



**Earnings Announcement
for the First Half of FY3/23**
November 21, 2022



Financial Summary

For the First Half of FY3/23

Financial Highlights (consolidated)

- Net sales decreased YoY, despite many construction projects carried over from the previous fiscal year, partly because many of them are large projects and most of them will be completed in the second half of the fiscal year or subsequently. Profits decreased significantly YoY, due in part to the small number of large projects which are profitable thanks to improved construction efficiency, etc.
 - Order backlog increased from the year-ago level. Orders received for projects to be completed in the current fiscal year also remained strong, so completed projects are expected to increase in the second half of the fiscal year.
- No change has been made to the forecast announced on May 12.

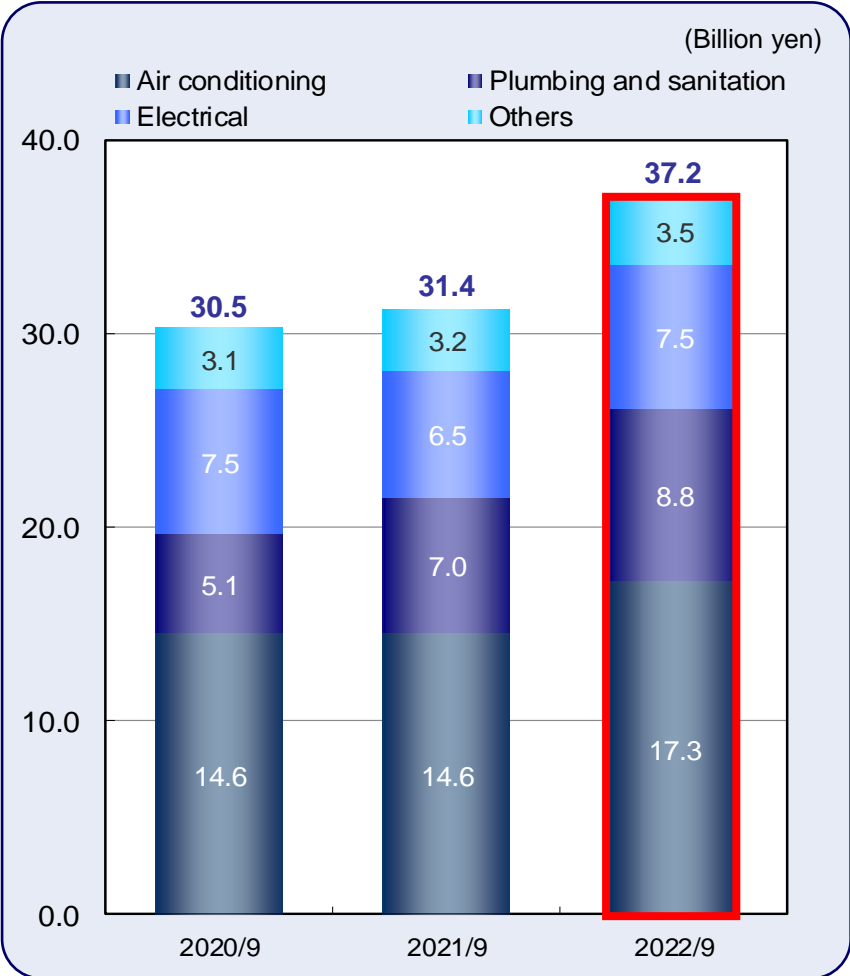
(Billion yen)

	2020/9 Actual	2021/9 Actual	2022/9 Actual	YoY	YoY (%)	2021/3 Actual	2022/3 Actual	2023/3 Forecast (Announced on May 12, 2022)
Orders received	30.5	31.4	37.2	+5.7	18.4%	74.3	78.9	80.0
Net sales	31.8	33.2	28.6	-4.6	-14.1%	73.1	75.4	80.0
Operating profit	1.1	3.3	0.7	-2.6	-77.8%	3.9	5.6	4.5
Ordinary profit	1.5	3.6	1.1	-2.5	-68.9%	4.5	6.1	5.0
Profit attributable to owners of parent	1.0	2.7	0.7	-1.9	-72.5%	3.0	4.3	3.5

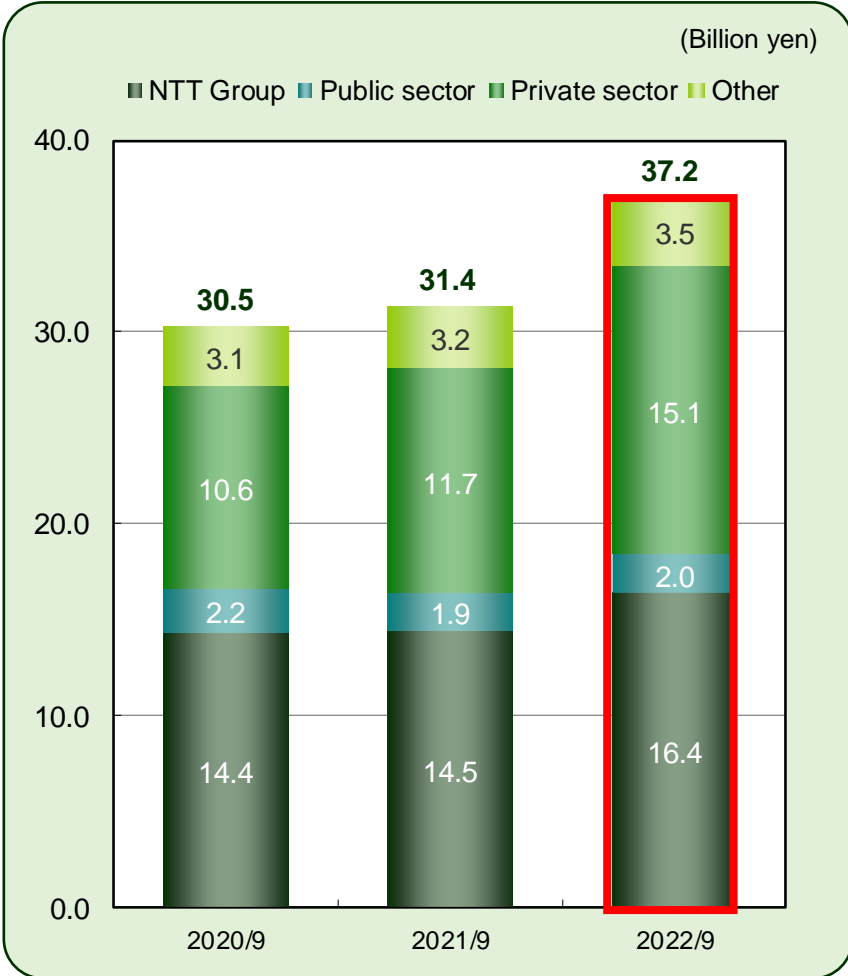
Orders Received by Category & by Customer (consolidated)

- Orders remained strong, primarily reflecting orders received for large redevelopment projects and data centers.
- Orders received from both the NTT Group and the private sector increased.

