

NTT Data

Trusted Global Innovator



TCFD | TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES



BUSINESS AMBITION FOR 1.5°C



Online Tour of Data Center

-Initiatives for Climate Change and Introduction of Data Center Business and Facilities-

March 16, 2022

Investor Relations Office, Corporate Headquarters

NTT DATA Corporation

Wednesday, March 16, 2022, 3:00pm-4:30pm (JST)

0. NTT DATA's Initiatives to realize a sustainable society (3:05pm - 3:15pm)

Speaker: Toshi Fujiwara, Senior Executive Vice President and Representative Director

1. Company-wide efforts to address climate change and medium- to long-term green initiatives (3:15pm - 3:25pm)

Speaker: Toru Shimogaki, Head of Green Innovation Office, Corporate Headquarters

2. Measures for Carbon Neutrality of Data Centers (3:25pm - 3:35pm)

Speaker: Shigeyoshi Horiguchi, Senior Manager, Facility Management Division, Consulting & Solutions Sector

3. Data Center Business Overview (3:35pm - 3:45pm)

Speaker: Hiroyuki Norikane, Executive Manager, Data Center & Cloud Services Division, Consulting & Solutions Sector

4. Facility Introduction of Mitaka Data Center EAST (3:45pm - 4:15pm)

Speaker: Shigeyoshi Horiguchi, Senior Manager, Facility Management Division, Consulting & Solutions Sector

5. Q&A Session (4:15pm - 4:30pm)



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**BUSINESS
AMBITION FOR 1.5°C**

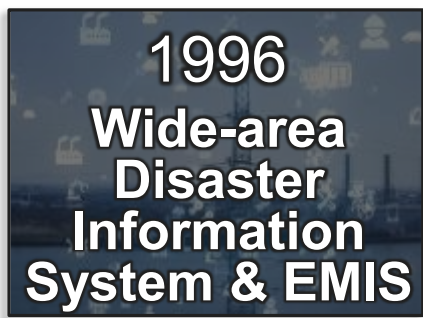
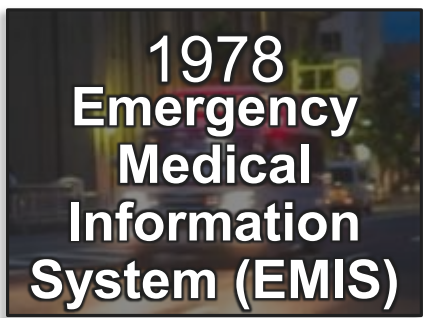
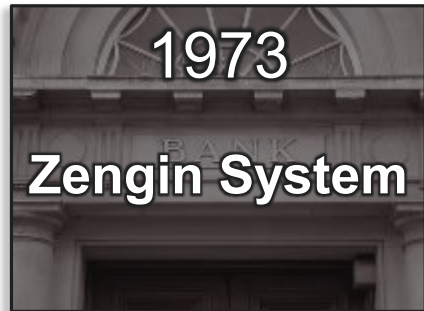
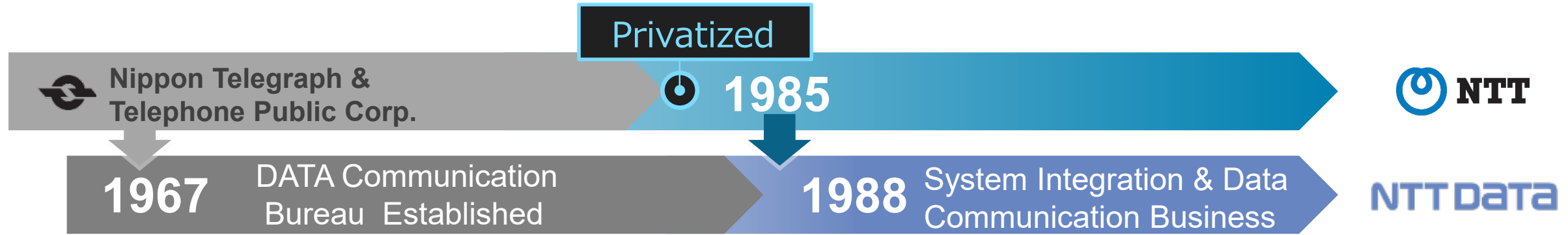


NTT DATA Initiatives to Realize a Sustainable Society

March 16, 2022

Toshi Fujiwara, Senior Executive Vice President and Representative Director
NTT DATA Corporation

0-1. The History of NTT DATA



0-2. Mission Statement

Our Mission Statement

NTT DATA uses information technology to create new paradigms and values, which help contribute to a more affluent and harmonious society.



0-3. Change in Positioning of Sustainability

Past

Business **and** Sustainability

Something to appeal
to external parties

Efforts within the scope
of business strategy

Promoted by executives and
corporate departments

Future

Business **with** Sustainability

To grow the business and acquire
a competitive edge

Essential element to formulate
business strategies

Incorporated into business
departments and promoted
by the whole company

0-4. NTT DATA Group's Vision for a Sustainable Society

Realize a sustainable society through business



Digital Transformation for Clients

Business **with** Sustainability

0-5. Reducing GHG Emissions Across Society with Technology

Two types of Green Innovation

Green Innovation **of IT**

Reduction of GHG emissions through the supply chain

Promote carbon neutrality throughout the entire life cycle of IT systems, including data centers

Green Innovation **by IT**

Contributing to the greening of clients and society toward carbon neutrality

Utilizing our digital technologies to make our clients and society carbon neutral and enhance their resilience to climate change

0-6. NTT DATA Group GHG Emissions Reduction Targets



SBT 1.5°C
*12th company in Japan

BUSINESS AMBITION FOR 1.5°C  

2020 Results

Scope 1+2: 31% reduction
Scope 3: 28% reduction
(compared to FY2016)

2030 Target



Scope 1+2: 60% reduction
Scope 3: 55% reduction
(compared to FY2016)

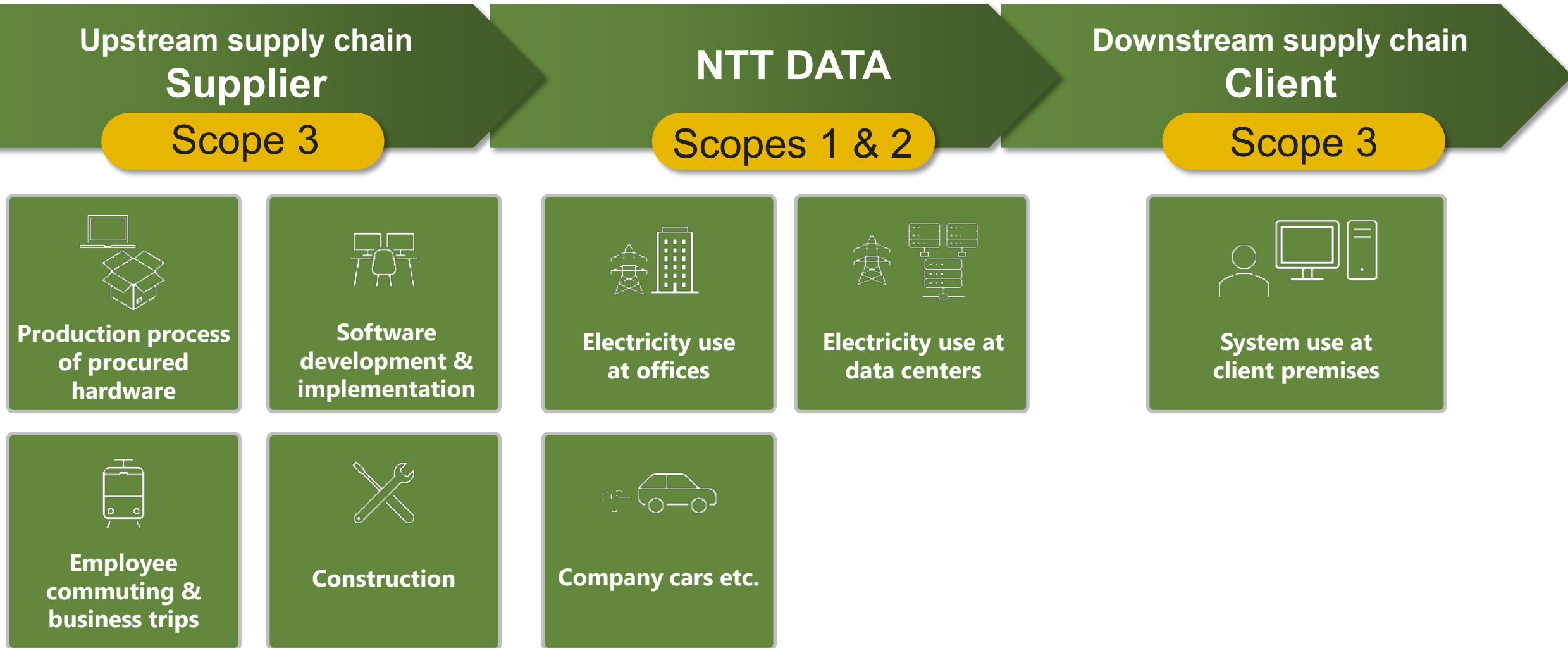
2040 Target

**Achieving
Carbon
Neutrality**

Scope 1+2*

* Carbon neutrality of Scope 3 will be achieved by FY2050.

Promoting reduction of co2 emissions



Digital technology can play a major role in data analysis & utilization for corporate activities.

STEP 1 Visualization

Correct understanding of direct & indirect emissions in business & extraction of factors that make up large proportions.

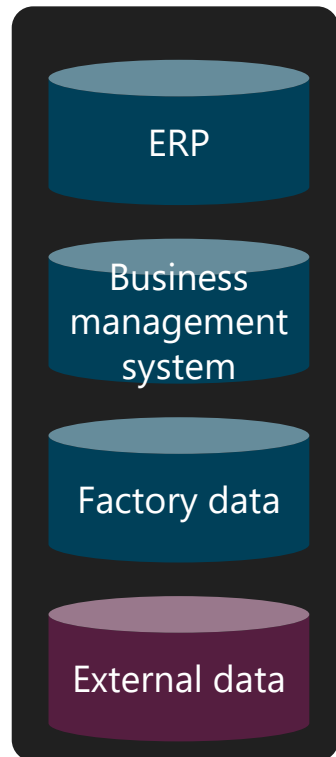


STEP 2 Reduction / Optimization

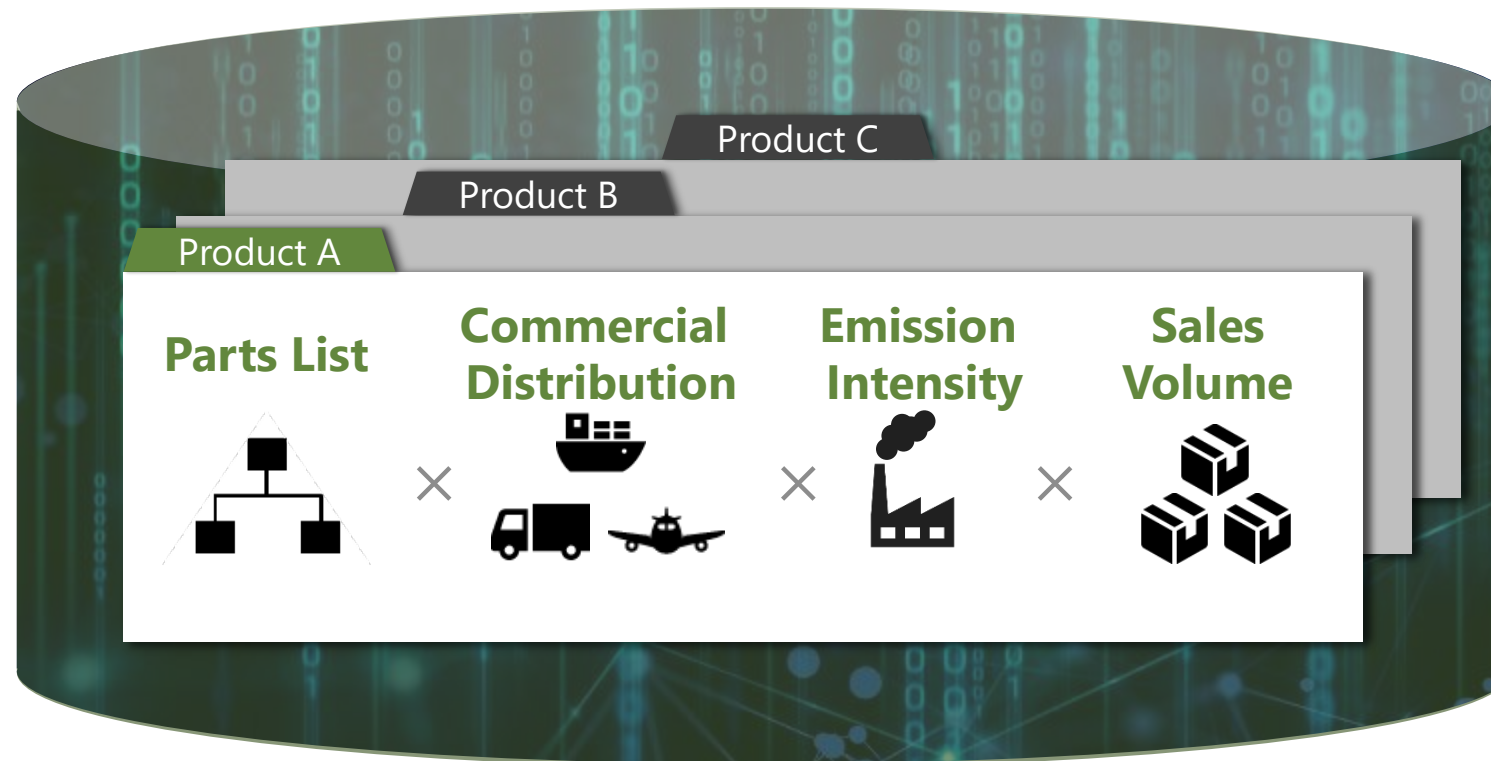
Plan & implement initiatives to reduce & optimize specified factors.



Visualize GHG emissions for each product by unified managing of global commercial distribution master and calculating emission intensity and sales volume

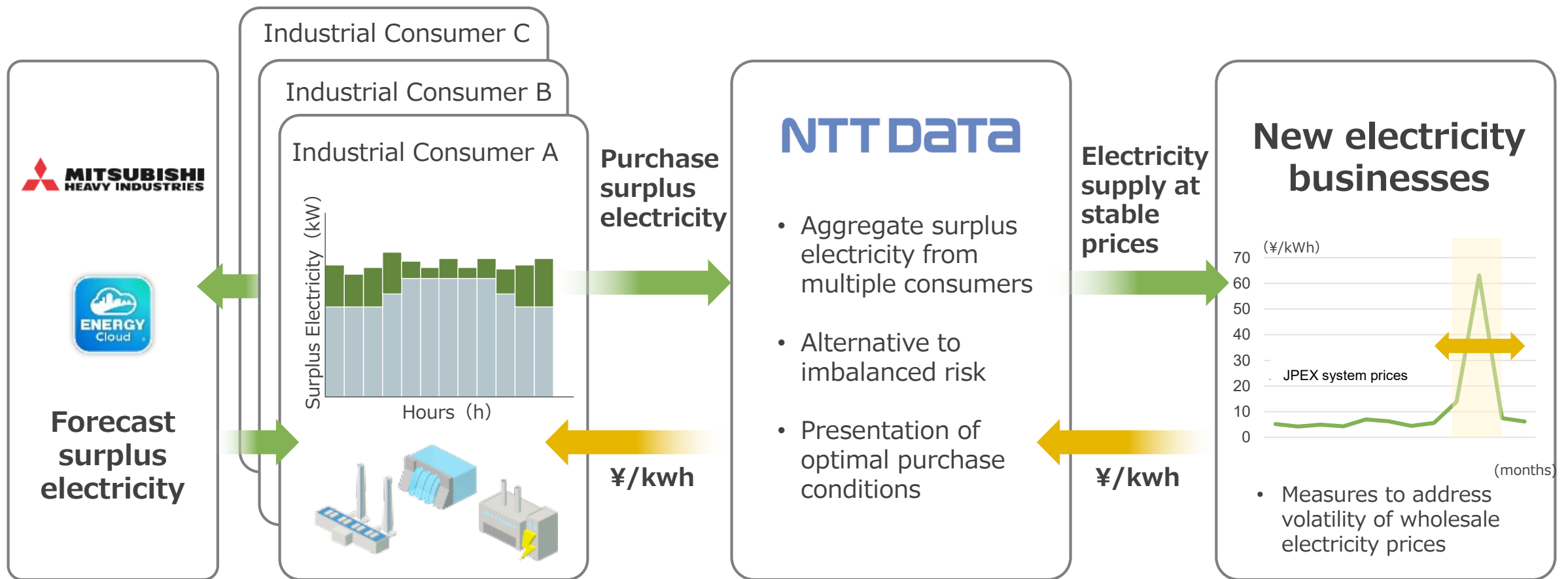


Linkage to peripheral systems



Timely information disclosure

**Forecast & control surplus electricity from power generation.
Profit by supplying surplus electricity to power provider
who wish to secure a stable electricity supply.**



