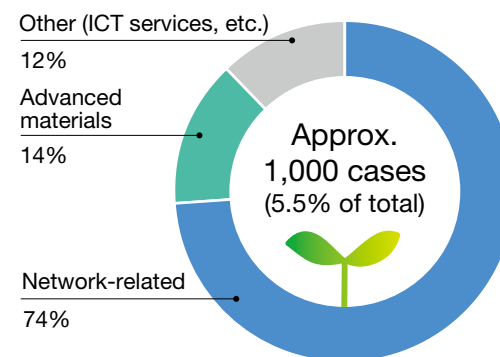
The NTT Intellectual Property Center is not only

responding to NTT Group's global business by strengthening overseas patent applications, but also working to obtain rights to a wide range of energy reduction technologies, such as photonics-electronics convergence technologies that will advance carbon neutrality, which IOWN aims to achieve by FY2040.

Number of NTT patents held



Number of patents held by NTT in energy reduction-related technologies



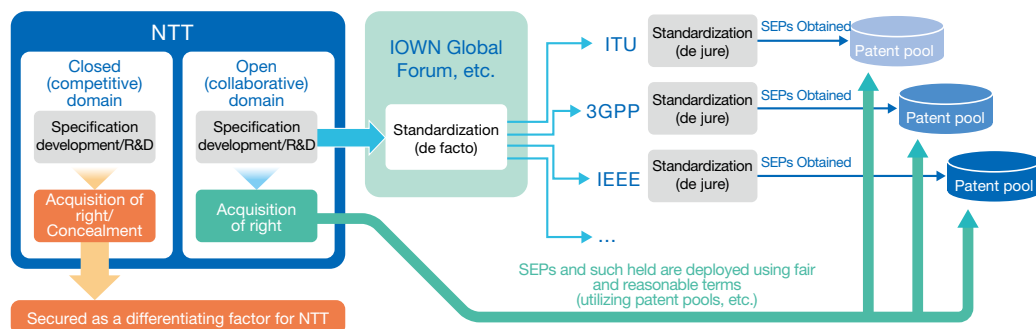
### Open & Closed Strategy (Initiatives related to Standard Essential Patents)

IOWN will not be achieved via a limited number of companies whose core business is information and communications technology. In fact, companies and organizations in various fields active around the world have gathered at the IOWN Global Forum to discuss use cases and technical specifications for making IOWN a reality. In these discussions, it is important to clarify open (cooperative) and closed (competitive) areas while working toward the same goal. In open areas, for example, it is essential to define technology standards to achieve stable communication between devices from different vendors (standardization).

While NTT laboratories play a central role in pro-

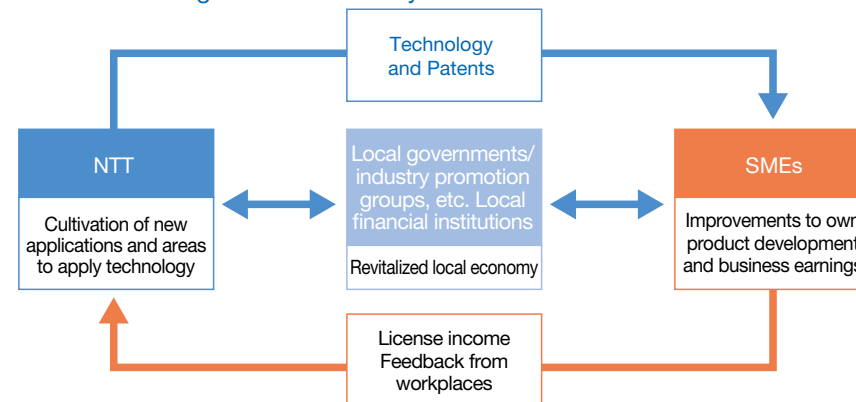
posing NTT technologies as standards, the NTT Intellectual Property Center is working to enhance its Standard Essential Patents (SEP) in coordination with these activities. SEPs are patents that must be used in the manufacture and sale of products and provision of services that conform to certain standards. The NTT Intellectual Property Center provides a secure platform for handling standardized technology rights by participating in and establishing patent pools, whereby companies and organizations in collective possession of SEPs manage patent royalties and other conditions, thereby maintaining relationships of trust with other companies and contributing to the safe and secure business operations of NTT Group.

### Open & Closed Strategy Summary



### Business Activity

#### Model for Regional Revitalization through Intellectual Property Matching Events Hosted by Local Governments and Others



### Participation in Intellectual Property Matching Events Organized by Local Governments and Organizations

In an effort to help vitalize regional business structures, we actively participate in intellectual property (IP) matching events sponsored by local governments to offer licensing agreements that enable local companies to use NTT's proprietary technologies in developing their own products. In the case of a company based in Kawasaki City, Kanagawa Prefecture, we signed a licensing agreement through a matching event organized by Kawasaki City and the Kawasaki Institute of Industrial Promotion that has enabled the company to use NTT's patented technology to provide a new service starting in 2019. We are committed to continue contributing to the vitalization of regional economies through this initiative.

### Reinforce and Globalize Research and Development Policies and Concepts

As ICT companies leading the world, the NTT Group recognizes R&D as a material issue that gives Group companies their competitive edge. R&D supports the digital transformation of our customers and lifestyle transformations tailored to individuals, and the R&D department works with operating companies to develop new technologies that provide the wellspring for new value creation in a variety of domains to enhance the NTT Group's R&D, a pillar of our medium-term management strategy.

The NTT Group seeks to overcome numerous problems involving safety, disaster readiness, and the improvement of productivity through R&D and, as a result, strengthen industrial competitiveness and resolve social issues. Since ICT is applied in a variety of fields, we are forging partnerships with counterparts in wide-ranging industries as we pursue our R&D initiatives.

### IOWN GLOBAL FORUM Linking Companies and Academic Institutions Across the Globe

We established IOWN Global Forum, Inc. (hereinafter "IOWN GF"), a new industry forum based in the United States, together with Intel Corporation and Sony Corporation in January 2020. This forum has grown to boast membership by 111 organizations as of November 2022.

IOWN GF's objective is to accelerate the adoption of a new communication infrastructure that will bring together an all-photonic network infrastructure including silicon photonics, edge computing, and wireless distributed computing to meet our future data and computing requirements through the development of new technologies, frameworks, specifications, and reference designs.

### Organization for Implementation

The NTT Group's R&D activities focus on making the IOWN concept a reality, as well as basic research and applied research. Basic research serves as the backbone of telecommunications, such as basic and component technologies related to services and networks, while applied research is conducted by operating companies and is closely related to their respective businesses. These R&D activities are undertaken by NTT's IOWN Integrated Innovation Center, Service Innovation Laboratory Group, Information Network Laboratory Group, and Science and Core Technology Laboratory Group. Also, we promote general producer activities, in which we formulate marketing and business plans and forge alliances so that the results of research by NTT laboratories can be transformed into Group businesses. In these general producer activities, we seek to develop business in a timely manner by combining the wide-ranging basic technologies of NTT laboratories with external technologies in collaboration with Group companies and with various other companies to create new services. In order for innovation to continually be an important driver of the NTT Group well into the future, we will aim to contribute to the realization of a sustainable society by promoting innovations for social issues. These efforts will include patent applications and the publication of scientific papers.



### Laboratories

<b>NTT IOWN Integrated Innovation Center</b>	<b>Research and development of cross-sector technologies to make the IOWN concept a reality</b>	
	IOWN Product Design Center	
	NTT Network Innovation Center	
	NTT Software Innovation Center	
		NTT Device Innovation Center
<b>Service Innovation Laboratory Group</b>	<b>Research and development of new communication services</b>	
	NTT Human Informatics Laboratories	
	NTT Social Informatics Laboratories	
		NTT Computer and Data Science Laboratories
<b>Information Network Laboratory Group</b>	<b>Research and development of future network core technologies</b>	
	NTT Network Service Systems Laboratories	
	NTT Access Network Service Systems Laboratories	
		NTT Space Environment and Energy Laboratories
<b>Science and Core Technology Laboratory Group</b>	<b>Research and development of most-advanced core technologies with an eye to a decade from now</b>	
	NTT Network Innovation Laboratories	
	NTT Device Technology Laboratories	
	NTT Communication Science Laboratories	
		NTT Basic Research Laboratories
<b>Research Centers in Specific Fields</b>	NTT Machine Learning and Data Science Center	NTT Bio-Medical Informatics Research Center
	NTT Research Center for Theoretical Quantum Physics	NTT Institute for Fundamental Mathematics
	NTT Digital Twin Computing Research Center	NTT Nanophotonics Center
	NTT Innovative Photonic Network Center	NTT Smart Data Science Center
<b>NTT Group's Overall R&amp;D Organization</b>	Number of Researchers	Approx. 5,000*1
	Research and development expenses	¥430.0 billion*2

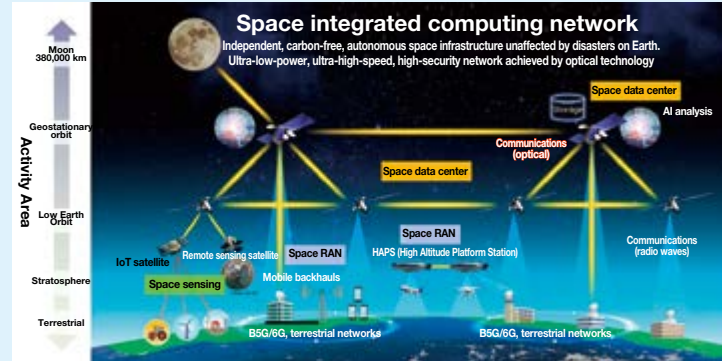
\*1 As of March 31, 2022. \*2 R&D expenses and total equipment investment and expenses related to system development

Driving collaboration to make the IOWN concept a reality



IOWN GLOBAL FORUM linking a broad range of companies

NTT, Intel Corporation and Sony Corporation established IOWN Global Forum, Inc. (hereinafter, "IOWN GF"), a new industry forum. IOWN Global Forum's objective is to accelerate the adoption of a new communication infrastructure that will bring together an all-photonic network infrastructure including silicon photonics, edge computing, and wireless distributed computing to meet our future data and computing requirements through the development of new technologies, frameworks, specifications, and reference designs.



Space integrated computing network

To establish sustainable economic and social activities, it will become ever more important to effectively maximize the use of stratospheric and near-Earth space as an ICT infrastructure platform in a diverse array of fields such as energy, environment and climate change, disaster prevention, marine infrastructure, and security. Based on the "Space Integrated Computing Network Concept," NTT will take on the challenge of building new infrastructure, beginning with an optical wireless communication network to be constructed in space and a mobile network to be constructed in the stratosphere.



NTT and SKY Perfect JSAT Corporation established the "Space Compass" joint venture company that operates a novel integrated space computing network business with the aim of achieving a sustainable society. The new company is involved in space data center (high-capacity communication and computing infrastructure in space) and space RAN (communication infrastructure for Beyond5G/6G) business and services as the first step to developing an integrated space computing network. The joint venture will take on the challenge of building new infrastructures in space, where business led by the private sector is expected to grow in the future, and contribute to the creation of a sustainable society.



### Reinforce and Globalize Research and Development

- The NTT Group is advancing innovative research and development that drives change worldwide while stepping up basic research at overseas centers. Specifically, we will use the research centers established overseas to strengthen joint research with a varied range of research bodies, actively utilize the latest external technologies, and increase investment in research on new growth fields. We will also promote the global rollout of R&D results and globalization of research targets. More specifically, in July 2019 we opened NTT Research, Inc., which operates three research laboratories, in Silicon Valley in the United States for the purpose of reinforcing fundamental research. We have launched a collaboration with universities and research institutes in the United States and Europe in the fields of quantum computational science, medical/health/healthcare, and basic cryptography/blockchain. We will further globalize our research and development by opening research centers in areas around the world, starting with Silicon Valley.

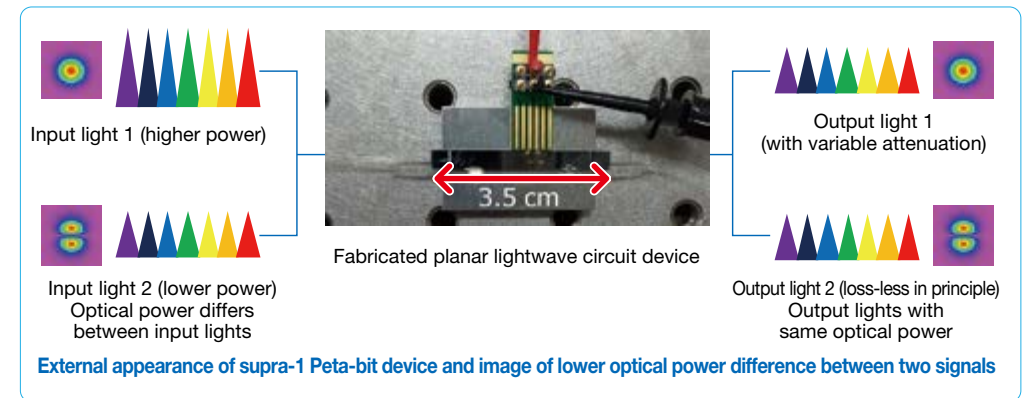
- The creation and utilization of photonics-electronics convergence technology that combines optical and electric signals will be key to the development of IOWN. The "NTT IOWN Integrated Innovation Center" was established in July 2021 in order to advance development and accelerate the creation and utilization of this technology. In addition to the three centers (the Network Innovation Center, Software Innovation Center, and Device Innovation Center) involved in cross-sector product development, the NTT IOWN Product Design Center has been established at the facility. This center formulates a development and expansion strategy backcast from market needs and social demands and consistently promotes technology development, dissemination activities, and implementation support based on that strategy.

NTT also assembled researchers who are known authorities in their respective fields to form the NTT R&D Authority Team. These Authority Team researchers take part in R&D activities at NTT to contribute to the development of IOWN and help shape our vision after making this concept a reality. Specifically, they are responsible for driving research in their fields of expertise by directing, providing guidance, and advising activities regarding research themes. As one facet of our efforts to accelerate R&D from a long-term perspective, NTT established the new Institute for Fundamental Mathematics, headed by Dr. Masato Wakayama, a member of the NTT R&D Authority Team who serves as the Fundamental Mathematics Research Principal. It will work on establishing a basic theoretical framework for modern mathematics and will accelerate research towards innovation in quantum technology by challenging to uncover the basic principles behind the superior power of quantum computing. It will also seek to contribute to NTT's R&D aimed at achieving IOWN by proposing the use of modern mathematics in groundbreaking new approaches to addressing various research problems, including the elucidation of unknown diseases and the discovery of new drugs.

### R&D to make the IOWN concept a reality

- NTT has established a feed-forward AI air-conditioning control system that predicts comfort levels even with short-term data, and demonstrated its ability to achieve energy conservation and comfortable environments. This technology was developed as part of the Urban DTC® initiative aimed at optimization of entire urban areas, by making predictions of the future and links between digital twins using the 4D digital platform® capable of observing the entire city in real-time in sophisticated detail. And to achieve the "Another Me" digital twin of oneself, NTT redefined and announced the philosophy behind the concept of "We" that encompasses oneself and Another Me, based on the Self as We theory developed together with research partners at Kyoto University.

- We teamed up with Hokkaido University to be the first in the world to demonstrate the capabilities of a compact optical device that achieves low loss, wide-band and variable compensation of optical power difference between different kinds of signals (modes). This was a major step forward for achieving the high-volume optical transmission backbone exceeding 1 Peta-bit capacity target of the IOWN concept. Development of a supra-1 Peta-bit class optical transmission backbone as the target of IOWN proposed by NTT calls for optical transmission line technology and optical transmission technology utilizing spatial modes. NTT will continue its industry-academia collaborative research in this field.



- NTT has developed a digital signal processing circuit and optical device that achieves the world's largest capacity of 1.2 Tbit/s per wavelength for coherent optical transmission.

Using the proprietary developed world's highest class digital coherent signal processing circuit and world's fastest optical device increases the optical signal modulation speed to the world's highest

140 Giga baud, and achieves 1.2 Tbit/s per wavelength, the world's highest capacity. When compared with existing technology, the optical signal modulation speed is 1.4 times faster, and the transmission capacity has increased by 1.5 fold. The developed device can also be expanded to more than double the optical transmission distance of 800 Gbit/s.

## Promoting Other Cutting-Edge Research

### • **6G experimental trials with world-leading vendors:**

NTT DOCOMO and NTT agreed to collaborate with world-leading vendors Fujitsu, NEC, and Nokia to conduct experimental trials for sixth generation mobile communications technology (6G) with the view of launching commercial 6G services by around 2030. Research and development of 6G systems is advancing as the technology capable of expanding communication coverage in the sky, at sea and in space, and enabling both ultra-low-power consumption and low-cost communications. Indoor trials will begin within fiscal 2022, with outdoor trials slated to begin from fiscal 2023 and after. NTT will continue working with these world-leading vendors to conduct experimental trials, with each company moving forward with other major vendors in developing initiatives that build on their individual expertise. This will help to accelerate research and development of 6G, and contribute to faster global standardization and commercialization of 6G.

### • **High-precision Detection of Rust in Social Infrastructure Facilities using Image Recognition AI:**

NTT successfully developed an image recognition AI that detects rust in various social infrastructure facilities with a high level of accuracy. The image recognition AI can distinguish multiple types of infrastructure facilities from images of roadside facilities taken by NTT's Mobile Mapping System (MMS) to detect rust that has formed on those facilities (roadside facilities and utility pole-mounted facilities), with a detection accuracy of 97.5%. The image recognition AI can identify and inspect in one run multiple infrastructure facilities in images captured simultaneously by MMS, which reduces operational costs as it allows consolidation of separate field inspections that had been performed by each infrastructure manager. Uniform inspection quality can also be achieved because the image recognition AI uses uniform standards that eliminates the variations in detection results between individual inspectors. Further improvements made to AI in the future will provide added value for social infrastructure maintenance management work and help achieve a smart society.

- As part of NTT's "Medical and Health Vision," a simulator called the Bio-Digital Twin has been developed to support risk control and improve well-being by predicting future physical and mental conditions of a person. A new type of sensing instrument is the wearable electrocardiographic device. The device being developed is centered on the apical region of the chest, where the heart is closest to the rib cage, as a reference point with opposite electrode poles in three nearly orthogonal directions to capture the activity of the heart in three dimensions.
- The quest to develop more compact quantum computers for more practical applications has struggled due to their need for large cooling and vacuum equipment, amongst other challenges. NTT, together with the University of Tokyo and RIKEN, has jointly developed an optical fiber-coupled quantum light source (squeezed light source), which is a key technology for achieving large-scale optical quantum computers.
- NTT was the first in the world to successfully acquire knowledge on the process of spin-wave generation and the electrical control of spin waves in a graphene quantum Hall state. This resulted in acquiring a means of investigating the fundamental properties of spin waves. Feeding back this knowledge to applied research will make a significant contribution to the development of magnonic devices.

### Why IOWN is essential

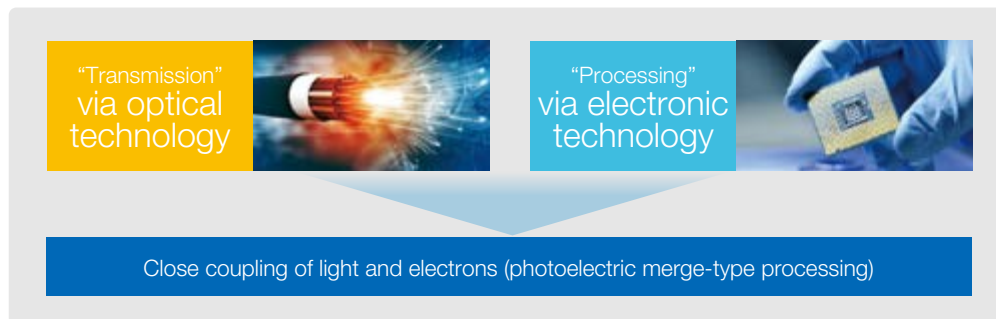
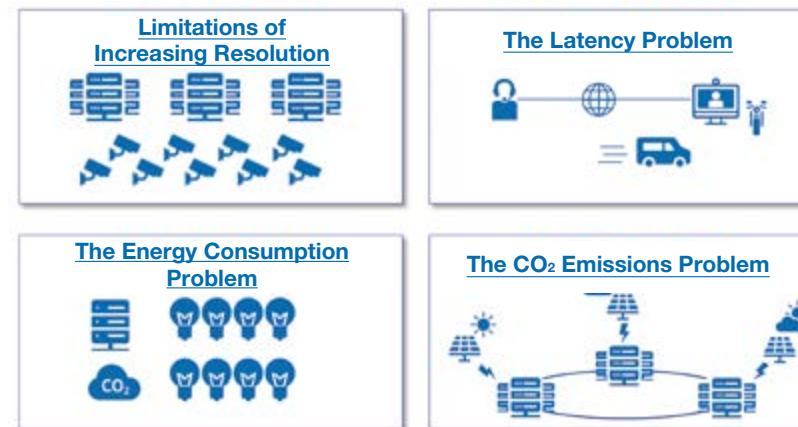
The development of digital technology has brought about a number of technological innovations, such as ultra-high definition images, but we believe that we must change our mindset to achieve further evolution. With IOWN, we believe it is important to try to grasp phenomena and information as they are through a more diverse set of values and perceptions, as opposed to filtering them through human-only values. Dr. Jakob von Uexküll, a German biologist, proposed the concept of the “self-centered world” (“Umwelt” in German), which states that all living things have a species-specific perceptual system, and that each has a world based on its own species-specific perception and acts as its own subject. The IOWN concept is based on the idea that different subjects see things in different ways, and that the information being conveyed and the processing method will vary according to the values of each subject. Thus, it aims to convey and process every bit of information in accordance with the values of each subject.

While dramatically low latency, enormous band-

width, and very small latency fluctuations are required to make these new ideas a reality, the current internet is reaching its limits in terms of both transmission and processing capacities. Furthermore, power consumption continues to increase in tandem with the enormous amount of information being processed, and the increase in CO<sub>2</sub> emissions has become a serious global issue. NTT Group’s vision of a high-capacity, low-latency, low-power-consumption infrastructure that can handle information as-is requires an end-to-end, full-stack redesign and optimization that breaks away from individually designed layers, from networking to computing. The key to this is “photoelectric merging” technology. Conventionally, optical signals and electronic signals have had their roles completely separated into “transmission” and “processing,” respectively, and the task of converting the two types of signals is inefficient and consumes a lot of power. If we tightly integrate optics and electronics, we can apply optical technology to the entire system, down to the processor level, and we can rethink the architecture (structure) from a full stack perspective.



A flower as seen by a human (left)/A flower as seen by a bee (right)



### The advantages of IOWN

I think the optics-related expertise that NTT has accumulated over the years is a big advantage. What everyone is probably most familiar with is internet connection services using fiber optic cables, but NTT has long been researching the possibility of not only using fiber optic cables as a transmission medium, but using optics as a basis for transmission equipment and information processing. The results of these research projects are being put on a development track that brings them closer to commercialization, with the goal being practical applications. In terms of recent achievements, the core of "photoelectric merging technology" is the ability to perform optical-electrical and electrical-optical conversion at ultra-high speeds and with ultra-low power consumption. In LSI, the input/output (I/O) consumes the most electricity, and the impact of replacing this with light is quite significant. Moreover,

with electricity, power consumption increases rapidly as the distance over which signals are transmitted increases, but with light, power consumption does not increase very quickly. Thus, by utilizing light through photoelectric merging technology, it is possible to achieve not only ultra-high speeds, an original characteristic of light, but also ultra-low power consumption. A typical example is the optical transistor developed by NTT in 2019, the first in the world to combine ultra-high speeds with ultra-low power consumption. A transistor is a conversion device that can output an electrical signal in its proper form by providing it with a control signal. Converting signals is called switching.

Conventional light-switching devices are huge and cost several hundred billion yen, but now that optical transistors have been created, they have been reduced to the size of a piece of chewing gum. In addition, the research and development of optical

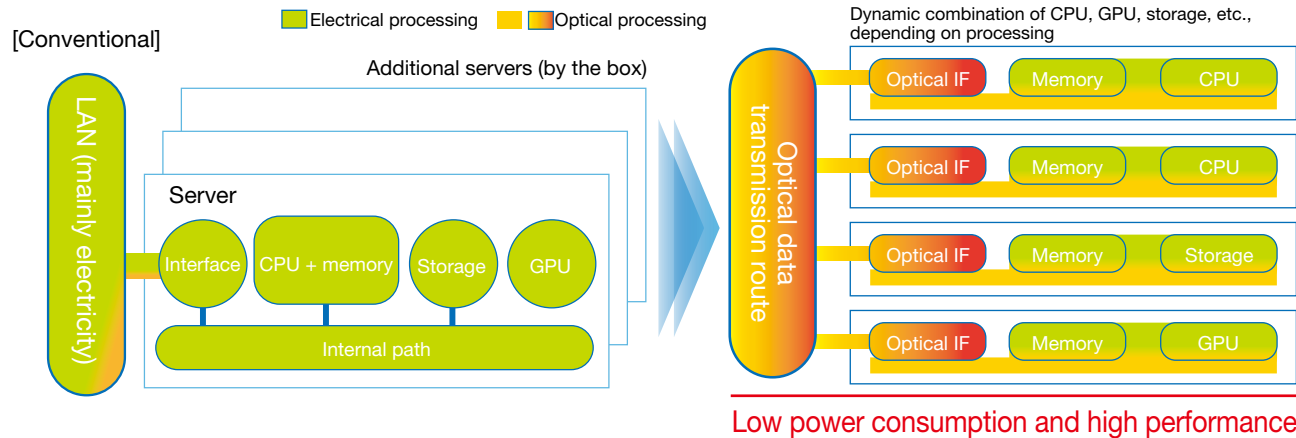
transistors involves not only signal processing technology, but also the creation of optical modulators. This requires know-how regarding stabilization at high accuracy so as not to disturb the spectrum of a certain wavelength, which is an analog technology that is part of a cottage industry. The fact that we are now able to connect long distances optically is largely due to utilization of our technology. To cope with the increase in data volume and power consumption, a structural evolution from electronic processing to optical transmission is essential, and the breakthrough in the technology supporting this structural evolution hinges on the higher precision, smaller size, and lower cost of optical transistors. Therein lies NTT's advantage.

### Anticipated business model

IOWN will be available in a variety of domains, but here are two easy-to-understand scenarios.

First, let's consider the interior of a data center, disaggregated computing. A personal computer has a similar structure, but a server has an interface, a CPU, memory, and storage. The current trend is for the CPU to issue instructions, temporarily store information in memory, and then store the information resulting from its calculations in storage. The CPUs used to be run by electrical signals, but by directly connecting accelerators such as GPUs and DPUs via light and linking them with different wavelengths, it is no longer necessary for each server to have its own CPUs and memory. CPUs are located in one casing and memory in another, and connecting them optically makes it possible to create a situation in which it appears as if a very large amount of CPUs and memory are installed on a single server.

### Disaggregated computing



This allows for a scalable computing infrastructure with ultra-low power consumption, high-speed processing, and the ability to add as many parts as required. One potential business model in this case would involve selling optical transistors. In addition to the optical transistors themselves, products that incorporate photo-electric merging technology and optical modulators into computer motherboards and semiconductor packages are also a possibility. Essentially, we would be selling key components. Next, we will expand the scope somewhat to include all-photonics networks, which utilize optics between networks, and areas outside the data center. Optical transmission technology used in the core of relay systems that connect cities and in metro networks that extend throughout cities can be expanded to the end user's neighborhood, which would allow for flexible configuration of ultra-high-capacity optical paths, such as a "one wavelength per person" model, for each application. It

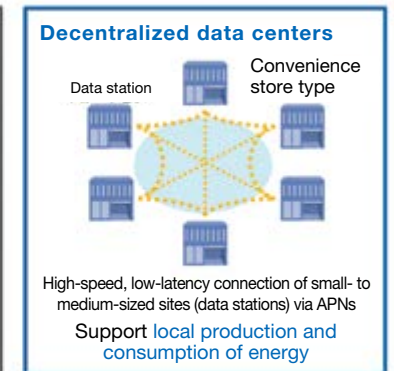
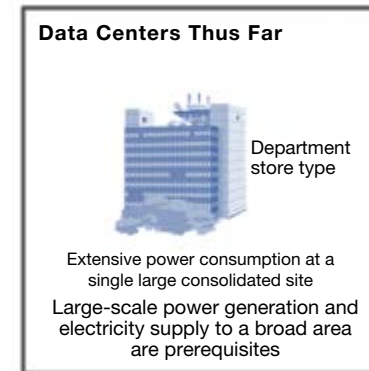
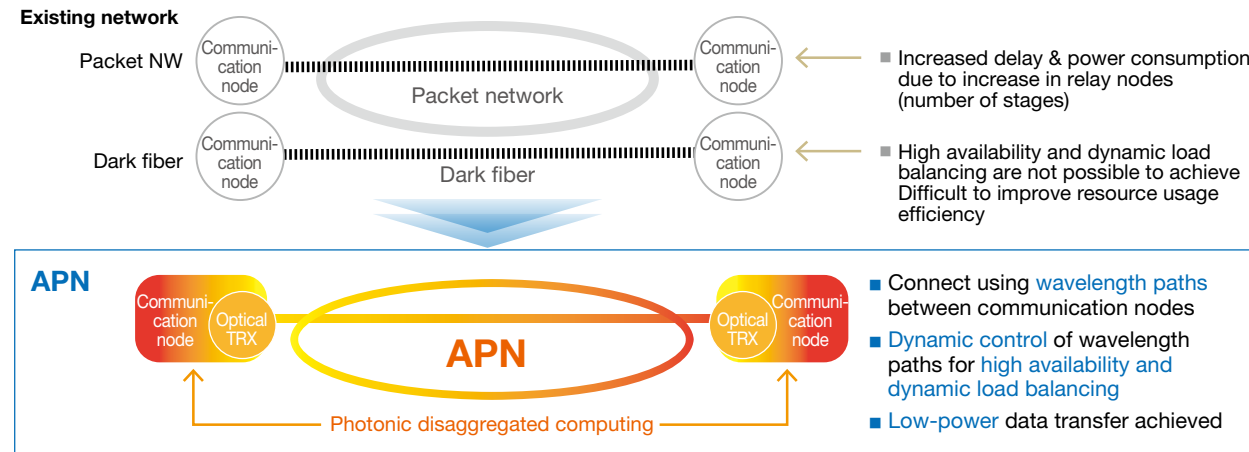
would be like having a dedicated, on-demand, one-to-one optical line with no video compression and almost no delay in transmission and reception. APNs could be used for the mobile fronthaul portion that links base stations and mobile antennas. In urban areas, the population changes depending on whether it is day or night, so traffic volumes will inevitably vary. For this reason, load balancing, which dynamically constructs optical paths, can be used to reduce power consumption.

APNs can also be used as lines linking data centers. These days, it is difficult to set up large data centers that require enormous amounts of power.

In the future, small- and medium-sized data centers will be dispersed over a broad area, and it will be necessary to connect these distributed data centers using light so that they can operate at a level comparable to that of large-scale data centers. Large-scale data centers require enormous amounts of electricity,

but if spread out, they can also make use of renewable energy generated close to their locations, thus enabling local production for local consumption of energy. Potential business models for cases in which APNs are provided include: acting as an infrastructure service provider, such as providing mobile fronthaul and networks between data centers; a data center business that provides distributed data centers connected by APNs; and a product business selling optical transceivers to be installed in data centers edges.

**All-photonics network (APN) characteristics**



### What are some use cases?

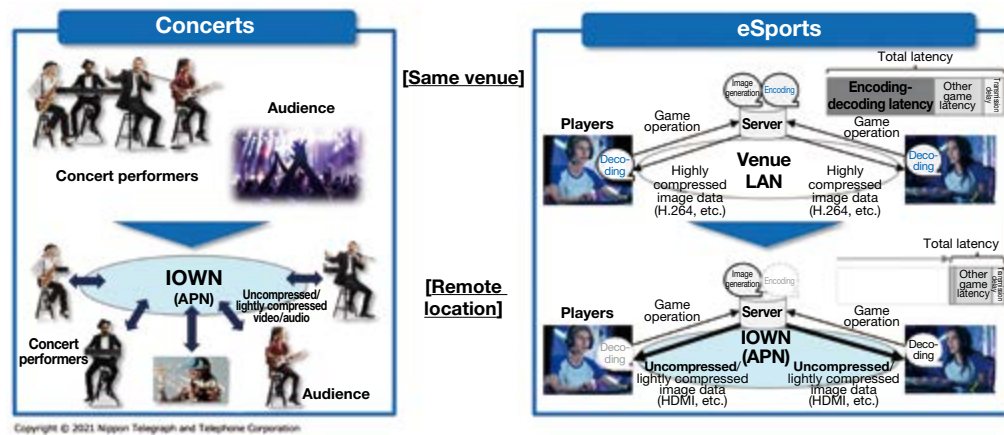
IOWN is an innovative concept based on light that communicates and processes things as-is and helps to create a new smart society with low energy consumption in a sustainable manner that is not attainable with our current internet. Some use cases that are anticipated at this stage include the following.

While (1) providing interconnect solutions for data center operators and (2) providing mobile networks for mobile operators have already been introduced, (3) providing networks for events (live broadcasts, cloud-based e-sports broadcasts) is another potential use case. We have already conducted

demonstration tests for cloud-based e-sports event broadcasts. Competitive games via the cloud are fought in real time, and it will be essential to exchange large amounts of 8k video data with a delay of less than 20 ms. A delay of a few milliseconds compared to a delay 10 times that amount will result in a different attack timing. It is impossible to fight within a game in an environment where the timing of attacks is off due to delay. The delay in the demonstration test was 20 ms, but we are making efforts to lower this to a few milliseconds, and we are currently developing a system that can control the delay in 1- $\mu$ s increments to enable synchronization.

### Virtual reproduction of real life (concerts, eSports)

- Reproduction of events offering two-way exchange of high-definition video and audio within a virtual space
- Low-latency data exchange allows for those at remote locations to have the same experience as those at the venue

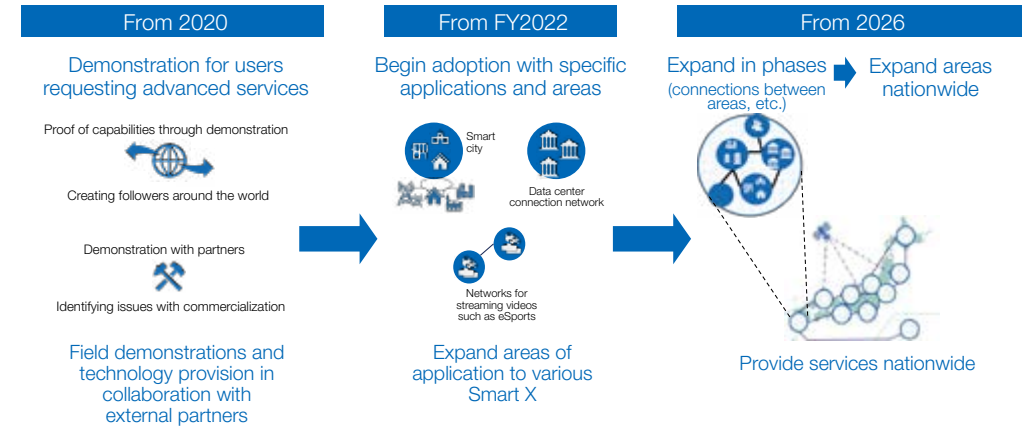


### Future schedule and milestones

We hope to conduct early demonstrations of these use cases, receive feedback from customers, and further refine the IOWN technology. Then, starting around 2020, we have been proceeding with field demonstrations to users and areas that need advanced services, such as smart cities and critical infrastructure. Around fiscal 2022, we will roll out services, though it will still be limited to specific uses and areas. After 2026, we will expand the service nationwide by connecting areas where it has already been implemented. Also, an important event coming up in the near future is the Osaka Kansai Expo 2025. We hope to convey a part of our

IOWN-based worldview in an easy-to-understand manner, combining some of the IOWN technologies we have mentioned thus far with existing technologies as well. In doing so, we hope to present a new kind of value through partnerships with various companies and organizations, which will lead to these technologies subsequently being implemented throughout society.

