

NTT Group Green Bond Framework

September 2021

Introduction

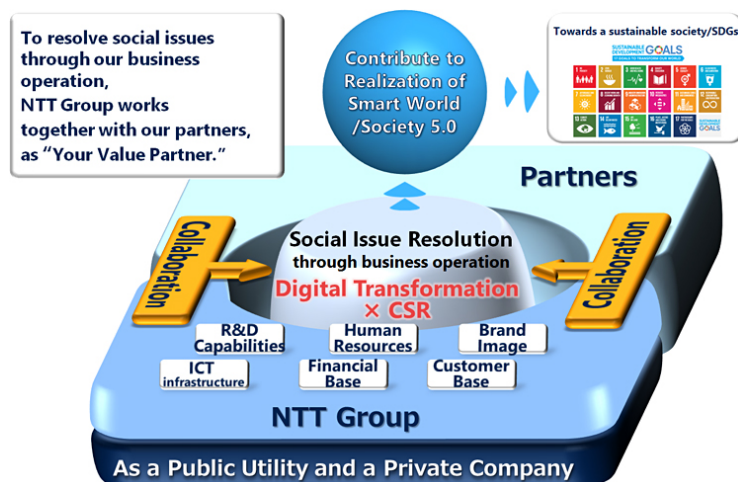
As “Your Value Partner,” NTT Group has strived to resolve social issues through its business activities and has contributed towards the achievement of sustainability objectives based on the “NTT Group CSR Charter,” our group policy for environmental and CSR activities. For NTT Group, which uses approximately 1% of Japan’s total power generation (FY2015) for its business activities, climate change is one of the most critical social issues. NTT Group has contributed towards the achievement of a more sustainable economy by offering products and services utilizing ICT (information and communication technology), and we believe further efforts and new approaches are becoming increasingly necessary at a time when taking action to address climate change on a global scale has become critical. NTT Group has established its Green Bond Framework as part of such efforts in 2020. Given increasing interest in transitioning to a decarbonized society, we have reviewed and refined the NTT Group Green Bond Framework. NTT Group intends to utilize the funds raised through the green bond issuance for sustainable growth by resolution of social issues identified in the framework.

1. Vision of NTT Group

NTT Group continues to address social issues in collaboration with our partners through its business activities.

In today’s world, various social issues are emerging: population growth, resource and water shortages on a global scale, decreasing birthrate and an aging population in Japan, etc. In order to address such issues, promotion of digital transformation utilizing ICT (information and communication technology) is necessary in all aspects.

NTT Group intends to address social issues through digital transformation by utilizing resources and capabilities, including R&D, ICT infrastructure and human resources, and collaborating with partners. NTT Group believes solving such issues will contribute to building a society utilizing ICT and contribute towards the United Nation’s Sustainable Development Goals.