By category



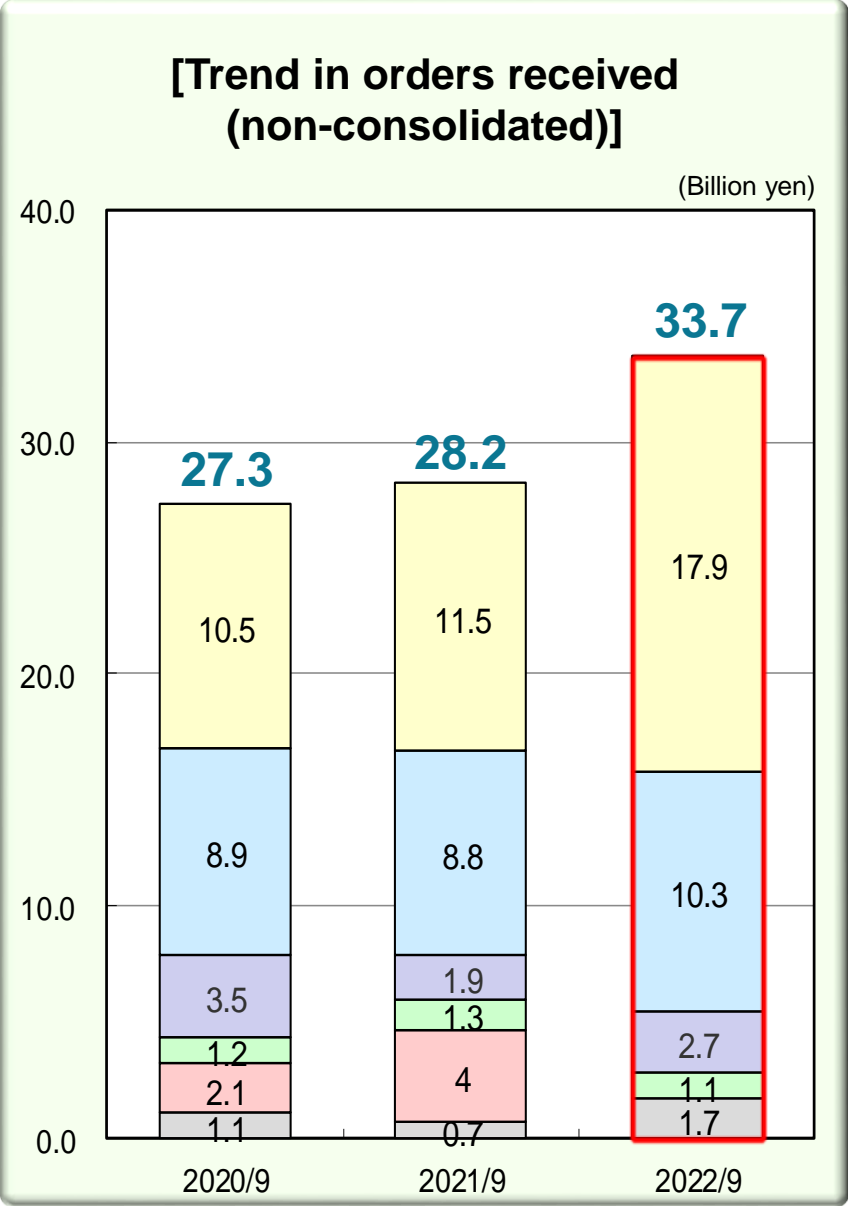
By customer



Orders Received by Priority Domains (non-consolidated)

[Priority domains]

Data centers/Information
<ul style="list-style-type: none"> Received orders for large new construction projects, reflecting an expansion in demand that resulted from the increased use of cloud services, etc. Received orders for on-demand process* related to new orders received in the previous fiscal year
Office buildings
<ul style="list-style-type: none"> Demand was strong for both new building construction and renovation.
Manufacturing/Distribution
<ul style="list-style-type: none"> Received orders for large manufacturing plants
Education/Health care
Hotels/Resorts
Other
<ul style="list-style-type: none"> High-rise condominiums, etc.

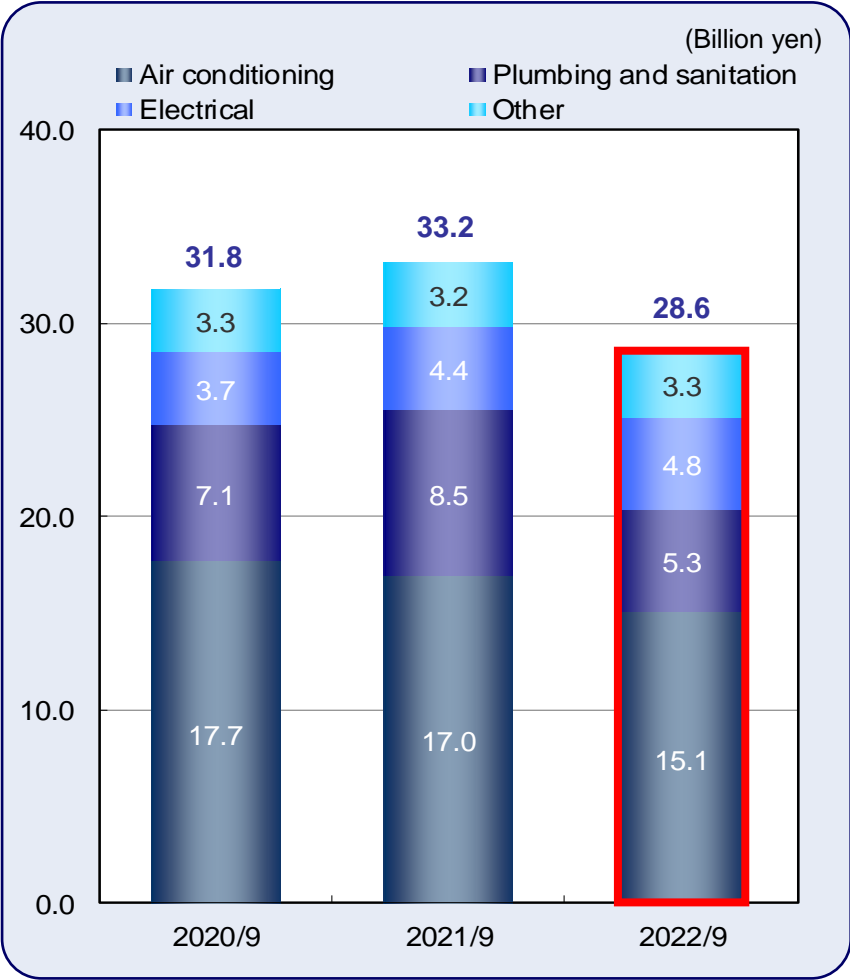


*On-demand process: Construction work which is needed when a tenant begins to use a data center and in other cases

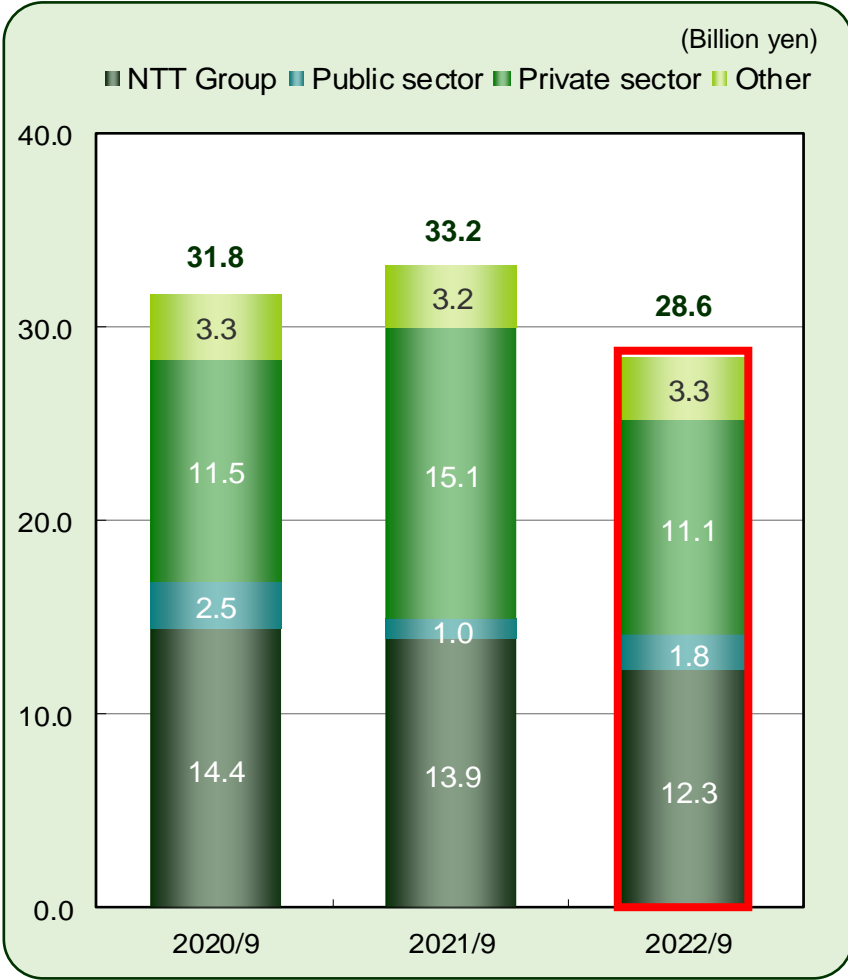
Sales by Category & by Customer (consolidated)

■ Net sales to both the NTT Group and the private sector decreased because many construction projects will be completed in the second half of the fiscal year.