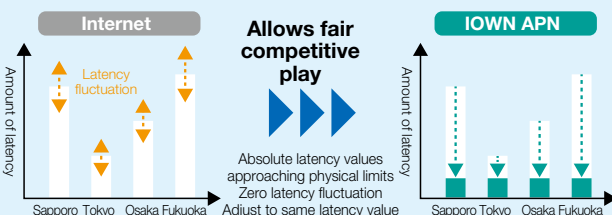
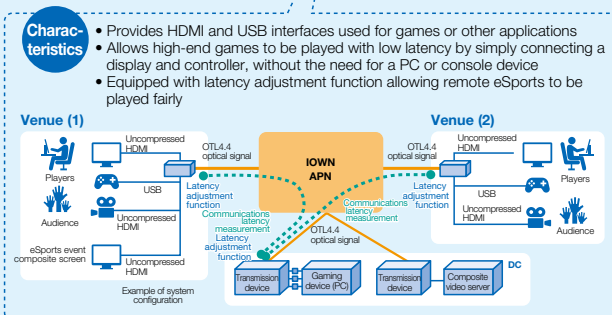
### IOWN Expansion Roadmap



## IOWN Case Studies

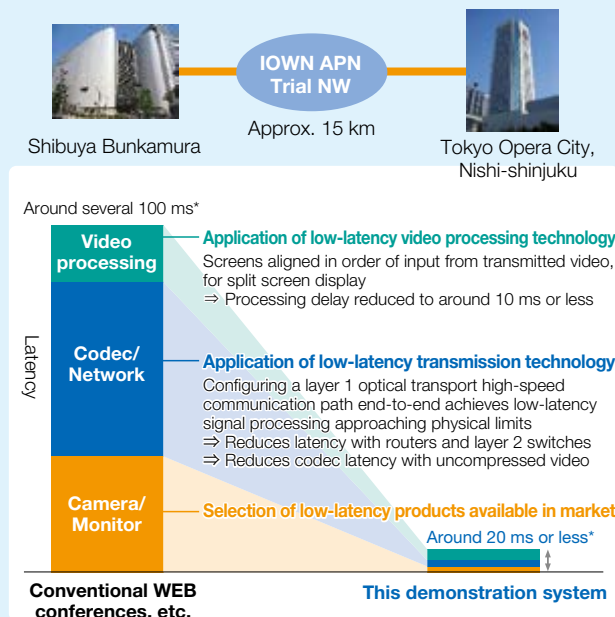
### (1) Optical Network Technologies to Support eSports

- For eSports events hosted among multiple sites, IOWN APN offers a gaming UX no way inferior to the UX of in-person events.
- Transferring uncompressed or slightly-compressed video signals enable users to use remote servers in distant data centers with simple operational inputs and video displays. Functions that offer network delay measurement and adjustments also ensure fairness in remote events held among multiple sites.



### (2) Real-time Remote Orchestral Ensembles with "Future Concerts"

- Allows for real-time remote sessions over IOWN APN that eliminates the need for performers to gather in the same location.
- Forming a split screen from multiple video streams delivered from multiple locations with low latency makes it possible to reduce video delays without sacrificing the low latency features of the APN, and allows multiple remote locations to exchange video without perceptible time lag.



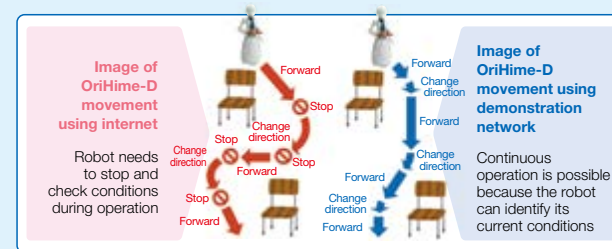
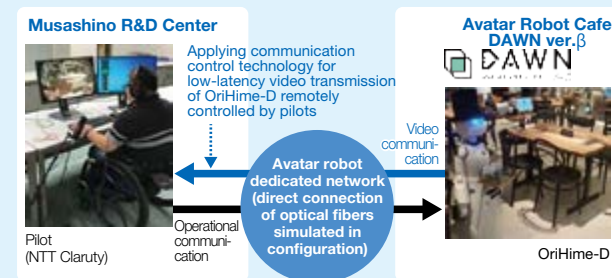
\* Latency depends on conditions and overall systems including factors other than transmission



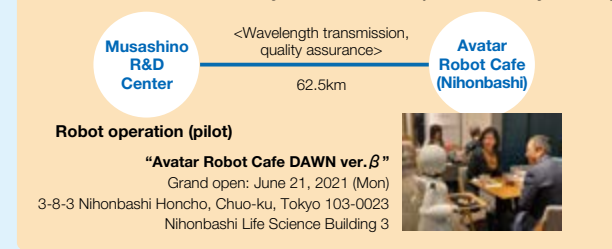
Source: NHK News "Good Morning Japan"

### (3) Natural Remote Control Utilizing Avatar Robots

- The low latency of IOWN has enabled remote robot operation without any time lag perceived by the operator.
- Video delays transmitted over the internet make it difficult to operate the robot because the robot had to be stopped often to check its status. This demonstration allowed robots to be controlled in real time with feedback, verifying that the robots could move along the same route in half the time.



### Demonstration test of remotely controlled robot (linked with OryLab Inc.)



## Business Activity 18

# Contribution to the revitalization of local communities and economies

### Our commitment

As a leader in digital transformation, we will act and contribute to helping resolve the social challenges unique to each country

For example, the declining birthrate and aging population, proper education, equitable healthcare, regional economic development, and long-term value through technology for the next generations

### Our objective

97%

Development rate of 5G infrastructure maintenance (by FY2023)

### Contributing to the Vitalization of Regional Societies and Economies

- NTT ArtTechnology Corporation was established in December 2020 to protect various tangible and intangible cultural and artistic assets, and to promote the appeal of regions both domestically and abroad by broadly spreading new online-based styles of cultural and artistic appreciation.
- Provided a simple and secure online storage service for SMEs. “Cowork Storage” was released in March 2021 to provide a more flexible and extensive service with file sharing functions to build secure computing environments, and used in a similar way to NAS or file servers.
- Established Co-Designing Institute for Polyphonic Society in July 2021 to promote regional vitalization by providing consulting services aimed at supporting the activities of municipalities, companies, organizations and other associated groups (local communities, public private partnerships) that are facing issues achieving revitalization at a local level.

### Advancing Personalization by Supporting the Transformation of Lifestyles

We support customers as they transform ever-diversifying lifestyles by providing personal solutions centered on DOCOMO that closely align with individual needs. Number of cell phone subscribers totaled 84.75 million in fiscal 2021.

In terms of service, we are enhancing electronic payment and contents while utilizing AI and big data to improve communication with every customer.

### Promoting Digital Transformation

We are raising operational efficiency by introducing robotic process automation (RPA)\*1. The operational process has been adopted in approximately 2,900 cases within the NTT Group as of the end of June 2020. We are also recommending the use of RPA among our customers, and more than around 6,500 of them have adopted the process as of the end of June 2020. We also sought to advance our Group management by actively introducing a unified enterprise resource planning (ERP)\*2 system for our personnel, finance, and procurement operations.

### Business Activity



### Initiatives for the Realization and Deployment of 5G

We launched our commercial 5G services in March 2020, and we will provide billing plans such as 5G Gigaho and 5G Gigalight, seven types of 5G devices, services in the gaming, music and sports genres, and solutions that contribute to advancing industry and driving digital transformation.

Furthermore, we are promoting initiatives that will increase convenience and enrich people's lives by creating new value and offering solutions for social issues toward our goal of rolling out services to all 1,741 municipalities in Japan, and achieving coverage for 90% or more of the population, by March 2024.

\*1 Solution for automating operations previously handled by humans by establishing procedural rules to replace humans with robots.

\*2 Management method for implementing centralized management of corporate resources to achieve optimization across the entire company.

## Promotional Activity

### “Regional agricultural culture connected with ‘NTT-grown’ tomatoes”

NTT East is advancing the agricultural DX concept as part of efforts to achieve a local, sustainable recycling-oriented society.

Providing support for smart agriculture by utilizing AI, IoT, drones and other ICT is part of this initiative.

While agriculture makes up the core industry in many regions, the reality is that the majority of agricultural produce relies on imports. As an IT operator, efforts were made to see if we could address the challenges that the agricultural business faces, such as an aging population and shortage of workers. NTTe-City Labo (NTT Central Training Center) harvests “NTT-grown” tomatoes available in the market grown by NTT AgriTechnology cultivation staff in its state-of-the-art vinyl greenhouses, and supplies for municipal elementary school lunches as part of a local production and consumption model. To learn how the tomatoes they eat were cultivated, 80 students from the local elementary school visited the farm as part of a field trip, making the initiative a valuable lesson for dietary education.



Robot equipped with a 4K camera.  
The remotely controlled robot moves around the greenhouse to carefully check the condition of tomatoes.

### Initiatives for Universal Design\*1

The NTT Group actively encourages the broader adoption of universal design, which ensures that products and services are easy for all customers to use, regardless of age, gender or physical abilities.

#### Examples of Universal Design Products and Services in Fiscal 2021

- Oshaberi Annaiban, an AI-based information board capable of engaging in natural conversation
- Smart Room Mimamori, a system for monitoring elderly citizens
- Home Currency Anywhere, which allows consumers to use their own country's currencies anytime, anywhere
- Face Sharing, a technology that reproduces the mouth movements and facial expressions of someone else onto the user's own face
- Small self-driving mobility technology and free rental service for next-generation electric wheelchairs

### Establishment of the NTT Group Web Accessibility Policy

The NTT Group is working to ensure and improve the accessibility of its websites for a wide spectrum of customers, including senior citizens and persons with disabilities. Specifically, the Group established the NTT Group Web Accessibility Policy. The policy for official websites of the Group companies with head office functions in Japan is set according to JIS X 8341-3:2016\*\*2 and each works to comply\*3 with Level AA.

NTT Group "Web Accessibility" Initiatives (Japanese only)  
<https://group.ntt.jp/accessibility/>

### User-Friendly Service Lineup

We offer a broad range of discount services for various users, including senior citizens and persons with special needs, to facilitate access to ICT services.

Special discounts on dedicated lines for educational facilities (NTT East and NTT West)

Since January 2001, NTT East and NTT West have offered special fees for schools on FLET'S services suitable for using the Internet at a fixed sum in an effort to promote educational use of the Internet.

NTT EAST (Japanese only)  
<https://business.ntt-east.co.jp/service/schoolplan/>  
 NTT West (Japanese only)  
<https://flets-w.com/limited/school/>

### Discounts on mobile phone use for persons with special needs (NTT DOCOMO)

NTT DOCOMO offers the Hearty Discount programs for encouraging more social participation by persons with disabilities.

#### Examples of Hearty Discount Programs

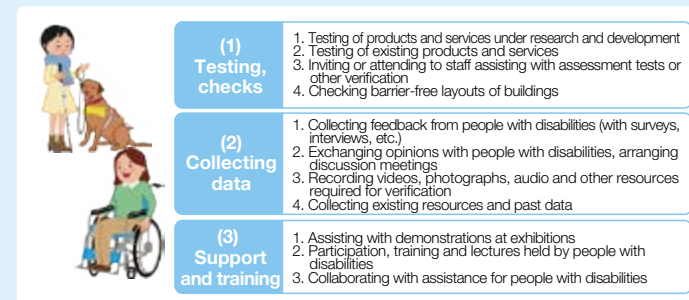
- DOCOMO's GIGA plans → **1,370 yen discount** (rate plan for subscribers after October 1, 2019, includes discount for sp-mode usage)
- Voice options → **700 yen discount**
- Monthly fees on various services such as voice mail → **60% discount**
- Video phone call charges → **Set at same level as voice call charges**
- Charges for some subscription options → **No charge**
- Support for setup of smartphones etc. → **No charge**
- Dialing and obtaining information via 104 directory assistance → **No charge**

<https://www.nttdocomo.co.jp/charge/discount/hearty/about/index.html> (Japanese only)

### Promotional Activity

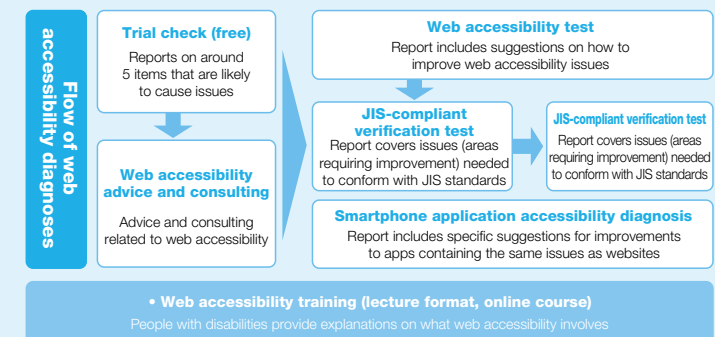
#### Consulting for universal design

NTT Clarity employs a large number of people with various disabilities. The company provides consulting services to suit customer requirements from an early stage of research, development and planning, with the view to designing structures with barrier-free layouts, accessibility assurance, universal design, and inclusive design.



#### Web accessibility diagnosis

NTT Clarity offers a broad range of services catering to web accessibility, by suggesting ways to make improvements to barriers present on websites from the perspective of use by people with disabilities.



\*1 Products and services that can be used by senior citizens, children, persons with disabilities, and foreign visitors facing language barriers (includes expanded functions)

\*2 JIS X 8341-3:2016: "Guidelines for older persons and persons with disabilities—information and telecommunications equipment, software and services— Part 3: Web content" of Japanese Industrial Standards

\*3 Refers to compliance with the description defined in the "Compliance Performance Announcement Guidelines for JIS X 8341-3:2016, March 2016 Edition (published on March 22, 2016)" of the Web Accessibility Infrastructure Committee, Info-communication Access Council. This means that we have established and disclosed an accessibility policy and confirmed that the pages fulfilled all the requirements through the tests implemented and based on JIS X 8341-3:2016.

## Policies and Concepts to Pursue Customer Satisfaction

The NTT Group serves various customers, from general consumers to corporate customers, providing a broad range of products and services.

Its main business fields, the telecommunications and ICT industries, continue to innovate, producing new products and services. Mobile devices such as smartphones and tablets continue to evolve almost daily, giving rise to a number of new services utilizing the NTT Group's network. At the same time, with the evolution of technology and services, the amount of information needed to use them has increased, and this has also increased opportunities for us to receive various confirmations, inquiries, feedback and requests from customers with regard to device malfunctions and questions about various fees and services.

The NTT Group believes that resolving customers' concerns or questions about the services they use and maintaining a high level of satisfaction for all customers will foster a relationships of trust with customers and lead to the acquisition of new customers.

## Organization for Implementation

The NTT Group companies have built a system for making operational improvements that will lead to reductions in the time taken to respond to customers, enhancing products and services, and influencing development based on the voice of customers received through surveys, the Customer Services Center, and other departments. In turn, we work toward developing and providing services closely in tune with the voice of our customers. Specifically, we work continuously to improve our year-over-year results for the KPIs of the reduction in waiting and customer service times at DOCOMO shops, the number of improvements made based on suggestions from customers, and the response rate of our call centers, which will give rise to a positive cycle of improvement.

The NTT Group will keep on making efforts to raise the level of customer satisfaction, including service quality and on-site responsiveness required by customers, in conjunction with the business operations of individual NTT Group companies.

## Main Initiatives

### Customer Contact Points

Each Group company has set up a call center that responds to customer inquiries on products and services, requests for repairs, and complaints. Major call centers of the NTT Group receive over 180,000 calls each day and endeavor to respond promptly to customers. Each call center has set its own targets aimed at improving response rates and enhancing the quality of responses and support. They also engage in various efforts including telephone response competitions and training to enhance skills for providing better responses.

### COVID-19 Outbreak and Support for Customers

In March 2020, NTT Group companies announced their policy of extending payment dates upon request from customers facing difficulties in paying for services on time, and this policy was extended through to the end of November 2021.

Recognizing that the government's stay home request created an environment that made it difficult for customers to use their d POINTS, NTT DOCOMO decided to reactivate d POINTS that expired between March and May 2020 and award them to customers, effectively extending their expiration dates.

In light of schools implementing remote classes and online education, a partial waiver of data communication fees was announced to support the use of smartphones for online learning. NTT Group companies have also been supporting telework, education, and health by setting up customer contact points and providing some services free of charge as initiatives. At the same time, the NTT Group has been using the way

cell phones connect to analyze demographic changes caused by government policies addressing the spread of COVID-19 and providing information to central and local governments and the media.

### Reflecting the Voice of Customers

The NTT Group listens to the voice of its customers, including their opinions and requests, through its call centers. Each Group company has constructed a system for reflecting the voice of customers in making operational upgrades and improving and developing products and services, and they are making an active effort in related activities as well.

For example, NTT Communications collects the voice of customers through various contact points in an effort to reinforce initiatives for enhancing services and improving operational processes. This includes not only annual surveys, but also soliciting customer feedback at the time of application and during various support processes.

For more information on these initiatives, please refer to each company's website, Sustainability Report, and other materials.

NTT East "Service with a Smile" activities (Japanese only)  
<http://www.ntt-east.co.jp/smile/>  
NTT West "Customers First" activities (Japanese only)  
<https://www.ntt-west.co.jp/withc/>  
NTT Communications "For Increased Customer Satisfaction" (Japanese only)  
<https://www.ntt.com/about-us/cs>  
NTT DOCOMO "Initiatives That Utilize Feedback from Customers" (Japanese only)  
<https://www.nttdocomo.co.jp/support/cs/case/index.html>

## Promotional Activity

### Social impact of “flow of people data” generated from approximately 85 million samples

DOCOMO InsightMarketing provides “mobile spatial statistics” that visualizes the movement of people. Society and the economy are closely linked to how people move around. “Mobile spatial statistics” provides a way to “visualize” the movement of people, and is an essential technology as the foundation of all efforts to support society. Providing citizens with accurate data on clusters with high concentrations of people, particularly during the COVID-19 pandemic, made a significant contribution to society.

When the state of emergency was first declared in April 2020, countless people were restricted from going outside. At the time, preventing infections required avoiding “clusters,” and DOCOMO received inquiries from media outlets around the clock requesting the use of “mobile spatial statistics” for identifying areas of congestion in real-time. DOCOMO also felt the need for neutral information that was not subjected to the bias of any particular media outlet.

In response to these requests, efforts were made to make “mobile spatial statistics” accessible to everybody so that information could be viewed from anywhere. Population maps shown to visualize areas of congestion as heat maps were made available for free, to much positive response.



## Social Challenge

# 6

## Moving towards a safe, secure, and resilient society

### Business Activity

- 19. Ensuring the stability and reliability of services
- 20. Strengthening information security and personal information protection
- 21. Contribution to the revitalization of local communities and economies



### Why it matters

As a company that supports the vital infrastructure of a digitalized society, the NTT Group believes one of its responsibilities is to make use of technology to keep people safe and secure from the major threats of this century: epidemics, natural disasters, and digital disasters like cyber-attacks.

### What can be accomplished

As a company that supports the vital infrastructure of a digitalized society, we will make full use of technology to keep people safe and secure from epidemics, natural disasters, digital disasters like cyber-attacks, and achieve a more resilient society.

### Future vision

The NTT Group is committed to contributing to the development of society by acknowledging diverse cultures, and thus we will contribute to solving social issues by connecting people, goods, and cultures, including communities, nations, and society, while promoting high ethical standards, diversity, and inclusion in fair and equitable ways, and work towards creating a better workplace through powerful and new digital technologies.



## Business Activity 19

# Ensuring the stability and reliability of services

### Our commitment

As a company that supports the vital infrastructure of a digitalized society, we will make full use of technology to keep people safe and secure from epidemics, natural disasters, digital disasters like cyber-attacks, and achieve a more resilient society

### Our objectives

0

Number of major accidents

99.99%

Stable service provision rate

### Policies and Concepts

As a corporate group with the mission of serving society by sustaining telecommunications infrastructure in normal times, the NTT Group is committed to building highly reliable telecommunications networks that connect people anytime, anywhere. Since telecommunications takes on a greater importance in the event of a disaster, we endeavor to secure the means of communication necessary for maintaining public order and for rescue and restoration operations at times of disasters, and for emergency communications, such as 110, 118, and 119. Japan is a country particularly prone to natural disasters such as earthquakes and typhoons. The importance of telecommunications networks was reaffirmed by the devastating Great East Japan Earthquake. Facing the possibility of an earthquake directly underneath Tokyo or the Nankai Trough off Japan's southern coastline, there is a pressing need for society to prepare for such potential disasters while ensuring the stability and reliability of its telecommunications infrastructure.

The NTT Group has defined three key themes for disaster countermeasures: securing critical communications, prompt restoration of telecommunications services, and improving network reliability. We have been strengthening efforts based on these themes since the Great East Japan Earthquake. We have also included Disaster Countermeasure Initiatives in our medium-term management strategy and are making a focused effort to further reinforce the communications infrastructure, seek proactive disaster response, and adequately provide information to the affected people.

### Organization for Implementation

Five Group companies—NTT, NTT East, NTT West, NTT Communications, and NTT DOCOMO—are designated public institutions under the Basic Act on Disaster Control Measures. Accordingly, based on this Act, in preparation for a disaster, the NTT Group has formulated the Disaster Management Operation Plan for the purpose of smooth, appropriate implementation of measures to prevent damage. Each company has prepared their respective Disaster Management Operation Plan by organizing response efforts that are mobilized at the time of a disaster in a manner proportionate to the scope and circumstances of the situation. At the same time, we will maintain close contact with the relevant government institutions to ensure a smooth and appropriate recovery from the disaster and secure critical communications.

We are also taking measures in normal times to improve the reliability of our telecommunications infrastructure. To ensure that our telecommunications services operate without interruption at all times, we employ transmission trunk line multi-routing, have enacted blackout countermeasures for telecommunications buildings and base stations, and are making telecommunications buildings more quakeproof. In addition, we are expanding the assortment of power supply vehicles and other disaster response equipment that we have positioned throughout Japan and are repeatedly conducting training to prepare for major natural disasters. We are making a daily effort to secure the necessary emergency and critical communications.

NTT Group Disaster Management Operation Plan  
<https://group.ntt/en/disaster/plan/>



## Main Initiatives

### Securing Critical Communications

To secure necessary communications in the event of a disaster, the NTT Group is implementing various response measures, including the installation of emergency-use public phones, a mobile phone lending service in affected areas, and providing means to confirm the safety of people in affected areas. We simultaneously install multiple lines to secure connections to the headquarters of the police department, fire department, and coast guard to prepare against the possibility that the 110, 119, and 118 emergency call services may be damaged.

A major disaster could also lead to social disorder, such as the disruption of transport systems. In such an event, we would consider the overall situation,

including whether other telecommunications carriers have put restrictions on mobile and fixed line phones and, if necessary, offer the use of public phones for free.\* We will not charge carriers for which we have set call fees and will not settle payments between carriers for which we have set connection fees. For the specific names of carriers, please refer to the following web-sites.

(Japanese only)

Free charge public phone policy for areas covered by NTT East  
<https://www.ntt-east.co.jp/info-st/saigai/>

Free charge public phone policy for areas covered by NTT West  
<https://www.ntt-west.co.jp/ptd/basis/disaster.html>



### Improving communications network reliability

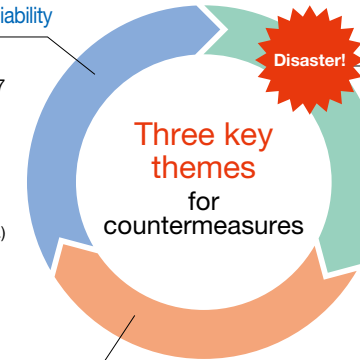
Building disaster-resistant facilities and transmission trunk line multi-routing 24/7 network monitoring and control, etc.

#### Countermeasures strengthened since the Great East Japan Earthquake

- Enhanced disaster resistance (damage prediction, hazard map utilization)
- Stable provision of telecommunications services (improving trunk line reliability, etc.)
- Introduction of large-zone base stations to provide backup for broad disaster relief in densely populated areas

#### Additional efforts in light of the growing intensity of disasters in recent years

- Introduction of medium zone base stations with enhanced disaster resilience compared to existing base stations
- Looking into placing cables underground, wireless fixed-line phones, etc.



### Securing Critical Communications

Securing 110, 119, and other emergency services and critical communications  
 Installing emergency-use public phones and providing safety status checking services when disasters strike, etc.

#### Countermeasures strengthened since the Great East Japan Earthquake

- Measures for securing critical communications
- Early resolution of communications blackouts
- Enhancements of disaster message services
- Further Information Station implementation

### Prompt restoration of telecommunications services

Early restoration of services by utilizing disaster countermeasure equipment, procurement of materials, equipment, and manpower for restoration purposes, etc.

#### Countermeasures strengthened since the Great East Japan Earthquake

- Building up stock of disaster response equipment
- Enhancement of organization for disaster countermeasure operations
- Exercises and practice for a major earthquake
- Training of crisis management personnel and utilization of knowledge and skills

#### Additional efforts in light of the growing intensity of disasters in recent years

- Centralized management and operation of Group-owned power supply vehicles
- Advance launch of restoration system based on damage estimation made using AI
- Appropriate information dissemination (service availability, recharging spots, availability of public phones for disasters, etc.)
- Consultation about problems in disaster-stricken areas (113 on-site visits)

## Further Enhancing Our Ability to Respond to Severe Disasters

Considering our disaster response based on unexpected scenarios for possible future catastrophic disasters, such as a massive earthquake or eruption at Mt. Fuji

- **Faster** : Predictive support for complex troubleshooting that exceeds human judgment through DX, such as AI and data utilization
- **Stronger** : Utilizing self-supplied energy, such as battery-equipped electric vehicles and on-site renewable energy generation
- **Safer** : Implement BCP measures such as diversifying supply chains and dispersing business locations and employee residences

### Providing Services for Easy Safety Status Checking and Information Gathering When Disaster Strikes

The NTT Group launches and provides the following services to enable people to confirm the safety of relatives and friends in areas hit by a major disaster that has disrupted phone connections.

When we launch these emergency services in the event of a disaster or other contingency, we promptly inform our customers through the mass media, website, and other means.

By integrating the Web 171 Disaster Message Board with the Disaster Message Board Service for mobile and PHS phones (i-mode/sp-mode), we have also made it possible to conduct one-stop searches spanning both services from the companies providing those services. There are additional functions for notifying designated contacts by e-mail or voice when safety status information is posted.

We are continuing to make improvements, such as by offering support in English, Chinese, and Korean for the Web 171 Disaster Message Board, and in English for the Disaster Message Board Service (i-mode/spmode), increasing the number of messages that can be posted and extending message storage time.

With regard to the Web 171 Disaster Message Board, NTT East, and NTT West agreed to collaborate with the disaster message boards operated by NTT DOCOMO, KDDI, and SoftBank to allow users to check each other's messages left with these carriers since August 2019.

#### Main Services

- 171 Disaster Emergency Message Dial  
We store recorded voice messages left by users to confirm the safety of those in affected areas
- Web 171 Disaster Message Board  
We store text messages left by users via the Internet
- Disaster Message Board Service (i-mode/sp-mode)  
We store text messages left by users via mobile phone

### Securing the Stability and Reliability of Telecommunications Services

Damage from natural disasters is becoming increasingly common in recent years as climate change causes more frequent instances of heavy rains, frequent typhoons, and other natural disasters. As a result, there is a growing risk of

water and lightning damage and power outages, which now threaten to cause extensive damage should they occur.

The NTT Group is devoted to early restoration of telecommunications services by deploying and enhancing the functions of mobile power supply vehicles, portable satellite equipment, and other mobile equipment as well as participating in disaster drills held in the respective regions. The NTT Group endeavors to build disaster-resistant communications infrastructure and maintain and operate it in a way that ensures its proper functioning at all times by conducting regular safety patrols, replacing devices as a preventive maintenance measure, and other such means, in an effort to develop disaster-resilient communication networks and equipment.

### Ensuring the Disaster Resistance of Telecommunications Equipment

We also strive to enable telecommunications equipment housings, pylons, and other facilities to withstand contingencies such as earthquakes, storms, flooding, fire, and power outages in accordance with predetermined design standards.

#### Main Measures

- NTT's telecommunications buildings and pylons are designed to withstand earthquakes of a seismic intensity of 7 on Japan's intensity scale and 60 m/sec winds experienced during the strongest typhoons
- Our facilities are equipped with flood doors and other defenses according to location to prevent inundation of telecommunications equipment by tsunamis or floods
- We equip our telecommunications equipment rooms with fire doors or shutters
- Our telecommunications buildings and wireless base stations are fitted with backup power sources to keep them running for extended periods in the event of sudden power outages
- As a further fallback, power supply vehicles can be hooked up to them to supply power
- We use trunk line multi-routing to ensure that our telecommunications services operate without interruption at all times
- We deploy large-zone base stations capable of covering wide areas during disasters and other emergency situations
- We install emergency power supply fuel tanks



### Increasing the Resilience of Equipment and Speeding Up Our Response

In recent years, disasters of greater magnitude have had significant impact. To address the increased impact on telecommunications equipment and services, as well as the longer time required to resume operations, we are also promoting additional initiatives toward such goals as increasing the resilience of our equipment and speeding up recovery.



#### Main Initiatives for Increasing the Resilience of Telecommunications Equipment

- Expansion in medium-zone base stations equipped to deal with disasters, such as blackout countermeasures
- Blackout countermeasures that use electric vehicles at base stations
- Centralized management and mobilization of approximately 400 power supply vehicles owned by the NTT Group
- Consideration of underground installation of power transmission cables and use of fixed line phones to deal with the impact of disasters

#### Main Initiatives for Speeding Up Service Recovery

- Advanced launch of recovery framework (national wide-area support system and other frameworks) based on damage prediction using AI
- Reinforcement of the recovery framework and recruitment of personnel, including the use of retired NTT employees

#### Initiatives for Bolstering Support for Disaster Victims

- Delivery of realistic and concise information, including status of damage to communications, status of recovery, location of charging stations, public phones in operation during disasters, information for visitors and foreign residents, and more to support evacuation and other activities
- Response to consultations on problems related to communications through emergency 113 call centers dispatched to affected areas



- Collaboration with local governments and other public offices for installing Wi-Fi and charging stations inside public phone booths to secure telecommunications during a disaster

### Providing Stable Telecommunications Services in Normal Times

To consistently provide secure telecommunications services to our users, the NTT Group operates a system for monitoring its telecommunications networks, implements measures for preventing accidents and failures, and works to enhance the skills of personnel responsible for network maintenance and operations.

- Operational system for monitoring and controlling the status of network operations on a real-time basis, 24-hours a day, 365 days a year
- Collection and analysis of performance data for telecommunications equipment under ordinary circumstances to identify and deal with signs of failure
- Establishment of a system and a review of procedures to enable prompt and appropriate restoration measures in the event of unexpected problems
- Application of lessons learned from past accidents to similar cases and thorough reinforcement of standard procedures based on an analysis of cases that may result in serious accidents
- Implementation of training and drills and development of related mechanisms for fostering personnel handling network maintenance and operations

### Providing Stable Telecommunications Services to Address a Large Spike in Demand Due to the COVID-19 Pandemic

NTT and its major subsidiaries in the telecommunications business have formulated operation plans to execute their responsibilities as designated public institutions and contribute to preventing infections from the standpoint of respecting human life. The spread of infections has been accompanied by an increased demand for Internet use and telework, significantly increasing data traffic, particularly between stationary communication terminals during daytime weekdays. The NTT Group companies have designed their existing networks to meet peak nighttime traffic and are currently capable of providing network capacity for daytime traffic. We will continue to bolster our equipment to deliver stable telecommunications services.

#### Operation of mobile phone base stations and terminals (NTT DOCOMO)

For more than 60 years, research has been conducted worldwide on the impact of radio waves on the human body. As a result, standards and systems have been put in place for the safe use of radio waves not only in Japan, but around the world, too.

In 1990, Japan's Ministry of Posts and Telecommunications (presently the Ministry of Internal Affairs and Communications) established its own Radio Radiation Protection Guidelines for Human Exposure to Electromagnetic Fields (RRPG) as a set of reference values for the safety of radio waves on the human body based on the results of research conducted over the preceding 40 years both inside and outside Japan. The reference values of these guidelines are the same as those recommended by the World Health Organization (WHO). Radio waves below these reference values are recognized internationally as having no adverse effects on health.

Mobile base stations and terminals of NTT DOCOMO are operated at levels lower than the reference values of the RRPG. Services are provided in compliance with related laws and ordinances incorporating the RRPG, which ensures DOCOMO mobile phones can be safely used.

NTT DOCOMO Radio Wave Safety (Japanese only)  
<https://www.nttdocomo.co.jp/corporate/csr/network/radio/safe.html>

## Business Activity

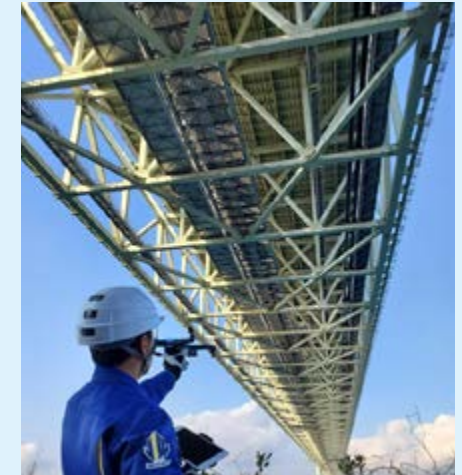
### Drones, as a public tool, bring a revolution to “infrastructure inspections” for social infrastructure

“Infrastructure” is something that people do not pay much attention to on a day-to-day basis. The importance of infrastructure underpinning our lifestyles—such as water, electricity, communications, and transportation—first comes to light when any of these services are disrupted. Any disruptions with infrastructure can have a significant impact on so many people, and thus pausing infrastructure inspections is not feasible. Infrastructure across Japan was built rapidly during the period of high economic growth, and after half a century, their dilapidation is becoming a serious issue. Consequently, the importance of regular infrastructure inspections is greater than ever.

A closer look at the cost of inspections of bridges, steel towers and other structures around Japan reveals that they amount to some 30 billion yen annually. When repairs are factored in, this cost increases to around 1 trillion yen. Japan will soon be facing a declining population. This will result in a decrease in tax revenue, which means less costs set aside for inspections. The engineers capable of conducting inspections are also getting older. It is because of this background that efforts are currently being made to use drones to increase the efficiency of inspection work. Japan Infra Waymark was established with the aim of resolving the issue of

deteriorating infrastructure, and uses drones to cover staff shortages for infrastructure inspections. An example that illustrates this is the inspection of elevated bridge supports—inspectors usually assemble scaffolding, use lifts, or sling ropes up to conduct visual inspections of supports. Yet these methods all take time, and are also dangerous to perform.