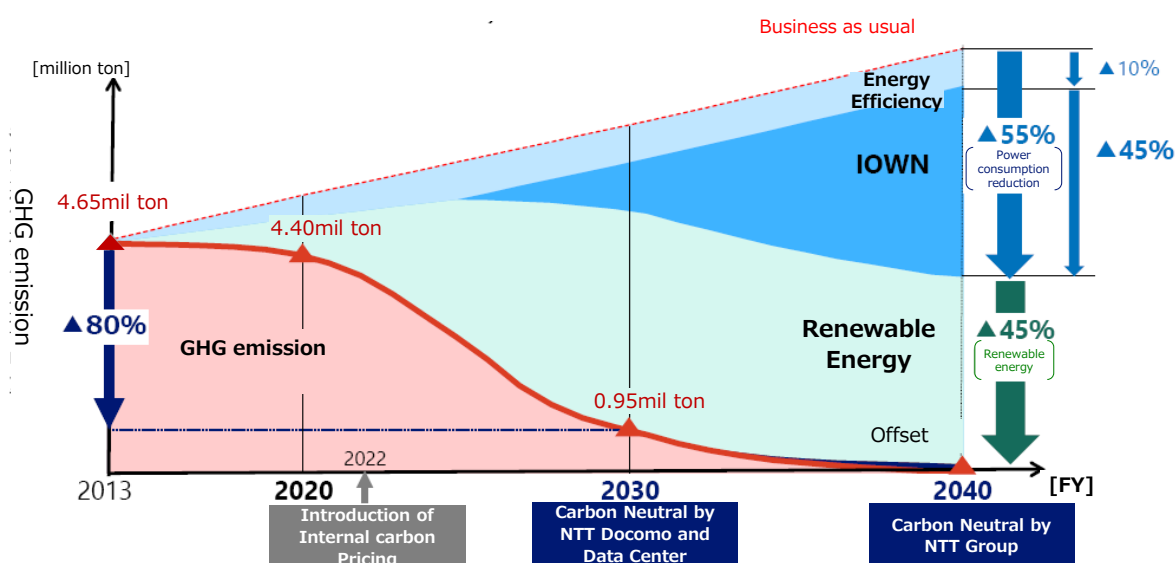


Commitment to Environmental Issues

Reducing emissions of CO₂ and greenhouse gases is critical as humanity battles climate change. In addition, efforts to cope with the impacts of climate change are becoming increasingly important. There is growing demand for energy efficient ICT products and services as energy consumption continues to grow. Meanwhile, ICT is able to contribute to energy saving in society, reduction of CO₂ emissions and climate change mitigation measures. NTT Group aims to contribute to the achievement of a low-carbon economy by developing and spreading energy efficient ICT services and state of the art technologies, in addition to the reduction of CO₂ emissions stemming from the group's own business operations.

NTT Group formulated the Environment and Energy Vision in May 2020 to promote ESG management. The vision consists of four core initiatives: 1) promoting renewable energy, 2) reducing climate change impact through ICT technologies, 3) developing innovative and environmentally friendly technologies, and 4) realizing extremely low power consumption. We will help reduce environmental impact for customers, companies, and society at large by pursuing business activities toward reducing that impact through our R&D for generating breakthrough innovations.

In September 2021, NTT Group refined the objectives of the “Environment and Energy Vision” and set and released our new environmental energy vision of “NTT Green Innovation toward 2040,” a well-defined goal of realizing carbon neutrality by 2040, including an action plan and interim GHG emission reduction targets.



NTT Group's Pathway to Green House Gas reduction (Japan and international)

- **Greenhouse gas reduction target (Scope1+Scope2) * SBT 1.5°C-aligned target**

Fiscal year	Major target
2030	NTT Group reduces greenhouse gas emissions by 80% (compared to FY2013) Mobile (NTT Docomo) and Data Center achieve net zero greenhouse gas emissions (carbon neutral)
2040	NTT Group achieves net zero greenhouse gas emissions (carbon neutral)

- **Major Initiatives for reduction**

	Reducing the environmental impact of our business activities	Creating innovations
Green By ICT Contribution to reduction of environmental impact of society	> Reducing the environmental impact of society	> Creation of innovative environmental energy technologies
Green of ICT Control of environmental impact of our group	> Introduction of IOWN and expansion of renewable energy	> Realization of Overwhelmingly Low Power Consumption > Creation of decentralized technologies

1) Reducing environmental impact on society

We believe that ICT will play an instrumental role in reducing the impact of climate change at large. For example, teleworking, digitization of the value chain, and computerization are all expected to limit overall energy usage throughout society. We will reinforce our efforts to reduce the environmental load of society by applying ICT.

Specifically, NTT group will contribute towards GHG emission reduction by expanding the adoption of IOWN*1 technology from telecommunications field to other industries, offering new services to contribute to carbon neutrality, etc..

We will also pursue initiatives for creating a closed loop society, such as by reducing the use of plastics and promoting recycling.

2) Development of innovative environmental and energy technologies

We will address climate change and other environmental issues by developing innovative technologies in addition to promoting a shift to renewable energy use in our operations. In July 2020, we established the Space Environment and Energy Laboratories for regenerating the global environment and realizing 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. We also became the first private company in Japan to conclude a Long-Term Non-Commercial Cooperation Agreement

with the International Fusion Energy Organization (IFER). We plan to successfully develop nuclear fusion reactors that hold significant promise as a future source of energy by offering support through IOWN's ultra-low-latency, high-speed, large-capacity data transmission and simulations based on digital twin computing.

3) Introduction of IOWN technology and acceleration of renewable energy use

We will actively incorporate renewable energy to meet our need for electricity, the major source of the NTT Group's greenhouse gas emissions. In 2020, we have declared our quantitative goal to increase the proportion of renewable energy use by the NTT Group as a whole by 30% or more by fiscal year 2031. In 2021, NTT Group raised and declared its renewable energy usage target to roughly 50% by fiscal year 2031 through its own electric power sources in Japan. These milestones will help us achieve the 45% GHG emission reduction by 2040. To achieve this goal, the NTT Group will develop renewable energy sources and promote a shift towards at its domestic office buildings, telecommunications buildings, data centers and research laboratories. Specifically we will drive the effort for GHG emission reduction in supply-chain with the introduction of internal carbon pricing from fiscal year 2023, and enhance localization of energy production and consumption by strengthening renewable energy facility development and settlement. As a concrete initiative for reducing the environmental impact of our business activities through the promotion of renewable energy, NTT began participating in the SBT^{*1} international climate change initiative in May 2020 and declared its support for the TCFD^{*3}.