By category



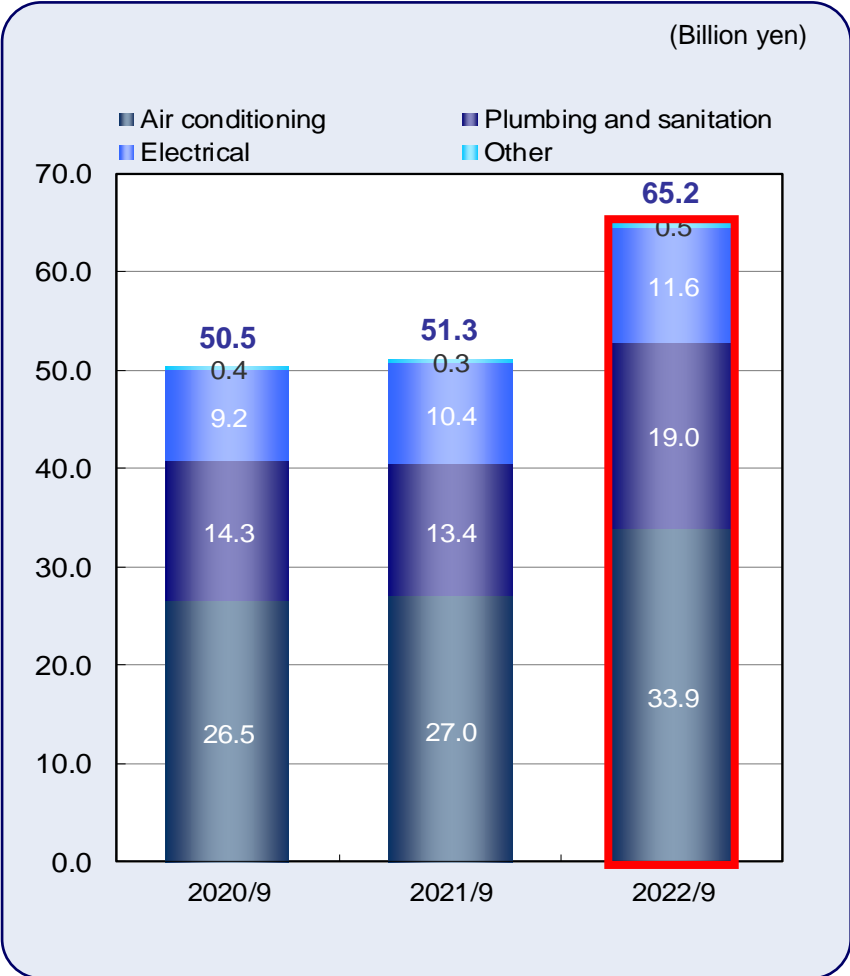
By customer



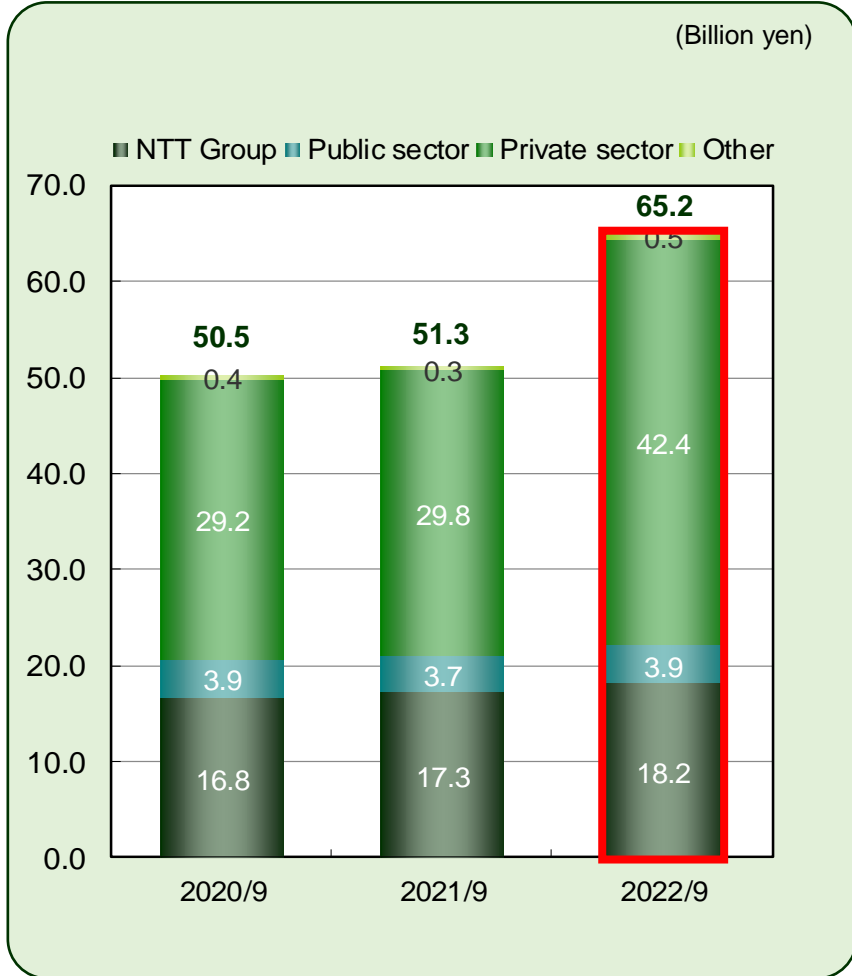
Order Backlog by Category & by Customer (consolidated)

■ There was a steady increase mainly in orders received for large construction projects in the private sector.

By category



By customer



Summary Income Statements (consolidated)

- The gross margin declined by 5.4 percentage points YoY, but 16.4% was secured.

(Billion yen)

	2020/9 (A)	2021/9 (A)	2022/9 (A)	YoY	YoY (%)
Net sales	31.8	33.2	28.6	-4.6	-14.1
Cost of sales	26.9	26.0	23.9	-2.1	-8.1
Gross profit	4.9	7.2	4.7	-2.5	-35.2
Gross profit [Gross profit margin]	15.4%	21.8%	16.4%	-5.4%	-
SG&A expenses	3.7	3.8	3.9	0.0	+2.1
Operating profit	1.1	3.3	0.7	-2.6	-77.8
Non-operating income	0.4	0.3	0.3	0.0	+29.0
Ordinary profit	1.5	3.6	1.1	-2.5	-68.9
Extraordinary income (losses)	-	0.2	-	-0.2	-
Income taxes	0.5	1.1	0.3	-0.7	-67.1
Profit attributable to owners of parent	1.0	2.7	0.7	-1.9	-72.5

Distributions to Shareholders

Maintaining stable dividends and increasing dividends consistently, and buying back shares flexibly

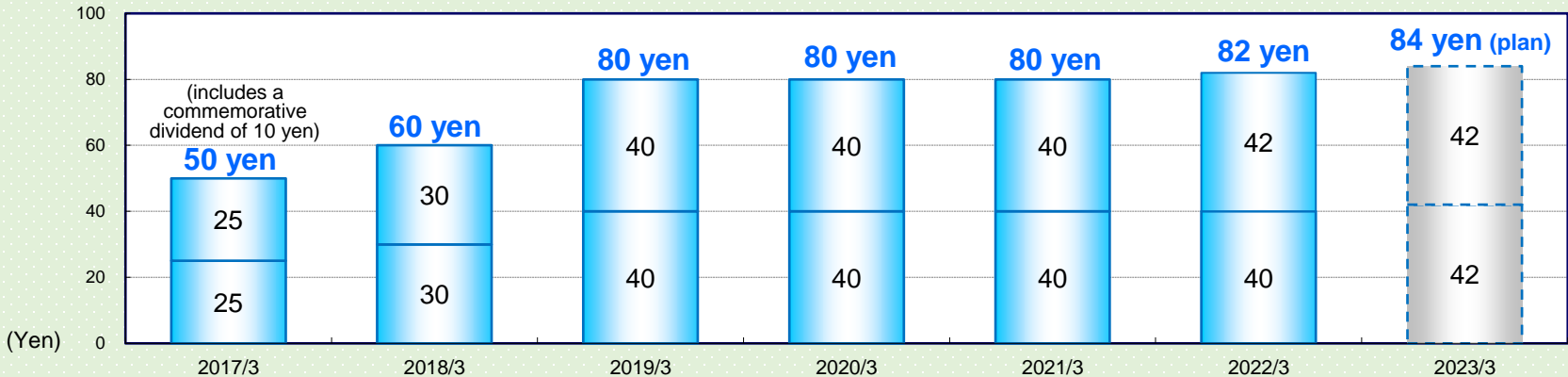
[Dividends]

We plan to pay interim and year-end dividends of 42 yen per share. The amount of annual dividends will be 84 yen, up 2 yen from the previous fiscal year.
 (Previous fiscal year: 40 yen for interim dividend and 42 yen for year-end dividend --> This fiscal year: 42 yen for both interim and year-end dividends)

