TAKASAGO CORPORATE REPORT 2021

Environmental Creator®

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Environmental Creator®

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Takasago Thermal Engineering

Mission and Targets as an “Environmental Creator®”

“Environmental creation needed by the earth and people”

Takasago Thermal Engineering Group, as an “Environmental Creator®,” will commit to the creation of comfortable and optimum space and the conservation of the global environment through the development of a one-stop service business targeting building space with HVAC construction at the core and the establishment of innovative business fields in the energy sector, among other sectors.

SCIENCE BASED TARGETS

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

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Editorial policy

The Takasago Thermal Engineering Group started to issue the Corporate Report (an integrated report) in 2017, and this is the fifth report. We have kept in mind that this report contains useful information for those who are interested in the current situation and medium- to long-term future of the Takasago Thermal Engineering Group. We will continue to improve the quality of the report based on your feedback and suggestions.

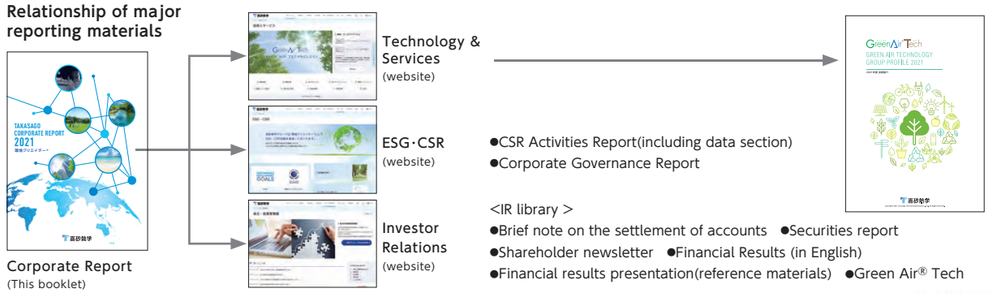
●Target organizations for this report
Takasago Thermal Engineering Co., Ltd. (all offices both in Japan and overseas) and Takasago Thermal Engineering Group companies
* The entire Takasago Thermal Engineering Group is referred to as “the Takasago Thermal Engineering Group” or “our Group,” and Takasago Thermal Engineering Co., Ltd. alone is referred to as “Takasago Thermal Engineering” or “we.”

●Reporting period
April 1, 2020 to March 31, 2021
* Some information before/after this period is included.

●Month of issue
December 2021

●Referenced guidelines
“International Integrated Reporting Framework,” International Integrated Reporting Council (IIRC)
“Guidance for Integrated Corporate Disclosure and Company-Investor Dialogues for Collaborative Value Creation,” Ministry of Economy, Trade and Industry (METI)
“G4 Sustainability Reporting Guidelines (4th edition),” Global Reporting Initiative (GRI)

Relationship of major reporting materials



For details, see the website of Takasago Thermal Engineering https://www.tte-net.com

SUSTAINABLE DEVELOPMENT GOALS

WE SUPPORT UN GLOBAL COMPACT

Corporate Mission, Management Philosophy, and Action Guideline

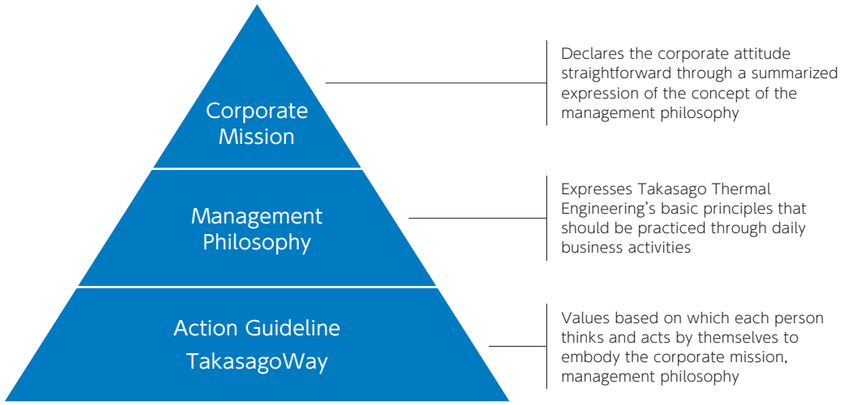
As a pioneer of HVAC technology, Takasago Thermal Engineering, with adherence to the Corporate Mission of "Contribution to society through personal harmony and creativity," has been working on the provision of the best product quality, ingenious technological development, and the development of human resources that can live up to these two. We will remain committed to raising different stakeholders' hopes and contributing to society after the 100th anniversary of our founding as well.

Corporate Mission

Contribution to society through personal harmony and creativity

Management Philosophy

1 To serve society through the development of business activities that focus on the creation of the best product quality
2 To develop distinctive technology that serves our customers' needs and utilizes the creativity of all employees
3 To enhance personal character and harmony between people by nurturing talent and promoting mutual respect



It has been over 30 years since we formulated the action guideline in 1985. In order to align the Takasago Thermal Engineering Group employees across the world in the same direction in view of our 100th anniversary in 2023, we renewed the action guideline as "TakasagoWay." By familiarizing TakasagoWay, which specifies the company's DNA (or values) in the form of three core values and 12 phrases for understanding the core values deeply, with the employees to encourage each of them to act autonomously, we will build up a solid foundation for the next 100 years.

Riding on the strength as a professional comfortable space creator, we will go on driving innovative changes to achieve a low carbon society as a global environmental solution company.

Rise in uncertainties like climate change and contributions to a low carbon society

While 2021 witnessed the Olympics and Paralympics Games, put off for one year, draw to close, COVID-19 is still casting a shadow globally partly because of the emergence of mutant strains. Apart from COVID-19, as extreme weather events such as record heavy rains and large wildfires are raging, uncertainties are rising to such an extent that VUCA does not have to be used any longer. On the other hand, what is becoming more certain is that there is no time left to lose for accelerating efforts for decarbonization. Of the energy consumed in buildings, air conditioning accounts for as much as roughly 40%. While recognizing our solid responsibility for realizing a low carbon society, we feel that it has huge potential for our growth.

Further strengthening Takasago Thermal Engineering's core value, on-site capabilities and reforming the business model

Our main business is air conditioning and since our founding in 1923, we have applied air conditioning and heat storage technologies to create comfortable infrastructures needed by customers, which are required to be environmentally friendly in recent times. This is supported by our on-site capabilities built on knowledge and technologies accumulated through construction results over the ages. In addition to promoting ongoing DX and off-site construction work, we will accelerate research and development in the Takasago Thermal Engineering Innovation Center, which was newly built in Tsukubamirai City, Ibaraki Prefecture, to further strengthen our on-site capabilities.

At present, the business environment is steady as the manufacturing sector, such as semiconductors and electronics parts, is thriving and redevelopment projects in large urban cities are in progress, while it is forecast that future workforce supply capabilities at a macro level will decline in view of the falling population in the country and the year 2024 problem. In addition to enhancing each person's productivity to improve our business competitiveness, we believe that expanding solution fields contributing to the global environment with the air conditioning business at the core will increase our corporate value and meet the expectations of stakeholders who support us. As the "Takasago as technology" that handles heat and energy, and a professional company that is currently focusing on energy services and green hydrogen to offer a comfortable environment, we will work on business model reform and our business fields expansion on the basis of air conditioning technology capable of creating comfortable space.
We are operating in 10 countries centered on Southeast Asia apart from the mother market Japan. Although the COVID-19 impact is huge, we have to enhance our presence in the global market to contribute to the global environment in view of a post-COVID-19 world.
Citing the phrase "Strategy the second class, action the first class" in-house, we always stress that it is important to act as soon as you form a strategy and to review it flexibly according to the action result.
As a global environmental solution company, we will contribute to the realization of a low carbon society with promptness of action in mind.

Toward increasing non-financial value—investment in human resources, Takasago brand

While we do not have hardware assets such as large production bases, our Group employees are working with makers and partner companies to create various spaces. Business is people, indeed, and no other asset is greater than people. With further investment in human resources, we will help each employee stimulate one another on a daily basis, demonstrate their ability to the fullest, and offer new values to society sustainably.
Takasago Thermal Engineering is known within the industry, but public awareness of us is still low. Environmental and ESG efforts will prevail globally at an accelerating pace not as a cost but as an opportunity. In the face of the situation, we have to raise the Takasago brand and its visibility through active public relations emphasizing efforts for environmental creations based on our high-level construction management and energy-saving technology-led comfortable spaces creation. We will try to further enhance human resources value as a non-financial off-balance-sheet asset, and Takasago brand.

First step toward the new Takasago

Takasago, which marks our 100th anniversary in 2023, has to move toward the next 100 years. As a leading air conditioning company, we will take steady and powerful steps toward a global environmental solution company contributing to the global environment through the creation of comfortable spaces and the realization of a low carbon society based on the establishment of new business fields. Your support for us would be appreciated.

Atsushi Ouchi
Chairman and Representative Director
CEO

As an environmental creator® that creates an environment the earth and people need, we will contribute to the development of a sustainable society.

小島　和人

Kazuhito Kojima
President and Representative Director
COO

Dear stakeholders

While our 100th anniversary is approaching, we are facing various management issues including the development of the environment for a low carbon society, COVID-19, and the proliferation of digital technology.

Amid an era when future prediction is said to be difficult, we will open up the future with our technology capable of addressing global issues based on the DNA of Takasago Thermal Engineering that has been seeking to offer more added value than our customers and society expect.

Today is symbolized by the acronym ESG, which we recognize as exactly embodying Takasago Thermal Engineering's corporate mission, management philosophy. Since our founding, we have adhered to the corporate mission "Contribution to society through personal harmony and creativity," committing to enriching people's life and developing a socioeconomy through HVAC.

I believe that the basic principle of corporate activities is understanding nature's law, putting harmony among nature, society, and humans before anything else, and acting with restraint. Principles must be expressed by deeds, not by words. To achieve "carbon neutrality by 2050" as declared by the government, a pile of challenges lies ahead, but as an environmental creator®, we will lead society, dedicated to the realization of a low carbon society.

We would appreciate it if you could expect much from our future and provide your continued support to us.

Review of the previous fiscal year (performance, market environment, initiation of the medium-term business plan)

In fiscal 2020 (year ending March 2021), construction demand that had peaked because of the Tokyo Olympics and Paralympics went down, while, at present, in addition to expected continuation of large-scale redevelopment projects mainly in the Tokyo Metropolitan Area, construction demand remains steady because of rising demand for semiconductors.
In addition, as illustrated in the Japanese government's declaration of "carbon neutrality by 2050" and revised Corporate Governance Code accompanied by modified market segmentation of the Tokyo Exchange Market, ESG is facing a major turning point. As the move toward decarbonization is accelerating globally, each company is required to be more committed to CO_2 emissions reduction. Our company, which engages in HVAC systems that consume a lot of energy for operating buildings, recognizes greater expectations from society and a larger role to assume in terms of how we can contribute to achieving not only ZEB (Net Zero Energy Building) combining energy and CO_2 saving and energy creation but also a low carbon society.

Surrounded by such circumstances, I became President and Representative Director, COO on April 1, 2020 and gave a green light to the medium-term business plan *iNnovate on 2023 go beyond !*
We set "commitment to ESG and SDGs" and "enhancement of employee engagement with the company" as the core elements of our business, now implementing 3 growth strategies under the basic policies for "strengthening of management infrastructure." The business environment during the period of the current medium-term business plan differs from that during the period of the previous medium-term business plan, when construction market was thriving, but we set the target sales of 325 billion yen, up from the previous medium-term business plan's final fiscal year target 320.8 billion yen, and the ordinary income of 20 billion yen. Besides, we also set quantitative CO_2 emissions reduction targets up to 2030, the year when SDGs are to be achieved. As a stepwise goal for the reduction efforts, we set in the current medium-term business plan a 10% reduction from the 2019 level as the goal for the current medium-term business plan's final fiscal year 2023.

Future outlook of the construction market and risks and opportunities surrounding changes in the business environment

The business environment in the construction industry of which we are part witnesses uncertainties and complexities surrounding business continuity growing due to environmental policies concerning energy and climate change issues as well as demographic changes, technological progress, and occurrence of infectious diseases represented by COVID-19.
We are formulating and implementing policies and measures for addressing challenges that influence the execution of our Group business. The challenges whose impact we consider to be huge for our business are as follows:

Commitment to climate change issues, energy issues, and low carbon society

While there can be risks to smooth production activities like rising costs triggered by supply chain disruption, we, based on our technologies in the thermal energy field accumulated through air conditioning, will contribute to the preservation of the global environment by committing to energy saving and CO_2 saving in customers' facilities.

Demographic changes, falling population, and aging society

We view these changes as hugely influential on construction demand and the production system. Investment amounts, which had peaked around 1990 and dropped after the bubble economy, rebounded temporarily in recent times partly because of the Olympics and Paralympics, but are expected to go down as the population falls.
We believe that in the labor-intensive construction industry, a shrinking manufacturing workforce means aging of and a decrease in construction workers, which will be detrimental to securing of the workforce and maintenance and enhancement of productivity. In addition, in response to the application of the ceiling on overtime work to the construction industry as well starting FY2024, we, in a bid to break away from or reform existing construction management methods, are working on a drastic review of what the construction system should be, trying not to become entrenched in traditional methods and practices. We will apply the review result to manpower saving and standardization and equalization of construction management work for solving issues.

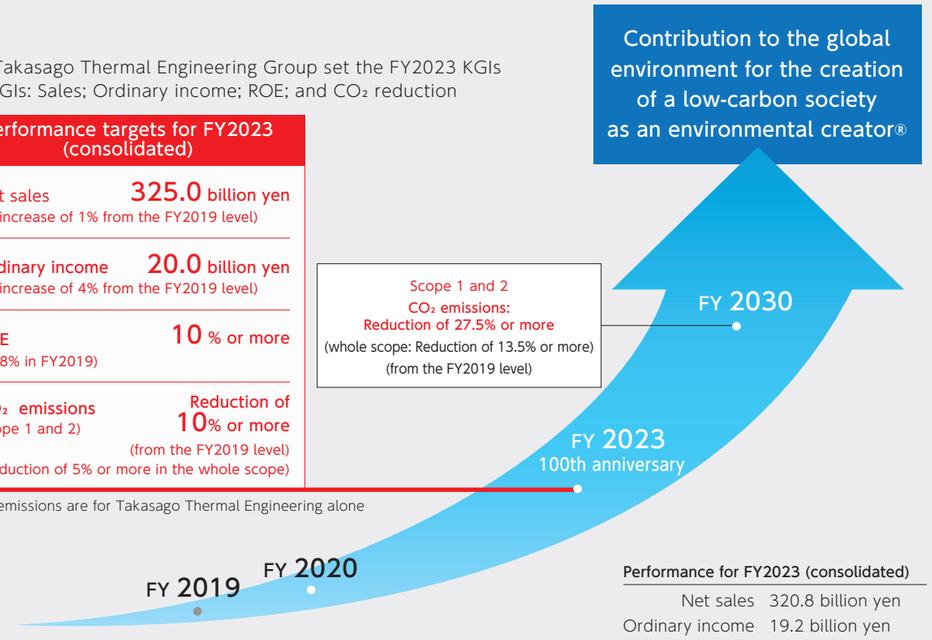
●KGIs (Key Goal Indicator) for the medium-term business plan

The Takasago Thermal Engineering Group set the FY2023 KGIs
▶4 KGIs: Sales; Ordinary income; ROE; and CO_2 reduction

Performance targets for FY2023 (consolidated)

- Net sales **325.0** billion yen (an increase of 1% from the FY2019 level)
- Ordinary income **20.0** billion yen (an increase of 4% from the FY2019 level)
- ROE **10** % or more (10.8% in FY2019)
- CO_2 emissions (Scope 1 and 2) Reduction of **10**% or more (from the FY2019 level) (Reduction of 5% or more in the whole scope)

* CO_2 emissions are for Takasago Thermal Engineering alone

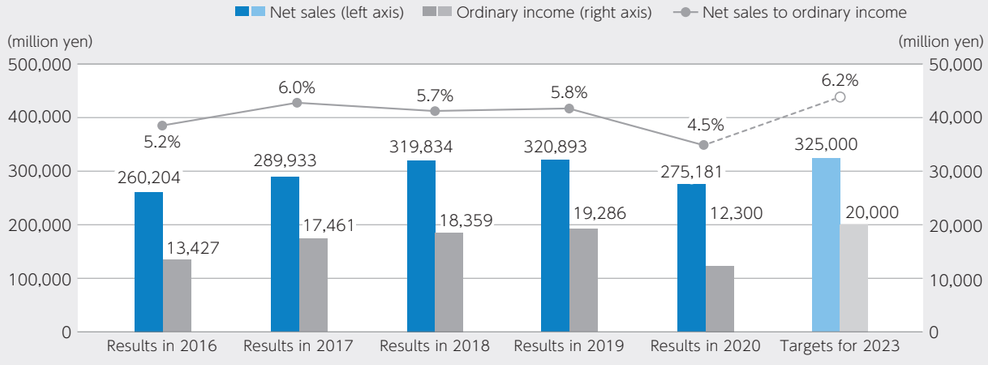


Performance for FY2023 (consolidated)

Net sales	320.8 billion yen
Ordinary income	19.2 billion yen
ROE	10.8%
CO_2 emissions	4,890,000 tons-CO_2 (whole scope)

* On the condition that the impact of COVID-19 declines gradually from the second half of FY2021

●Consolidated performance of our Group



Technological progress

As illustrated in the proliferation of EV in the auto industry and the fast growing information and communication technology industry, technologies in each industry are changing both in speed and quality at an unprecedented level. These new technology and business models may bring about a drastic change or the threat of new entry in the construction industry, which has managed to avoid major industry restructuring and block newcomers.
Reversely, it can also be said that the reform of the business model based on cutting-edge technologies and chances to create new innovations are spreading. The key to creating new innovations probably lies in how to use information.
By connecting knowledge and information that has been scattered around to each stakeholder including the company and customers through digital technology and transforming all business activities, we find it possible to come up with new problem-solving methods and provide added value. For that purpose, we will promote DX (Digital Transformation).

