

時代にまっすぐ、技術にまじめです。

# Earnings Announcement

## Fiscal Year Ended March 2020

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May 26, 2020



**Hibiya Engineering, Ltd.**

These materials include forward-looking statements that incorporate risks and uncertainties and are not guarantees concerning future performance. Future performance may differ from forecasts in these materials due to changes in the operating environment and other reasons.



# **Financial Summary**

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- Orders received increased 3.4% (¥2.6 billion) mainly because of higher NTT Group orders
- Sales increased 8.4% (¥5.8 billion) mainly because of progress at large projects
- Big increases in earnings at all levels mainly because of a higher profit margin

\*Most Sixth Medium-term Management Plan targets and FY3/20 financial goals were achieved.

(Billion yen)

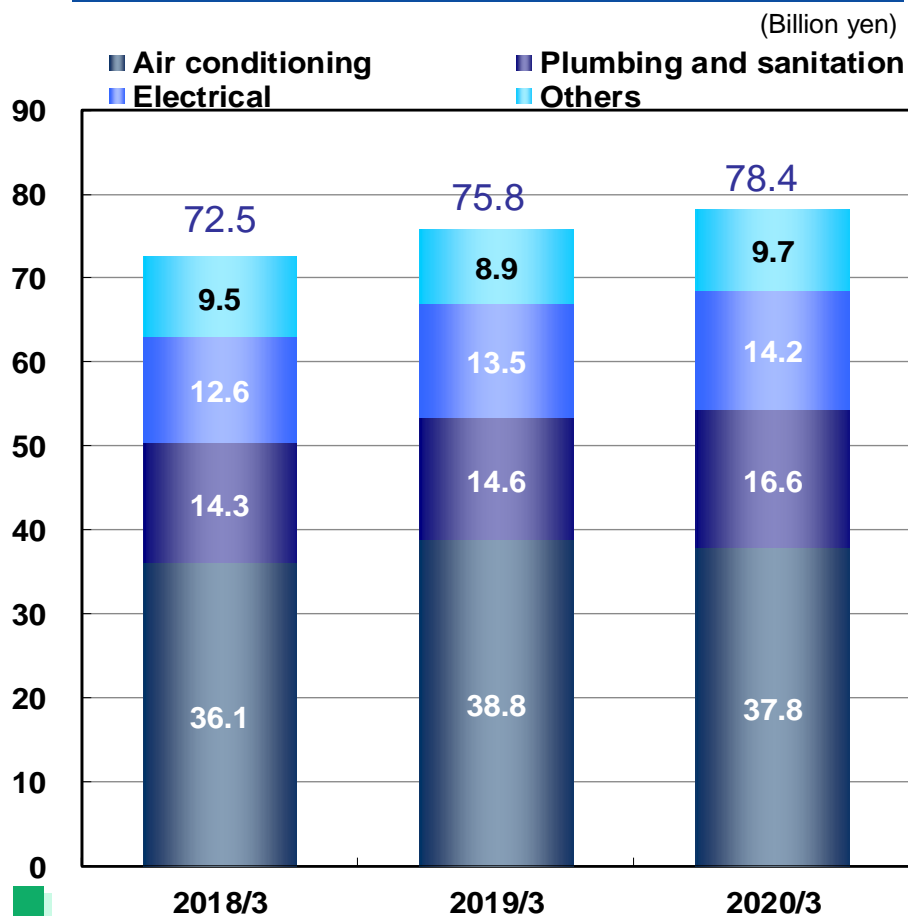
	2018/3 Actual	2019/3 Actual	2020/3 Actual	YoY (%)	2020/3 Forecast (Announced Feb. 5, 2020)	Targets of 6th Medium-term Management Plan
Orders Received	72.5	75.8	78.4	3.4%	75.0	75.0 ~
Net sales	66.8	70.0	75.8	8.4%	75.0	75.0 ~
Operating Profit	3.1	2.0	3.6	80.1%	4.0	4.0 ~
Ordinary Profit	4.0	3.2	4.2	32.0%	4.4*	5.0 ~
Profit attributable to owners of parent	7.2	2.7	3.5	30.5%	3.6*	3.0 ~

\*Forecasts were revised mainly due to the sale of all shares of Nihon Meccs, which was an equity-method affiliate.

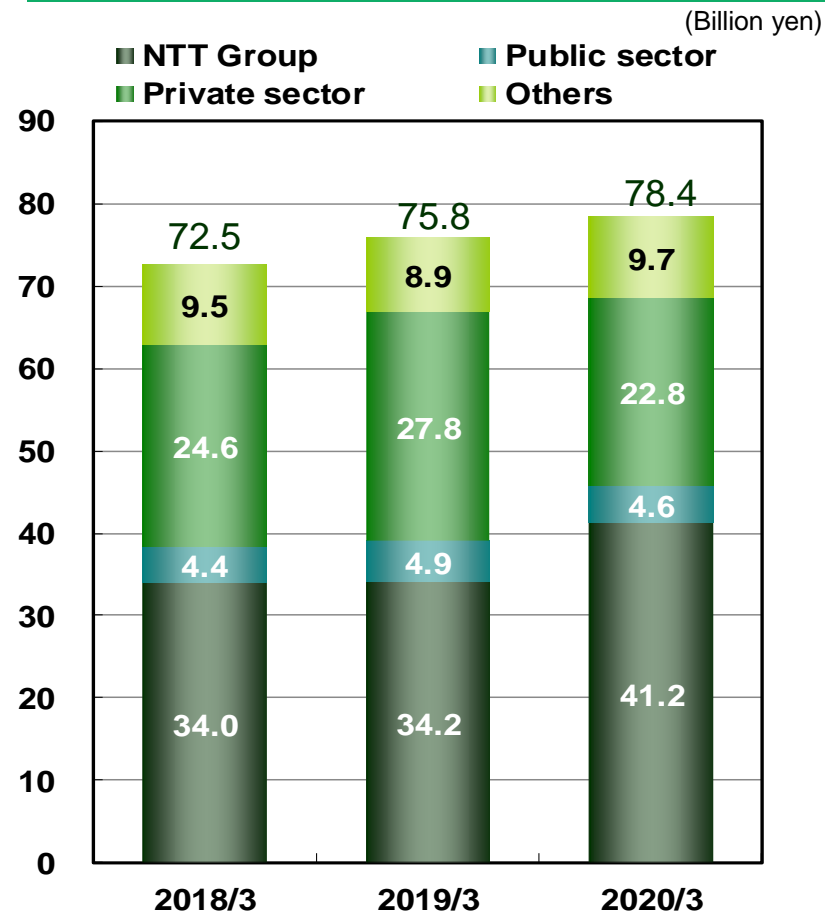
# Orders received by category & by customer (consolidated)

- The order backlog continued to increase.
- NTT Group orders increased in FY3/20 to the ¥40 billion level because of increasing demand for 5G facilities and data center renovations.

## By category



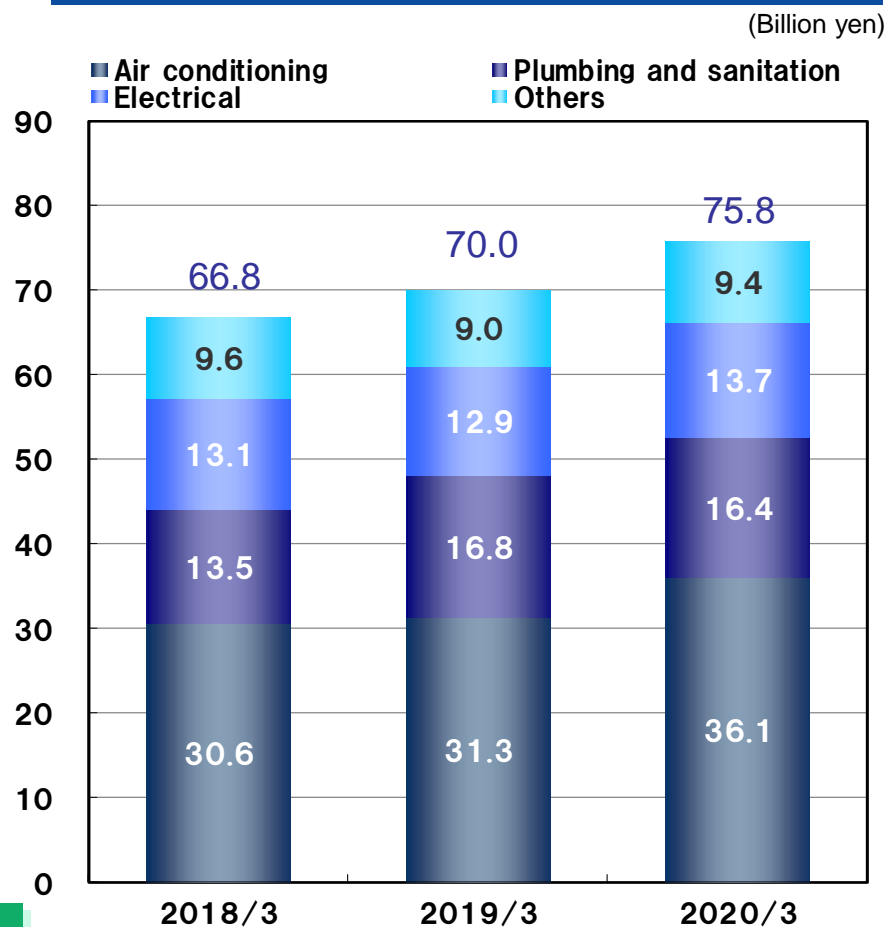
## By customer



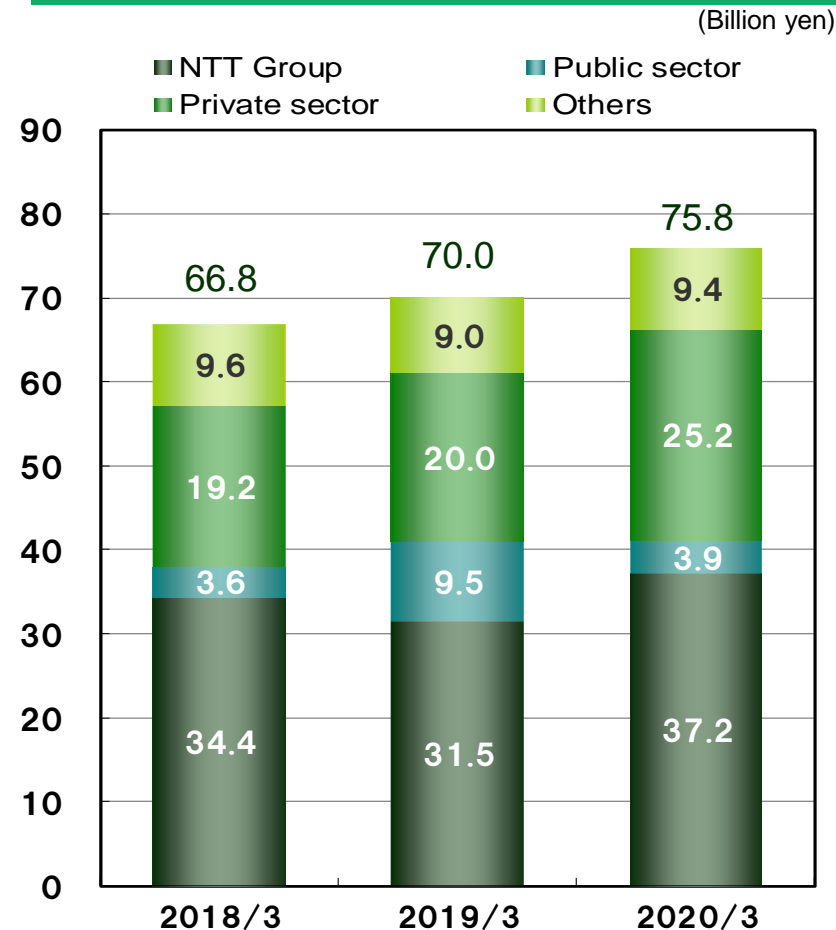
# Sales by category & by customer (consolidated)

- Sales growth continued in FY3/20.
- A big increase in sales due to progress at large private-sector projects and a recovery in sales involving NTT Group projects.