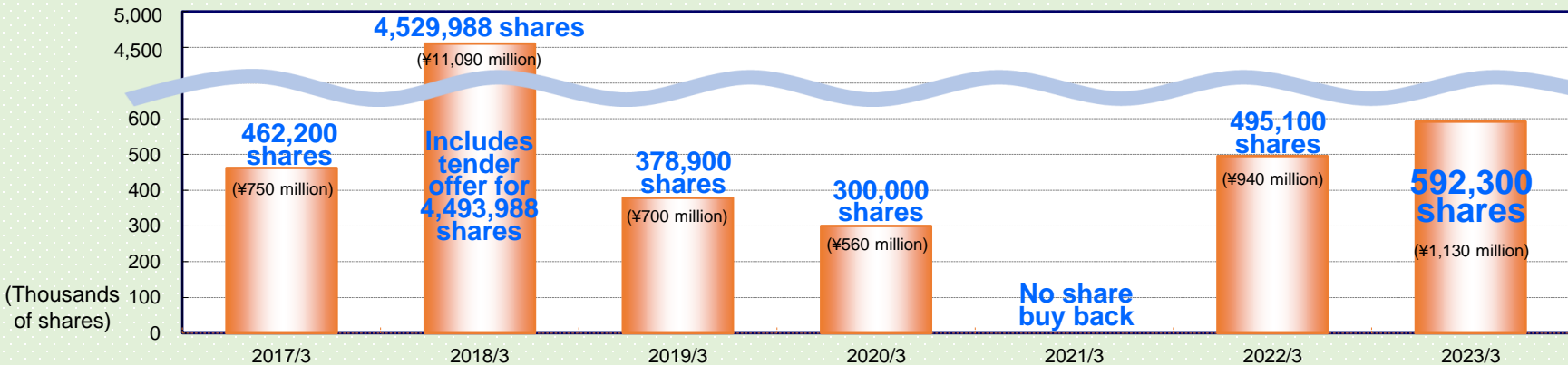
[Treasury shares]

Plan: 600,000 shares and 1.2 billion yen (maximum)
 Actual: 592,300 shares and 1.13 billion yen (August 2022)

[Trend in Annual Dividends Per Share]



[Trend in Share Buy Backs]





Seventh Medium-term Management Plan and Priority Domains

Fundamental goals

To achieve growth in business and corporate value by making core businesses more profitable and creating new business opportunities

To help create a sustainable society through the convergence of people and technologies

Core strategies

Business strategy

More advanced life cycle total solutions that can benefit all stakeholders

Technology strategy

Leading-edge technologies for higher productivity

Human resources strategy

Smart WORK working style reforms and workforce diversity

ESG

Contributing to a sustainable society and striving to enhance corporate value

Priority Domains

Create the Future of Hibiya

Focus on decarbonization and low-carbon technologies in renovation projects and aim to grow into a green engineering company

Pursue DX

Build DX as a new core value and link this to expansion of the solution business and working style reforms

■ Business strategy

- (1) Expanded business domains by creating new customer bases
- (2) Expanded business domains by creating new customer bases (achievements, examples of initiatives, etc.)
- (3) Implemented smart business initiatives

(P13–15)

■ Technology strategy

- (1) Used ICT technology to improve efficiency of construction management
- (2) Pursued BIM*

(P16–17)

■ Human resources strategy

Implemented Smart WORK working style reforms and diversity

(P18)

■ ESG Response

Pursued ESG to contribute to the realization of a sustainable society

(P19)

■ Group Strategies

Expanded the Group's value chain organically

(P20)

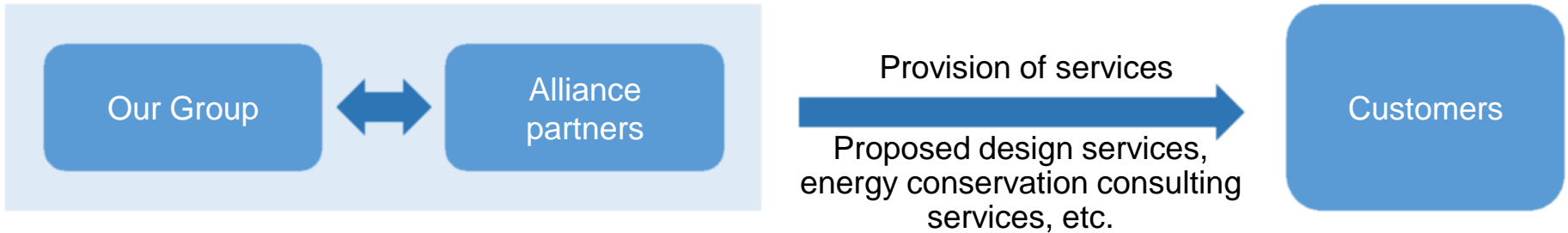
* BIM: An abbreviation of Building Information Modeling. A method for building virtual buildings on a virtual platform. It is used to integrate information on planning, design, construction, and maintenance and management.

We use it to improve the efficiency of design and construction, reduce the hours of work involved, and improve quality.


Business strategy (1)

Expanded business domains by creating new customer bases

Provided services to customers through cooperation with alliance partners (NTT Group, leasing companies, consulting companies, energy suppliers, etc.).



■ Implemented initiatives for expanding business domains

Area	Alliance partners	Customers	
Decarbonization and CO ₂ reduction	Leasing companies	Local governments, public facilities, etc.	 <p>Driving the Create the Future of Hibiya activities</p> <p>Pursue DX</p>
ZEB*	Consulting companies	Energy center	
Energy	Energy suppliers	Offices, laboratories, etc.	
DX	NTT Group companies		

* ZEB: An abbreviation of Net Zero Energy Building. Refers to a building designed to achieve net zero primary energy consumption on an annual basis while maintaining a comfortable room environment.

Business strategy (2)

Expanded business domains by creating new customer bases
(achievements, examples of initiatives, etc.)

■ Achievements in the first half of FYE March 2023: Cooperated with 12 companies in 18 projects

[Reference] Achievements in FYE March 2022: Cooperated with 12 companies in 46 projects

* In the table below, bold letters indicate new projects and non-bold letters indicate continued projects.

Alliance partners	Area	Status of implementation, etc.
NTT Group	Decarbonization and CO ₂ reduction	Took carbon neutrality initiatives for local governments
	DX	Developed and implemented gateways linking sensors and equipment to create smart buildings
Leasing companies	Decarbonization and CO ₂ reduction	Received an order for air-conditioning equipment work in two public university buildings using leased equipment
	ZEB	Provided consultation on the conversion of a local government museum to ZEB using leased equipment
Consulting companies	Decarbonization and CO ₂ reduction	Received an order from a local government for improvement work on EV-charging equipment using renewable energy
	Energy	Suggested the upgrading of heating equipment of a nationwide hotel group (35 facilities), etc.
	ZEB	Received orders for consultation on the conversion of stores to ZEB and for conversion of a technology institute building into ZEB
Energy suppliers	Energy	Installed heating equipment in an energy center

Business strategy (3)

Implement smart business initiatives

Provide new value in urban development and to communities through IoT, AI, and other smart technologies.

Smart technologies	Status of implementation, etc.
<p>Smart buildings/ Data usage</p>	<p>Achieve energy savings and comfort through integrated control of equipment and instrumentation based on data obtained from sensors</p> <ul style="list-style-type: none"> ✓ Provision of a location information system (a facility for verifying smart building technologies) ✓ Use of IoT sensors (buildings constructed in a redevelopment project in Tokyo) ✓ Development of software for verifying wireless sensors (a research and development facility in West Japan)
<p>Gateways/ Cloud link</p>	<p>Support streamlined operation of a multiple different buildings and facilities through integrated management that links them together</p> <ul style="list-style-type: none"> ✓ Provision of cloud BEMS* (a medium-sized building constructed in a redevelopment project in Tokyo) ✓ Robot integration (high-rise buildings in Tokyo and the Tokyo Metropolitan Area)
<p>Attendance management/ Security</p>	<p>Improve the level of security through integrated management and operation of buildings, equipment, communications, and other diverse systems</p> <ul style="list-style-type: none"> ✓ Security system upgrades (a government building and multiple buildings in West Japan)

*BEMS stands for Building Energy Management System. It measures and visualizes power consumption and other aspects in a building and controls air conditioners, lighting systems, and other equipment.

Technology Strategy (1)

Use ICT technology to improve efficiency of construction management

Reduce costs and achieve higher safety and quality by using ICT technology to improve the efficiency of construction management.

Introduction

- Introduce camera systems and application software in construction divisions nationwide.
- Perform checks and follow-up remotely, from one's desk.



A remote site inspection being made using a wearable camera and a communication app ▶

Establishment and development

- Drive efficiency improvements by using cameras linked with the app and by developing the management method with the cameras and app.
- Improve safety and quality by using accumulated video and image data for training.