Commitment to ESG and SDGs, progress in the medium-term business plan

Progress in "commitment to ESG" that makes up the core of our business is as follows:

E (Environment): Toward an environmental creator® company that contributes to global environmental conservation

We believe that we can make environmental contributions through our main business. By providing support to air conditioning equipment, we deliver to a customer's facility in the form of the introduction and renewal of an energy-saving system in addition to equipment operations support from designing and construction to completion and after, so we are helping save energy and reduce CO_2 emissions. To accelerate these efforts, with the target value for CO_2 emissions reduction set as a KGI in the medium-term business plan, with the announcement of our approval for TCFD (Task Force on Climate-related Financial Disclosures), and with the acquisition of an SBT (Science Based Targets) initiative certification, we will advance our commitment to reduction goals and disclose it positively.
In the Takasago Thermal Engineering Innovation Center, which was opened in Tsukubamirai City, Ibaraki Prefecture, in 2020, taking advantage of it being an in-house facility, we have examined the effects of introducing a variety of environmental or energy-saving technologies including ones whose effects have not been demonstrated yet. Through these activities, we are preparing a recipe of technologies for achieving ZEB and will go on honing our technological edge so that ZEB can be achieved in an optimum manner that should also be customer-friendly.
In addition, we will go on developing a new energy field for a low carbon society. Hydrogen-related technology is attracting attention as next-generation energy and we have been advancing development in hydrogen formation and hydrogen accumulation for ages. With further advancement of the technology, we aim for its early practical use in society and a lunar economic zone. To that end, we will continue to make a steady progress in the future.

S (Society): Enhancement of employee engagement

Our company, where people are the greatest asset, depends on each employee's fullest demonstration of their ability for sustainable growth. In addition to developing a flexible employee-friendly personnel system, we are creating a human resources utilization strategy based on each employee's personal data to realize work styles benefiting human resources.
When it comes to harmony with local communities, the COVID-19 pandemic forced us to call off volunteer activities and environmental preservation ones or discouraged us from taking part in them, but we donated some of our products such as BARRIFLOW and BARRIHOOD to local municipalities in order to curb the pandemic instead.
In June 2021, as another effort to curb the pandemic, we created an open innovation system using our own chlorine dioxide technology and released the technology for early practical use of technology in products.

G (Governance): Enhancement of governance

We are working on governance enhancement with a view to a long-term increase in corporate value.
In order to strengthen the functions and improve the effectiveness of the Board of Directors, we have raised the ratio of outside directors. Besides, in order to accelerate efforts for contributions to the global environment, we have introduced a system that reflects the degree of achievement of CO_2 emissions goals in the assessment of directors.
When it comes to shares held for policy purposes, shareholding suitability is assessed by the Board of Directors every year and some stocks are sold accordingly, in compliance with the Corporate Governance Code.

Progress in the medium-term business plan (progress in each growth strategy)

Progress in each growth strategy in place under the 3 basic policies is as follows:

Strengthening of business in Japan

In order to reform the construction process through the fundamental reform of the core business, we have started a trial introduction of T-Base®. This project, which carries out construction management focusing on single-item production on construction sites off-site, aims to improve construction quality and level tasks. It is expected to function as a measure against future decrease in the number of construction workers.
For deepening of design technique, in order to consolidate knowledge on design techniques scattered in each main and branch office and each department, we founded the Design Supervisory Department in the Head Office in April 2021, focusing on the industrial air conditioning field which is recently growing in demand and strengthening design techniques of air conditioning equipment such as design renewal and developing human resources.

Reform of international business

The impact of COVID-19 differs, depending on the overseas base, but as a whole, other countries restrict people's activities more strictly than Japan and we need to keep abreast of new development of the pandemic.
Under such circumstances, in order to establish robust business infrastructure in overseas markets, we transferred the International Business Headquarters in the Business Management Headquarters starting FY2021. The transfer has enabled closer cooperation between it and other headquarters in the Head Office as well as strengthening of management control such as technological and sales capabilities. We are also engaged in fostering of executives and improvement of the skills of each employee in local overseas subsidiaries for resulting reinforcement of their management. With the establishment of the "All Takasago" system, we will continue to work on management stabilization and initiatives to reform the business model.

Commitment to the environmental business

In a bid to establish our second and third core businesses with a view to medium- to long-term future, we are working to expand new business fields with the environmental business-related R&D and basic technologies for air conditioning accumulated so far at the core.
Taking advantage of the location in Tsukuba, the Takasago Thermal Engineering Innovation Center is increasing opportunities for co-creation and engaging in speedy innovation creations with the help of industry-government-academia cooperation.
As a step for the expansion of new business fields, we are trying to fuse hydrogen-related technologies we have developed with green energy.
We are also advancing the real estate business HERE™ with a view to reducing the environmental impact and improving consumers' comfort.
As for progress in the lunar exploration program HAKUTO-R project, we, as a member of the industry-government-academia council, submitted to the Japanese government the "Lunar Industry Vision" in July 2021 in anticipation of the construction of an ecosystem for Japan's lunar business, steadily advancing toward hydrogen production on the moon for the first time in the world.

Takasago Thermal Engineering
History of value creation

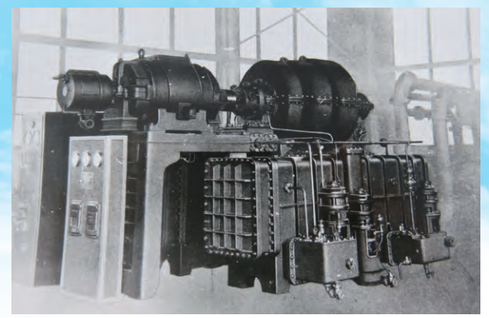
Since its founding in 1923, the company, mainly covering HVAC system construction and its peripheral fields, has engaged in technological advancement through designs and construction living up to customers' trust and the development of optimum systems and devices.
Using technologies accumulated so far, we aim to achieve a low-carbon and sustainable society, going on pursuing technological advancement.

1923

Our background

Takasago Kogyo's heating division, which had been manufacturing potassium chlorate, a material for matches, one of the star export industries of the day, became independent and was reborn as Takasago Heating Works Co., Ltd. on November 16, 1923. The founder was Kunizo Hara, a leading banker of the day and head of the Takasago Corporate Group. Some Western buildings constructed in various places after 1868 had been equipped with heaters, but they had all been imported from overseas, designed and constructed by foreign engineers. When the construction industry was lively following World War I, heating companies were founded one after another, becoming involved in imported goods sales battles, while peripheral devices started to be manufactured domestically. In 1927, we constructed the country's first fully air-conditioned theater Mitsukoshi Hall (currently Mitsukoshi Theater) which was opened in Mitsukoshi Main Store, contributing to the creation of an air-conditioned comfortable theater space. The successful installation of air conditioning in the theater led to a lot of prominent theaters and movie halls following suit.

Mitsukoshi Hall (currently Mitsukoshi Theater)



Takasago Ebara turbo refrigerator

1930

Development of the first domestically-produced product

Large air conditioners of the day had not been domestic and were very expensive because of transport expenses and engineers' travel expenses added to the price of the main body. Masanosuke Yanagimachi, future first President of the Takasago Thermal Engineering Co., Ltd., developed the first domestically-produced product Takasago Ebara turbo refrigerator after years of research. Appreciated as epoch-making in the construction industry of the day, the product was mass-produced for large facilities including department stores and spinning factories.

1943

High economic growth era following the postwar reconstruction

The company was renamed to the current name Takasago Thermal Engineering Co., Ltd. in 1943 and the articles of incorporation were amended with a presidential system introduced and Masanosuke Yanagimachi became the first President.
With large construction projects surging during the postwar high economic growth era, we engaged in air conditioner installation in the Tekko Building No.1 in Yaesu, Tokyo, a symbol of the first building construction boom. Shortly before the 1964 Tokyo Olympics, the nation went into the second building construction boom centered on metropolitan areas. When it was determined that the 40-storied World Trade Center Building would be constructed in Hamamatsu-cho, Tokyo, as the country's second skyscraper, we participated in the project as the administrative agent of the HVAC consortium.
To handle our first skyscraper project, we prepared the construction plan of over 500 pages, while developing construction technologies suitable for a skyscraper. This method became a model for subsequent skyscrapers construction. In the following year after the World Trade Center Building was completed, we participated in the construction of the Keio Plaza Hotel in Shinjuku, a 47-storied skyscraper hotel.

World Trade Center Building

1970

Oil crisis and dramatic changes in business environment

The oil shocks of the 1970s shrank construction capital investment, driving the nation into the era of a low-growth economy. We were also made to change our business policy and turned to industrial air conditioning for factories. In 1980, in order to shift to become a profitable company, we stipulated our corporate mission and management philosophy underlying all employees' attitudes toward our management. By respecting personal harmony or encouraging each person in an organization to act in harmony with the organization's purposes, we aimed to overcome a severe business environment.
Our global business started by opening a Singapore resident office, a Macao branch, and a Hong Kong branch in 1974. We engaged in the construction of Southeast Asia's first semiconductor (preceding process) plant and cleanrooms in Singapore. Thailand, which had overcome the oil shocks, witnessed a factory investment boom start and was expected to attract plants manufacturing cleanrooms, which allowed us to found a local joint venture Thai Takasago in Bangkok.
Domestically, demand for air purification or dust-free space had been growing in manufacturing sites and medical ones, but full-fledged technologies had to be imported from America. We had been engaged in the cleanroom from its early days but had been forced to develop them with no guide available. After World War II, as interactions with overseas were restored, our company, which had been gathering knowledge about new technologies and new products through whatever opportunities, constructed our first full-fledged cleanroom Nihon Denso cleanroom research building in 1968. We went on developing and promoting new and different technologies represented by the cleanroom with various industries growing during the era of high-economic growth.

1989

Technological advancement along with industrial development

Entering the 1990s, the liveliness of the DRAM semiconductor market raised demand for semiconductor plants construction and we, as a pioneer in cleanroom construction, participated in a lot of projects. They were characterized by demand for technological advancement coupled with their outsized scale and product miniaturization and we founded the Advanced Cleanroom Technology Group and the Industrial Air Conditioning Supervisory Department to provide more value than customers needed.

At the same time, lithium-ion batteries started to be mass-produced domestically. They cannot be manufactured without a low dew point environment. In order to generate this unique environment, we developed a low humidity environmental control room Dry Room®, which is still used to manufacture lithium-ion batteries.

2000

Optimum operations of HVAC in response to growing global environmental preservation and development of energy-saving technologies

In response to growing social energy-saving sentiment, Building and Energy Management System (BEMS), which visualizes energy consumption of the equipment of a building, drew attention. In 2005, we developed data gathering analysis software GODA® to keep track of the operational state of an HVAC system adequately for its resulting optimum operations. By making various data about HVAC systems purchased through different channels of distribution compiled in one database for analysis and accessible via the Internet, we were able to supervise the operational state of an HVAC system in place of the owner and provide support for advanced system operations.
We also developed a Swirling Induction type TAKASAGO HVAC System SWIT® to improve the comfort level of the living environment in large spatial facilities like factories, which also enabled improvement in energy-saving performance and a reduction in system costs.

2010

From an environmental engineering company to an environmental creator®

Since 2008, with the Kyoto Protocol in action, among others, achieving a low carbon society has been taken as a matter of urgency.
As illustrated in ESG and SDGs, we recognize that companies are required to make further environmental efforts.
We have been working on technological development of hydrogen, which is viewed as next-generation energy, since 1996. In April 2020, we released a water electrolyzer system generating hydrogen Hydro Creator®, making efforts for the expansion of its practical use.

Value creation process

Takasago Thermal Engineering Group aims to create comfortable and optimal environments in all types of space, promote environmental contributions as an environmental creator®, create an environment the earth and people need, and realize sustainable growth creating new values.

Input

Management resources that support the value creation

Intellectual capital (non-consolidated)

Number of patents we own: 746 (As of the end of March 2021)

Number of the awards given by the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan: 127

Number of qualified employees (in each division)

Professional engineer	38
Qualified person for energy management	179
First-class architect	45
First-class plumbing work supervisor	1,176

* Current employees as of March 2021

Financial capital

Total assets	271.1 billion yen
Shareholder's equity	132.1 billion yen
Equity ratio	48.7% (As of the end of March 2021)

Social capital

Cumulative income from completed construction	approx. 8.6 trillion yen
Kowakai* member companies	1,831

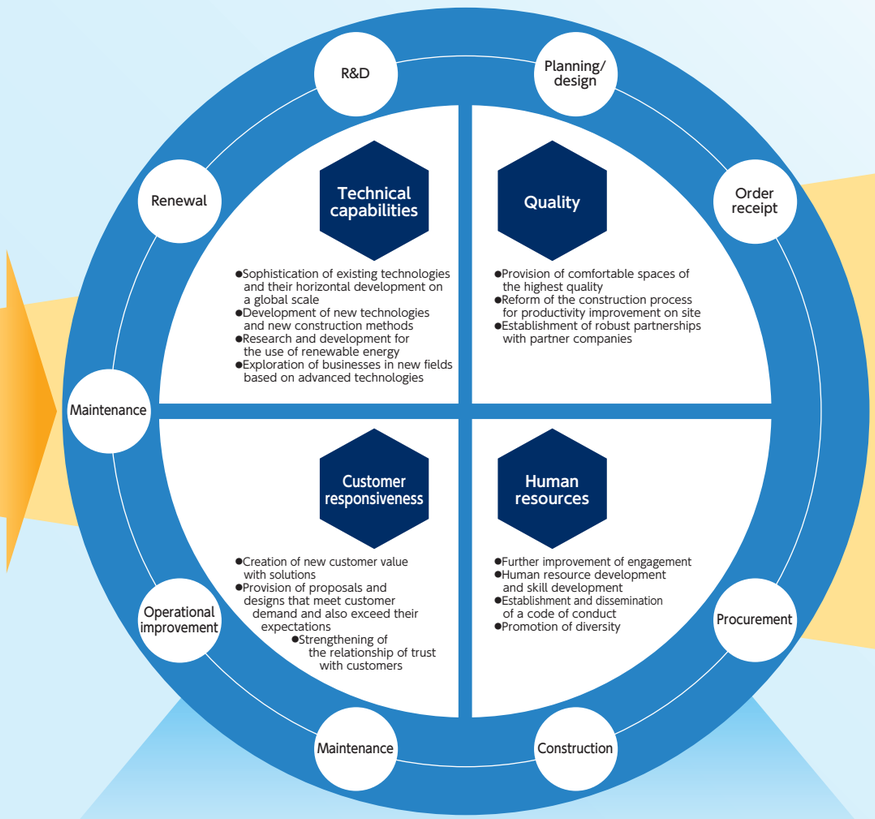
Human and organizational capital

Number of Group's employees	5,890 (As of the end of March 2021)
Global network	29 offices in 11 countries
Domestic business sites	59

Natural capital (non-consolidated)

Energy consumption (crude oil equivalent): 389,319 kl

* Kowakai was organized with our partner companies as the members in 2003 to enhance cooperation with the partner companies working on the construction sites. The organization shares information on quality, health and safety, environmental conservation and other subjects of management with Takasago Thermal Engineering and also gives such information to the members to ensure proper management.



Basic policies for the medium-term business plan

Steady evolution into a multi-disciplinary equipment business

Establishment of the second and third core businesses

Further improvement of engagement

Output

Achievements from business activities

●**Provision of comfortable spaces friendly to people**
Air conditioning aimed at the preservation of people's health and the creation of a comfortable living environment in various spaces

●**Environment for the manufacturing of high-quality products**
Provision of a highly controlled production process environment where cleanliness, temperature and humidity are controlled such as cleanrooms and Dry Room®.

●**The most advanced energy-saving operation**
Provision of optimum total facility management and solutions to customers' problems (Eco-Tuning, energy saving)

●**Technologies that contribute to the global environment**
Creation of solutions that help solve social challenges by applying the technologies we have acquired to new areas

Results in FY2020

●Consolidated net sales: 275.1 billion yen
●Consolidated ordinary income: 13.9 billion yen
●ROE: 8.0%
●Consolidated dividend payout ratio: 30.0%
●Dividend per share: 56 yen
●Bond rating (JCR): A (non-financial information)
●CO_2 emissions reduction (from FY2019)

▲19.9% reduction (Scope 1 and 2)

▲19.3% reduction (Scope 3)

Outcome

New value creation

Intellectual capital

●Improvement in environmental technologies that help realize a low carbon society or recycling-oriented society
●Strengthening of the structure for innovation (open innovation)
●Reform of the construction process

Financial capital

●Enhancement of medium- to long-term shareholder value
●Dividend per share: 56 yen

Social capital

●Strengthening of the relationship of trust with Kowakai and stakeholders
●Contribution to the solution of local communities' challenges

Human and organizational capital

●Development and production of employees with advanced expertise
●Improved job satisfaction

Natural capital

Reduction in environmental impact

28,044 t-CO_2

Sum of reduction shared as a significant reduction example in CO_2 subcommittee

We will promote optimal capital allocation and positively visualize non-financial values for the improvement of medium to long-term corporate value

Yoshiyuki Hara
Director and CFO

Review of FY2020 and future outlook

While FY2020, which was the first fiscal year of the medium-term business plan, recorded decreased sales and profits owing to a low demand for construction work and lingering effects of the COVID-19 pandemic, among other factors, we were able to secure a ratio of operating income to net sales equivalent to that in FY2019, when record-high income was achieved. This resulted from our focus on order-taking activities in view of profitability of projects and early determination of construction plans, among other things. When it comes to the order-taking environment, price competition is becoming more intense, but large-scale investment is being made in industrial fields in response to growing demand for semiconductors for communications and cars in particular. We view urban redevelopment projects as steadily profitable as well for a while.

We were forced to make major modifications to the new medium-term business plan due to the COVID-19 pandemic. The plan, released in November 2020, advocates strengthening of management infrastructure and sets sales of 325 billion yen, ordinary income of 20 billion yen, 10.0% or higher ROE, a 10% or more reduction in CO_2 emissions (Scope 1 and 2) from FY2019 as KGIs.