## By category



## By customer

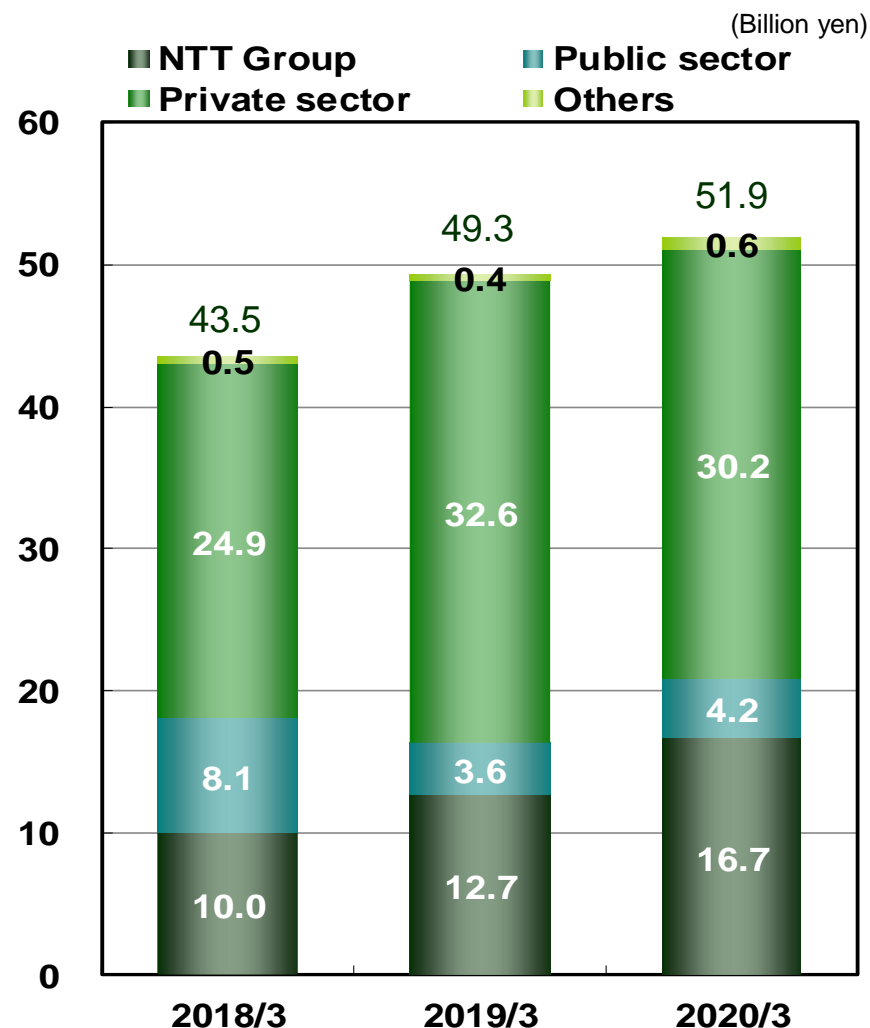


# Major completed projects and projects carried over

## Completed projects

Private sector	The Okura Tokyo
Private sector	Shibuya Scramble Square (East tower)
Private sector	Mitsui Garden Hotel Jingugaien Tokyo Premier
Private sector	Park Hyatt Niseko Hanazono
Private sector	Fujita Academy Okazaki Medical Center
Private sector	Terumo Yamaguchi 3 <sup>rd</sup> Building
Private sector	The HIRAMATSU Kyoto
Public sector	National Hospital Organization Saitama Hospital New ward building
NTT Group	NTT Communications Minami Boso Landing station

## Projects carried over



## Summary income statements (consolidated)

- The gross profit margin increased in FY3/20 because of rigorous management of construction project budgets.
- The ROE recovered to 6.1%.

(Billion yen)

	2018/3 Actual	2019/3 Actual	2020/3 Actual		2020/3 Forecast (Announced Feb. 5, 2020)	Targets of 6th Medium-term Management Plan
Net sales	66.8	70.0	75.8	<b>Net sales</b>	75.0	75.0~
Cost of sales	55.9	60.4	63.9	<b>Operating profit</b>	4.0	4.0~
Gross profit (GP margin)	10.9 (16.3%)	9.5 (13.5%)	11.9 (15.8%)	<b>Ordinary profit</b>	4.4	5.0~
SG&A expenses	7.7	7.5	8.2	<b>Profit attributable to owners of parent (ROE)</b>	3.6	3.0~ (5.0%~)
Operating profit	3.1	2.0	3.6			
Non-operating income	0.9	1.1	0.5			
Ordinary profit	4.0	3.2	4.2			
Extraordinary income	4.5	0.5	0.8			
Income taxes	1.2	0.9	1.4			
Profit attributable to owners of parent (ROE)	7.2 (12.3%)	2.7 (4.7%)	3.5 (6.1%)			

\*Forecasts were revised mainly due to the sale of all shares of Nihon Meccs, which was an equity-method affiliate.

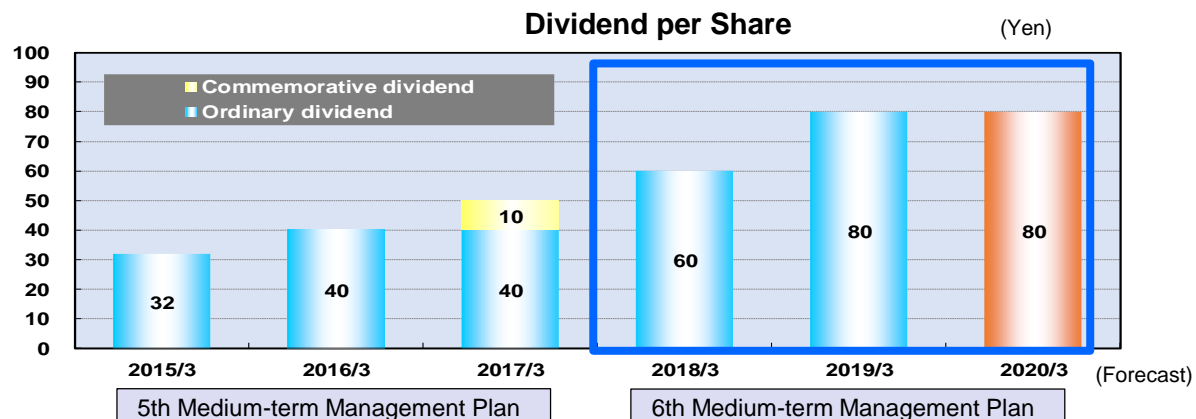
# Distributions to shareholders

## Basic policy

- Based on the earnings targets of the 6th medium-term plan, stock will be repurchased in a flexible manner as part of shareholder distributions while continuing to place emphasis on dividends.

## Dividends

- A big increase in shareholder distributions using dividends



## Repurchases

- Consistently repurchasing shares

**Treasury Shares Repurchased**

	2015/3	2016/3	2017/3	2018/3	2019/3	2020/3
Shares	450,000	440,000	460,000	4,490,000	370,000	300,000
Amount (million yen)	720	700	750	11,020	700	560

5th Medium-term Management Plan
6th Medium-term Management Plan





# **Sixth Medium-term Management Plan and Achievement**

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The Sixth Medium-term Management Plan: April 2017 - March 2020



# Fundamental goal and core strategies

## Fundamental Goal

**“Establish and reinforce corporate reforms”  
for the stable and long-term continuation and advancement of  
business operations**

## Core Strategies

**Invest in human resources and ICT to  
change how people work**

- Recruiting, training and skill enhancement activities
- Workforce diversity activities
- Maintain the proper work-life balance
- Establish a competitive edge and operate efficiently

**More advanced life cycle total solutions**

- Expand and upgrade consistent-revenue businesses
- Cooperation among Hibiya Engineering Group companies
- Collaborative sales activities with the NTT Group
- Use alliances

# Achievement in FY3/18- FY3/20

## Invest in human resources and ICT to change how people work

### Invest in human resources and ICT to change how people work

- A company-wide cloud-based desktop service
- Started using a cloud-based expense processing system and working time management system
- Started using a cloud-based human resources system
- Internet processing of invoice and order forms using the Hibiya-EDI system

(P9)

### Jobsite efficiency and stronger risk management by using ICT and discussions & follow-ups

- Using apps for remote jobsite confirmations and follow-ups
- Higher efficiency due to schedule management, chart and other apps
- Virtual jobsite accident lessons using virtual reality
- Quickly use discussions and follow-ups for jobsite progress and studies

(P10)

### The career design project for women

- Received second-tier Eruboshi certification for female workplace participation and career advancement
- Tokai Office designated Aichi Female Empowerment Company
- Follow-up training programs following pregnancy/child-raising time off
- Started leader development orientation (construction site field trips, discussion groups, etc.)

(P11)

### Working style reform working groups and stronger ties with partner companies

- Conducted many types of training programs (construction industry working style reform seminar, communication training, etc.)
- Established a portal site for members of the Safety and Health Cooperative Association
- Started the Hibiya Meister Program
- Information sharing meetings and seminars held jointly with partner companies (training for eliminating customer complaints)

(P12)

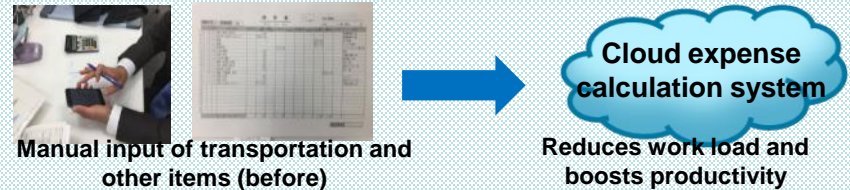
# Use of ICT to improve efficiency

## Cloud-based virtual desktop service at all group companies



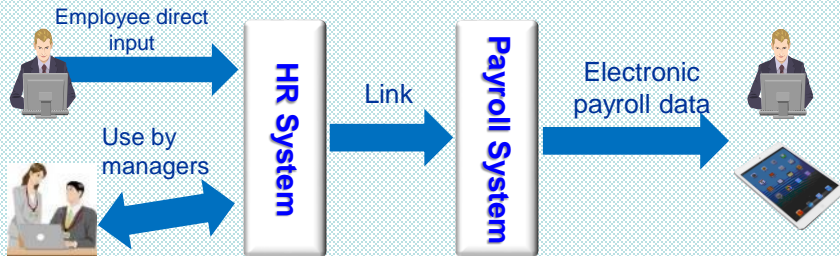
- All group employees can do their jobs wherever they are (visiting a customer, at a job site, at home, etc.) just as if they were at the office.
- The virtual desktop can be accessed using smartphones and tablets, too.