0-11. Realization of a Sustainable Society with Green Innovation





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Company-wide efforts to address climate change and medium- to long-term green initiatives

March 16, 2022

Toru Shimogaki, Head of Green Innovation Office, Corporate Headquarters
NTT DATA Corporation

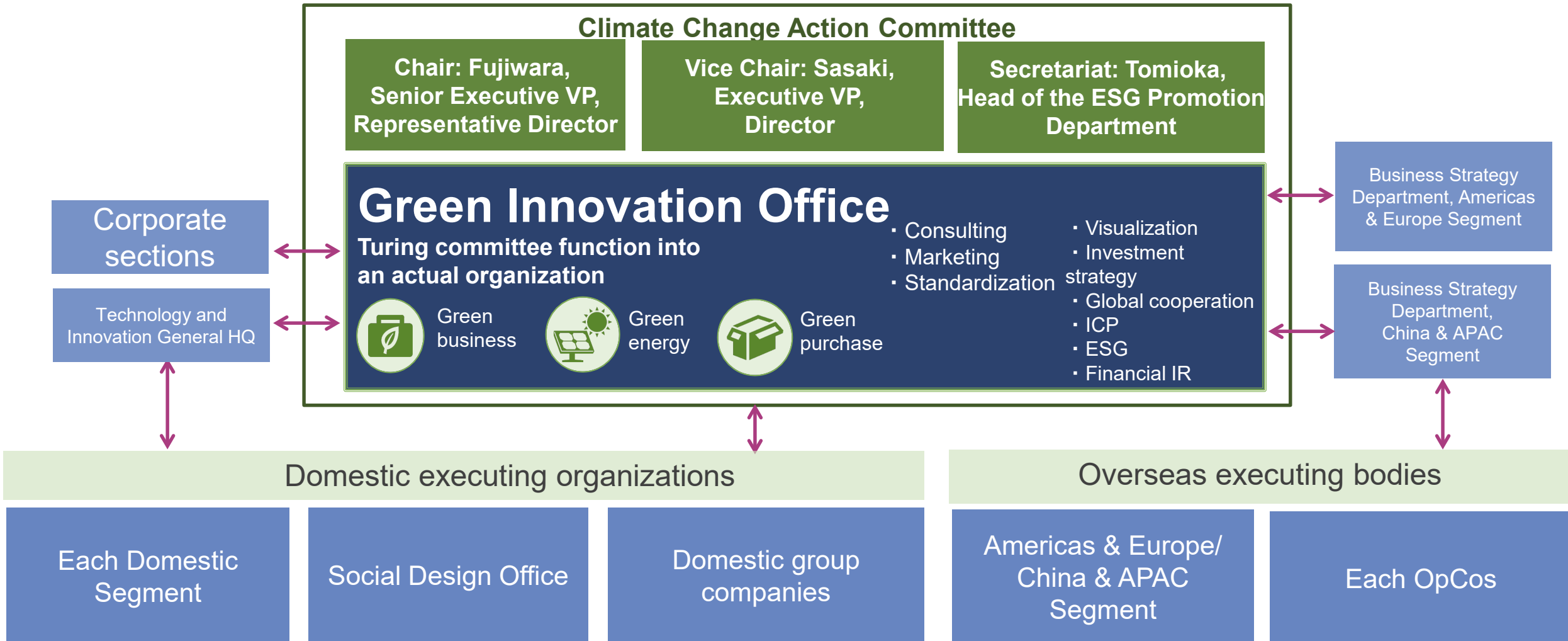
1-1. Structure to Promote Climate Change Initiatives

As a company that leads social change through digital technology, NTT DATA helps various clients and industries reduce CO₂ emissions and contributes to building a decarbonized society.



1-2. Overview of Green Innovation Office

Green Innovation Office, the promotion function of Climate Change Action Committee, was established to manage and promote decarbonization efforts in Japan and overseas in an integrated manner.

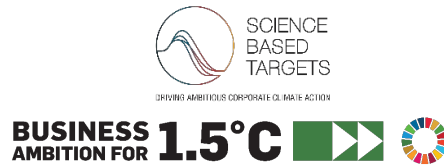


1-3. Pursuing Carbon Neutrality Together With Global Initiatives



Express support for the TCFD Recommendations in March 2021

Placing climate change responses as an important management issue, NTT DATA promotes company-wide activities and ensures transparency of public activities.



Receive the SBT 1.5°C target certificate in June 2020

In March 2021, NTT DATA declared the Business Ambition for 1.5°C. NTT DATA is the **12th Japanese company** that expressed support for the SBT Business Ambition for 1.5°C and received the SBT 1.5°C target certificate.



In March 2021, NTT DATA participated in the **RACE TO ZERO Circle** that is led by the United Nations Framework Convention on Climate Change (UNFCCC) through the **Business Ambition for 1.5°C** campaign. It also participated in the **JCI RACE TO ZERO CIRCLE** organized by the Japan Climate Initiative as a member. Through these activities, NTT DATA works to help make society carbon neutral.



Start activities as a supply chain member in April 2021

About 200 companies, government agencies, and other bodies around the world, including 13 Japanese companies, government agencies, and others participate. (as of June 2021)



Express support for Challenge Zero in April 2021

In cooperation with the Japanese government, the Japan Business Federation promotes measures to realize a decarbonized society, which is the long-term goal of the Paris Agreement.

As for the use of these initiative logos by respective companies, please refer to the following website. <https://home.groupwide.net/nttdata/soumu/kankyo/climateaction/initiative.html>.

1-4. NTT DATA Included in CDP's "Stories of Change"

A renowned international NGO praised NTT DATA for climate change initiatives.

- Our case study was featured in CDP Stories of Change as one of the nine global change case studies.

*CDP: The most authoritative international NGO in the field of climate change.



NTT DATA
Trusted Global Innovator

Creating a Sustainable Society by Leveraging Digital Technology

NTT DATA is a leading global IT services provider, operating in 208 cities across 55 countries with approximately 140,000 professionals, providing IT services to various organizations and businesses. Our mission is to build long-term relationships with clients, to do this we strive towards carbon neutrality in collaboration with them and a wide range of partners and colleagues across the globe.

NTT DATA aims to achieve carbon neutrality by or before 2040. We set science based targets aiming to decarbonize 60% by 2030 compared to 2016. We are also part of initiatives including 'Business Ambition for 1.5°C', CDP Supply Chain Program, and Green Software Foundation. We aspire to play a leading role in reaching global carbon neutrality.

NTT DATA provides IT services to support mission-critical social infrastructure for governments, financial institutions, and telecommunications, as well as diverse IT services to support clients. Extreme weather caused by climate change has the potential to disrupt social systems and business activities. Tackling climate change is an essential action for us to help clients and society, and we believe that our efforts in helping society to be smarter through IT will help out clients. NTT DATA recognizes that climate change is a global issue, and to tackle it transformation of social structures will be required. We offer consulting services to clients to cope with climate change, and decarbonize strategies to achieve carbon neutrality, so we contribute to global society by leveraging our IT services.

Tips for success

- Set ambitious long-term commitments and align them with your business strategy.
- Consider risks and opportunities based on the latest climate change information. It is especially important to consider risks and opportunities for clients.
- Collaborate with stakeholders including clients, suppliers, employees, and others related to shared goals, and develop joint activities, and
- Develop cutting-edge green technology to decarbonize your own business activities.

To successfully provide IT services, collaboration with suppliers is vital. To help drive forward decarbonization, we joined the CDP Supply Chain Program in April 2020, and we are continuously working to improve our approach and communications to increase supplier engagement in carbon neutrality. To accelerate our activities to tackle climate change, we established the Green Innovation Office in October 2021. The initial goals are to develop technology for green innovation, create global standards, and strengthen global one-stop green business and solutions.

As part of NTT Group, a leading global information and communication technology group, NTT DATA is promoting IOWN, "Innovative Optical and Wireless Network" concept. IOWN is the next generation integrated infrastructure for telecommunication and computing, enabled by photoelectric fusion technologies. Its advantages compared to existing infrastructure, include low energy consumption, as well as high capacity and low latency, and thus it will contribute to reduced energy consumption.

We are also working on saving energy in our data centers including equipment. Green data center has earned a LEED gold certification and uses cooling systems using outside air, solar power, AI and IoT to achieve maximum energy efficiency.

To drive forward the carbon neutrality of IT services, we joined the non-profit foundation, Green Software Foundation, as a steering committee member in September 2021. We are engaged in developing methods and global standards for software development, system integration and operation, which enables software to operate with low energy consumption and maximum efficiency.

Toshi Fujiwara, Representative Director and Senior Executive Vice President

Summary

Goal:

- Achieve carbon neutrality by 2040
- Achieve SBT1.5°C by 2030 (decarbonize 60% compare to FY2016)

Past initiatives:

- Joined CDP Supply Chain Program in April 2020
- Joined Green Software Foundation as a steering committee member in September 2021 (First company in Asia)
- Established Green Innovation Office in October 2021

Future:

NTT DATA will further strengthen its global initiatives including CDP, create a new society by connecting various people and organizations globally, and work together with you to achieve carbon neutrality.

https://cdn.cdp.net/cdp-production/comfy/cms/files/files/000/005/269/original/Stories_of_Change_2021.pdf

https://www.nttdata.com/jp/ja/news/services_info/2022/012000/

1-5. Certified as the first CDP Gold Partner in Japan

Collaborating with CDP to further promote green innovation to decarbonize global society



NTT DATA has been certified "Climate consultancy" and "Software" out of ten categories.

*As of February 2022

•Climate consultancy

The category recognizes companies that work together with their customers and society to become carbon neutral, from strategy development to implementation.

•Software

The category recognizes companies that design and build systems to make customers and society carbon neutral.

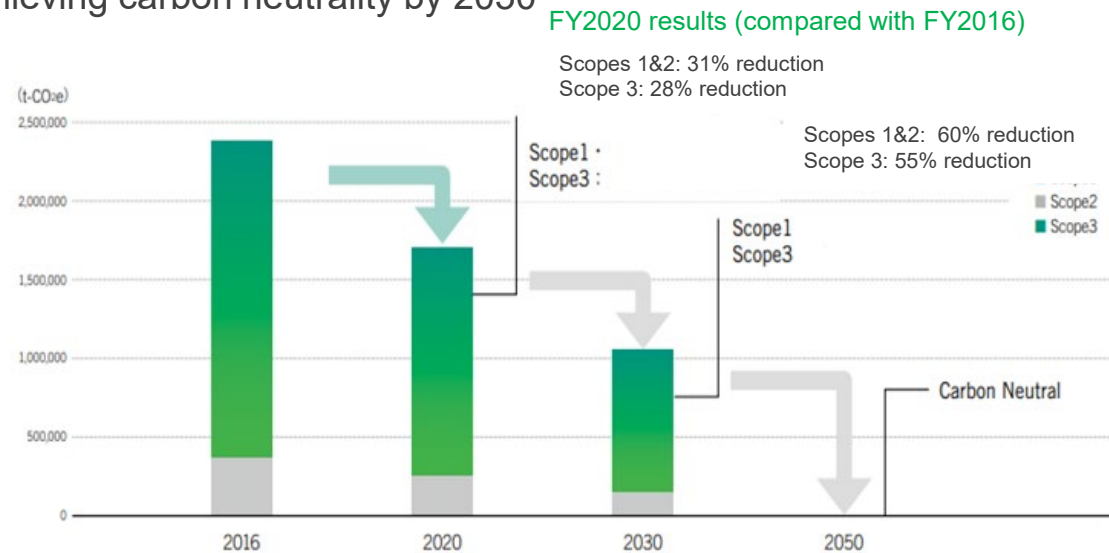
1-6. GHG Emission Reduction Targets for 2030 to Achieve Net-Zero Emissions (Scope 1-Scope 3)

NTT DATA supports the Business Ambition for 1.5°C and have set our own greenhouse gas emission reduction targets for 2030 as NTT DATA Group.



NTT DATA Group's GHG emission reduction targets	Scopes 1 and 2 reduction target for the end of FY2030 : 60% reduction from FY2016 31% reduction in FY2020
	Scope 3 reduction target for the end of FY2030 : 55% reduction from FY2016 28% reduction as of the end of FY2020

Toward achieving carbon neutrality by 2050



SCIENCE BASED TARGETS

Support for SBT Business Ambition for 1.5°C
Received the SBT 1.5°C certificate

(12th company in Japan)

FY

1-7. NTT DATA's Green Innovation Business Initiatives

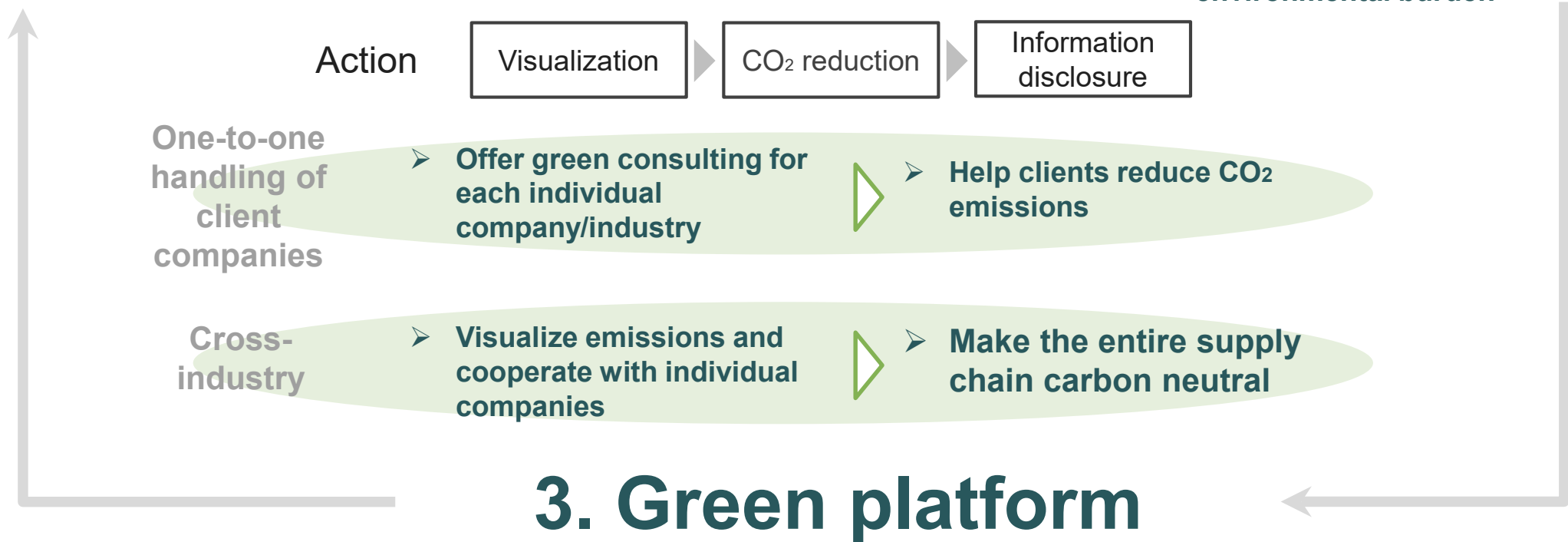
NTT DATA caters to the needs of each individual company with three major pillars of consulting, SI, and platform to ensure priority given to green businesses and lead cross-industry carbon neutrality.

1. Green consulting

Design customer journey for achieving carbon neutrality

2. Green SI

Realize system development with low environmental burden



Create "standards" of emissions and make it easier to realize visualization and cross-industry cooperation

1-8. NTT DATA Begins Offering Green Consulting Service

On January 14, 2022, NTT DATA started green consulting service

We support our clients from strategy planning to implementation toward carbon neutrality

Home/News

NTT DATA Begins Offering Green Consulting Service Supporting Customers from Strategy Planning to Implementation Toward Carbon Neutrality

SHARE

News release/NTT DATA

January 14, 2022

NTT DATA Corporation

On January 14, 2022, NTT DATA Corporation (Headquarters: Koto Ward, Tokyo, President and Chief Executive Officer, Representative Director; Yo Honma, hereafter “NTT DATA”) began offering a green consulting service to realize a carbon-neutral society. This service is to provide comprehensive support for customers, irrespective of the public and private sectors, from planning carbon-neutral strategies suited for the characteristics of respective industries to implementing emission reduction using digital technologies owned by NTT DATA. Especially, when it comes to visualization of greenhouse gas emissions, which will be increasingly required going forward, we will provide support not only to simply visualize them but also to realize visualization to help clients reduce emissions on the basis of our original five-scale level definition. In introducing the service, we will help clients establish emission visualization processes considering feasibility and effects in a way suited for the business conditions of respective client companies.

Background

With social conditions toward carbon neutrality changing dramatically, such as global policy measures including EU taxonomy, demands from client companies to disclose information on greenhouse gas emissions and reduce emissions, and responses to climate change initiatives, all industries, companies, and municipalities are required to work on the issue of climate change from multifaceted and medium- and long-term perspectives.

Aiming to achieve the “NTT Green Innovation toward 2040,”¹ NTT DATA is working to reduce our company’s greenhouse gas emissions while making the most of our digital technologies to help customers and society become carbon neutral. To that end, NTT DATA offers a green consulting service to comprehensively support clients from strategy planning to implementation on the basis of the characteristics of respective industries.