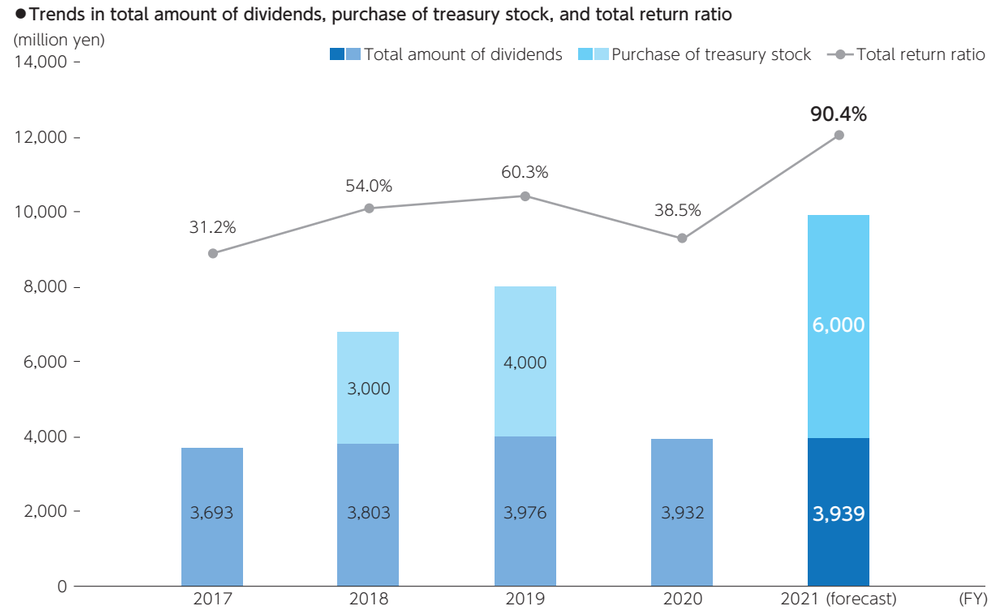
We will raise the industrial ratio and renewal ratio in order-taking and sales to enhance profitability, and reform the construction process, promote DX, and advance efforts for business creation for strengthening of management infrastructure, one of the plan's cores.

Approach to medium- to long-term improvement in corporate value and financial and capital strategy

1.Growth investment and pursuit of improvement in corporate value through shareholder returns

In order to realize a stable 10% or higher ROE specified in the medium-term business plan, it is important to pay attention to the harmony between growth investment and shareholder returns to carry out optimal capital allocation. Concerning dividends, we have changed our dividend policy so that we will not decrease the dividend during the current plan and increase it according to growth in profits. When it comes to the acquisition of treasury stock, we will go on doing so flexibly, giving comprehensive consideration to the market environment, capital levels, business environment, and other factors. Of the 60 billion yen of investment specified in the current plan, when it comes to growth investment, we will select carefully those projects possibly leading to expansion of future business fields or profits. With risks of any kind taken into account, we will prepare a capital cost-conscious investment adoption standard so that we can take on such projects that help improve corporate value.

●Trends in total amount of dividends, purchase of treasury stock, and total return ratio

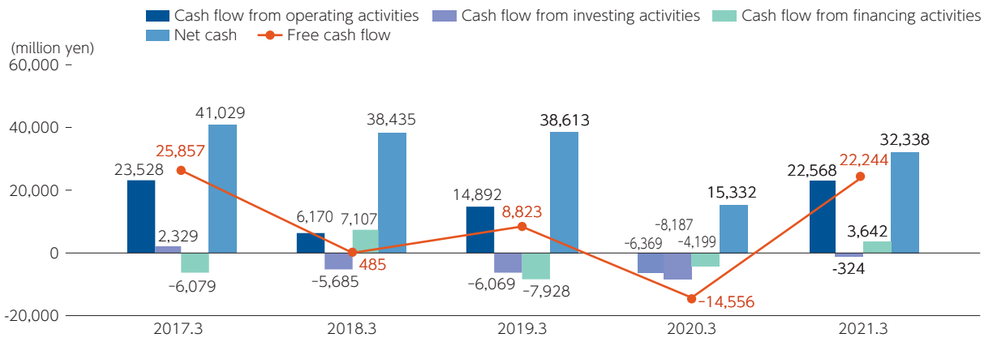


2.Pursuit of capital efficiency with emphasis on cash flow

We will enhance profitability in the main business by strengthening management infrastructure, the core of the medium-term business plan, and focus on strengthening cash flow by improving the cash conversion cycle (CCC). Because the construction industry is characterized by huge differences in the balance sheet by season, we will raise capital efficiency and control cash levels by carrying out flexible borrowing or increasing the liquidity of receivables, which we believe will contribute to corporate value creation in term of improved profitability in the main business and reduced capital costs.

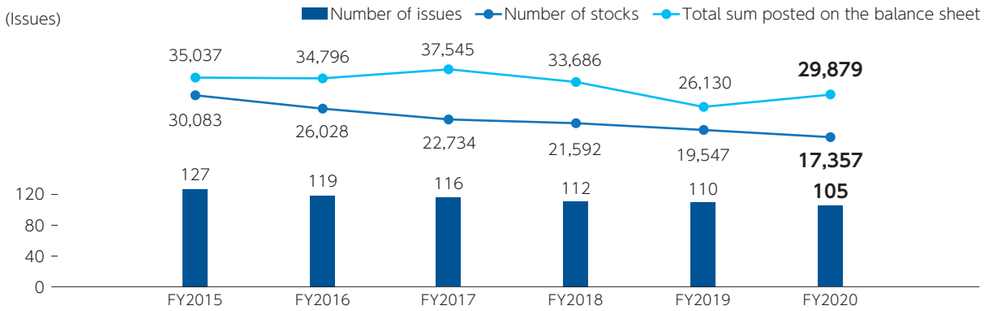
When it comes to shares held for policy purposes, we have shifted to the policy of not owning them in principle unless doing so is useful for sustainable corporate value improvement and will consider selling them if there is no significance found in owning them as a result of the Board of Directors' assessment, among others.

●Cash flow and net cash at end of year in the past 5 years, by year



Number of issues and stocks we own for purposes other than net investment and total sum posted on the balance sheet

Categories / FY		FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
Number of issues	(issues)	127	119	116	112	110	105
Number of stocks	(thousand stocks)	30,083	26,028	22,734	21,592	19,547	17,357
Total sum posted on the balance sheet	(million yen)	35,037	34,796	37,545	33,686	26,130	29,879



Active approach to improved non-financial value for decarbonization and ESG

The medium-term business plan positions ESG as the foundation of business: environmental creator® benefitting the earth **(E)**; further improvement of engagement of the employees, the greatest asset **(S)**; and advanced governance **(G)**. Under the ESG Promotion Committee chaired by President and Representative Director COO, which was newly formed in FY2020, we have established subcommittees for CO_2 reduction, engagement promotion, and diversity promotion to focus on the solution of ESG-related important social issues. In addition, we have embarked on the development of FP&A specialists, who make up global companies in the West, for advanced management control.

When it comes to CO_2 emissions reduction (Scope 1 and 2), a KGI, in addition to aiming to achieve a 10% or more reduction (from FY2019) during the period of the current plan, we have set a 27.5% reduction as the numerical target by FY2030, including the indicator in the performance assessment of the remuneration of executives as a non-financial indicator.
We will engage in further improvement in corporate value as an environmental creator® by actively focusing on non-financial factors for realizing a low-carbon society as well as enhancing the main business competitiveness through strengthening of management infrastructure.

Promoting a positive cycle of corporate value enhancement through constructive dialogue with investors and analysts in terms of financial and non-financial point of view

We belatedly began to engage actively in IR a few years ago and, in addition to regular IR meetings, met with a lot of investors and analysts from home and abroad individually and spoke to the press in the last fiscal year. With a PBR ratio greater than 1, the surplus can be seen as non-financial value and given non-financial values such as technological accumulation, technological development for the future, and intellectual property we have attained as a pioneer in HVAC, we believe that further corporate value enhancement is fully feasible.
While the HVAC business accounts for much of sales at present, we believe that our transformation into an environmental creator® through energy-saving technology or energy management technology of which we are the master will lead to the diversification of our business portfolio and enhancement of competitiveness we are pursuing.
In addition to promoting understanding of our business through active engagement in IR and constructive dialogue with investors and analysts, we will advance a healthy constructive dialogue cycle of sharing in-house what market players want us to do and in turn reflecting them in the next business plans and action plans. We will go on promoting a two-way communication with an emphasis on transparency and fairness and your candid comments would be appreciated.

Messages from outside analysts

Hiroki Kawashima
Equity Research Team,
SMBC Nikko Securities

Takasago Thermal Engineering has been appreciated as a company representing the HVAC industry in the stock market. In the construction sector with the general contractor at the top, demand for industrial air conditioning for manufacturers in particular is relatively high and the industry tends to gather business attention at the recovery stage of business cycles.
As ESG and SDGs become more universal, responding to major issues including global climate change is required and the company is expected to transform itself from a leading domestic air conditioning business into a multi-disciplinary equipment business covering electricity, hygiene, and instrumentation.
Just generating stable income does not lead to the stock market's satisfactory judgment. The company is credited with carrying out the total return policy ahead of leading general contractors, but I hope for the company's further capital efficiency improvement.

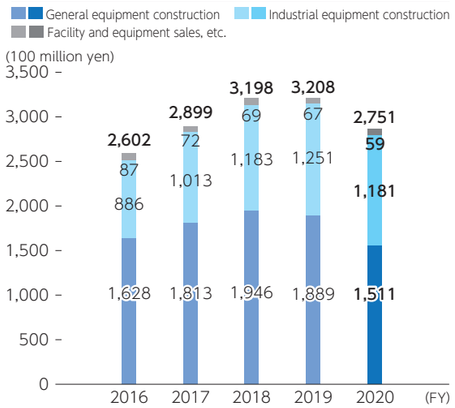
Ryo Yagi
Investment Research Division,
Mitsubishi UFJ Morgan Stanley Securities

Takasago Thermal Engineering, as a leading company in the HVAC industry, makes its presence felt both in industrial and general air conditioning, but I am interested in industrial air conditioning in particular, which is relatively profitable.
In industrial air conditioning, I see strong demand for the semiconductor and electronic parts industries at home and abroad as business opportunities and at present, the demand is steadily met.
On the other hand, seeing construction staffing living up to the strong demand at home and order increase from abroad as the key to further growth, I pay attention to what measures the company will take. The company, in addition to pursuing further growth as an equipment company focusing on air conditioning, is enhancing hydrogen and space technologies contributing to decarbonization and the environment as an environmental creator® to further improve corporate value. I am looking forward to their future growth.

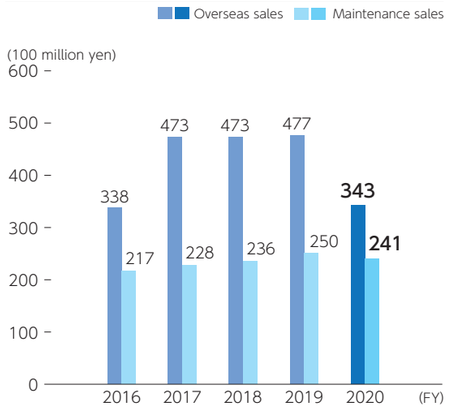
* Figures are rounded down to the nearest unit.

Financial performance

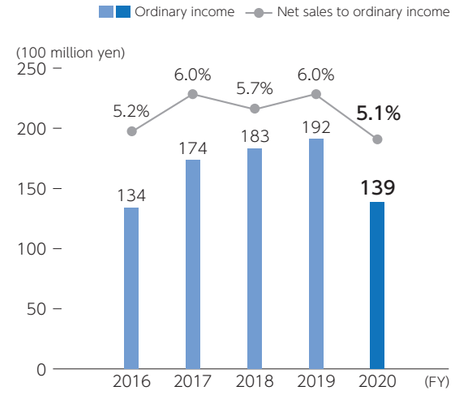
Net Sales



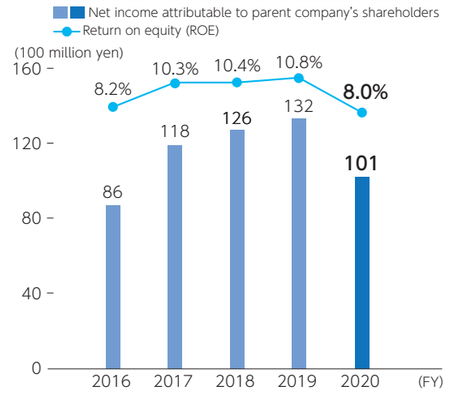
Overseas sales and maintenance sales



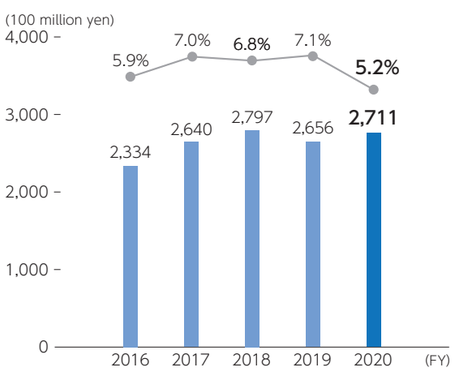
Ordinary income and net sales to ordinary income



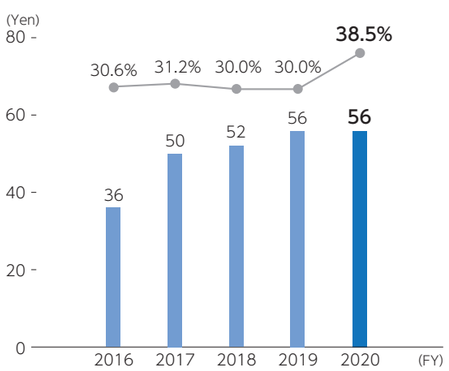
Net income attributable to parent company's shareholders and return on equity (ROE)



Total assets and return on assets (ROA)



Annual dividend per share and payout ratio



Non-financial Highlights

CO_2 emissions and reduction rate (Targets for applying for SBT and results in FY2020)

	Results in 2019 ($t\text{-}CO_2$)	Annual reduction rate	Results in 2020 ($t\text{-}CO_2$)	From the 2019 level	Results in 2030 ($t\text{-}CO_2$)	From the 2019 level
Scope 1	1,244	△2.5%	1,045	△19.9%	901	△27.5%
Scope 2	3,110		2,442		2,255	
Scope 3	4.96 million	△1.23%	4.00 million	△19.3%	4.29 million	△13.5%

* The emissions and reduction targets mentioned above are on a non-consolidated basis (Takasago Thermal Engineering alone).

Engagement of employees (work style reform, work-life balance and health and productivity management are on a non-consolidated basis)

●Number of employees

Non-consolidated	2,116
Consolidated	5,890

●Work style reform

Total annual working hours per person (unit: hours)	2,307.7

●Work-life balance

Percentage of annual paid holidays taken		58.0%
Number of persons who took childcare leave	Total	44
	Women	21
	Men	23 *
Rate of return to work after childcare leave		100%

* Among them, 18 persons took a leave of one week or less.

●Health and productivity management

Percentage of those who had a health checkup	100%
Comprehensive health risk (Note)	90

(Note) The comprehensive health risk is calculated by HOKENDOHJINSHA INC., a company that implements stress checks.
The average is 100 and a lower value indicates that the risk is lower.

●Diversity

Number and ratio of female employees* (excluding fixed-term employees)	347 (16.1%)
Number and ratio of newly employed female employees in fiscal 2021	22 (25.9%)
Number and ratio of female employees who are candidates for managers *1	15 (4.3%)
Number of managers appointed from among local staff *2	359
Employment rate of people with disabilities	2.48%

*1 Ratio of deputy managers to all employees
*2 The above-mentioned figures are on a non-consolidated basis except for the number of managers appointed from among local staff.
* As of the end of March 2021

Research and development

Number of patents (non-consolidated)
746
(as of the end of March 2021)

Research and development costs (consolidated)
890 million yen
(fiscal 2020)

April 2020

Formulation of work style reform promotion slogan “Find New Way: Let’s Create a Happy Way of Life Together”

Thai Takasago was awarded a contract for the project of Thailand’s first pilot plant for semi-solid lithium ion batteries.

We increased the production of clean booths BARRIFLOW®Ⅲ and BARRIHOOD® for medical use to address the COVID-19 pandemic.

August 2020

Conclusion of a comprehensive collaboration agreement with Tsukubamirai City, Ibaraki Prefecture

We are working together in the fields of education, disaster prevention, community, and energy for a local community’s sustainable development.

Subscription to a third-party allocation of new shares by ispace.

As a corporate partner of HAKUTO-R, which is a commercial lunar exploration program operated by ispace, we are engaged in order to strengthen a space business development partnership.

We started to use LIMEX, a new material whose prime ingredient is limestone for safety signs in construction sites. We distributed to all employees eco bags made of surplus former uniforms, replacing the paid plastic bag service.

September 2020

For the third accelerator program partner, we selected Hmcomm Inc., which is engaged in the development of techniques to detect abnormal noises in building facilities with AI.

We approved the recommendation of the Task Force on Climate-related Financial Disclosures (TCFD) and joined the TCFD consortium.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

October 2020

Takasago Thermal Innovation Center won the highest rating S of “CASBEE Wellness Office”

CASBEE Wellness Office is a certification system initiated in 2019 by the Institute for Building Environment and Energy Conservation, designed to assess the extent to which a building’s specifications, performance, and environmental commitment help maintain and improve the building users’ health and comfort.

December 2020

We donated the anti-coronavirus HVAC booth for disaster shelter to Tsukubamirai City, Ibaraki Prefecture.

November 2020

Development of the new medium-term business plan

We developed the new medium-term business plan “iNnovate on 2023 go beyond!” (FY2020 to FY2023), the final step of the long-term management framework “GReeN PRIDE 100,” which had been launched towards our 100th anniversary in 2023.

February 2020

The Kyoto Station Building thermal source HVAC renewal project won the 2021 First Place ASHRAE (*) Technology Award

* American Society of Heating, Refrigerating and Air-Conditioning Engineers

With approaches to ESG and SDGs promoted through all business activities, we aim to achieve a good balance between contributions to the solution of social issues and innovation creation, as well as operational and work style reforms.

ESG promotion organization

■Installation of the ESG Promotion Committee

We installed the ESG Promotion Committee in April 2021, an expanded version of the conventional CSR committee, to position approaches to ESG and SDGs at the core of business activities and promote them.
The ESG Promotion Committee, chaired by President and Representative Director COO, consists of inside directors, Chief Executive Officers of each Headquarters, and General Managers as the committee members, subject to the Board of Directors' direct instructions and supervision and entitled to report directly to the Board of Directors.
The ESG Promotion Committee deliberates on our approaches to ESG-related social issues, operating structures, and FY action plans, among others, monitoring company-wide and each office's and division's ESG promotion activities.

We may install subcommittees affiliated with the committee for issues to focus on so that they can be addressed relatively quickly with company-wide knowledge.