4) Realization of extremely low power consumption and creation of decentralized technologies

We will pursue efforts to realize the IOWN initiatives announced in May 2019, which are expected to vastly reduce the power consumption of computers and networks by applying optical technologies. As part of this drive, we concluded a three-year joint research agreement with Intel Corporation, our partner in the IOWN Global Forum. Together, we will create IOWN technology as the communications infrastructure of the future that will break through current technological limits in areas such as significantly reducing electricity consumption. With introduction of IOWN in business activities, NTT Group has set targets of 15% and 45% power usage reduction by fiscal year 2031 and year 2041 respectively. We will harness the NTT Group's industry-leading technologies in photonics, digital signal processing (DSP), computing and network infrastructure management with Intel's abundant technological portfolio, support systems, and expert knowledge in hardware and software to develop technologies for processing the explosive rise in data volume, which is necessary for realizing a smart and connected world.

^{*1}: IOWN(Innovative Optical and Wireless Network) : IOWN is an innovative network and information processing platform featuring ultra-high capacity, ultra-low power consumption and ultra-low latency, built around a breakthrough photonic technology, optimizing the individual with the whole based on all kinds of information and creating a society open to diversity.

*2: Science Based Targets: Greenhouse gas reduction targets set by companies to be attained in five to fifteen years that are consistent with the levels required by the Paris Agreement; limiting the increase in global temperatures at well below 2°C (WB2°C) or below 1.5°C as measured against the pre-industrial revolution era.

*3: Task Force on Climate-related Financial Disclosures established by the Financial Stability Board in response to a request from the G20 countries as a framework for corporate information disclosure on climate change initiatives.

Green Bond Framework

NTT Group has updated its Green Bond framework it established in 2020 as we further enhance our financial commitment and efforts to achieve our sustainability targets.



NTT Group and its affiliates will issue green bonds based on this Green Bond Framework.

The Green Bond Framework aligns with the following four requirements based on the Green Bond Principles (GBP) 2021 version published by the International Capital Markets Association (ICMA) and the Green Bond Guidelines (2020 version) published by the Ministry of the Environment of Japan.





1. Use of proceeds
2. Process for project evaluation and selection
3. Management of Proceeds
4. Reporting

1. Use of proceeds

An amount equal to the net proceeds of the green bonds are planned to be allocated to finance new or existing projects that meet the following eligibility criteria. The look-back period for refinancing operating expenditure (OPEX) will be limited to three years on or prior to the date of green bond issuance.




Eligible Project	ICMA Project Category	Eligibility criteria and related eligible projects	UN SDGs
1) 5G-related investment	Energy Efficiency	<p>An amount equal to the net proceeds will be allocated to investments in the development, refurbishment and operation of base stations for building 5G networks that meet the following criteria:</p> <ul style="list-style-type: none">> Installation of 5G base stations that can save power compared to existing base stations> Development of base stations that can save standby power by automatically shifting to sleep mode at night and during low traffic periods, and introduction of such technology to commercial base stations <p>We expect the amount of traffic to increase exponentially in the coming years as the IoT society progresses. With these social trends in mind, 5G has achieved lower power consumption¹</p>	 



¹ "While a 5G antenna currently consumes around three times more electricity than a 4G antenna, power-saving features such as sleep mode could narrow the gap to 25% by 2022.1213 Network infrastructure providers and operators are projecting that 5G could be up to 10 to 20 times more energy-efficient than 4G by 2025-

		due to improved transmission efficiency compared to conventional communication technologies, and NTT Group will progress 5G-related investments to realize a low-carbon society through migration to 5G, which will be the foundation of the remote world.	
2) FTTH-related investment	Energy Efficiency	An amount equal to the net proceeds will be allocated to investments in the installation and operation of an optical fiber network (FTTH) ² , which is expected to contribute towards a reduction in electricity consumption compared to NTT Group's existing facilities and be the foundation of the remote world.	 
3) Research and development for the realization of the IOWN concept	Energy Efficiency	<p>An amount equal to the net proceeds will be allocated to research and development to pursue the Innovative Optical and Wireless Network (IOWN) concept and achieve overwhelmingly high efficiency and power savings through the "fusion of mobile and fixed" and "fusion of networks and computing," provided that allocations to research and development cost make up no more than 20% of the total allocations from any given Green Bond issuance.</p> <p>Under the IOWN concept, NTT Group will create an information processing infrastructure that enables overwhelmingly large capacity, low latency, and low power consumption by 2030, utilizing an all-photonics network and</p>	 