## Cloud-based expense calculation system



- A reader automatically inputs transportation expenses from a transportation IC card
- Prevents mistaken entries and eliminates manual input for higher efficiency

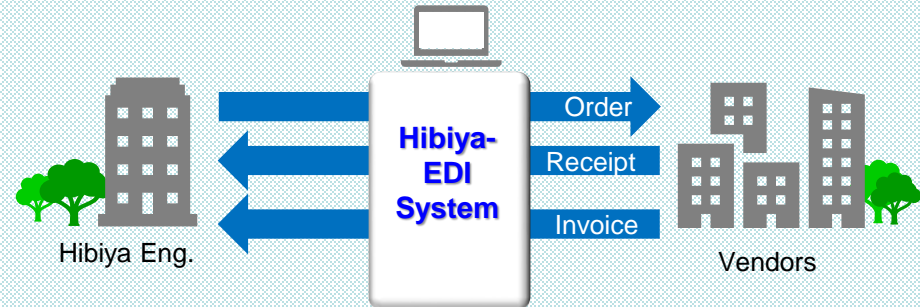
## Started using a cloud-based human resources system



### Advantages of the new system

- ▶ Direct employee input (after approval) eliminates dual input
- ▶ Can be utilized for career plans of employees
- ▶ Reduces annual HR-task working time by about 2,500 hours

## Hibiya-EDI System invoices and order forms

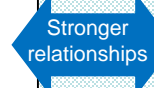


### Benefits for Hibiya Eng.

- ▶ Improves efficiency by completing contract procedures faster
- ▶ Stronger relationships with partner companies
- ▶ Strengths compliance

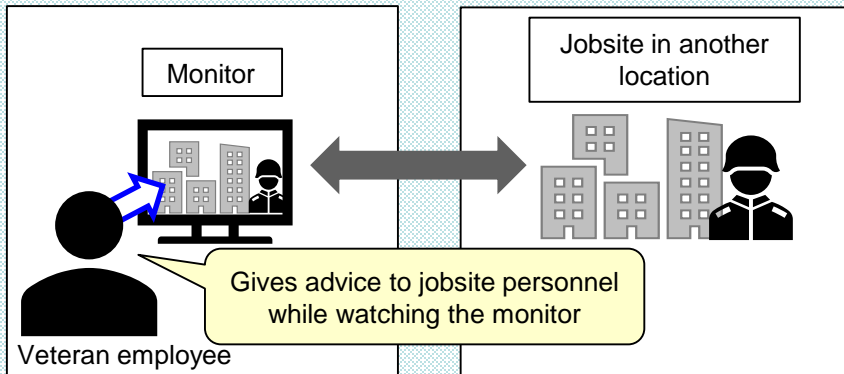
### Benefits for Vendors

- ▶ Efficient use of personnel due to faster finalization of contracts
- ▶ Higher productivity due to a smaller volume of work
- ▶ Lower cost



## Jobsite efficiency and stronger risk management by using ICT and discussions & follow-ups

### Using apps for remote jobsite confirmations and follow-ups



▶ Experienced people can provide assistance without visiting jobsites

### Higher efficiency with schedule management, chart and other apps



Sharing and monitoring of daily jobsite tasks

### Virtual jobsite accident lessons using virtual reality



- Falls
- Flying or falling objects
- Moveable platforms

Virtual reality accidents

▶ A virtual reality experience of an accident

▶ See causes of accidents and learn how to prevent them

### Discussions and follow-ups for jobsite progress quickly



Face-to-face jobsite discussions

Countermeasures for jobsite risk factors and identification of hidden problems in order to quickly solve jobsite problems and lower the likelihood of accidents

# The career design project for women

Received second-tier Eruboshi certification for female workplace participation and career advancement and the Tokai Office was designated an Aichi Female Empowerment Company

## L Star Certification



Achieved 4 of the 5 requirements

- ✓ 1. Recruitment
- ✓ 2. Retention
- ✓ 3. Working time and other job characteristics
- 4. Pct. of management personnel
- ✓ 5. Wide range of career paths

Achieved May 2019

## Aichi Bright Women Company



Certified by Aichi prefecture in January 2020

## Follow-up training after maternity leave



### Benefits

- Sharing information with others in the same environment helps eliminate worries
- Increases motivation to return to work
- Creates a framework for uniform follow-up activities at all departments

## Orientation program for training leaders

Job site tours for female employees



Women group discussion



## Results of the Promotion of Female Participation and Career Advancement (at least 20% of all newly hired people)

	2018	2019	2020	Total
New graduate	28	23	27	78
Of which women	7	6	6	19

➡ % of women: 24.3%

## Working style reform working groups and stronger ties with partner companies

### Seminars

Construction industry working style reform seminar



Communication skills training



### Safety and Health Cooperative Association Portal



- Raise safety awareness by sharing safety information (videos of accidents, etc.) with partners
- Improve work efficiency by sharing Hibiya's safety manuals and training schedules with partners.
- Disseminate and share business/work-related information (MLIT, measures to prevent the spread of COVID-19, etc.)

### The Hibiya Meister Program



74 Meisters were certified in FY3/19-3/20

- ▶ FY3/19: 41
- ▶ FY3/20: 33

- Recognizes outstanding skills and provides people needed at job sites
- Increases salaries and motivation



Meister



Premium Meister

### Hibiya Eng. & Partner company discussion groups and joint training sessions

Group discussion with partner companies



Zero claim workshop



## Achievement of Sixth Medium-term Management Plan

### Results of life cycle total solutions sales activities (FY3/18 to FY3/20)

Growth of renovation projects due to consistent-revenue activities and the use of alliances

#### Consistent-revenue activities

Orders: ¥29.0 billion  
Number of orders: 817

#### Renovation sales activities

Orders: ¥129.3 billion  
Pct. of total orders: 64.9%

#### CO<sub>2</sub> emission reduction

Orders: ¥3.8 billion  
Number of orders: 35/175 facilities

Medium/long-term proposals based on the life cycles of the installed base of equipment and nationwide sales for CO<sub>2</sub> reduction, zero-energy buildings (ZEB) and other projects

#### ■ Expand/upgrade consistent-revenue businesses\*

- Proposals to NTT Group and other major customers for comprehensive building renovation work
- Medium/long-term maintenance proposals for regular inspections and aging diagnosis service
- Use the new Life Cycle Service Center for growth of consistent-revenue businesses (page 17)

#### ■ Proposals for using subsidies for replacing equipment

- Capture orders for renovation projects eligible for subsidies for diagnostic projects with the potential to lower CO<sub>2</sub> emissions (page 16)

\* Consistent-revenue businesses are equipment upgrade and replacement services that match the life cycles of customers' buildings.

#### ■ Use alliances for CO<sub>2</sub> reduction, ZEB and other activities

- Use experience with CO<sub>2</sub> emission reduction projects to capture ZEB orders for public-sector buildings (page 14)
- Use alliances with leasing companies to capture orders for large LED lighting projects (page 31)

#### ■ The local government carbon management reinforcement program

- Use subsidies of the local government carbon management reinforcement program to meet local government needs involving disaster preparedness and lowering CO<sub>2</sub> emissions (pages 15, 26)

#### ■ Project for school heating/AC systems

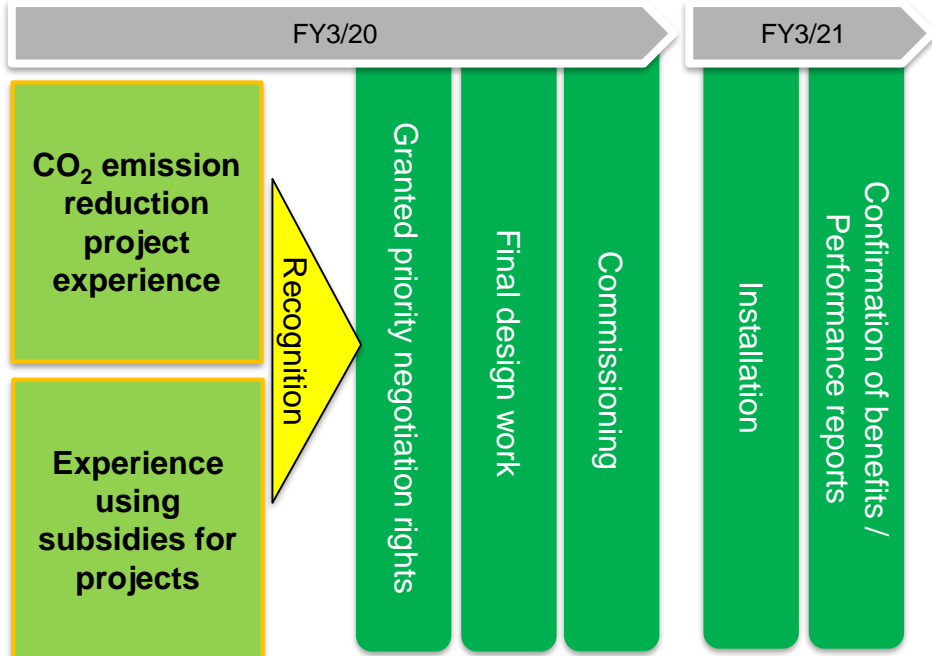
- Installation of heating/AC system at elementary schools in Taiwa-cho in Miyagi



Use of CO<sub>2</sub> emission reduction expertise to receive a ZEB Ready\* order for a public-sector building

## Zero-energy building project for the Kamigori-cho town office

### Kamigori-cho town office, Ako-gun, Hyogo



- ▶ **Exterior**
  - Building exterior renovation using the external thermal insulation process
  - Better door/window insulation by using low-e vacuum multi-pane glass
- ▶ **Air conditioning**
  - Use of thermal burden calculations to downsize AC equipment
  - Use of highly efficient equipment to reduce energy consumption
- ▶ **Lights**
  - Fluorescent lights were replaced with LED fixtures throughout the building
  - Control system with brightness sensors near windows and lighting adjustment for different areas of the building
- ▶ **Ventilation**
  - Replaced conventional ventilation units with heat exchangers for energy efficiency
- ▶ **Renewable energy**
  - The building has a solar power system with a battery

**Design consultant** (design supervision, commissioning) **Hibiya Engineering** (oversight, design/construction)

\* ZEB Ready is a building that has cut its energy consumption by at least 50%.

# Alliance for meeting public sector needs to receive a renovation project order

## Carbon management reinforcement program and use of self-reliant and dispersed energy equipment

Sango-cho, Nara: public health center, elementary school, culture center, library

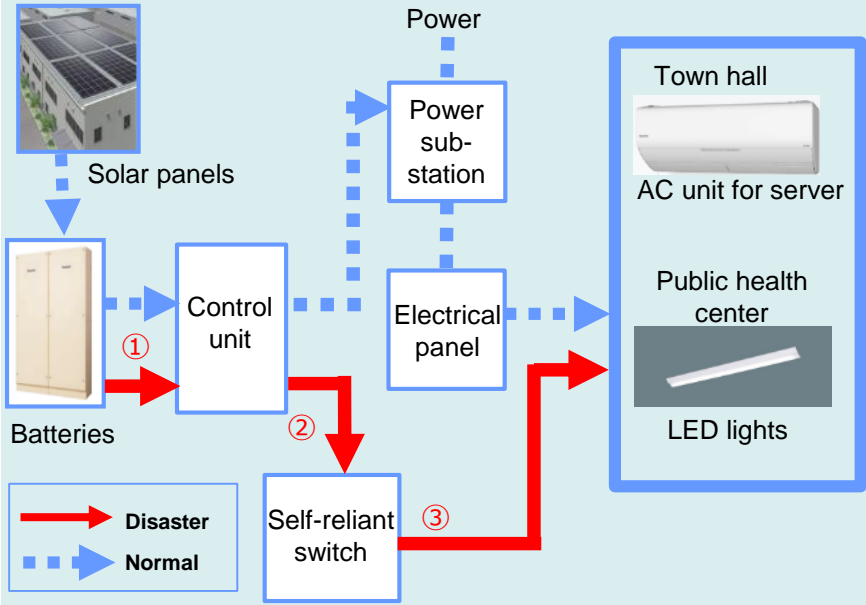


**Needs**

- Replace aging equipment
- Reduce greenhouse gas emissions
- Add evacuation center capabilities (town hall, public health center)

FY3/19 → FY3/20

### Increased town hall illumination disaster resilience



- Disaster response**
- 1) Electricity supplied by storage batteries
  - 2) Electricity goes to the self-reliant switch
  - 3) Power to LED lights and other facilities

Final plan for a carbon management reinforcement project

Project and final plan for disaster preparedness, carbon reduction, self-reliant and dispersed energy, etc.