●ESG promotion organizational chart

■Intensive deliberation with the 3 subcommittees installed

We installed 3 subcommittees affiliated with the ESG Promotion Committee in FY2021. The details of each subcommittee are as follows:

① **CO_2 subcommittee**
Consists of heads of design divisions and the Quality, Environment & Safety Control Division to promote CO_2 reduction through the compilation of reduction measures and company-wide sharing of reduction methods based on Scope 3.

② **Engagement enhancement subcommittee**
Designed to promote and routinize activities to address engagement issues leading to enhancement of employee engagement with the company.

③ **Diversity promotion subcommittee**
Designed to create an environment where women, foreign staff, and mid-career workers, a social minority, can thrive at work. Considers developing in-house structures and hosts workshops by subject.

Management cycle for ESG and SDGs

In response to each ESG and SDG issue, we will address them through the PDCA cycle below.

●PDCA cycle for ESG activities

▶**Enhancement of employee engagement with the company**
- ●Checking in terms of diversity promotion and health and productivity management

ex. Systems and measures
→Activities development (development of actual cases)
→Dissemination and contribution checks
→Improvement plan
- ●Fixed-point observation and disclosure of contributions

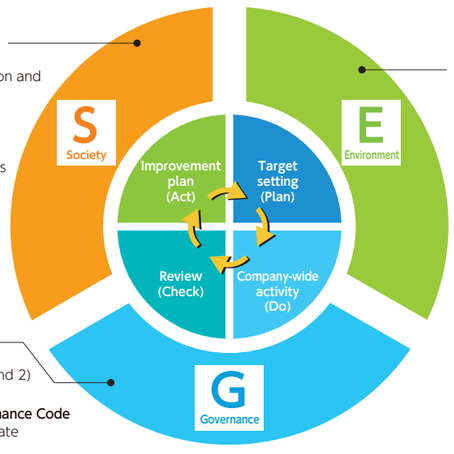
▶**Quality (customer satisfaction, among others)**
- ●Employee training on quality

▶**Social contribution**
- ●Forestation, etc.

▶**Reflection of performances in the remuneration of executives**
- ●Reflecting CO_2 reduction (Scope 1 and 2) in the remuneration of executives

▶**Responses to revised Corporate Governance Code**
- ●Checking responses where appropriate

▶**Communication with stakeholders**



▶**Contributions to CO_2 reduction**
- ●Reduction activities leading to reduction targets meeting SBT

ex. Reduction targets
→Reduction activities development (development of actual cases)
→Reduction checks→Improvement plan
- ●Fixed-point observation and disclosure of contributions
- ●Disclosure in conformity to the TCFD frame

▶**Contributions to a circular economy**
- ●Waste reduction
- ●Plastic waste reduction (using signs made of natural material)

▶**Activities to preserve water resources**
- ●Drainless on-site consumption reduction

Each employee internalizes ESG and SDGs' issues and takes sustainable actions through daily business tasks

Recently, energy, climate-related issues, human rights, and diversity promotion, among others, are gaining prominent attention as social issues and we, if setting priorities, are advancing our efforts leading to even a small part of their solutions through our technologies and know-how developed over ages.
When it comes to climate-related issues, we announced our approval for TCFD in September last year and acquired an SBT certification in an effort to promote greenhouse gas emissions reduction, while we are addressing environmental preservation issues by reducing waste/plastic waste and promoting a circular economy. These issues, however, cannot be solved overnight, which is the case with human rights and human resources issues. As a company-wide ESG and SDGs promotion activity of each term, we have each office and division set up activities to promote and have quantitative targets, disclosing progress toward goals for principal activities.
Commitment to ESG and SDGs is not completed just because the targets have been met. Challenges come up one after another when one target is met.
Efforts to address ceaseless challenges, which are not finished in an eye's blink like a showy firework, must be something unspectacular and sustainable that needs slow though steady steps.
What is important in sustainable activities, I believe, is to build up a bottom-up system in which efforts of each executive and employee familiar with each workplace are, if a little time-consuming, put together autonomously.

Tomoji Amano
Head of ESG Management Office,
Corporate Planning Division
Global Business Planning Headquarters

Key declarations and initiatives we are engaged in or approve for

- **UN Global Compact** (July 2018)
- **Declaration to approve for TCFD** (September 2020)
- **Acquisition of SBT certification** (March 2021)
- **Participation in Japan Climate Initiative (JCI)**
- **Supporting member of Japan-CLP**

WE SUPPORT UN GLOBAL COMPACT

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

SCIENCE BASED TARGETS

CDP DISCLOSER 2021

We will identify material issues (materiality) speedily to which we should give priority through the following process and update them where appropriate while also considering the current social conditions and changes in the business environment

Process to identify material issues

STEP1
Identification of challenges

Identify social challenges with reference to SDGs, ISO 26000 and other international guidelines

STEP2
Assessment of the challenges

Assess the challenges from the two perspectives of importance for our Group and importance for stakeholders (society)

STEP3
Prioritization of the challenges

Prioritize the challenges our Group will tackle and consider the KPIs of actions

STEP4
Determination of material issues

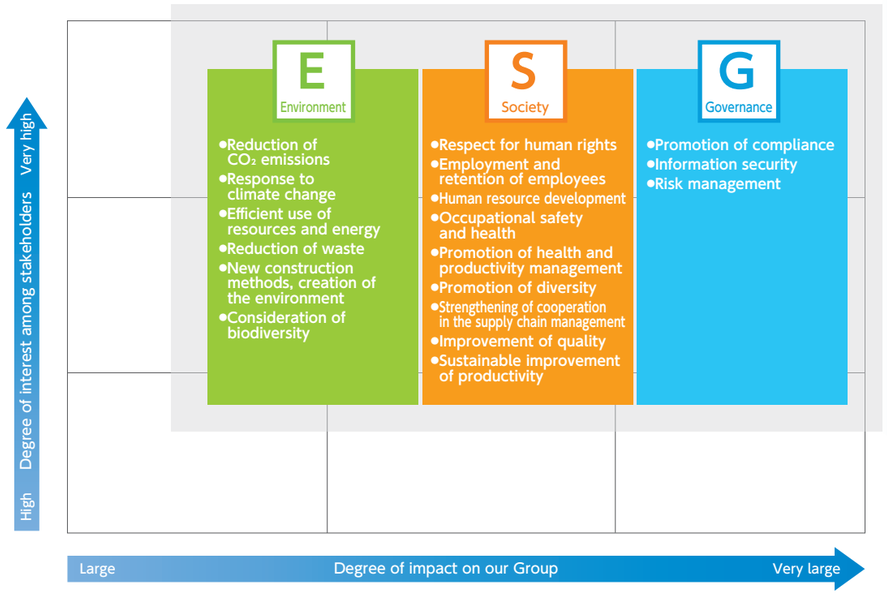
Present the challenges, the action plan and KPIs at the ESG Promotion Committee, Management Committee, etc., verify the adequacy and determine material issues

* ISO 26000: International standard on social responsibility

Assessment of the identified challenges

We assessed each of the identified challenges from the perspectives of (1) degree of interest among stakeholders and (2) degree of impact on our Group

Identified material issues



Identification of social challenges and our initiatives

Identification of social challenges	Material Issues		Initiatives	Targets for FY2021
E Environment: Measures to address climate change and environmental conservation — Creation of: Recycling-oriented society; Society harmonized with nature — Low carbon society	Reduction of CO_2 emissions		Reduction meeting Scope 1 and 2	△5.0% (from FY2019)
			Reduction meeting Scope 3	△2.5% (from FY2019)
	Reduction of waste		Reduction of materials at the time of construction ・Recycling of industrial waste	△10.0% reduction More than 85% of recycling rate
			Development of actual cases for plastic abolition	Introduction of LIMEX to 5 construction sites or more per office
	Reduction of water use		Introduction of an Drainless policy to construction sites of more than a certain scale	Introduction of the policy to 50 or more construction sites
	Reduction of paper use		Reduction of copy paper use in the headquarters, main and branch offices	Not more than 600 sheets/month per person
	Development of environmental technology		Development of CCUS technology (applying recovered CO_2 to agriculture)	Completion of lab-scale experiments and assessments
			Development of CCUS technology (applying recovered CO_2 to bio reactors)	Completion of manufacturing of the prototype
S Society: Provision of a strong, safe, secure and comfortable space environment — Improvement of the work environment: •Respect for human rights •Correction of long working hours and promotion of health and productivity management •Improvement of work-life balance •Promotion of diversity	Quality control (improvement of customer satisfaction)		Generation of troubles and complaints	Down from the previous FY
	Engagement enhancement ・Development of human resources ・Reform of work style ・Health and productivity management ・Diversity ・Human rights		Engagement (employee satisfaction)	Up from the previous FY level (the survey method changed starting FY2021)
		Health and productivity management	Implementation of subsequent measures after regular health checks	All of those at high risks or potentially high risks consult with industrial physicians
			Health checks concerning specific work (midnight or other times)	All have a health checkup
			Decrease in those at high risks (those whose blood pressure and glucose level exceed in-house criteria)	5% decrease in the number from the previous FY
		Diversity	Development of prospective female managers	Increase in the percentage to 30% by FY2030
			Male employee's acquisition of childcare leave (those eligible take 5 or more business days off)	Increase in the number from the previous FY
			Promotion of mid-career workers employment	80 people or more / year
			Employment of persons with disabilities	More than 2.3% of employment rate
			Measures to implement employment of persons with disabilities	Training of in-house supporters, digital signage, TV captions, information sharing events, seminars
			Mutual understanding and interactions among local staff	Social gathering, workshops, identification of problems from questionnaire
		Human rights	Education on human rights and provision of information on human rights	Education on human rights and provision of information on human rights: 5 or more times per year
	Employee satisfaction		Lost-time injury	Decrease in the number of cases from the previous FY
	Social harmony	Social contribution	Forestation (Takasago-UNIMAS Educational forest, the University of Malaysia, Sarawak)	Once or more per office / year
			Local activities	Once or more per office / year
			Measures against infectious disease (project to combat COVID-19 using chlorine dioxide technology)	System development and field demonstration tests
G Governance: Enhancement of corporate governance — Thorough compliance and enhancement of risk management — Information disclosure and dialogue — Composition of the members of the Board of Directors	Governance	Enhancement of corporate governance	Reduction of shares held for policy purposes	Consideration of reduction and implementation of negotiations
		Fruitful dialogue with stakeholders	Evaluation of integrated report	Average or higher in the evaluation
			Information disclosure and fruitful dialogue	Dialogue with 80 people or more in total

We position climate change issues as one of the most material issues and will incorporate them into our management strategy to tackle them.

Responses to climate risks and opportunities

Based on energy-saving and thermal use technologies developed in the HVAC business, we have been engaged in equipment designing and construction in buildings capable of achieving the reduction of environmental impact. In September 2020, in order to enhance our approach to climate-related issues, we announced our approval for the recommendation of the Task Force on Climate-related Financial Disclosures (TCFD).
In addition, we specified in the medium-term business plan "*iNnovate on 2023 go beyond!*" (FY2020 to 2023) released in November 2020 a greenhouse gas emissions reduction target for the first time and received a certification from the SBT initiative.
In this way, we position climate issues as one of the most important challenges. In addition to utilizing renewable energy and engaging in energy-saving technology-based designing and construction through all business activities, we will further advance R&D on environmental technologies enabling decarbonization with a view to realizing a carbon-neutral society.
Besides, by entering a new field for us such as hydrogen generation beyond the HVAC field to reduce greenhouse gas emissions and create a comfortable environment needed by people, we will enhance our identity and value as an environmental creator®.
We will proceed with climate change-related information disclosure in conformity with the framework recommended by TCFD.

■Governance

We have the ESG Promotion Committee in action, which deliberates on important matters on climate change and reports the results to the Board of Directors. This system facilitates the implementation of important decisions on climate-related issues through the Board of Directors' instructions and supervision.
The top officer responsible for climate issues is President and Representative Director, COO, who appoints the Chief Executive Officer of Global Business Planning Headquarters as the person in charge. The latter manages and promotes approaches to climate change including the TCFD recommendation.
Recognizing the climate change risk as that of business activities, the committee shares information with the Risk Management Committee, which manages business risks as a whole.

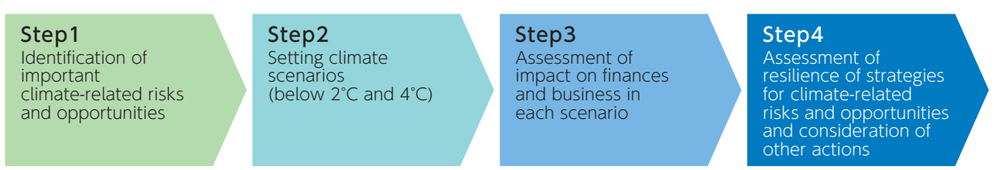
Meeting body	Role
Board of Directors	• Supervision of and instructions on climate-related important matters
ESG Promotion Committee (see P25)	• Deliberation on climate-related important matters, resolutions on climate issues as a whole • Report to the Board of Directors
Risk Management Committee	• Sharing of information with the ESG Promotion Committee with climate risk recognized as one of the risks of the whole business
Global Business Planning Headquarters ESG Promotion Office	• Functioning as the secretariat of the ESG Promotion Committee

■Strategy

We identify climate-related important risks and opportunities from short-to long-term perspectives, carry out scenario analyses to assess the degree of impact on business and resilience of remedial actions, and consider other actions.

(1) Scenario analyses process

We carry out scenario analyses in accordance with the process below. Setting two scenarios, the below 2℃ scenario, where the Paris Agreement goal is met, and the 4℃ scenario, where each country's disclosed goals are met without new measures implemented, we assess the degree of impact on finances and business quantitatively or qualitatively.



Period targeted by reference scenario analyses: up to 2030
●Below 2℃ scenario: IEA Sustainable Development Scenario/ IPCC RCP2.6
●4℃ scenario: IEA Stated Policy Scenario / IPCC RCP8.5

(2) Climate-related risks and opportunities / assessment of impact on business operations

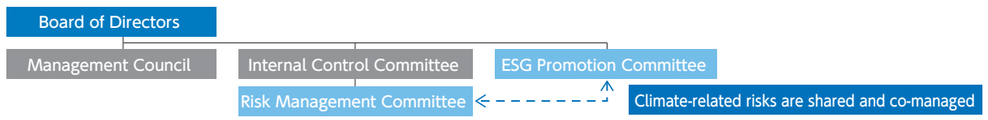
We assessed the items listed below we identified as important climate-related risks or opportunities for potential financial impact quantitatively or qualitatively by using scenario analyses in addition to considering the resilience of the current actions and future ones. We consider and implement measures to reduce risks whose impact on finances and business operations is judged as huge and to gain opportunities.

Categories	Types	Risk details	Degree of impact on finances and business operations 2℃	Degree of impact on finances and business operations 4℃	Remedial actions≒growth opportunities
Transition risks	Policies and regulation	• Increase in cost resulting from the carbon pricing system	High	Medium	• Consideration of the introduction of renewable energy generation equipment or rechargeable batteries • Participation in corporate PPA in the future • Implementation of measures to reduce CO_2 including through use of low-carbon vehicles
		• Increase in supplier procurement cost resulting from the carbon pricing system-related cost increase • Delivery delay or procurement difficulty owing to high demand for suppliers			• Consideration of use of new materials and equipment or methods in collaboration and cooperation with suppliers
		• Increase in the costs of material procurement and waste disposal resulting from progress in the circular economy			• Reduced waste in construction sites • Consideration of the construction of a recycling system on an equipment and material basis
	Market and technology	• Loss of order-taking opportunities resulting from failure to meet customer demand such as greenhouse gas emissions reduction and ZEB	High	Medium	• Keeping abreast of customer trends and market needs • In our Innovation Center (IC) —Promotion of ZEB demonstration —Promotion of development of energy-saving technology See Green Air Tech https://www.tte-net.com/solution/pdf/gat.pdf • Promotion of development of CO_2 reduction technology in a new field e.g., Advancement of water electrolysis hydrogen generation technology
		• Loss of order-taking opportunities resulting from delay in development of new technologies helping reduce greenhouse gas emissions (including energy-saving designs and construction techniques)			
		• Weakening of advantage of existing technologies or in-house products resulting from the emergence of new technologies or declining natural energy technology effects			
		• Failure in the development of new technologies and new commercialization			
	Reputation	• Reputation damage and increased investment-related risks resulting from inadequate responses to climate-related issues and inadequate information disclosure	High	Medium	• Active participation in climate change initiatives such as TCFD, SBT, and CDP • Active participation in environmental activities such as forest preservation
Physical risks	Acute	• Process delay and cost increase resulting from disaster-stricken construction sites or supply chains amid increased natural disasters	Medium	High	• Strengthening of BCP covering supply chains
	Chronic	• Increased health damage such as heat stroke and infectious disease among construction workers and those in supply chains	Medium	High	• Strengthening of health and productivity management including measures against heat stroke • Consideration of work environment improvement, remote operations, Iot
		• Worsening labor shortage resulting from reduced employees with work environment becoming tougher • Reduced work efficiency resulting from worsening work environment and increased worker care cost			• Promotion and consideration of efficiency measures including manpower saving through off-site operations and use of AI • Improved productivity through use of BIM
		• Procurement difficulty and increased price resulting from declining extraction of natural resources			• Collaboration and cooperation with suppliers • Strengthening of information gathering
Opportunities	Products and services	• Increase in demand adapted to climate change and order-taking opportunities	High	Medium	• Construction of a sales organization focusing on providing products and services adapted to climate change • Further promotion of development of energy-saving technology • Promotion of ZEB demonstration and of the development of relevant technology (energy grid and thermal technology) in our Innovation Center (IC) • Promotion of water electrolysis hydrogen generation technology and renewable energy technology • Open innovation led by university-business alliance or other forms • Knowledge acquisition through environmental real estate • Strengthening of collaboration with suppliers including equipment makers
		• Increase in order-taking opportunities resulting from energy-saving- or ZEB-related technology development			
		• Creation of order-taking opportunities in a new business field produced by environmental policies			
	Resilience	• Increase in demand for infrastructure resilience and earning opportunities with equipment renewal brought forward (equipment, products, and services countering disaster or heat)			
		• Increase in performance and efficiency of equipment and machinery (energy-saving air conditioning enhancement work)			
		• Increased resilient energy network (in- smart city heat supply)			
	Resource efficiency	• Decreased operational cost and enhanced productivity resulting from the construction process reform	High	High	• Off-site operations, member unitization, dissemination of T-Base TM for standardization of methods • Improved productivity through use of BIM

Definition of degree of impact on finances and business operations
High: The impact on our business operations and finances is very large
Low: The impact on our business operations and finances is small
Medium: The impact on our business operations and finances is large

■Risk management

Climate-related risks and opportunities are discussed through the ESG Promotion Committee for necessary measures. Those risks are also monitored by the Risk Management Committee, tasked with reducing and controlling company-wide risks that influence business operations and necessary measures are discussed where appropriate.