Instead, drones are being used for this work. A drone jointly developed with an American company is equipped with three cameras on both the top and bottom, which identify target areas just like human eyes, and operates autonomously to avoid flying into obstacles. This is the only type of drone capable of automatically flying to avoid obstacles in areas like below bridges, where GPS signals cannot reach, making it possible to conduct inspections under bridges—something that was not possible in the past. When the drone approaches a target area and takes a photograph, cracks (fractures) as small as 0.05 mm can be identified. When the drone returns back to base, image data is automatically uploaded to the cloud, and an inspection record is created. This increases the efficiency of the entire inspection process, and in the three years since being established, the company has a proven track record of inspecting 6,400 structures (as of June 2022).



### NTT Communications and GS Yuasa work together to help create a safe, secure, and stable infrastructure for a carbon-neutral society

Batteries are used in a wide range of applications, including for the shift to electric vehicles to achieve a carbon-neutral society, as well as for curbing output fluctuations from renewable energy sources such as wind power. Advancements in technologies (quicker, more uniform detection level) for detecting failures have become a key challenge for facilitating reliable battery operation.

NTT Communications has jointly developed technology successfully to detect early signs of battery failures by utilizing AI. This technology will be used for more efficient monitoring of large-scale storage battery systems while also achieving labor

savings. Development of AI involved trial and error of systems for detecting different types of batteries, allowing for more advanced detection of failures (quicker, more uniform detection level) and automation.

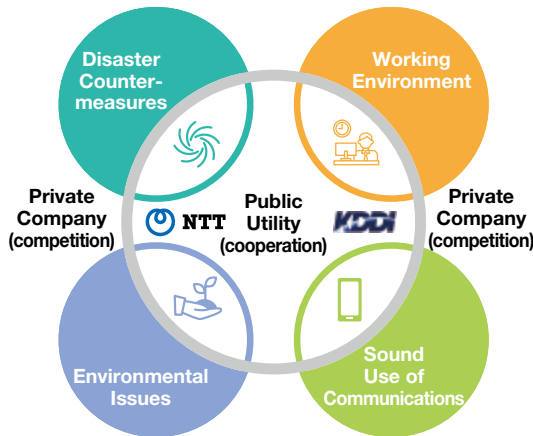
This means only batteries with potential failures need to be replaced before a failure actually occurs—it also enables monitoring of large-scale systems under more efficient, labor-saving environments, ensuring that batteries are a safe, secure and stable type of infrastructure.



### Social Contribution Coordination Agreement with KDDI

On September 11, 2020, NTT formed a social contribution coordination agreement with KDDI to begin mutual cooperation for the joint utilization of ships transporting necessary supplies in the event of large-scale disasters, as well as joint disaster preparedness drills and awareness-raising activities.

Building resilient social infrastructure through these initiatives has the goal of developing a sustainable society. In addition to disaster countermeasures and job assistance, NTT and KDDI will coordinate efforts to identify areas that can benefit from the mutual use of assets of both companies, such as the sound use of smartphones and addressing climate change.



### Cooperation with mutual utilization of ships owned by both companies for faster restoration

#### KDDI cable laying ship KDDI OCEAN LINK



#### NTT cable laying ship KIZUNA



### Employment support for the Employment Ice Age Generation

The employment support initiative developed by NTT together with KDDI provides support for employment such as training related to remote work and ICT skills from March 2021, to applicable people whose employment has been significantly affected due to sudden changes in the social environment such as the employment ice age and the increasing number of infections of novel coronavirus infections in recent years.

The second stage of this initiative provided employment support for the employment ice age generation, leading to 248 successful employees from both companies.

#### Overview of employment support initiative

	Target number	Overview
Invitations open	8,300	Applications open on special site
Provide remote work skills training	5,800	ICT skills foundation • Web conference usage • Tips for remote work to increase productivity
Provide skills counselling	3,400	Dedicated counsellors provide counselling to 3,400 applicants of the remote work skills trainees
Support for acquiring certification	500 (321 certified)	Support for acquiring certification by providing a 2-month online training program for 500 applicants seeking positions in the ICT and communication industry or roles that utilize ICT
Recruitment and employment activities	500	Provide support for recruitment and employment activities to graduates of the past support-for-acquiring-certification program graduates
Secure employment	248	Employment at the NTT Group, KDDI Group and other suitable companies sought by trainees

[Reference] (breakdown of certified employees) MOS (Microsoft Office Specialist): 97, IT passport: 152, CCNA: 46, CompTIA: 26 (target number of recruitments at time of release) 300 (NTT 100, KDDI 30, other companies 170)



## Past Initiatives

### 1 Improve Communications Network Reliability

- Employ transmission trunk line multi-routing
- Install large-zone base stations
- Build disaster-resistant facilities

### 2 Secure Critical Communications Systems

- Secure 110, 119, and other emergency services
- Provide tools to check safety status (171)



### 3 Promptly Restore Services

- Deploy disaster countermeasure equipment (power supply vehicles, portable satellite equipment, etc.)
- Procure and convey materials and equipment for restoration purposes
- Use drones

**Lessons from the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake**

## Further Efforts

### Major Facility Resilience Initiatives

- Expansion in medium-zone base stations equipped to deal with disasters, such as blackout countermeasures
- Blackout countermeasures that use electric vehicles at base stations
- Centralized management and mobilization of approximately 400 power supply vehicles owned by the NTT Group
- Consideration of underground installation of power transmission cables and use of fixed line phones to deal with the impact of disasters

### Main Initiatives for Speeding Up Service Recovery

- Advanced launch of recovery framework (national wide-area support system and other frameworks) based on damage prediction using AI
- Reinforcement of the recovery framework and recruitment of personnel, including the use of retired NTT employees

### Initiatives for Bolstering Support for Disaster Victims

- Delivery of realistic and concise information to support evacuation and other activities (status of damage to communications, status of recovery, location of charging stations, public phones in operation during disasters, information for visitors and foreign residents, etc.)
- Response to consultations on problems related to communications through emergency 113 call centers dispatched to affected areas
- Collaboration with local governments and other public offices for installing Wi-Fi and charging stations inside public phone booths to secure telecommunications during a disaster

**Disasters causing wider, bigger, and more lasting damage**

### Countermeasures for Earthquakes, Fires, and Floods

NTT's communications buildings and towers are designed to be sufficiently earthquake-resistant to avoid collapse even in the event of an earthquake with a seismic intensity of 7, and were built to our own strict standards to be able to withstand the worst disasters Japan has ever experienced.

For fires, communications buildings and other buildings were made noncombustible and fireproof, fireproof shutters and doors were installed in communication machinery rooms, and fireproof sealing was applied to through holes.

To prepare for tsunamis and floods, we have taken location-appropriate measures to prevent communications buildings from being flooded, such as replacing building doors with flood doors, closing windows and other openings, and reinforcing walls with concrete to withstand the water pressure from a tsunami.

### Blackout Countermeasures at Communications Buildings and Base Stations

Communications buildings and wireless communications base stations are equipped with batteries, engines, and other auxiliary power supplies that can be used as a prolonged source of electricity in the event of a blackout.

Moreover, we are enacting the lessons learned from the Great East Japan Earthquake by implementing blackout countermeasures for engine generators and having batteries available for use around the clock at its roughly 1,900 base stations in important areas, such as those where municipal disaster response headquarters or city offices are located.

In addition, mobile power supply vehicles and portable power generators are deployed in each area as backup to provide support over a wide area to disaster-stricken regions as the situation requires.

### Transmission Trunk Line Multi-Routing and Distributed Location of Important Communications Buildings

Our nationwide network of trunk lines has been designed to secure communications and prevent disruption of services over the network as a whole by automatically diverting transmission through other routes when a certain route is damaged. Meanwhile, if communications buildings (important communications buildings) fitted with transit switches suffer disaster damage, communications via such buildings may be severed. Distributing important communications buildings in different locations helps avoid the risk of multiple buildings suffering disaster damage at the same time.

### Prompt restoration of telecommunications services

Should a disaster strike, swift action will be taken to restore service via the utilization of mobile disaster response equipment and the use of drones to confirm the situation.

### Disaster Response Equipment

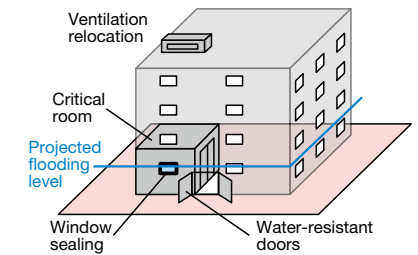
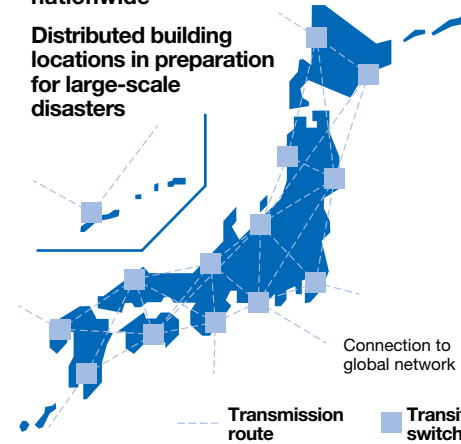
NTT has positioned mobile base stations and power supply vehicles across Japan that can be quickly deployed to disaster sites should a wireless communications base station be damaged by a disaster. Moreover, we have adopted off-shore base stations comprised of mobile communications base stations mounted on ships. Should a tsunami or other disaster knock out service over a wide spread of coastal area, we can provide service by using entrance satellite lines to transmit signals to the coastal areas from anchored ships.

### Disaster Site Confirmation with Drones

When damage to roads or other conditions prevent us from reaching base stations, drones will be deployed to confirm the status of the site and facilitate the quick restoration of service thereafter.

### Improvement of reliability through multi-routing nationwide

#### Distributed building locations in preparation for large-scale disasters



Large-scale power supply vehicle for powering communications buildings



Further, lessons gleaned from past disaster responses are deployed across the organization to implement measures to prevent recurrences, review action procedures, and ensure that basic operations are thoroughly implemented.

### Initiatives for Maintaining Stable Telecommunications Services

#### Real-time Network Monitoring and Control

The nationwide communications network monitors and controls operational status in real time, 24 hours a day, 365 days a year, and responds immediately to breakdowns and disasters.

To respond immediately to emergencies and other contingencies, the monitoring system is reinforced as required in response to social conditions.

#### Improved Response to Disasters and Major Failures

To enable prompt and appropriate recovery measures in the event of a disaster or unexpected equipment failure, training and drills are conducted as required to train the personnel involved in network maintenance and operation.



## Business Activity 20

# Strengthening information security and personal information protection

### Our commitment

The NTT Group works together with its partners to resolve social issues through its business operations toward a zero-trust & cloud connected age. Based on this approach, we are contributing to the healthy development of a digital economy and remote society by exercising our responsibility as a supplier of safe and secure ICT infrastructure to guarantee effective information security.

### Our objective

0

Number of service suspensions due to cyber attacks (annual)

### Reinforce information security

#### Policies and Concepts

With the progressing digitalization of society and the economy and changes in international circumstances, security threats are becoming more serious and sophisticated, particularly cyber-attacks. Within this environment, the NTT Group has a responsibility to protect ICT service infrastructure and customers' basic rights, freedoms, and information assets, as well as to provide a sound foundation for the growth of the digital economy. When formulating our medium-term management strategies in 2018, we made it our mission in terms of security to contribute to the building and development of a free, open, and safe ICT platform for supporting the infrastructure of the digital economy.

We also made it our vision to realize the digital transformation of both customers and NTT itself, and for that reason, we will be chosen by customers. In order to realize these, we will strive to engage in research and development that leverages the scale of the Group, realize superior abilities for early detection and rapid response, cultivate human resources who share the values of sincerity and advanced skill, and transcend profit-focused principles to transmit pioneering knowledge to society. Furthermore, to achieve the transformation to a New Management Style outlined in the medium-term management strategy refined in October 2021, NTT Group is implementing security measures capable of facilitating the shift to remote work styles.

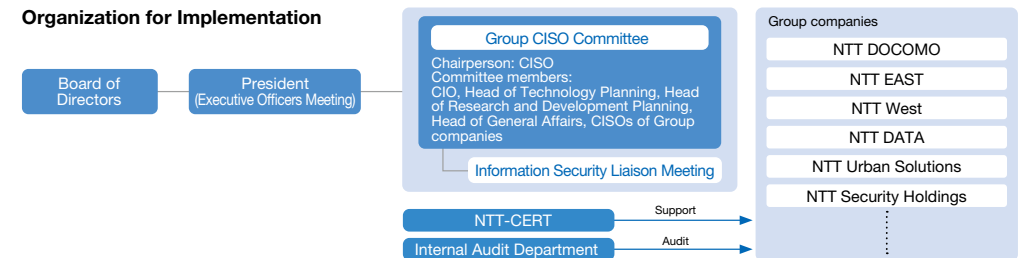
As a member of the global community building the digital society, NTT Group will contribute to solving social issues through our security business.

The concept of cybersecurity is no longer just an aspect of crisis management that reduces negatives to zeroes, but is now entering an era in which it is a positive driving force that offers stabilizing support for the prosperity that technology provides. As we progress through the era of Zero Trust and Next Zero Trust, NTT Group will continue to investigate the value of security as we confront never-ending cyber risks.

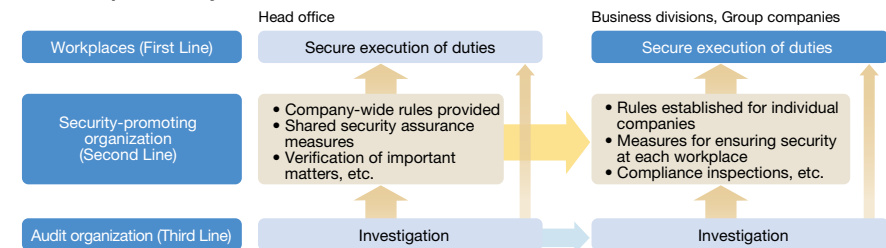
### NTT Group's Security Governance Goals

NTT Group enforces information security management under the charge of the Chief Information Security Officer (CISO), and is thorough in its information security management. We have also established a Group CISO Committee, and are working to formulate Group information security management strategies, plan and implement related measures, undertake human resources training, and otherwise engage in activities in collaboration with companies across the Group. We are also advancing efforts to maintain and improve security defenses within the Group based on the idea of a "three-line organization."

### Organization for Implementation



### NTT Group's Security Governance Goals



## Security Initiatives Supporting the Medium-Term Management Strategy

Security is one of the three pillars defined in the refined medium-term management strategy that is particularly important for supporting “Transformation to a New Management Style.”

### Transformation to a New Management Style

#### Introduction of zero-trust systems

Development of IT infrastructure with security measures prefaced on cloud and mobile usage for accommodating the shift to remote work styles.

#### Systematizing Information Security

Completely revised with zero-trust security measures. Regulations that are less ambiguous and more easily understood will be developed to ensure compliance, in order to increase the security awareness of all employees, not just information security staff.

## Main Initiatives

### Systematizing Information Security

The NTT Group will be completely revising information security regulations to implement zero-trust security measures based on flexible working styles that are not constrained by working location. The goal is to develop regulations that are less ambiguous and more easily understood, and ensure compliance in order to increase the security awareness of all employees, not just information security staff.

### Strengthen Service Security

Information communication services are an important social infrastructure and a foundation for the digitalization of society and the economy, so to provide these services in a safe and secure manner, we are working to strengthen the security of telecommunications equipment, IT service environments, and all services provided by smart cities, smart buildings, and the like.

### Global Cooperation within the NTT Group

We are advancing global partnerships in the security field in order to enhance competitiveness in global business under One NTT. This NTT Group cooperation includes many businesses and regions and incorporates an approach to risk-based management, the introduction of a framework that acts as a shared language, and the setting of standards that should be met by all Group members in regard to identification, defenses, detection, response, and recovery.

### Engaging with and Contributing to the Global Community

We are engaging with the cybersecurity initiatives of governments and industries around the world, particularly in North America and Europe, by sharing information and best practices in regard to security threats and building a community of companies and organizations based on mutual trust.

## NTT Group Information Security Policy

As “Your Value Partner,” NTT Group will aim to resolve social issues together with our partners through our business activities. As a trusted global provider of safe and secure ICT services, NTT Group will strive to ensure the security of the information entrusted to us and contribute to the sound development of the digital economy and the Remote World in accordance with the following policies.

1. NTT Group will (a) be fully aware of the importance of information security in the digital economy and the Remote World, (b) strive to establish a safe, secure and convenient ICT-related service environment and (c) strive the security of information entrusted to us.
2. Under the supervision of the Chief Information Security Officer (CISO), NTT Group will establish a unified information security management framework. Furthermore, NTT Group will continuously enhance its strict security measures (including Baseline Security Standards), employee security education, and audits, in order to prevent and minimize damage from unauthorized access, and information loss/falsification/leakage. NTT Group also require contractors and suppliers who handle confidential information to ensure appropriate information security, in order to strive to protect information throughout the entire supply chain.
3. All board members, executive officers, supervisors, managers and employees of NTT Group fully recognize that (a) information is a valuable asset for business and economic activities, and that (b) the protection of information is the basis of NTT Group’s business activities and a corporate social responsibility. Upon these recognition, NTT Group shall comply with relevant laws and regulations (country and jurisdiction), including those relating to the protection of personal information as well as the secrecy of telecommunications, and shall establish the information security management rules. If any violation of these rules is found, NTT Group will take strict action in accordance with its disciplinary rules.

NTT Group Information Security Policy [https://group.ntt/en/g\\_policy/](https://group.ntt/en/g_policy/)

## Business Activity

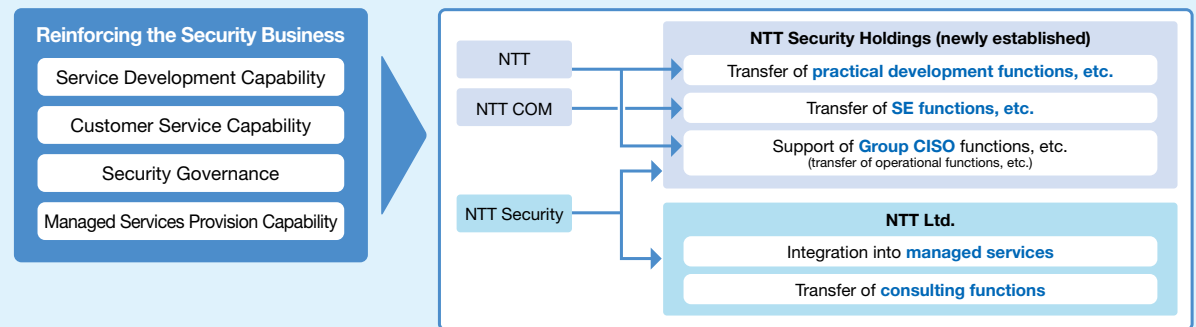
### Advanced Security (1) Protection and Resiliency (Resiliency)

The international sporting event held in Tokyo in 2021 was subjected to the largest cyberattack ever seen. However, there were no cyber incidents during the events that disrupted operations. Behind the victory was the expertise and cutting-edge technologies of NTT, who has been thinking about communication and information security for the last 30 years and more, combined with the capabilities of human beings armed with wisdom and resolve. In particular, the “4 T’s” on the right supported our efforts. These are ingrained far and wide in NTT Group’s overall cybersecurity resiliency maintenance and improvement.

T1: Threat Intelligence & Monitoring (Threat Intelligence & Monitoring)	NTT meticulously evaluated case studies on past events as well as the latest threat information, thoroughly developing scenarios in advance, monitoring every item of threat information, whether it came from internal or external systems. The key was NTT’s ability to put together information in partnership with global ICT service operators and security providers.
T2: Total Security Solutions (Total Security Solutions)	Within a complex ICT operation environment, NTT selected safe and secure equipment and organized a Cyber Hygiene environment. NTT also employed its proprietary technology Wide Angle MSS to detect and respond to risk factors early. This equipment and technology were put to use at the security operation center for the event, in collaboration with a wide range of specialists from both inside and outside the company.
T3: Talent, Mind & Formation (Talent, Mind & Formation)	The development of a prevention and maintenance mindset was also as important for security program personnel as learning advanced knowhow and technologies. NTT enhanced the staff’s capabilities through preliminary training programs and red teams. At the event operation center, NTT clarified the roles for each team and how their movements should be coordinated, with a focus to maximize human capabilities.
T4: Team 2020 (Team 2020)	Everyone had to form one team because the event was so large. The strongest-ever defense would not have been possible without this. ICT service operators and providers inside and outside Japan, key infrastructure organizations, government, the Tokyo 2020 Organising Committee... NTT collaborated with all stakeholders to bring a wealth of wisdom and technological integration, leading the event to a success.

### Advanced Security (2) Responding to Change (Agility) - Resiliency: A Blend of Knowledge, Cutting-edge Technology, and People Power

The time has come to consider security even in cyberspace. Given the circumstances, we especially want to strengthen our threat analytics, which are the cornerstone of cybersecurity. For this reason, we reorganized NTT Security in April 2022 to strengthen its service development, client support, security governance and managed services. We established NTT Security Holdings as a new wholly owned subsidiary. Practical development functions were transferred from NTT Laboratories, SE functions were transferred from NTT Communications, and operational functions from NTT were transferred to support the group’s CISO functions. In addition, security services will be merged and integrated with NTT Ltd.’s managed services, and consulting functions of NTT Ltd. will be transferred to each region. These moves will strengthen NTT Ltd.’s managed services. Further, in July 2022, NTT East, Trend Micro Incorporated, and Tokio Marine & Nichido Fire Insurance Co., Ltd. jointly established the new company NTT Risk Manager Corporation, to develop a wide range of risk management businesses, with a focus on the cybersecurity domain.



### Information Security Training

Each Group company seeks to raise information security literacy by organizing training for all employees as well as the employees of partner companies. Training is offered through e-learning, and all employees are obliged to participate in the course once a year. Looking ahead, we are considering unifying training content throughout the Group to provide employees with a standard level of knowledge on information security required in their business operations. By doing so, we will seek to enhance the security capabilities of the NTT Group and reinforce its human resources to deliver safe, secure services for our customers and society at large.

### Overhaul of Security-related Regulations

From FY2021 to FY2022, we proceeded with a company-wide overhaul of security-related regulations. We are taking steps to prepare not just for the zero-trust era, but beyond.

### Research and Development Initiatives

In addition to advancing the technological development of service security, we are focusing on developing elemental security technologies. In 2019, we established a global research center for research into cybersecurity and encryption technology centered around some of the world's leading researchers.



### Business Activity



### Basic Level Information Security Training

NTT Group launched a security expert certification system in 2015 with the aim of increasing the quality and number of its security personnel. This system defines three levels based on human resource type and skill level.

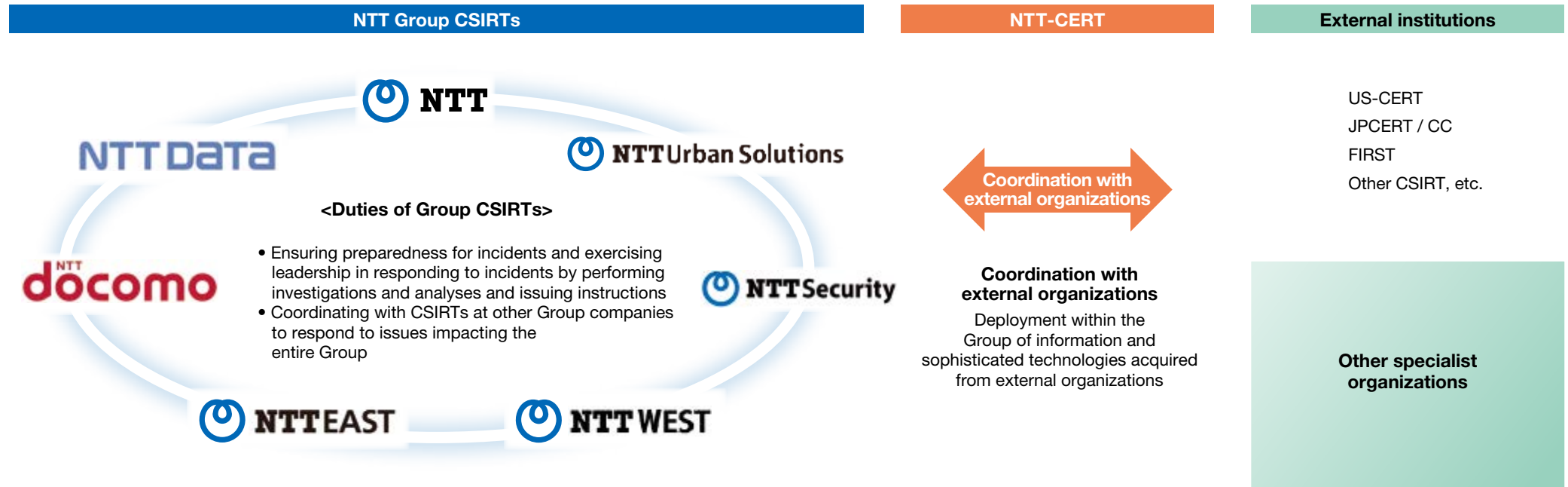
We must be constantly vigilant in our effort to remain abreast of the recent changes in security technologies and circumstances (zero trust, cloud native, DX, teleworking, etc.). As such, the effective and consistent training of security experts is a matter of utmost importance.

NTT used to offer basic level certification, but the rising number of certification holders coupled with the increase in awareness regarding the importance of security prompted us to develop security training programs targeting all employees worldwide.

People tend to shy away from security training due to its level of difficulty or by being turned off with the limited applicability of the subjects covered. To address this issue, we positioned raising employee interest in these subjects as our top priority, which we went about doing with animated videos and other endearing content, including a humorous introductory message by the CISO structured like a dramatic performance. Through these programs, we hope to make all employees recognize the necessity of security awareness and instill in them the basic practice of reporting any suspicious activities in their daily work. We thereby aim to motivate employees to participate in and contribute to our organization-wide drive to quickly detect and address security issues.

(1) Clarification of governance targets	<ul style="list-style-type: none"> <li>Clarify the scope of CISO responsibilities to include commercial services, customer SIs, and partners</li> </ul>
(2) Utilization of risk-based management	<ul style="list-style-type: none"> <li>Besides the minimum baseline to be followed by the Group as a whole, craft additional rules based on the risks faced by each company</li> <li>Adopt the National Institute of Standards and Technology (NIST) methodology as a risk-based approach</li> </ul> <p>* NTT Group actively provided comments during the NIST-Cyber Security Framework (CSF) revision process</p>
(3) Rules based on the assumption of remote work	<ul style="list-style-type: none"> <li>Give new consideration to system construction work</li> <li>Reinforce precautions and other procedures during normal operations</li> <li>Create a structure that takes the readers into consideration and prevent it from becoming a formality</li> </ul>

## NTT Group CSIRT Activities



### Management of CSIRT

The NTT Group established NTT-CERT in 2004 to function as a computer security incident response team (CSIRT). This team collects information regarding security incidents associated with the Group. It then offers support for addressing these incidents, formulates measures to prevent recurrence, develops training programs, and provides security-related information.

As a central element of the NTT Group's security initiatives, NTT-CERT provides a reliable venue for consultations regarding information security. The team also collaborates with organizations and specialists inside and outside the NTT Group to offer support for detecting and resolving security incidents, minimizing damages, and

preventing occurrence. NTT-CERT is thereby contributing to better security for both the NTT Group and societies that are permeated by information networks.

Moreover, NTT-CERT coordinates with the United States Computer Emergency Readiness Team (US-CERT\*<sup>1</sup>) and the Japan Computer Emergency Response Team Coordination Center (JPCERT/ CC\*<sup>2</sup>) and is also a member of the Forum of Incident Response and Security Teams (FIRST) and the Nippon CSIRT Association\*<sup>3</sup>, which enables it to coordinate with domestic and overseas CSIRT organizations. This coordination makes it possible for NTT-CERT to share information on relevant trends and response measures.

In addition, NTT-CERT participates in the cross-industry drills held by the National Center of Incident Readiness and Strategy for Cybersecurity (NISC) to share expertise and gather information. NTT-CERT also plays a role in promoting the establishment of CSIRTs at Group companies and helping improve their response capabilities.

NTT-CERT will expand its collection of information on vulnerabilities and attacks to cover areas including the dark web and will strengthen its information analysis platform and further automate and enhance its response to cyber threats in order to continually respond to threats as they change.

\*1 US-CERT: An information security preparedness organization under the Department of Homeland Security (DHS)

\*2 JPCERT Coordination Center: An organization that collects reports inside Japan, supports responses, monitors situations, analyzes entry points, and reviews and provides advice on measures for preventing reoccurrences from a technical standpoint with regard to computer security incidents such as intrusions through the Internet or service interruptions

\*3 NTT-CERT founded the Nippon CSIRT Association

NTT-CERT  
<https://www.ntt-cert.org/index-en.html>  
 Nippon CSIRT Association  
<https://www.nca.gr.jp/en/index.html>  
 FIRST Forum of Incident Response and Security Teams  
<https://www.first.org/>

## Personal Information Protection

### Policies and Concepts

Every year, the importance of ensuring the protection of personal information and the comprehensive management of information around the world continues to grow. The NTT Group has been entrusted with a considerable quantity of personal information, ranging from data on individual customers to that of corporate customers, and as such ensure that personal information is handled appropriately in accordance with the laws and regulations of each country, such as Japan's Act on the Protection of Personal Information and the EU's General Data Protection Regulation (GDPR).

Under these circumstances, personal information leakage could have various repercussions for the NTT Group in the operations of its businesses, including damage to its corporate value and loss of customers, which makes it essential to rigorously manage personal information as the NTT Group's top priority.

### Organization for Implementation

Under the NTT Group Information Security Policy, we disclose on our website specific policies for protecting the personal information of customers and shareholders and policies for protecting personally identifiable information required by Japan's Social Security and Tax Number System. In this policy, we also define how we respond to requests for disclosure, correction, and suspension of use related to the personal information retained by the NTT Group. We have also put in place a security management system that ensures thorough and rigorous security practices, with the Chief Information Officer (CISO) placed in charge (see page 054).

#### Policy on Protecting Personal Information

About personal information protection  
<https://group.ntt/en/protection/>

Policy on Protecting Personal Information of Customers  
<https://group.ntt/en/protection/customers.html>

Policy on Protecting Personal Information of Shareholders  
<https://group.ntt/en/protection/shareholders.html>

Policy on Protecting Specific Personal Information of Business Partners  
<https://group.ntt/en/protection/partners.html>

Policy on Protecting Specific Personal Information of Shareholders  
[https://group.ntt/en/protection/specific\\_personal\\_information.html](https://group.ntt/en/protection/specific_personal_information.html)

### Main Initiatives

NTT has systematic security control measures, human security control measures, physical security control measures, and technical security control measures in place for handling our customers' personal information.

#### (1) Systematic security control measures

We have created a statement outlining the building of management systems such as placing a person responsible for management of the committee and each organization, the establishment of internal regulations, management ledgers and process management charts, and other matters. Furthermore, we are also building management systems for handling ongoing improvements and the like.

#### (2) Human security control measures

All employees who handle customers' personal information are informed and made aware of the importance of protecting this information, regardless of whether they are officers, regular employees, or temporary employees. We ensure employees conclude non-disclosure agreements and provide necessary auditing and supervision to ensure their effectiveness.

#### (3) Physical security control measures

We enact various measures including controlling access to physical equipment which handles customers' personal information and the floors where these are kept, measures to prevent theft, measures to prevent damage to customers' personal information during incidents such as fires and lightning strikes, and the use of locks when taking out, moving, or storing systems and documents.

#### (4) Technical security control measures

We have put in place various technical security control measures such as access management when accessing personal data including authentication, authority administration, control, and recording, countermeasures against viruses and malware in systems, measures for use when sending and receiving information including encryption and clarification of responsibility, and the monitoring of information systems.

Each domestic company in the Group has established a personal information protection system in line with its business and based on the Protection of Personal Information. We are consistently pursuing initiatives to protect information, including stringent measures on the physical and systems aspects of security and appropriate supervision of outsourcing contractors. Management of information is being further enhanced, as personal information acquired by group companies in Japan via individual or household services like cell phones and internet access will be retained and accessed from within Japan after May 2021.

#### Main Initiatives of Domestic Group Companies

- Establishment of internal rules and regulations
- Employee training to ensure appropriate implementation of the above rules and regulations
- Establishment of an organization to promote information security management
- Establishment of a security management system for preventing illegal access to information or the loss, alteration, or information leakage as well as managing antivirus measures and the physical transfer of information

### Establishment of Contact Points on Personal Information

NTT has set up the Customer Contact Point on Personal Information, and similar contact points for services related to personal information have been set up at each NTT Group company. Since NTT is a holding company that does not directly provide telecommunications services, inquiries regarding personal information related to services are redirected to the contact points of the operating companies concerned.

Additionally, inquiries regarding the handling of personal information under laws and regulations are redirected to the person responsible for information security at the operating companies concerned.

Nippon Telegraph and Telephone Corporation Customer Contact Point on Personal Information  
 Email: [ntt\\_kojin@ntt.com](mailto:ntt_kojin@ntt.com)  
<https://group.ntt/en/protection/customers.html>



## Business Activity 21

# Promoting a decentralized society based on remote work

### Our commitment

Shifting toward new work styles centered on remote work, by upgrading IT environments and reviewing systems, in addition to advancing DX projects and work reforms with an eye on the post-pandemic world

### Our objective

0

Major personal data leaks (annual)

### Policies and Concepts

The NTT Group recognizes that remote work will play a key role in society even after COVID-19 subsides. Based on this recognition, we will make active efforts as an ICT company to improve DX and other environments that allow for more opportunities for remote work. We believe these initiatives ensure the Group's sustainable growth, enhance its corporate value, and eventually help find solutions to social issues.

In light of this background, the NTT Group is currently rolling out various specific initiatives such as (1) Making "general improvements" by rolling out cloud based systems/zero-trust systems, (2) "Promoting DX" to enable remote work for automating and making operations more efficient, and (3) Re-examination of systems for promoting work styles based on remote work. Remote work systems and remote work allowances will be established as part of promoting work styles required for remote work, and thereby offering a greater choice of "work time" and "work location" for employees.

Different to "work-life balance" that aims to separate and create a balance between work and private life, we are considering the promotion of "work-in-life (health management)" where employees can select and design their own work style by viewing work as part of the lifestyle of each and every employee. In addition to flexibility with "work time" and "work location," flexibility with regard to "residence" is also considered important, so remote work systems are being revised to develop work styles centered around remote work.

### Decentralization of the Organization (Including Head Offices and Back-Offices)

The NTT Group began initiatives for decentralizing the organization from metropolitan areas to regional areas, or core cities.

<Specific Initiatives>

- Trial run for dispersing the organization across regions to begin at the holding company (starting in October 2022)
- From the standpoint of resilience, we will aim for sustainable business operations by opening offices in Takasaki City and Kyoto City and promoting split shifts. The first step will involve a trial of certain organizations (with approx. 200 employees) of the holding company
- The trial will be used to test for issues or measures related to business operations and communications with split shifts, with a view to applying it to actual operations
- Introduce a working style based on telework in which employees engage in head office operations while residing in a distant location
- Introduce a "hometown double work" program to contribute to the revitalization of local communities and areas associated with the Company while continuing current assignments

### Promotion of a decentralized society and work-in-life (health management) through the workplace-residence proximity

The NTT Group is taking initiatives to shift to new work styles premised on remote work.