Construction work for disaster preparedness, carbon reduction, self-reliant and dispersed energy, etc.

Construction work for the carbon management reinforcement program project

Location	Renovations				Disaster response
	AC	Lights	Trans:	EMS	
Sango elementary school	○			○	
Sango north elementary school	○			○	
Town hall	○	○		○	○
Library	○	○		○	
Culture center		○	○	○	
Sports center	○	○		○	
Public health center		○			○

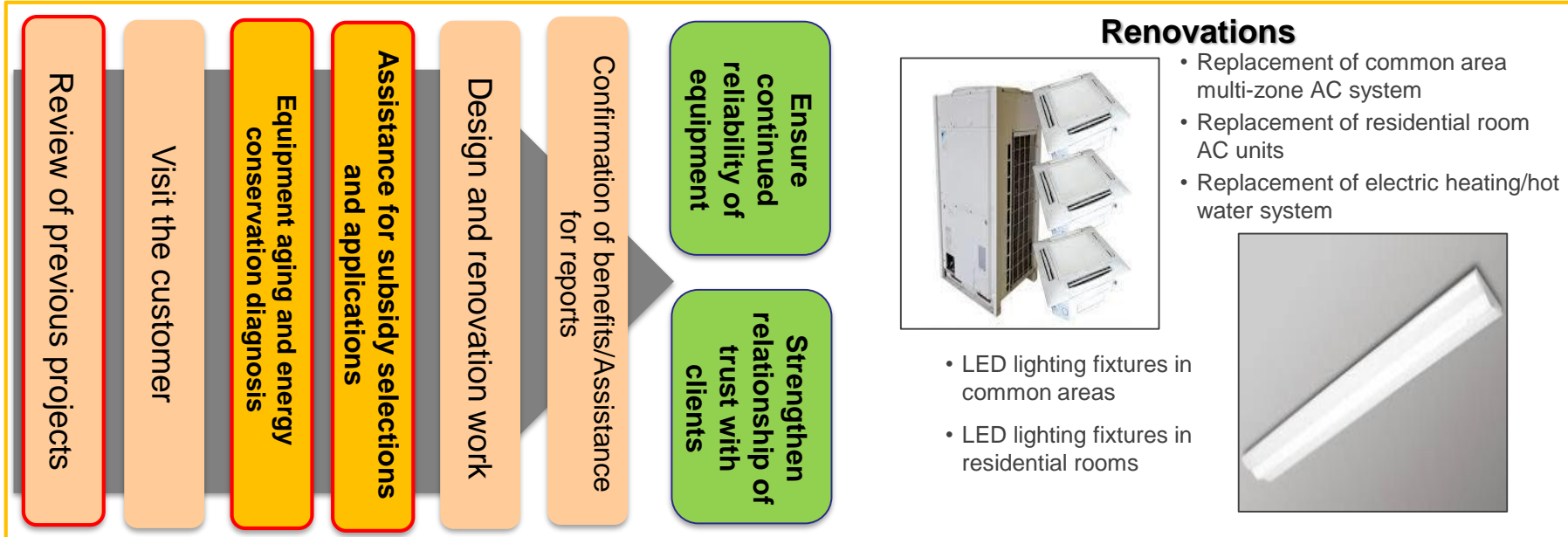
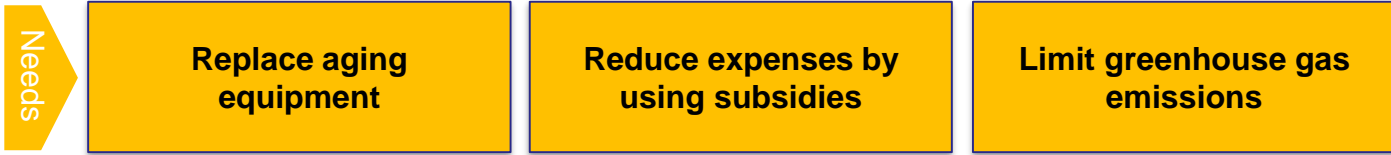
**Design consultant** (design supervision, commissioning)

**Hibiya Engineering** (oversight, design/construction)

Use of a potential diagnosis project subsidy to receive a renovation order

Total solutions for current customers for equipment at many locations

Senior Home Care House Reitaku of the Reitaku Social Welfare Association



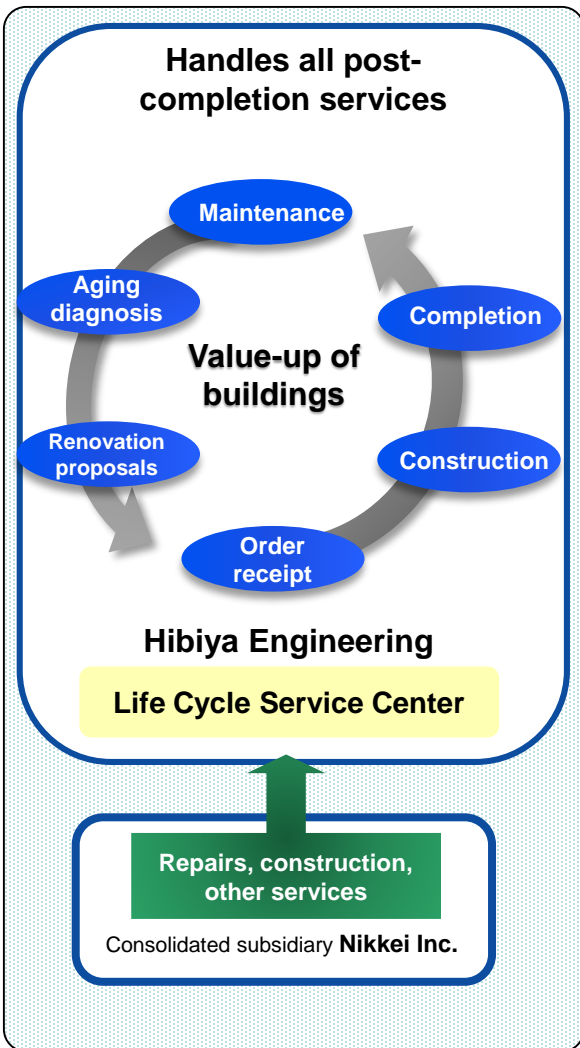
- Subsidies cut the cost of renovations by about 50%
- Annual cost of electricity reduced by about ¥2.9 million (20%)
- Annual CO<sub>2</sub> emissions down 44%



- Sales activities for other buildings of this customer
- Use subsidies that match the customer's needs
- Solution-based sales combining head office/branch office resources

# New LC Service Center strengthened consistent-revenue activities and increased orders

## Expanded Life Cycle Service Center contributed to growth in renovation projects



### Reinforced service infrastructure

▷ **Repair/maintenance services at the entry point for creating renovation proposals**

### Improve business efficiency

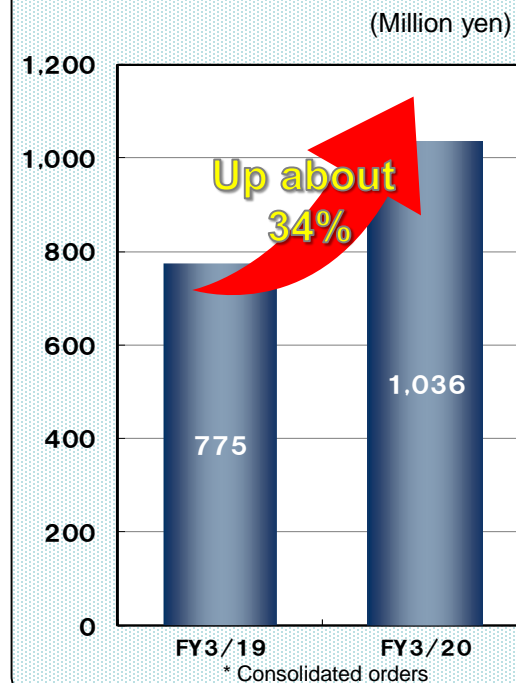
- ▷ **Quick action by single contact**  
New email service
- ▷ **Use of tablets**  
Common cloud server also used with partner companies, smaller risk of information leaks

### Upgrade capabilities for electrical work

- ▷ **Training and use of electric ES engineers**  
Utilize Hibiya Engineering technologies as integration increases interactions among engineers
- ▷ **Use Hibiya Engineering electrical partner companies**  
Receive a broader range of orders by working with partner companies
- ▷ **Use cooperation among departments for more efficient estimates**  
Use of departmental cooperation to create an estimate calculation system for Gold Customers for more efficient construction project budget determinations and decisions

■ Number of buildings receiving LC services and orders for construction work for tenants increased

**Increase in orders for post-completion services from Gold Customer S**





# **Forecast and Distributions to Shareholders of FY3/21**

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# Forecast and Distributions to Shareholders of FY3/21

## Forecast (consolidated)

(Billion yen)

	FY3/20 Actual	FY3/21 Forecast
<b>Orders</b>	78.4	<b>62.0</b>
<b>Sales</b>	75.8	<b>68.0</b>
<b>Operating profit</b>	3.6	<b>2.0</b>
<b>Profit attributable to owners of parent</b>	3.5	<b>1.5</b>

**The forecast is based on the following assumptions concerning the business climate amid the uncertain outlook caused by the COVID-19 crisis.**

- Downturn in orders because of weak building construction demand
- Slower progress at construction projects as customers push back completion dates
- Lower profit margins caused partly by higher prices of some building materials

**Hibiya Engineering will respond with speed and flexibility to changes in market conditions.**

## Distributions to Shareholders

**Plan to continue paying a stable dividend from a long-term perspective**

Dividends: Maintain 80 yen per share

Repurchases: Undecided

## **Postponement of the Seventh Medium-term Management Plan**

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Hibiya Engineering planned to start its Seventh Medium-term Management Plan in April 2020. However, the new coronavirus crisis and other events have made the outlook for business operations uncertain. Consequently, the announcement of the new management plan is currently expected to take place with the announcement of results of operations for the first half of the fiscal year ending in March 2021.