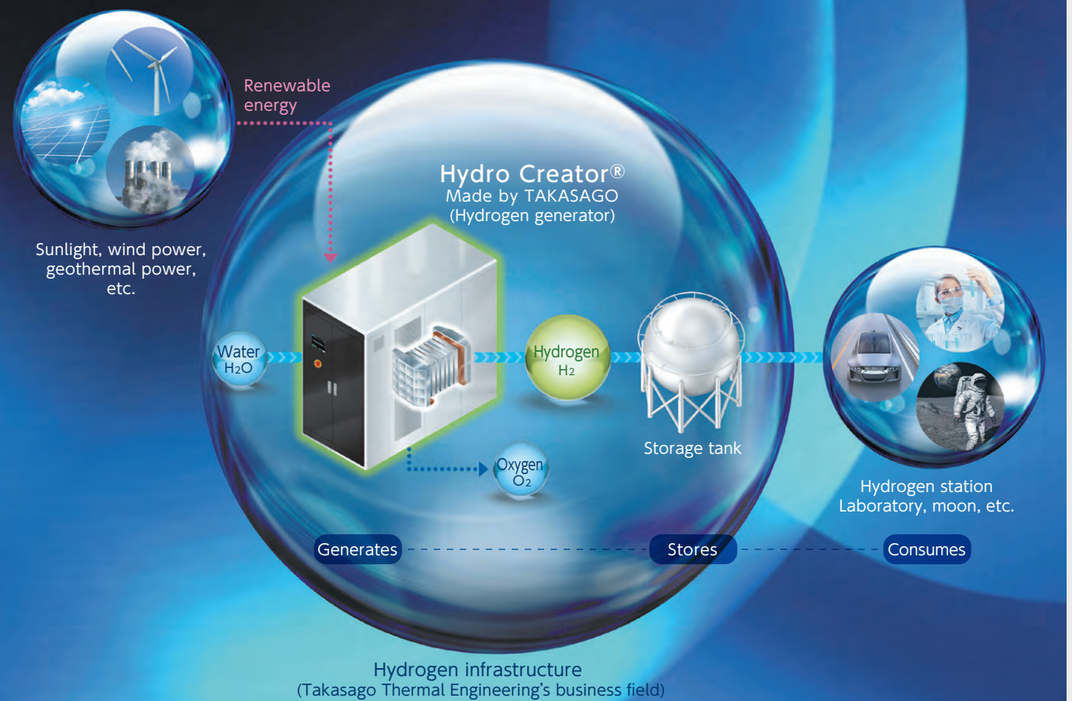


■Targets and goals

We formulated medium- to long-term greenhouse gas emissions goals and received a certification from the SBT initiative in March 2021.
In FY2020, greenhouse gas emissions significantly dropped as a result of the expansion of renewable energy use, energy-saving activities, and reduced amount of completed work, among others (see P22).
In order to approach the FY2030 target level steadily with future recovery and growth of amount of completed work taken into account, we continue to engage in environmental impact reduction through active use of renewable energy specified in Scope 1 and 2, energy-saving construction and designs specified in Scope 3, and cooperation in the value chain.

Special Feature

Toward the realization of carbon neutrality Takasago Thermal Engineering's hydrogen business



As illustrated in the Japanese government's "2050 Carbon Neutrality Declaration" in 2020, each nation across the world has embarked on national policies toward the realization of a green society.

We aim to create businesses that will contribute to the realization of a low-carbon society by honing hydrogen energy-related technology developed particularly in the HVAC field thus far.

We have been developing technology to generate high-purity hydrogen by electrolyzing water. By using this technology to promote practical use of renewable energy such as sunlight, wind power, and biomass, we will contribute to the proliferation of green energy to break away from fossil fuels.

Among the problems with renewable energy is weather-induced significant volatility of power generation. To tackle this challenge, our water electrolysis-based hydrogen production system Hydro Creator® can function as a power supply regulator, paving the way to the proliferation of renewable energy leading to a low carbon society.

When the power generation by renewable energy exceeds power demand, our water electrolysis-based hydrogen production system creates hydrogen to promote its practical use. In the reverse case, power is produced from hydrogen stored during normal times so that power supply levelling is promoted.

While, with Hydro Creator®, which started to be sold starting FY2020, we are trying to meet small-scale energy demand, we are also developing a larger type of the device to meet medium-scale energy demand in regional or urban areas or a highly efficient type capable of manufacturing hydrogen cheaper. By showing an optimal service according to renewable energy available in each region to customers, we aim to contribute to the region's decarbonization and autonomy. To achieve the 2050 carbon neutrality, we will promote social application of our system to other fields than the conventional HVAC one.

Entry into space development
—Construction of a lunar economic zone using hydrogen—

Among the achievements of our hydrogen technology development so far is the home-grown PEM-type unitized reversible cell, one of the National Aeronautics and Space Administration's (NASA's) technologies, with which we have been advancing efforts for a low-carbon society.

By mobilizing technologies developed through this effort, we are also promoting the R&D on the practical use of hydrogen on the moon.

The moon is said to contain more than several billions of tons of water. Because hydrogen and oxygen are made by electrolysis of water, practical use of the water electrolysis technology on the moon would make it possible to use hydrogen energy as fuel to power rockets or other devices, which can help promote space development.

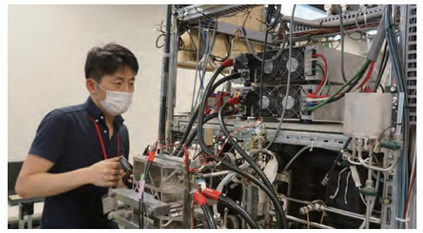
As the first step toward the lunar project, we concluded in December 2019 a corporate partner contract with HAKUTO-R, a private lunar exploration program run by space startup ispace and subscribed to a third-party allocation of new shares by the company, which had requested the reinforcement of its ties with us as a long-term partner for the creation of a lunar economic zone.

In addition to the development of a water electrolysis device tailored to the moon, we, in cooperation with ispace, will apply our HVAC technologies we have been honing to the development of thermal mining, a technology to extract water resources expected to be present on the moon as part of the construction of a lunar ecosystem that facilitates use of water resources on the moon as energy to promote our efforts.

In July 2021, as a member of the Lunar Industry Vision Council under the cooperation among government, industry and academia, we submitted to the Minister of State for Special Missions a road map to the formation of lunar industry.

In October 2021, as part of the Ministry of Economy, Trade and Industry's project "Space Development Utilization Promotion R&D (Development of Energy-Related Technologies on the Moon)," we were assigned "World's First Hydrogen and Oxygen Generation on the Moon Project" as a non-space private company.

Keeping in mind that the accomplishments obtained through the project should be used for social application of hydrogen utilization to the earth as well as for the lunar economic zone, we will proceed with a two-way practical use of hydrogen between the moon and the earth and environmental contributions to both worlds.


Scene of water electrolysis device research


With the Lunar Industry Vision Council members who are submitting the lunar industry vision to the Minister of State for Special Missions (President COO Kojima, fourth right in the back)

Special Feature

—Sustainable research facility that balances environmental impact reduction and intellectual productivity improvement—

Takasago Thermal Innovation Center

Green bond Impact reporting (environmental impact assessment report)

Takasago Thermal Innovation Center adopts photovoltaic and biomass power generation as renewable energy sources, in addition to various energy-saving methods, and procures green electricity to meet any additional demand for commercial electricity to achieve the target of establishing zero CO_2 emissions and decarbonization.

FY2020 results

● CO_2 emissions

Achievement state of ZEB	FY2020	Ratio of energy consumption to baseline value (*)	Ratio of energy supply to baseline value (*)
Office building	ZEB	0.45	0.56
Site as a whole	Nearly ZEB	0.16	0.10

*Baseline value: 1,389 MJ/(㎡ per year) for office building; 3,150MJ (㎡ per year) for site as a whole

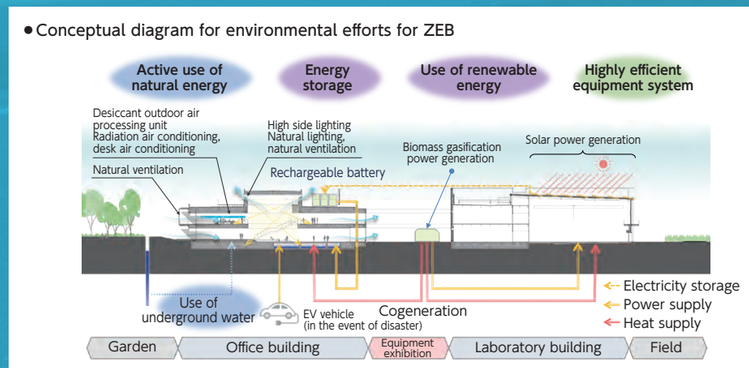
① Designing of environmental building

The center consists mainly of two buildings: an office building that houses social interaction space and work space on the first and second floors, respectively; and a laboratory building where experiments and verification tests are conducted. Between the buildings are located an equipment exhibition building and water basins. With open space that allows wind to flow in the east-west direction prepared in the middle area of the office building, the center is also characterized by a façade plan that realizes both energy saving and comfort and biophilic design, which pursues harmony between humans and nature.

② Various efforts for global environmental impact reduction and ZEB

In order to achieve ZEB, the office building aims for ZEB, in which the result value of energy consumption is zero, while the site as a whole for ZEB Ready or higher. In addition to various energy-saving methods that mobilize our own technologies, we have solar power generation, biomass generation, and rechargeable batteries in place for energy creation.

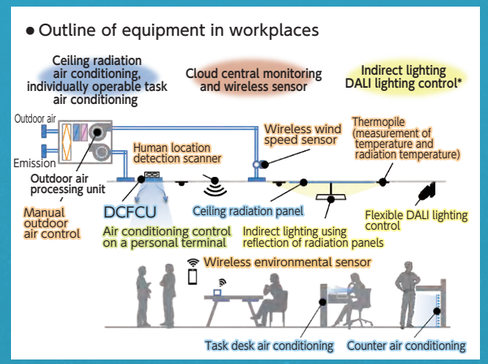
● Conceptual diagram for environmental efforts for ZEB



③ Improvement in indoor comfort and intellectual productivity

Adopting the separation process of latent heat and sensible heat by a desiccant outdoor air processing unit that uses underground water or exhaust heat from a biomass power generator or by radiation air conditioning as well as personal air conditioning that enables personal operations on a smartphone, we provide people-friendly air conditioning that is tailored to individual tastes and work style.
With the LED lighting system installed in all buildings, the main workplace adopts indirect lighting combined with radiation panels or task and ambient lighting.

● Outline of equipment in workplaces



* Dali lighting control: control system enabling individual setting for each lighting device

④ Assessment certification for building environment performance

Designed for high environmental performance, the center was awarded the highest five-star rating in BELS, a certification system which assesses energy-saving performances, Nearly-ZEB, and a GOLD certification in LEED®, a certification system which assesses total environmental performance of a building.
The center was also awarded an S rank certification in CASBEE Wellness Office, a certification system that assesses the comfort and health of a building. Designs with emphasis on integrating equipment, structure, and furniture into a unified whole, a variety of communications based on Activity Based Working (ABW), adoption of work areas, and BCP-based energy supply plan, among others, resulted in high ratings. The center is appreciated as a building leading to improved intellectual productivity as well.

● Environmental performance assessment certification

BELS certification mark

LEED® certification* logo

CASBEE-WO certification logo

* LEED® certification logo, a registered trademark owned by US Green Building Council, is used under its authorization.

Contributions to the world going toward a low-carbon society

Our Group, as an environmental creator®, is working on the creation and social application of technologies, goods, and services that will help achieve a low-carbon sustainable society. With constant checks in action so that our business activities will be able to help achieve SDGs, we aim to pursue the 2030 goal with society.
In the energy value chain technology field, in addition to developing technology to use effectively renewable energy and unused heat such as waste heat, we are engaged in far-sighted developments such as a hydrogen generation and use system. In the resource recycling technology field, we are developing technologies to recycle water and useful resources or reduce environmental impact or CO_2 using biomass. In the technology to provide an advanced environment field, apart from energy-saving air conditioning technology contributing to a low-carbon society, we are developing space creation technology that could improve intellectual productivity in offices and offer a high-quality manufacturing environment. In the production system reform technology field, we are working on the development of production technology and a production management system in construction sites leading to our own drastic work style reform using AI and IOT technologies.
With the Innovation Center, which has R&D and incubation functions, and our Group working together to hone green technologies* contributing to future global environment, we will accelerate our efforts as an environmental creator®.

*Green technology: environmental technology contributing to the global environment

Energy-saving closed VOC recovery system

—Earned award for Excellence for Environment Prize hosted by the National Institute for Environmental Studies, Japan and Nikkan Kogyo Shimbun, Ltd. (under the auspices of the Ministry of the Environment)—

Printing factories and adhesive tape production plants have a dryer that evaporates solvent (solvent dryer) operating in their production process, which produces volatile organic compounds (VOC) such as toluene or ethyl acetate. Causing photochemical smog, they are known to create health damage to the respiratory system and mucous membranes. They are legally treated, but their total domestic emissions in FY2018 amounted to roughly 640,000 tons. The most common method to treat VOC exhaust gas from plants is incineration, which generates a large amount of CO_2. Therefore, the treatment of VOC without incineration is needed for the prevention of global warming and the realization of a low-carbon society.
We have developed a system that adsorbs for recovery and treats VOC without incineration and also reduces the amount of VOC emitted into the air significantly. This system, by treating waste gas from the dryer to recycle it (making it closed) as gas supplied to the dryer, can reduce a large amount of VOC emissions to zero in principle without a gas outlet.
We installed a verification tester in a running adhesive tape production plant (Teraoka Seisakusho Co., Ltd.) starting in FY2020 and jointly started a demonstrative operation with the company. As a result, we confirmed that our system was able to reduce VOC and CO_2 emissions 95% and 78%, respectively, compared with conventional ones. The assessment of impact on the production environment revealed that the production environment could be maintained in a certain low-humidity environment, free from outdoor air influences with gas emission and supply closed and the quality of products was as it had been before. This technology won an award for Excellence for the 48th Environment Prize (hosted by National Institute for Environmental Studies, Japan and Nikkan Kogyo Shimbun, Ltd. under the auspices of the Ministry of the Environment), appreciated as a technology contributing to environmental preservation and environmental quality enhancement.
By promoting the non-incineration treatment system capable of achieving CO_2 and VOC emissions reduction simultaneously, we will go on contributing to the global environmental preservation.

Environmental Prize award ceremony


Demonstration system

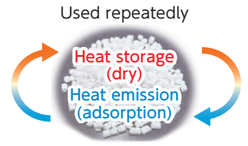
Adsorbent thermal storage system Mega Stock ™

—Earned the excellent business operator award for the NEDO Energy-Saving Technology Development Prize—

The use of waste heat is required for further energy saving and reduction of CO_2 emissions in the areas of industry. While the use of high-temperature waste heat for power and steam generation, etc. is promoted, most low-temperature waste heat of around 100 ℃ is discarded at present because their uses are limited and the mismatch in time and space between the supply of the heat and thermal demand makes it difficult to use the heat. To solve this challenge, we have developed and are marketing a new large-scale thermal storage system that recycles waste/unused heat for air conditioning and as a thermal source.

Features of this system

- **The low-temperature waste heat of 80 to 200 ℃ can be stored.**
- **The thermal storage density is more than twice that of a conventional system.**
- **The recovered waste heat can be used for air conditioning and hot water supply.**
- **The heat loss from the stored heat is minimized.**
  →The users of the heat can substantially reduce their CO_2 emissions.



Using reaction heat from the absorption and desorption of water to and from adsorbent (heat storage material)

Desorption of water → heat storage
Adsorption of water → heat emission (use of heat)

This system can be fixed or used as a portable type in plant facilities and enables the recovered exhaust heat to be used in different places and at different times. The heat can be used effectively for dehumidification, heating and drying processes, for example.
We also expect to introduce it as an offline heat recovery, transport and utilization system to recover exhaust heat from sludge and garbage incineration plants of local governments, etc., as well as exhaust heat from factories, and use the heat in the nearby areas.
In fiscal 2018-19, we launched a demonstration test for the system as a project subsidized by the New Energy and Industrial Technology Development Organization (NEDO) jointly with Hamura City, Tokyo, and 5 other organizations. We created a thermal storage system using HASClay, a new high-density heat storage material, to collect full-year demonstration data on the fixed type and the offline heat transport type and demonstrated the storage of waste heat from factories, cogeneration exhaust gas and waste warm water, as well as the use of heat in production lines and commercial facilities. With this project, we earned the NEDO strategic energy-saving technology innovation program excellent business operator award in 2018 and the excellent business operator award for NEDO Energy-Saving Technology Development Prize in 2020.

● Examples of use: Heat transmission in Hamura City areas (around the Hamura Plant of Hino Motors)

Heat transport by trailer


In-plant cogeneration system
→Recovering heat from exhaust gas (160°C) and exhaust warm water (80°C)

Heat transport by in-plant vehicle


Nearby municipal swimming center
→Reduction in hot supply water and heating load

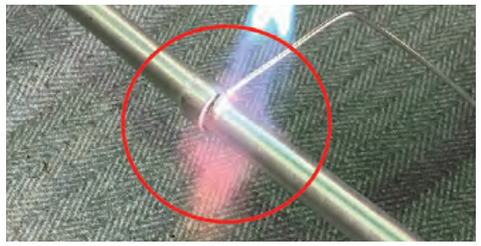

In-plant industrial air conditioning (painting process)
→Reduction in dehumidification and heating load

● Press release https://www.aist.go.jp/aist_i/press_release/pr2019/pr20190725/pr20190725.html
● Advanced Industrial Science and Technology's YouTube "かがくチップス(Science chips)"
https://www.youtube.com/watch?v=0Rw38swZvfQ

Development and dissemination of the aluminum refrigerant piping system

By changing the refrigerant piping material from copper to aluminum, CO_2 emissions can be reduced 30% environmentally, and manpower and the material cost for piping can be reduced 20% and 10%, respectively, in construction work. We strongly believe that this system will greatly help companies that are contributing to a low-carbon society advance their environmental impact reduction campaigns. Aluminum is more difficult to reduce than copper and new aluminum metal can be produced only through electrolytic smelting, a refining method that consumes huge amounts of electricity. On the other hand, aluminum is resistant to corrosion and degradation and aluminum scrap can be returned to the nearly original metal when it is simply remelted and solidified. Manufacturing reproduced metal consumes no more than 3 to 4% of energy needed to manufacture new metal, which leads to a total reduction in manufacturing energy. Beverage aluminum cans, whose recycling system is socially established, are said to have 85% of them recycled. With this recycling rate set as the benchmark in the equipment industry as well, the pipe made of 85% reproduced aluminum metal is expected to reduce CO_2 emissions roughly 30% compared with the pipe made of 45% reproduced copper metal. Using this system, we are developing and promoting aluminum refrigerant piping, mechanical joints for aluminum refrigerant piping, branch pipe units for aluminum refrigerant piping, and a brazing method for aluminum refrigerant piping.