- Remote work ratio: 70.8% (conducted from October to December, 2021)
- Creating an environment that offers greater choice of work location
- Remote work that does not require approval on a case-by-case basis, elimination of restrictions on residential areas for employees who can work remotely, and sharing costs and other expenses associated with commuting to work from remote locations (FY2022 onward)
- No Need for Relocations and Unaccompanied Assignments Recruitment of Remote-Based Employees (From FY2022)
- Expand the number of organizations that support remote work through DX (establish security requirements at major contact centers, begin introducing tools to prevent peeping)
- Satellite offices: 249 sites (end of January, 2022, target of 260 sites or more during FY2022)
- Re-Examination of the Office Environment  
Increase the amount of space per person in the office by 1.5x, and enhance the space for idea creation and co-creation (From FY2022)

## Business Activity

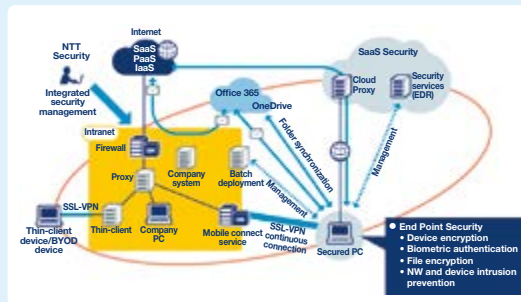
### Rolling out zero-trust security and increasing the remote work ratio

In this day and age, IT has become an essential part of our lives and work, but this also increases the amount of threats from cyberattacks. As a company that handles sensitive customer information, implementing measures to protect against these threats is of the utmost importance. In many cases, the way employees work must be restricted to ensure security.

We came up with the “Work from Anywhere” slogan as a way of reforming working styles, and developed an IT environment that allows employees to work from anywhere in the same way as working in the office. This is a work style that has a greater degree of flexibility thanks to advancements in IT. This requires a high level of security to ensure work is performed in the same way from any location. To achieve this, the “zero-trust” concept has been adopted.

“Until now, the approach to ensure security had been to complete all work within the company intranet, and to make sure the connection was closed securely. Yet with cyberattacks becoming more advanced in recent years, we need to factor in the possibility of unauthorized access to the intranet. A new approach was established, with the entire system designed not to trust any type of access, whether it is from within the intranet or from external sources. This is the basic approach to zero-trust security.”

Whether employees are working from home, a satellite office or any other location, the concept of “Work from Anywhere” is a great way to boost their motivation.



### Generating value as new regional communities created by “another workplace” —Maintaining employee health, while developing environments equivalent to the office to ensure business continuity—

When the state of emergency was declared, we needed to quickly develop an environment that employees could work with. A long-term vision has emerged in recent years, covering the COVID-19 and post COVID-19 stages, and the role of these satellite offices are shifting to providing an environment where each and every employee can work in a lively manner. The value created by satellite office communities is being recognized once again.

Some 330,000 employees working at more than 900 companies support the NTT Group worldwide. And each employee has its own household and its own environment. This approach was neither a conventional office, nor is it quite, home. We needed to provide an area suitable for remote work as quickly as possible. To allow each employee to select their own workplace where they could work in the most lively manner, we embarked on a project to open satellite offices for employees of the NTT Group.

The NTT Group owns some 7,000 “office buildings” around the country that are equipped with communications facilities. They are located in many areas around Japan—not only in cities, but also residential areas and almost every other type of area. This project aimed to turn those buildings into suburban satellite offices for use by employees of the NTT Group. Every building that would become a satellite office needed to be planned carefully. The project team aimed to open its first such building in October 2020, around half a year after the state of emergency was declared—the team worked at an unprecedented pace at preparing the buildings, and ended up opening 10 satellite offices during fiscal 2020, and 50 during fiscal 2021. The number of these satellite offices continued to grow throughout the NTT Group, and today around 5,000 employees are registered to use them.





# Maximizing well-being for all

Based on the concept of “Self as We” - moving from a standalone individual toward a community and cultures, the NTT Group is committed to maximizing well-being for all people.

# Maximizing well-being for all

The NTT Group revised its existing Human Rights Charter and established the new NTT Group Human Rights Policy in November 2021 applying business activities internally and externally for addressing international practices. There has been a growing awareness of various issues related to human rights both in Japan and overseas, and the responsibility of companies has become more important than ever. Creating and coexisting with a society that recognizes diverse cultures and understands different values is vital for maximizing well-being. This means understanding and accepting differences, and being inclusive. The key to this approach is taking an altruistic stance. In essence, it is respecting human rights based on the concept of altruistic coexistence (people seek to increase their happiness along with the happiness of others). Adopting this approach will lead to maximizing the well-being of everyone. With this in mind, we aim to ensure that each and every one of our 320,000 employees can perform to the best of their abilities and that no human rights violations occur across the entire value chain. The management team will take the lead in respecting the human rights of all stakeholders, and reviewing and improving our operations whenever necessary, and reflecting them to ensure our business activities fulfill the goal in creating a corporate culture that respects human rights.

Maximizing well-being for all

Today

What should NTT be aiming for?

	Potential Future and Underlying Reasons	Commitments	Action
Respect for human rights	Creating and coexisting with a society that recognizes diverse cultures and understands different values is vital for maximizing well-being. The NTT Group respects the Universal Declaration of Human Rights as well as other internationally recognized initiatives on human rights through its corporate activities, and the NTT Group will pursue ways to respect international human rights principles when there is a conflict between internationally recognized human rights and the laws and regulations of individual countries and regions. Due diligence in human rights will also be conducted throughout the entire value chain, including business partners, to ensure that the NTT Group is fully compliant with human rights best practice at all times.	<b>100% Human rights training and attendance</b> <b>0 Number of confirmed cases of human rights violations</b> <b>100% Ratio of direct dialogue with important suppliers</b> The NTT Group will work toward eradicating human rights violations, while also developing a lively employee-friendly work environment to suit a diverse range of personnel	Compliance with the NTT Group Global Human Rights Policy
			Encouraging society as a whole to respect human rights
Diversity & Inclusion	The NTT Group will work with local communities to promote diversity and inclusion across the entire value chain, which will help create a society that is accepting of even more diverse values where everyone can work while staying true to themselves. To be able to respond to external factors while continuing to create innovation, it is vital that differences and diversity are considered as value, and to transform that value into a viable force.	<b>30% Ratio of women newly promoted to management positions</b> <b>15% Ratio of women in management roles by 2025</b> <b>25-30% Ratio of female directors by 2025 (directors + audit and supervisory board members + executives)</b> <b>30% Ratio of outside personnel by 2023</b> We will create workplaces where a diverse range of employees can achieve their full potential. We will be hiring, training and appointing diverse human resources, building up a better understanding of working with the LGBTQ community, people with disabilities, those undergoing treatment or suffering from disease, and employees using childcare or nursing care services, to promote an inclusive corporate culture.	Promoting recruitment, training, and education of diverse human resources and women's advancement in the workplace
			Encouraging of understanding of LGBTQ and promoting the advancement of people with disabilities
			Supporting a work-life balance that allows for childcare and nursing care
Creating new work style models	We believe that creating a safe and secure workplace, developing employment conditions, and respecting a variety of work styles means a workplace where employees can work energetically in good health, both physically and mentally, so we are implementing initiatives to achieve this. Giving employees a range of options to choose their own working style, working location and career development paths that suit their own particular lifestyles will motivate and invigorate each and lead to the growth of the NTT Group as a whole.	<b>70% Remote work ratio by FY2022</b> <b>Zero Number of accidents causing injury or death during construction work</b> <b>Improvement in employee satisfaction compared to previous year (engagement rate)</b> <b>Zero Amount of paper used by 2025</b> We will be reforming working styles while paying consideration for the health of our employees as well as their families and partners. Increasing the specialization of each employee empowers them to take control of developing their own careers.	Promoting remote work and other workplace models
			Achieving zero fatal accidents as well as maintaining and promoting employee health
			Supporting autonomous capacity development
			Promoting paperless operations

# Feature 3: Promoting Supplier Engagement



## Engaging in direct dialogue

We assess social and environmental risks by conducting the Supply Chain Sustainability Survey to confirm the status of compliance with various guidelines. The survey targets all of the NTT Group's critical suppliers that account for at least 90% of total procurement value, supplier of non-substitutable products and supplier of important products. Based on the results of these surveys, we began supplier engagement activities in fiscal 2021, including direct dialogues with suppliers. The direct dialogue covers subjects such as the environment, information security, and BCP as well as issues related to forced labor and human rights

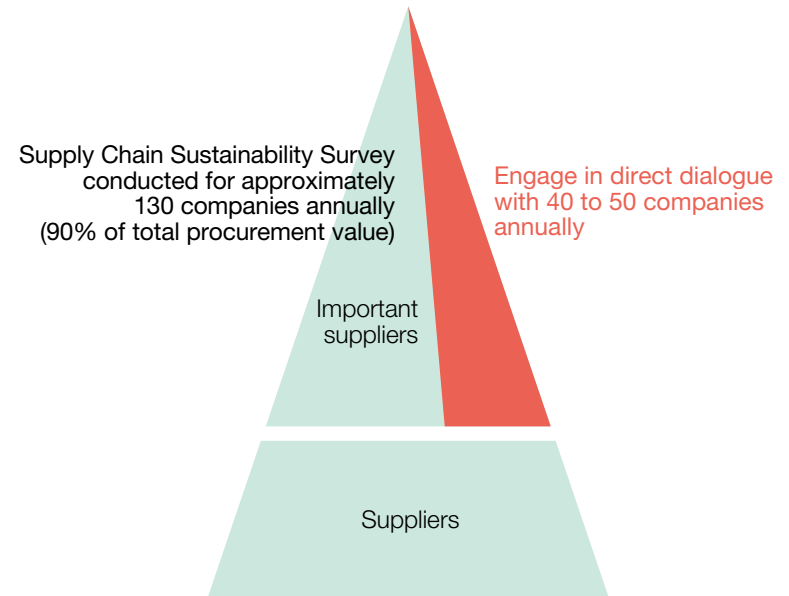
risks. In the dialogue meetings, we exchange opinions with all our suppliers, and check with our suppliers about how they are handling occupational health and safety at the workplace and other factors. With regard to human rights, we will conduct human rights due diligence based on the NTT Group Human Rights Policy that was revised in November 2021, as part of initiatives for correcting violations of forced labor or human rights. We will continue working with high ethical standards together with all of our suppliers and strive toward resolving the various issues related to human rights that exist in various countries and regions.

## Becoming a member of JAC (Joint Alliance for CSR)

In July 2022, NTT became a member of the association of telecom operators, Joint Alliance for CSR (JAC) that involves conducting CSR audits of ICT suppliers around the world. By becoming a member of JAC, NTT will be able to better coordinate efforts with global telecommunications carriers, and exchange intelligence on CSR-related conditions and challenges of each company in the supply chain and the best practices with the other JAC member companies, and thus will be able to promote supplier due diligence on a global level. NTT is the first Asian telecommunications carrier to join the association and will contrib-

ute to realizing a sustainable society by building and maintaining a safe and secure supply chain.

The NTT Group will focus on enhancing CSR throughout the entire supply chain by holding meetings to exchange information with global telecommunications carriers, and by participating in JAC activities such as joint audits as a JAC member. In addition to supplier audits it conducts itself as a JAC member, NTT will continue to hold direct dialogue with all suppliers as part of supplier engagement activities.



# Reinforce Supply Chain Management

## Inclusion of diverse values

### Respect for human rights throughout the entire value chain

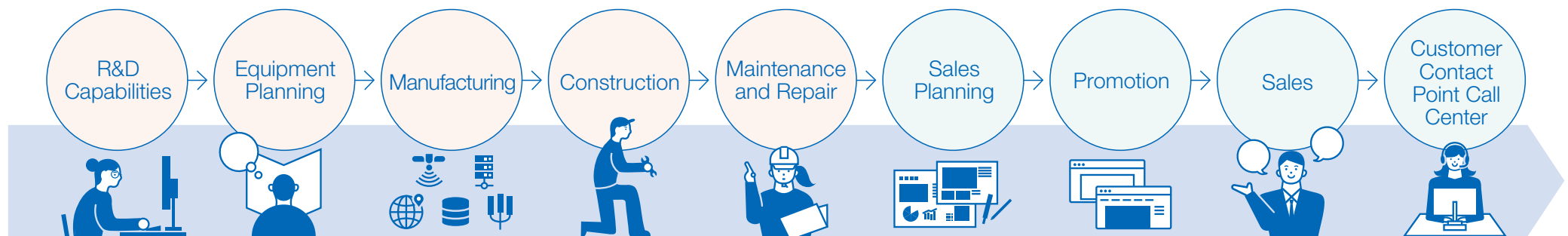
We will strive to build relationships of trust and cooperation with our stakeholders to better understand and respond appropriately from the perspective of those affected by our business.

As the NTT Group handles a wide variety of network and digital services worldwide, ensuring a sustainable value chain has become one of the most critical issues.

Various problems have arisen in the supply chain in recent years, such as long working hours, child labor, illegal dumping of chemical substances, and bribery. Therefore, companies are required to comply with social norms and laws in their procurement activities and fulfill their social responsibilities.

In response to this situation, NTT Group will ask all members of the value chain to comply with respect for human rights in the six areas of human rights and labor, health and safety, environment, fair trade and ethics, quality and safety, and information security, in order to fulfill our social responsibility in our procurement activities.

In the value chain, the NTT Group will identify the existence and risks of human rights violations, such as forced labor, inhumane treatment, child labor, discrimination, and wages below the minimum wage, and work toward eradicating human rights violations.



# Social Challenge

# 7

## Respect for human rights

### Business Activity

- 22. Compliance with the NTT Group Global Human Rights Policy
- 23. Encouraging society as a whole to respect human rights



### Why it matters

Respecting human rights is an important foundation for creating a safe, secure, prosperous and sustainable society, and striving to correctly understand and recognize each country and region's laws, cultures, religions, and values is the social responsibility of companies.

### What can be accomplished

We will respect the Universal Declaration of Human Rights and other internationally recognized human rights in all our corporate activities. We will strive to ensure that we are not directly or indirectly involved in discrimination or other human rights violations.

### Future vision

The NTT Group is making every effort to implement internal training to ensure that there are no violations of human rights. Based on the Guiding Principles on Business and Human Rights, we will use the human rights due diligence process to identify, prevent, mitigate, and correct any human rights issues identified on a global scale, and strive to raise awareness and management of human rights across the Group.

Human rights due diligence will be conducted throughout the entire value chain, including business partners, to ensure that the NTT Group is not indirectly involved in human rights violations.



## Business Activity 22

# Compliance with the NTT Group Global Human Rights Policy

### Our commitment

The NTT Group will work toward eradicating human rights violations, while also developing a lively employee-friendly work environment for a diverse range of personnel

### Our objectives

100%

Human rights training and attendance

0

Number of confirmed cases of human rights violations

### Policies and Concepts

NTT is committed to respecting global human rights and believes it is an important corporate social responsibility. The NTT Group will strive to correctly understand and recognize each country and region's laws, cultures, religions, and values. We aim to create a safe, secure, prosperous and sustainable society by fulfilling this responsibility.

We included parts of NTT Group's existing Human Rights Charter in the NTT Group Global Sustainability Charter, and established the NTT Group Human Rights Policy in November 2021.

The NTT Group discloses its global human rights policies both internally and externally, in addition to meeting the requirements of international laws and evaluation organizations. This policy applies to all employees and officers of the NTT Group. We also ask our suppliers and business partners to support this policy and strive to respect human rights.

### Organization for Implementation

NTT is committed to supporting its Group companies in their efforts to raise awareness on human rights issues. We believe it is important for the entire NTT Group around the world to instill an understanding of respect for human rights and undertake business activities with a full awareness of human rights. Accordingly, NTT has established the Human Rights Committee, headed by a senior executive vice president, under the Executive Officers Meeting. Through this framework, we are working to heighten human rights awareness across the NTT Group and reinforce human rights management, including conducting human rights due diligence, training on human rights issues (training for officers including those at Group companies, training for all employees, etc.), and establishing and operating contact points for human rights.

### NTT Group Global Human Rights Policy Preamble

NTT is committed to respecting global human rights and believes it is an important corporate social responsibility. The NTT Group will strive to correctly understand and recognize each country and region's laws, cultures, religions, and values. We aim to create a safe, secure, prosperous and sustainable society by fulfilling this responsibility.

To this end, we will respect the Universal Declaration of Human Rights and other internationally recognized human rights in all our corporate activities. We will strive to ensure that we are not directly or indirectly involved in discrimination or other human rights violations. We respond appropriately when negative impacts on human rights occur.

When negative impacts on human rights are done by a business partner and are linked to a product or service of the NTT Group, we also expect them to respect human rights and not to infringe on them.

To fulfill this responsibility, senior management will take the initiative to respect all stakeholders' human rights. We will review and improve business operations and other aspects as necessary from the perspective of respecting human rights and reflect this in our business activities to establish a corporate structure that respects human rights.

### Human Rights Committee

Chairperson  
Representative  
Member of the Board

Members  
Heads of  
each organization

Leaders responsible for promoting initiatives /  
General managers of the supervisory  
departments of each organization

Secretariat  
General Affairs Department,  
Sustainability Promotion

Liaison Group  
Human rights officers  
at Group companies

### Group-wide Human Rights Training and Education Programs

To ensure awareness of the need to respect human rights and educate employee on expected global standards at key points in employees' careers (joining the Company, receiving promotions, etc.), we provide training on human rights issues connected to business activities. In addition, for those in the top management positions of Group companies or in other management positions, we offer programs that include lectures by outside experts on global issues in human rights. To foster awareness of human rights among employees, we issue invitations to employees and their families to submit human rights slogans, while the Board member responsible for human rights issues delivers a message to mark Global Human Rights Day.

Since fiscal 2014, the NTT Group has worked to disseminate its Human Rights Policy by sharing the content of e-learning courses with Group companies in Japan and continuously carrying out educational activities during training for all employees as well as on other occasions. During the training, we communicate the importance of respect for human rights and the significance of addressing the issue within the NTT Group.



### Reviewing Our Initiatives with Human Rights Experts Stakeholder Dialogue

#### Outline

In October 2019, we invited four human rights specialists and experts from three overseas organizations and one Japanese organization to share their views on the NTT Group's human rights initiatives. We received advice on the Group's overall initiatives on human rights, human rights in the ICT industry, related challenges, information disclosure, and Group-wide promotion of initiatives.

During the dialogue, the participants exchanged views on a broad range of topics, including the need to address privacy and human rights issues, development of a grievance mechanism and incorporation into the management system, establishment of a human rights management system linked with overseas Group companies, and the need to disclose information on these initiatives. This was our first dialogue with experts on human rights. We renewed our awareness of the importance of promoting human rights initiatives by considering measures in response to this review and by continuously engaging in dialogue with stakeholders as we pursue these issues in the future.

#### Human Rights Specialists and Experts

Verisk Maplecroft	Mr. Gus MacFarlane
World Benchmarking Alliance	Ms. Pauliina Murphy
Corporate Human Rights Benchmark	Ms. Camille Le Pors
Japan Research Institute	Mr. Mitsuo Wakameda

### Preventing Harassment

We are aiming to create a workplace environment in which each and every employee is able to perform to the best of their ability. Instances of harassment at the workplace are viewed as issues related to human rights, and acts that harm the personality or dignity of individual workers are socially unacceptable. Such acts also result in deteriorating workplace relations and adversely affect job performance, and we recognize this as a major issue. In light of this, the NTT Group Global Human Rights Policy was revised in 2021.

The NTT Group is striving to develop a corporate culture where acts of harassment are not allowed to happen and are unacceptable. While various measures have already been put in place, the types and methods of harassment have become increasingly varied in recent years. We will continue to develop a broad range of initiatives regularly toward achieving a goal of eliminating harassment.

More specifically, all employees will be provided with ongoing training in order to increase



awareness for eliminating harassment. We will constantly seek to enhance employees' understanding and knowledge of harassment, and provide ways to learn how to respond to harassment. We will also be taking other measures such as setting up contact points both within the company and externally, revising employment rules to cover the diversifying ranges of harassment, and increasing penalties for those found to be involved in harassment.

We will continue our efforts toward creating a safe and comfortable workplace free of harassment where all employees respect one another, to ensure that each and every person at the NTT Group is able to work in an energetic manner with mutual respect.

### Akira Shimada

President and Chief Executive Officer,  
Representative Member of the Board

## Business Activity 23

# Encouraging society as a whole to respect human rights

### Our commitment

Working to eliminate issues related to human rights in various countries and regions.

### Our objective

100%

Ratio of direct dialogue with important suppliers

### Establishment of the NTT Group Global Human Rights Policy

In its goal of achieving a sustainable world, the NTT Group is shining a spotlight on various human rights themes that exist in various countries and regions, and is highlighting its attitude toward human rights issues in value chains. To this end, we included parts of NTT Group's existing Human Rights Charter in the new NTT Group Sustainability Charter, and established the NTT Group Global Human Rights Policy in November 2021, based on principles like the International Bill of Human Rights (Universal Declaration of Human Rights and International Covenants on Human Rights), Declaration of Fundamental Principles and Rights at Work, and UN Guiding Principles of Business and Human Rights.

Accordingly, an internal due diligence manual was established to ensure that effective due diligence can be conducted as part of efforts to promote respect for human rights.

This human rights policy applies to all people involved in the NTT Group value chain. The NTT Group is committed to respecting human rights throughout its business operations by proactively working with and engaging in constant dialogue with all of its partners and stakeholders, including customers, shareholders, investors, employees, local communities, business partners, other companies and industry organizations, national and local government agencies, and NGOs, NPOs, and experts. We will comply with human rights respectfully throughout our business activities while listening to and responding to changes taking place in society. To ensure that the NTT Group is not complicit in infringing human rights moving forward, we will continue to engage with stakeholders and staff in charge of human rights overseas every year, and we are always revising the human rights policy so that we can respond in the appropriate manner.

NTT Group Global Human Rights Policy

<https://group.ntt/en/newsrelease/2021/11/10/pdf/211110ca.pdf>

### Responding to International Norms

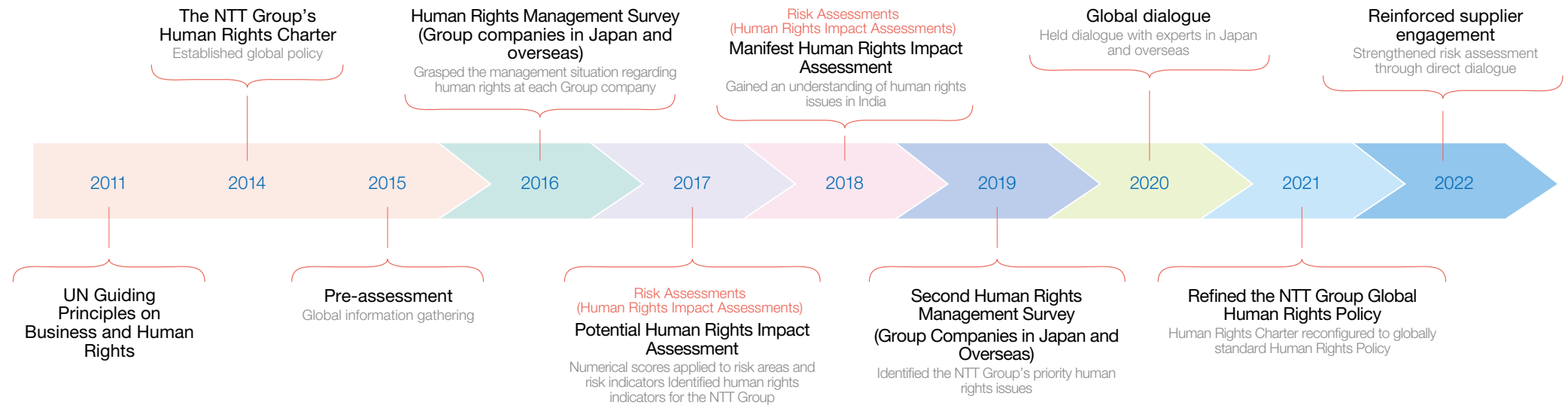
As a company that operates globally, the NTT Group supports the Universal Declaration of Human Rights, adopted as a common standard for all people and countries to achieve. International covenants and conventions are discussed and adopted from a global perspective. The NTT Group will also pursue ways to respect international human rights principles when there is a conflict between internationally recognized human rights and the laws and regulations of individual countries and regions.

Universal Declaration of Human Rights  
International Covenant on Economic, Social and Cultural Rights  
International Covenant on Civil and Political Rights  
Declaration of Fundamental Principles and Rights at Work  
Eight core principles of the International Labour Organization:

- "Forced Labor," "Freedom of Association and Protection of the Right to Organize"
- "Right to Organize and Collective Bargaining"
- "Equal Remuneration"
- "Abolition of Forced Labour"
- "Discrimination (Employment and Occupation)"
- "Minimum Age Convention"
- "Elimination of the Worst Forms of Child Labour"



# Addressing critically important human rights issues



Theme 1

Promotion of “Diversity & Inclusion,” a concept that recognizes diverse cultures and values (Prohibition of discrimination, respect for freedom and rights, fairness in the workplace, economic disparities and poverty)  
Aiming to create new value, NTT Group believes it is essential to respect the diverse values and individuality of its employees in order to address the diversifying needs of its customers.



Theme 3

Promotion of “Healthy work in daily life” (Diverse work styles, prohibition of forced labor and child labor, workplace safety, freedom of association and the right to organize, living wage, enhanced benefits)  
We believe it is important to create safe and secure work environments and promote diverse work styles so that employees can work in physical and mental health with enthusiasm and motivation.



Theme 2

Promotion of “Technology that is based on high ethical standards,” which balances both high ethical standards and technology (Technology, data bias, privacy, personal data protection, and security)  
New technology will be necessary to strike a balance between people and nature. We believe it will therefore be necessary to pursue R&D and the social implementation of technologies while maintaining the highest level of ethics.



Theme 4

Promotion of “Appropriate expression, speech, and display” in consideration of human rights (Freedom of expression and respect for human rights in advertising and other presentations)  
As the Internet becomes more and more widespread, companies are required to be more considerate in their communications than ever before. The NTT Group will take actions that absolutely refrain from discriminatory expressions, speech, and inappropriate displays.

## Risk identification and assessment

At the NTT Group, human rights managers from domestic and overseas companies discuss and select human rights issues to be addressed by NTT and determine priority issues to be addressed each year.

We will also hold dialogue with experts to obtain advice regarding our initiatives.

In our human rights management survey in fiscal 2016 covering all Group companies in Japan and overseas, and based on the Guiding Principles on Business and Human Rights, we checked up on their human rights policy, management systems and priority human rights issues. The results identified priority human rights issues for 250 of the 258 companies surveyed and indicated that 248 companies are working on specific initiatives to raise awareness about these human rights issues.

Since fiscal 2017, we have brought in external specialized institutions to implement risk assessments based on results obtained from in-house surveys. In fiscal 2017, a potential human rights impact assessment was carried out which assigned an evaluative score to the degree of negative impact of the NTT Group's businesses on the human rights of stakeholders from the perspective of "the likelihood of

future human rights risks in each country" and "severity of human rights risks arising in each business." The results of this led to us identifying Asia as a priority area for tackling human rights issues and establishing 21 human rights indicators for ICT business.

In fiscal 2018, a manifest human rights impact assessment was carried out to verify the initiatives implemented in the previous fiscal year. After considering factors such as country risk for each country in Asia and impact on business, India was selected as the country to be assessed. Interviews were conducted with our local subsidiary and a local NGO that deals with human rights risk associated with specific business activities. The results of this confirmed there are currently no serious human rights issues that present a major risk to business operations. Meanwhile we identified priority issues out of the 21 human rights indicators that should be addressed in India in the future.

In fiscal 2019, we conducted a second human rights management survey following the first one in fiscal 2016 to confirm the management status of human rights contact points at each company and to set the NTT Group's

human rights priorities. The survey was conducted targeting the NTT Group and our supply chain regarding the following items.

As a result, we identified "women's rights," "privacy rights," "working hours," "occupational health and safety" and "the right to organize and collective bargaining" as our top five issues and became aware of the urgent need to reconfigure management to address global human rights issues. We also held a stakeholder dialogue involving five experts from three overseas organizations (Verisk Maplecroft, World Benchmarking Alliance and Corporate Human Rights Benchmark) and one Japanese organization (Japan Research Institute) with the head of the Human Rights Office. And we received advice on the NTT Group's overall human rights initiatives, human rights in the ICT industry, related challenges, information disclosure and Group-wide promotion of initiatives.

In fiscal 2020, we held an in-house lecture for each issue with external experts from the organization, BSR. We held these lectures with the aim of fostering an understanding of the priority human rights issues we face as a united NTT Group company, including our

global operations, and we also considered the reporting efforts of each company within the group. This dialog was conducted several times. We also researched the human rights management content required of us as a global ICT company, and worked with staff in charge of human rights including at global group companies to focus on particularly important issues and select four themes.

In fiscal 2021, we will continued to hold dialogues with each company in Japan and overseas to determine specific courses of action, and also establish a global standard for human rights policy.

The entire Group also focused efforts on holding direct dialogue with 40 important suppliers in particular. In addition to risk assessments conducted through direct dialogue, we recognized the need to cooperate with suppliers to implement corrective measures.

From fiscal 2022, further efforts will be made to increase supplier engagement, with steps like becoming a member of JAC (Joint Alliance for CSR) and utilizing external audits like Eco Vadis.

## Promotion of “Diversity & Inclusion”

### “D&I Statement”

The NTT Group has established the D&I Statement as a means of promoting Diversity Equity & Inclusion. We will be promoting D&I in line with this statement.

Details ▶P140



## Our Diversity & Inclusion

We aim to achieve sustainable growth by recognizing our differences as valuable strengths for our business.

Our society is constantly changing. We will continue to experience events globally that have an impact on our employees and the clients and communities we serve. NTT will continue to evolve its focus and programs to sustain a commitment to diversity and an inclusive culture at NTT.

### Our commitments:

- We will create work environments:
  - where all of us have equal opportunities
  - where all of us feel encouraged to take on challenges without fear of failure
  - where all of us feel included and engaged

Regardless of ethnicity, race, nationality, origin, class, religion, belief, language, culture, gender, sexual orientation, gender identity, age, disability, disease/health status, appearance, values, family status, lifestyle, or any other social or personal characteristics.

- With social responsibility in mind, we contribute to create a more diverse, inclusive and sustainable society through connecting precious resources such as people, the environment, and culture to the future.

Promotion of “Technology that is based on high ethical standards,” which addresses both high ethical standards and technology

The NTT Group views the appropriate use of technology as a valuable way to support the future development of life, society, and the universe as a whole.

The development of technology increases the diversity and immediacy of communications, making things more efficient, and creating a safer, more comfortable lifestyle—all for a better future.

Until now, NTT has rolled out communications services and communications infrastructure on a global scale as a universal service based on its mission from both a public utility and a corporate viewpoint.

In addition to employing high ethical standards for advancing the use of technology, the norms of countries, regions and communities need to be respected for fair

and appropriate implementation as well as to ensure the technology can continue to be provided for future generations.

We believe that human autonomy should be applied when seeking ways to adopt artificial intelligence(AI). The operational results of AI systems may contain bias depending on the characteristics of the data and algorithms being used. Efforts are being made to better understand those characteristics so that there are no undesirable consequences like prejudices held by people making use of AI, and we are advancing research and development to increase transparency when AI is being used.

We will continue to promote technology based on constant dialogue with all members of society and high ethical standards to ensure the development of trusted technology into the future.

### Our Approach to the Use and R&D of AI

AI has been rapidly penetrating society through technological innovations such as deep learning, and it is solving everyday problems of various scales without full human awareness or understanding.

However, there have been fears that the use of AI could lead to unintended discrimination and unjustified restrictions or inducements to action. In addition, most of the long-term consequences and impact of AI behaviors still remains unknown, thus raising both expectations and anxiety. In order to answer these concerns and to embed AI more deeply and successfully into society, the NTT Group, as well as its employees and engineers (hereafter “we”), need basic principles in our approach to AI, which we should constantly be aware of and keep in mind, as a company involved in the use and R&D of AI. Accordingly, NTT’s research centers recognize six principles for using and developing AI.

- Enabling Sustainable Development
- Human Autonomy
- Ensuring Fairness and Openness
- Security
- Privacy
- Communication & Co-creation with Society

Details  
<https://www.rd.ntt/e/ai/0005.html>

#### Business Activity



itelligence AG

itelligence AG develops and supplies AI tools to assist with conversations between children and counselors, when Danish child protection organization “Children’s Welfare” provides counseling to children in need. This tool draws on various functions to assist the counselor based on the topics of conversations, including guidance, advice while talking, and providing useful reference information. After the conversation, the tool can also be used to provide a statistical insight of the topics covered.

### Healthy work in daily life (health management)

The NTT Group is promoting “Healthy work in daily life” for working close to home.

A diverse range of working styles is vital to ensure that a diverse range of personnel are able to harness their full potential. The NTT Group is home to diversity that cannot be defined by any single characteristic alone. As employees are drawn from an increasingly diverse pool, being accepting of others, building a relationship of trust and working together to achieve a common goal is vital in order to maintain ongoing growth of the company.

Transforming work styles helps to boost each individual employee’s capabilities and provides for greater opportunities. To achieve this, we believe it is important to create a safe and secure workplace, and promote a variety of work styles suited to a diverse range of lifestyles

and life events. Different to “work-life balance” that aims to separate and create a balance between work and private life, work-in-life is a concept where employees can select and design their own work style by viewing work as part of the lifestyle of each and every employee. As we work toward maximizing well-being for all, NTT will be implementing a concept of work-in-life (healthy work in daily life) by creating workplaces where employees can work energetically in good health.

Details ▶ P149



### Promotion of “Appropriate expression, speech, and display” in consideration of human rights

As the Internet becomes more and more widespread, the negative impact of harmful websites and slanderous content on social media targeting on young people is becoming a societal problem. One aspect of communications technology like social media is that it leads to platforms created solely based on individual’s preferences or sense of values. In this context, companies are required to be more considered in their communications than ever before. The General Manager of the Sustainability Promotion Office concurrently serves as the Chief Privacy Officer (CPO) and acts as a contact point for complaints of privacy violations in the company.

### Specific Initiatives

DOCOMO gives careful consideration to protecting the freedom of expression and privacy rights of people communicating via the Internet, social media and digital communication devices, which are ICT industry specific issues that have been gaining more recognition by most telecommunications carriers in Europe and the U.S. With reference to the Principles of Freedom of Expression and Privacy established in 2013 by the Global Network Initiative, a global network of telecommunications companies, we take a stance to fulfill our own responsibility to respect and protect the freedom of expression and privacy of our users. This includes protecting the globally recognized rights of our users, even in situations where we need to provide customer information under special circumstances, such as a matter of national security requested by the government.

### Business Activity



#### NTT Communications

Beat COVID-19! “Manabi Pocket” so that children can continue learning whenever and wherever they desire

In February 2020, Japanese prime minister requested all schools around Japan to temporarily shut down as a way of curbing the spread of the novel coronavirus. In light of this, NTT Communications partnered with the company that developed the “Manabi Pocket” cloud-based educational platform to offer Manabi Pocket content in 11 fields of study free of charge, as its unique way of helping children in Japan to continue learning. Creating a platform that can be used by children and students during school closures provides them with learning opportunities and helps to develop a digital approach to education in the future.