About the news release

Information on the news release, such as the content, price, and specifications of the service or the product, and contact, is as of the release date and could be changed without prior notice. Also, please note that as for plans, targets, and other information published in the news release, results could be different from estimates because of various risks and uncertain facts.

Distribution of news releases

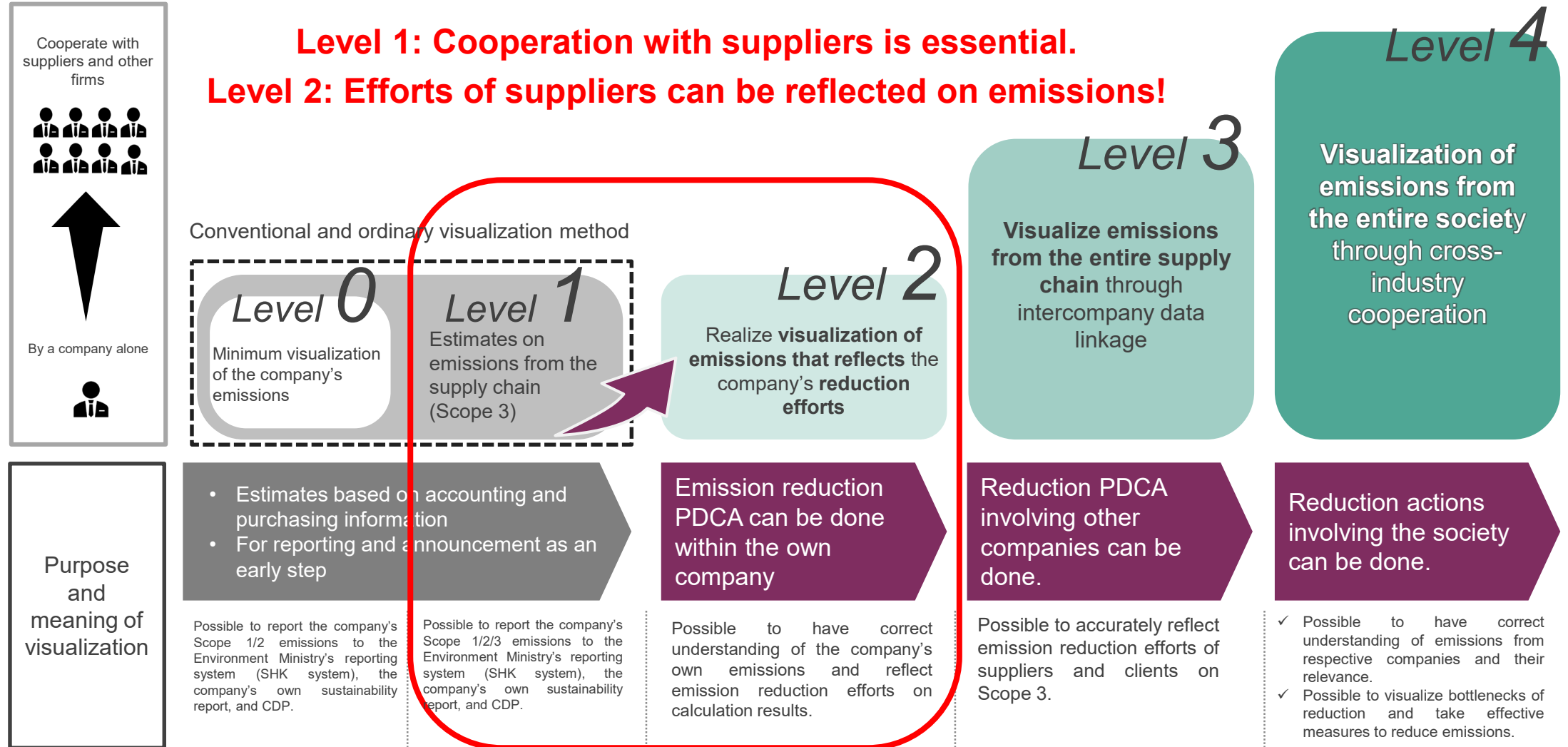
To give you updates on news releases, we have an e-mail delivery service.

To apply, click here.

<https://www.nttdata.com/jp/ja/news/release/2022/011400/>

1-9. NTT DATA Begins Offering Green Consulting Service

- To visualize GHG emissions, which is increasingly needed these days, NTT DATA provides support to help clients reduce emissions through visualization, rather than simply visualizing emissions, on the basis of our original five-scale level definition.



1-10. CO2 Emission Reduction Steps to Be Taken Together with Suppliers

To reduce CO₂ emissions, it is important to **visualize** emissions from suppliers, make a **reduction plan** equivalent to SBT 1.5°C and **implement reduction measures** in line with the plan.



1

Visualization

Correct understanding of direct and indirect emissions in business and extraction of factors that make up large proportions

- ✓ Purchases
- ✓ Employees' activities
- ✓ Production activities
- ✓ Supplied electricity, etc.



2

Reduction plan

Planning reduction approaches for each scope to address factors specified



3

Implementation

Implementation and continuous monitoring

SAP SaaS Solution | Visualization service

NTT DATA EMEAL

- Linking with back office data makes it possible to collect highly credible information with traceability
- Working to visualize emissions using ServiceNow and other solutions as well as SAP

Portal of Volunteering
Welcome back Peter!

COVID-19: everis foundation joins the technology support channel
everis foundation, in its vocation to put technology at the service of social problems, joins the channel of help, guidance and support organized by the Committee on Digital Transformation of the AEF

5 INITIATIVES | 6 OBJECTIVES | 19 PROGRAMS | 4 PROJECTS

umbiambu
OF TRACKING PARTNERS

Progress
Volunteering projects completed
60%

CLIMATE & ENVIRONMENT
CLIMATE & ENVIRONMENT

Dashboard

Greenhouse gas emissions
Energy performance
Biodiversity
Water
Waste

Climate & Environment
Gender equality is not only a fundamental human right, but a necessary foundation for a peaceful and sustainable world. Real change has been slow for the most of women in the world.

TOTAL AMOUNT OF CLIMATE & ENVIRONMENT
Last 12 months of 2019

10% Greenhouse gas emissions
1248 TONS CO₂E GAS EMISSIONS

20% Energy performance
384 kWh ENERGY PERFORMANCE

40% Biodiversity
542 SHARES BIODIVERSITY

20% Water
1248 TONS WATER

10% Waste
1248 TONS WASTE

Low Month performance: +0.5%
Total performance: +29.7%

LAST MONTH DATA (March 2019)

Greenhouse Gas Emissions: 104 tons
Energy performance: 104 kWh
Biodiversity: 104 shares
Water: 104 tons
Waste: 104 tons

Other indicators
Water, waste and material
Green securities

SOCIAL RESPONSIBILITY TRACKER
Support Technovation

Diversity

Education
Work
Talent

TARGET: 300
CURRENT: 200
BUDGET: 15000€
REMAINING: 28000€
ETC: 3000€

60%

LAST PERIOD OBJECTIVE: 228/400
LAST PERIOD: 150

Last projects created

Project	Date	Status	Initiative	Program
Technovation Skills	2019-03-29 09:00:00	Completed	Skills & Knowledge Development	Support Technovation
Technovation Skills	2019-03-29 09:00:00	Completed	Skills & Knowledge Development	Support Technovation
Technovation Skills	2019-03-29 09:00:00	Completed	Skills & Knowledge Development	Support Technovation
Technovation Skills	2019-03-29 09:00:00	Completed	Skills & Knowledge Development	Support Technovation
Technovation Skills	2019-03-29 09:00:00	Completed	Skills & Knowledge Development	Support Technovation

Emission visualization and reduction measures via NTT DATA supply chain

NTT DATA

➤ As for emissions from the supply chain, NTT DATA visualizes emissions from the entire company and those from respective organizations and promotes emission reduction including green purchasing.

Image of emission visualization implemented on the portal site for employees (right)
Various visualization of GHG emissions; by organization, by building, by GHG Scope category, by supplier, etc.



1-13. Green Consulting Service for Manufacturers

To help make the whole society carbon neutral, NTT DATA utilizes Mitsubishi Heavy Industries' AI solution "ENERGY CLOUD®" to sophisticate green consulting service for manufacturers and began offering the service on January 27.

<Range of the latest sophistication >

Visualization of GHG emissions

Simulation of investment in fuel conversion facilities

Proposal of utilizing surplus electricity from in-house power generation for industrial use

By combining NTT DATA's green consulting method with MHI's ENERGY CLOUD® plant simulations and digital twin building technology, we support customers in the manufacturing industry to achieve carbon neutrality.

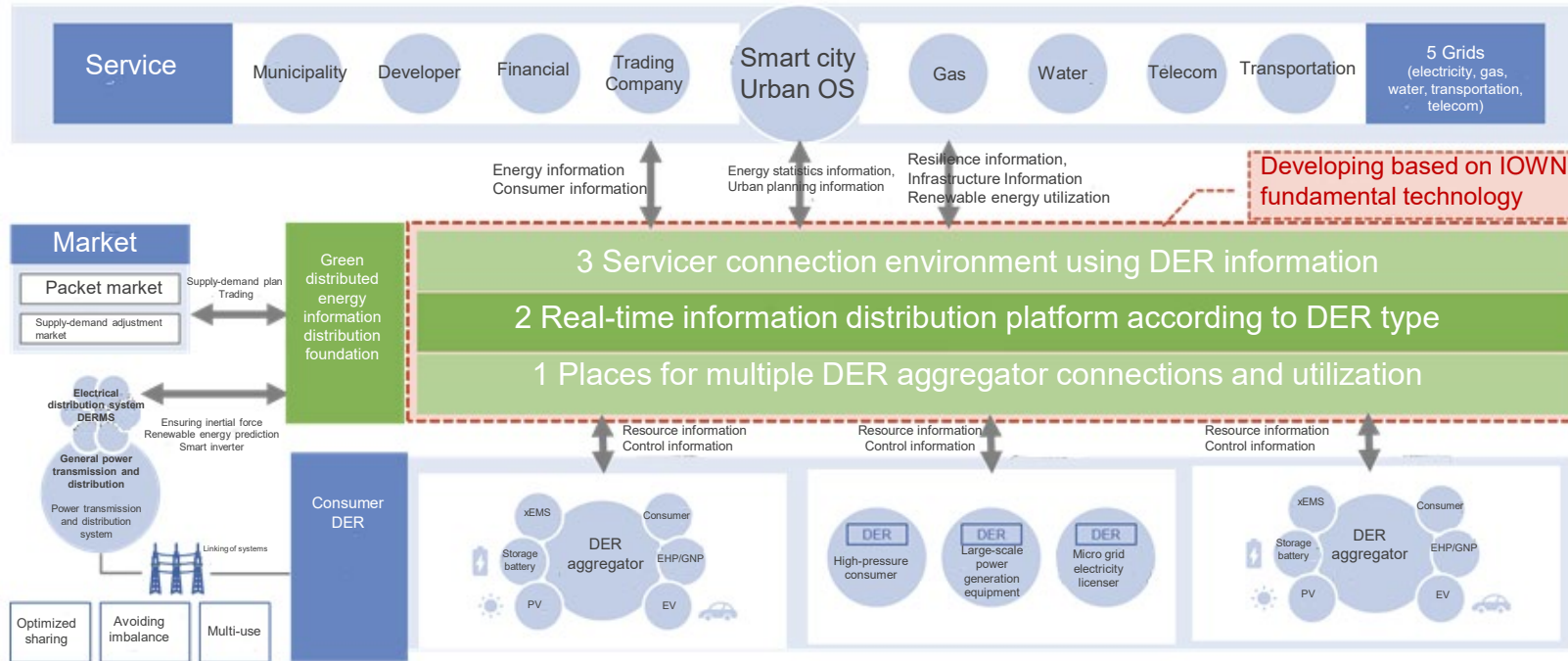
<https://www.nttdata.com/jp/ja/news/release/2022/012701/>

1-14. NTT DATA Starts to Build a Distributed Energy Information Distribution Platform Toward Carbon Neutrality

A proof of concept will be conducted in FY2022

Aiming to achieve high-speed processing of distributed energy information for 30 million units at periods of several seconds to one minute in FY2025

Green distributed energy information distribution platform



By developing the platform, we visualized distributed energy, and enabled to utilize data (grasping, forecasting, and controlling), and realize services (trading).

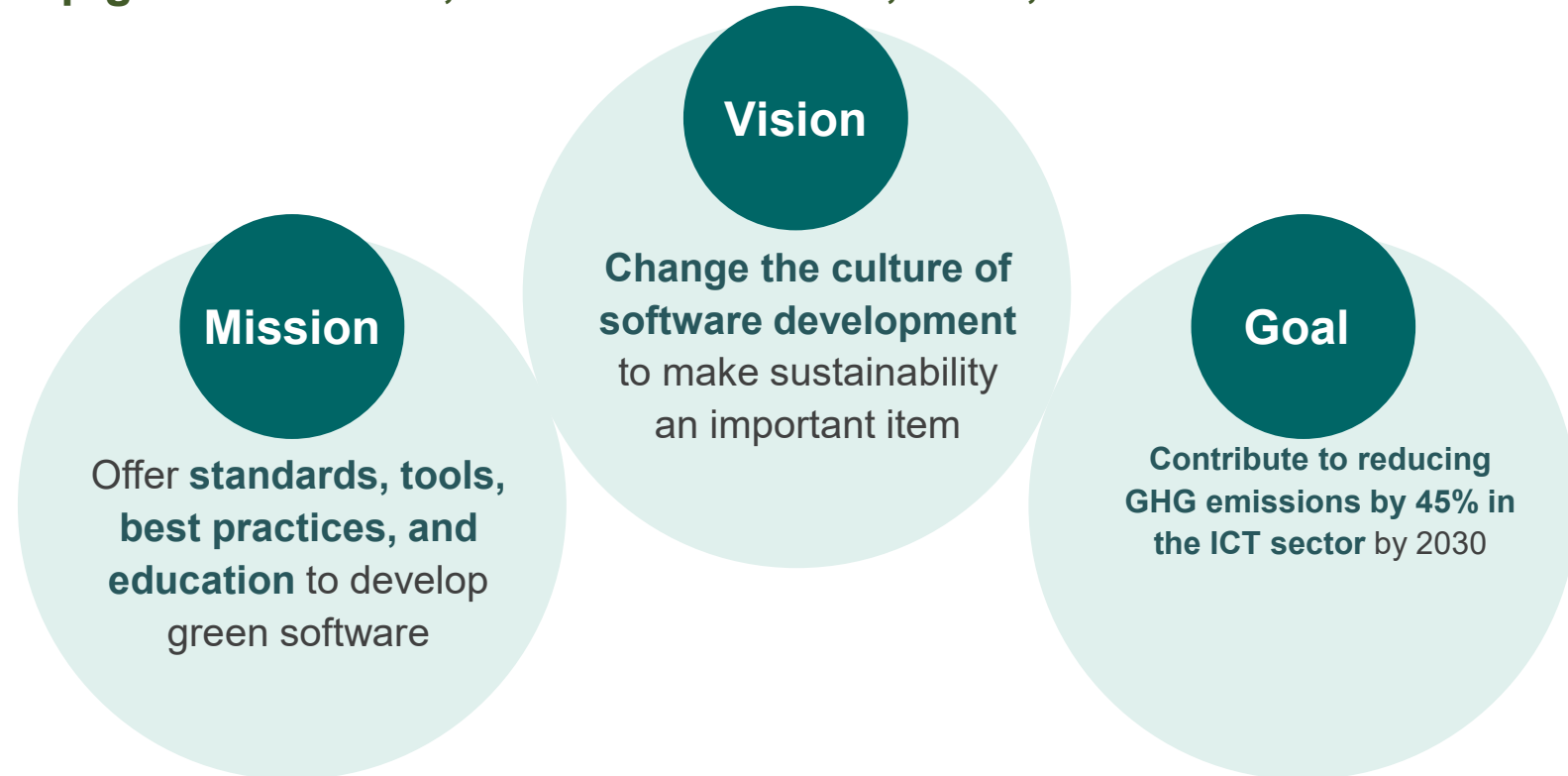
<https://www.nttdata.com/jp/ja/news/release/2022/012800/>

A global nonprofit organization working on green software development

It establishes an ecosystem to develop green software, such as standards, tools, and education.



Established in May 2021 by Microsoft, GitHub, Accenture, and ThoughtWorks



NTT DATA participates as a sixth core member company promoting green software development on a global scale

<https://www.nttdata.com/jp/ja/news/release/2021/091600/>

1-16. Alpha Version of “Software Carbon Intensity (SCI)” Specification

The Green Software Foundation (GSF) created an alpha version of **Software Carbon Intensity (SCI) specification that defines a methodology for calculating the rate of carbon emissions for a software system** (December 6, 2021).

In line with the release, **six GSF steering member companies issued press releases on the same day** (at different times and with different texts).