**Major completed projects  
(FY3/18-3/20)**

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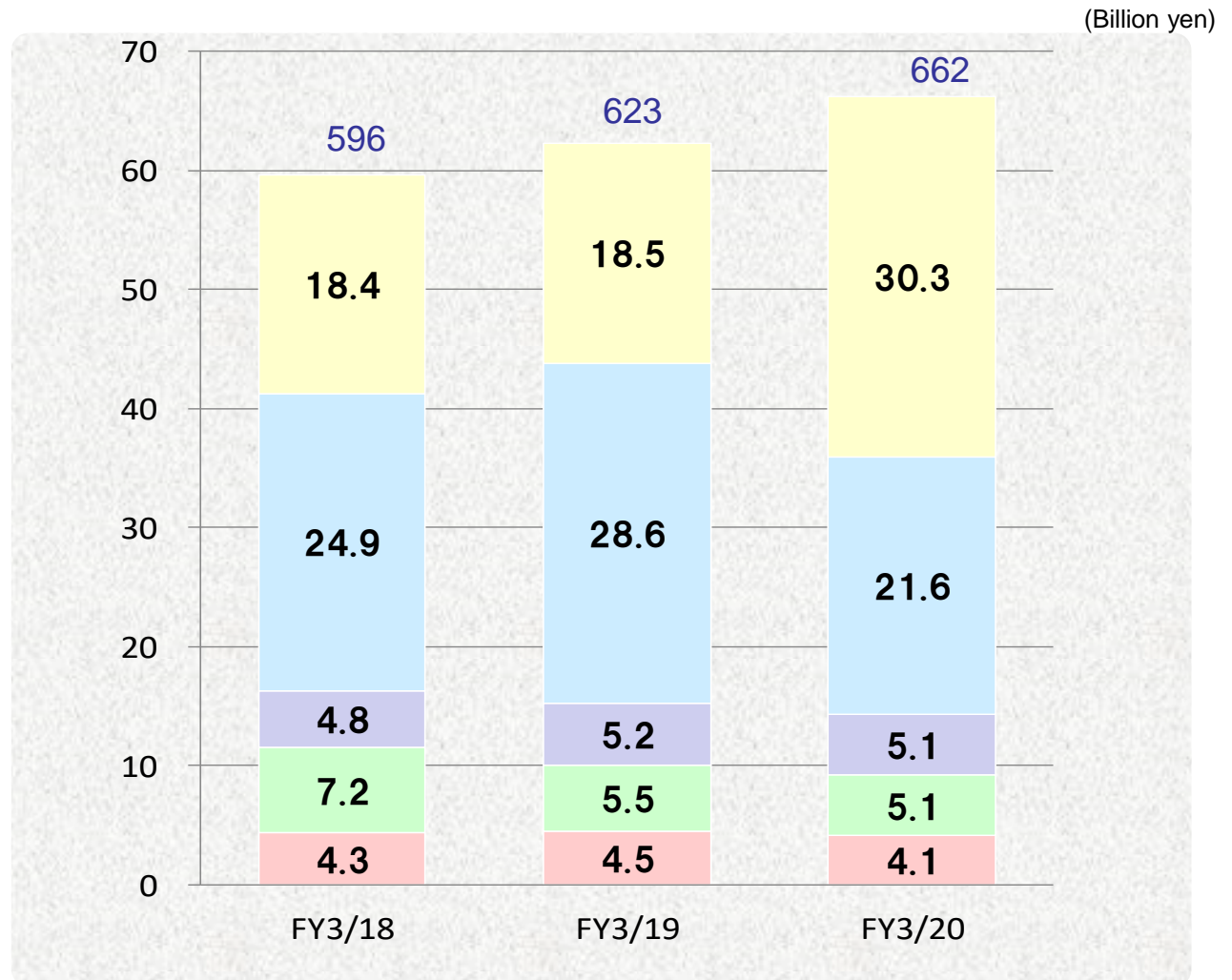




# Orders received of the priority domains

## 【Priority Domains】

- Data centers  
/Information
- Office buildings
- Manufacturing  
/Distribution
- Health care  
/Medical Welfare
- Hotels/Resorts



An environmentally friendly office building located directly above Onarimon Station in central Tokyo



An onsen hotel that incorporates nature and Japanese design themes; every guest room has an outdoor bath



Sumitomo Fudosan Onarimon Tower	
Location	Minato-ku Tokyo
Floor area	32,631 m <sup>2</sup>
Structure	22 stories above ground/2 stories below ground/2 levels of roof
Hibiya's work	Air conditioning/sanitation

Hakone Kowakien Ten-yu	
Location	Hakone, Ashigarashimo-gun, Kanagawa
Floor area	14,660 m <sup>2</sup>
Structure	9 stories above ground/1 story below ground
Hibiya's work	Sanitation

# Logistics facilities

Projects in FY3/18

A large postal distribution center for the Kyoto area



The largest GLP distribution facility in Japan, conveniently located near major Osaka area highways



Kyoto post office	
Location	Joyo city, Kyoto
Floor area	55,130 m <sup>2</sup>
Structure	5 stories above ground
Hibiya's work	Air conditioning

GLP Suita	
Location	Suita city, Osaka
Floor area	165,236 m <sup>2</sup>
Structure	4 stories above ground
Hibiya's work	Air conditioning/sanitation

A hospital in the city of Toyoake that is designated an advanced treatment hospital



Fujita Health University new building B	
Location	Toyoake city, Aichi
Floor area	31,776 m <sup>2</sup>
Structure	8 stories above ground/1 story below ground/1 level of roof
Hibiya's work	Sanitation

A super mega-solar project located in a model recovery district of Fukushima prefecture with a substation for very high voltages



F-IITATE Solar power plant	
Location	Soma-gun, Fukushima
Floor area	312,317 m <sup>2</sup>
Structure	1 story
Hibiya's work	Electrical

# Office buildings

## Projects in FY3/19

This building is part of a development project at Tamachi Station by Tokyo Gas, Mitsui Fudosan and Mitsubishi Estate.



A building combining office space for a prominent IT company with luxury apartments



**msb Tamachi Station tower S**

<b>Location</b>	<b>Minato-ku, Tokyo</b>
<b>Floor area</b>	<b>138,300 m<sup>2</sup></b>
<b>Structure</b>	<b>31 stories above ground/2 stories below ground</b>
<b>Hibiya's work</b>	<b>Electrical (fire alarm/security system)</b>

**Sumitomo Realty & Development Shibuya First Tower**

<b>Location</b>	<b>Shibuya-ku, Tokyo</b>
<b>Floor area</b>	<b>37,942 m<sup>2</sup></b>
<b>Structure</b>	<b>21 stories above ground/2 stories below ground/1 levels of roof</b>
<b>Hibiya's work</b>	<b>Air conditioning/sanitation</b>

A call center serving all areas of the Shikoku



A luxurious hotel at Kyoto Station designed to meet the highest standards of hospitality along with Japanese design themes



NTT West New Sanban-cho Building	
Location	Matsuyama, Ehime
Floor area	5,447 m <sup>2</sup>
Structure	4 stories above ground/1 stories below ground
Hibiya's work	Air conditioning/sanitation

THE THOUSAND KYOTO	
Location	City of Kyoto
Floor area	22,063 m <sup>2</sup>
Structure	9 stories above ground/1 stories below ground
Hibiya's work	Sanitation

A large distribution center serving many tenants that is located at the Keihin Truck Terminal



A college building designed for a new style of education and research as well as to serve as place for people to gather and a disaster response facility



DynaBASE	
Location	Ota-ku, Tokyo
Floor area	97,000 m <sup>2</sup>
Structure	5 stories above ground
Hibiya's work	Air conditioning/sanitation

Otemon Gakuin University Ibaraki Sojiji Campus, Osaka	
Location	Ibaraki, Osaka
Floor area	20,130 m <sup>2</sup>
Structure	5 stories above ground /1 levels of roof
Hibiya's work	Air conditioning

A renovation project to create a high-end hotel that reflects the architecture and atmosphere of Kyoto, Japan's capital for more than 1,000 years



©Forward Stroke Inc.

**Faithful restoration of the main lobby of The Okura Tokyo, including lights incorporating the famous Okura lantern motif that is a symbol is this historic hotel.**

The Okura opened in 1962 as a hotel featuring a distinctly Japanese design and atmosphere rather than a format based on overseas hotels. The recent renovation carries on this tradition and takes the design to an even higher level.



Lobby



Okura Fitness & Spa

### THE HIRAMATSU KYOTO

Location	City of Kyoto
Floor area	3,982 m <sup>2</sup>
Structure	5 stories above ground/ 1 stories below ground
Hibiya's work	Air conditioning/sanitation

### The Okura Tokyo

Location	Minato-ku, Tokyo
Floor area	180,905 m <sup>2</sup>
Structure	41 stories above ground/1 stories below ground/2 levels of roof
Hibiya's work	Sanitation



# Hotel / Multipurpose Building

# Projects in FY3/20

"Jingu Gaien no Mori" is a vacation home that provides a front seat to the greenery, views and excitement of the city.



<b>Mitsui Garden Hotel Jingugaien Tokyo Premier</b>	
<b>Location</b>	<b>Shinjuku-ku, Tokyo</b>
<b>Floor area</b>	<b>15,800 m<sup>2</sup></b>
<b>Structure</b>	<b>13 stories above ground</b>
<b>Hibiya's work</b>	<b>Air conditioning</b>

A spectacular tower in the heart of Tokyo's vibrant Shibuya district with offices, shops, restaurants and event spaces



<b>Shibuya Scramble Square (East tower)</b>	
<b>Location</b>	<b>Shibuya-ku</b>
<b>Floor area</b>	<b>181,000 m<sup>2</sup></b>
<b>Structure</b>	<b>47 stories above ground/7 stories below ground</b>
<b>Hibiya's work</b>	<b>Air conditioning/sanitation</b>

## Health care / other facilities

Projects in FY3/20

A university-affiliated medical center with an emergency room that never closes



These high-end condominium buildings are in a quiet residential neighborhood of the city of Hakodate



FUJITA Health University OKAZAKI Medical Center	
Location	Okazaki, Aichi
Floor area	37,674 m <sup>2</sup>
Structure	7 stories above ground
Hibiya's work	Sanitation

Gardenia Matsukage IV	
Location	Hakodate, Hokkaido
Floor area	4,266 m <sup>2</sup>
Structure	4 stories above ground
Hibiya's work	Air conditioning/sanitation