### Penetration into the business

We make improvements aimed at stopping, preventing or reducing any negative effects related to human rights. We also establish common global targets for human rights issues to be addressed and promote their adoption with the NTT Group business operations.

We continued to hold dialogue with group companies in Japan through fiscal 2021, and after reassessing the situation, established globally standard targets for the way our management needs to be enhanced. We also created internal guidelines for human rights due diligence, which serve to foster a common understanding as well as outline the appropriate procedures to take.

### Confirmation of viability and effectiveness

To confirm the viability and effectiveness of the measures and check progress, performance targets (KPI) have been set and will be followed up. This process will be held regularly, with sustainability liaison meetings held to check progress of viability and effectiveness.

### Disclosure and evaluation

The Sustainability Committee and global conferences are held once a year to share progress and results around the world.

The details of due diligence are disclosed in “Human Rights Reports” together with reports of activities.

The NTT Group also endeavors to broadly communicate its “Business and Human Rights” initiatives. In fiscal 2019, we shared an overview of the business and human rights activities of the NTT Group at an international conference hosted by the Caux Round Table Japan. We also reported on the results of human rights due diligence and risk assessment conducted from 2017 to 2018 as well as on how these processes are being applied across Group companies. Moreover, we expressed our intention to continue assessing risks, bolster educational programs on business and human rights, and establish an effective management system. The conference was attended by 97 people from 54 companies and 8 organizations, including companies, NGOs, NPOs, and universities.

### Dialogue with third parties

In each process, when risks are discovered, we will hold dialogues with experts and other third parties and work with everyone in the value chain to make improvements to finding a broad and fair solution.

Even now we seek advice from outside experts and other specialists to discuss our Human Rights Policy and measures related to human rights.

### Suspension of transactions

As a result of due diligence, if forced labor, inhumane treatment, child labor, discrimination, or wages below the minimum wage are recognized, we will consider suspending transactions as a viable option, after first making improvements together with everyone in the value chain. The entire NTT Group is working toward creating a better future by cooperating with partners to resolve issues related to human rights. In addition to the Human Rights Policy, we will also require third parties to comply with the “NTT Group Supply Chain Promotion Guidelines” provided separately.

### Accusation and Remedy

In an effort to ensure awareness and prevent recurrence, we have set up a Corporate Ethics Action Q&A section on our employee-oriented corporate website to explain nine representative examples of ethics violations. Each example action is described and laws and regulations that are the basis of reasoning are explained. When the NTT Group has taken disciplinary action related to human rights, we publish excerpts of the cases and expound the cases on the site to raise employee awareness and prevent recurrence by calling for their attention and organizing training and other educational opportunities.

### Contact Point for Human Rights Issues

The NTT Group provides internal and external contact points that employees can consult on various concerns related to human rights.

One of these, the Corporate Ethics Help Line, is an external consultation desk outsourced to a law firm that responds to consultation by third parties or by employees, on a confidential basis, for situations that cannot be reported internally. Consultations are accepted in various forms, including email, telephone and letter. All consultations are kept confidential to protect the privacy of the person and ensure they are not subjected to disadvantageous treatment.

The contact point also handles consultations on compliance issues. Please see page 64 for details.

## Other Human Rights Initiatives

### Introduction of B-BBEE

South Africa, where Dimension Data, a subsidiary of NTT, is headquartered, adopts the Broad-Based Black Economic Empowerment (B-BBEE) policy to enhance the status of people who had been disadvantaged by discriminatory treatment during the apartheid era. Under B-BBEE, which the Government of South Africa uses as an assessment standard, companies are rated on a scorecard for their level of contribution to ownership, management, employment equity, skills development, preferential procurement, enterprise development, and socio-economic development. As a result of its efforts in the areas of ownership, employment equity and skills development, Dimension Data was recognized as a Level 2 contributor in March 2020, the second highest recognition in the eight level B-BBEE system, two ranks higher than the previous year.

### Assessment of Risks Associated with Conflict Minerals

In accordance with the NTT Group's Approach to Conflict Minerals, we conducted written surveys and inspected the offices and factories of suppliers to determine whether or not these minerals are used in their products.

### Initiatives to Address Gender Pay Gap

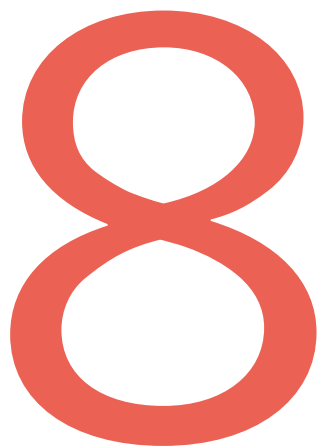
NTT Security (UK) Limited, which serves customers around the world by providing total solutions incorporating advanced technologies and services related to security, has been publishing a gender pay gap report since 2017. NTT Security discloses the gender gap in its hourly wages and bonus payments to employees in response to the Equality Act 2010 (Gender Pay Gap Information) Regulations 2017 enacted by the British government in 2017.

Embracing Gender Pay Gap Reporting  
<https://services.global.ntt/en-us/legal/-/media/ntt/global/legal/united-kingdom/ntt-gender-pay-gap-report.pdf?rev=407bf504450f4774bbe94b8183f27729&hash=44F2B16C4079E43B97C01494E0459737>

### Modern Slavery Act Statement

NTT Group companies have published their statements in accordance with Article 54, Item 1 of the Modern Slavery Act 2015 enacted in the United Kingdom. With the "Modern Slavery Statement," companies set out their actions to ensure that slavery and human trafficking are not taking place in their business operations or in their supply chain.

## Social Challenge



# Diversity & Inclusion

### Business Activity

- 24. Promoting recruitment, training, and education of diverse human resources and women's advancement in the workplace
- 25. Encouraging of understanding of LGBTQ and promoting the advancement of disabled people
- 26. Support for balancing work and life such as childcare and nursing care



### Why it matters

The NTT Group is promoting Diversity & Inclusion with the aim of achieving ongoing growth and developing a sustainable society.

To be able to respond to changes in external factors in a flexible manner and continue creating innovation, we consider it essential to shift from a homogenous organization to one where a diverse range of personnel are able harness their full potential. Improving the well-being of employees, providing fair opportunities, and creating an environment where a diverse range of personnel are able to harness their full potential are seen as a way of helping to achieve work-in-life and a sustainable society.

### What can be accomplished

To improve well-being, achieve healthy workstyle and develop a sustainable society, we will be creating workplaces where a diverse range of employees can work energetically in good health while staying true to themselves. We will be focusing even more on hiring, training and appointing diverse human resources, building up a better understanding of working with LGBTQ people and those with disabilities, those undergoing treatment or suffering from diseases, developing an inclusive corporate culture, and creating a flexible and work style.

### Future vision

The NTT Group will continue promoting diversity, equity and inclusion, not just toward customers but throughout the entire value chain, and encouraging local communities to do the same will help create a society that is accepting of even more diverse values where everyone can work while staying true to themselves.



## Business Activity 24

# Promoting recruitment, training, and education of diverse human resources and women's advancement in the workplace

### Our commitment

We will create workplaces where a diverse range of employees can achieve their full potential. Increasing opportunities for people from diverse backgrounds leads to greater personal growth and better well-being of each individual.

### Our objectives

**30%**

Ratio of women newly promoted to management positions

**15%**

Ratio of women in management roles by 2025

**25–30%**

Ratio of female directors by 2025 (directors + audit and supervisory board members + senior vice presidents)

**30%**

Ratio of outside personnel by 2023

### The Fundamental Principle

As a global ICT group company, the NTT Group must create innovation to breed new value and address the needs of various users around the world. To respond to dramatic changes in the markets and meet diversifying customer needs, as well as to become a consistently selected "Your Value Partner", we believe that respecting and making use of the individuality of employees and their differing values is essential.

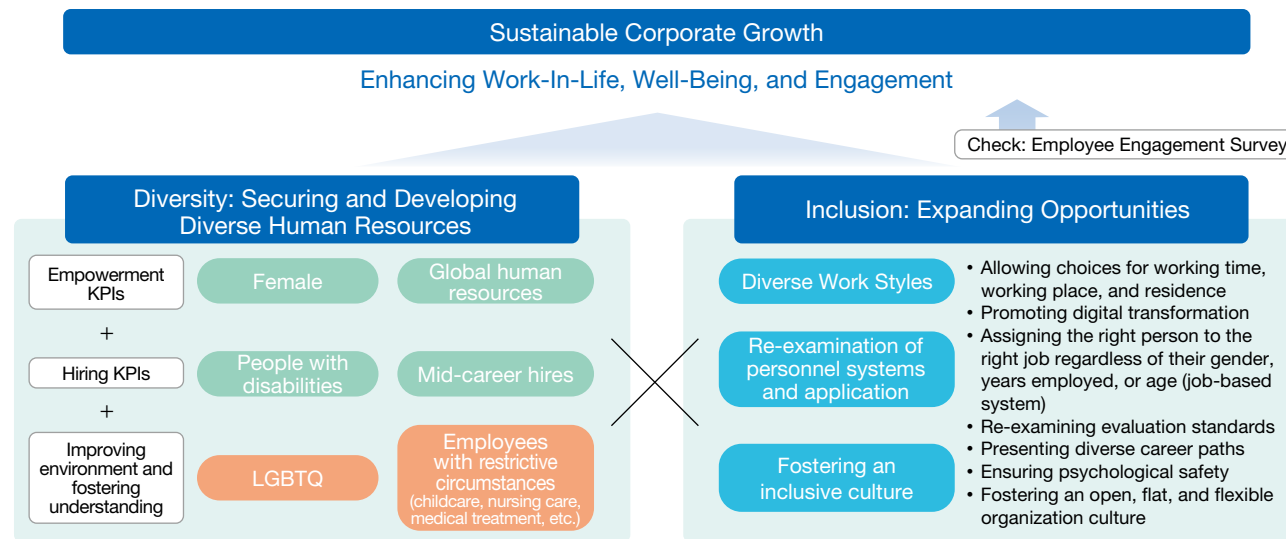
A diverse range of work styles will lead to diversity in human resources, and that expand opportunities for diverse human resources leads to personal growth and the realization of well-being of each individual.

### Organization for Implementation

The NTT Group has positioned diversity and inclusion as an important management strategy and the president himself is communicating inside and outside the Group the importance of accepting a diverse range of values. We are working to implement initiatives aiming for diversity and inclusion companywide. In 2007, NTT established the Diversity Management Office to bolster efforts to create an environment which enables participation by diverse human resources across the whole Group, and by April 2008, diversity promotion supervisors were in place in Group companies. The Diversity Management Office and diversity promotion supervisors continue to cooperate to promote diversity,

equity and inclusion, to achieve Healthy work in daily life (health management) and career development, and to conduct educational activities aimed at reforming corporate culture and ingrained practices. We regularly hold diversity promotion meetings with each Group company to share their activities and discuss future diversity promotion measures for the Group based on female employee ratios by position, the status of hiring people with disabilities, and other diversity management parameters. Also, management meetings attended by directors are held when necessary to report on and discuss diversity-related initiatives, which are then promoted companywide.

### NTT's D&I for achieving a sustainable society



### New Targets for Empowering Women

The NTT Group provides appropriate compensation to all employees, regardless of gender, adopting equal payment as stipulated in the Equal Employment Opportunity Law, and works Group-wide to promote women's active participation at the workplace.

In 2021, we set a new target of 25–30% for the ratio of women in director positions by fiscal 2025, in order to incorporate diverse opinions in decision-making settings. We also see the need for expanding the pipeline of female candidates in order to continue reflecting diverse opinions in decision-making, and thus set a target of 30% for the ratio of new female managers appointed. In light of this, we raised our target for the percentage of women in manager and director positions from the existing 10% to 15% by fiscal 2025.

Ever since fiscal 2013 when we set a target of 30% or higher for the percentage of women in new hires straight out of college, we have achieved at least 30% every year.

### Empowerment of Women in the Workforce

The NTT Group is stepping up initiatives to empower or prepare more female employees for decision-making management positions and positions for providing guidance.

#### All female employees

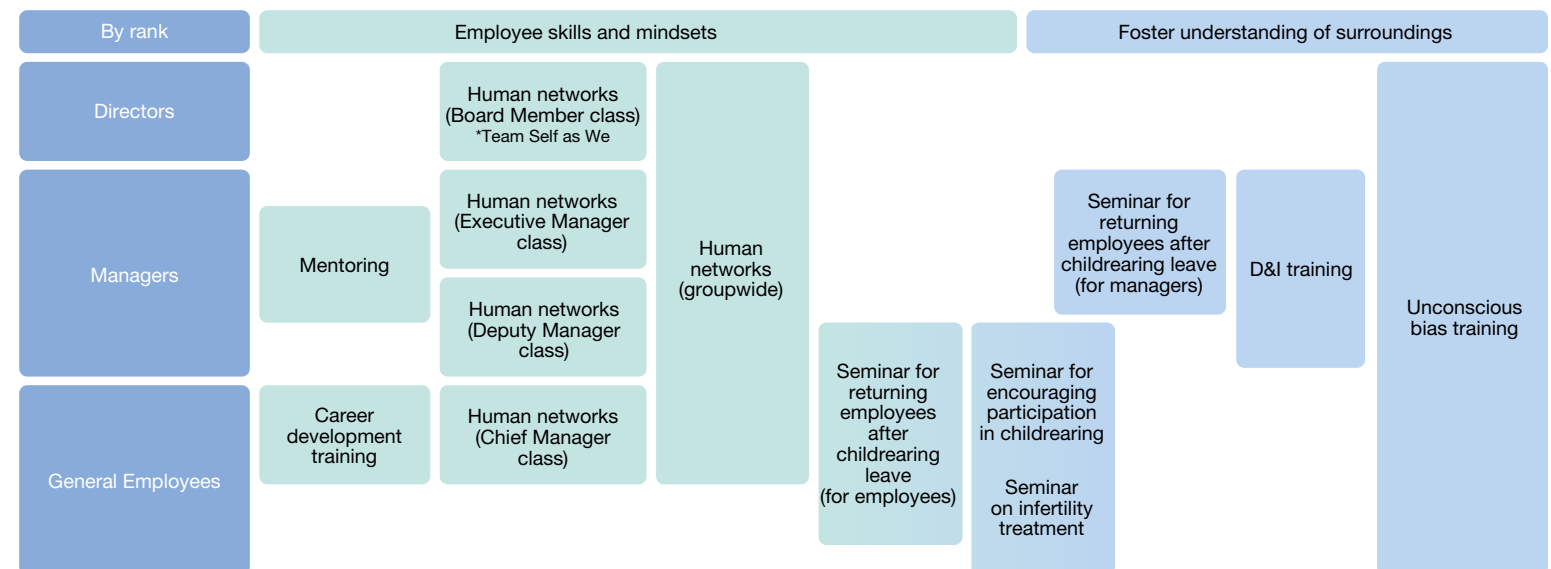
The NTT Group provides a human networking program for strengthening vertical and horizontal connections for women within the Group. On top of management levels (such as executives, senior managers and managers), training is provided across all positions and ranks. In addition to off-the-job training, we provide on-the-job training, including putting employees in tough assignments, with the intention of training women with the skills, mindsets and experiences necessary for promotions. NTT University has been established for the purpose of preparing candidates for upper management positions within NTT Group, and it aims to have at least 30% women in the program.

#### Female employees interested in management positions

Career development training programs for women are provided throughout the NTT Group, and we also run programs for building up necessary leadership skills and awareness through dialogues with upper management and exchanges with other companies. Employees are also encouraged to take part in external training programs where they can interact with members from outside the NTT Group.

#### Managers

NTT University was inaugurated in fiscal 2022 for the purpose of grooming candidates for upper management positions within NTT Group. The goal has been set to ensure a women participation in the program of 30% or higher as part of efforts to expand training opportunities.



### Initiatives for International Women's Day

On the occasion of International Women's Day on March 8, we held a seminar for initiatives for balancing work with health risks unique to women. Seminars involved talks by gynecologists and industrial counselors aimed at having employees learn about gynecological symptoms such as infertility treatment, breast cancer, PMS, and menopausal disorders and their treatment, as well as alleviating concerns about balancing treatment and work.

### Signing statement of support for the Women's Empowerment Principles and joining the 30% Club

The NTT Group endorses the goals of the Women's Empowerment Principles (WEPs), which establish action principles for actively supporting the advancement of women in the workplace for fiscal year 2022, and has signed a statement in which it pledges to act in accordance with these principles. In addition, in an effort to achieve sustainable growth for the company, the Group joined the 30% Club, which aims to increase the percentage of female directors.



In support of

### WOMEN'S EMPOWERMENT PRINCIPLES

Established by UN Women and the UN Global Compact Office

### Active Promotion of Outside Personnel

The NTT Group hires outside personnel (mid-career hires) in order to incorporate diverse opinions in business operations, with the ratio at the six major domestic Group companies at 30% in fiscal 2023. We will continue to hire outside personnel in order to have diverse personnel on staff, and aim for a 32.5% ratio of mid-career hires by fiscal 2021.

### Continuous Employment of Employees at Retirement Age

In 1999, the NTT Group introduced a continuous employment program for employees who have reached the retirement age of 60 in response to employee needs and public expectations regarding elderly employment. Furthermore, from the standpoint of making maximum use of limited human resources in managing the NTT Group's businesses in the future, we introduced a new program in October 2013 that will enable applicants to continue working in a way that fits their lifestyles up to the age of 65 and demonstrate their abilities by putting their experience to work.

### Rehiring Program for Employees Who Resigned

A significant number of employees who left the Company for reasons such as childcare, care for parents or the relocation of their spouse aspire to resume work at the NTT Group in the future. To respond to their requests and to effectively use the experience and skills they had acquired during their previous period of employment, NTT has established a rehiring program.

The program applies to employees who worked more than three years and were forced to leave due to their need to care for children under the age of the third grade of elementary school or elderly family members, or due to their inability to continue commuting because of the change of address necessitated by the relocation or career change of their partner, or by marriage. A request for reinstatement is followed by interviews and a health checkup, and the Company decides whether or not to reemploy them.

Ratio of Women at the Group's Six Main Domestic Companies\*1

		FY2019		FY2020		FY2021		FY2022		New Target
Directors*2	Ratio	7.1%	↗	10.6%	↗	11.4%	↗	17.7%		25–30% FY2025
		(11)		(17)		(20)		(32)		
	Manager Ratio	6.7%	↗	7.3%	↗	8.7%		—		15% FY2025
		(1,378)		(1,506)		(1,830)		—		
	New Manager Appointment	—		—		29.1%		—		30% FY2021
						(418)				
General Employees	Ratio	21.9%	↗	22.7%	↗	23.0%		—		—
		(10,867)		(11,166)		(11,436)				

\*1 Six major domestic companies (NTT, NTT DOCOMO, NTT East, NTT West, NTT Communications, NTT DATA)

\*2 Directors refer to Board Members, Audit & Supervisory Board Members, and Senior Vice Presidents

## Business Activity 25

# Encouraging of understanding of LGBTQ and promoting the advancement of disabled people

### Our commitment

Diverse values and individualities are part of NTT's strengths, and we are creating workplaces that are welcoming of each and every person as they are, allowing them to share equal opportunities, take on challenges without being afraid of mistakes, and achieve mutual growth

### Our objective

2.3%

Ratio of employees with disabilities

### Promotion of Global Diversity

Each year, we conduct Group training for senior managers of NTT Group in Japan and overseas, called Global Leadership Development Program Leadership Excellence and Accelerating Diversity (GLDP LEAD). This training is designed to foster leadership among managers aiming to move to higher positions. This training, in which more than half of the participants are female, emphasizes diversity and innovative culture as organizational capabilities of topmost importance. In fiscal 2021, 42 employees from nine countries underwent this training in an online format.

Scenes from GLDP LEAD



### Outside Interaction and External Certifications

The NTT Group took part in TOKYO RAINBOW PRIDE, and also became a sponsor of Pride House Tokyo, the first permanent center for LGBTQ in Japan.

A total of 21 NTT Group companies were recognized at the highest-level Gold status in PRIDE Index 2021, established by a volunteer organization called "work with Pride" to evaluate corporate activities for sexual minorities and the LGBT community. NTT has received the Gold ranking for six consecutive years since 2016.

### Initiatives for LGBTQ

#### Enhanced Systems and Welfare

To realize an organization and a society in which everyone can be themselves and work freely regardless of sexual orientation or gender identity, in 2016 we began applying programs related to important life events, such as marriage leaves, bereavement leaves, congratulatory/condolence money, and the sending of congratulatory/condolence telegrams, to same sex partnerships. In 2018, we extended all allowances, benefit programs, and other programs involving spouses and families to same-sex partners as well.

#### Initiatives for Encouraging Understanding

We run training every year by LGBTQ people, to deepen understanding and provide the correct knowledge of LGBTQ issues for staff newly promoted to management positions. We also hold ALLY meetings regularly in a show of support for LGBTQ. In fiscal 2021, ALLY meetings were held two times and included talks by LGBTQ people and group discussions, with around 130 employees from the NTT Group taking part.



### Expanding Employment Opportunities for People with Disabilities

In addition to direct hires, the NTT Group provides more employment opportunities for people who have disabilities. The NTT Group currently employs around 3,700 people with disabilities, with 980 of them working at a special-purpose subsidiary.

Four special-purpose subsidiaries have been established by the NTT Group to provide workplaces that are easy to work at for people with disabilities, as part of measures that enable employees with disabilities to harness their skills and perform at their maximum level.

They assess problem areas in website accessibility, perform web accessibility diagnostics that offer reports with suggestions for improvements, and conduct training taught by people with disabilities to foster understanding of disabilities (barrier-free mindset seminars).

#### NTT Group's special-purpose subsidiaries (4 companies)

- NTT Claruty (Japanese only)  
<https://www.ntt-claruty.co.jp/>
- NTT West Lucent (Japanese only)  
<https://nttwest-lucent.co.jp/>
- NTT DATA DAICHI (Japanese only)  
<https://www.nttdata-daichi.co.jp/>
- Docomo PlusHearty (Japanese only)  
<http://www.docomo-plushearty.com/>

### Business Partnership with OryLab Inc.

In July 2020, NTT began providing reception desk duties using OriHime-D, a robot that can be controlled remotely by people with disabilities. NTT entered into a capital and business tie-up with OryLab Inc. in October 2020, for the purpose of strengthening its business responsiveness in remote environments while advancing the interests of people with disabilities. Through this partnership, NTT Group's R&D capabilities are combined with the advanced product development capability of OryLab, such as OriHime, a robot that can be controlled remotely by people who have disabilities. We aim to provide employment opportunities and broader access to people with physical disabilities or find it difficult to go outdoors through this effort to connect remotely to the world.

### Use of OriHime Remote-Controlled Robot

The NTT Group is using OriHime in a variety of scenarios.

#### Sports

Joint experiment with E Cheer Up!, a project for ICT x sports x regional co-creation

#### Culture

Collaborative agreement with a Kyogen troupe about making DX a reality (Nomura Mansai II (Mansaku no Kai))

#### Education

OriHime and NTT R&D offer well-being classes at elementary schools

#### Research

At robot café DAWN, conduct experiments with remote robot control based on based on IOWN

### Promoting the advancement of disabled people with VR space platforms, and use of avatar AI

NTT began guidance services in February 2022 with avatars using the VR spatial platform "DOOR™". In this initiative, "OriHime-D" avatar robots controlled by people who find it difficult to go outdoors provide visitors to DOOR with guidance on DOOR content and information on how to use the service. Automated responses by AI avatars developed by the NTT Group based on NTT R&D technology started to be used at the DOOR virtual salon. Visitors to virtual salons within DOOR are automatically provided with information such as available content.

Through this initiative, NTT is helping to expand the scope of areas where people who find it difficult to go outdoors can play an active role, and is creating added value through the use of AI avatars in virtual spaces.

### Global Commitment

In December 2019 we joined The Valuable 500, an international initiative to promote the participation of people with disabilities in business. In December 2020, applicable regions were expanded to a global scale.





**Yuko Ito**  
OriHime-D Pilot

## Interview

OriHime-D's forte is that it can link up more people, instead of being limited to specific people.

With motivation and skill, the potential for work is available to anyone

Looking forward to continuing work as a pilot, overflowing with gratitude to those nearby. We spoke with OriHime-D pilot Yuko Ito to find out more.

A member of the Sales Department, NTT Claruty, residing in Aichi Prefecture. Joined NTT Claruty in 2020 by winning the company's favor of her experience as a pilot for the DAWN Cafe demonstration project run by OryLab in 2017. She currently works as an OriHime-D pilot at the NTT head office reception.

### A pilot's mission is to alleviate any nervous feelings customers may have

— Tell us about how you became an OriHime-D pilot. I injured my spinal cord in a traffic accident, and from then on had to live life in a wheelchair. I then got married and had children, but after they entered high school and college, I started thinking about re-entering the workforce. It was around that time that I heard about OriHime-D, and began to think whether I would be able to work catering at a cafe—a job that is almost impossible to do in a wheelchair. So I signed up for the "Avatar Robot Cafe DAWN" demonstration project in 2017, and took part as a pilot.

When I started using OriHime-D to attend to and serve customers, I felt just how much fun and meaningful it was to me to be able to chat with customers at their table and spend time with others in society. OryLab then introduced me to a position working at the NTT head office as reception, and I started a trial job in February 2020. The customers are different to a cafe, and everyone is there for business, and I was surprised at the level of nervousness at the reception of a major company.

— What were your impressions after actually becoming a pilot?

I feel that my role as a pilot is to help alleviate any stress that customers may be feeling before they come to attend a meeting—a sort of icebreaker in a way. While customers are naturally focused on their

work duties first and foremost, I try to focus on ways I can hopefully give customers a smile, by changing the way my information is shown (like introducing myself as the pilot of OriHime-D) to suit the seasons, creating English versions, or reading books on conversation skills so I can make use of it. My current job role mainly involves controlling OriHime-D remotely to guide customers from the reception to their meeting room or guest area at the NTT head office. Other business related tasks include creating job reports or performance graphs, and following up with or assisting other pilots—I do all of this remotely from my home in Aichi Prefecture.

### Befriending colleagues while working together

— What are some of the things you enjoy, and find challenging, as a pilot?

Just recently I was appointed the role of chief pilot. Despite working from home, I am grateful for being recognized for the efforts I put in, and it is an achievement I am proud of. And when customers tell me with a smile that their meeting showed promise or express their appreciation to me, I end up smiling myself and feel how rewarding my job is. Yet I need the cooperation of my entire family while I am working—my husband and children have to turn the TV off and they are careful to be quiet. Even our dogs stay quiet while I have my computer open, but the moment I close the lid they come running over wagging their tails wildly. I am particularly

grateful to my mother, who understands my type of work and helps out as much as possible.

On the technical side, a hotline to contact the OSC (Office Service Center) from the NTT Diversity Management Office was set up, and they are standing by to ensure smooth operations when there are technical troubles. I really enjoy working with everyone at the OSC, reception and security, as sometimes we face challenges together, and at others, we all have a laugh together. In other areas, five of my colleagues from NTT Claruty help out as support pilots as a backup if I am feeling unwell, and they are so important to me that I consider them friends. I hope to meet up with them directly and have a chat with them some day.

— Is there anything you often think of that you wish OriHime could be capable of?

I used to work at an intensive-care old people's home in the past, and based on my experience, I think that OriHime would be a great conversation partner for the elderly or people with disabilities. In the past, I also visited junior-high schools, high schools and special needs schools around Aichi Prefecture with OriHime pamphlets to explain to school staff how the system can be used by students with injuries, who have illnesses or disabilities, who refuse to go to school, or who have other special circumstances, as a way of allowing them to attend classes. I heard that projects have begun recently throughout Aichi to provide OriHime to



help such students take part in classes. In my experience, I think the best application of OriHime would be if it could be used for classroom visitation days. As children advance through school, classrooms tend to be further upstairs in buildings, and in many cases I had to give up attending the visitation day. Some day in the future, I would love to take part in my grandchildren's visitations days using OriHime (laughing).

I can let my imagination go wild—some future ideas that are still in the concept stages include flying through the sky in an OriHime drone, dancing with celebrities with OriHime, and even having OriHime manzai comedians entering into the M-1 Grand Prix competition. So...I am currently looking for someone to join me as a partner in stand-up comedy (laughing).

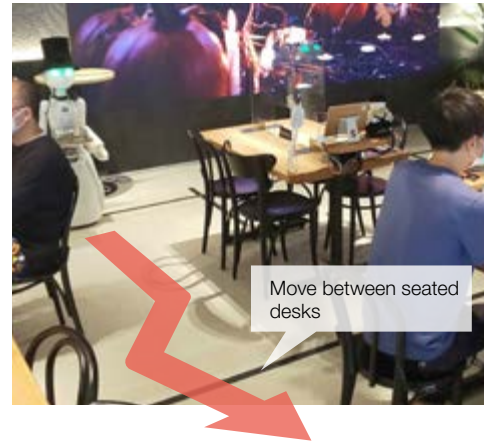
Despite being classed as a type of remote work, the forte of OriHime is that it provides a way of linking up with so many other people—this approach differs to video phone calls or remote conferences where you only talk to specific people on the other end. I also want to directly meet up with the people that I have interacted with using OriHime, and even want to head out to venues to do so—in a way, OriHime inspires me to venture outside. As a "lifestyle technology" for people with severe disabilities, those who find it difficult to go outside, and the elderly, I hope that OriHime will provide a way for meaningful employment in the future, to anyone who has the motivation and skills.

### Demonstration experiment using IOWN technology

We built a network for demonstration experiments between the Musashino R&D Center and the Avatar Robot Cafe DAWN ver.β. With the cooperation of NTT Claruty, we conducted experiments in which people with disabilities operated the avatar robot OriHime-D, and performed service work at the cafe.

OriHime-D used a demonstration experiment network (demonstration experiment OriHime-D) to allow the operator to control the robot in real time, enabling it to move forward and change direction continuously and very smoothly.

Route traveled



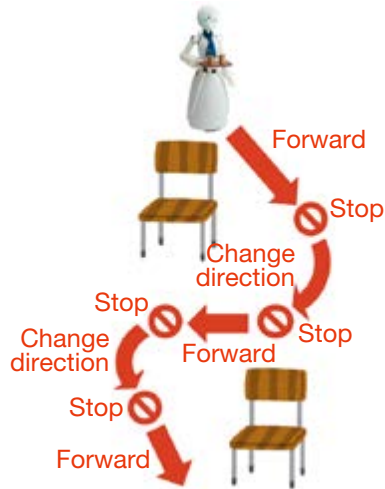
### Art Contest

We held the “NTT Art Contest Depicting our ‘Connections’” (August 24 to October 20) for people with disabilities, which had some 200 works of art submitted from Japan and overseas. The contest was held as part of initiatives aimed at promoting activities for people with disabilities based on the concept of “Showcasing individuality with the power of art—Disability or not, everyone can make the world brighter.” An award ceremony was held at the Avatar Robot Cafe DAWN ver.β on December 3, which is International Day of Disabled Persons. In fiscal 2022, we plan to hold the contest in collaboration with Japan Airlines Co., Ltd. which endorses the concept behind this contest, and expand the number of eligible entries.

Grand Prize winner: “Airplane”

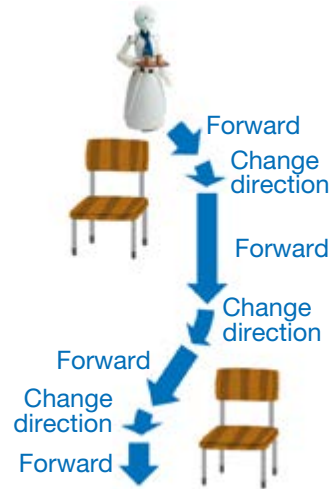


Image of OriHime-D movement using internet



Robot needs to stop and check conditions during operation

Image of OriHime-D movement using demonstration network



Continuous operation is possible because the robot can identify its current conditions

Award ceremony held at the Avatar Robot Cafe DAWN ver.β on December 3, 2021



## Business Activity 26

# Support for balancing work and life such as childcare and nursing care

### Our commitment

As a leader in digital transformation, we will act and contribute to helping resolve the social challenges unique to each country

For example, the declining birthrate and aging population, proper education, equitable healthcare, regional economic development, and long-term value through technology for the next generations

### Childcare and Nursing Care Support Systems

Amid ongoing changes in employees' needs concerning health, childcare, and nursing care, in 2018 we conducted a major review of our benefit program menu to prepare environments even more conducive to work, and enhanced our childcare and nursing care support menu as the NTT Benefit Package. Specifically, we introduced a Childcare Concierge to support childcare placement in employees' areas of residence, and greatly enhanced services such as childcare subsidies. For nursing care, we also established a Nursing Care Concierge for consultations on nursing care, including matching of care managers.

We use Tomonin a symbol created by the Ministry of Health, Labour and Welfare to promote the establishment of working environments that allow the balancing of work and nursing care. NTT uses the symbol to publicize its initiatives and develop a workplace environment that enables employees to balance work and nursing care.

### Initiatives for Balancing Work with Nursing Care

Looking ahead to the coming age of major nursing care needs, our Group companies organize nursing care study sessions and other events aimed at creating an environment that enables their employees to balance work with nursing care commitments. With many interested employees participating in these events, we plan to continue providing such opportunities.

### Encouraging Employees to Take Various Types of Leave

In an effort to achieve an even better work-life balance for each and every employee, the NTT Group is creating an encouraging environment conducive to taking various forms of paid leave, by encourage employees to take long vacations by combining paid leave with long major holidays such as Golden Week holidays, end-of year and New Year holidays, and summer vacation.

### Initiatives for diverse work styles

The NTT Group has established a childcare and nursing care web site with information about the programs and how to use them, and also the experiences of employees who balance childcare and nursing care. In addition, we hold seminars for childcare leave and for people returning to work, hold talks with employees before childbirth and after parental leave, and establish nurseries in workplaces. NTT has set a target for having 100% of male employees take paid leave for childrearing by fiscal 2022, and starting from fiscal 2021, NTT has been

holding seminars to encourage employees to participate in childrearing, with panel discussions featuring explanations of the system and talks by employees who took time off, to create a workplace culture that encourages childrearing. Other support tools include interview sheets and manuals that explain the system, a revised Communication Handbook that covers the necessary procedures for life events, and posters to encourage employees to take childcare leave. We are committed to creating systems and work environments where employees feel free to take time off for childrearing.



### Business Activity

#### NTT Urban Development

Mr. Kawakubo, Manager, Project Management Division, Development Management Headquarters

Mr. Kawakubo was the first male employee to take childcare leave at NTT Urban Development. He then took time off a total of three times for caring for his children, and is planning to take his first long-term leave in the future. He balances his life between work as a manager and a father of four children. While male employees are advised to take childcare leave now, at the time males struggled as there was a poor level of understanding by other employees.

For Mr. Kawakubo, taking childcare leave was naturally beneficial for his family, but he also says that it gave him the time to think carefully about what type of working style he wants to aim for, and how to live a better life.

He explains that communication and team building with colleagues is a vital aspect for a position like his in management, and taking a positive approach provides a source of motivation for other members. To achieve this, he is seeking to create a team where people can speak their mind, while maintaining a level of psychological safety. The idea that conversing with children at their level helps to bring out their true feelings—something he learnt while raising his children—also applies to superiors and their junior staff, and is vital for achieving a workplace mood where everyone is free to speak their mind.