Aluminum pipes brazing work


Change in flame color of preheated aluminum pipe

Development and dissemination of the El-brazing method (local nitrogen replacement method)

The El-brazing method (local nitrogen replacement method) for refrigerant copper pipes has been introduced into more than 120 construction sites in total to save labor in construction work and ensure quality, while 31 construction sites of other companies have introduced it in total (as of the end of April 2021). Compared with the batch nitrogen replacement method, a conventional method, it can reduce man-hours and nitrogen use 80% and 70%, respectively. Effective to ensure quality and save labor, the method has been registered in the New Technology Information System (NETIS) of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) under the name of the local nitrogen replacement method.

What is NETIS?

NETIS is a system MLIT runs designed to actively promote new useful technologies developed by private businesses, among others, for public works in particular. If this method is utilized for public works through NETIS, it will receive assessment scores, gain credibility, and be disclosed as an improved technology.
We aim to have this method published in MLIT's unified specification as an officially approved method.


Construction work to apply the El-brazing method

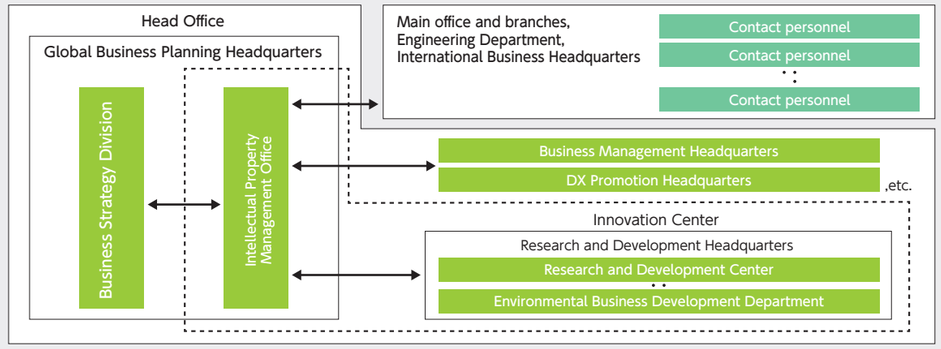
Intellectual property management

As of the end of March 2021, the number of patents, etc. we own is 746 (including patents, utility models, designs and trademarks), which is the largest in the HVAC industry. Among them, the number of patents is 475, which account for two-thirds of the total, comprising 459 domestic patents
and 16 overseas patents. In addition to patents concerning quality improvement and energy saving in the design and construction of HVAC systems, which is our main business, we are aggressively working to acquire patents of unique technologies in our new business fields. We are also promoting initiatives to use the patents we have acquired not only for our solutions but also for open innovation and to grant them to other companies.

Takasago Thermal Engineering's intellectual property management structure

In Takasago Thermal Engineering, by organizing the Intellectual Property Management Office along with the Business Strategy Office under the Global Business Planning Headquarters and making it based in the Innovation Center, which houses the Research and Development Headquarters, we design and carry out intellectual property strategies combined with management strategies, business strategies, and research and development strategies. There is an internal system in place to establish cooperation between the office and the main office and branches via contact personnel. The office has also established a system to work together with patent offices in relevant technological fields and law firms specializing in IP-related conflicts.

● Organizational chart of management



Prevention of technology leakage

Technological know-how on design, procurement and construction is an important management asset for engineering companies. To prevent the leakage and misuse of technological know-how accumulated on a daily basis, we are also involved in the establishment of internal rules for security management of technological know-how. In addition to disseminating the rules via contact personnel in sites, etc., we have an intellectual property-related contracts management system in place.

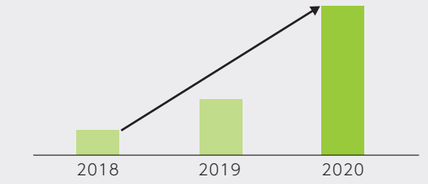
Protection of new technologies

To address such a challenge for the construction industry as a whole as improvement in productivity in design, procurement and construction to compensate for the lack of labor, we work to obtain intellectual property rights for new technologies for equipment and site tools as well as for newly developed technologies that can be a foothold for an advance into a new business field.

Establishment of business models and support for intellectual property contracts

When an engineering company introduces new technologies into society, it is essential to cooperate with manufacturers. In particular, companies in the construction industry need to cooperate with individual companies in the value chain including parts manufacturers and sales agencies. While we need to pay attention to non-disclosure agreements with these companies so that we can prevent technology leakage and recover the investment in development, we provide backup support for intellectual property contracts aimed at co-existence and co-prosperity with individual companies in the value chain while seeking to maximize our revenue. Engineering fee income has increased roughly tenfold over the past three years.

● Trends in engineering fee income



Support for realizing a low-carbon society

Our basic philosophy on environmental conservation is to "contribute to the conservation of the global environment while working for the sustainable development of society by fully using environmental conservation technologies and our corporate power." Based on this philosophy, we have established the Basic Environmental Policy to specify rules on the promotion system. We will actively develop energy-saving and CO_2 emission reduction technologies in our business activities and achieve optimal operation of facilities through cooperation with customers to help create a low-carbon society. Meanwhile, we have estimated CO_2 emissions in fiscal 2020 for the disclosure of environmental data (CO_2 emissions), etc. The value is used as a benchmark for long-term targets to be achieved in fiscal 2025 and 2030.

● CO_2 emissions by scope (results in FY2020)*

Class/category		Scope of the estimation	Relevant activities	Emissions in FY2020 (tons-CO_2)
Scope 1	Direct emissions	Direct emissions from the use of oil, etc. and industrial processes in the company	Gas, oil, gasoline	**1,045**
2	Energy-derived indirect emissions	Indirect emissions in association with the use of the electricity and heat purchased by our facility	Electricity, etc. in business sites, offices, etc.	**2,442**
3	Other indirect emissions (excluding those which fall under Scope 1 or 2) Design, construction work, etc.			**4,000,944**
Category 1	Purchased goods and services	Emissions in association with the activities up to the production of raw materials and other materials	Ductwork, piping, scaffolding	104,307
			Main items of HVAC systems (freezers, air conditioners, packaged air conditioners, fan coils, fans)	
2	Capital goods	Additional construction of production facilities	Capital investment	13,190
3	Energy-related activities	Minerals required for the generation of the electricity purchased by the company	Electricity usage	606
4	Transportation (upstream)	Emissions in association with the transportation of products from suppliers to construction sites	Number of trucks required for the transportation	5,269
5	Waste generated in operations	Emissions in association with the transportation and disposal of general and industrial waste generated by the company	General waste from buildings and offices	7,168
			Disposal of industrial waste from sites	
6	Business travel of employees	Business travel	Domestic and international business trips	822
7	Employee commuting	Commuting	Commuting	632
11	**Use of the sold product**	**Emissions in association with the use of products by users (consumers, business operators)**	**Facilities for delivery to customers**	**3,835,590**
12	End-of-life treatment of sold products	Emissions in association with the end-of-life treatment of products	End-of-life treatment of purchased products	33,359
			Total	**4,004,431**

* An independent third-party assurance has been received from Sustainability Accounting Co., Ltd.

Support for realizing a recycling-oriented society

Reduction of waste

We regard waste as precious domestic resources and aggressively strive for 3R* in production sites and offices to use it effectively. All of the waste manifests in contract work sites are controlled for the thorough management of waste up to the final disposal.

* 3R means Reduction, Reuse and Recycling.

Achievement of a recycling rate of 86% on sites

We worked to reduce construction facility waste from contract work through such initiatives as the use of prefabricated facilities, elimination of packaging, promotion of recycling and thorough separation of waste. As a result, the overall recycling rate in our 950 contract work sites in fiscal 2020 was 86%. We will continuously endeavor to increase the recycling rate.

Recovery of 100% of CFCs

We started to recover CFCs in fiscal 1995, ahead of other members of the industry. In fiscal 2020, we recovered 100% of the CFCs to be collected in 365 sites, which weighed approximately 22 tons in total. The amount of CFCs we have recovered since the start of the activities is equivalent to 793 tons. We will continue to control the recovery process completely and strive to recover CFCs to protect the ozone layer.

Creation of a society in harmony with nature

Practical use of technology for flushing without any water drainage

To reduce the environmental impact of effluent from production sites, we have developed technology for flushing without any water drainage and are committed to the practical and widespread use of it. For effluent treatment, we have developed a technique to purify effluent containing zinc eluted from coated zinc as a result of flushing in pipes at the completion of piping and to return the purified effluent to the pipes instead of discharging it. We worked to disseminate the technique and had 56 cases of the introduction into sites in fiscal 2020.

Flushing water purification unit

Targets and achievements of environmental conservation activities

In fiscal 2020, we implemented environmental conservation activities to meet the quantitative target set for each of the activity targets and items in construction sites and offices.
The results are as follows:

● Targets and achievements of environmental activities in fiscal 2020

✓:Achieved ✕:Not achieved

Goal of the activities	Description of the activities			Control items	Baseline value	Actual result	Evaluation
Contribution to the realization of a low-carbon society	Proposal for energy saving at the design and construction stages	Proposal for energy saving at the design stage	New construction	Amount of energy saved*1 / Baseline*2 energy consumption	10%	23%	✓
			Renovation	Amount of energy saved*1 / Baseline*2 energy consumption	30%	29%	✕
		Reduction of energy used by equipment during construction		Amount of energy saved*3 / Energy consumption in the original design	10%	9%	✕
	Energy saving in offices	Reduction of energy used at head office, main branches, sales branches and R&D center		Reduction of power consumption in offices	200 kWh or less per person per month	100%	✓
	Reduction of construction materials	Reduction of the amount for piping, ductwork and equipment scaffolding during construction		1 − Amount of reduced materials / Amount of materials used for ductwork, piping and scaffolding in the original design	10%	17%	✓
Contribution to the realization of a society in harmony with nature	Participation in local environmental activities			Local cleanup activities and support for events	One or more activities per office	Suspended owing to COVID-19	—
	Practical and widespread use of technologies that contribute to biodiversity			Trial introduction of the flushing technology to clean pipes without any water drainage	50	56	✓
Contribution to the realization of a recycling-oriented society	Implementation of activities to generate no industrial waste from construction sites *4			1 − Recycling rate: Final disposal volume / Total waste volume	85%	86%	✓
	Thorough management of industrial waste manifests			Number of sites managed with manifests / Total number of contract work sites	100%	100%	✓
	Thorough management of the CFC recovery process control table			Number of sites managed with the CFC recovery process control table / Total number of sites recovering CFCs	100%	100%	✓

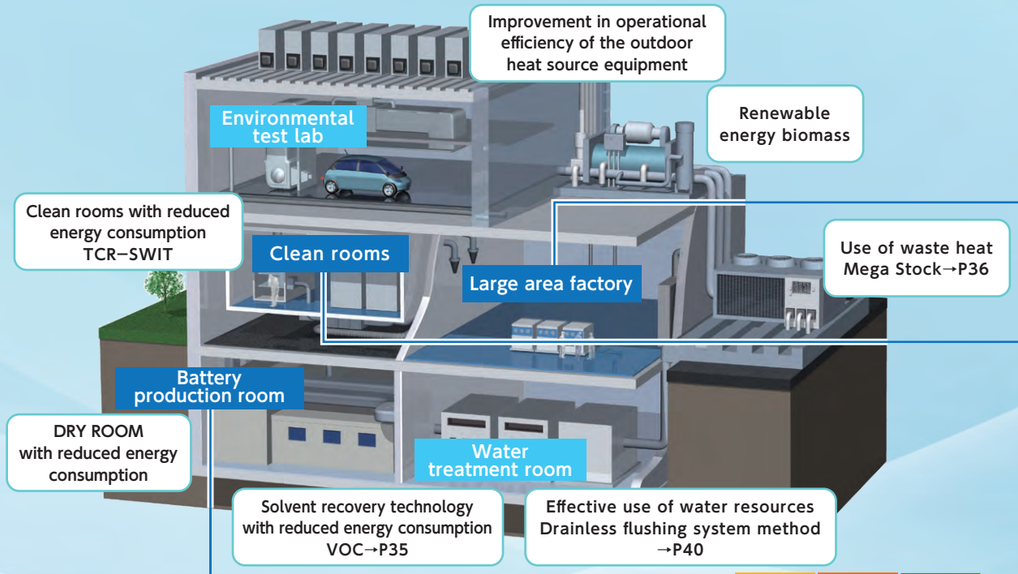
*1: Buildings of a certain scale designed by the company (new construction and renovation)
*2: The baseline value is annual energy consumption equivalent to the baseline in the Act on the Rational Use of Energy or the amount defined specifically for each building.
*3: Buildings of a certain scale (new construction and renovation)
*4: All buildings in contract work

Special Feature

Toward the realization of energy-saving and environmental impact reduction technology and improvement of comfort

We work on technological development of air conditioning systems with emphasis on achieving both comfort and energy saving in different types of buildings from the planning, design and construction of air conditioning equipment through to its operation, management and renewal work and those technologies are used to reduce CO_2 emission in the field of Scope 3.
We will present clean rooms, which is used in plants manufacturing semiconductors growing in demand particularly in the communications (5G) field, DRY ROOM®, which is needed in the battery manufacturing process, and our own technologies in the data center.

Industrial air conditioning | **Semiconductor plant, lithium-ion battery plant, etc.**

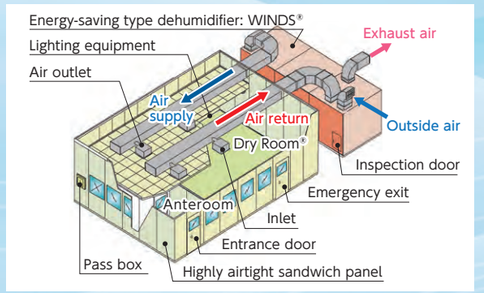


DRY ROOM® technology

Achieving low-cost and energy-efficient DRY ROOM® facilities with appropriate equipment configuration and optimal operational control

Moisture in the air is an impediment to yield improvements in the manufacturing processes for the increasing production of rechargeable lithium-ion batteries and next-gen secondary batteries, which are expected to be widely used in the future. This manufacturing is therefore performed in a DRY ROOM®, which has the moisture in the air removed in a controlled low dew point environment.
The manufacturing cost for the dehumidified air used in the DRY ROOM® is higher than that for the conditioned air used in ordinary air conditioning. There are therefore increased demands for energy conservation in large-scale mass production factories. In order to respond to these demands, we optimized the configuration of the dehumidification equipment to achieve reduced energy consumption and lower cost. In addition, we achieve further reductions in energy consumption by implementing optimal operation controls to deal with the periods when the dehumidification load is low, for example, during the winter months.

● Basic configuration of the DRY ROOM®



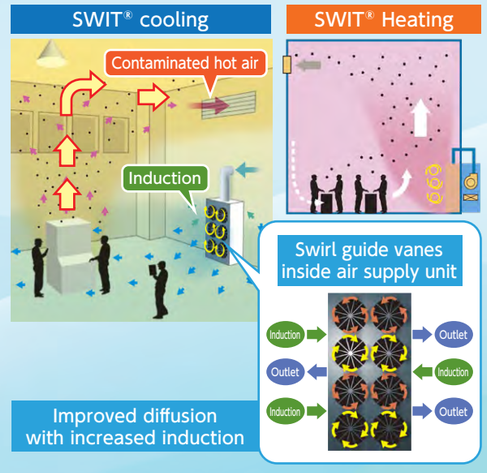
Patent No. 4334688, Patent No. 4754358, Patent No. 4990443, Patent No. 5587571, Patent No. 5681360, Patent No. 5681379, Patent No. 5684478

Swirl inducing-type stratified air conditioning system: SWIT®

Achieving both comfort and energy conservation with a 40% reduction in HVAC energy use

SWIT® is a displacement ventilation enhanced entrainment effect type HVAC system which uses the natural principle that warm air rises and cold air falls. The contaminated hot air is moved up to the ceiling and the environment in the working area is kept clean and comfortable.
SWIT® can condition the air with less air flow than a mixed air conditioning system as well as with the air flow temperature close to the room temperature. This makes it possible to build an HVAC system that conserves energy at a low cost. SWIT® is the best system for large spaces and places with high heat generation loads, high outdoor air loads, and high dust emissions.

Awards won
- Winner of the 7th "Environmental and Equipment Design Award"
- Winner of the 24th "Technology Promotion Award" by the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan
- Winner of the 2012 Energy Conservation Grand Prize "Agency for Natural Resources and Energy Director-General"



TCR-SWIT®

Constructs a high-precision environment in an ultra-short execution period while also providing energy and cost savings

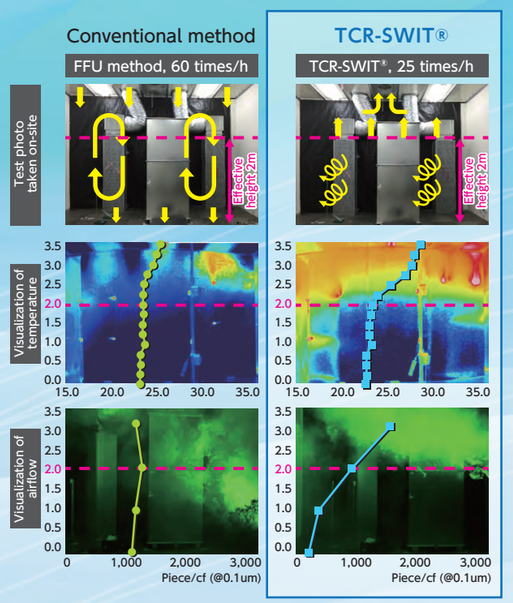
● Applying to clean rooms

TCR-SWIT® is a next-gen clean room technology which makes it possible to achieve both effective indoor environment maintenance and energy savings in large-scale clean rooms, which had previously been a major challenge. The special features of SWIT® have been technically tested and verified, and we demonstrated that thermal environments and cleanliness can be maintained with less air flow by means of excellent ventilation efficiency. We have an established track record of commercial installation in a semiconductor manufacturing process (front-end) clean room (ISO Class 5 ultra-precision air conditioning).