30"(<https://www.iea.org/reports/data-centres-and-data-transmission-networks>)

² 1) "Data transmission network technologies are also rapidly becoming more efficient: fixed-line network energy intensity has halved every two years since 2000 in developed countries" (IEA "Data Centres and Data Transmission Networks, <https://www.iea.org/reports/data-centres-and-data-transmission-networks>) , 2)"Major Technological Shifts> In addition, energy efficiency improvements can be hard to predict due to the potential for technology shifts that do not follow historical projections. Over long time periods, step changes in technology can be observed. For the Internet, this could be considered moving from technologies such as dial-up to ADSL broadband or more recently from ADSL broadband to fiber optic broadband, driven by demand for higher Internet speeds."/ "Discussion> For the five studies that satisfy our criteria, the electricity intensity of transmission networks has declined by factor of ~170 between 2000 and 2015. "(Aslan, J. et al. (2018), " Electricity intensity of internet data transmission: Untangling the estimates", Journal of Industrial Ecology, 22(4), 785-798, <https://doi.org/10.1111/jiec.12630>) , 3)"A study launched in 2017 by Europacable has found that fibre is the most energy efficient technology for broadband access networks, compared with DSL, xDSL, vectoring and DOCSIS. Per capita per year, performing at 50 Mbps, fibre networks consume 56 kWh compared to 88 kWh for DOCSIS." (European Commission, "Shaping Europe's digital future", <https://digital-strategy.ec.europa.eu/en/library/fibre-most-energy-efficient-broadband-technology>)

		<p>optoelectronic fusion technology. In July 2021, we established the NTT IOWN Innovation Center, which brings together the development resources of NTT Laboratories.</p> <p><Example Projects></p> <ul style="list-style-type: none"> > Photonics in the connection between substrates in endpoint devices such as terminals and computers > Research and development of "optical disaggregated computing" architecture, which is expected to significantly reduce power consumption through photonic connections (opticalization in large-scale integration (LSI)) in signal transmission between chips on a substrate, with the aim of commercialization by 2030. 	
4) Highly energy efficient and power-saving data center	Energy Efficiency	<p>An amount equal to the net proceeds will be allocated to investment in the construction, refurbishment, acquisition and operations of data centers that meet the following criteria and improve power efficiency and reduce environmental impact of business operations:</p> <p><Eligibility Criteria></p> <ul style="list-style-type: none"> > PUE (Power Usage Effectiveness) under 1.5 <p>Data centers are the infrastructure to support ICT. Data centers, on the other hand, consume a lot of power, so improving efficiency and power saving performance of data centers are essential to achieve a low carbon society.</p>	 
5) Green Building	Green Building	<p>An amount equal to the net proceeds will be allocated to investments and expenditures for the construction, modification, and acquisition of properties that were confirmed to meet any of the following eligibility criteria within 24 months prior to the issue date of the relevant green bond, and properties that are planned to meet with the criteria in the future.</p>	

		<p><Eligibility Criteria></p> <ul style="list-style-type: none"> > LEED-BD+C (Building Design and Construction) or LEED-O+M (Building Operations and Maintenance) certified: Platinum, Gold or Silver > CASBEE building (New, existing or modified) or CASBEE real estate (including CASBEE by local governments) evaluation/certification: S, A or B+ > BELS (Building-Housing Energy-efficiency Labeling System): Three stars or above > DBJ Green Building Certificate: Three stars or above > Power-saving evaluation based on the Tokyo Building Environment Plan: AAA for both thermal insulation property of building and power-saving property of facility system 	
6) Renewable Energy	Renewable Energy	<p>An amount equal to the net proceeds will be allocated to finance expenditures on investment in the construction, refurbishment, acquisition and operation for the following NTT Group's renewable energy projects:</p> <ul style="list-style-type: none"> > Wind power generation projects: Project with output of 10,000 kW or more should have already completed the environment assessment defined by the Environmental Impact Assessment Law. Project with output of less than 10,000 kW shall undergo an environment assessment as required. When an environmental impact assessment needs to be processed by a local government of the area where operations are conducted, such should be properly executed. > Solar photovoltaic generation projects: Project with an installed capacity of 40 MW or more should have already completed the environment assessment defined by the Environmental Impact Assessment Law. A 	 