## Social Challenge

# 9

## Creating new work style models

### Business Activity

- 27. Promote remote work
- 28. Achieving zero fatal accidents as well as maintaining and promoting employee health
- 29. Supporting autonomous capacity development
- 30. Promoting paperless operations



### Why it matters

We believe that creating a safe and secure workplace, developing employment conditions, and respecting a variety of work styles that suit life events means a workplace where employees can work energetically in good health, both physically and mentally, can be created, and so we are implementing initiatives to achieve this. We also believe that giving due consideration for the health of our employees as well as their families and partners will motivate and invigorate each of them and lead to the growth of the NTT Group as a whole.

### What can be accomplished

We will be promoting diverse work styles with the use of remote work and “Super flex-time system”. In addition to increasing productivity and efficiency, these initiatives allow employees to make more effective use of their time than before, and will result in a better balance between work and life. We will also strive to provide even better employment conditions, such as fair evaluation, equal opportunity, opportunities for growth, and benefit programs.

### Future vision

We will create a workplace environment and culture where employees are able to work with peace of mind in a lively manner. We view maximizing well-being as a way of providing each and every employee with options for working style and career formation.



## Business Activity 27

# Promote remote work

### Our commitment

The NTT Group is shifting toward new work styles centered on remote work, by upgrading IT environments and reviewing systems, in addition to advancing DX projects and work reforms with an eye on the post-pandemic world

### Our objective

70%

Remote work ratio by FY2022

### Implementation of Remote Work System, Super Flextime System, and Remote Standard

The global environment underwent unprecedented change as COVID-19 infections continued to spread, and our work styles also changed accordingly. Until that point there was a limit to the number of times employees could use the work from home system, but the NTT Group introduced a remote work system and lifted restrictions on how many times it can be used. The introduction of a super flex-time system also allowed for flexible work styles that are no longer constrained by location or time. Implementing various changes like these not only increases productivity and efficiency, but also allowed employees to make more effective use of their time than before, and resulting in a better balance between work and life. We introduced the “Remote Standard” system from July 2022 to implement a work style that is not restricted by one’s place of residence. Through this initiative, we aim to eliminate work styles that require relocation or solo transfer assignments.

### Remote Standard

- Any residence in Japan is acceptable
- Any reasonable transportation method to and from work that can be considered travel expenses (lodging expenses provided as well) is acceptable
- No need to relocate to a remote location if the new location is an organization that accepts the Remote Standard

### From employee satisfaction to employee engagement

In fiscal 2021, NTT Group revamped its existing Employee Satisfaction Survey, which focused on questions related to ease of working, and added questions related to job satisfaction. It also conducted a Group-wide Engagement Survey to quantify employees’ attachment to and trust in the company to which they belong as an “engagement score.” Approximately 132,000 Group employees in Japan responded.

By understanding current levels of engagement among NTT Group employees and the issues that need to be improved, and by taking action to make

improvements, we hope to increase the number of highly engaged employees who identify with the company’s and organization’s policies and strategies, as well as feel pride and take initiative in their work.

### NTT Group’s Four KPIs

#### Willingness to make voluntary contributions

- (1) I am motivated to contribute more than is required to get the job done at the company

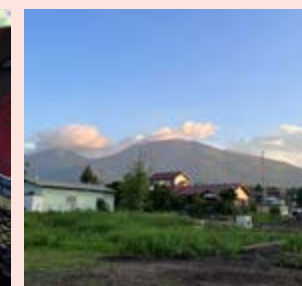
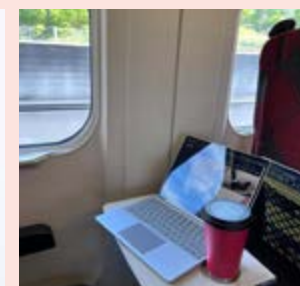
#### Attachment to and pride in the company

- (2) I am proud to work at this company
- (3) I would recommend our company as a great place to work to those I know

#### Job satisfaction

- (4) I gain a sense of personal accomplishment through my work

### Business Activity



### NTT DATA

Ms. Shinohara, Section Manager, Public Relations Department, Global Marketing Headquarters

Ms. Shinohara currently lives in Nagano Prefecture where she balances her work in management with raising her children. Despite her husband being assigned to a position overseas, she continued her work while raising her children by herself because she was involved in a major project, and was subsequently promoted to a management role. Being selected for such a major project, Ms. Shinohara finds herself busy balancing work and her own life. She explains that while she has developed her skills as a manager, the most satisfying aspect of being in a management role is being able to train junior staff and lead other employees to help advance the company, which in turn allows her to achieve her own goals.

She made the decision to relocate to Nagano Prefecture right before the COVID-19 pandemic began spreading. Ms. Shinohara explains how remote work allowed her to achieve a balance between working and her private life: “The best part of relocating and teleworking is being surrounded by the natural environment while working on large, rewarding projects. I love jogging, and having the opportunity to run along forest paths is such a valuable time for me. The biggest advantage for me is that I have found more time to spend communicating with my children. I am so grateful to be able to witness my children growing up from so close. Whether relocating or not, working from home is very convenient while raising children. If they develop a fever, I can take care of them while doing my work. The type of flexible working style is something that needs to be respected, and I will definitely continue recommending remote work.”

## Business Activity 28

# Achieving zero fatal accidents as well as maintaining and promoting employee health

### Our commitment

Health management is pursued as a key corporate strategy with the understanding that initiatives for maintaining and improving employee health also enhance motivation and productivity and ultimately lead to higher corporate earnings. We also believe that giving due consideration for the health of our employees as well as their families will motivate and invigorate each of them and lead to the growth and development of the Group as a whole.

### Our objective

## Zero

Number of accidents causing injury or death during construction work

### Policies and Concepts

Health management is pursued as a key corporate strategy with the understanding that initiatives for maintaining and improving employee health also enhance motivation and productivity and ultimately lead to higher corporate earnings. The NTT Group has developed a personnel system that responds to diverse work styles and provides generous benefit programs for employees and their families.

We also believe that giving due consideration for the health of our employees as well as their families will motivate and invigorate each of them and lead to the growth and development of the Group as a whole.

We believe that ensuring employee safety should be the top priority of business management. To ensure occupational safety and health, the NTT Group has established its own Safety Management Rules and Health Management Rules to facilitate safety and health management in addition to observing relevant laws and regulations such as Japan's Labor Standards Act and Industrial Safety and Health Act. The NTT Group's businesses include telecommunications-related construction and maintenance involving high risk operations such as aerial work. Therefore, we continually implement measures to prevent accidents and enhance safety awareness across the NTT Group, including subcontractors and other corporate partners.

### Organization for Implementation

In addition to establishing and maintaining safety measures and safety management systems based on relevant laws and internal rules, we have set up a health and safety committee for preventing industrial accidents across the NTT Group. Also, we are working to prevent accidents during telecommunications-related construction and maintenance that serve as the foundation of the NTT Group's businesses and create a safe working environment.

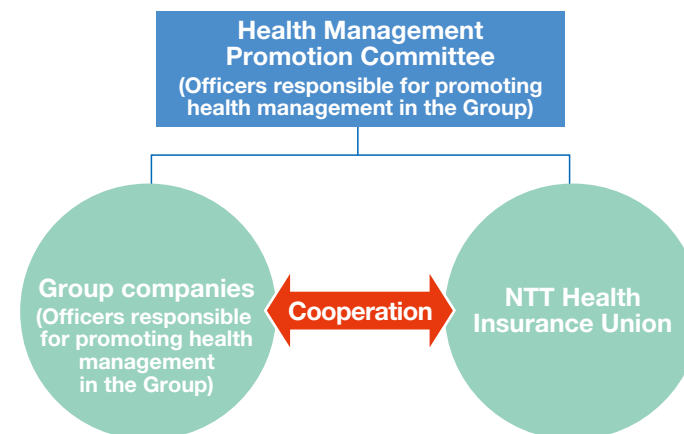
The NTT Group also established the Health Management Promotion Committee to promote health management through a collaborative effort between Group companies and the NTT Health Insurance Union. General managers of human resources department who are responsible for personnel at each Group company and directors of the NTT Health Insurance Union are appointed as officers in charge of promoting health management. The effectiveness of the initiatives is ensured by implementing PDCA cycles (formulate health management plans + set health targets → formulate and implement health focused actions → identify and confirm health results → verify the effectiveness of health-focused actions).

We have also designated KPIs for wellbeing using health data, and we endeavor to achieve them by planning and implementing initiatives for raising awareness and promoting health-focused activities.

### Promoting Work-Life Management Work and Leave Style Reforms

The NTT Group seeks to create new value through innovation. In order to accomplish this goal, there is a strong need for all NTT Group employees to break away from traditional work styles to adopt more efficient practices not bound by time and place, and thereby exercise greater levels of independence and creativity. We are also aware of the great importance of supporting this shift by cultivating a deeper understanding of work-life management throughout workplaces and fostering a corporate culture that accepts the diverse work styles of each individual employee.

NTT has set a goal of shortening total hours worked by achieving under 1,800 total hours actually worked by the end of fiscal 2022.



### Systems Promoting Work-Life Balance

	System	Description	
Description	Paid vacation days	Paid leave that can be taken regardless of reason. Employees who have worked continuously for the company for one year or more are entitled to 20 days per year. * Employees who have worked for the company less than one year are entitled to 13 days	
	Special leave	Leave that can only be taken due to specified reasons <Reasons> Marriage, bereavement, summer leave, childbirth, childcare time, menstrual leave, transport restrictions, loss of home due to a natural disaster, etc.	
	Life planning vacation	Up to three days of unused paid vacation days, which become invalid at the end of each fiscal year, can be accumulated for use as a life planning vacation.	
	Sick leave	Leave that can be taken if an employee is injured or falls ill.	
Childbirth and Childcare	Mitigation of commuting during pregnancy	Paid program that exempts pregnant employees from working at the start or end of the workday for up to 60 minutes per day	
	Measure related to health examinations, etc., during and after pregnancy	Paid program that exempts employees from working to attend health guidance or a health examination during pregnancy or within a year after pregnancy	
	Maternity leave (Special leave)	Six-week paid leave before childbirth (14 weeks for multiple pregnancies) and eight-week paid leave after childbirth	
	Reengagement of former employees who left for childcare	Program for rehiring former employees who left to care for a child, within a certain period of time since leaving the Company	
	Childcare leave	Program that enables employees with a child under three years old to take non-paid leave for childcare	
	Shortened working hours for childcare	Program that offers shortened working hours for employees with a child below the third grade of elementary school (options: four-hour, five-hour and six-hour workdays)	
	Shifted working hours for childcare	Program that offers individualized shifts (moving up or moving down the starting/ending hours of the workday) to secure time for dropping off and picking up children from daycare centers up to the end of elementary school	
Nursing Care	Limits on overtime or overnight work	Program that limits overtime, etc., for employees who need to care for a child below the third grade of elementary school	
	Nursing care leave	Program that enables employees to take non-paid leave to look after a family member in need of nursing care	
	Shortened working hours for nursing care	Program that offers shortened working hours for employees with a family member in need of nursing care (options: four-hour, five-hour and six-hour workdays)	
	Shifted working hours for nursing care	Program that offers individualized shifts (moving up or moving down the starting/ending hours of the workday) to secure time for nursing family members	
Systems related to working	Limits on overtime or overnight work	Program that limits overtime, etc., for employees who need to care for a family member	
	Shifted working hours	Program that enables an individual to change the starting or ending hours of the workday to secure time for child or nursing care	
	Flex time	Flextime system	Employees work during standard core times (10:00–15:00, specific times can be set by each organization) and flexibly outside of these times (7:00–22:00)
		Super Flextime system	Employees work flexibly between 7:00–22:00 (minimum unit: 3 hours)
	Remote work	Program that allows an employee to temporarily work at a location other than their regular worksite as a means of supporting work-life balance, encouraging independence and creativity, or increasing productivity	
Rehiring program	Program that enables employees who leave due to childcare, nursing care, or the relocation of their partner to apply to be rehired after they quit		

### Extensive Benefit Programs

The NTT Group operates a comprehensive optional benefit program (cafeteria plan). Employees are given points that can be used to freely choose from a wide range of benefit items, including health maintenance, such as scheduling comprehensive physical checkups or acquiring health and fitness technology devices as well as personal wealth building. Several core menu items do not require the use of points, such as comprehensive physical checkups aimed at the early discovery of lifestyle-related diseases and cancer, which tend to occur more frequently with age. We also offer items such as subsidies for fitness club memberships and health improvement activities using smartphones (d healthcare), which can be used by employees at their convenience.

### Life Plan Study Sessions

In light of increasing diversity in employee life plans, the NTT Group provides website-based life plan design support for employees reaching a certain age or career milestones to help them consider how they wish to spend the rest of their lives, including their working lives. We have also established in-house system contact points to promote greater understanding of matters including support and in-house systems for maintaining and improving physical and mental health, personal wealth building, specialist advice for tackling lifestyle-related concerns and issues, life plan creation, and support for balancing work with child or nursing care.

### Major Items on The Cafeteria Plan Menu

Health improvement	Comprehensive physical checkups (including subsidies for optional items), introduction to the best doctors, multiple opinion service, purchase of health and fitness technology such as wearable devices
Asset accumulation	Various incentives such as asset accumulation savings, Employee Shareholding Association
Housing	Renting company housing and dormitory space, support for home ownership, etc.

### Core Menu Items for All Employees (Points Not Required)

Health improvement	Comprehensive physical checkups (offered every five years between the ages of 30 and 60), d healthcare
Support for daily life	NTT Benefit Package (subsidy for fitness club membership, support for childcare and nursing care, use of recreation facilities)
Asset accumulation	General asset accumulation savings
Housing	Affiliated housing loan
Other	Insurance, mutual aid

## Physical Healthcare

The NTT Group also takes steps to help employees fortify their physical health by using ICT. Specifically, we focus on the two measures below.

### (1) Encourage healthy activities with smartphone app (d health care)

Information about how to refresh oneself and eat and sleep better, as well as information about NTT Group's sports teams (Exercise Videos), are pushed to the smartphone app to get employees more engaged in healthy activities

### (2) Guidance for specific health guidance via smartphones

Introduce ICT-based specific health guidance so that employees can conveniently receive specific guidance anytime and anywhere on their smartphone apps

To augment periodic health checkups, employees are eligible for an extensive health checkup every five years, from age 30 to age 60 (younger and older people can also receive these checkups if they wish). We also support employees who wish to join sports gyms.

## Mental Healthcare

The NTT Group has established contact points for handling mental health inside and outside the Company and has been implementing mental health initiatives such as stress testing, counseling on work-related issues, and training for line managers. As part of our initiative to promote remote work styles, we address mental health issues by periodically conducting simplified interviews to monitor changes in an employee's condition and their self-care efforts. Employees are also encouraged to communicate with superiors (line managers) by conducting pulse surveys that provides fixed point observations of employee awareness on a real-time basis.

## Activities to Eliminate Accidents

In fiscal 2021 four\*<sup>1</sup> serious accidents resulting in casualties\*<sup>2</sup> occurred during construction and repair work ordered by NTT Group companies and performed by those companies or by subcontractors for the construction and maintenance of telecommunications equipment and building facilities. The incidents involved making contact with falling trees while cutting them.

The incidents involved two cases of trees falling down from the crane bucket while on an elevated work platform, and two cases of traffic guides being caught up in accidents.

To prevent accidents involving human casualties, NTT Group companies will continue to work in concert to reaffirm standard procedures, reinforce adherence, and improve the safety awareness of all workers.

Given the traffic guides being involved in one accident after another, and the large number of cases involving experienced employees including team leaders in particular, efforts continue to be made for all workers involved in NTT construction work—and not just NTT Group employees—for verifying details in a meeting before starting work, ensuring comprehensive KYT activities, and re-training experienced employees including team leaders.

Furthermore, we continue to engage in activities for achieving a safe labor environment and ensuring zero industrial accidents across the Group, such as exploring means to prevent passing vehicles from entering restricted areas as well as the use of advanced technologies including sensing, AI, and vital data.

## Business Activity



### NTT COMWARE

#### Use of DX Solution "SmartMainTech" (field trial)

NTT COMWARE is improve the safety of telecommunications facility construction with the use of multi-AI that can detect certain dangerous tasks and dangerous situations by using DX solution SmartMainTech\*<sup>3</sup>, which was developed to contribute to more sustainable social infrastructure.

Work that uses stepladders requires special safety measures, and instead of simply relying on on-site supervisors to caution the construction workers, safety checkers are tasked to watch videos recorded at construction sites and provide guidance afterward if they notice dangerous work.

The use of multi-AI significantly reduces work that requires visual inspections, and also aims to shift the work of safety checkers to more detailed task analysis and appropriate safety guidance, thereby achieving safety measures that are both more sophisticated and more efficient.

\*1 Breakdown of accidents: 0 by NTT Group companies and 4 by subcontractors (in Japan)

\*2 Serious accidents resulting in casualties: Accidents that led to fatalities or disabling injuries that would prevent the employee from working again.

\*3 "SmartMainTech" is a registered trademark of NTT COMWARE CORPORATION.

### Actions in Response to COVID-19

As society embraces social distancing as part of daily life in response to the COVID-19 pandemic, we have been creating safe workplace environments, which do not require close human interaction by, extending the use of ICT, and promoting digital transformation in operational processes. In operations that require present on-site presence, such as customer support, our employees have been applying safe practices. We are also conducting thorough measures to prevent our customers from being infected.

To combat the spread of COVID-19, the NTT Group is monitoring the number of employees who have tested positive, preventing the spread of infections, and implementing measures to prevent infections. We follow the basic principles of avoiding the “Three Cs” (closed spaces, crowds and close contact) by rigorously implementing such measures as social distancing, remote work, and staggered commuting. We are thoroughly committed to preventing infections by promoting telework in addition to encouraging the use of masks, disinfecting hands, installing hands-free door openers, employing appropriate seating arrangements, and installing acrylic-glass dividing screens.

### Maintaining and Improving the Health of Employees

The NTT Group helps employees maintain and improve their health by providing a full range of regular health checks and offering health guidance based on the results of these checks. Furthermore, as a measure for preventing lifestyle related diseases, we provide more extensive physical checkups for employees who request them and we require all employees to receive a comprehensive physical checkup every five years from ages 30 to 60. We also provide support to help employees use sports gyms. Together with the NTT Health Insurance Union, we are supporting employees’ health-related activities by providing a portal site through which they can use a wearable device to record and check vital data such as the number of steps taken each day, as well as an app that uses health check data to predict and simulate potential future health risks related to metabolism and high blood pressure. Additionally, business sites with a cafeteria prepare lunch menus with the help of a nutritionist, and certain business sites offer massage services that employees can freely free of charge.

### Prevention of Overwork

The NTT Group is striving to prevent overwork through actions that include recording and managing the times employees log in and off their computers to appropriately oversee the work hours of each individual employee, regardless of whether they work in the office or from a remote location. Health management staff also conduct interviews with employees working extended hours and offer appropriate advice and guidance on personal health care.

We are establishing a sound workplace environment for employees by introducing flex-time system, a discretionary work system, and a remote work system to offer a variety of flexible work styles.

### Favorable Labor-Management Relationship

With the exception of managers, most NTT employees in Japan belong to the NTT Labor Union, a member of the Japan Labor Union Confederation, and labor-management relations have remained stable (79.4% membership as of March 2020). There have been no labor union strikes for more than 10 years.

The Company adheres to the minimum notice period of 10 days before an official announcement, as designated by the Agreement on Employee Relocation under the collective agreement with the NTT Labor Union.

### Layoffs

Organizational changes are implemented after discussion and negotiation with all labor unions. As in the previous year, no layoffs occurred in fiscal 2019.

### Business Activity



NTT DATA United  
NTT Live

With lockdown measures having an impact on employees around the world, NTT DATA developed an online video streaming platform that helped to link up with those working from home.

Based on Microsoft Azure, “NTT Live” was designed to run for a low cost with the latest technology by using NTT’s internal IP addresses. Available videos covered topics like Go-To- Market and NTT value propositions, as well as topics related to individual lifestyles like health, fitness and well-being.

## Business Activity 29

# Supporting autonomous capacity development

### Our commitment

We actively support employee career development. Increasing the specialization of each employee helps develop them into professionals capable of deciding their own careers. We also strive to understand the issues at hand in order to improve the working environment and corporate mechanisms toward creating companies that are acceptable for workers.

### Our objective

Improvement in employee satisfaction compared to previous year (engagement rate)

### Policies and Concepts

Retaining a diverse array of human resources serves as a powerful management foundation for any organization. This requires the development of employment conditions, such as fair evaluation, equal opportunity, opportunities for growth and benefit programs. We are also currently constructing a personnel database for registering past career experience and expert knowledge of employees engaged in our international businesses to accelerate the pace of visualizing and nurturing global human resources toward ensuring an optimal allocation of personnel.

### Helping Employees Develop their Abilities

In addition to Group training and on-the-job training to enable employees to gain necessary skills in various fields of business, we provide many other opportunities for employees who are eager to get ahead, including e-learning, distance learning, in-house certification of skill levels, and support for external qualifications. We have also introduced a Group-wide talent management system

to create an environment that enables employees to play a more active role in developing their careers, and we recommend training courses that would be effective in achieving their career goals.

We actively support employee career development in various ways, including having superiors hold personal talks with their subordinates at the start, the middle and the end of the fiscal year to review performance and career plans, and holding management training for employees tapped for promotion. In particular, we have created a curriculum for nurturing experts in the security field given the heightening security risks of recent years, and we offer leadership development and a personal network building training curriculums to around 400 carefully selected general managers and section managers. With an eye on the further globalization of our operations, and to nurture personnel capable of performing in global markets, we also send employees to study at overseas graduate schools or participate in our overseas work experience programs.

### Improving Human Resource Management and Payment Systems

The NTT Group implements policies aimed at enabling each and every employee to make the most of their abilities as members of Team NTT and to grow steadily as competent professionals and take the initiative in developing their careers. We consider it vital to have each and every employee further increase their area of specialization, acquire skills and create added value in a broad range of fields in order to better reform business, expand into new business areas, and supply and generate new value in various areas. A new compensation system will be introduced from 2023 that determines compensation based on the level of acquired "specialization" instead of the number of years employed, age, or years in the position, to help employees achieve their career vision while maintaining the motivation to acquire a higher level of specialization.



### Business Activity

#### NTT DATA NTT DATA Academia

The IT training program "NTT DATA Academia" was launched in fiscal 2020 for elementary school students as part of efforts to promote IT education. NTT DATA and group companies in Japan coordinated efforts to develop activities that teach how programming and IT systems work. This program will be used to assist with education by supporting children in regional communities, creating inquisitive minds toward IT and society amongst children, and nurturing children's capacity to act independently through experiences with IT.

### Increasing employee engagement

In FY2021, NTT Group revamped its existing Employee Satisfaction Survey, which focused on questions related to ease of working, and added questions related to job satisfaction. It also conducted a Group-wide Engagement Survey to quantify employees' attachment to and trust in the company to which they belong as an "engagement score." Approximately 132,000 Group employees in Japan responded.

By understanding current levels of engagement among NTT Group employees and the issues that need to be improved, and by taking action to make improvements, we hope to increase the number of highly engaged employees who identify with the company's and organization's policies and strategies, as well as feel pride and take initiative in their work.

### Fair Evaluation and Compensation

In our employee qualification system, the NTT Group puts priority on performance and sets behavior and performance targets tailored to each qualification rank. By steadily and accurately carrying out a series of evaluation processes that feedback evaluations based on these targets, our personnel system promotes autonomous and independent work by employees.

### Personnel Evaluation System that Employees Find Very Fair

Rather than having each company operate its own mechanisms for human resources management and development, we operate an all-inclusive system for managing employees' placement, building skills, evaluation, rating and payment, centered on an employee qualification system that indicates our expectations in terms of behavior and performance according to the employee level.

Proper evaluation requires appropriate execution of a series of processes that span target setting, everyday communication, evaluation implementation, and interviews to provide feedback. Toward this end, we adhere to the following cycle (evaluation system applies to 60% of the NTT Group).

### Regular Personal Interviews with Superiors and Human Resources Managers

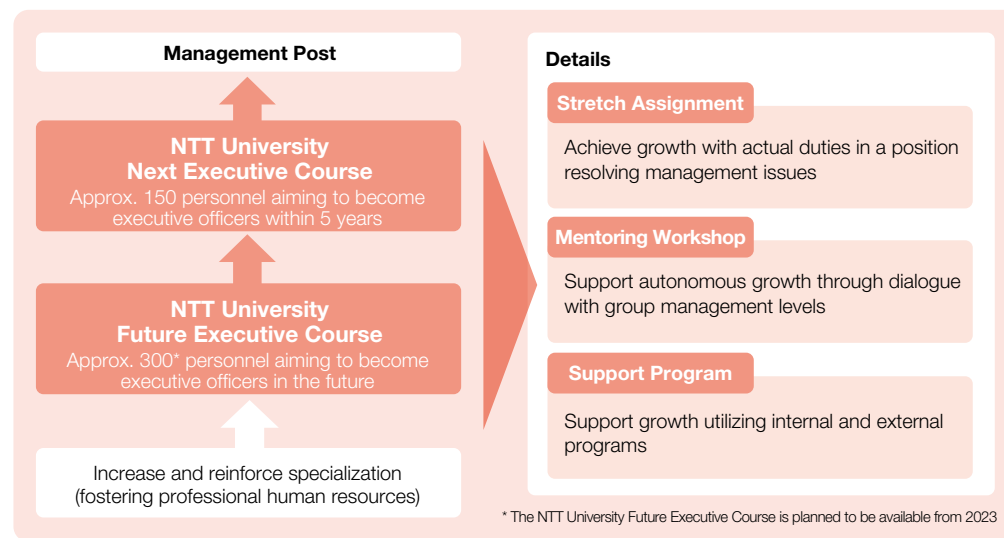
NTT Group employees meet regularly with their superiors and human resource managers for personal interviews to ensure that they share the same perception as their superiors regarding performance targets and the processes required to achieve them, to share thoughts on areas that can be improved, and to discuss career paths and personal growth.

Employees are given six opportunities each year to talk with their superiors, once each at the start, middle, and end of each fiscal year, plus one overall evaluation feedback interview and two performance evaluation feedback interviews (April and October). The first interview of the year is for employees and their superiors to align their views on targets for the year and for the superiors to provide advice. The mid-year, year-end and feedback interviews are for managers and their subordinates to review results, performance, and the processes for achieving targets, and for managers to provide advice and motivation for making further improvements and growth. The implementation of these interviews is managed so they are held without fail, except when vacations or leave prevent them from being held in the allotted time.

### Programs for Cultivating Management Leaders and Globally Capable Employees

Goal	Program	Details
CULTIVATION OF LEADERS TO FILL FUTURE MANAGEMENT POSITIONS	NTT University	This mentoring program entails assigning a mentor, usually a senior executive vice president or corporate officer from within the Group, and running support programs for growth opportunities as part of key practical initiatives.
	Group leader development program	This program is designed to help the young managers who will be responsible for promoting collaboration between NTT Group companies gain experience, broaden their perspective, and develop a mindset focused on advancing cross-Group businesses. This is accomplished through periodic relocations to other Group companies and exchanges of opinion with managers.
	MAC Management Workshop	The purpose of this program is to cultivate managers with broad perspectives that are not restricted to the Company, to foster a sense of solidarity within the NTT Group, and to enhance personal networks. The curriculum consists of four management workshop courses conducted by external lecturers over a period of seven months.
Fostering of globally capable human resources	GLDP (Global Leadership Development Program)	The Global Leadership Development Program (GLDP) aims to broaden the horizons of the next generation of managers who will be responsible for developing global businesses, cultivate a sense of leadership within them, and help them form personal networks. The program includes a one-week curriculum of study at an overseas business school.
	GLDP LEAD (Leadership Excellence and Accelerating Diversity)	This extension of the GLDP is targeted at senior managers in Japan and overseas, aiming to help them acquire leadership skills and otherwise cultivate global leaders within the NTT Group. Participants are sent to a curriculum of study at an overseas business school, where they take part in discussions on leadership and diversity, among other curriculum items.

### NTT University



\* The NTT University Future Executive Course is planned to be available from 2023

### In-house recruitment

At the NTT Group, in addition to offering the NTT Group Job Challenge which provides opportunities for regular employees with ambition to take on the challenge of shaping their own careers, we also operate NTT Group Job Offerings, a program for the management staff who will advance the transformation of the NTT Group. The program enables a variety of individuals who offer fresh ways of thinking to apply for important positions in each business area.

We are actively promoting the usage of these internal job posting systems as part of efforts to build a group-wide culture that supports employees taking on new challenges.

### Skill Mapping and Encouraging and Supporting Acquisition of Qualifications

Each Group company sets up a unique program of skill mapping based on the characteristics of their respective business operations and conducts human resources training according to those categories. Companies measure the level of each employee according to the mapping, identify the number of employees who are qualified for each level, and measure the status of implementation. Specifically, the process is operated as follows:

- (1) Designate areas of expertise according to the expert skills required by each operation;**
- (2) Define and certify levels according to the skill set for each area of expertise; and**
- (3) Develop a PDCA cycle based on the employee's own career plan, supported by supervisors and the organization.**

The NTT Group also encourages employees to acquire qualifications related to their respective duties, including major qualifications that are in broad demand in the ICT industry such as Professional Engineer, Information Technology Engineer and Certified Information Systems Security Technology Professional qualifications, and we intend to boost the number of qualified employees.

### Placing the Right People in the Right Jobs

The NTT Group engages in businesses across a broad range of fields. The development of each business requires placing the right people in the right jobs so that each employee can fully demonstrate their potential.

Therefore, we periodically rotate personnel on the basis of each employee's overall skill development and career plan decisions.

### Evaluator Meetings

Evaluator meetings have been held twice annually— once in the spring and once in the autumn—since fiscal 2001. We endeavor to enhance the fairness and objectivity of our evaluation process and prevent subjective and arbitrary evaluations by having all of the evaluators in the same business unit hold evaluator meetings to align their evaluation criteria and perspectives.

### Evaluator Training

We provide employees in evaluator positions with evaluator training (e-learning) and new manager training as well as our Human Resources Evaluation Manual as part of our efforts to further improve the fairness of evaluations and employee satisfaction. We also provide employees with training for the evaluations, setting targets, and, a handbook explaining the process using evaluation, target setting, online educational tools for promoting the understanding of our human resources management and pay systems, and a collection of high performance model examples.

### Business Activity



### NTT Ltd.

#### Educational program to protect girls' rights to learn

For those in poverty of India, education is a low priority and 66% of girls are unable to receive appropriate education. With this in mind, NTT Ltd. started the "Our Girl Children" initiative in 2017 that focuses on overall development and preparation for future employment, which included building a computer room and science lab at a public school for girls of the poorest families in Mumbai, as well as inviting them to the company offices to give them an opportunity to experience the latest technologies. Other initiatives included the installation of water coolers to provide clean drinking water, provision of mid-day meals, health initiatives such as dental check-ups, as well as holding various training programs on a regular basis. Since starting this program, attendance, graduation rate and the percent of students that has gone on to college have increased significantly. Thanks to this initiative, the girls have started to dream about an educated and empowered future and, by extension, contributing to India's economic growth.

## Business Activity 30

# Promoting paperless operations

### Our commitment

Proactively promoting business transformation and DX to increase work efficiency

### Our objective

**Zero**

Amount of paper used by 2025

### Promotion of business transformation and DX

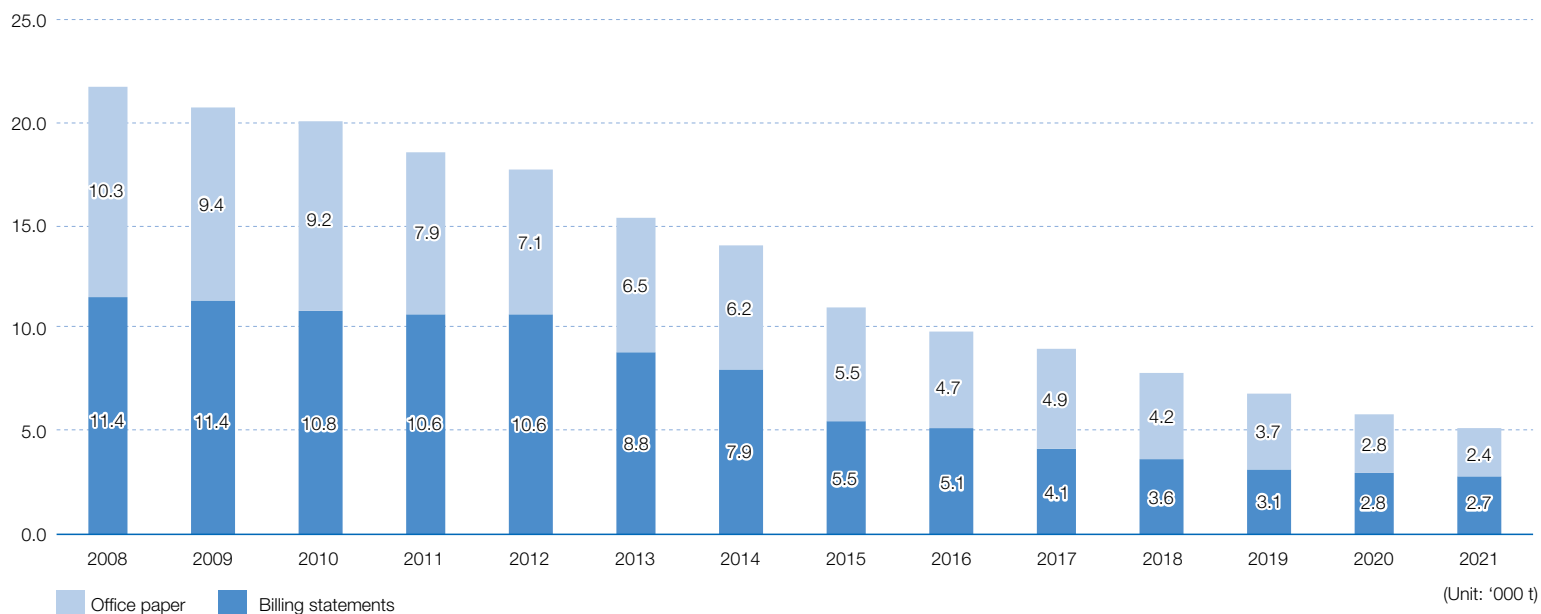
Promoting DX for business operations aims to increase work efficiency as well as implement initiatives for addressing environmental issues. The NTT Group is ramping up measures aimed at reducing the use of paper, such as charging for printed documents and changing invoices from envelopes to postal cards. In fiscal 2021, paper usage has been reduced by around 76% compared to fiscal 2008 levels. We also aim to completely phase out paper, including that used for bills and order processing documents, by fiscal 2025 together.

### Paper Management and Recycling

We established a closed loop recycling system in 1999 to collect old telephone directories and recycle them to produce new ones.

We undertake numerical management for our use of virgin pulp. We are also working to reduce paper consumption of society through the use of ICT, which includes measures such as our Web billing service\*1.

**Amount of paper resources (office paper + billing statements)\*2**



\*1 A service enabling customers to check their charges and usage at any time online.