Cost reductions

- **Reduced** construction division personnel transfers and stand-by time by roughly **1,400 hours** (cumulative total over six months)
- Prevented defects, errors in advance

Safety & quality improvements

- Conducted remote inspections and had each site inspected from multiple perspectives, thus increasing the number of inspections of each site and the number of viewpoints from which each site is checked.
- Increased training and support of and opportunities to communicate for young employees

Category	360° Cameras	Wearable cameras for work	Remote monitoring cameras	MetaMoji application software
Number installed (as of September 30, 2022)	148 cameras	43 cameras	30 cameras	360 ID
Number of projects used in (Total installations nationwide from April 2022 to September 2022)	231 projects	66 projects	122 projects	305 projects

Technology Strategy (2)

Pursue BIM

Drive the on-site use of BIM by developing human resources who can respond to the growing needs for BIM.

Current situation

Respond to on-site needs of customers for BIM for construction.

Developed human resources and improved employees' knowledge

- **Training session on Rebro^{*1}**
First half of FYE March 2023: 2 sessions/38 participants
(FYE March 2022: 3 sessions/33 participants)

On-site initiatives

- **Use of BIM in the on-site construction stage**
First half of FYE March 2023: 10 projects
(FYE March 2022: 7 projects)

Future Initiatives

Make full use of BIM information to increase convenience and efficiency.

Developing human resources

- **Start developing two engineers by positioning Revit^{*2} as a strategic tool for the future.**

Enhance initiatives toward medium- and long-term plans.

- **Provide integrated services, from participation in planning and consulting to design, construction, and maintenance and management, through data integration made by using BIM.**

^{*1}CAD software for building construction equipment: 3D drawing software provided by NYK Systems Inc., a Japanese company, which excels in operability and is widely used as a high-performance 3D CAD system

^{*2}CAD software for building construction equipment: A BIM design support tool developed by Autodesk, Inc., a US company, which has functions for architectural design, structural design, and facility design and excels in functional linkage and expandability

Smart WORK working style reforms and workforce diversity

Encourage male employees to take childcare leave

■ Percentage of male employees who took childcare leave

(Hibiya Group Action Plan)

Goal: 15% or more
FY2022/1H Result: 22.6%

(FY2021/1H Result: 11.4%
 FY2021 Result: 22.8%)

■ Percentage of employees who took special leave for childbirth

(New targets)

Target value: 100%
FY2022/1H Result: 50.0%

(FY2021/1H Result: 20.0%
 FY2021 Result: 38.5%)

[Initiatives to encourage them to take the leave]

- Giving explanations individually to all target employees and confirming their intentions
- Providing all employees with e-learning training themed on childcare leave and postnatal paternity leave
- Conducting a survey of employees who have not taken the leave to identify and analyze their reasons for not taking it

Initiatives to promote active participation of women

Providing training

- ✓ **Targets: Young employees, both males and females, who will have major life events such as marriage and childbirth**
- ✓ **Considering career plans for continuing to work by balancing work and private life.**

Participating in pan-industry social events and Setsubi Joshi-kai (an association of female building mechanical and electrical engineers)

- ✓ Holding opinion exchange sessions with female managers from different industries
- ✓ Participating in social events (Tokai) of the equipment industry
- ✓ Aiming to obtain external knowledge and information and build systems and environment, for encouraging male employees to take childcare leave and tackling health problems specific to women

Exchange via internal social media (activating communications)

Health community



A walking activity report with photos and comments



Reports on sports activities, such as running and soccer



At Kansai Branch, we had a recreational activity of climbing a mountain.

Social contribution activities

Report on *Fukuhima*, the Fukushima Sunflower Foster Parent Project



Like



Pursued ESG to contribute to the realization of a sustainable society

Element	Important Issue	Action Item
<p>E Environment</p>	<p>Environmental management</p>	<ul style="list-style-type: none"> ■ Operated an environmental management system based on ISO 14001 <ul style="list-style-type: none"> ➤ Collected and analyzed information about each disclosure item recommended by TCFD^{*1}, in an attempt to enhance future disclosure in both <i>quality</i> and <i>quantity</i>
<p>S Society</p>	<p>Investment in human capital</p>	<ul style="list-style-type: none"> ■ Promotion of diversity, human resource development, and promotion of good health (See "Human Resources Strategy" on page 18.)
	<p>Contributing to society and local communities</p>	<ul style="list-style-type: none"> ■ Measures to contribute to society and local communities <ul style="list-style-type: none"> ➤ May 2022: Implemented a donation activity by adopting a matching gift^{*2} program, aiming to aid Ukrainian refugees ➤ August 2022: Participated in a volunteer activity of creating roof tiles of Shuri Castle and enhanced initiatives on community cleanup activities and volunteer activities
	<p>Ensuring safety & quality</p>	<ul style="list-style-type: none"> ■ Quality control based on ISO 9001
<p>G Governance</p>	<p>Sound management</p>	<ul style="list-style-type: none"> ■ Ensuring compliance and full-scale implementation of risk management ■ Transferred to the Prime market on April, 2022 ■ Information security management system (ISMS) based on ISO 27001



The volunteer activity of creating roof tiles of Shuri Castle

*1 Task Force on Climate-Related Financial Disclosures: Recommends that companies disclose information concerning the risks and opportunities associated with climate change.

*2 A method of donations, with which the amount of donations collected from employees is increased with additional donations made by the company at a certain rate

Group Strategies

Expanded the Group's value chain organically

Enhance the functions of each company to achieve growth in each segment and produce synergies.

Hibiya Tsushou Co., Ltd. (trading company)

- Sales of air-conditioning, sanitary, and electrical equipment

Nikkey Co., Ltd. (manufacturer)

- Manufacturing of fire protection and smoke control equipment (dampers) and access control systems, etc.

✓ Expanded Noda plant (introduced and began operating new equipment) to expand the damper business

Hibiya Engineering Group

Produce synergies

- Strengthen initiatives on digital and environmental products
- Initiatives on the business of recycling CFC

- Strengthen initiatives to develop and sell systems
- Security business: A government building and multiple buildings in West Japan



Major completed projects in the first half

List of Major Completed Projects

Priority Domain	Name of Property	Page Listed on
Data centers/ Information	Data center A (on-demand process/air-conditioning equipment)	-
	Data center B (on-demand process/air-conditioning equipment)	-
	Data center C (on-demand process/air-conditioning equipment)	-
Office buildings	Hakata East Terrace (new construction/air-conditioning equipment)	P23
	JR Meguro MARC Building (new construction/air-conditioning and sanitary equipment)	P23
	A large building in the center of Tokyo (renovation/air-conditioning, sanitary, and electrical equipment)	-
Production/ distribution facilities	Prologis Park Inagawa 1 Project (new construction/air-conditioning and sanitary equipment)	P24
	Warehouse of a transportation company (new construction/air-conditioning and sanitary equipment)	-
Education/ healthcare	New school building of Kansai Ohkura Gakuen (new construction/air-conditioning and sanitary equipment)	P24
	Research building on university campus (Tohoku area) (new construction/sanitary equipment)	-
	General medical center (Kansai area) (renovation/air-conditioning and electrical equipment)	-

Hakata East Terrace

A new office building in front of Hakata Station



Location	Fukuoka City, Fukuoka
Floor area	29,200 m ²
Scale	10 stories above ground
Our work	Air conditioning

JR Meguro MARC Building

An office building in a leafy environment, where people can work comfortably



Photo by: The Kensetsutsushin Shimbun Corporation

Location	Meguro-ku, Tokyo
Floor area	38,710 m ²
Scale	13 stories above ground, 1 story below ground
Our work	Air conditioning and sanitation

Prologis Park Inagawa1 Project

One of the largest distribution hubs of Prologis



Location	Kawabe-gun, Hyogo
Floor area	218,179 m ²
Scale	6 stories above ground
Our work	Air conditioning and sanitation

Kansai Ohkura Gakuen

A new school building for deeper learning



Location	Ibaraki City, Osaka
Floor area	10,857 m ²
Scale	4 stories above ground
Our work	Air conditioning and sanitation



References

Create the Future of Hibiya (1)