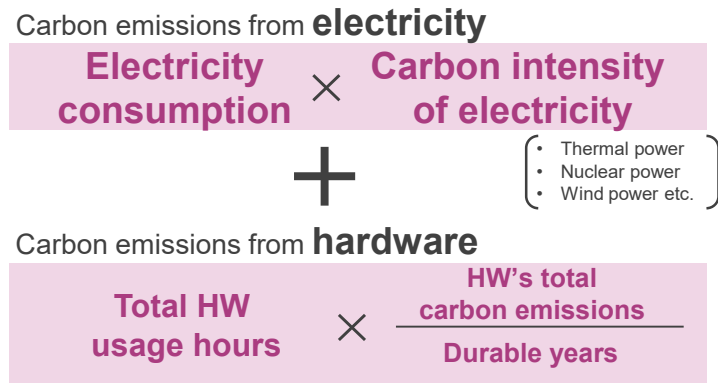
Under the leadership of Microsoft, late-joining NTT DATA also contributed to the discussion.

What is SCI?

- **A score to compare carbon emissions from software per unit processing**
 - Standards like the “fuel economy” for automobiles
 - **It is not CO₂ emissions themselves**, but it is a score.
- SCI can be used to compare emissions from software programs and improve implementation.



Per unit processing... (e.g., one transaction)



* This material uses a simplified explanation to help readers understand, but in the official definition, the emissions from hardware are calculated with a math formula taking into account multiple devices.

Future of GSF

- ✓ Planning to improve to create the 1.0 version
- ✓ Holding assets and events for rollout

Standards	Assets		Events	
SCI ver1.0	Tools	Open data	Hackathons	Training

NTT Data’s purpose

- ✓ **Develop SCI to promote our measures**

Measure 1: Standards for emissions in the process of development (measurement)

Measure 2: Standardizing of electricity consumption visualization tools, etc.

Green Software Foundation logo is a trademark of Linux Foundation registered in the US and other countries.

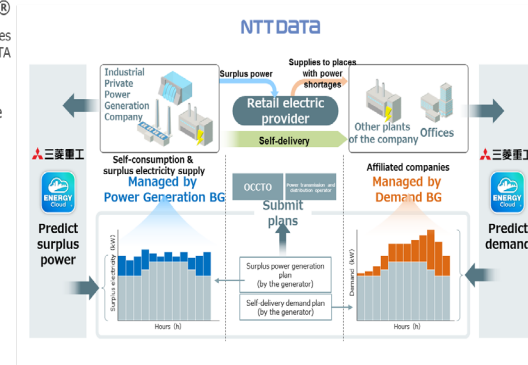
<https://www.nttdata.com/jp/ja/news/release/2021/120601/>

Green Innovation

1-17.
Through cocreation with clients, NTT DATA accelerates efforts to build a green society.

ENERGY CLOUD®
Mitsubishi Heavy Industries
× NTT DATA

Forecast and control the amount of power generated by private power generation facilities in factories and on-site demand to develop optimal energy strategies.

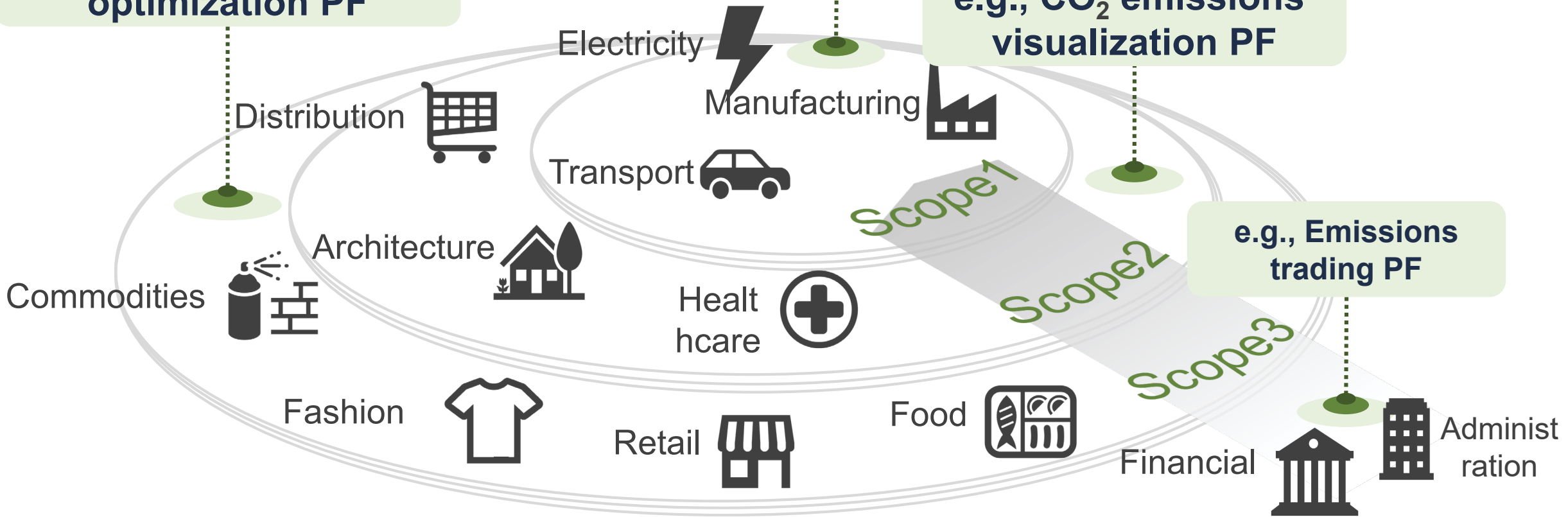


e.g., Energy use optimization PF

e.g., Supply chain optimization PF

e.g., CO₂ emissions visualization PF

e.g., Emissions trading PF



1-18. NTT DATA ANSER/CAFIS/OpenCanvas as well as Toyosu Center and Annex buildings will be introduced 100% renewable energy

NTT DATA has set the goal of using **100% renewable energy** at all of **our own DCs by 2030**.

We decided to **use 100% renewable energy** at the operation centers of the payment/financial services **ANSER®**, **CAFIS®** as well as the digital transformation infrastructure **OpenCanvas®** from April 2022.

We also decided to use 100% renewable energy for **all the electricity used for Toyosu Center Building and Toyosu Center Building Annex**.

Two of Toyosu head office buildings are used by approximately 15,000 employees during peak hours.

We utilize green energy service provided by Mitsui Fudosan for renewable energy procurement.

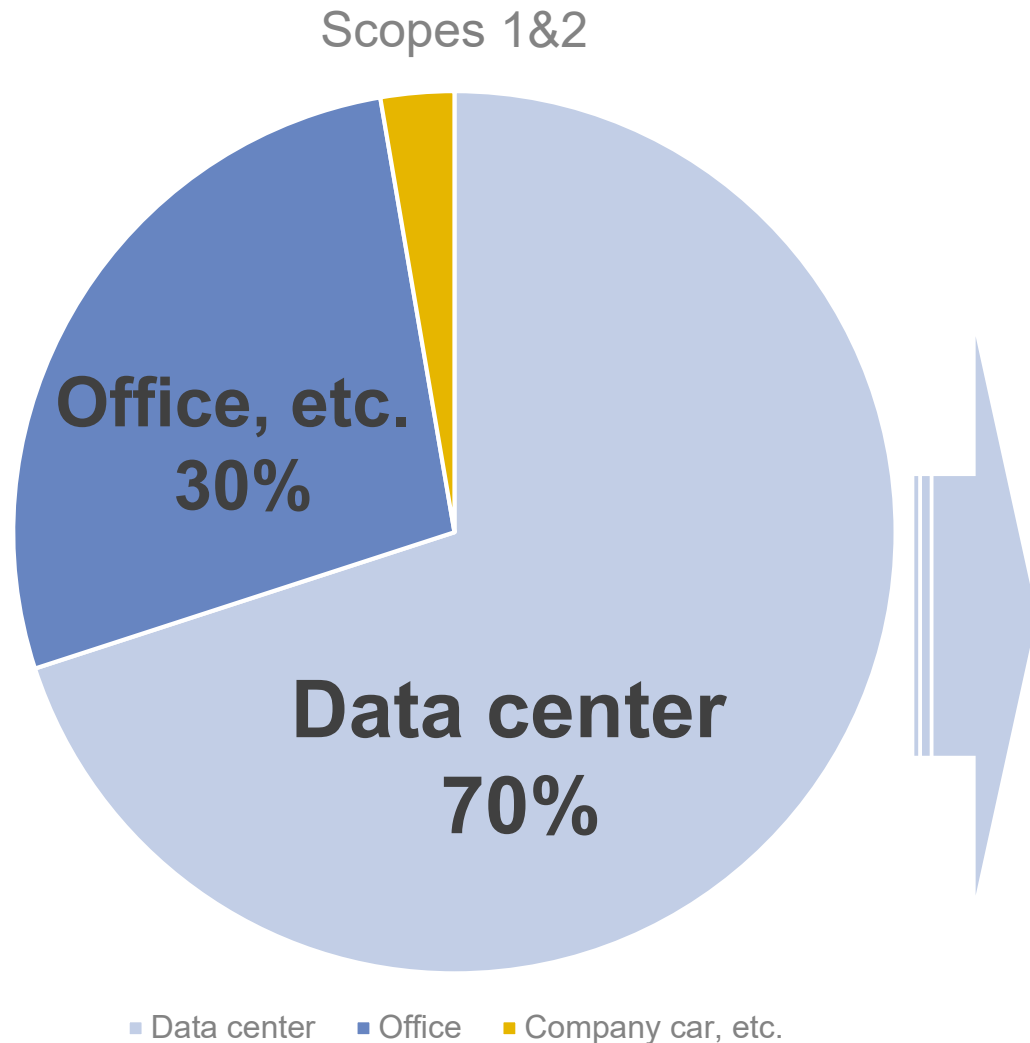
→ We **contribute to reduce carbon emissions through clients' supply chains**

1-19. Summary: NTT DATA Group's Green Innovation Initiatives

- **Establishment of Green Innovation Office**
 - ⇒Promote green initiatives on a global scale
- **Pursuing Carbon Neutrality Together With Global Initiatives**
 - ⇒Global partnership with CDP, etc.
 - ⇒support SBT Business Ambition for 1.5°C (Scope1-3)
- **NTT DATA's Initiatives for Green Innovation**
 - ⇒Ensure priority given to green businesses and lead cross-industry carbon neutrality with three major pillars of consulting, SI, and platform.
 - ⇒Founded an ecosystem for software development through **Green Software Foundation**
- **Implementation of 100% renewable energy**
 - ⇒ANSER/CAFIS/OpenCanvas, Toyosu Center Building and Annex buildings 100% renewable energy use in 2022

1-20. Reduction of NTT DATA's CO₂ Emissions

Current status of CO₂ emissions from NTT DATA Group



Next

Horiguchi from the Facility Management Division will explain measures to achieve carbon neutrality of **data centers that account for 70% of NTT DATA's emissions (Scopes 1&2)**



Measures for Carbon Neutrality of Data Centers

March 16, 2022
Shigeyoshi Horiguchi, Senior Manager, Facility Management Division,
Consulting & Solutions Sector NTT DATA Corporation

NTT DATA's Green Initiatives

2-1. Published on the Nikkei Sangyo Shimbun on New Year's Day 2022

Next Medium-term Management Plan will focus on two pillars of “digital” and “green” to expand business

“Toward a decarbonized society, NTT DATA will pursue green business activities as well as supporting client companies and the society to be greener. **For our own company, we will improve energy efficiency of data centers and purchase renewable energies, among other measures.**”

“For clients, we will not only build energy-saving systems for respective companies but also offer systems that can be used by multiple companies across industries.”



President Honma aims to expand business while focusing on “digital” and “green”



Energy efficiency of data centers is being improved

2-2. GHG Emission Reduction Targets for 2030 to Achieve Net-Zero Emissions (Scope 1-Scope 3)

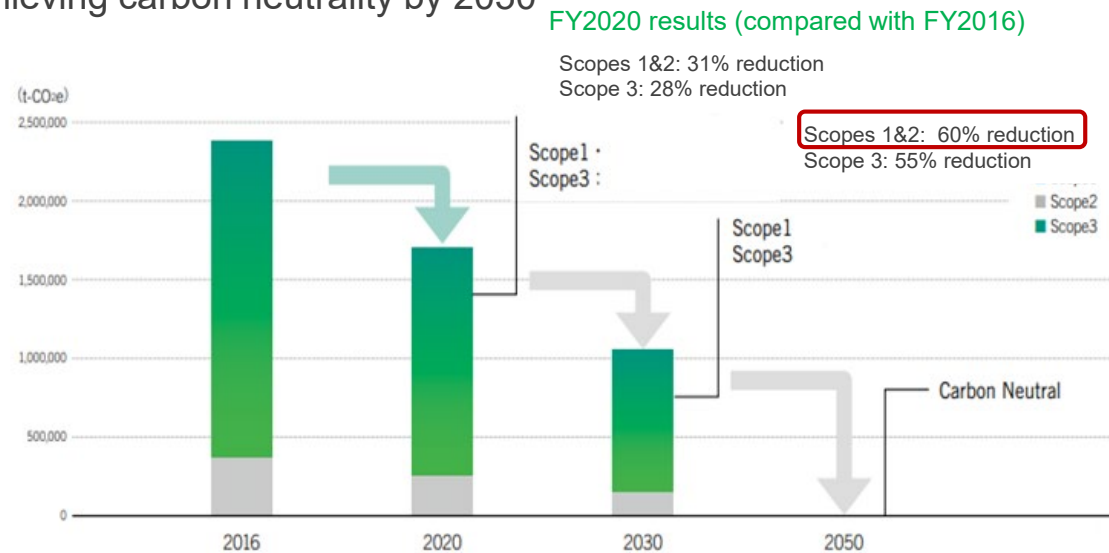
To achieve SBT target of 60% reduction, NTT DATA reduces energy consumption in data centers and offices.



NTT DATA Group's GHG emission reduction targets

Scopes 1 and 2 reduction target for the end of FY2030	: 60% reduction from FY2016 31% reduction in FY2020
Scope 3 reduction target for the end of FY2030	: 55% reduction from FY2016 28% reduction as of the end of FY2020

Toward achieving carbon neutrality by 2050



SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Support for SBT Business Ambition for 1.5°C
Received the SBT 1.5°C certificate
(12th company in Japan)

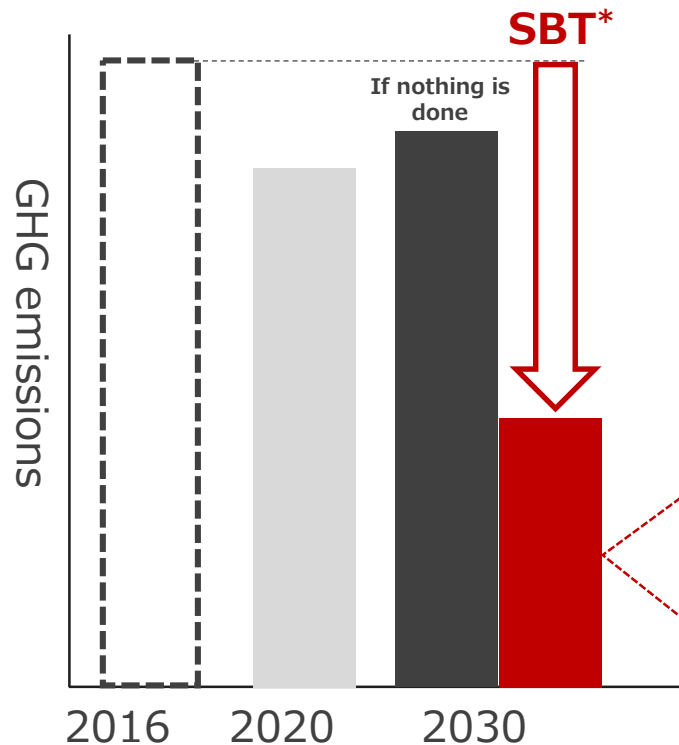
FY

2-3. NTT DATA Group's Greening Targets for Corporate Activities

Reduce energy use in data centers **by working across industries and technologies from both the facility and IT perspectives**

- **About 70%** of our carbon emissions (Scope 1&2) come from **data centers**
- In accordance of NTT Green Innovation toward 2040, we declared to achieve **carbon neutrality in data centers by 2030**

■ Measures to achieve the SBT of 60% reduction



*SBT : Science Based Targets. An indicator of GHG reduction targets set by companies over the medium to long term, consistent with the levels required by the Paris Agreement.

1. Improving air conditioning operations in data centers

- Improve the exhaust heat in machinery rooms to promote energy saving of air conditioners

2. Utilizing the latest energy-saving technologies

- Control air conditioning according to IT load conditions, monitor resource management, and consider innovative energy-saving solutions

3. Energy-saving of IT equipment

- Low power consumption, introduction of IT equipment capable of handling high temperatures, and ensuring reliability

4. Green energy procurement

- Introduce renewable energy electricity, not only based on certifications, but quality considerations.

2-4. IT Service Provision Model That Realizes Carbon Neutrality: Early case

- Advanced implementation of energy reduction measures (1. improved operation (survey/improvement) + 2. new technology (SmartDash/air conditioning IoT) + 3. renewable energy (green certificate)) using the cloud common IT foundation (OpenCanvas).
- Using OpenCanvas as an ideal model for horizontal rollout, NTT DATA aims to achieve the SBT targets and carbon neutrality at data centers by 2030.