● Constructing a TCR-SWIT® experimental and testing site

We constructed an experimental and testing site for TCR-SWIT® in the Takasago Thermal Engineering Innovation Center.
It is the experiential site where you can switch between a TCR-SWIT® method and the conventional FFU method in the same room and visualize temperature distribution, cleanliness, air flow, etc. so that you can compare and test.
Our clients from various fields came to experience the HVAC system of TCR-SWIT® and it has received positive feedback.

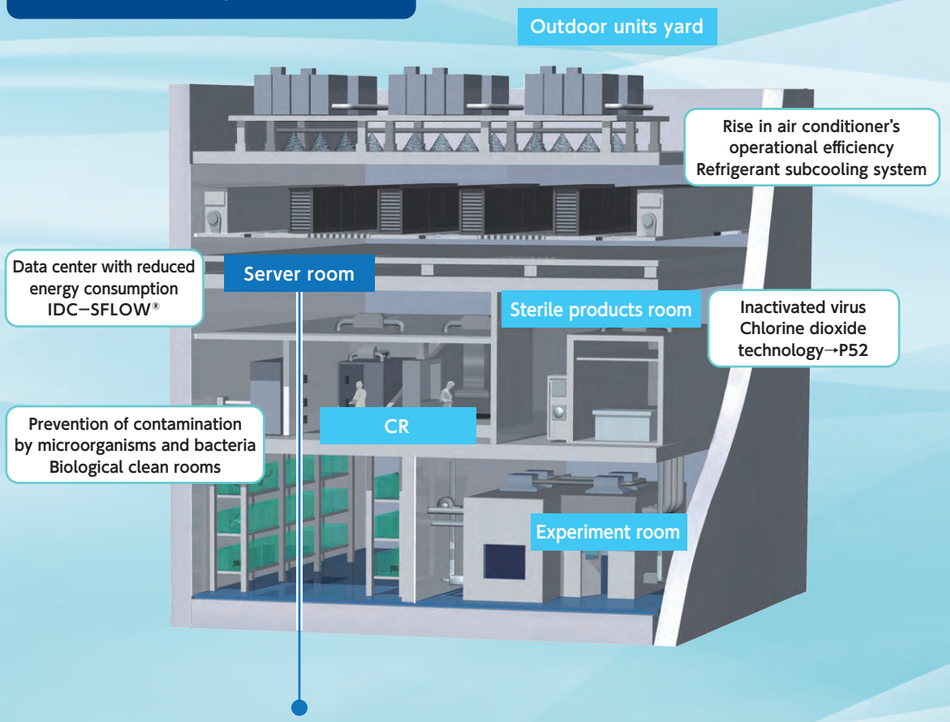
TCR-SWIT® test and demonstration facility



Special Feature

Toward the realization of energy saving and environmental impact reduction technology and improvement of comfort

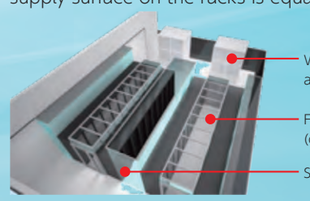
Data centers and pharmaceutical



Wall outlet type air conditioning system for IDCs IDC-SFLOW®

Air conditioning system for IDCs that achieves both conservation of energy and thermal environment

IDC-S FLOW® (*1) is an air conditioning system for IDCs, which consists of wall air outlets, flow control mechanisms (cold aisles), and shielding plates for hot aisles. Air supply is provided via the flow control mechanism, which means the wind speed on the air supply surface on the racks is equalized to a low flow.



Features (compared to common wall outlet type air conditioning systems)

1. High energy conservation: Reduces the flow back of the rack exhaust heat, and the air supply temperature can be set quite high
2. Adjustment is easy: Air flow adjustment depending on the heat generation status is unnecessary
3. Good operability: Draft is reduced near the air outlets in the cold aisles

A test and demonstration facility is in operation in the Takasago Thermal Engineering Innovation Center. The facility makes it possible for one to experience the performances, features, and airflow of the system as well as to check actual measurement data through CFD or VR. It also can be used as a mock-up verification facility.

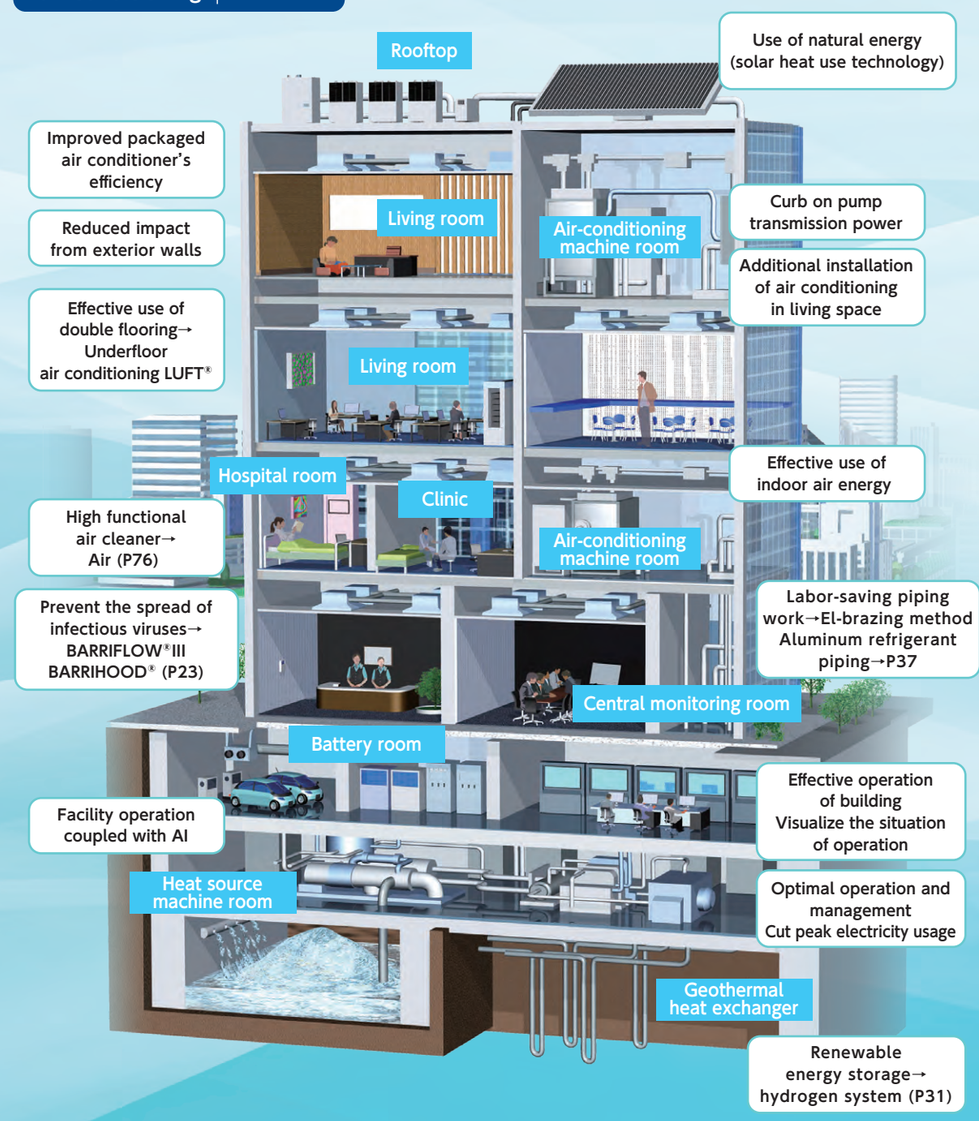
*1 Co-developed by Kanden Energy Solutions Co., Inc.


IDC-SFLOW® verification room

Winner of Green IT Award 2012 "Judging Committee Special Award"
Winner of the 13th Industry-Academia-Government Collaboration Contribution Award Ministry of the Environment Award"

IDC-SFLOW® : Internet Data Center Side Flow System
Patent No. 5743536 and more

General air conditioning | Building



Others

Circulate of local resources

Distribute fisheries products in a highly fresh state→SIS (P51)

We have been consistently committed to human resource development and the creation of a comfortable working environment to achieve the growth of employees and the growth of the company at the same time.

Further engagement enhancement

It is each employee that supports our Group and we believe that the valuable human resources' autonomous growth will lead to the company's growth.
To ensure that employees are motivated to stay engaged, in addition to developing an environment that helps them develop themselves, we need to have our management philosophy and business accepted as something important for social contribution so that they can stay engaged with motivation and pride. We also have to realize a worker-friendly environment that enables healthy disciplined diverse work styles and a work-life balance benefiting employees' life. By accumulating these efforts, we are building trust between employees and the company, aiming to become a company that allows each employee to feel motivated and happy.
We have started a new employee engagement survey starting in FY2021 in place of the Employee Satisfaction Survey thus far. With the annual serious survey and monthly simple surveys, we will continue to tackle organizational issues they clarify for further engagement enhancement.

Personnel system focusing on the added value created by employees, not ages or times

In April 2019, we fundamentally revised the conventional grade, compensation and evaluation systems and introduced a new personnel system that evaluates employees based on the added value created by them instead of their age or working hours. Through the introduction of this new system, we aim to encourage employees to grow and feel motivated and also help reform the organization of the company.

1 Revision of the grade, compensation and evaluation systems	To establish a system that highly values the employees who increase productivity and create higher added value within a limited time, we abolished age-based pay, and newly introduced role-based pay.
2 Introduction of a flexible age-limit system at the age of 65	In consideration of phased increases in the pension age and the diversification of personal life plans, we introduced a selective retirement system where employees can select the retirement age from 60 to 65.
3 Multi-path personnel system	In addition to the line management posts who manage an organization, we allowed specialist personnel to get promoted to posts higher than general managers (chief engineers, fellows, experts, etc.). We also created a new post of high-level professional personnel in the annual salary system to facilitate the appointment of human resources with a high level of professional skills needed to achieve a management plan.
4 Systematization of career paths	We systematized career paths to develop human resources through the experience of wide-ranging duties and deploy human resources from a long-term perspective according to what is best for the company as a whole. To promote various work experiences in-house, in addition to promoting job rotations such as interorganizational transfers, we introduced a new overseas trainee system to give short-term work experience to employees.

Introduction of board benefit trust leading to improved corporate value and the recognition of one's own growth

By strengthening linkage between our stock price and treatment of management staff in particular among our employees to share economic effects with shareholders in anticipation of management staff's further commitment to stock price rise and increased morale, we introduced an incentive plan of offering our equities to management staff.

Human resource development

Basic concept for human resource development

As a pioneer of the construction equipment field, we are helping the world commit to a low-carbon society through environmental engineering under the corporate mission of "Contribution to society through personal harmony and creativity" in addition to creating a future earth where everyone has a good life as an environmental creator®.
To fulfill these missions, we are developing human resources capable of providing the highest quality and ingenious technologies. With employee training and self-improvement performing a complementary role, we are creating an organizational climate that encourages a "give-it-a-try" spirit and inventiveness.

Basic policy for human resource development

Based on our principle that "people are our most important assets," we will develop human resources who have high ethical standards and awareness of problems and work for the growth of themselves and the younger workforce through systematic and well-planned training in the most inventive manner.

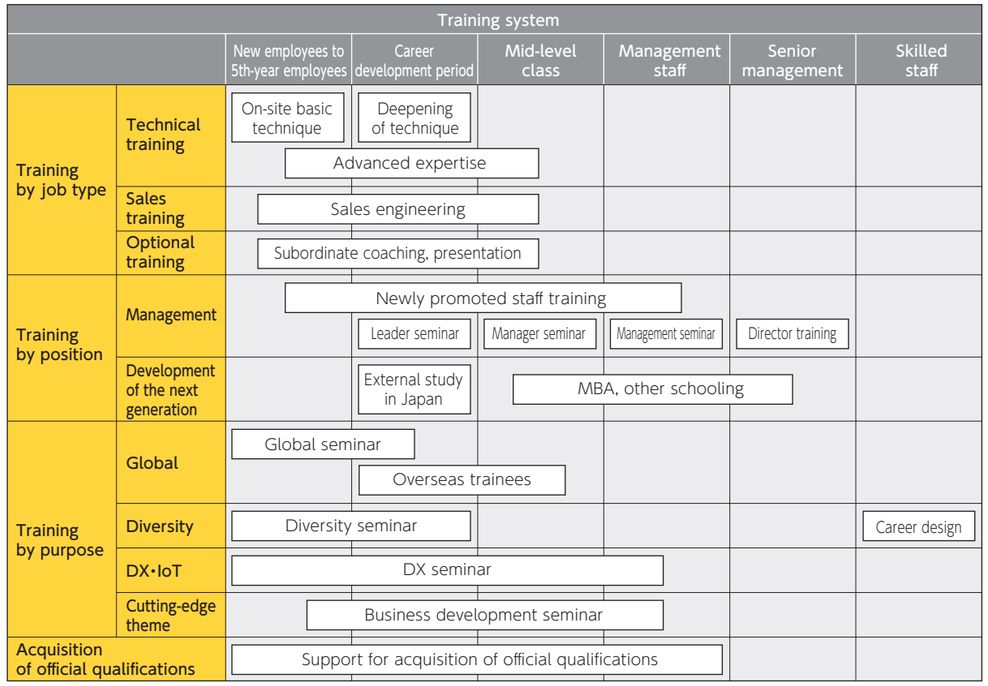
Training tailored to individual objectives and career stage

● Human resource development in the Takasago Academy
In the Takasago Academy, which aims to develop human resources who will create our future, we offer practical and multifaceted training programs with various types of training (Off-JT: off the job training) and various experiences (OJT: on the job training) as the two main components and provide training tailored to individual objectives and career stages with "Steady evolution into a multi-disciplinary equipment business," "Establishment of the second and third core businesses" and "Further engagement enhancement" in the medium-term business plan as the basic policies.

● On-site training in the first two years
On-site training is given to new employees, irrespective of whether they are technical or clerical staff, for two years after they join the company. This program, which allows the new employees to directly learn and understand how the company grows through the creation of added value and profits, helps them build the foundation on which to develop diverse career paths subsequently.

● Purpose-based training and position-based training
In the purpose-based training, the trainees work to acquire necessary capabilities and business skills and develop a sense of ethics so that they can work actively at all stages from the time of joining the company through retirement. In the position-based training, which focuses on management skills, we offer opportunities to acquire an MBA degree and implement the Young Board Project to train next-generation leaders, manager seminars for management candidates, leader seminars for young employees and other programs to continuously develop human resources who will play the main role in our future management.

● Training system chart



To ensure that all employees can demonstrate their abilities to the fullest with enthusiasm

Diversity and inclusion

Setting mutual respect as a basis in our management philosophy, we promote the fair appointment of human resources irrespective of nationality or sex. As illustrated in the installation of a working group that promotes a cross-sectoral diversity, we are actively committed to the creation of workplaces where diverse human resources can make the fullest use of their personality and capabilities to prove themselves.
In addition to actively employing women, persons with disabilities and international students with foreign nationalities, we have abolished the non-career position so that employees can be fairly appointed or actively engaged irrespective of sex. We also provide training supporting women employees' career development such as a career seminar for them.

● **Employment rate of persons with disabilities**

FY2018	FY2019	FY2020
2.20%	2.26%	2.48%

VOICE

Want to participate not only in international business but also the development of my mother country

Ye Wint Htun
Technical engineering section 3,
technical engineering division 2

After graduating from an engineering college in Myanmar, I flew to Japan with the thought of working as an engineer in a high-tech country and at my grandfather's recommendation. He had worked in Japan in his youth and I had been interested in the country since my childhood as he had often talked about it.
I majored in electrical system at college, but I had a lot to learn technically as a Takasago engineer. Nevertheless, thanks to careful technical training by the Process Support Section of the Tokyo Main Office and OJT, I was able to learn technical knowledge smoothly. I was aware of my superiors' and senior staff's interest in my professional growth as soon as possible through day-to-day tasks, which encouraged me to keep going.
My immediate goal is, in addition to studying Japanese more and deepening my technical knowledge, to get certified as a first-class plumbing work operation and management engineer to become an on-site manager. Full-fledged, I wish to engage in international projects, especially those related to Myanmar to contribute to the development of my mother country.

Support for achieving a balance between work and family life

To support employees in balancing work and childcare or nursing care, we have in place a childcare/ nursing care leave system, a reduced working hour system, and various holiday systems such as a system of leave for taking care of children. In addition, we encourage flexible work styles including staggering commuting and teleworking. When it comes to the latter, we modified in FY2020 the application conditions that had been in action for all employees to work from home. We also support men in taking part in childcare actively and encourage male employees to take a childcare leave by, for example, allowing them to take the leave partly with pay. As part of supporting employees' return to work from childcare leave, we conduct a return-to-work interview or introduce nursery schools operated by companies.

● **Number of male employees who took childcare leave by year**

FY2018	FY2019	FY2020
11	22	23

VOICE

Balancing work and childcare to become a childcare father of Takasago Engineering

Asato Kawase
Engineer, Technical engineering section 1,
Tokyo second Area office, Tokyo main office

Seeing senior staff take childcare leave, I wished to do as they did. But the idea of taking childcare leave while engaging in construction site work also made me feel uneasy.
When I told my superior that I had a child, he recommended that I take childcare leave. Relieved, I took a two-week childcare leave in August 2020.
My superior and coworkers actively addressed my professional concerns, so I was able to be engaged in childcare while being off duty.
Being close to my child every day made me feel their growth firsthand, but, at the same time, brought home to me how hard and tough childcare was, which caused me to reconsider housework sharing at home. Having a stronger sense of responsibility with awareness as a father, I experienced very significant leave. I will go on keeping a good balance between work and childcare to become a childcare father of Takasago.

System of leave

As part of efforts to encourage employees to take annual paid holidays, we have in action a planned grant of annual paid holidays system and an hourly paid leave system that enables flexible acquisition of annual paid leave. We also offer refreshment leave given as a reward for many years of service (20, 30, 40 and 50 years), three-day summer holidays usable between July and September, and anniversary leave.