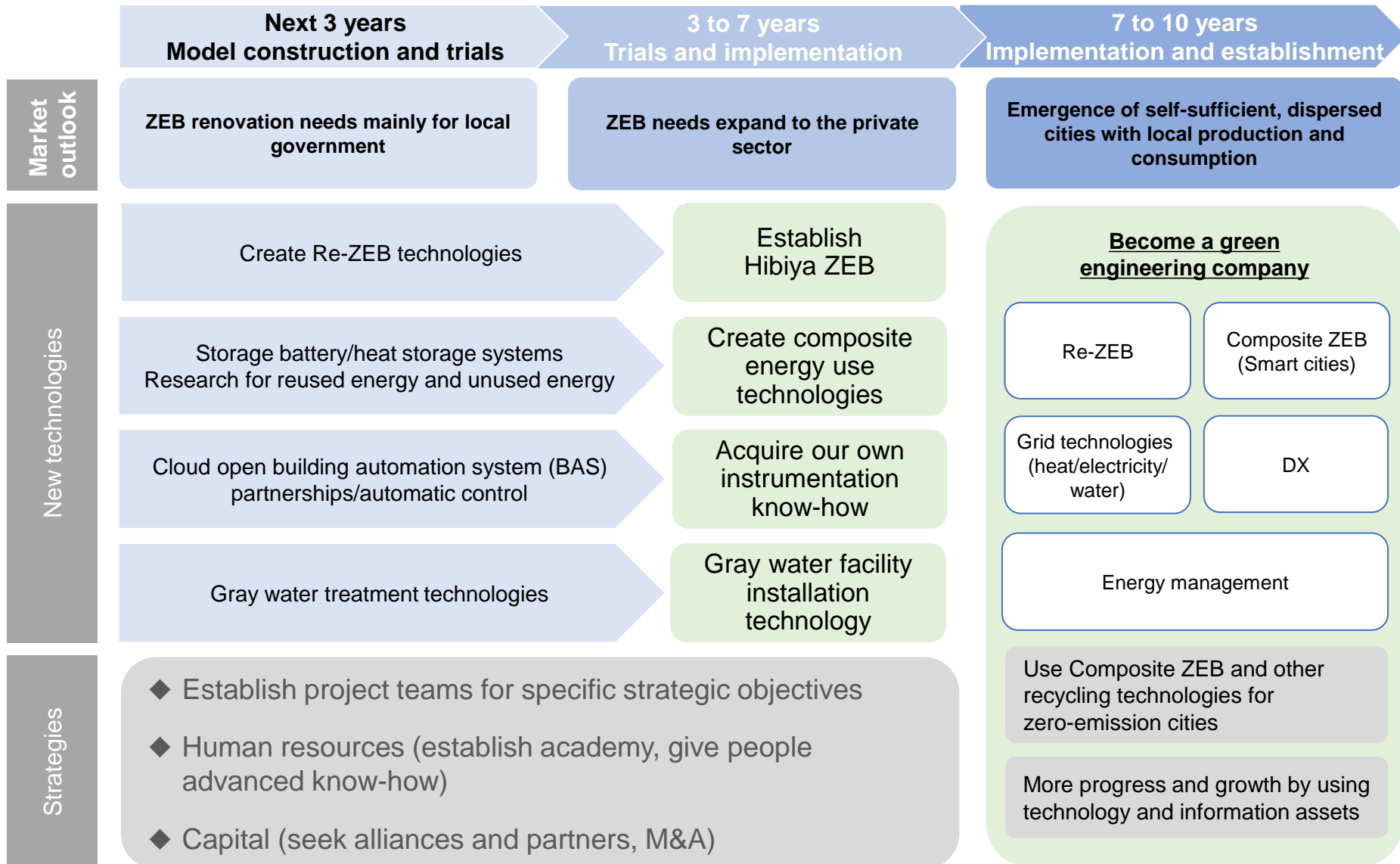
- ◆ Needs involving buildings are likely to shift from new construction to the utilization of existing buildings in response to the rising public interest in climate change and sustainability. Create the Future of Hibiya aims for growth along with a focus on decarbonization and low-carbon technologies in renovation projects.

[Goals of Create the Future of Hibiya]

<p>Opportunities</p>	<ul style="list-style-type: none"> ● Needs involving zero emissions building (ZEB) technologies for decarbonization, low carbon and resource recycling ● Growth of the renovation market reflecting structural issues for buildings and cities ● Creation of smart cities based on self-sufficient, dispersed energy
<p>Actions</p>	<ul style="list-style-type: none"> ● Use renovations for ZEB and Re-ZEB for energy efficiency plus people-friendly properties (pleasant work spaces, health, etc.) ● Beyond ZEB for increasing real estate value ● Composite ZEB for recycling regional heat, electricity and water ● Build a new business model that matches changes to the profit structure due to using Composite ZEB for an energy management business and other actions
<p>Our reputation</p>	<ul style="list-style-type: none"> ● Incorporate Create the Future of Hibiya activities in ESG measures to contribute to society ● Earn recognition as a green engineering company with technologies for a sustainable society ● Create businesses with substantial added value by using ZEB technologies targeting mainly the renovation market ● A new stage of growth as an engineering company for smart cities
<p>Progress</p>	<ul style="list-style-type: none"> ● Develop technologies, strengthen the technology development infrastructure ● Establish strategic task forces for human resources, technologies and other resources and for construction experience ● Investments for business alliances, M&A and other activities ● Sales channels (switch from local governments to public-sector companies)

Create the Future of Hibiya (2)

[Roadmap for green engineering]



The Digital Transformation (1)

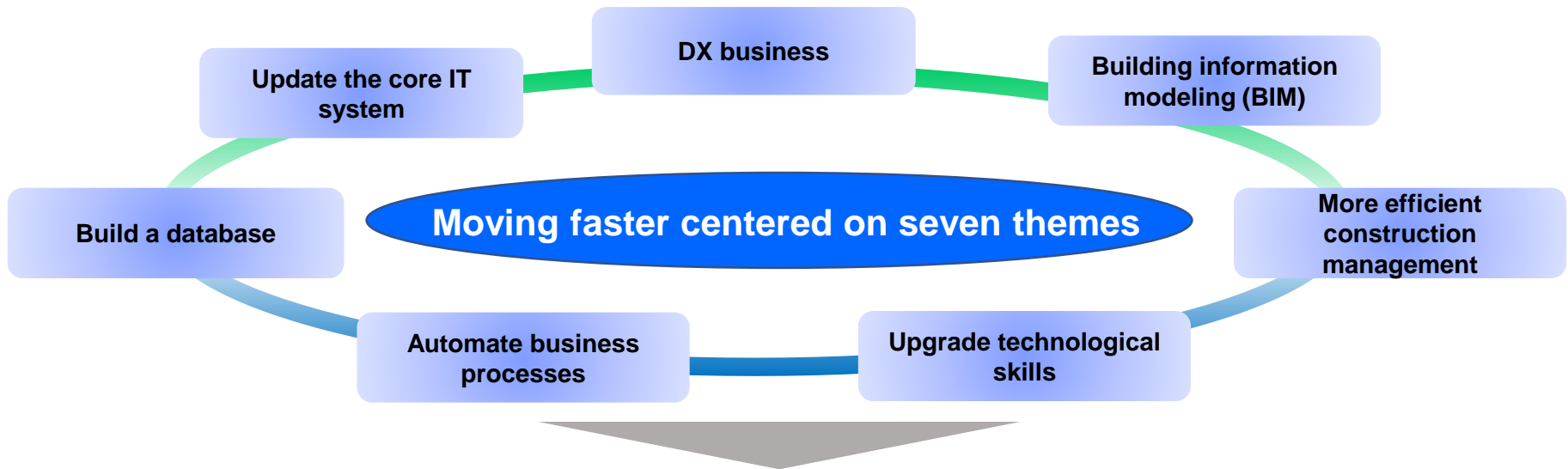
- ◆ New services backed by equipment using smart office and other ICT/digital technologies
- ◆ Proposals and construction for value-added systems for growth of the solutions business

Business strategy

Assemble a framework for DX business activities to expand to new market sectors, develop and acquire new technologies, proposals using new technologies, demonstrations of benefits of new technologies