\*2 Total amount used including recycled paper

## Social Contribution

### Policies and Concepts

The NTT Group has operating bases located not only in Japan but also around the world, from which it provides telecommunications networks, an important lifeline, and develops business that works to realize a smart world and Society 5.0 by leveraging ICT and data to solve social issues.

Thus, it is essential that we not only aid the various organizations aiming to develop ICT but also pursue harmonious relationships and strive to resolve local issues in collaboration with local residents, central and local governments, NGOs, NPOs, and educational institutions.

The NTT Group looks to address the various issues faced by local communities in which we operate, including those related to environmental issues, aging populations, declining birthrates, and the education of children. NTT believes it is important to contribute to the development of flourishing and vibrant local communities through the actions of each member of Team NTT comprising NTT Group employees, their families, and retired employees.

We seek to have each employee of the 30,000 NTT Group interact with members of their local community, identify local needs, and contribute in even small ways to addressing issues through our business activities. We believe that these efforts will eventually come back to us in the form of business opportunities and avoidance of risk, and thus we view activities that invest in local communities as our most important area of activity. Herein lies the strength of the NTT Group, a global enterprise that engages in businesses deeply rooted in local communities.

### Organization for Implementation

The NTT Group Sustainability Charter calls on the NTT Group to work together to help achieve a sustainable society. In accordance with this policy, six key social contribution activities of “Environmental conservation,” “Social welfare,” “Education and cultural promotion,” “Local community development and dialogue,” “International exchange activities,” and “Sports promotion” have been defined, and each NTT Group company engages in citizenship activities following the policies and detailed action plan set by NTT’s Sustainability Promotion Office.

### Main Initiatives Citizenship Activity Categories

#### Community Investments

Corporate citizenship activities carried out over the medium- to long-term to address social issues that concern both the NTT Group and local communities

#### Charitable Donations

Corporate citizenship activities that are carried out on a one-time basis or are expected to be completed within a short period

#### Commercial initiatives

Corporate citizenship activities that generate profit for the NTT Group

### Measures to Support Citizenship Activities

Programs	Description
Volunteer Gift Program	This program provides goods from the volunteer’s company to facilities and other places where the volunteer has been active over a long period.
Matching Gift Program	Under this program, the NTT Group companies support employees’ fundraising and charity activities by matching donations made by employees.
Volunteer Leave Program	This program enables employees to take extended leave for volunteer activities or other purposes in line with life design plans.
NTT Group Volunteer Portal Site	This portal site introduces and supports a range of volunteer activities across the NTT Group, with a focus on sports volunteers.

### Promoting volunteer activities through the NTT Group Volunteer Portal Site

The NTT Group Volunteer Site was established in 2017 to introduce and support a diverse range of volunteer activities for NTT Group employees. Under the motto “Smiles for all,” we promote group-wide social contribution activities that can bring smiles to everyone involved in these activities. Going forward, we will expand activities that use the NTT Group’s workforce strength to develop the site as a “third place” venue for creative interaction, with the aim of enhancing the well-being of employees and local communities.

### Support for Citizenship Activities by Employees

With the belief that participation in citizenship activities can help to broaden the mind, the NTT Group is implementing an increasing range of policies to support employee citizenship activities, informing employees of support programs, and commending citizenship activities carried out under such programs. Other programs include a Matching Gift Program under which Group companies match donations collected independently by employees, and a Volunteer Gift Program under which Group companies donate goods to facilities and other places where employees are engaged in voluntary citizenship activities.

#### Business Activity



#### ICT x sports x regional co-creation using avatar robot OriHime

##### Non-contact project

We aimed to solve the social problem of “lonely meal problems” that has increased in severity with the COVID-19 pandemic by using technology and regional assets for co-creation with multiple stakeholders.

We delivered one OriHime unit to the home of an elementary school student residing in Urayasu City, and another unit to facilities used by the ShiningArcs rugby team. The OriHime robots at each location were controlled by the junior-high school student and ShiningArcs players so they could enjoy having a conversation while eating together.

# Members of the Board As of June 30, 2022

## Jun Sawada

### Chairman of the Board

Years Served as Member of the Board .....8  
 Shares Owned .....41,500

#### Brief Career Summary

April 1978: Joined Nippon Telegraph and Telephone Public Corporation  
 June 2008: Senior Vice President, Executive Manager of Corporate Strategy Planning Department, Representative Member of the Board of NTT Communications Corporation  
 June 2011: Executive Vice President, Executive Manager of Corporate Strategy Planning Department, Member of the Board of NTT Communications Corporation  
 June 2012: Senior Executive Vice President, Executive Manager of Corporate Strategy Planning Department, Representative Member of the Board of NTT Communications Corporation  
 June 2013: Senior Executive Vice President, Representative Member of the Board of NTT Communications Corporation  
 June 2014: Senior Executive Vice President, Representative Member of the Board of the Company  
 June 2016: Director and President, Chief Executive Officer of NTT Security Corporation  
 June 2018: President and Chief Executive Officer, Representative Member of the Board of the Company  
 August 2018: President and Chief Executive Officer, Representative Member of the Board of NTT, Inc.  
 June 2020: President and Chief Executive Officer, Representative Member of the Board of the Company  
 June 2022: Chairman and Representative Member of the Board of the Company (present post)

## Akira Shimada

Representative Member of the Board President  
 Chief Executive Officer (CEO)  
 President

Years Served as Member of the Board ..... 10  
 Shares Owned ..... 26,808

#### Brief Career Summary

April 1981: Joined Nippon Telegraph and Telephone Public Corporation  
 June 2007: Vice President of Corporate Strategy Planning of the Company  
 July 2007: General Manager of the Accounts and Finance Department of Nippon Telegraph and Telephone West Corporation  
 July 2009: General Manager of the General Affairs and Personnel Department of Nippon Telegraph and Telephone East Corporation  
 June 2011: Senior Vice President, General Manager of the General Affairs and Personnel Department, Member of the Board of Nippon Telegraph and Telephone East Corporation  
 June 2012: Senior Vice President, Head of the General Affairs Department, Member of the Board of the Company  
 June 2012: Member of the Board of Nippon Telegraph and Telephone West Corporation  
 June 2015: Executive Vice President, Head of General Affairs Department, Member of the Board of the Company  
 June 2018: Senior Executive Vice President, Representative Member of the Board of the Company  
 August 2018: Member of the Board of NTT, Inc.  
 October 2018: Senior Executive Vice President of NTT, Inc.  
 June 2020: Senior Executive Vice President, Representative Member of the Board of the Company  
 June 2022: President and Chief Executive Officer, Representative Member of the Board of the Company (present post)  
 June 2022: President and Chief Executive Officer, Representative Member of the Board of NTT, Inc. (present post)

## Katsuhiko Kawazoe

Representative Member of the Board  
 Senior Executive Vice President  
 In charge of technical strategy Chief Technology Officer (CTO)  
 Chief Information Officer (CIO)  
 Chief Digital Officer (CDO)

Years Served as Member of the Board .....2  
 Shares Owned ..... 13,300

#### Brief Career Summary

April 1987: Joined the Company  
 August 2003: Senior Research Engineer of the Cybersecurity Laboratories of the Cyber Communications Laboratory Group of the Company  
 October 2007: Senior Research Engineer of the Cyber Solutions Laboratories of the Cyber Communications Laboratory Group of the Company  
 July 2008: Vice President of Research and Development Planning Department of the Company  
 July 2014: Head of the Service Evolution Research Laboratory, Service Innovation Laboratory Group of the Company  
 July 2016: Head of the Service Innovation Laboratory Group of the Company  
 June 2018: Senior Vice President, Head of Research and Development Planning Department, Member of the Board of the Company  
 June 2020: Executive Vice President, Head of Research and Development Planning Department of the Company  
 June 2022: Senior Executive Vice President, Representative Member of the Board of the Company (present post)

## Takashi Hiroi

Representative Member of the Board Senior Executive Vice President  
 In charge of business strategy Chief Financial Officer (CFO)  
 Chief Compliance Officer (CCO)  
 Chief Human Resource Officer (CHRO)

Years Served as Member of the Board .....5  
 Shares Owned ..... 12,000

#### Brief Career Summary

April 1986: Joined the Company  
 May 2005: Vice President of Medium-Term Corporate Business Strategy of the Company  
 June 2008: Vice President of Strategic Business Development Division of the Company  
 July 2009: Vice President of Corporate Strategy Planning Department of the Company  
 June 2014: Head of Finance and Accounting Department of the Company  
 June 2015: Senior Vice President, Head of Finance and Accounting Department, Member of the Board of the Company  
 June 2020: Executive Vice President, General Manager of Accounts and Finance Department, Member of the Board of Directors of NTT DOCOMO, INC.  
 December 2020: Senior Executive Vice President, Representative Member of the Board of Directors of NTT DOCOMO, INC.  
 June 2022: Senior Executive Vice President, Representative Member of the Board of the Company (present post)

## Akiko Kudo

Member of the Board  
 Senior Vice President

Years Served as Member of the Board ..... —  
 Shares Owned .....2,900

#### Brief Career Summary

April 1990: Joined the Company  
 June 2014: Head of Public Relations Office of Corporate Planning of NTT Communications Corporation  
 July 2016: Director of Tokai Branch of West Japan Sales Division of NTT Communications Corporation  
 June 2019: Senior Vice President, Head of Fifth Sales Division of NTT Communications Corporation  
 April 2020: Deputy Senior Vice President of Fourth Business Solutions Department of Business Solution Division of NTT Communications Corporation  
 June 2020: Senior Vice President, Head of Public Relations Office, Deputy Head of Business Strategy of the Company  
 June 2022: Senior Vice President, Executive Manager of the Strategic Business Development Division of the Company (present post)

## Ken Sakamura

### Outside Member of the Board

Years Served as Member of the Board .....3  
 Shares Owned .....1,700

#### Brief Career Summary

April 2000: Professor of the Interfaculty Initiative in Information Studies and the Graduate School of Interdisciplinary Information Studies of the University of Tokyo  
 January 2002: Director of YNP Ubiquitous Networking Laboratory (present post)  
 April 2009: Director of Institute of Infrastructure Application of Ubiquitous Computing of the Interfaculty Initiative in Information Studies of the University of Tokyo  
 October 2014: President of Vitalizing Local Economy Organization by Open Data & Big Data (present post)  
 April 2017: Professor and Dean of Faculty of Information Networking for Innovation and Design of Toyo University  
 Head of Collaboration Hub for University and Business of Toyo University (present post)  
 June 2017: Emeritus Professor of the University of Tokyo (present post)  
 June 2019: Member of the Board of the Company (present post)  
 August 2019: President of Association for IoT Services Coordination (present post)

## Yukako Uchinaga

### Outside Member of the Board

Years Served as Member of the Board ..... —  
 Shares Owned .....0

#### Brief Career Summary

July 1971: Joined IBM Japan, Ltd.  
 April 2004: Director and Senior Executive Officer, IBM Japan, Ltd.  
 April 2007: Technical Advisor of IBM Japan, Ltd.  
 April 2007: Board Chair, Japan Women's Innovative Network, a non-profit organization (present post)  
 April 2008: Representative Director, Chairman of the Board, President & CEO of Berlitz Corporation  
 June 2008: Director, Sony Corporation  
 October 2009: Director and Executive Vice President, Benesse Holdings, Inc.  
 April 2013: Honorary Chairman, Berlitz Corporation  
 May 2013: Director, AEON, Co., Ltd.  
 June 2013: Director, HOYA CORPORATION (Chairperson of the Audit Committee)  
 September 2013: President and CEO, Globalization Research Institute, Inc. (present post)  
 March 2014: Director, DIC Corporation  
 June 2018: Director, TEIJIN LIMITED, Member of the Advisory Board, TEIJIN LIMITED (present post)  
 June 2021: Director, SINTOKOGIO, LTD. (present post)  
 June 2022: Member of the Board of the Company (present post)

## Ryoji Chubachi

### Outside Member of the Board

Years Served as Member of the Board ..... —  
 Shares Owned .....0

#### Brief Career Summary

April 1977: Joined Sony Corporation  
 June 2005: President, Representative Corporate Executive Officer and Member of the Board of Sony Corporation  
 April 2009: Vice Chairman, Representative Corporate Executive Officer and Member of the Board, Sony Corporation  
 April 2013: President of National Institute of Advanced Industrial Science and Technology  
 June 2018: Director, JAPAN POST BANK Co., Ltd. (present post)  
 April 2020: Grand Emeritus Advisor of National Institute of Advanced Industrial Science and Technology (present post)  
 June 2022: Member of the Board of the Company (present post)

## Koichiro Watanabe

### Outside Member of the Board

Years Served as Member of the Board ..... —  
 Shares Owned .....0

#### Brief Career Summary

April 1976: Joined The Dai-ichi Mutual Life Insurance Company  
 April 2010: Representative Director and President of The Dai-ichi Life Insurance Company, Limited  
 October 2016: Representative Director and President of The Dai-ichi Life Holdings, Inc.  
 October 2016: Representative Director and President of The Dai-ichi Life Insurance Company, Limited (a new company that took over the domestic life insurance business)  
 April 2017: Chairman of the Board and Representative Director of The Dai-ichi Life Holdings, Inc.  
 April 2017: Chairman of the Board and Representative Director of The Dai-ichi Life Insurance Company, Limited  
 March 2018: Member of the Board, Japan Tobacco Inc.  
 June 2020: Director, Chairman of the Board of Dai-ichi Life Holdings, Inc. (present post)  
 June 2020: Director, Chairman of the Board of The Dai-ichi Life Insurance Company, Limited (present post)  
 June 2022: Member of the Board of the Company (present post)

## Noriko Endo

### Outside Member of the Board

Years Served as Member of the Board ..... —  
 Shares Owned ..... 600

#### Brief Career Summary

June 1994: Joined DIAMOND Inc.  
 April 2004: Concurrently served as Director of Kyushu University and Head of Tokyo Office  
 March 2006: Deputy Editor-in-Chief of Diamond Weekly of DIAMOND Inc.  
 September 2013: Visiting Researcher at Policy Alternatives Research Institute of the University of Tokyo  
 April 2015: Project Professor of Graduate School of Media and Governance of Keio University  
 June 2016: Director, NTT DOCOMO, INC.  
 July 2018: Director of AIN HOLDINGS INC. (present post)  
 June 2019: Director of Hankyu Hanshin Holdings, Inc. (present post)  
 April 2020: Project Professor of Keio University Global Research Institute (present post)  
 March 2021: Director of Techpoint, Inc. (present post)  
 June 2021: Director of Japan Elevator Service Holdings Co., Ltd. (present post)  
 June 2022: Member of the Board of the Company (present post)

## Audit & Supervisory Board Members As of June 30, 2022

### Keiichiro Yanagi

#### Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... —  
Shares Owned ..... 0

#### Brief Career Summary

April 1984: Joined Nippon Telegraph and Telephone Public Corporation  
April 2009: President and Representative Director of NTT DATA Geonics Corporation (currently NTT DATA Luweave Corporation)  
June 2012: Head of General Affairs Department of NTT DATA Corporation  
July 2013: Senior Vice President, Head of Second Financial Sector of NTT DATA Corporation  
June 2016: Director and Executive Vice President, Head of General Affairs Department, concurrently serving as Head of Human Resources Department of NTT DATA Corporation  
July 2017: Director and Executive Vice President, Head of HR Headquarters, concurrently serving as Head of General Affairs Department of NTT DATA Corporation  
June 2018: Representative Director and Senior Executive Vice President, concurrently serving as Head of HR Headquarters of NTT DATA Corporation  
June 2020: Executive Advisor of NTT DATA Corporation  
June 2020: CEO and President of NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.  
June 2022: Full-Time Audit & Supervisory Board Member of the Company (present post)

### Kanae Takahashi

#### Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... 2  
Shares Owned ..... 6,500

#### Brief Career Summary

April 1987: Joined the Company  
July 2013: Deputy Head of the Internal Control Office of the General Affairs Department of the Company  
June 2014: Head of the Internal Control Office of the General Affairs Department of the Company  
June 2016: Executive Manager of the Kanagawa Division and Manager of the Kanagawa Branch of the Kanagawa Division, Member of the Board of Nippon Telegraph and Telephone East Corporation  
June 2016: Executive Manager of the Kanagawa Division and Manager of the Kanagawa Branch of the Kanagawa Division, Member of the Board of NTT EAST-MINAMI KANTO CORPORATION  
June 2019: Executive Vice President, Executive Manager of the Corporate Strategy Planning Department and the NW Facilities Business Department, Member of the Board of NTT InfraNet Co., Ltd.  
June 2020: Full-Time Audit & Supervisory Board Member of the Company (present post)

### Kensuke Koshiyama

#### Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... —  
Shares Owned ..... 0

#### Brief Career Summary

April 1984: Joined Board of Audit of Japan  
December 2016: Senior ASG of Secretariat of Board of Audit of Japan  
April 2017: Director General of 2nd Bureau of Board of Audit of Japan  
April 2018: Deputy Secretary General of Board of Audit of Japan  
December 2018: Secretary General of Board of Audit of Japan  
June 2022: Full-Time Audit & Supervisory Board Member of the Company (present post)

### Takashi Iida

#### Outside Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... 8  
Shares Owned ..... 7,700

#### Brief Career Summary

April 1974: Registered as attorney-at-law (Daini Tokyo Bar Association) (registration up-to-date)  
Joined Mori Sogo Law Offices (currently Mori Hamada & Matsumoto)  
April 1991: Deputy Chairman of the Daini Tokyo Bar Association  
April 1997: Executive Governor of the Japan Federation of Bar Associations  
April 2006: Chairman of the Daini Tokyo Bar Association  
April 2006: Vice President of the Japan Federation of Bar Associations January 2012: Established Kowa Law Office (present post)  
June 2012: Corporate Auditor (Part-Time) for Shimadzu Corporation  
June 2013: Corporate Auditor of JAFCO Co., Ltd (currently JAFCO Group Co., Ltd.)  
June 2013: Outside Director of Alps Electric Co., Ltd. (currently ALPS ALPINE CO., LTD.) (present post)  
June 2014: Outside Audit & Supervisory Board Member of the Company (present post)

### Hideki Kanda

#### Outside Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... 3  
Shares Owned ..... 0

#### Brief Career Summary

April 1977: Research Assistant of Faculty of Law of the University of Tokyo  
April 1980: Lecturer of Faculty of Law of Gakushuin University  
April 1982: Associate Professor of Faculty of Law of Gakushuin University  
April 1988: Associate Professor of Faculty of Law of the University of Tokyo  
April 1991: Associate Professor of Graduate Schools for Law and Politics of the University of Tokyo  
May 1993: Professor of Graduate Schools for Law and Politics of the University of Tokyo  
April 2016: Professor of Professional School of Law (Law School) of Gakushuin University (present post)  
June 2016: Emeritus Professor of the University of Tokyo (present post)  
June 2017: Director of Sumitomo Mitsui Trust Bank, Limited (present post)  
June 2019: Outside Audit & Supervisory Board Member of the Company (present post)

### Kaoru Kashima

#### Outside Audit & Supervisory Board Member

Years Served as Audit & Supervisory Board Member: ..... 3  
Shares Owned ..... 0

#### Brief Career Summary

November 1981: Joined Showa Audit Corporation (currently Ernst & Young ShinNihon LLC)  
April 1985: Registered as a certified public accountant (registration up-to-date)  
June 1996: Partner of Showa Ota & Co. (currently Ernst & Young ShinNihon LLC)  
June 2002: Senior Partner of ShinNihon & Co. (currently Ernst & Young ShinNihon LLC)  
July 2006: In charge of personnel of HR Development, Headquarters of ShinNihon & Co.  
September 2010: Managing Director of ShinNihon & Co. (currently Ernst & Young ShinNihon LLC) In charge of Public Relations Office of Corporate Culture Promotion Office  
July 2012: Managing Director, General Manager of Knowledge Headquarters of Ernst & Young ShinNihon LLC  
July 2013: Representative Director of Ernst & Young Institute Co., Ltd.  
June 2019: Outside Audit & Supervisory Board Member of the Company (present post)  
June 2019: Director of Sumitomo Mitsui Trust Bank, Limited  
March 2020: Audit & Supervisory Board Member of Kirin Holdings Company, Limited (present post)  
June 2021: Director of Sumitomo Mitsui Trust Holdings, Inc. (present post)

### Executive Officers

#### Akira Shimada

Representative Member of the Board  
President  
CEO (Chief Executive Officer)

#### Katsuhiko Kawazoe

Representative Member of the Board  
Senior Executive Vice President In charge of technical strategy  
CTO (Chief Technology Officer)  
CIO (Chief Information Officer)  
CDO (Chief Digital Officer)

#### Takashi Hiroi

Representative Member of the Board  
Senior Executive Vice President In charge of business strategy  
CFO (Chief Financial Officer)  
CCO (Chief Compliance Officer)  
CHRO (Chief Human Resource Officer)

#### Tadao Yanase

Senior Executive Vice President Head of Business Strategy In charge of economic security  
CBDO (Chief Business Development Officer)

#### Atsuko Oka

Executive Vice President Head of Research and Development Planning

#### Shinichi Yokohama

Executive Vice President  
Executive Vice President Head of Security and Trust  
CISO (Chief Information Security Officer)

#### Hideaki Ozaki

Senior Vice President, Head of Global Business

#### Kazuhiko Nakayama

Senior Vice President, Head of Finance and Accounting

#### Akiko Kudo

Member of the Board Senior Vice President  
Head of Strategic Business Development

#### Takashi Taniyama

Senior Vice President, Head of Corporate Strategy Planning

#### Kei Ikeda

Senior Vice President, Head of Technology Planning

#### Kyoko Yamamoto

Senior Vice President, Head of General Affairs

#### Makiko Sekine

Senior Vice President, Head of Public Relations

#### Natsuko Fujiki

Senior Vice President, Head of Internal Audit

## Number of Board Members and Audit & Supervisory Board Members

As of March 31, 2021

		Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Number of Board Members		NTT	People	12	15	8	8
Inside	Male			10	10	4	4
	Female			0	1	0	0
	Total			10	11	4	4
Outside independent	Male			2	3	3	3
	Female			0	1	1	1
	Total			2	4	4	4
Ratio of female Board Members		NTT	%	0	13.3	12.5	12.5
Number of Audit & Supervisory Board Members		NTT	People	5	5	5	5
Inside	Male			1	1	1	1
	Female			1	1	1	1
	Total			2	2	2	2
Outside independent	Male			2	2	2	2
	Female			1	1	1	1
	Total			3	3	3	3
Ratio of female Audit & Supervisory Board Members		NTT	%	40	40	40	40

## Compensation of Board of Directors, Audit & Supervisory Board, Outside independent Audit & Supervisory Board Members, Members of the Board and Audit & Supervisory Board Members

As of March 31, 2021

		Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Board of Directors	Number of meetings	NTT	—	13	11	13	15
	Attendance		%	99.1	100	99.3	99.0
	Outside independent board member attendance		%	100	100	100	98.3
Audit & Supervisory Board	Number of meetings	NTT	—	24	23	20	20
	Attendance		%	99.2	98.6	100	100
	Outside independent Audit & Supervisory Board member attendance		%	96.6	97.6	100	100
Appointment and Compensation Committee		NTT	—	1	5	5	6
Nomination Committee			—	—	—	—	2
Compensation Committee			—	—	—	—	1
Total compensation of members of the board and Audit & Supervisory Board members (Number of people) *1-3	Members of the board	NTT	Million yen	547 (13)	545 (11)	387 (12)	377 (4)
	Audit & Supervisory Board members		People	74 (2)	74 (2)	74 (3)	86 (2)
	Board and Outside Audit		People	75 (5)	97 (9)	105 (7)	121 (7)
	Total		People	696 (20)	719 (22)	566 (22)	584 (13)
Compensation of NTT's Independent auditors	Compensation for audit services	Consolidated	Million yen	4,433	5,106	4,891	5,053
	Compensation for non-audit services		Million yen	299	267	344	392
	Total		Million yen	4,732	5,373	5,235	5,445
The ratio of the compensation per director to the compensation per employee		NTT	—	5.3:1	4.3:1	4.7:1	5.9:1

\*1 May include compensation to Board and Audit & Supervisory Board members who retired at the conclusion of the Ordinary General Meeting of Shareholders for the same fiscal year. \*2 Total compensation of members of the board includes bonuses for each fiscal year.

\*3 In addition to the above, may include bonuses received by members of the board who are also employees for their service as employees, depending on the fiscal year.

## Reports to the corporate ethics help line by type of violation

		2018			2019			2020			2021		
		Number of Reports			Number of Reports			Number of Reports			Number of Reports		
		Disciplinary actions	Warnings		Disciplinary actions	Warnings		Disciplinary actions	Warnings		Disciplinary actions	Warnings	
Overall	Number of Reports	334	18 (1)	77	342	35 (3)	81	346	16 (1)	33	314	27 (2)	14
	Compliance Violations	95	18 (1)	77	116	35 (3)	81	49	16 (1)	33	41	27 (2)	14
	Violation of Internal Rules	95	18 (1)	77	116	35 (3)	81	49	16 (1)	33	41	27 (2)	14
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violation	239	—	—	226	—	—	297	—	—	273	—	—
Harassment	Number of Reports	184	10 (1)	34	210	19	48	203	11 (1)	11	197	15	6
	Compliance Violations	44	10 (1)	34	67	19	48	22	11 (1)	11	21	15	6
	Violation of Internal Rules	44	10 (1)	34	67	19	48	22	11 (1)	11	21	15	6
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violation	140	—	—	143	—	—	181	—	—	176	—	—
Misconduct	Number of Reports	44	2	10	45	7 (1)	14	60	2	11	48	3	2
	Compliance Violations	12	2	10	21	7 (1)	14	13	2	11	5	3	2
	Violation of Internal Rules	12	2	10	21	7 (1)	14	13	2	11	5	3	2
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violations (Bribery, Accounting Fraud, Disguised Contracting, etc.)	32	—	—	24	—	—	47	—	—	43	—	—
Violation of the rules of employment	Number of Reports	39	1	16	23	2	9	21	1	6	14	2	2
	Compliance Violations	17	1	16	11	2	9	7	1	6	4	2	2
	Violation of Internal Rules	17	1	16	11	2	9	7	1	6	4	2	2
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violation	22	—	—	12	—	—	14	—	—	10	—	—
Fraud (personal use of company funds)	Number of Reports	28	3	5	39	6 (2)	6	19	2	2	16	5 (1)	2
	Compliance Violations	8	3	5	12	6 (2)	6	4	2	2	7	5 (1)	2
	Violation of Internal Rules	8	3	5	12	6 (2)	6	4	2	2	7	5 (1)	2
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violation	20	—	—	27	—	—	15	—	—	9	—	—
Other	Number of Reports	39	2	12	25	1	4	43	0	3	39	2 (1)	2
	Compliance Violations	14	2	12	5	1	4	3	0	3	4	2 (1)	2
	Violation of Internal Rules	14	2	12	5	1	4	3	0	3	4	2 (1)	2
	Violation of Laws and Regulations	0	0	0	0	0	0	0	0	0	0	0	0
	No Violation	25	—	—	20	—	—	40	—	—	35	—	—

\* Numbers in parentheses indicate dismissals

The Whistleblowing Mechanism Guidelines, revised in December 2016 by the Consumer Affairs Agency, recommend that neutral and fair third-party assessments be carried out. We had such an assessment carried out in May 2017 and received the comment that overall, a whistleblowing mechanism is in place and is being administered appropriately.

**Details of assessment** ● Investigation of the mechanism and operational status of the help line in order to verify its effectiveness in terms of utilization and reliability. ● Sample survey on the establishment of regulations and responses to whistleblowers, etc. ● Confirmation of compliance with the Whistleblowing Mechanism Guidelines. ● Interviews with administrators and discussion about operational issues.

**Disciplinary Actions against Confirmed Violations** A compliance violation or breach of the NTT Group Corporate Ethics Charter is dealt with using the disciplinary measures taken in accordance with the disciplinary code established at each Group company. This includes pay cuts and work suspension, and may also be reflected in assessments (evaluations) and personnel transfers.

## Employment in the NTT Group

			Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Total number of employees			C	People	307,894	319,039	324,667	333,840
Employees by region	Domestic	179,902			183,824	186,228	185,778	
	Overseas	127,992			135,215	138,439	148,062	
	Percentage of overseas employees	41.6			42.4	42.6	44.4	
Number of employees by gender			E	People	106,997	110,207	104,281	103,143
	Male	88,756			88,724	84,169	82,952	
	Female	18,241			21,483	20,112	20,191	
	Percentage of female employees	17			19.5	19.3	19.6	
NTT			NTT	People	2,562	2,494	2,496	2,486
	Male	2,273			2,200	2,180	2,144	
	Female	289			294	316	342	
	Number of temporary employees included in the above	68			65	62	66	
Total managers*1			E	People	25,736	25,616	25,520	25,955
	Male	24,268			23,991	23,730	23,775	
	Female	1,468			1,625	1,790	2,180	
	Percentage of female managers	5.7			6.3	7.0	8.4	
Average age			NTT	Years	41.3	41.1	41.8	41.8
	Male	41.7			41.7	42.4	42.4	
	Female	37.6			37.1	37.7	37.7	
Average years of employment			NTT	Years	16.8	16.7	16.7	16.7
	Male	17.2			17.1	17.3	17.3	
	Female	13.5			13.3	12.9	12.7	
Average annual compensation			NTT	Yen	5,913,532	5,954,975	6,022,537	6,080,220
			A		6,449,078	6,520,047	6,544,513	6,561,798
Ratio of basic salary per employee and remuneration of women to men*2	Managers	Basic salary	D	—	—	1:1.02	1:1.02	1:1.02
		Remuneration			—	1:1.03	1:1.03	1:1.03
	Non-managerial employees	Basic salary			—	1:1.17	1:1.15	1:1.17
		Remuneration			—	1:1.17	1:1.15	1:1.17
Number of new graduate hires			A	People	1,721	1,877	2,025	2,232
	Male	1,170			1,270	1,361	1,499	
	Female	551			607	664	733	
	Percentage of female employees	32			32.3	32.8	32.8	
Number of foreign national hires			D	People	75	55	42	43
	Male	44			31	22	20	
	Female	31			24	20	23	
Ratio of employees with disabilities*3			NTT	%	2.7	2.7	2.69	2.80
			A		2.6	2.6	2.66	2.66
			B		2.4	2.4	2.45	2.47
Number of re-employed members			D	People	16	11	14	27
	Male	0			2	0	0	
	Female	16			9	14	27	
Turnover rate (including mandatory retirement)			D	%	6.1	9.9	7.1	6.7
					3.7	3.7	2.8	3.4
Continuous Employment of Employees at Retirement Age			D	People	14,000	10,000	11,000	11,000
Percentage of NWJ membership			B	%	84.8	79.4	79.4	78.1
Enhancing employee satisfaction			B	Points	3.8	3.79	3.9	—
Employee engagement			B	%	—	—	—	57

\*1 Section manager level or higher \*2 We have a single pay scale for men and women. Differences are due to age and job grade. \*3 As of June 1 of the following year

## Number of Employees Using Company Systems, Working Hours, etc.

		Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Special leave (childbirth)		D	People	1,081	1,164	1,169	1,335
Number of employees taking childcare leave		D	People	2,370	2,394	2,568	2,804
	Male			169	257	372	540
	Female			2,201	2,137	2,196	2,264
	Ratio that returned to work		%	98.1	99.2	99.2	99.3
Number of employees taking shortened working hours for childcare		D	People	2,530	2,042	2,687	2,251
	Male			39	36	40	44
	Female			2,491	2,006	2,647	2,207
Number of employees taking nursing care leave		D	People	94	58	83	73
	Male			42	28	37	31
	Female			52	30	46	42
Number of employees taking shortened working hours for nursing care		D	People	86	67	77	49
	Male			36	31	34	20
	Female			50	36	43	29
Leave programs		D	Days	19.3	17.7	16.6	17.7
Paid vacation	Male		%	97	89.3	84.1	89.1
	Female			93.8	85.8	78.9	86.9
	Percentage of total entitled leave			96.4	88.7	83	88.6
Working hours	Total hours actually worked	NTT	Hours	1,933	1,906	1,950	1,831
	Average annual overtime hours			22.2	23	24.7	242
	Overtime hours	D	Hours	—	17.5	18	20.2
	Overtime pay	D	Yen	—	48,180	57,096	62,160
Number of employees taking leave for mental health		A	People	1,550	1,815	1,738	2,335
	Male			1,202	1,323	1,227	1,551
	Female			348	492	511	784
Number of industrial accidents		A	Cases	36	71	28	27
	Operational accidents			8	7	2	8
	Commuting accidents			28	64	26	19
	Frequency rate		—	0.09	0.11	0.02	0.09
	Number of accidents causing injury or death during construction work*	A	Cases	3	2	1	4
Implementation rate of specified health guidance		B	%	21.90	20.60	21.9	20.2
Completion rate of specified health guidance		B	%	33.30	40.20	32.8	32.9

\* Construction by partner companies and directly managed construction

## Status of Human Rights Initiatives

	Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Number of confirmed cases of human rights violations	B	Cases	24	29	33	21
Human rights training and attendance	B	%	96.6	97.3	97.2	96.0

## Status of Human Resources Development

	Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021	
Average annual training	B	Hours per employee	Hours	28.0	30.0	24.0	34.0
		Cost per employee	Ten thousand yen	10.9	11.3	9.1	9.0
Job challenge	B	Use	People	297	296	199	264
Job offering		Transfer		113	107	86	106
Number of qualified employees (cumulative total)		B	People	38,437	48,564	48,754	51,185

## Status of Supply Chain Initiatives

	Unit	FY2018	FY2019	FY2020	FY2021	
Percentage of critical suppliers that we sent CSR surveys (SAQ) to, and percentage that were responded to	Sent	%	100	100	100	100
	Responded	%	98	100	100	100
Number of recognized high-risk suppliers	Cases	0	0	0	0	
Percentage of issues recognized as actual risks that were corrected at suppliers	%	100	100	100	100	
Percentage of employees in procurement trained on ESG	Sent	%	100	100	100	100

## Safe, Secure, and Resilient Society Related Indicators

			Results			
			FY2018	FY2019	FY2020	FY2021
Reinforce information security	Suspension of telecommunications services due to cyber attacks from the outside*1	Number of service suspensions	–	0	0	0
	Number of incidents of personal information leaks due to cyber attacks from the outside*1	Number of incidents of personal information leaks	–	1	1	0
Personal information protection	Zero incidents of personal information leaks	Number of incidents of personal information leaks	1	1	0	3
Ensure Stability and Reliability of Communications Services*4	Provide stable telecommunications services free of major communications problems	Stable service provision rate*2	100%	100%	99.99%	100%
		Number of major accidents*3	0	0	2	1

\*1 Newly established in fiscal 2020

\*2  $[1 - \text{total hours under the impact of major accidents (number of affected users} \times \text{hours of major accidents)} / \text{total hours of major service provision (number of users} \times 24 \text{ hours} \times 365 \text{ days)}] \times 100\%$

\*3 Number of accidents that led to a suspension of telecommunications services or a decline in communications quality that meet the following criteria regarding duration and number of people affected:

- Emergency call services (110, 119, etc.): at least 1 hour affecting at least 30,000 users
- Voice services other than emergency calls: at least 2 hours affecting at least 30,000 users, or at least 1 hour affecting at least 100,000 users
- Internet-related services (free of charge): at least 12 hours affecting at least 1 million users, or at least 24 hours affecting at least 100,000 users
- Other services: more than 2 hours affecting 30,000 users, or more than one hour affecting 1 million users

\*4 Targets of statistics: Four telecommunications business companies (NTT East, NTT West, NTT Communications, and NTT DOCOMO)

## Employee Volunteering

		Scope of Disclosure	Unit	FY2018	FY2019	FY2020	FY2021
Employee participation rate		B	%	69	54.9	18	37.5
Results of Citizenship Activities*	Number of activities	B	Cases	3,977	3,713	2,307	4,383
	Number of participants		People	123,734	100,834	33,545	69,679
	Expenditures		Million yen	8,030	6,632	13,359	6,182
Environmental conservation	Number of activities	B	Cases	1,106	894	351	419
	Number of participants		People	76,889	60,714	17,669	26,927
	Expenditures		Million yen	796	1,408	377	1,068
Social welfare	Number of activities	B	Cases	513	534	502	313
	Number of participants		People	9,559	7,516	5,631	18,614
	Expenditures		Million yen	1,860	439	652	171
Education and cultural promotion	Number of activities	B	Cases	388	341	292	254
	Number of participants		People	2,845	2,544	1,263	3,094
	Expenditures		Million yen	2,423	2,656	10,375	2,148
Local community development and dialogue	Number of activities	B	Cases	1,507	1,609	669	818
	Number of participants		People	26,868	25,396	5,391	12,117
	Expenditures		Million yen	1,126	1,606	1,210	944
International exchange activities	Number of activities	B	Cases	55	13	11	7
	Number of participants		People	320	411	6	9
	Expenditures		Million yen	72	202	205	0.4
Sports promotion	Number of activities	B	Cases	224	161	72	318
	Number of participants		People	3,752	234	51	5,021
	Expenditures		Million yen	1,579	118	68	548
Other (e.g., activities that combine multiple categories)	Number of activities	B	Cases	184	161	410	2,254
	Number of participants		People	3,502	4,019	3,534	3,897
	Expenditures		Million yen	174	203	471	1,303
Breakdown of activities by type	Community Investments	B	%	60	67.1	22.6	50.7
	Charitable Donations			15.6	13.7	66.3	40.6
	Commercial initiatives			24.5	19.2	11.1	8.7

\* Expenses related to corporate citizenship include monetary donations, donation of goods, effective costs of opening facilities to the public, personnel costs of employee participation, and costs for implementing corporate citizenship programs (work outsourcing fees, transportation costs, etc.).