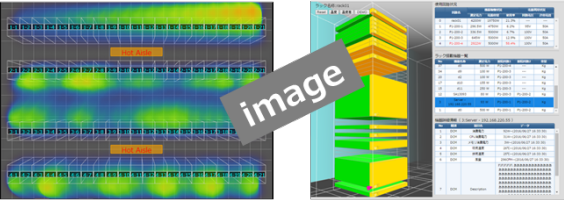
- 1. Improving air conditioning operations in data centers**
 - Improve the exhaust heat in machinery rooms to promote energy saving of air conditioners
- 2. Utilizing the latest energy-saving technologies**
 - Control air conditioning according to IT load conditions, monitor resource management, and consider innovative energy-saving solutions
- 3. Energy-saving of IT equipment**
 - Low power consumption, introduction of IT equipment capable of handling high temperatures, and ensuring reliability
- 4. Green energy procurement**
 - Introduce renewable energy electricity, not only based on certifications, but quality considerations.

1. Improved operation (survey/improvement) & 2. new technology (SmartDash)

1 Visualization

Visualize indoor environment in the OpenCanvas area (temperature distribution, current value of each server)

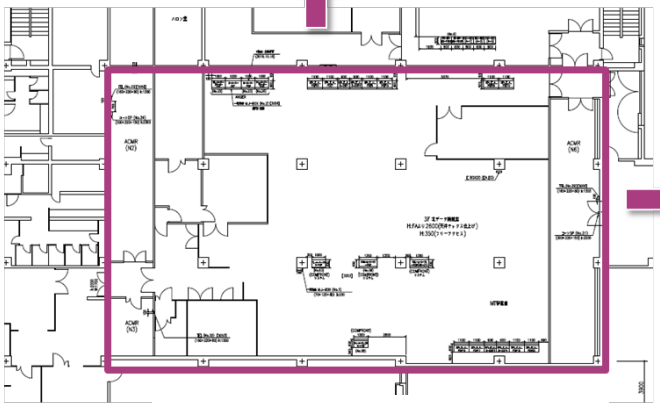
- Temperature sensor on server racks
- Installing CT (current measurement sensor) in the power source between PDU and the server and visualize the server room environment on a large-screen monitor, etc.



image

Raising awareness of energy saving

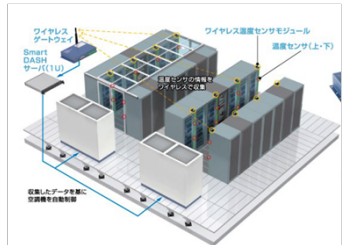
Appeal to external parties for our eco-friendly measures



The machine room concerned
(part of the floor plan of the machine room on the 3rd floor)

2 Reduction of electricity consumed by air conditioning equipment (introduction of SmartDASH)

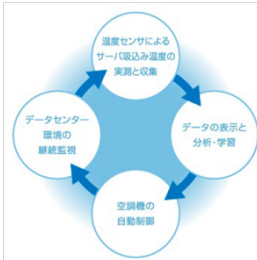
Automatic measurement and control using learning function enables optimized air conditioning environment and energy efficiency.



ワイヤレスデータ収集
Smart DASH サーバ(IU)

ワイヤレス温度センサモジュール
温度センサ(上・下)

設置したデータホストに空調機を自動制御



温度センサによるサーバ(国込み)温度の実測と収集

データの表示と分析・学習

空調機の自動制御

データセンター環境の継続監視

3. Purchasing green energy

As for important systems such as ANSER, OpenCanvas, and CAFIS, **NTT DATA will purchase green energy to cover the amount of electricity that cannot be made up for by energy reduction measures and preferentially use the energy for such systems.**

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41

NTT DATA

Overview of MITAKA Data Center EAST and Green Initiatives

**(Details will be explained in
Agenda 4.Facility Introduction of Mitaka Data Center EAST.)**

2-5. Overview of NTT DATA Mitaka Data Center East

Japan's largest and cutting-edge data center

(Total floor area: approx. 90,000 m², electricity receiving capacity: approx. 56,000 kVA) *Combined value with the West Building

Seismic
isolation

Underground
cable tunnel

Three substations
72-hour
continuous
operation
without refueling

High load
20 kVA

High
energy
efficiency



Building	<ul style="list-style-type: none">• Total floor area: 37,650 m²• Maximum number of racks: 5,600 racks ※Combined value with that of Building II to be completed in 2023• Latest seismic isolation technology is used for the building• Floor load: 1.5 t/m²
Power supply facility	<ul style="list-style-type: none">• Maximum electricity receiving capacity: 41,000 kVA• Emergency power generator continues to operate for 72 hours without refueling
Rack specs	<ul style="list-style-type: none">• Maximum 20 kVA/rack
Air conditioning equipment	<ul style="list-style-type: none">• High energy efficiency using an outdoor air-cooling system (Direct use of outdoor air)
Security	<ul style="list-style-type: none">• Complying with FISC guidelines• ISO27001
Network	<ul style="list-style-type: none">• Corresponding to multicarrier networks/ NTT leading-in underground cable tunnel
DC facility standards	<ul style="list-style-type: none">• J-Tier3+
External certificate	<ul style="list-style-type: none">• LEED(Gold), ISMS, BCMS

2-6. Location of the Data Center and Planned Site for Building II

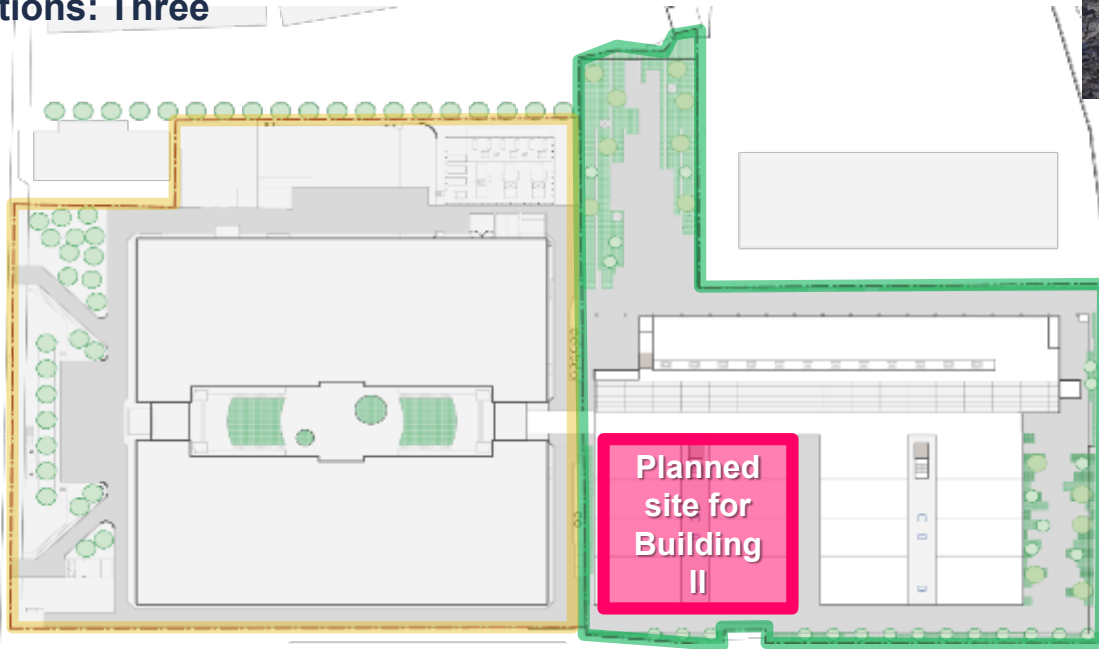
A site adjacent to the existing Mitaka building, which is one of the centers for NTT DATA's system development and operation

- **Access:** About 30 minutes from JR Shinjuku Station, approximately 45 minutes from JR Tokyo Station.
- **Disaster risks:** The area is expected to suffer little damage from all kinds of disaster risks such as earthquakes, floods, liquefaction, tsunami, and traffic control.
- **Number of substations:** Three



**NTT DATA
Mitaka Data Center
West Building**

Year of completion: 1980
Total floor area: 51,496 m²
Electricity receiving capacity: 15,000 kVA



WEST

EAST



**NTT DATA
Mitaka Data Center East Building**

Year of completion: 2018 (Building II to be completed in 2023)

Total floor area: 37,650 m²
Electricity receiving capacity: 41,000 kVA

2-7. The Entire Building Is Designed to Serve as a Cooling Device

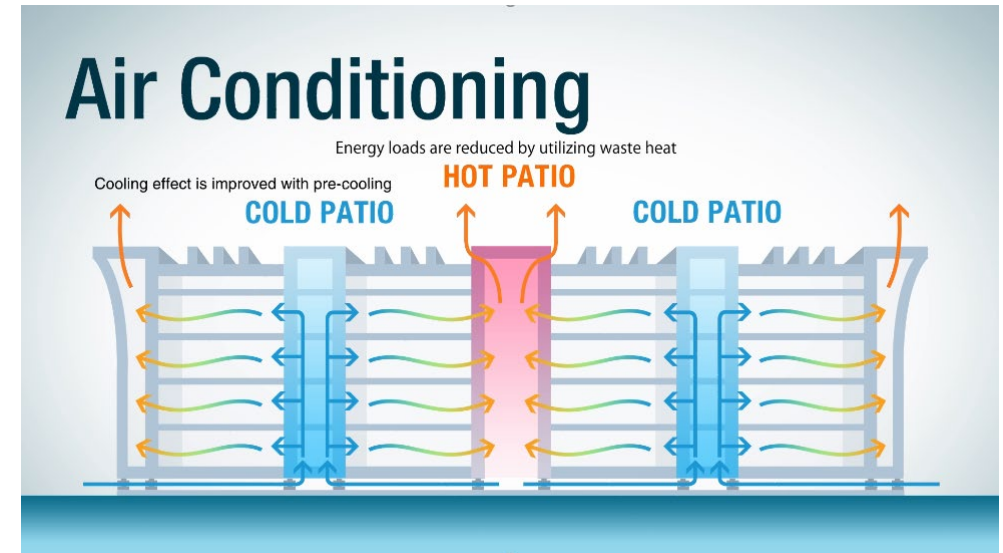
By making the most of natural energy

PUE = 1.3 or less (design value)

Power Usage Effectiveness

NTT DATA adopts its first side flow air conditioning system introducing outdoor air

- The system drastically lowers power required to transport cool air than the conventional underfloor air conditioning system and contributes to reducing environmental burden.
- The effects to increase space efficiency and energy efficiency make the data center more sustainable.



2-8. Metropolitan-type Green Data Center

Use of daylight for multiconcourse, exhaust heat from servers, and solar power enables us to **realize net zero**. *1

Amount of CO₂ to be reduced by solar photovoltaic panels a year: **16,146 kg** (FY2020 results)

Renewable energy
Solar photovoltaic panels are installed on the rooftop.



Energy-saving lighting

A soft light emitted from the light diffusion system creates a bright space.



Energy-saving air conditioning

(Summer, spring, and autumn)
Use exhaust heat from servers for air heating.
(Winter)
Introduce outdoor air cooled by geothermal heat.

*1: Net zero was achieved only for the multiconcourse (common space on the third floor) not for the entire building.

Mitaka Data Center East received **LEED GOLD** certification

In recognition of Mitaka Data Center East's environmental performance such as the use of reclaimed water and highly efficient air conditioning system, the center received the LEED Version 4 Gold certificate, becoming Japan's first data center receiving the certificate.



LEED (Leadership in Energy & Environmental Design) is a system developed and operated by the U.S. Green Building Council to certify environmentally friendly buildings and area development, and they are rated according to scores.

Further Challenges to Be Greener

2-9. Use IoT to Sophisticate Air-Conditioning Control and Operation

1. Improving air conditioning operations in data centers
 - Improve the server's heat exchangers to promote energy saving of air conditioners
2. Utilizing the latest energy-saving technologies
 - Control air conditioning according to IT load conditions, monitor resource management, and consider innovative energy-saving solutions
3. Energy-saving of IT equipment
 - Low power consumption, introduction of IT equipment capable of handling high temperatures, and ensuring reliability
4. Green energy procurement
 - Introduce renewable energy electricity, not only based on certifications, but quality considerations (RE100)

- Pursue safety and energy efficiency with an integrated operation making use of enhanced environmental durability of equipment.
- Integrate data center operations, IT, and facilities and work to realize the PUE 1.1 level.

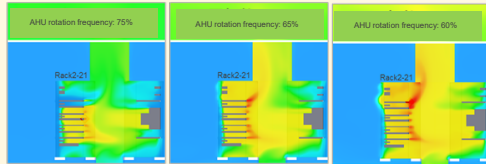
Existing data center

Individual optimization	Independent control systems for IT devices comprising the system and for facilities (room environment)
Rules of thumb	Air-conditioning control counting on operators' experience and intuition
Potential	Prolonged processes from the emergence of a problem to detection of cause and solution

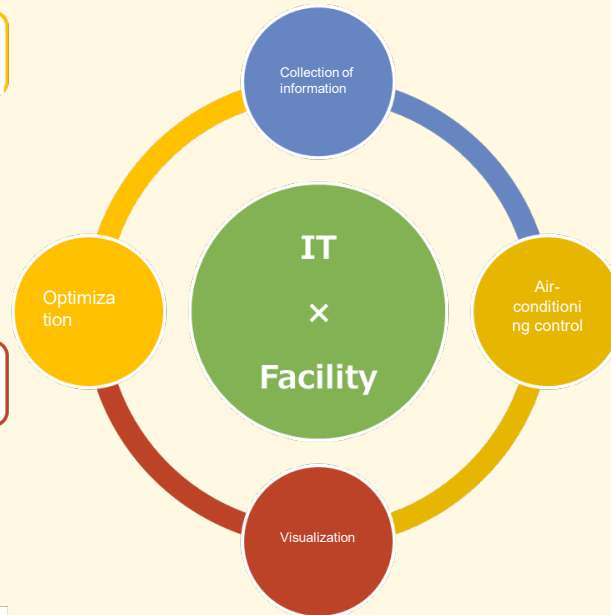
Ideal data center

Total optimization	Give information feedback on IT devices and use it for room environment control
Data utilization	Use AI to instantly determine optimal solution and automatically control air conditioning
Visualization	Visualize the machine room with digital twin and instantly detect causes

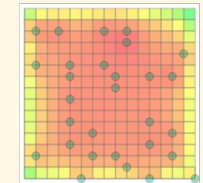
Automate operation and control, which have been done by humans, by using AI's learning and analysis



Recreate real-time information with digital twin. Accurately find hot spots



Information is extracted directly from server's sensors



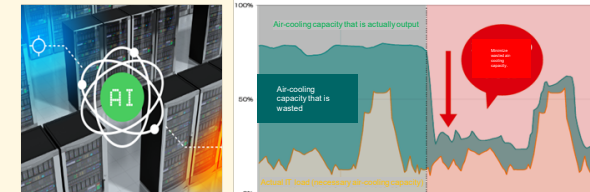
Sensors placed in the server



Server is the storehouse of sensors.

Increase devices durable to high temperature and high humidity

Used for air-conditioning control to resolve excessive cooling or insufficient cooling

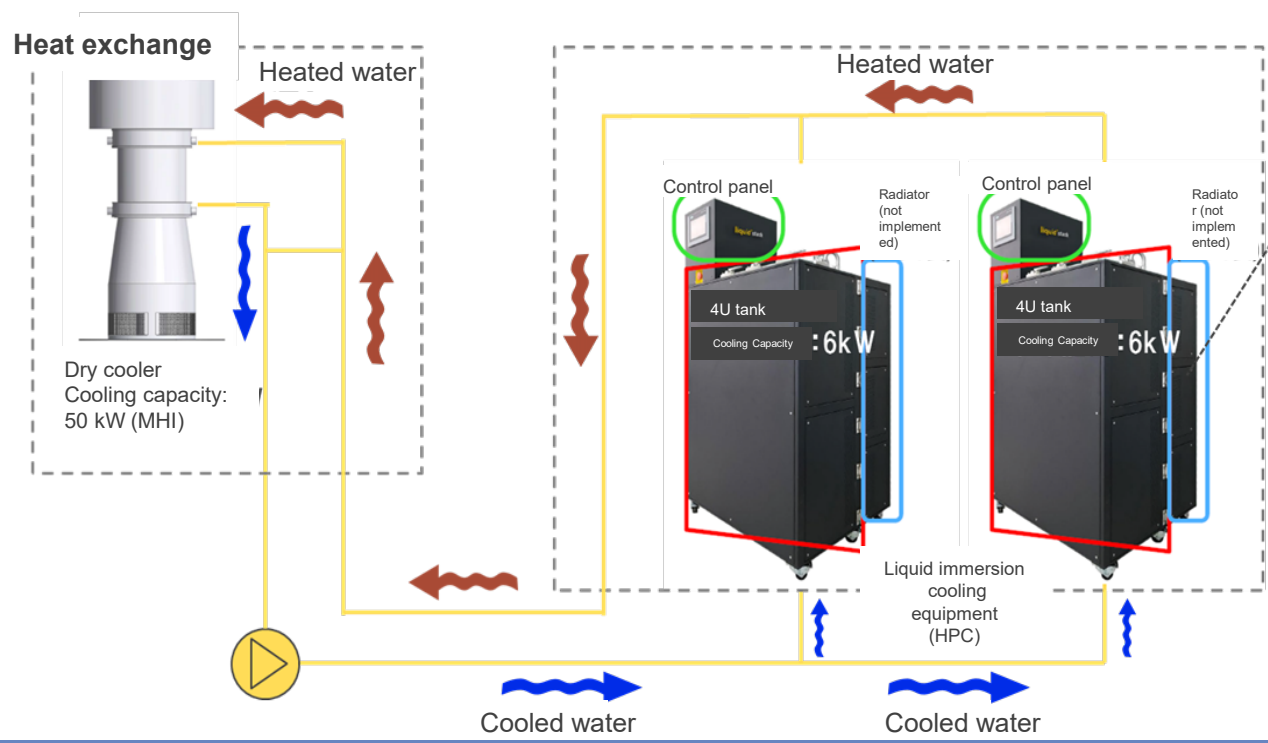


2-10. Verification of New Technology That Will Change the Concept of Cooling in Data Center (liquid immersion cooling solution)

1. Improving air conditioning operations in data centers
 - Improve the exhaust heat in machinery rooms to promote energy saving of air conditioners
2. Utilizing the latest energy-saving technologies
 - Control air conditioning according to IT load conditions, monitor resource management, and consider innovative energy-saving solutions
3. Energy-saving of IT equipment
 - Low power consumption, introduction of IT equipment capable of handling high temperatures, and ensuring reliability
4. Green energy procurement
 - Introduce renewable energy electricity, not only based on certifications, but quality considerations (RSE)

- Higher density of servers equipped with high-performance CPU and GPU at data centers
- Starting PoC using Mitaka East as a field with **focus on the liquid immersion cooling technology** as a next-generation cooling method that helps reduce environmental burden dramatically.