Working style reforms

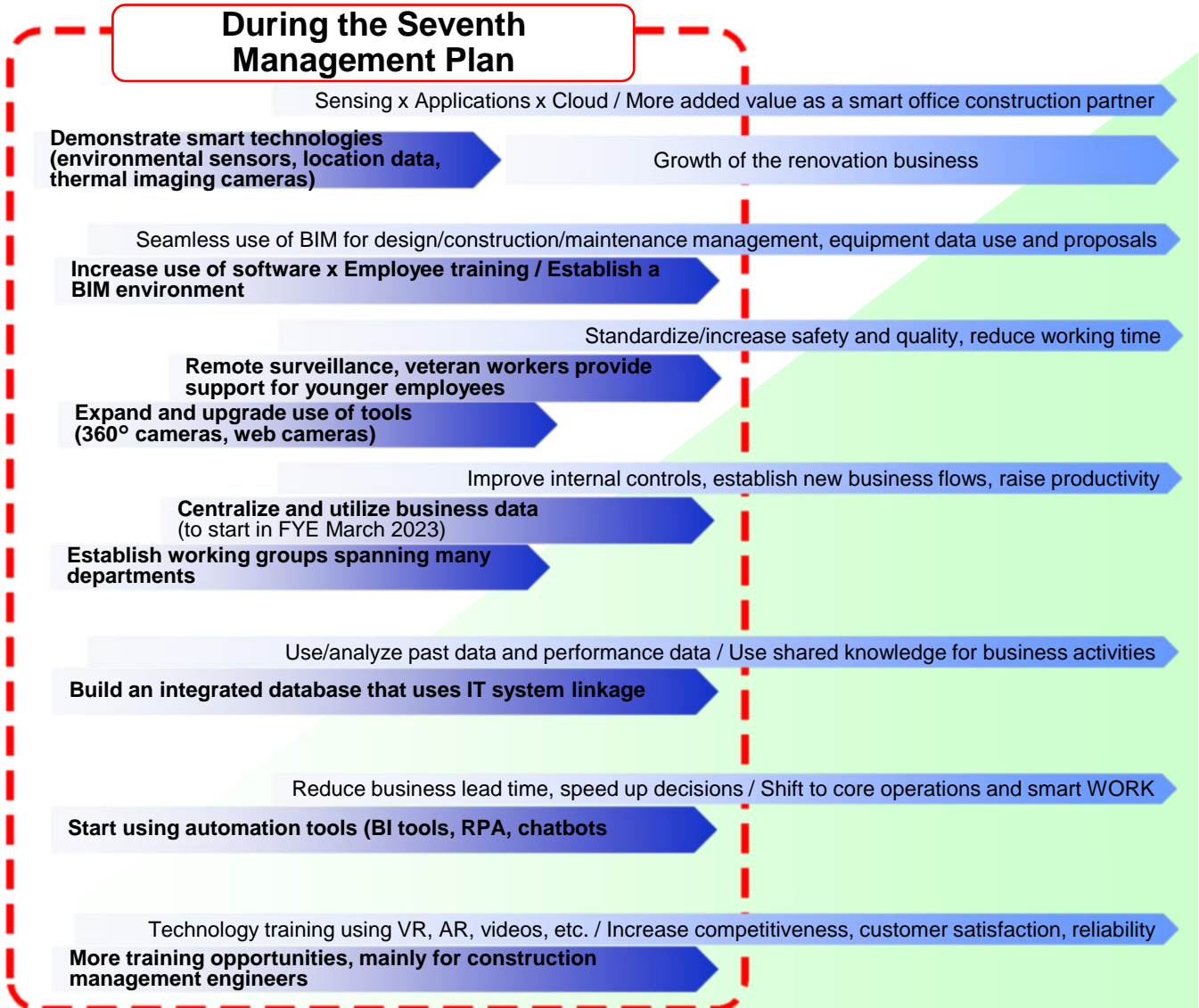
Use the DX for more efficient working styles and the use of many ways of doing jobs that are not restricted by time of day or locations (telework, shifts, etc.)



Use these measures to standardize business processes and DX progress

The Digital Transformation (2)

Hibiya Engineering Group activities based on the Seventh Management Plan



Solution business expansion
Working style reforms

DX business

Building information modeling (BIM)

More efficient construction management

Update the core IT system

Build a database

Automate business processes

Upgrade technological skills

ZEB Business Initiatives

Examples of local government ZEB initiatives and private sector ZEB initiatives

Local government ZEB

City/Town halls, etc.

- Survey project aimed at using subsidies from the Ministry of the Environment for ZEB conversion/creation

Group structure

Hibiya Engineering, Ltd.
(representative)

Company A

We surveyed the potential for converting a town hall and three other facilities to ZEB and reported that it was possible to achieve ZEB Ready status.

Target conversion to ZEB

Private sector ZEB

Research facilities

- Construction to build a new ZEB research facility for a building construction company

Role of Hibiya Engineering, Ltd.

Facility design

ZEB planner

Also provided guidance on achieving ZEB status during construction, as a ZEB planner

Local government museum

- A ZEB verification project to strengthen resilience using subsidies from the Ministry of the Environment
ZEB conversion project using initial company leases

Leasing company

Construction contract

ZEB-related application & project report

Hibiya Engineering, Ltd. (design, construction, application, project report): Cooperating company

Construction

ZEB-related application & project report

Local construction company, etc.

Alliance company

Retail stores

- Provided consulting services to convert retail stores to ZEB

Hibiya Engineering, Ltd.

Consulting company

7 projects completed
(1 of which has a BELS* certification application in progress)

Aim to provide consulting services for stores nationwide

*BELS: Refers to the Building-Housing Energy-efficiency Labeling System. This system provides third-party rating and certification of energy-saving performance.

Initiatives Aimed at Decarbonization and Energy Conservation Projects

Decarbonization/energy conservation using alliances

Project Group

Consultant, others

Alliance

Hibiya Engineering, Ltd.

Roles: Survey of existing equipment for energy conservation/CO₂ reduction, installation/maintenance of equipment, use of local companies to support the local economy

Accomplishments

Nagano prefecture government buildings

Used bulk lease for LED lights to reduce CO₂ emissions

Local government building of Kamigori-cho, Ako-gun, Hyogo

A ZEB Ready* project involving an upgrade to a total heat exchanger and LED lighting installation



* ZEB Ready: An architectural structure with energy consumption reduced by at least 50%

Use accomplishments of prior years

Public facility run by a local government in Nagano

Survey project for LED lighting installation

Local government building in Nagano

Survey project for conversion into ZEB

Local government museum in Mie

ZEB demonstration project for increasing resilience

A Stronger Jobsite Oversight System

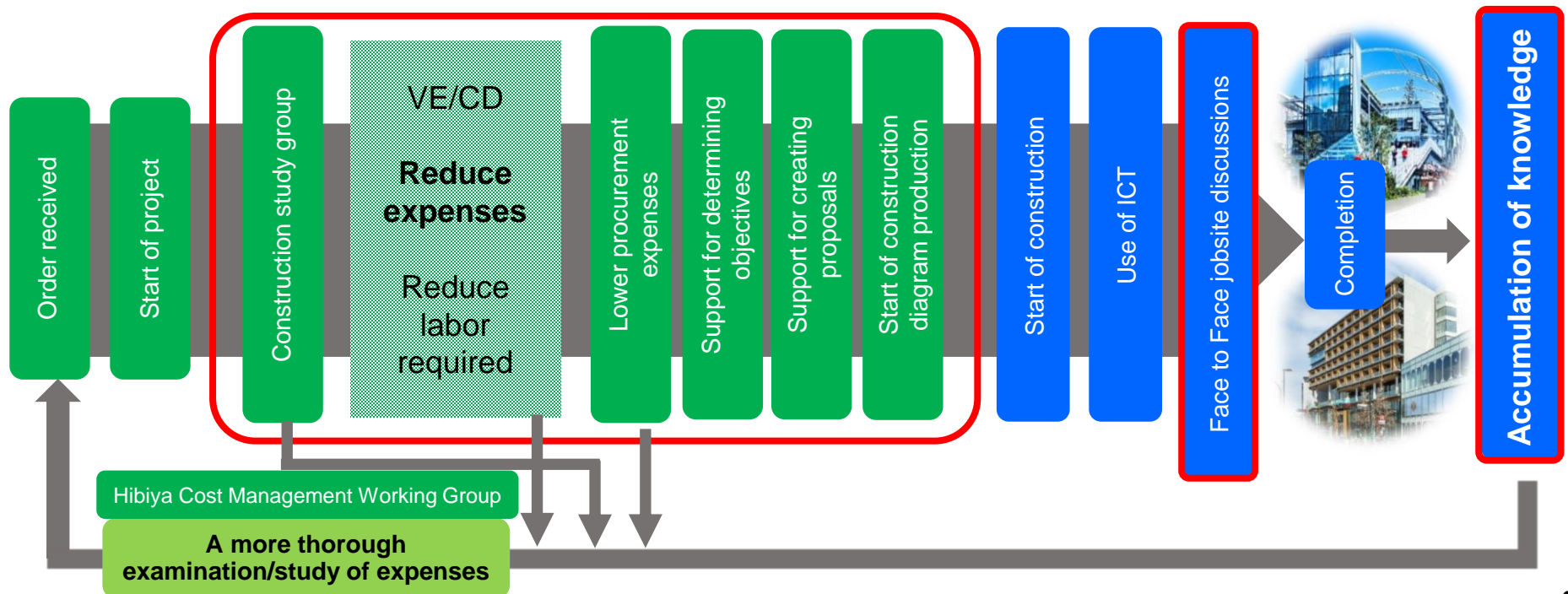
ONE TEAM and Face to Face activities

ONE TEAM Project

Establishment of a team encompassing all tasks to support construction operations from the very first stage; aims for cost reductions and other benefits