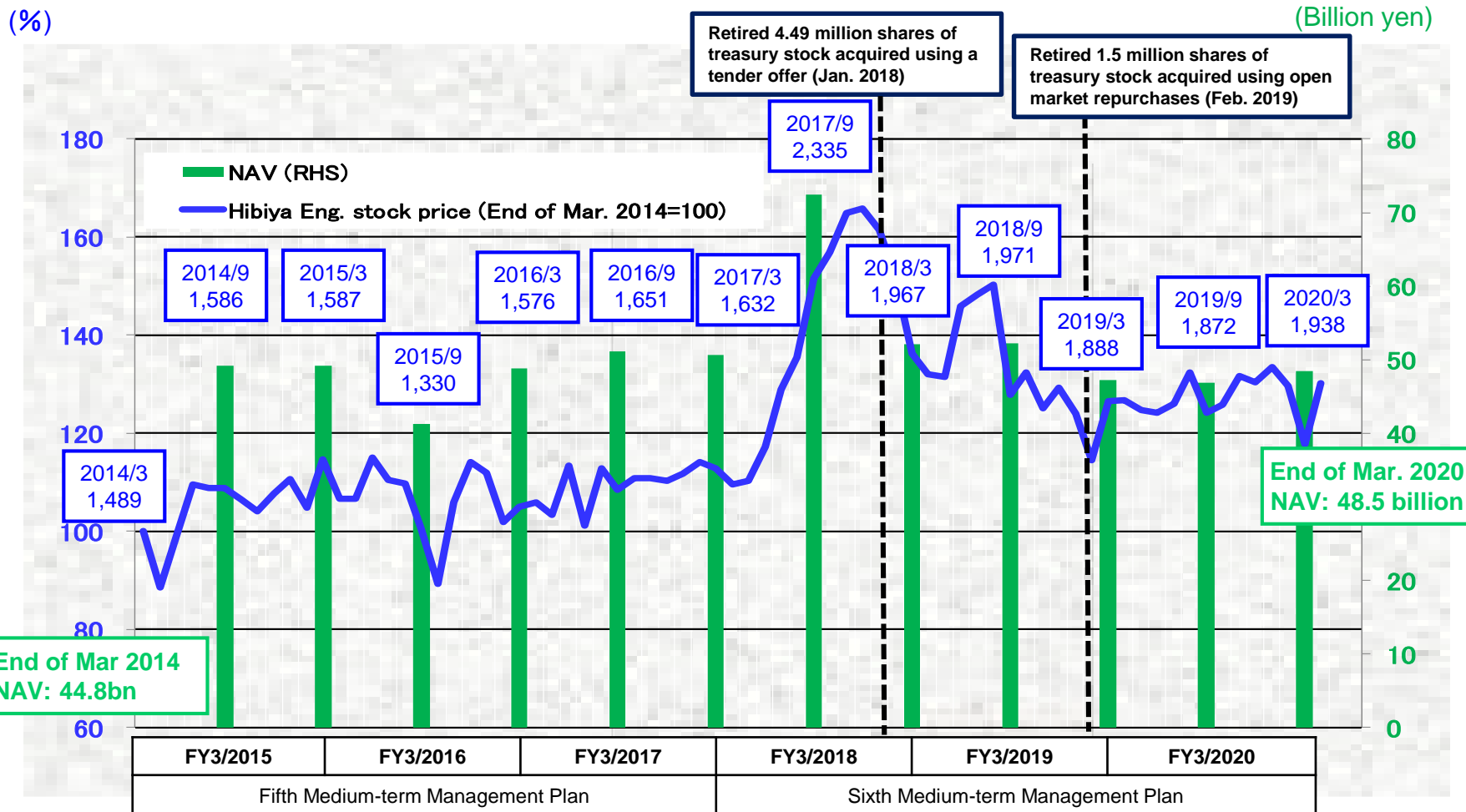
# Reference

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# Stock price and net asset value (~ end of March 2020)

## Performance of Hibiya Engineering stock since the end of March 2014

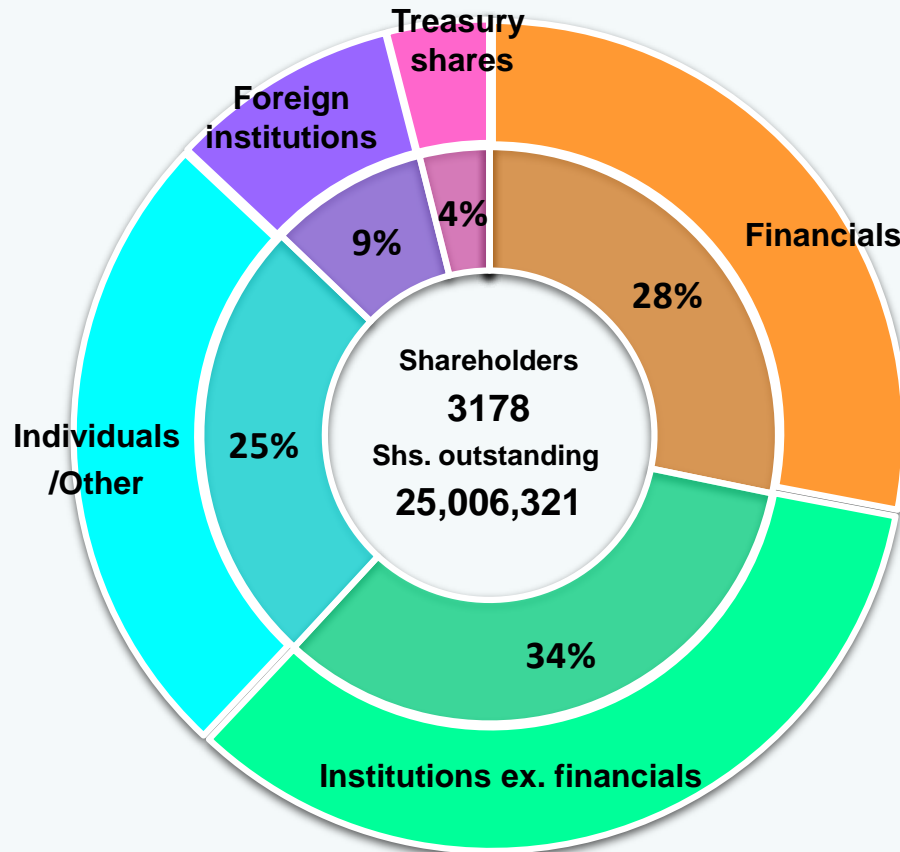


# Shareholders

No. of shareholders: 3,178

Shares outstanding: 25,006,321

(As of end of March 2020)



## CO<sub>2</sub> Reduction Initiatives

### Use of LED lights at all Nagano prefectural government buildings

The first project by a prefecture in Japan that uses a large-scale bulk lease for many buildings and facilities in order to lower CO<sub>2</sub> emissions

#### The Nagano Prefecture LED Light Project

A bulk lease was used to install LED lights at all prefectural government buildings and facilities in order to lower CO<sub>2</sub> emissions.

##### 【Cost】

▶ About ¥300 million

##### 【Purpose】

- ▶ Reduce CO<sub>2</sub> emissions and electricity use at the prefectural government buildings and facilities
- ▶ Use of a lease prevented spikes in expenses

##### 【Length of project】

▶ July 2018 to September 2019 (LEDs in police stations and boxes)

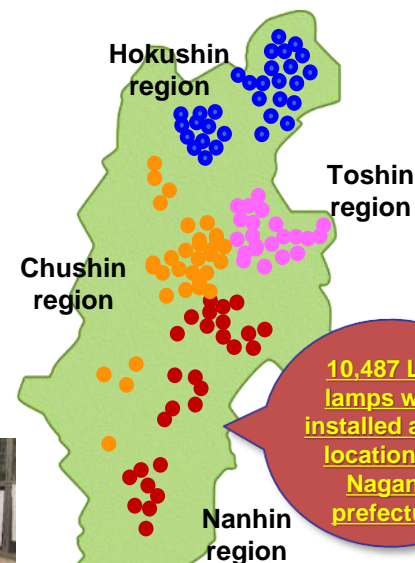
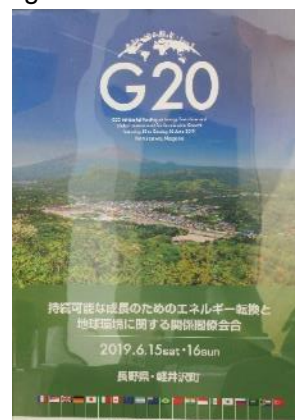
#### Participating companies

Organization /financing	Mitsubishi UFJ Lease & Finance Co., Ltd.
Design/installation /inspection	Hibiya Engineering
Design/installation	Six companies in Nagano

#### Hibiya Engineering activities

▶ Studies, installation work and maintenance services for lowering CO<sub>2</sub> emissions associated with current equipment

Information about the LED project was presented at the G20 Climate Sustainability Working Group meeting that was held in Nagano



Hibiya Engineering plans to use expertise gained from this project to meet the needs of local governments throughout Japan for activities that lower CO<sub>2</sub> emissions.

# Alliances to meet public sector needs and receive renovation project orders

## Self-sufficient and dispersed energy and other equipment for Information Center Manazuru

Information Center Manazuru, Manazuru-machi, Ashigarashimo-gun, Kanagawa

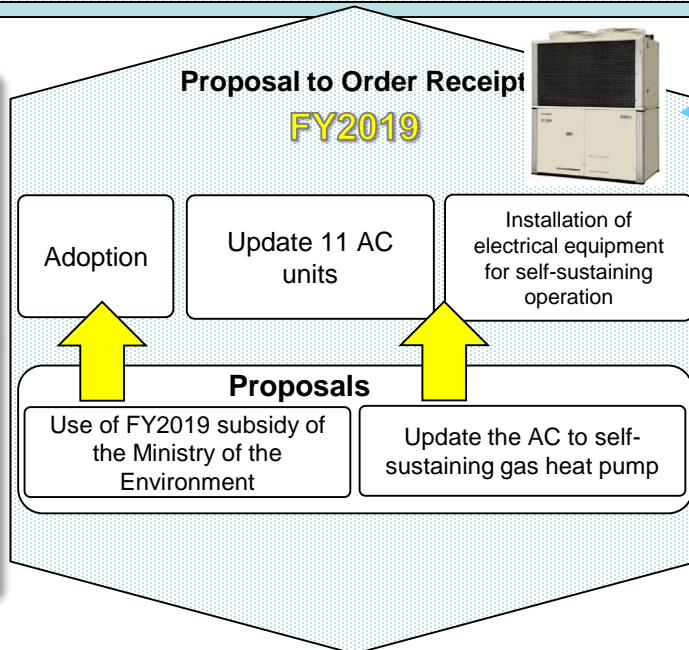


### Needs

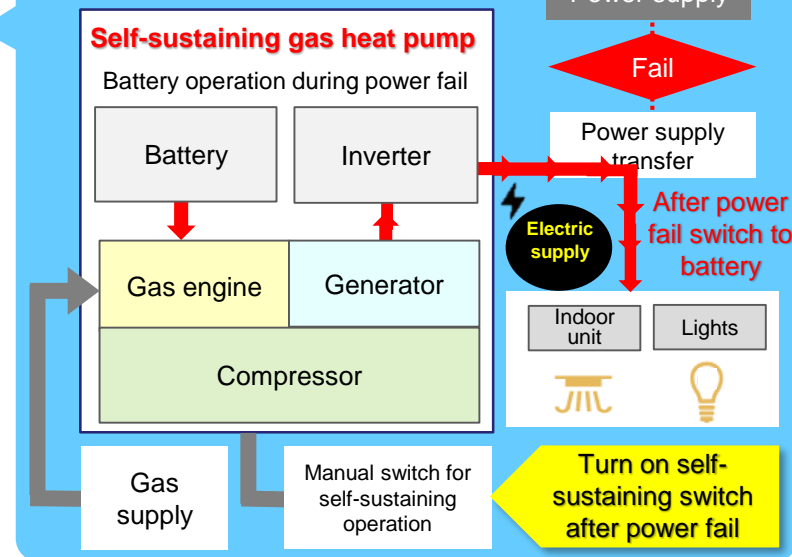
Equipment for evacuation site designation based on the Manazuru regional disaster response plan

Upgrade of the current air conditioning system, which is more than 20 years old

Renovations to conserve energy and lower the cost of operating the center



### Example of the System



**Construction consultant (Design, supervision, etc.)**



**Hibiya Engineering (Oversight, construction)**

### Expected benefits

- ◆ Reduction in greenhouse gas emissions (CO<sub>2</sub>)
- ◆ Lights, AC and other equipment at evacuation sites function even after a disaster

## Human Resources Initiatives

Internships for Kanazawa Institute of Technology and Vietnam Japan Institute of Technology (Vietnam) students



CAD Training



Presentations by interns

### Overview

- Internships for Japanese and Vietnamese mechanical engineering and construction engineering students to gain work experience
- Interns study the latest technologies for comfort, energy conservation and convenience involving environmentally friendly construction equipment



## New customers, alliances and other sources of opportunities

### Fall Data Center & Storage EXPO (Makuhari Messe)



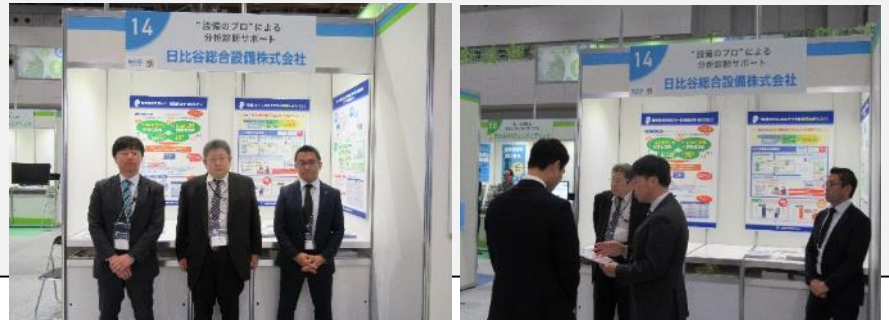
#### Summary

Hibiya Engineering's booth featured the group's many accomplishments involving data center renovations.