		<p>project with an installed capacity of less than 40 MW shall undergo an environment assessment as required. When an environmental impact assessment needs to be processed by a local government of the area where operations are conducted, such should be properly executed.</p> <ul style="list-style-type: none"> > Geothermal power generation projects: CO₂ emissions shall be 100gCO₂/kWh or less. Project with output of 10,000 kW or more should have already completed the environment assessment defined by the Environmental Impact Assessment Law. Project with output of less than 10,000 kW shall undergo an environment assessment as required. When an environmental impact assessment needs to be processed by a local government of the area where operations are conducted, such should be properly executed. > Biomass power generation projects: Fuel to be used should be waste-derived (excluding palm oil waste). When an environmental impact assessment needs to be processed by a local government of the area where operations are conducted, such should be properly executed. > Hydroelectric power generation projects: The output shall be less than 22.5 MW, or the product should be a run-of-river type. When an environmental impact assessment needs to be processed by a local government of the area where operations are conducted, such should be properly executed. 	
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2. Process for project evaluation and selection

Projects that may be financed and/or refinanced by the green bond are identified by the operating company that executes each eligible project based on the aforementioned eligibility criteria. Evaluation and selection of eligible projects is done by way of discussion and consideration of the conformity to the

NTT Group CSR Charter, a basic guideline for the Group, by the Group Treasury Department of NTT Finance Corporation's Finance and Accounting Business Headquarters and Nippon Telegraph and Telephone Corporation. The director in charge of the Group Treasury Department of NTT Finance Corporation's Finance and Accounting Business Headquarters shall make the final decision.

In the selection of target projects, the Group confirms whether the eligibility criteria has been met and whether the mitigation of environmental and social risks has been considered as follows:

- Conformity to environmental laws, regulations, etc., required by the central and local governments of the area where the operation site exists, and environmental impact surveys as necessary
- Provision of a thorough explanation of business to local communities
- Implementation of proper toxic waste handling in accordance with laws related to waste treatment and cleaning, as well as proper storage, management, and safe and adequate disposal of equipment that uses or is contaminated by PCB in compliance with the Act on Special Measures concerning Promotion of Proper Treatment of PCB Waste
- Execution of risk evaluations of suppliers based on the Guidelines for CSR in Supply Chain. Requesting of suppliers' abidance to the Guidelines for Green Procurement and the Energy Efficiency Guidelines

3. Management of Proceeds

The Group Treasury Department of NTT Finance Corporation's Finance and Accounting Business Headquarters, which is responsible for the group finance function of NTT Group, centrally controls the proceeds of the green bonds issued based on this Green Bond Framework and confirm the status of proceeds allocation to the eligible projects at the operating companies executing eligible project. The Finance and Accounting Department of NTT Finance Corporation manages the proceeds and allocates proceeds using the internal control system, and tracks the funds every quarter. Until allocation, the equivalent amount of the proceeds are managed as cash or cash equivalent. The allocation is planned to be completed within 24 months from the date of the relevant issuance.

4. Reporting

1) Allocation reporting

Until proceeds are fully allocated, the Group will annually report on the status of allocation on its group website and/or integrated report.

The Group plans to report the following items where feasible:

- The status of allocation of the green bond issuance amount to eligible projects
- Overview of eligible projects funded (including the age of the assets and remaining useful life)
- The amount allocated and unallocated to eligible projects
- The share of finance and refinance
- Where there is an unallocated portion, the planned allocation policy

The first report on the allocation status of proceeds is scheduled to be provided within a year from the issuance of the green bonds. Should a significant change occur in the status of the fund following allocation of proceeds, such will be disclosed in a timely manner.

In addition, when refinancing an asset that needs to be maintained over a long period of time through the issuance of multiple green bonds, the elapsed life, remaining useful life and refinancing amount of the asset will be disclosed at the time of issuance.

2) Impact Reporting

As long as there is an outstanding balance of green bonds, the Group will annually report on the environmental impact from the green bond allocation.

The following items will be reported individually and as a category total.

Eligible project	Impact reporting item
1) 5G-related investment	<ul style="list-style-type: none"> Number of 5G base stations installed
2) FTTH-related investment	<ul style="list-style-type: none"> Number of subscribers (units)
3) Research and development for the realization of the IOWN concept	<ul style="list-style-type: none"> Explanation of the intended effects of the eligible R&D projects Introduction of the progress of R&D and examples of services and products expected to be realized
4) Highly energy efficient and power-saving data center	<ul style="list-style-type: none"> Volume of CO₂ emissions (t-CO₂)
5) Green building	<ul style="list-style-type: none"> Property name of green building, obtained certification level, and the timing of acquisition and reacquisition Volume of CO₂ emissions (t-CO₂)
6) Renewable energy	<ul style="list-style-type: none"> Power generation capacity/actual volume (GWh) Volume of CO₂ emissions reduced (t-CO₂)