Face to Face Project

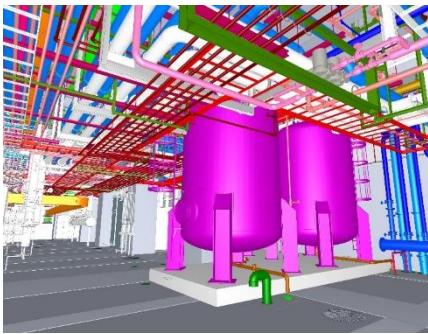
Supervisors with extensive knowledge of the construction project visit the jobsite to strengthen communications and reduce the need to redo jobs and other risks



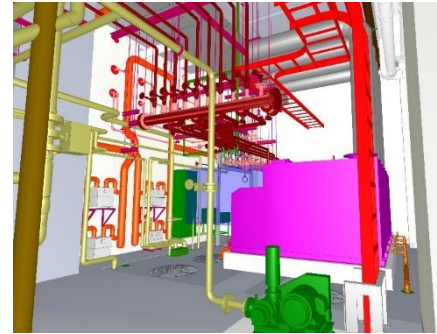
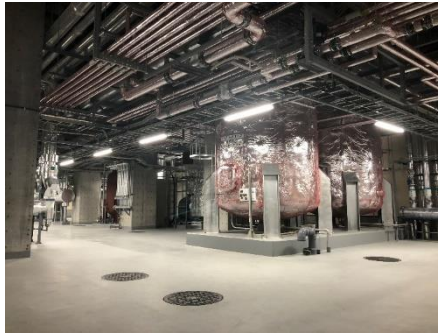
Examples of Building Information Modeling

BIM for constructing a new building with greater efficiency

- 3D imaging for determining placements of pipes and ducts relative to steel beams, braces and many other obstacles eliminates the risk of needing to redo a job
- 3D presentations of the locations of equipment ensure trouble-free agreements between designers and project owners; customer response is very positive
- Using BIM for pipe processing orders, simulated deliveries and other items makes all tasks efficient and trouble-free



▶ No need to repeat tasks to fix mistakes



▶ Construction proceeds using adjusted diagrams



Features of BIM software (Rebro/Revit) and initiatives for the future

Rebro (NYK Systems Inc.: Japan)

- To be used in the **on-site construction stage** in response to the on-site **needs of customers**
- User-friendly software featuring superior **operability demonstrated in 3D drawing**, such as the creation of a construction diagram
- It is expected that this software will continued to be used as 3D drawing software which will replace CAD software for building construction equipment

Revit (Autodesk, Inc.: US)

- At present, this software is used mainly in the architectural design stage.
- Excelling in **functional linkage and expandability**, as a design automation tool and for automatic computation, simulation, etc.
- Promising software that is likely to be used more widely in the equipment industry if standardization progresses

- Position them as **strategic tools** for the future and enhance initiatives for **human resource development** and tool **improvement**.
- Make maximum use of BIM information through **database integration** in an attempt to **improve business efficiency**.

Data Center Construction Technologies

Capabilities for all data center cooling needs, from new construction to updates

Industry-leading track record of working in 850,000 m²

Extensive track record

- Engaged in equipment installation in computer rooms for more than 50 years since the founding
- Renovation work in data centers in operation and installation work in newly constructed large data centers

	FYE March 2020	FYE March 2021	FYE March 2022
Number of air conditioners	1,683 units	1,593 units	1,502 units
Capacity	64.2 MW	58.5 MW	78.7 MW



Ready to install air conditioners in data centers ranging from those with low workloads to those with ultra-high workloads

We also validate data centers before their completion and suggest operational improvements.

Heat load test

Simulating actual heat generation before completion to check if the facility will be cooled appropriately

- ✓ Doing validations, measurements, etc. by using simulated heating elements, thereby checking if the designed environment has been built

Operational improvement

Suggesting efficiency improvements that use our technologies for separating cool air from warm air, as well as simulations

- ✓ Preventing the mixing of cool air and warm air, prior confirmation of the flow of cool air, etc.

What We Do for Data Centers (1)

Technologies for addressing the increasing amount of heat generation from

Next-generation cooling technology for high-heat-generating servers (1)

Rear door cooling: A method featuring installation of an air-cooling unit (coils and fans) on the back of the rack (on the exhaust side of the server)

- Warm air exhausted from the server is cooled by coils and blown into the room at the set temperature, thereby maintaining a constant room temperature.
- It saves more energy and space than methods which cool the entire server room.

For 30 kW/rack



Water-cooled air-cooling unit / CyberAir® for Rear Door Air Cooling

NTTファシリティーズ



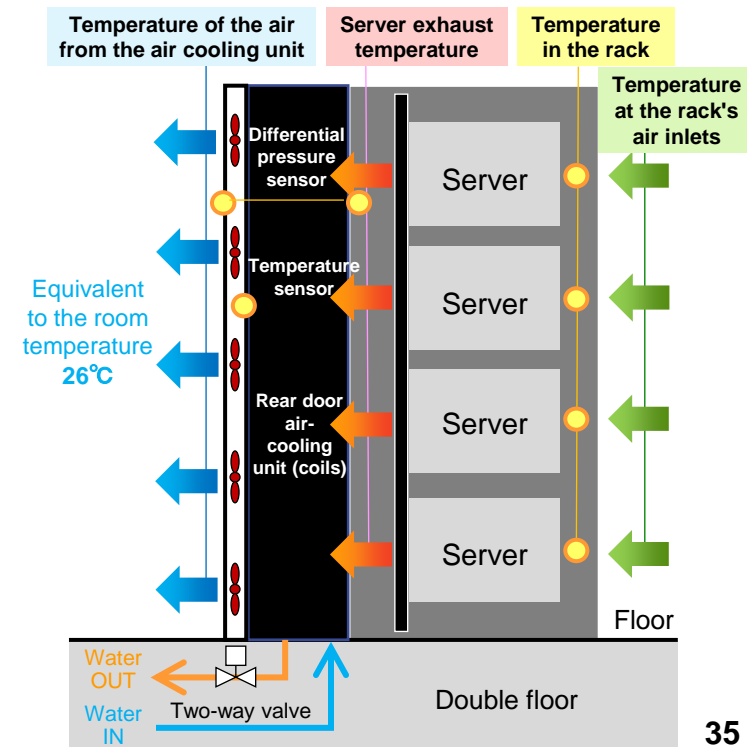
For up to 65 kW/rack



ChilledDoor® Rack Cooling System



Illustration of rear door air cooling



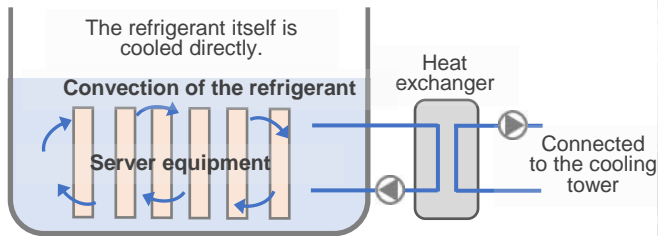
(Source) NTT Facilities, https://www.ntt-f.co.jp/service/data_center/cyber_air_door/
DC ASIA, <https://www.dcasia-ltd.com/product/facility/motivair/>

What We Do for Data Centers (2)

Technologies for addressing the increasing amount of heat generation from

Next-generation cooling technology for high-heat-generating servers (2)

Liquid immersion cooling system: Server equipment is immersed directly and cooled in a liquid bath filled with dedicated refrigerant liquid.



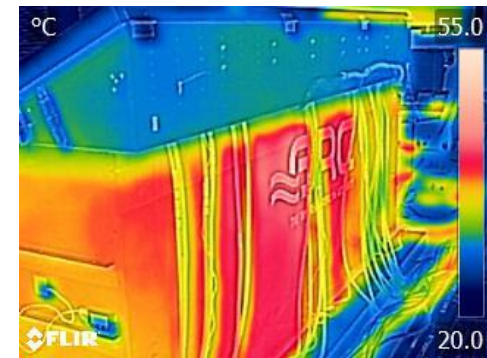
- ✓ The refrigerant itself is cooled directly through a heat exchange between the refrigerant liquid in the device and cooling water. Thus, the refrigerant in the device containing the server equipment is kept at a constant temperature.
- ✓ Typical example: Oil immersion cooling system which uses insulating oil as the refrigerant

Operation of an oil immersion cooling system

* Cooling effect being checked by using simulated heating elements



Thermal image: Front side of the liquid bath



Thermal image: Back side of the liquid bath

The refrigerant temperature is determined based on the balance between the cooling water temperature and the server's heat generation.

⇒ The system can be operated with cooling water at a temperature of around 35 degrees Celsius, which can be generated from the outdoor temperature in the summer.

時代にまっすぐ、技術にまじめです。