# Independent Assurance Statement



Independent Assurance Statement

November 18, 2022

Mr. Akira Shimada  
President and Chief Executive Officer, Representative Member of the Board  
NIPPON TELEGRAPH AND TELEPHONE CORPORATION

**1. Purpose**  
We, Sustainability Accounting Co., Ltd., have been engaged by NIPPON TELEGRAPH AND TELEPHONE CORPORATION ("the Company") to provide limited assurance on the Company's Performance Indicators (covered indicators are listed in the appendix) during the fiscal year 2021 (April 1, 2021 to March 31, 2022) reported on NTT Group Sustainability Report 2022. The purpose of this process is to express our conclusion on whether the Performance Indicators were calculated in accordance with the Company's standards. The Company's management is responsible for calculating the Performance Indicators. Our responsibility is to independently carry out a limited assurance engagement and to express our assurance conclusion.

**2. Procedures Performed**  
We conducted our assurance engagement in accordance with International Standard on Assurance Engagement 3000 (ISAE 3000) and International Standard on Assurance Engagement 3410 (ISAE 3410). The key procedures we carried out included:


- Interviewing the Company's responsible personnel to understand the Company's standards
- Reviewing the Company's standards
- Performing crosschecks on a sample basis and performing a recalculation to determine whether the Performance Indicators were calculated in accordance with the Company's standards.

**3. Conclusion**  
Based on the procedures performed, nothing has come to our attention that causes us to believe that the Performance Indicators have not been calculated in all material respects in accordance with the Company's standards.

We have no conflict of interest relationships with the Company.



Takashi Fukushima  
Representative Director  
Sustainability Accounting Co., Ltd.



(Appendix)  
Lists of Performance Indicators

Themes	Indicators	Results of the fiscal year 2021
Ensuring the positive coexistence of nature and humanity	Greenhouse gas emissions (Scope 1,2,3)	Scope 1: 14 ten thousand t CO <sub>2</sub> e Scope 2/market-based: 270 ten thousand t CO <sub>2</sub> e Scope 3 (categories 1,2,3,4,5,6,7,11, 12,13,14,15): 2,082 ten thousand t CO <sub>2</sub> e
	Total waste	47.6 ten thousand t
	Water withdrawal (tap water)	475 ten thousand m <sup>3</sup>
Improving prosperity for all people and cultures	Number of incidents of personal information leaks	3 cases
	Suspension of telecommunications services due to cyber attacks from the outside	0 case
	Number of incidents of personal information leaks due to cyber attacks from the outside*	0 case
	Stable service provision rate	100%
Maximizing well-being for all	Number of major accidents	1 case
	Ratio of woman in senior management positions (Board of Directors, Audit & Supervisory Board and Executive Officers)	18%
	Ratio of female managers	8.7%
	Ratio of newly appointed female managers	29.1%
	Number of male employees taking childcare leave	540 People
	Ratio of employees with disabilities	NTT 2.60%, major group 2.66%, domestic group 2.47%
	Ratio of Basic Employee Salary and Remuneration of Women to Men	1:1.02 in basic salary and 1:1.03 in total remuneration for management 1:1.17 in basic salary and 1:1.17 in total remuneration for general staff
	Number of confirmed cases of human rights violations	21 cases
	Human rights training and attendance	99.4%
	Number of recognized high-risk suppliers	0 cases
	Number of industrial accidents	27 cases
	Number of accidents causing injury or death during construction work	4 cases
	Implementation rate of specified health guidance	20.2%
	Completion rate of specified health guidance	32.9%
	Employee engagement (Ratio of affirmative responses)	57%
Total number of participants in citizenship activities	70 thousand people	

Boundary of each Performance Indicators is stated in NTT Group Sustainability Report 2022

\*Ratio of female directors: Six major domestic companies (NTT, NTT East, NTT West, NTT Communications, NTT DATA, NTT DOCOMO)

# GRI content index

The NTT Group Sustainability Report 2022 has been prepared in accordance with the GRI Reporting Standards 2016/2018/2019/2020: Core option.

## GRI 102: General Disclosures 2016

Information Disclosure	Description	Report Page	
<b>Organizational profile</b>			
● 102-1	Name of the organization a. Name of the organization.	P002	Scope of Disclosure
● 102-2	Activities, brands, products, and services a. A description of the organization's activities. b. Primary brands, products, and services, including an explanation of any products or services that are banned in certain markets.	P10-11 (A)	NTT at a Glance
● 102-3	Location of headquarters a. Location of the organization's headquarters.	P002	Inquiries
● 102-4	Location of operations a. Number of countries where the organization operates, and the names of countries where it has significant operations and/or that are relevant to the topics covered in the report.	P002	Scope of Disclosure (Reference) NTT Group companies <a href="https://group.ntt/en/group/gnavi/">https://group.ntt/en/group/gnavi/</a>
● 102-5	Ownership and legal form a. Nature of ownership and legal form.	P002	Scope of Disclosure
● 102-6	Markets served a. Markets served, including: i. geographic locations where products and services are offered; ii. sectors served; and iii. types of customers and beneficiaries.	P10-11 (A)	NTT at a glance
● 102-7	Scale of the organization a. Scale of the organization, including: i. total number of employees; ii. total number of operations; iii. net sales (for private sector organizations) or net revenues (for public sector organizations); iv. total capitalization (for private sector organizations) broken down in terms of debt and equity; and v. quantity of products or services provided.	P78-87 (A)	Financial Data Summary
● 102-8	Information on employees and other workers a. Total number of employees by employment contract (permanent and temporary), by gender. b. Total number of employees by employment contract (permanent and temporary), by region. c. Total number of employees by employment type (full-time and part-time), by gender. d. Whether a significant portion of the organization's activities are performed by workers who are not employees. If applicable, a description of the nature and scale of work performed by workers who are not employees. e. Any significant variations in the numbers reported in Disclosures 102-8-a, 102-8-b, and 102-8-c (such as seasonal variations in the tourism or agricultural industries). f. An explanation of how the data have been compiled, including any assumptions made.	P165	Data List
● 102-9	Supply chain a. A description of the organization's supply chain, including its main elements as they relate to the organization's activities, primary brands, products, and services.	P127 P128	Feature 3: Promoting Supplier Engagement Reinforce Supply Chain Management
● 102-10	Significant changes to the organization and its supply chain a. Significant changes to the organization's size, structure, ownership, or supply chain, including: i. Changes in the location of, or changes in, operations, including facility openings, closings, and expansions; ii. Changes in the share capital structure and other capital formation, maintenance, and alteration operations (for private sector organizations); and iii. Changes in the location of suppliers, the structure of the supply chain, or relationships with suppliers, including selection and termination.	Not applicable	
● 102-11	Precautionary Principle or approach a. Whether and how the organization applies the Precautionary Principle	P055-067 P073-078	<ul style="list-style-type: none"> <li>● NTT Group Disclosures in Line with TCFD Recommendations</li> <li>● Establishing and thoroughly complying with ethical standards</li> </ul>
● 102-12	External initiatives a. A list of externally-developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes, or which it endorses.	P035 P121	<ul style="list-style-type: none"> <li>● Pursuing Initiatives across the Industry for Energy-Efficient ICT Devices</li> <li>● NTT Group CSIRT Activities</li> </ul>
● 102-13	Membership of associations a. A list of the main memberships of industry or other associations, and national or international advocacy organizations.	P003	List of Memberships

●: Required contents disclosures in accordance with the Core option / (A): Annual Report 2022

Information Disclosure	Description	Report Page	
<b>Strategy</b>			
● 102-14	Statement from senior decision-maker a. A statement from the most senior decision-maker of the organization (such as CEO, chair, or equivalent senior position) about the relevance of sustainability to the organization and its strategy for addressing sustainability.	P006-007 P018-019 P023-024	<ul style="list-style-type: none"> <li>• CEO Message</li> <li>• Message from Management (Senior Executive Vice President)</li> <li>• Message from Management (Senior Executive Vice President)</li> </ul> (Reference) Message from the President <a href="https://group.ntt.jp/csr/message/">https://group.ntt.jp/csr/message/</a>
102-15	Key impacts, risks, and opportunities a. A description of key impacts, risks, and opportunities.	P055-067 P073-078 P085-107	<ul style="list-style-type: none"> <li>• NTT Group Disclosures in Line with TCFD Recommendations</li> <li>• Establishing and thoroughly complying with ethical standards</li> <li>• Future with the power of technology</li> </ul>
<b>Ethics and integrity</b>			
● 102-16	Values, principles, standards, and norms of behavior a. A description of the organization's values, principles, standards, and norms of behavior.	P011-014 P032-034 P073-078 P129-139	<ul style="list-style-type: none"> <li>• NTT Group Global Sustainability Charter</li> <li>• NTT Group Environment and Energy Vision</li> <li>• Establishing and thoroughly complying with ethical standards</li> <li>• Respect for human rights</li> </ul>
102-17	Mechanisms for advice and concerns about ethics a. A description of internal and external mechanisms for: i. seeking advice about ethical and lawful behavior, and organizational integrity; and ii. reporting concerns about unethical or unlawful behavior, and organizational integrity.	P073-078	Establishing and thoroughly complying with ethical standards
<b>Governance</b>			
● 102-18	Governance structure a. Governance structure of the organization, including committees of the highest governance body. b. Committees responsible for decision-making on economic, environmental, and social topics.	P014 P056 P067 P079-081 P073-078	<ul style="list-style-type: none"> <li>• Sustainability Promotion System</li> <li>• Environmental Management</li> <li>• Environmental Accounting</li> <li>• Thoroughly reinforcing corporate governance and compliance</li> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-19	Delegating authority a. Process for delegating authority for economic, environmental, and social topics from the highest governance body to senior executives and other employees.	P014	Sustainability Promotion System
102-20	Executive-level responsibility for economic, environmental, and social topics a. Whether the organization has appointed an executive-level position or positions with responsibility for economic, environmental, and social topics. b. Whether post holders report directly to the highest governance body.	P014	Sustainability Promotion System
102-21	Consulting stakeholders on economic, environmental, and social topics a. Processes for consultation between stakeholders and the highest governance body on economic, environmental, and social topics. b. If consultation is delegated, describe to whom it is delegated and how the resulting feedback is provided to the highest governance body.	P015-017	Stakeholder Engagement
102-22	Composition of the highest governance body and its committees a. Composition of the highest governance body and its committees by: i. executive or non-executive; ii. independence; iii. tenure on the governance body; iv. number of each individual's other significant positions and commitments, and the nature of the commitments; v. gender; vi. membership of under-represented social groups; vii. competencies relating to economic, environmental, and social topics; and viii. stakeholder representation.	P079-081 P161-163	<ul style="list-style-type: none"> <li>• Thoroughly reinforcing corporate governance and compliance</li> <li>• Data List</li> </ul>
102-23	Chair of the highest governance body a. Whether the chair of the highest governance body is also an executive officer in the organization. b. If the chair is also an executive officer, describe his or her function within the organization's management and the reasons for this arrangement.	P079-081	Thoroughly reinforcing corporate governance and compliance
102-24	Nominating and selecting the highest governance body a. Nomination and selection processes for the highest governance body and its committees. b. Criteria used for nominating and selecting highest governance body members, including whether and how: i. stakeholders (including shareholders) are involved; ii. diversity is considered; iii. independence is considered; and iv. expertise and experience relating to economic, environmental, and social topics are considered.	P079-081	Thoroughly reinforcing corporate governance and compliance

●: Required contents disclosures in accordance with the Core option / (A): Annual Report 2022

Information Disclosure	Description	Report Page	
102-25	Conflicts of interest a. Processes for the highest governance body to ensure conflicts of interest are avoided and managed. b. Whether conflicts of interest are disclosed to stakeholders, including, as a minimum: i. Cross-board membership; ii. Cross-shareholding with suppliers and other stakeholders; iii. Existence of controlling shareholder; and iv. Related party disclosures.	P079-081	Thoroughly reinforcing corporate governance and compliance
102-26	Role of highest governance body in setting purpose, values, and strategy a. Highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental, and social topics.	P014 P079-081	<ul style="list-style-type: none"> <li>• Sustainability Promotion System</li> <li>• Thoroughly reinforcing corporate governance and compliance</li> </ul>
102-27	Collective knowledge of highest governance body a. Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental, and social topics.	P079-081	Thoroughly reinforcing corporate governance and compliance
102-28	Evaluating the highest governance body's performance a. Processes for evaluating the highest governance body's performance with respect to governance of economic, environmental, and social topics. b. Whether such evaluation is independent or not, and its frequency. c. Whether such evaluation is a self-assessment. d. Actions taken in response to evaluation of the highest governance body's performance with respect to governance of economic, environmental, and social topics, including, as a minimum, changes in membership and organizational practice.	P70-71 (A)	Board of Directors, Audit & Supervisory Board, Activities of the Audit & Supervisory Board
102-29	Identifying and managing economic, environmental, and social impacts a. Highest governance body's role in identifying and managing economic, environmental, and social topics and their impacts, risks, and opportunities—including its role in the implementation of due diligence processes. b. Whether stakeholder consultation is used to support the highest governance body's identification and management of economic, environmental, and social topics and their impacts, risks, and opportunities.	P014 P055-067 P073-078	<ul style="list-style-type: none"> <li>• Sustainability Promotion System</li> <li>• NTT Group Disclosures in Line with TCFD Recommendations</li> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-30	Effectiveness of risk management processes a. Highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental, and social topics.	P014 P073-078	<ul style="list-style-type: none"> <li>• Sustainability Promotion System</li> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-31	Review of economic, environmental, and social topics a. Frequency of the highest governance body's review of economic, environmental, and social topics and their impacts, risks, and opportunities.	P014 P073-078	<ul style="list-style-type: none"> <li>• Sustainability Promotion System</li> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-32	Highest governance body's role in sustainability reporting a. The highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material topics are covered.	P014	Sustainability Promotion System
102-33	Communicating critical concerns a. Process for communicating critical concerns to the highest governance body.	P015-017 P073-078	<ul style="list-style-type: none"> <li>• Stakeholder Engagement</li> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-34	Nature and total number of critical concerns a. Total number and nature of critical concerns that were communicated to the highest governance body. b. Mechanism(s) used to address and resolve critical concerns.	P073-078	<ul style="list-style-type: none"> <li>• Establishing and thoroughly complying with ethical standards</li> </ul>
102-35	Remuneration policies a. Remuneration policies for the highest governance body and senior executives for the following types of remuneration: i. Fixed pay and variable pay, including performance-based pay, equity-based pay, bonuses, and deferred or vested shares; ii. Sign-on bonuses or recruitment incentive payments; iii. Termination payments; and iv. Clawbacks. b. Retirement benefits, including the difference between benefit schemes and contribution rates for the highest governance body, senior executives, and all other employees.	P079-081	Thoroughly reinforcing corporate governance and compliance
102-36	Process for determining remuneration. a. Process for determining remuneration. b. Whether remuneration consultants are involved in determining remuneration and whether they are independent of management. c. Any other relationships that the remuneration consultants have with the organization.	P079-081	Thoroughly reinforcing corporate governance and compliance
102-37	Stakeholders' involvement in remuneration a. How stakeholders' views are sought and taken into account regarding remuneration. b. If applicable, the results of votes on remuneration policies and proposals.	P079-081	Thoroughly reinforcing corporate governance and compliance

●: Required contents disclosures in accordance with the Core option / (A): Annual Report 2022

Information Disclosure	Description	Report Page	
102-38	Annual total compensation ratio a. Ratio of the annual total compensation for the organization's highest-paid individual in each country of significant operations to the median annual total compensation for all employees (excluding the highest- paid individual) in the same country.	P163	Data List
102-39	Percentage increase in annual total compensation ratio. Ratio of the percentage increase in annual total compensation for the organization's highest-paid individual in each country of significant operations to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual) in the same country.	Not applicable	
<b>Stakeholder Engagement</b>			
● 102-40	List of stakeholder groups. A list of stakeholder groups engaged by the organization.	P015-017	Stakeholder Engagement
● 102-41	Collective bargaining agreements a. Percentage of total employees covered by collective bargaining	P165	Data List
● 102-42	Identifying and selecting stakeholders a. The basis for identifying and selecting stakeholders with whom to engage.	P015-017	Stakeholder Engagement
● 102-43	Approach to stakeholder engagement a. The organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.	P015-017	Stakeholder Engagement
● 102-44	Key topics and concerns raised a. Key topics and concerns that have been raised through stakeholder engagement, including: i. how the organization has responded to those key topics and concerns, including through its reporting; and ii. the stakeholder groups that raised each of the key topics and concerns.	P015-017 P073-078	<ul style="list-style-type: none"> <li>Stakeholder Engagement</li> <li>Establishing and thoroughly complying with ethical standards</li> </ul>
<b>Reporting Practice</b>			
● 102-45	Entities included in the consolidated financial statements a. A list of all entities included in the organization's consolidated financial statements or equivalent documents. b. Whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report.	P002	Scope of Disclosure Basic Information (Reference) Group companies <a href="https://group.ntt/en/group/gnavi/">https://group.ntt/en/group/gnavi/</a>
● 102-46	Defining report content and topic Boundaries a. An explanation of the process for defining the report content and the topic Boundaries. b. An explanation of how the organization has implemented the Reporting Principles for defining report content.	P013	Process for Selecting Material Issues
● 102-47	List of material topics a. list of the material topics identified in the process for defining report P011 Process for Selecting Material Issues	P013	Process for Selecting Material Issues
● 102-48	Restatements of information a. The effect of any restatements of information given in previous reports, and the reasons for such restatements.	Not applicable	
● 102-49	Changes in reporting a. Significant changes from previous reporting periods in the list of material topics and topic Boundaries.	Not applicable	
● 102-50	Reporting period a. Reporting period for the information provided.	P002	Reporting Period
● 102-51	Date of most recent report a. If applicable, the date of the most recent previous report.	P002	Reporting Period
● 102-52	Reporting cycle a. Reporting cycle.	P002	Reporting Period
● 102-53	Contact point for questions regarding the report a. The contact point for questions regarding the report or its contents.	P002	Inquiries
● 102-54	Claims of reporting in accordance with the GRI Standards a. The claim made by the organization, if it has prepared a report in accordance with the GRI Standards, either: i. this report has been prepared in accordance with the GRI Standards: Core option; or ii. this report has been prepared in accordance with the GRI Standards: Comprehensive option.	GRI Content Index (refer to this table)	

● : Required contents disclosures in accordance with the Core option / (A): Annual Report 2022

Information Disclosure	Description	Report Page	
● 102-55	GRI Content Index a. The GRI content index, which specifies each of the GRI Standards used and lists all disclosures included in the report. b. For each disclosure, the content index shall include: i. the number of the disclosure (for disclosures covered by the GRI Standards); ii. the page number(s) or URL(s) where the information can be found, either within the report or in other published materials; and iii. if applicable, and where permitted, the reason(s) for omission when a required disclosure cannot be made.	GRI content index (refer to this table)	
● 102-56	External assurance a. description of the organization's policy and current practice with regard to seeking external assurance for the report. b. If the report has been externally assured: i. A reference to the external assurance report, statements, or opinions. If not included in the assurance report accompanying the sustainability report, a description of what has and what has not been assured and on what basis, including the assurance standards used, the level of assurance obtained, and any limitations of the assurance process. ii. The relationship between the organization and the assurance provider; and iii. Whether and how the highest governance body or senior executives are involved in seeking external assurance for the organization's sustainability report.	P170	Independent Assurance Statement

**GRI 103: Management Approach 2016**

Information Disclosure	Description	Report Page	
103-1	Explanation of the material topic and its Boundary a. An explanation of why the topic is material. b. The Boundary for the material topic, which includes a description of: i. where the impacts occur; and ii. the organization's involvement with the impacts. For example, whether the organization has caused or contributed to the impacts, or is directly linked to the impacts through its business relationships. iii. Any specific limitation regarding the topic Boundary.	P013	Process for Selecting Material Issues
103-2	The management approach and its components For each material topic, the reporting organization shall report the following information: a. An explanation of how the organization manages the topic. b. A statement of the purpose of the management approach. c. A description of the following, if the management approach includes that component: i. Policies ii. Commitments iii. Goals and targets iv. Responsibilities v. Resources vi. Grievance mechanisms vii. Specific actions, such as processes, projects, programs and initiatives	P028-067 P068-124 P125-160	<ul style="list-style-type: none"> <li>• Ensuring the positive coexisting of nature and humanity</li> <li>• Improving prosperity for all people and cultures</li> <li>• Maximizing well-being for all</li> </ul>
103-3	Evaluation of the management approach a. An explanation of how the organization evaluates the management approach, including: i. the mechanisms for evaluating the effectiveness of the management approach; ii. the results of the evaluation of the management approach; and iii. any related adjustments to the management approach.	P014	Organization for Implementation

●: Required contents disclosures in accordance with the Core option / (A): Annual Report 2022

**200: Economic topics**

Information Disclosure	Description	Report Page	
<b>GRI 201: Economic Performance 2016</b>			
201-1	Direct economic value generated and distributed	P003	Basic Information (Reference) Annual Securities Report, etc. (documents filed with the Financial Services Agency)
201-2	Financial implications and other risks and opportunities due to climate change	P055-067	NTT Group Disclosures in Line with TCFD Recommendations
201-3	Defined benefit plan obligations and other retirement plans		(Reference) Annual Securities Report (37th Business Term): Employee Benefits (pages 152-158) <a href="https://group.ntt/en/ir/library/yuho/2021/pdf/37yuho_2.pdf">https://group.ntt/en/ir/library/yuho/2021/pdf/37yuho_2.pdf</a>
201-4	Financial assistance received from government		(Reference) Annual Securities Report (37th Business Term): Major Shareholders (pages 59) <a href="https://group.ntt/en/ir/library/yuho/2021/pdf/37yuho_2.pdf">https://group.ntt/en/ir/library/yuho/2021/pdf/37yuho_2.pdf</a>
<b>GRI 202: Market Presence 2016</b>			
202-1	Ratios of standard entry level wage by gender compared to local minimum wage —	Not applicable	
202-2	Proportion of senior management hired from the local community	Not applicable	
<b>GRI 203: Indirect Economic Impacts 2016</b>			
203-1	Infrastructure investments and services supported P069-097	P085-122	<ul style="list-style-type: none"> <li>• Promoting the B2B2X model</li> <li>• Protection and respect for intellectual property</li> <li>• Contribution to the revitalization of local communities and economies</li> <li>• Ensuring the stability and reliability of services</li> <li>• Strengthening information security and personal information protection</li> </ul>
203-2	Significant indirect economic impacts	P085-122	<ul style="list-style-type: none"> <li>• Promoting the B2B2X model</li> <li>• Protection and respect for intellectual property</li> <li>• Contribution to the revitalization of local communities and economies</li> <li>• Securing the Stability and Reliability of Telecommunications Services</li> <li>• Strengthening information security and personal information protection</li> </ul>
<b>GRI 204: Procurement Practices 2016</b>			
204-1	Proportion of spending on local suppliers	Not applicable	
<b>GRI 205: Anti-corruption 2016</b>			
205-1	Operations assessed for risks related to corruption	P073-078	• Establishing and thoroughly complying with ethical standards
205-2	Communication and training about anti-corruption policies and procedures	P073-078	• Establishing and thoroughly complying with ethical standards
205-3	Confirmed incidents of corruption and actions taken	P073-078 P082-083	<ul style="list-style-type: none"> <li>• Establishing and thoroughly complying with ethical standards</li> <li>• Sharing high ethical standards with business partners</li> </ul>
<b>GRI 206: Anti-competitive Behavior 2016</b>			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	P073-078	• Establishing and thoroughly complying with ethical standards
<b>GRI 207: Tax 2019</b>			
207-1	Approach to tax	P081	Thoroughly reinforcing corporate governance and compliance
207-2	Tax governance, control, and risk management	P081	Thoroughly reinforcing corporate governance and compliance
207-3	Stakeholder engagement and management of concerns related to tax	P081	Thoroughly reinforcing corporate governance and compliance
207-4	Country-by-country reporting	P081	Profit before Income Tax (FY2020) Income Taxes Paid (FY2020)

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**GRI 300: Environmental topics**

Information Disclosure	Description	Report Page	
<b>GRI 301: Materials 2016</b>			
301-1	Materials used by weight or volume	P066 P158 P065	<ul style="list-style-type: none"> <li>• Material Balance of the NTT Group</li> <li>• Promoting paperless operations</li> <li>• Environmental Performance Data</li> </ul>
301-2	Recycled input materials used	P158	Promoting paperless operations
301-3	Reclaimed products and their packaging materials	P158	Promoting paperless operations
<b>GRI 302: Energy 2016</b>			
302-1	Energy consumption within the organization	P064–066	<ul style="list-style-type: none"> <li>• Environmental Performance Data</li> <li>• Material Balance of the NTT Group</li> </ul>
302-2	Energy consumption outside of the organization	Not applicable	
302-3	Energy intensity	Not applicable	
302-4	Reduction of energy consumption	P061–067	Metrics and Targets
302-5	Reductions in energy requirements of products and services	P064–065	Environmental Performance Data
<b>GRI 303: Water and Effluents 2018</b>			
303-1	Interactions with water as a shared resource	P050	Appropriate and efficient management of water resources
303-2	Management of water discharge-related impacts	P050	Appropriate and efficient management of water resources
303-3	Water withdrawal	P065 P066	<ul style="list-style-type: none"> <li>• Environmental Performance Data</li> <li>• Material Balance of the NTT Group</li> </ul>
303-4	Water discharge	P065 P066	<ul style="list-style-type: none"> <li>• Environmental Performance Data</li> <li>• Material Balance of the NTT Group</li> </ul>
303-5	Water consumption	P050 P065 P066	<ul style="list-style-type: none"> <li>• Appropriate and efficient management of water resources</li> <li>• Environmental Performance Data</li> <li>• Material Balance of the NTT Group</li> </ul>
<b>GRI 304: Biodiversity 2016 304-1</b>			
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Not applicable	
304-2	Significant impacts of activities, products, and services on biodiversity	P054	Contributing to natural ecosystem conservation
304-3	Habitats protected or restored	(Reference) The NTT Group strives to preserve ecosystems. <a href="https://group.ntt/en/environment/whatdoing/nature01.html">https://group.ntt/en/environment/whatdoing/nature01.html</a>	
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	Not applicable	

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Information Disclosure	Description	Report Page	
<b>GRI 305: Emissions 2016</b>			
305-1	Direct GHG emissions (Scope 1)	P055-067	<ul style="list-style-type: none"> <li>• Material Balance of the NTT Group</li> <li>• NTT Group Disclosures in Line with TCFD Recommendations</li> <li>• Environmental Performance Data</li> </ul>
305-2	Energy indirect GHG emissions (Scope 2)	P055-067	<ul style="list-style-type: none"> <li>• Material Balance of the NTT Group</li> <li>• NTT Group Disclosures in Line with TCFD Recommendations</li> <li>• Environmental Performance Data</li> </ul>
305-3	Other indirect GHG emissions (Scope 3)	P064-066	<ul style="list-style-type: none"> <li>• Material Balance of the NTT Group</li> <li>• Environmental Performance Data</li> </ul>
305-4	GHG emissions intensity	P055-067	NTT Group Disclosures in Line with TCFD Recommendations
305-5	Reduction of GHG emissions	P055-067	NTT Group Disclosures in Line with TCFD Recommendations
305-6	Emissions of ozone-depleting substances (ODS)	Not applicable	
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Not applicable	
<b>GRI 306: Waste 2020</b>			
306-1	Waste generation and significant waste-related impacts	P046-051 P066	<ul style="list-style-type: none"> <li>• A commitment to a resource-recycling future</li> <li>• Material Balance of the NTT Group</li> </ul>
306-2	Management of significant waste-related impacts	P046-051 P066	<ul style="list-style-type: none"> <li>• A commitment to a resource-recycling future</li> <li>• Material Balance of the NTT Group</li> </ul>
306-3	Waste generated	P046-051	A commitment to a resource-recycling future
306-4	Waste diverted from disposal	P046-051	A commitment to a resource-recycling future
306-5	Waste directed to disposal	P046-051	A commitment to a resource-recycling future
<b>GRI 307: Environmental Compliance 2016</b>			
307-1	Non-compliance with environmental laws and regulations	P030	Compliance with Environmental Laws and Regulations
<b>GRI 308: Supplier Environmental Assessment 2016</b>			
308-1	New suppliers that were screened using environmental criteria	P075-076	Value Chain Management
308-2	Negative environmental impacts in the supply chain and actions taken	P044 P167	<ul style="list-style-type: none"> <li>• Reduction of environmental impact throughout the supply chain</li> <li>• Data List</li> </ul>
<b>GRI 400: Social topics</b>			
Information Disclosure	Description	Report Page	
<b>GRI 401: Employment 2016</b>			
401-1	New employee hires and employee turnover	P165	Data List
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Not applicable	
401-3	Parental leave	P140-148 P166	<ul style="list-style-type: none"> <li>• Diversity &amp; Inclusion</li> <li>• Data List</li> </ul>
<b>GRI 402: Labor/Management Relations 2016</b>			
402-1	Minimum notice periods regarding operational changes	P151-154	Favorable Labor-Management Relationship

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Information Disclosure	Description	Report Page	
<b>GRI 403: Occupational Health and Safety 2018</b>			
403-1	Occupational health and safety management system	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-2	Hazard identification, risk assessment, and incident investigation	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-3	Occupational health services	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-4	Worker participation, consultation, and communication on occupational health and safety	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-5	Worker training on occupational health and safety	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-6	Promotion of worker health	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-8	Workers covered by an occupational health and safety management system	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-9	Work-related injuries	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
403-10	Work-related ill health	P151–154	Achieving zero fatal accidents as well as maintaining and promoting employee health
<b>GRI 404: Training and Education 2016</b>			
404-1	Average hours of training per year per employee	P167	Data List
404-2	Programs for upgrading employee skills and transition assistance programs	P155–157	Supporting autonomous capacity development
404-3	Percentage of employees receiving regular performance and career development reviews	P155–157	Supporting autonomous capacity development
<b>GRI 405: Diversity and Equal Opportunity 2016</b>			
405-1	Diversity of governance bodies and employees	P165–166	Data List
405-2	Ratio of basic salary and remuneration of women to men	P165	Data List
<b>GRI 406: Non-discrimination 2016</b>			
406-1	Incidents of discrimination and corrective actions taken	P130–131	Compliance with the NTT Group Global Human Rights Policy
<b>GRI 407: Freedom of Association and Collective Bargaining 2016</b>			
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	P167	Data List
<b>GRI 408: Child Labor 2016</b>			
408-1	Operations and suppliers at significant risk for incidents of child labor	P167	Data List
<b>GRI 409: Forced or Compulsory Labor 2016</b>			
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	P167	Data List
<b>GRI 410: Security Practices 2016</b>			
410-1	Security personnel trained in human rights policies or procedures	Not applicable	
<b>GRI 411: Rights of Indigenous Peoples 2016</b>			
411-1	Incidents of violations involving rights of indigenous peoples	Not applicable	

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Information Disclosure	Description	Report Page	
<b>GRI 412: Human Rights Assessment 2016</b>			
412-1	Operations that have been subject to human rights reviews or impact assessments	P130–131	Compliance with the NTT Group Global Human Rights Policy
412-2	Employee training on human rights policies or procedures	P130–131	Compliance with the NTT Group Global Human Rights Policy
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	P127 P129–139	Feature 3: Promoting Supplier Engagement, Direct Dialogue with Suppliers Human Rights
<b>GRI 413: Local Communities 2016</b>			
413-1	Operations with local community engagement, impact assessments, and development programs	P109–116 P168	<ul style="list-style-type: none"> <li>Ensuring the stability and reliability of services</li> <li>Data List</li> </ul>
413-2	Operations with significant actual and potential negative impacts on local communities	P109–116	<ul style="list-style-type: none"> <li>Ensuring the stability and reliability of services</li> </ul>
<b>GRI 414: Supplier Social Assessment 2016</b>			
414-1	New suppliers that were screened using social criteria	P075–076	Value Chain Management
414-2	Negative social impacts in the supply chain and actions taken	P167	Data List
<b>GRI 415: Public Policy 2016</b>			
415-1	Political Contributions	P073–078	Establishing and thoroughly complying with ethical standards
<b>GRI 416: Customer Health and Safety 2016</b>			
416-1	Assessment of the health and safety impacts of product and service categories	P084–107	Prepare for a new future with the power of technology
		P109–124	Ensuring the stability and reliability of services
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	P109–116	Ensuring the stability and reliability of services
<b>GRI 417: Marketing and Labeling 2016</b>			
417-1	Requirements for product and service information and labeling	(Reference) Environmental Labeling System for Solutions <a href="https://group.ntt/en/environment/protect/lowcarbon/label/">https://group.ntt/en/environment/protect/lowcarbon/label/</a>	
417-2	Incidents of non-compliance concerning product and service information and labeling	Not applicable	
417-3	Incidents of non-compliance concerning marketing communications	Not applicable	
<b>GRI 418: Customer Privacy 2016</b>			
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Not applicable	
<b>GRI 419: Socioeconomic Compliance 2016</b>			
419-1	Non-compliance with laws and regulations in the social and economic area	Not applicable	

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