#### The Hibiya Engineering booth

- Hot/cold air separation technology
- Experimental liquid immersion cooling unit
- Heat-resistant server, wall outlet cooling with improved efficiency
- Energy conservation for university computer rooms
- Analysis of simulated server heat generation using Hibiya Engineering's own mock heat source

### Renovation EXPO 2020 (Tokyo Big Sight)



#### Summary

Visitors learned about Hibiya Engineering technologies and services involving energy conservation, CO<sub>2</sub> emission reduction, creating, storing and managing energy, and other fields

#### The Hibiya Engineering booth

- The energy management business, which uses subsidies for the management and conservation of energy
- Bulk leases, a cost-efficient scheme for updating equipment at many locations

### JFMA Facility Management Forum 2020 (Tower Hall Funabori)



#### The Hibiya Engineering booth

- Disaster preparedness project for Manazuru-machi
- Bulk lease for Nagano prefectural government
- Energy conservation at data centers
- Information about renovation projects

\*No attendance at the booth due to the COVID-19 crisis.

## Seminars at the Hibiya Information Plaza

### Technology Seminar – Using the IoT and AI



#### Summary

Companies with innovative IoT and AI technologies explained some of the latest activities in these two fields

#### Presentations

- EXBeacon and other technologies for the use of digital twins
- The DBMCS building automation solution for using open systems to support the IoT
- The DiAs energy conservation navigation system using AI
- Examples of community creation and smart community activities

### Technology Seminar – Next-generation Data Centers



#### Summary

Explanations by several companies of the increasing importance of data centers

#### Presentations

- AC control for heat-resistant servers using ICT device data and activities for creating a digital twin environment
- Server technology trends evident in the NEC Express server and precautions when installing servers
- An overview of data centers in other countries
- The last bastion of immersion cooling? Toyota's mobility service platform is hot!

# Natural gas cogeneration system

A local gov't used a Hibiya natural gas cogeneration system at a hot spring lodge

Previously unused energy is utilized to cut the cost of electricity by 60%, which lower CO<sub>2</sub> emissions

## City of Shimada

A place where people/industry/culture come together  
A healthy city of water and greenery

+ Goal is also to be a leader in the field of reusable energy

### Issue at city's hot spring facility

Natural gas produced by the hot spring, containing 86% methane, **was released to the atmosphere**

Idea and execution

Lowers CO<sub>2</sub> emissions

Hibiya technologies/expertise  
Use natural gas cogeneration to produce electricity and use exhaust heat

## Kawane Hot Spring

Hotel and bathing facility

For the lodge (100kW)

For spa hot water (155kW)

Electricity

Heat

Methane's greenhouse effect is more than 20 times higher than for CO<sub>2</sub>

Natural flow hot spring well

Gas separator

Hot spring water

### New equipment

Compressor

Gas storage

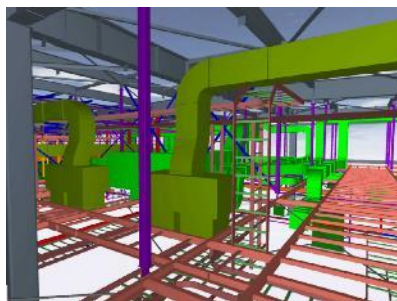
Cogeneration unit  
Corresponding power failure

Hot spring water

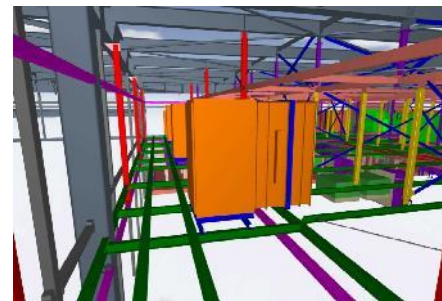
## Examples of the Use of Building Information Modeling (BIM)

### Fully utilizing BIM raises calculation profits without any reworking

- Repeating output along with construction BIM improves the ability to create cost-reduction ideas, such as for altering pipe configurations
- 3D studies as construction proceeds for placing pipes and ducts while avoiding steel beams, braces, racks and other obstacles
- Allows giving priority to Hibiya Engineering's requests, resulting in faster progress and no need to redo any work



No need to repeat tasks to fix mistakes



Construction proceeds using adjusted diagrams



### Advantages of using BIM

#### 3D

- Placement adjustments/interference checks for facility designs
- Adjustments using overall diagrams, faster decision-making
- More efficient checking of confirmation applications, etc.



#### Database links

- BIM-linked automatic calculations (loads, energy conservation)
- Automated equipment designs (device tables, device configurations)
- Use of information about building characteristics for maintenance operations

**Building Information Modeling** is a method for constructing a building data model consisting of 3D shape information created in a computer and various characteristics of a building, such as names and floor areas of rooms, the types and properties of materials used, finishing work, and other items.

# Aisle Capping for Small Computers for Data Centers

A flexible aisle capping system for small computer rooms

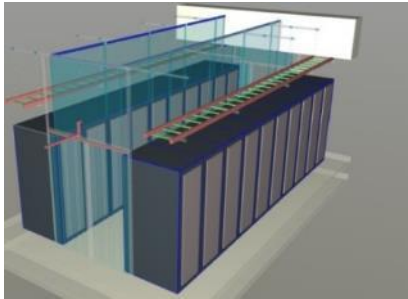
## Features

**More efficient climate control**  
Uniform temperature of rack air supply surface

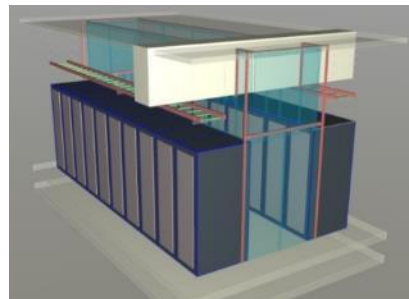
**Flexible installation to match environment for equipment**

**Low cost by using general-purpose sheets**

## Potential applications



Capping with ceiling



Capping with no ceiling

## Capping in use



Installed under a ceiling beam

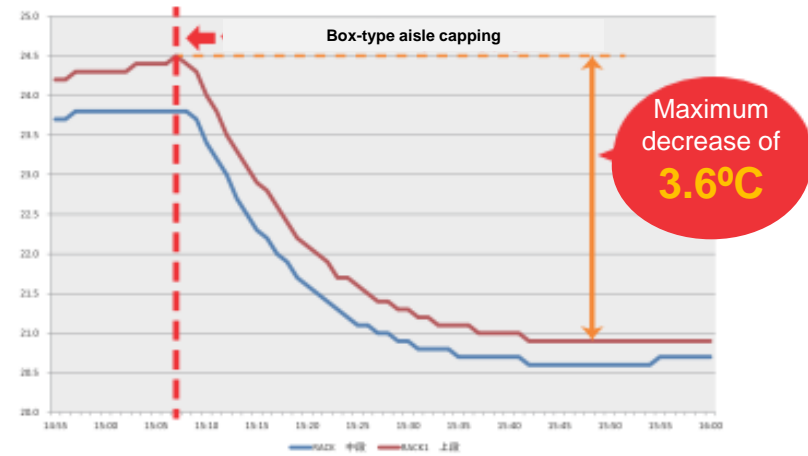


Box-type capping

## Benefits

**2.2°C decrease in temperature**

Improvement in air supply surface allows a more energy efficient thermostat setting for the climate control system



## 3D Scanners

Use state-of-the-art technology (3D scanners) for more technological advances



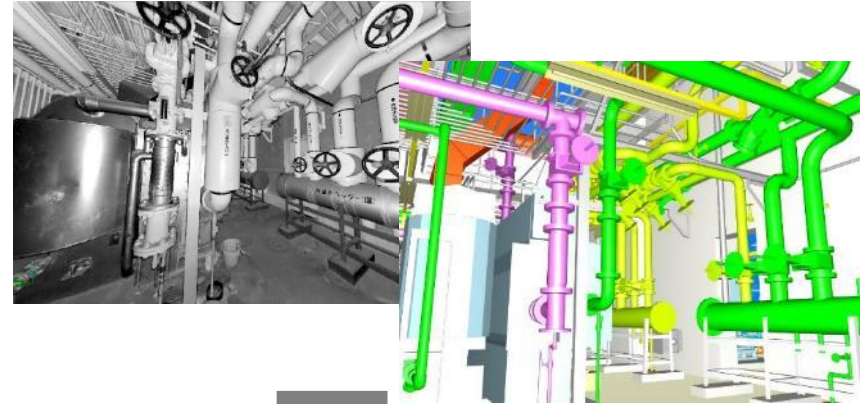
A Faro Focus3D high-speed 3D laser scanner

【Use 3D scanners】

Acquire project site data

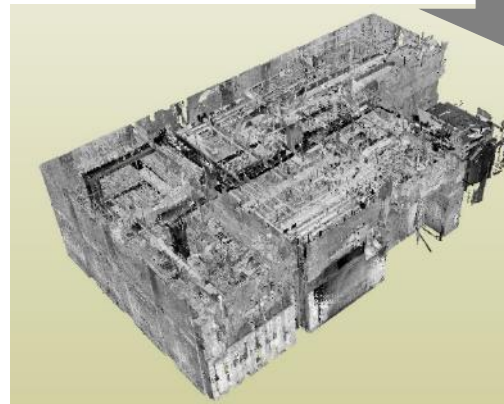


Transform image data to CAD

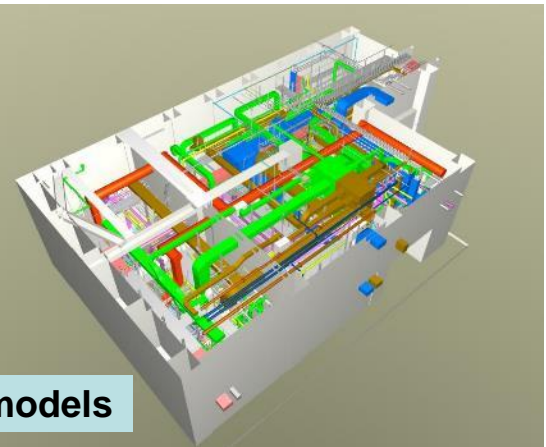


【Advantages】

- Reduces number of people and time needed to perform jobsite surveys
- Improves the safety of jobsite surveys
- Increases the accuracy of construction drawings
- Produces CAD and 3D models quickly



Use point cloud data for 3D models



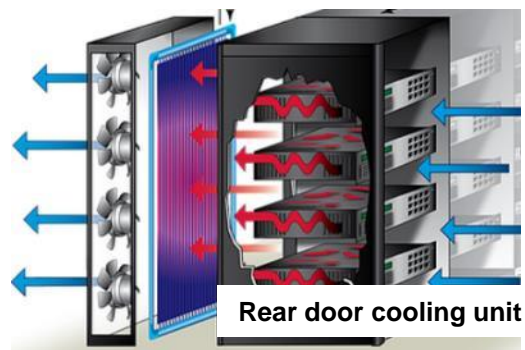
Utilizing this technique as much as possible as a renovation technology