Theoretically, energy efficiency is approx. PUE 1.06, making it possible to reduce GHG emissions from an existing data center by slightly more than 30%.



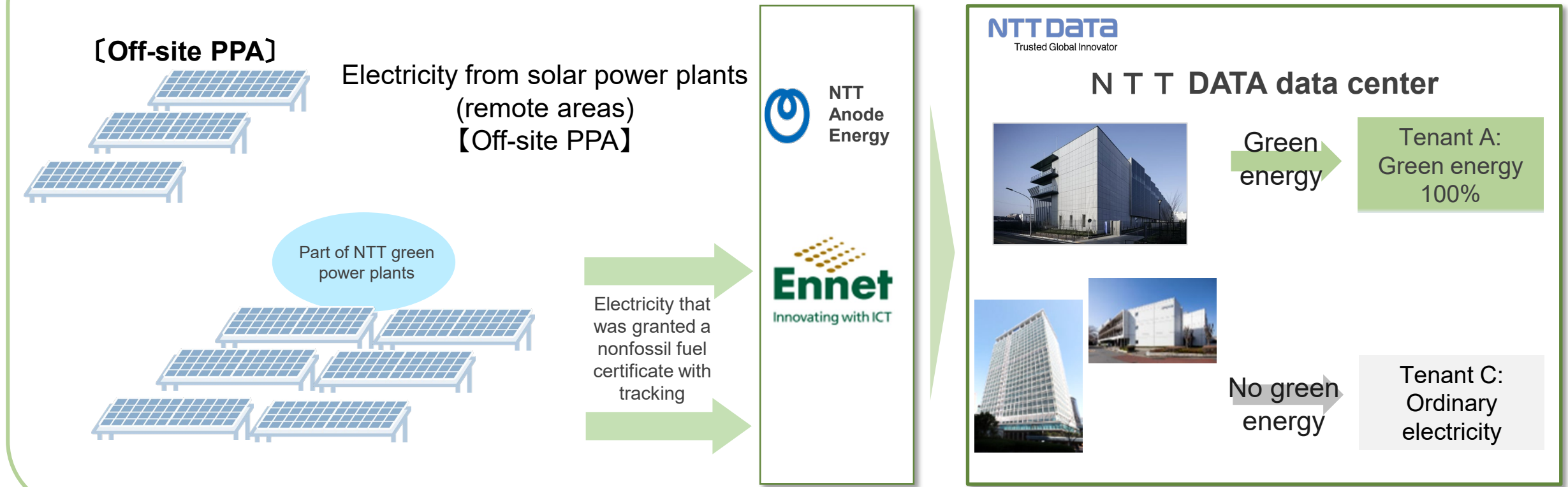
Joint verification was implemented in cooperation with manufacturers, IT equipment vendors, CPU vendors, etc.

2-11. Active Introduction of Green Energies

- Focus on cooperation with NTT Group and utilize green energies in order for NTT DATA Group to achieve the SBT targets
 - Make it possible to select from various green energies for respective customers using NTT DATA's data centers

- Improving air conditioning operations in data centers**
 - Improve the exhaust heat in machinery rooms to promote energy saving of air conditioners
- Utilizing the latest energy-saving technologies**
 - Control air conditioning according to IT load conditions, monitor resource management, and consider innovative energy-saving solutions
- Energy-saving of IT equipment**
 - Low power consumption, introduction of IT equipment capable of handling high temperatures, and ensuring reliability
- Green energy procurement**
 - Introduce renewable energy electricity, not only based on certifications, but quality considerations.(要確認)

NTT Group Introduction of green energies and supply scheme for customers



2-12. Summary: Measures for Carbon Neutrality of Data Centers

NTT DATA's Green Initiatives

- Next Medium-term Management Plan will focus on two pillars of “digital” and “**green**” to expand business
- Aiming to **realize net-zero** through clients, society, and the supply chains of the Company
- **Advanced** implementation of energy reduction measures (1. improved operation (survey/improvement) + 2. new technology (SmartDash/air conditioning IoT) + 3. renewable energy (green certificate)) **using the cloud common IT foundation (OpenCanvas)**.
- Using OpenCanvas **as an ideal model for horizontal rollout, NTT DATA aims to achieve the SBT targets and carbon neutrality at data centers.**

Overview of NTT DATA Mitaka Data Center East & Green Initiatives

- **Japan's largest and cutting-edge data center**
- Design the entire building as a cooling system, making the most of natural energy to achieve **PUE = 1.3 or less** (design value)
- Use of daylight, exhaust heat from servers, and solar power. Received **LEED GOLD** certification

Further Challenges to Be Greener

- Pursue safety and energy efficiency making use of **enhanced environmental durability** of equipment **by utilizing detailed information** from IT devices **controlled by AI operations**.
- Integrate data center operations, IT, and facilities and work to **realize the PUE 1.1 level**.
- Starting PoC using Mitaka East as a field with **focus on the liquid immersion cooling technology** as a next-generation cooling method that helps reduce environmental burden dramatically.
- Focus on **cooperation with NTT Group** and **utilize green energies** in order for NTT DATA Group to achieve the SBT targets

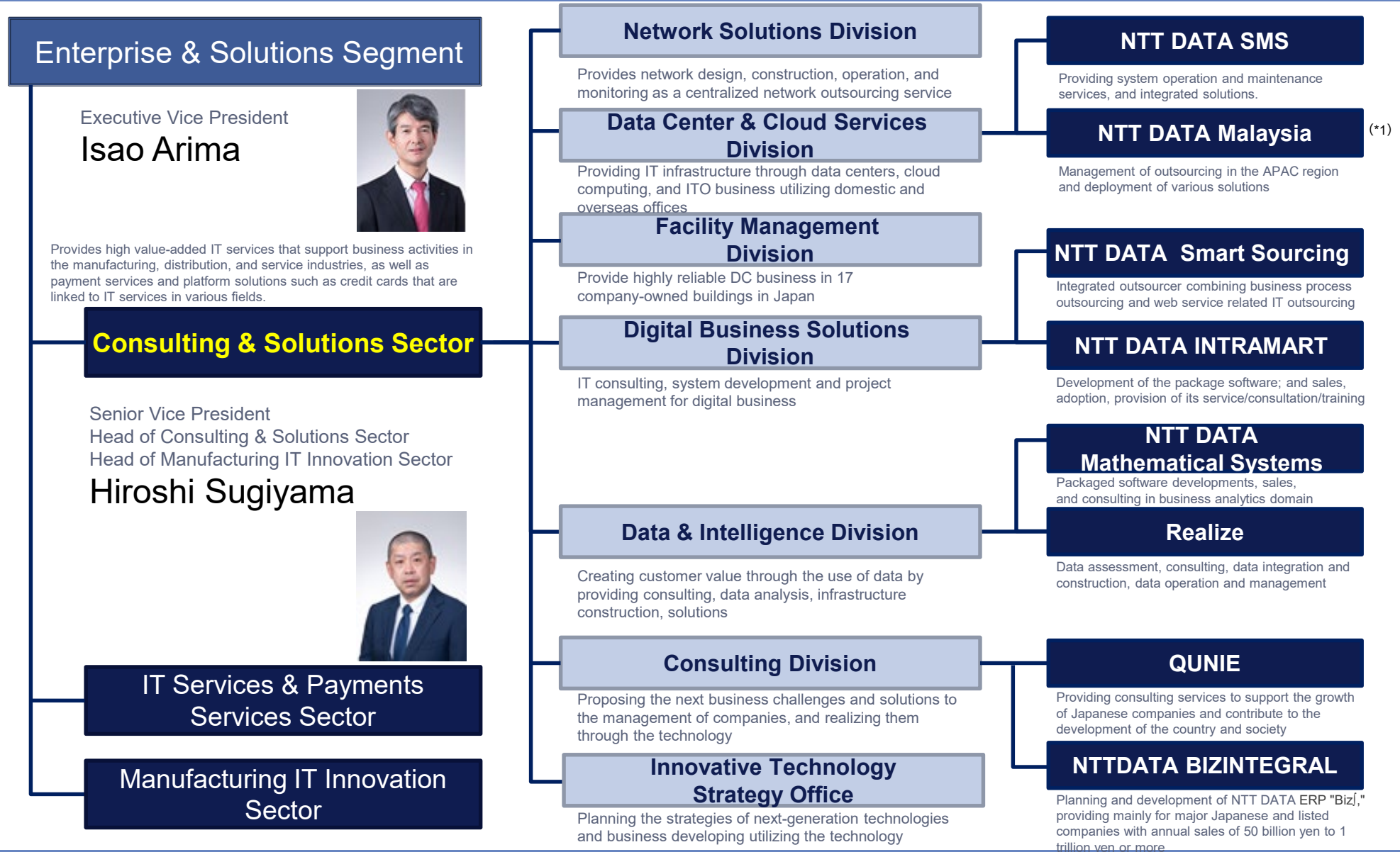


Data Center Business Overview

March 16, 2022

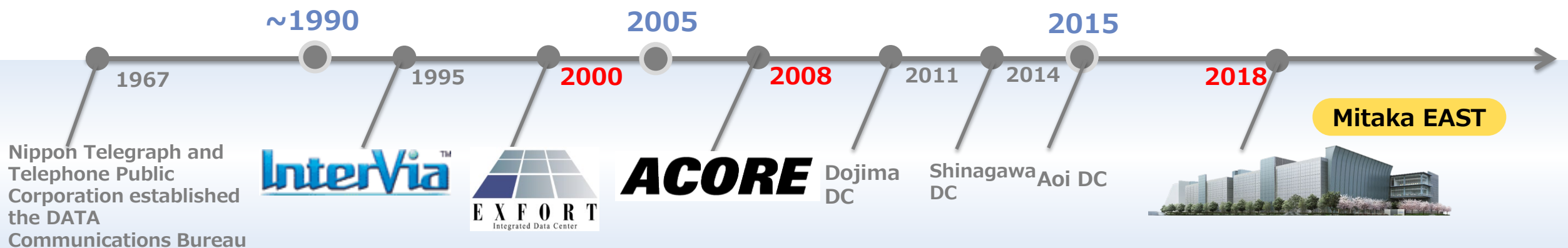
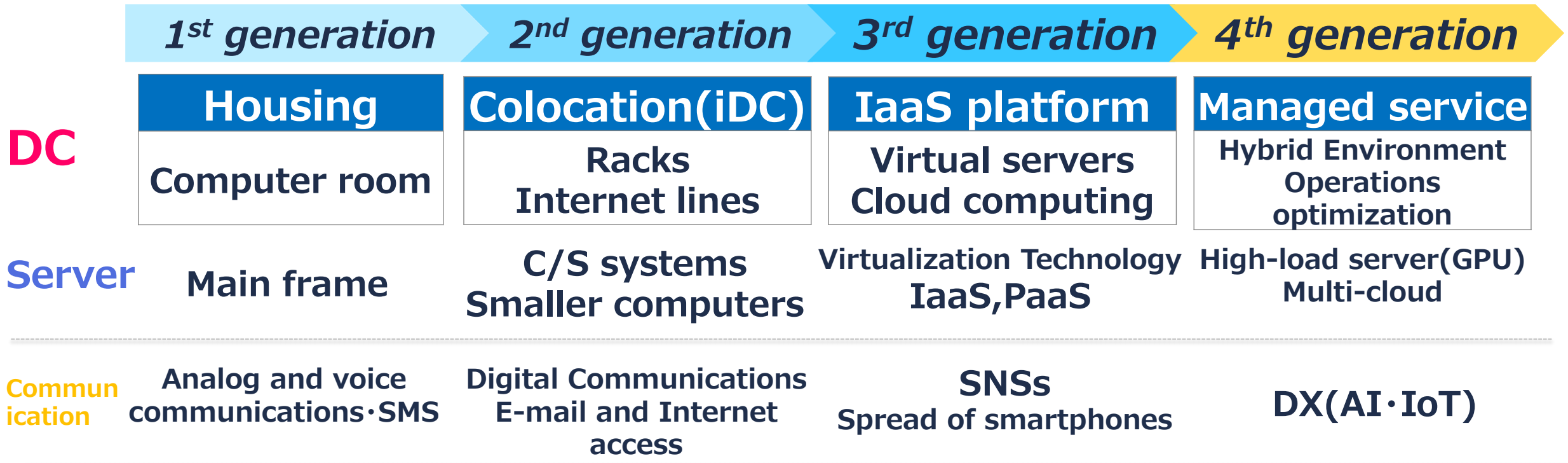
Hiroyuki Norikane, Executive Manager, Data Center & Cloud Services Division,
Consulting & Solutions NTT DATA Corporation

3-1. Consulting & Solutions Sector Organizational Structure (as of July 1, 2021)

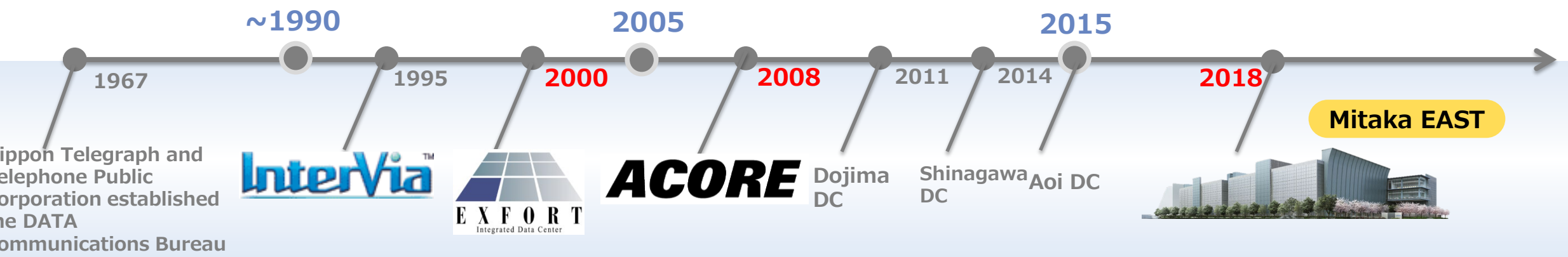
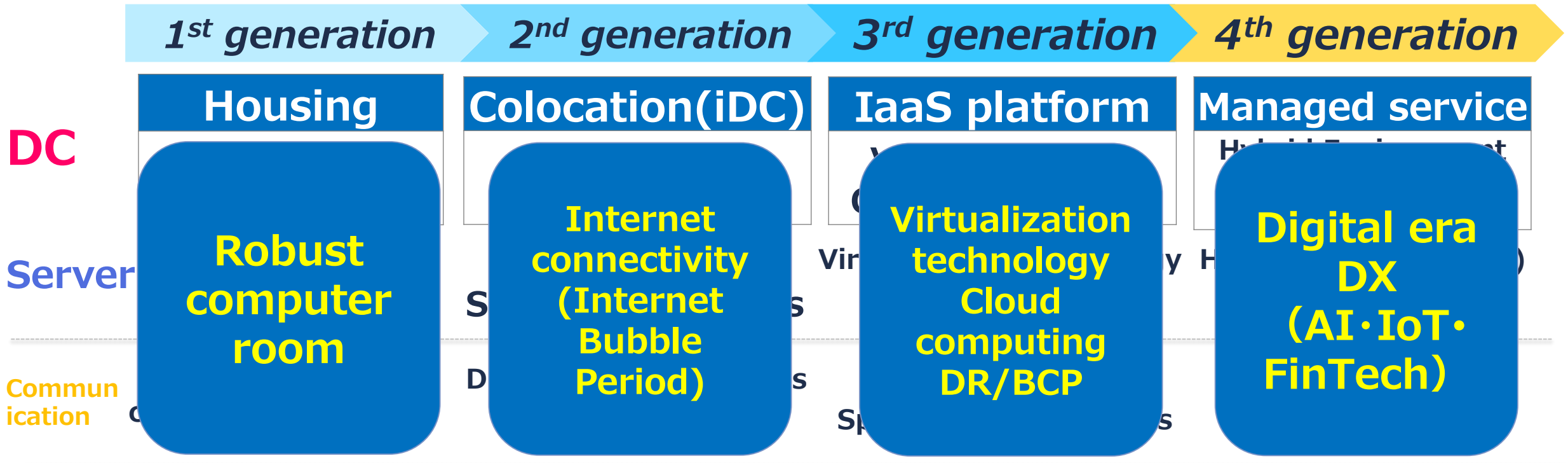


(*1) Overseas group company

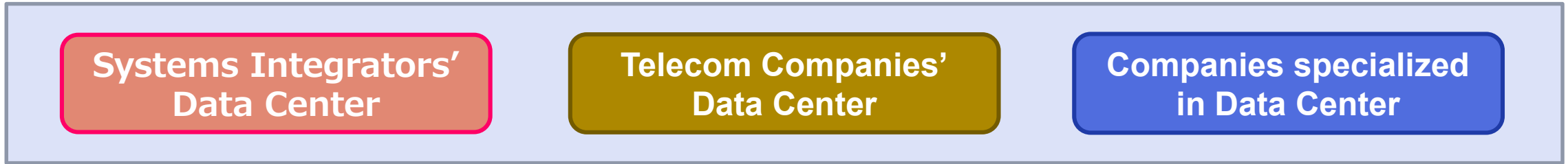
3-2. History of NTT DATA's Data Center Business



3-2. History of NTT DATA's Data Center Business

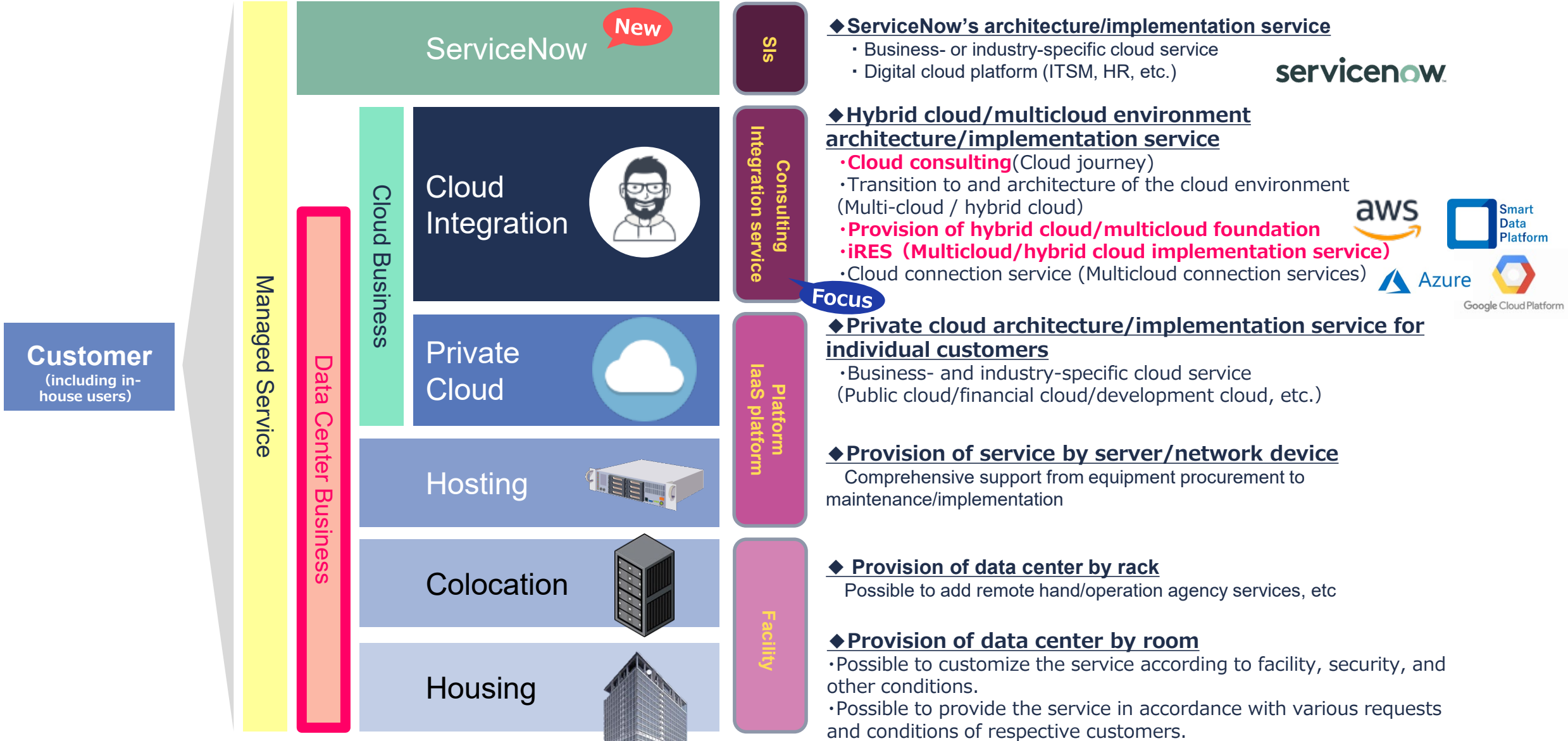


3-3. Definition and Business of Data Center Operator Classification



	NTT DATA	Systems Integrators accenture/NEC/NRI	Telecom Companies NTTCom/KDDI/SB	Companies specialized in DC @Tokyo/EQUINIX
Business styles	Focusing on operation management services with full support from application layer to infrastructure by providing advanced function-based services using its own DCs.	Providing services that meet a wide range of needs including IaaS and PaaS. Focusing on housing and outsourcing businesses .	Providing large-scale colocation DCs for cloud service providers by leveraging its network service advantages.	Gained demand for DC involvement by strengthening its strength as a hyper scale DC. Emphasizes its connectivity to the Cloud.
Target	<ul style="list-style-type: none"> • Large-scale systems for clients (mission critical) • Shared services • In-house cloud services 	<ul style="list-style-type: none"> • Large-scale systems for clients (mission critical) • In-house cloud service 	<ul style="list-style-type: none"> • Middle-scale systems for clients • HyperScaler (OTT, etc.) • In-house cloud service • In-house communication facilities 	<ul style="list-style-type: none"> • Foreign companies (SaaS companies) • HyperScaler (OTT, etc.) • Data center companies (DC in DC)

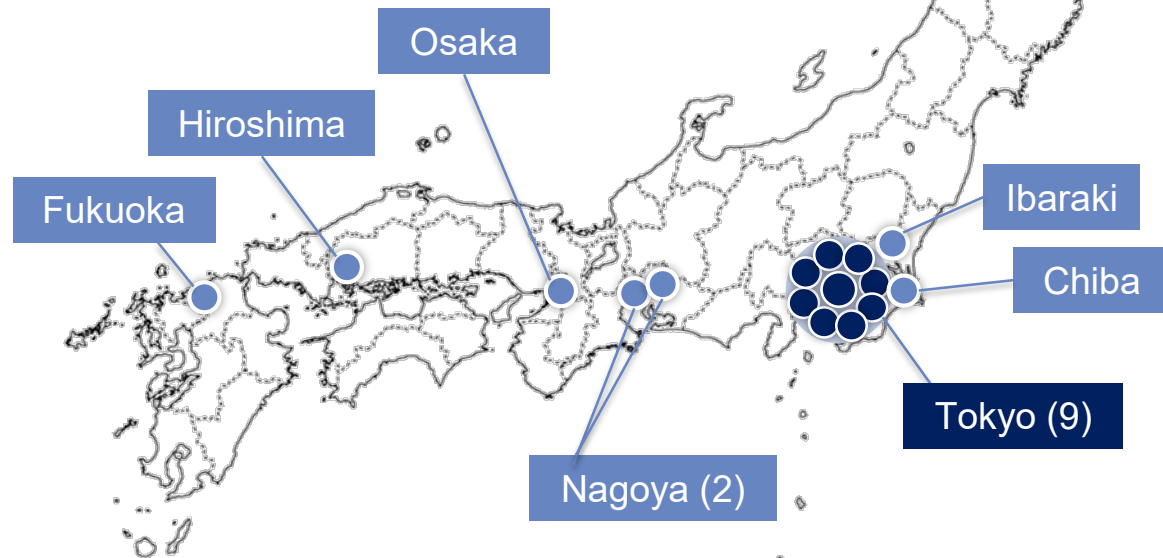
3-4. Portfolio of Data Centers & Cloud Services



3-5. Data Centers in Japan

Data centers having a track record of stably operating mission critical systems

- NTT DATA runs highly reliable data centers that have stably operated domestic mission critical systems for more than 30 years since the times of former Nippon Telegraph and Telephone Public Corporation on our own.
- High reliability is realized by **offering comprehensive services from application to facility.**



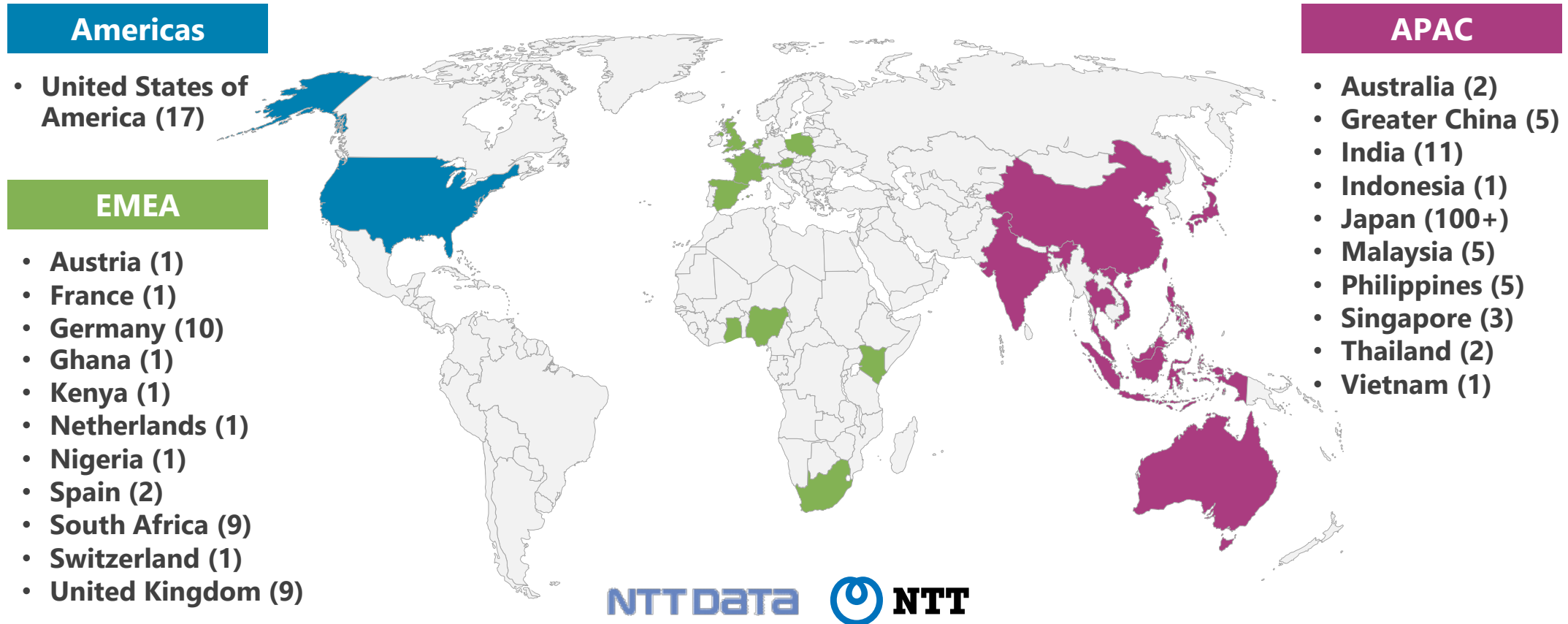
NTT DATA operates

16 data centers
in Japan

- 16 buildings dedicated to data centers in Japan
- Total floor area: 600,000 m²
- Total floor area of data centers: 350,000 m²
- Japan's largest data center operator

3-6. NTT Group's Data Centers (Global)

NTT Group operates data centers in more than **189 places in 22 countries worldwide**. We are able to offer NTT-standard quality data centers in locations needed by clients.

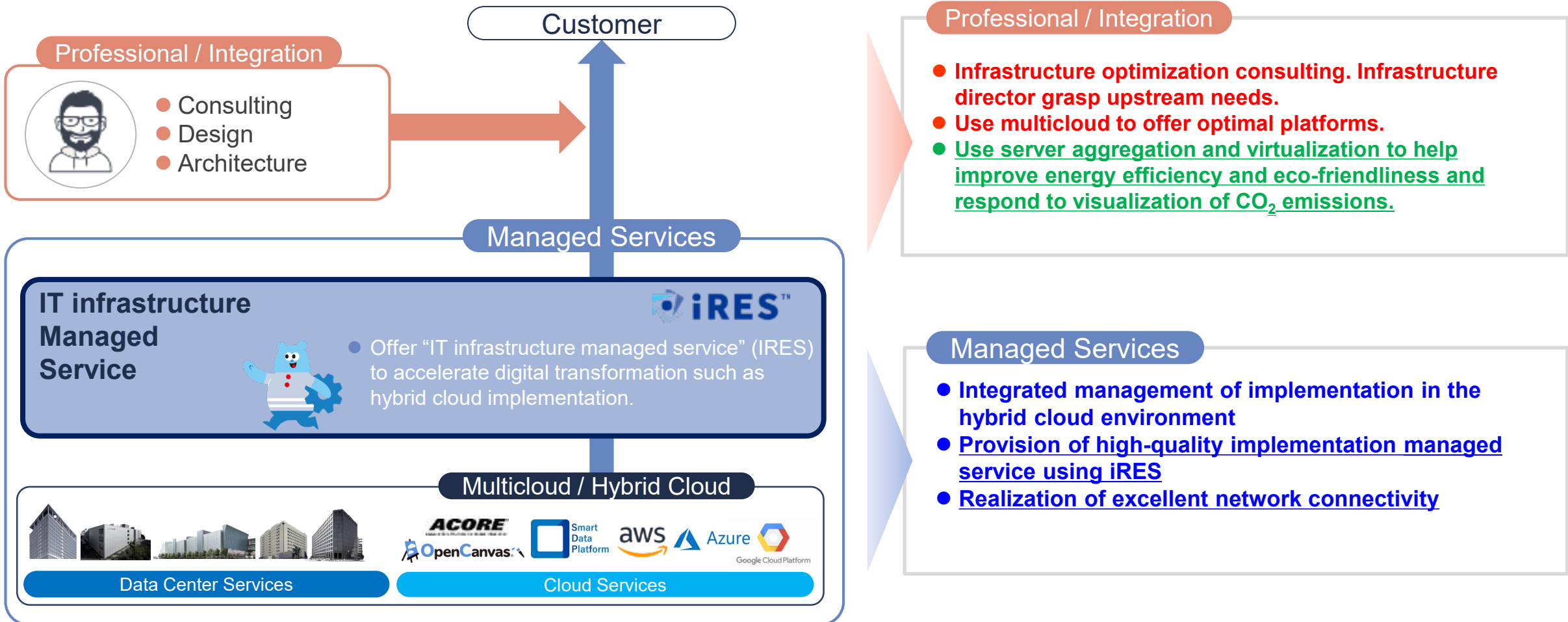


Note: Number mentioned in brackets represents the number of data centers located in respective countries