## Data Center Construction Technologies

A leader in the data center building sector – 850,000 square meters

From low to high loads and even **ultra-high loads**

Period	1966~	2013~	2020~
Category	The first DCs/phone equipment room	Cloud DC	AI/Supercomputer DC
Major customers	Telecommunications companies	E-commerce sites	Automobile companies, research institutes, others
Heat generation	Low load	High load	Ultra-high load
Rack heat output	~5kW/rack	~10kW/rack	~50kW/rack
Cooling method	Computer AC units	Chilled water Indirect evaporation	Rear door cooling Liquid immersion cooling
Features	Reliable <ul style="list-style-type: none"> <li>• Individual AC units</li> <li>• Floor blowers</li> </ul>	Energy efficient <ul style="list-style-type: none"> <li>• Wall blowers</li> <li>• Uses natural energy (external air/water)</li> </ul>	Cooling for substantial heat generation <ul style="list-style-type: none"> <li>• Cooling units for individual racks</li> <li>• Immersed in a liquid for cooling</li> </ul>



# Streamlining construction and installation technologies

Labor-saving method for installing rooftop equipment raises efficiency

## Simple installation with single unit package for exterior equipment

Improves quality



**A single unit for exterior equipment/base /refrigerant pipes**

- Smaller amount of labor required
- Better, more uniform quality due to fabrication at a factory

More efficient



**One rooftop placement using a crane**

- No need for placing separate units

Less labor



**Simple rooftop installation**

- No time-consuming installation steps

## Installation of pre-assembled rooftop water tank

Improves safety



More efficient



- Reduces the need for performing work in high places (safety)
- Reduces scaffolding, the need for protective plastic coverings of adjacent areas, and crane use (efficiency)

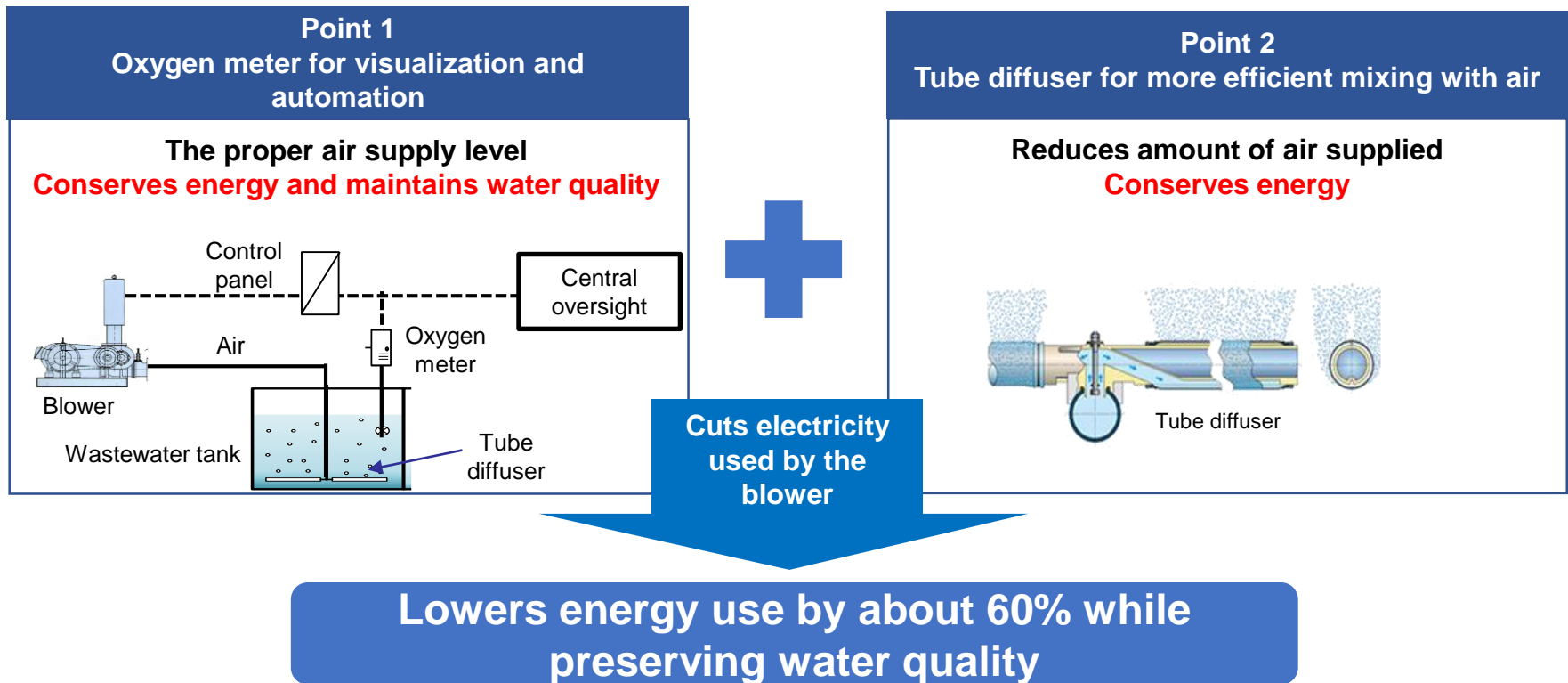


# Energy conservation technologies for sanitation equipment

## Energy conservation and water quality at wastewater treatment facilities

Energy-efficient climate control and electrical equipment as well as a focus on conserving energy in sanitation equipment

- Wastewater treatment facilities
- Requires the supply of an enormous volume of air at a steady rate
  - Required amount of air changes depending on day of the week and time of day
  - Too much or too little air causes water quality to decline

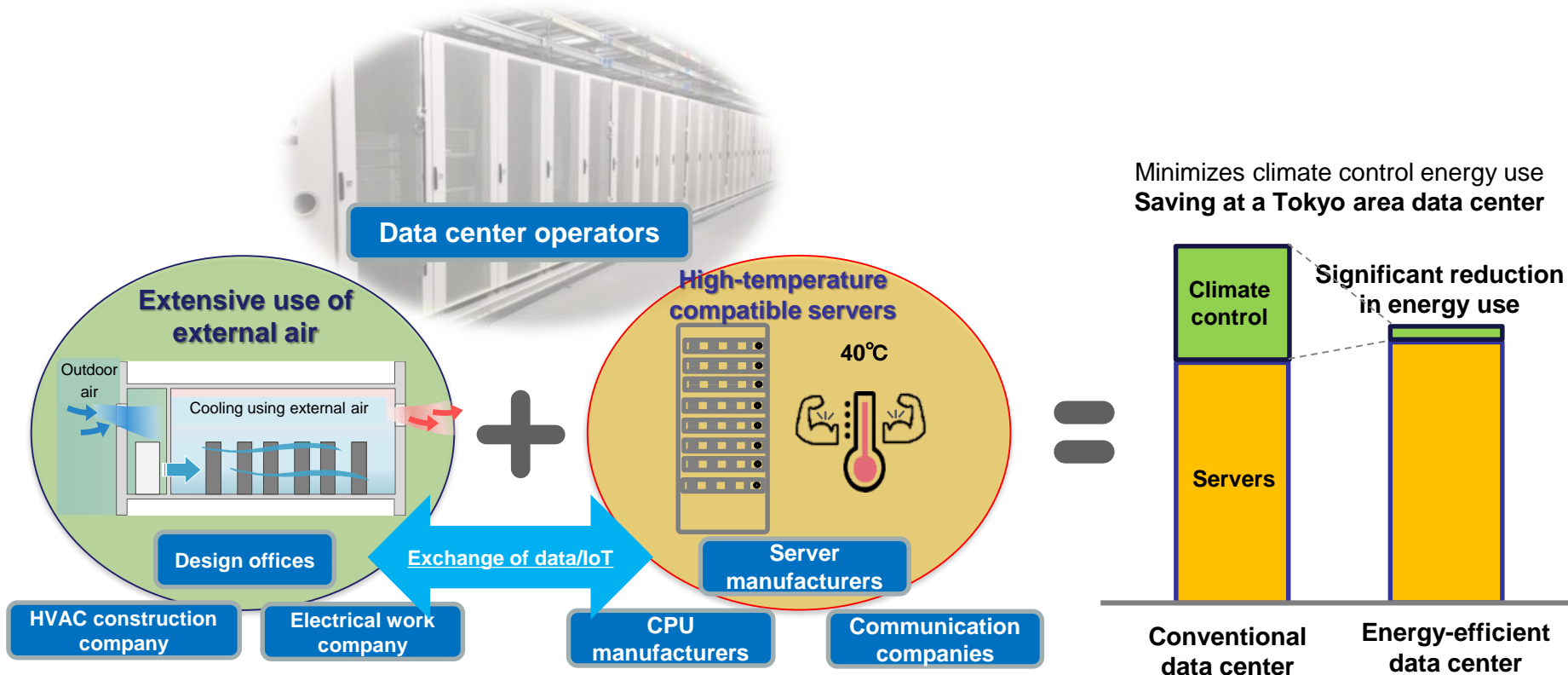


# Minimizing energy use of a data center climate control system

## Activities for creating an energy-efficient data center for NTT Data Corporation

### Used for HVAC equipment control by server internal sensors

- Data links incorporating the IoT overcome barriers between ICT equipment management and facility management
- Conventional temperature sensors do not monitor the internal temperature of servers, which is what must be held down  
 ⇒ **Using data from sensors inside servers for climate control makes it possible to control temperatures in the most important locations**



# Services and technologies of Hibiya Engineering group

Hibiya Tsusho Trading company

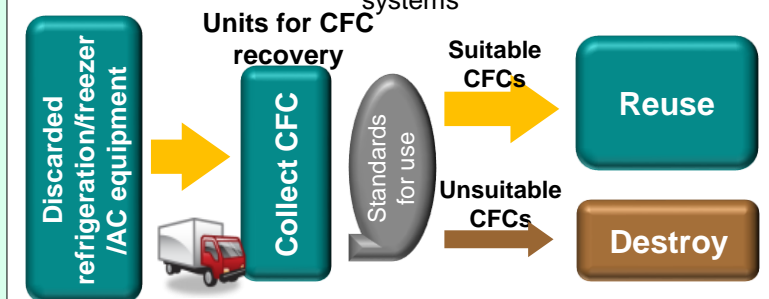
## Reuse of recovered chlorofluorocarbons (CFCs)

### Highlights of processing CFCs for reuse

- ◆ Little energy needed for reuse of CFCs
- ◆ Minimal release of CO<sub>2</sub> during processing
- ◆ Processing produces little industrial waste
- ◆ Recovered CFCs can be used effectively
- ◆ Less expensive than destroying CFCs

### Processing of recovered CFCs and reuse

- ◎ CFCs collected from refrigeration/freezer/air conditioning equipment and converted to a CFC gas by a recovery system
- ◎ The gas is reused mainly by using it to refill air conditioning systems



CO<sub>2</sub> emissions from the reuse of CFCs are only 1/12 of emissions from CFC destruction

Source: Refrigerant Collection and Processing Technologies (published by Refrigerant Collection Promotion and Technology Center)

Nikkei Manufacturer

## Manufacture of equipment, disaster response units, etc.

### Water cutoff damper



- ◆ Prevents rainwater from entering through ducts during a downpour or flood

### Access control system (NASCA)

- ◆ Can be linked with card reader, biometrics and other various systems



**時代にまっすぐ、技術にまじめです。**

**Earnings Announcement  
For the Fiscal Year Ended March 2020**

 **Hibiya Engineering, Ltd.**

May 26, 2020