Data as of February 2022

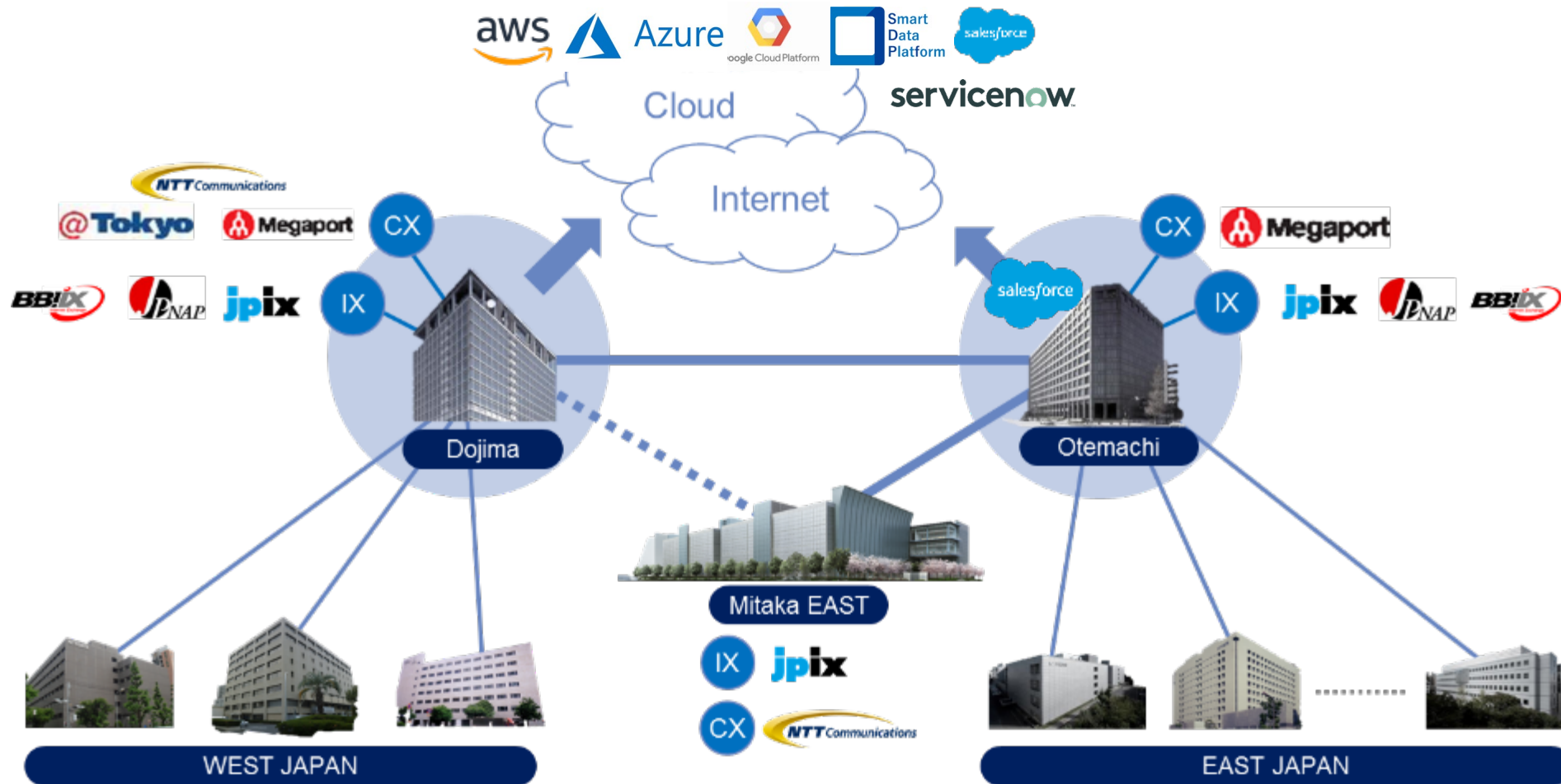
3-7. Advantages of NTT DATA's Data Centers and Cloud Services

- NTT DATA can provide comprehensive and optimal services for clients' infrastructure foundation, from upstream- to downstream-layers.
- NTT DATA can respond to clients' business agility at a high service level by making effective use of its assets.



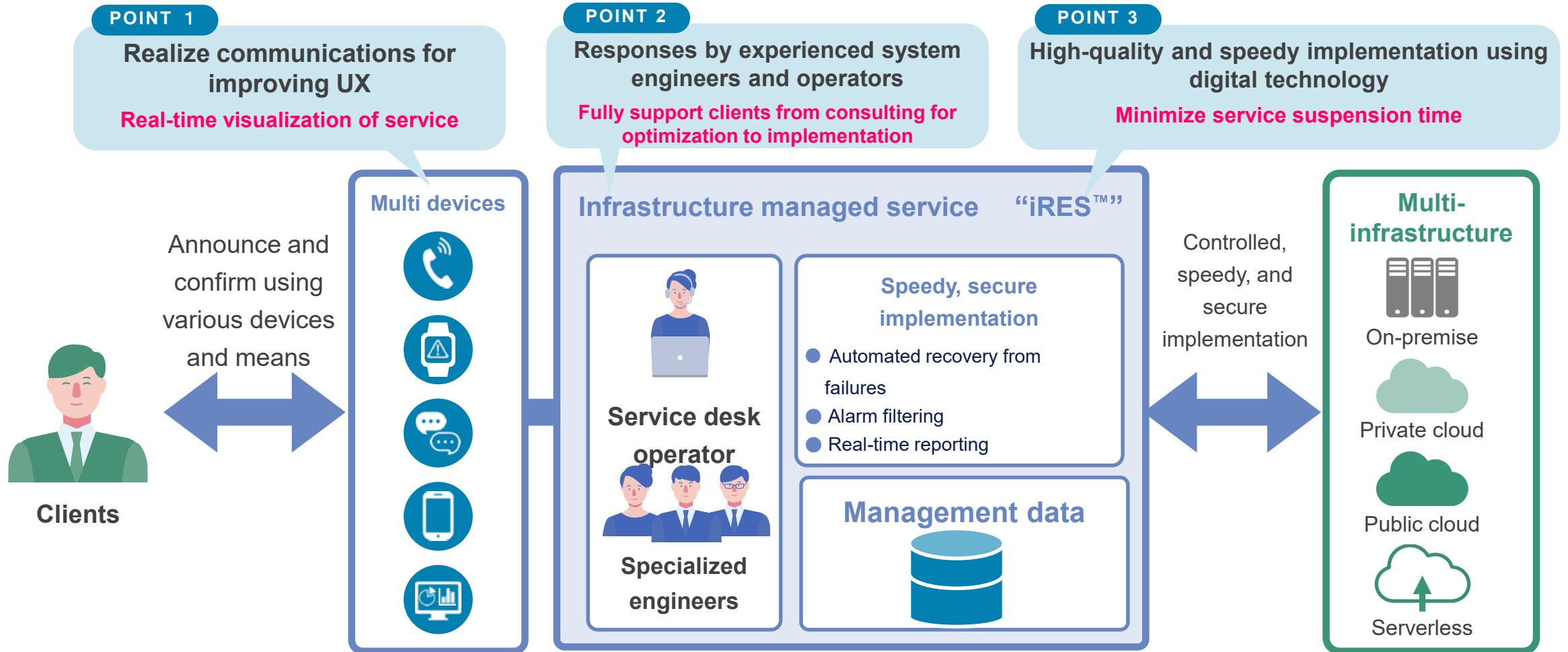
3-8. Strengths 1: Realization of Excellent Network Connectivity

- Turning the Otemachi DC in eastern Japan and the Dojima DC in western Japan into centers for NW connectivity to connect respective data centers
- Otemachi and Dojima, both of which are carrier neutral, can **store cloud exchange (CX)** as well as **Japan's three major IX**, making it possible to **offer low latency and high-quality environment for the Internet and various cloud services at reasonable prices.**



3-9. Strengths 2: NTT DATA Offers High-quality Implementation Managed Service with Comprehensive Managed Service “iRES”

- Although IT departments of respective companies have individually operated various and multivendor IT infrastructure environments such as on-premise and cloud thus far, NTT DATA will operate these environments in an integrated manner and accelerates clients’ business DX.
- iRES Observability service helps shorten hours to recover from failures and prevent users from suffering damage from declining service levels and performance.

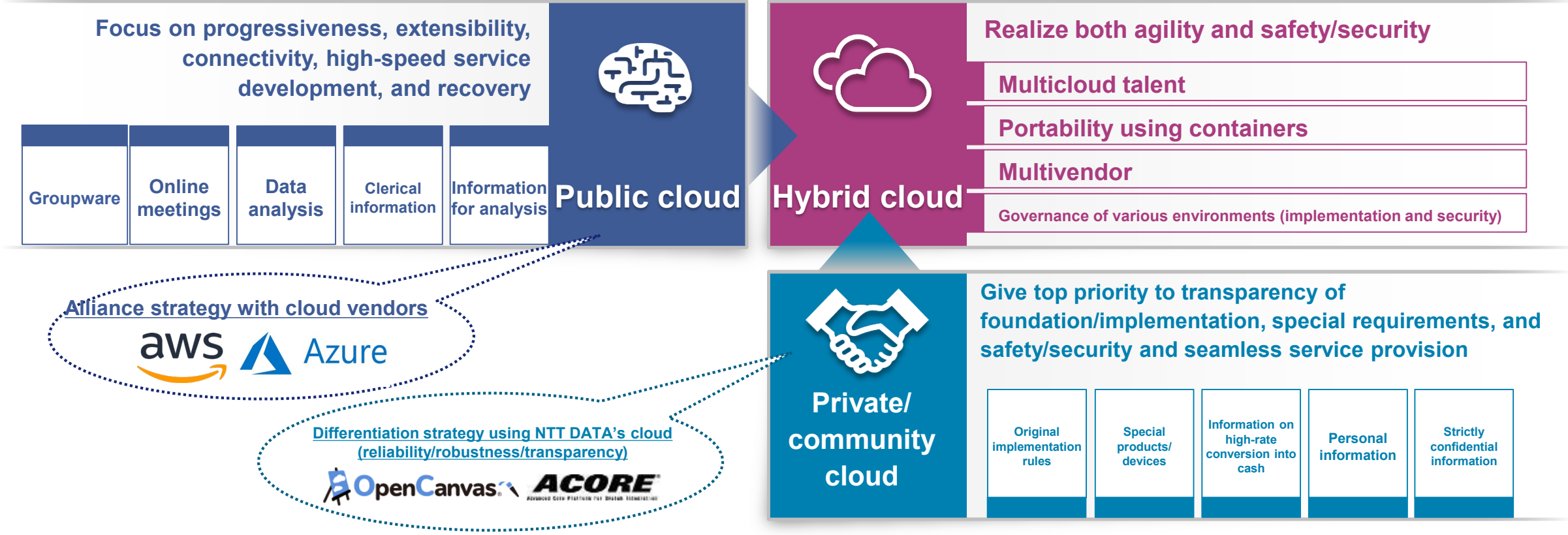


3-10. NTT DATA's Cloud Strategy

- “Hybrid cloud strategy” to offer comprehensive services by carefully determining IT platforms best suited for the needs of respective clients.

Digital agility

Easiness of extension, introduction of advanced technologies



One-on-one response, transition/operability, security

SLA/individual requirements

Partner ranking

AWS · Azure Highest partners

Strategic alliance

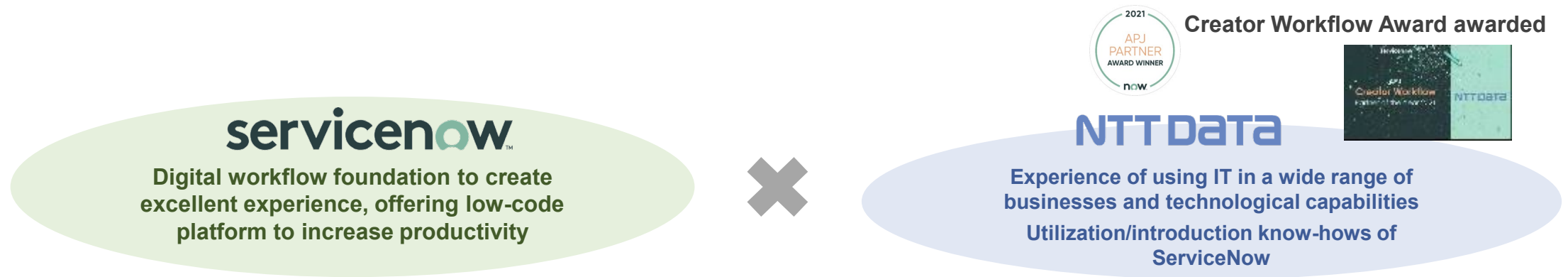
AWS · Azure Digital business collaboration

Certified engineers

AWS · Azure Largest scale in Japan

3-11. ServiceNow Business (ServiceNow Business Office was established in January 2021)

- NTT DATA combines ServiceNow's latest digital technology with the business know-how and IT use experience that we have accumulated for many years to develop industry-specific services, so that we can help clients' DX.



A team of 150 ServiceNow engineers and consultants leads the business.

① Digital cloud platform
Create excellent experience and offer digital workflow that helps increase productivity

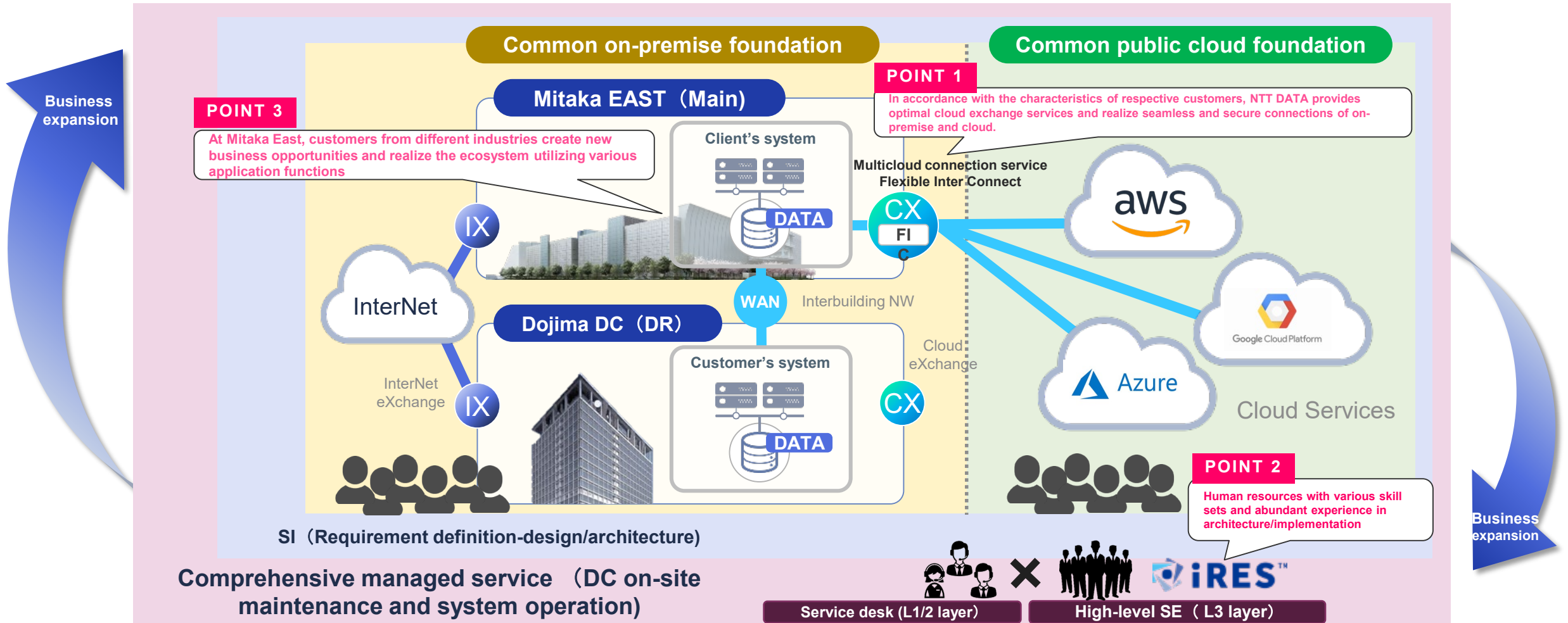
IT business Productivity improvement	Enhancement of customer experience	Enhancement of employee experience
--------------------------------------	------------------------------------	------------------------------------

② Industry-specific service
Develop services to address issues and conditions specific to business environments of respective industries

Telecom	Food	Medicine/healthcare
Government agencies	Financial	...

3-12. Example of Introduction of Infrastructure Solution Business Centering on Data Centers: For the Distribution and Manufacturing Industries

- In a project to build a hybrid cloud common foundation to achieve DX, NTT DATA **succeeded in expanding business by providing a comprehensive managed service centering on the provision of data center services** and going beyond borders of **SI business**, on-premise and cloud.
- NTT DATA achieves both security and flexibility and provides solutions to help realize DX of the customer's business on a continuous basis.



3-13. Summary: Data Center Business

- **History of the Data Center Business**
⇒Updating DC functions in response to market changes and expanding services to promote DX.
- **Definition and Business of Data Center Operator Classification**
⇒Provide tailored services for each target clients of three categories; System integrators, telecom, and DC company
- **Service Portfolio**
⇒NTT DATA can provide full support services from facility layer, cloud integration, to managed services.
- **Location of the Data Center**
⇒NTT Group operates 16 DCs in Japan and about 190 DCs worldwide.
- **Strengths of the Data Center and Cloud Service**
⇒Provide comprehensive and optimal services for client's infrastructure foundation, from upstream- to downstream layers, which suits for its business needs.
- **NTT DATA's Cloud Strategy**
⇒"Hybrid cloud strategy" to offer best IT platforms suited for the needs of respective clients.
- **ServiceNow Business**
⇒To help clients' DX, we utilize ServiceNow's latest digital technology with our IT business experiences
- **Example of Introduction of Infrastructure Solution Business**
⇒Succeeded in expanding business by providing a comprehensive managed service centering on the provision of data center services and going beyond borders of SI business, on-premise and cloud.



NTT DATA

Trusted Global Innovator