Health and productivity management

We have the Health Care Office operating as a department dedicated to helping executives and employees maintain and improve their health and promoting health and productivity management. To become a company where all executives and employees are physically and mentally healthy and work energetically ("Well-Being company"), we issued a "health declaration" as a top message. We were certified as a 2020 Health and Productivity Management Organization (Large Enterprise Category).

2021 健康経営優良法人 Health and productivity

Measures to address harassment issues

To prevent sexual and other forms of harassment including abuse of authority and discrimination against pregnant employees, we send messages of top management and clarify our basic policy to never allow any forms of harassment. We have set up consultation counters on and off the company premises to address the matter and also conduct regular questionnaire surveys to check whether there is any harassment in the workplace. Moreover, we continuously provide training to enhance awareness of the prevention of harassment.

Special Feature

Formulation of “TakasagoWay” by renewing the employees’ action guidelines from different viewpoints according to the changing times

Background of the formulation of “TakasagoWay”

Since its founding in 1923, the company has developed our DNA (values) through the development of our business and it has been passed down to employees as the corporate mission “Contribution to society through personal harmony and creativity.”
In 1984, we formulated the Employees’ Action Guidelines, the guide for the basic requirements needed to embody the employee model with the management philosophy pursued as well as concrete actions, and the employees have acted in accordance with the guidelines since.
But with social values and business environment significantly changing in recent times, each employee, in addition to following conventional values and methods, has come to be required to think and act on their own when engaging in tasks.

Formulation of “TakasagoWay”

“TakasagoWay”, the backbone of the corporate mission and principles, specifies the values employees need to think on their own feet and act autonomously.
To formulate it from different viewpoints, headquarters members consisted of employees of diverse backgrounds and careers.
In the formulation process, in addition to individual interviews with the President & COO, board members, employees in the Head Office and main and branch offices, and a questionnaire of all employees, discussions across workplaces, departments, and ages were developed.
Working as one, employees discussed our DNA (values) passed down as implicit knowledge and what the Takasago employee should be over and over to formulate it.

3 core values

“TakasagoWay” consists of 3 core values.
The first one is **Beyond**. Which means offering more value than is expected.
The second one is **Pride**. Which means getting through a task openly and squarely.
The third one is **Trust**. Which means that ties with other people are worth a fortune.
Each core value has 4 phrases that help understand it deeply, 12 phrases prepared in total.
By allowing employees to continue to act and pay attention in accordance with the “TakasagoWay” in daily tasks to improve corporate value, we will make social contributions.

Member interview

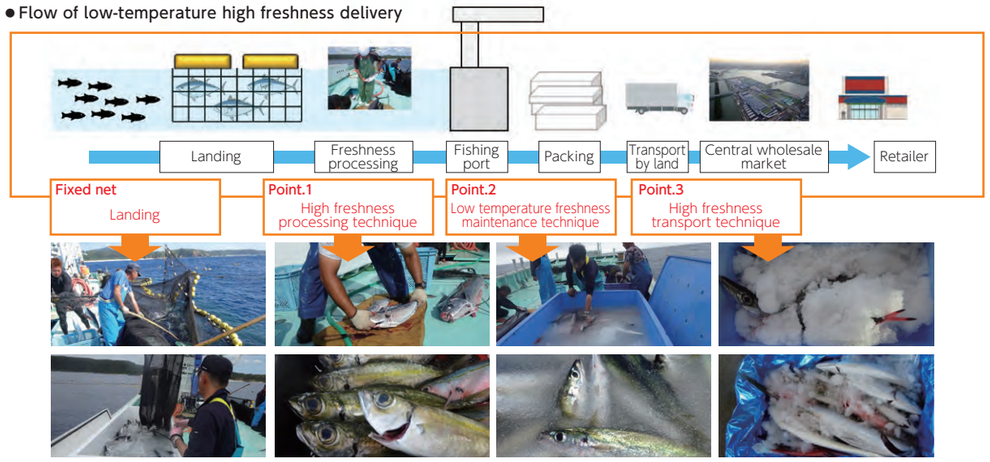
Akiko Narita
Deputy Manager,
Corporate Communication Division,
Global Business Planning Headquarters

I participated in the formulation of “TakasagoWay” as a headquarters member.
At first, we held a series of discussions about planning of formulation guideline, through which we converged on one point: that we would formulate the foundation based on which employees act autonomously with the idea, “It is I who act.” A guideline that encourages behavioral changes by showing what to do concretely as we know it would be unsustainable in the face of changing social values and environment.
The formulation process was wide-ranging, and we discussed not only with board members but also employees of a wide range of generations and backgrounds from the main office and branches. I believe that through the work the Takasago Thermal Engineering DNA passed down as implicit knowledge was extracted from executives’ and employees’ words.
But we had difficulty drawing up the words. Using words in interviews like catchphrases would have made them look presentable, but at the expense of power to make one act. By exploring the context of each person’s words thoroughly, we put the true meaning of the words into what is simple and straightforward.
“TakasagoWay” is shifting to the dissemination phase and I hope that all employees will disseminate the spirit by internalizing it and acting autonomously.

Contribution to the improvement and development of the fishing industry with Super Ice System (SIS)

In the SIS business, we applied our heat storage air conditioning sherbet ice making technology to an ice maker for fisheries and delivered the first unit to Hiradouoichi, Nagasaki Prefecture, in March 2016. We have delivered 6 units thus far. The customers using the machine have achieved rising fish prices, distribution networks expansion, and quality improvement.
For the Kunigami Gyokyo, Okinawa Prefecture, to which we are going to deliver the machine in FY2021, with a test machine, we conducted an examination of rising fish prices and distribution networks expansion through domestic and international high freshness transports by employing our accumulated experiences and a scientific freshness delivery method using the freshness index K value. The examination result showed that regular transports to supermarkets in the prefecture as well as overseas materialized. Based on the result, we, after the installation of the machine, are going to undertake active distribution networks expansion and rising fish prices in cooperation with the Gyokyo, helping them improve business with a SIS-based freshness delivery method.
The Kunigami Village, located in a subtropical zone, poses a lot of challenges for fresh fish delivery as it takes 2 hours to travel from the village to the Naha Airport, but we view the trials and results there as the foundation for business opportunities at home and abroad, and aim to operationalize the SIS business in full scale with a business model covering from the sales of the machine to improvement in business after the machine delivery.
The fishing industry has been in a severe financial situation since before the COVID-19 pandemic, but by establishing a SIS-based freshness delivery method, or a cold chain, we aim to commit to the improvement and development of the fishing industry including turning Japanese marine products into prestige brands.

● Flow of low-temperature high freshness delivery



● Adoption track record


① JF Misawa City
Purpose of use: cooling and freshness maintenance of landed fish
Ice making capacity: 7.5 tons / day


② Zengyoren Hachinohe food
Purpose of use: cooling of unprocessed fresh fish
Ice making capacity: 5.0 tons / day


③ JF Kuji City
Purpose of use: cooling and shipping of landed fish
Ice making capacity: 12 tons / day


④ JF Iwaki City
Purpose of use: cooling and freshness maintenance of landed fish
Ice making capacity: 0.5 tons / day


⑤ Tsuji Suisan
Purpose of use: cooling and shipping of landed fish
Ice making capacity: 7.5 tons / day


⑥ Hiradouoichi
Purpose of use: cooling and shipping of landed fish
Ice making capacity: 10 tons / day


⑦ Kunigami Gyokyo
Purpose of use: cooling and freshness maintenance of landed fish
Ice making capacity: 5.0 tons / day

SIS-HF introduction HP

Malaysia “Takasago no Mori” (Forest of Takasago) tree planting

Of the 20-ha section of the premises of the University of Malaysia, Sarawak, to be used for its rainforest restoration program, we named the 10-ha section “Takasago no Mori” (Forest of Takasago) and have been engaged in a five-year tree-planting program there since 2018. Despite a temporary suspension of the program due to the governmental restrictions on it resulting from the COVID-19 pandemic, teachers and university staff are taking care of the planted trees regularly. The total number of planted trees exceeded 13,500 as of January 2021 and seedlings raising and tree-planting are in progress.

Takasago no Mori in Sarawak, Malaysia

Donated the Takasago Evacuation Booth to Tsukubamirai City

We donated the Takasago Evacuation Booth (anti-COVID-19 air-conditioning and ventilating booth for anti-disaster shelters) to Tsukubamirai City, Ibaraki Prefecture, with which we had concluded a comprehensive cooperation agreement in the four fields of education, disaster prevention, community, and energy in August 2020.
Amid increased natural disasters in recent times, anti-disaster shelters pose the following challenges: high risk of getting infectious diseases like COVID-19 and influenza due to densely packed space; inadequate measures against the heat and cold; and difficulty in privacy protection. Utilizing knowledge on the clean booth for medical use released in 2009 to prevent influenza virus infection, we newly developed a booth for anti-disaster shelters that controls the inner pressure appropriately to reduce infection risk and allows for the installation of a spot cooler to raise comfort.
Made of aluminum poles and plastic sheets, the Takasago Evacuation Booth is 2m in length, breadth and height, available in 6 units in one set, and can be stored compactly and built up easily.


Full view of the anti-COVID-19 air-conditioning and ventilating booth for anti-disaster shelters

Looking for a partner company that combats COVID-19

We have been working on the research and development on chlorine dioxide technology mobilizing technologies and know-how accumulated mainly through the development of HVAC. We recently conducted a chlorine dioxide-based antivirus test using the real novel coronavirus (SARS-CoV-2) in a nearly real environmental condition in the Japan Textile Products Quality and Technology Center. The test result demonstrated that the novel coronaviruses attached on the surface of an object were reduced 99.9%.
In response to the demonstration test result, we advertised for a partner company to make an open innovation system for prompt commercialization of the technology on a newspaper. With our chlorine dioxide technology and a prospective partner company’s expertise combined, we aim to achieve the development of machinery, the construction of a stable supply network of chlorine dioxide, and the establishment of a supply chain leading to the real on-site work as soon as possible. (*The application is closed now.)


新型コロナウイルスを
(SARS-CoV-2)
99.9%減少
させることが実証されました
高砂熱学
Advertisement on the Nihon Keizai Shimbun on June 15, 2021

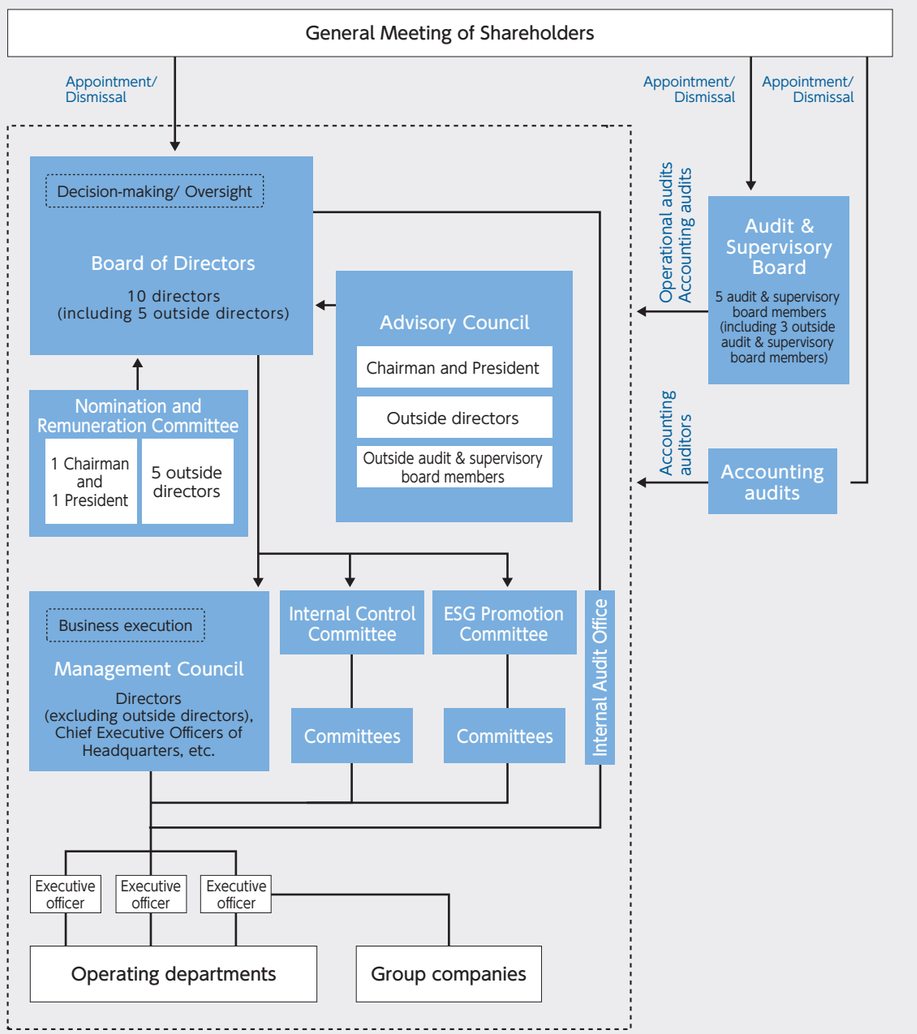
To achieve our Group's sustainable growth and medium and long-term improvement in corporate value, we will work to secure the legality, transparency and agility of corporate management and improve management efficiency.

Corporate governance system

Takasago Thermal Engineering has a Board of Directors and an Audit & Supervisory Board. We have adjusted the number of directors and shortened their term, which is one year at present, and also introduced an executive officer system to clarify management decision-making and supervisory functions as well as business execution functions for prompt and flexible management.

The Board of Directors currently consists of 10 members (including five outside directors) and its meeting is held once a month in principle and on an as-needed basis. At the meetings, the Board of Directors passes resolutions on the matters specified by laws and the articles of incorporation as well as important matters based on the Board of Directors Regulations to supervise the execution of duties by the directors.

● Corporate governance system



The term of directors is one year with specified management responsibility. Outside directors provide useful advice and opinions from an independent perspective while outside audit & supervisory board members provide useful advice and opinions from an objective and professional perspective by attending board meetings. As such, they try to fulfill the roles expected of outside officers.

The Board of Directors strives to improve the efficiency of business management and secures the legality and validity of business execution by making important decisions on business execution and supervising the performance of duties by directors.

The Audit & Supervisory Board currently consists of five members (including three outside audit & supervisory board members). Its meeting is held once a month in principle and an extraordinary meeting is also held when necessary. The Audit & Supervisory Board supervises the execution of duties by the directors through the reporting of audit results to the Board of Directors and other activities.

We have also established the Management Council to enhance deliberation on important matters concerning management and make prompter decisions on the allocation of management resources, as well as the Internal Control Committee to promote the improvement and operation of the internal control system of Takasago Thermal Engineering and its Group in a cross-sectoral manner.

In addition, we have set up the Nomination and Remuneration Committee as an arbitrary advisory body for the Board of Directors. The committee deliberates on the new appointment, reappointment and dismissal of directors, audit & supervisory board members and executive officers of Takasago Thermal Engineering and its subsidiaries to make recommendations to the board (however, the new appointment or reappointment of audit & supervisory board members requires the approval of the Audit & Supervisory Board) as well as the remuneration of the directors and executive officers of Takasago Thermal Engineering and its subsidiaries while also checking the policy and the progress of the plan for the successor of the Director and CEO formulated by the Director and CEO. A majority of the committee must be outside directors.

Furthermore, we have formed the Advisory Council, which consists of Representative Directors, outside directors and outside audit & supervisory board members, as an arbitrary advisory body for the Board of Directors. The Council helps activate the board through such activities as the examination of the structural balance of the Board of Directors as a whole, the analysis and assessment of its effectiveness and the check of the policy for the training of directors and audit & supervisory board members and the provision of information.

In addition to the activities mentioned above, audit & supervisory board members coordinate with accounting auditors and the Internal Audit Office to enhance corporate governance by conducting effective audits through active communication between them.

● Organizations and their members

Title	Name	Board of Directors	Management Council	Audit & Supervisory Board	Nomination and Remuneration* Committee	Internal Control Committee	ESG Promotion Committee	Advisory Council
Chairman and Representative Director, CEO	Atsushi Ouchi	◎	○		○	○	○	◎
President and Representative Director, COO	Kazuhito Kojima	○	◎		○	◎	◎	○
Director and Senior Managing Executive Officer, CFO	Yoshiyuki Hara	○	○			○	○	
Director and Managing Executive Officer	Tadashi Kamiya	○	○			○	○	
Director and Managing Executive Officer, CDXO	Toshikazu Yokote	○	○			○	○	
Outside Director	Kazuo Matsunaga	○			○			○
Outside Director	Kiyoshi Fujimura	○			○			○
Outside Director	Yoko Seki	○			○			○
Outside Director	Makio Fujiwara	○			○			○
Outside Director	Hideka Morimoto	○			○			○
Full-time Audit & Supervisory Board Member	Yukitoshi Yamamoto			◎				
Full-time Audit & Supervisory Board Member	Kunihiro Kondo			○				
Outside Audit & Supervisory Board Member	Tetsuo Ito			○				○
Outside Audit & Supervisory Board Member	Masahiro Seyama			○				○
Outside Audit & Supervisory Board Member	Shigeharu Kawahara			○				○

○: Member of the organization ◎: Head of the organization *The head is elected by mutual vote

Corporate governance system

Audit & supervisory board members

The Audit & Supervisory Board currently consists of five members (including three outside audit & supervisory board members). The audit & supervisory board members monitor the implementation status of governance, attend the Board of Directors' meetings and other important meetings, review important approval documents and visit business sites for on-site audits in accordance with the audit policy and audit plan set by the Audit & Supervisory Board. They also strive to increase the effectiveness of the audits to monitor the execution of duties by the directors through coordination with accounting auditors and the Internal Audit Office and other efforts. For subsidiaries, the audit & supervisory board members exchange information and cooperate with the directors and audit & supervisory board members of subsidiaries at a meeting of the Group Management Council and the Group Audit & Supervisory Board and other occasions. Outside audit & supervisory board members obtain and provide information from an independent standpoint and strive for monitoring from an external perspective. On the other hand, full-time audit & supervisory board members conduct monitoring based on their familiarity with our operations. The audit & supervisory board members are thus enhancing the effectiveness of audits from their respective positions.

Internal audits

Having been established as a section under the direct control of the President, the Internal Audit Office (with seven staff members) conducts systematic audits on the appropriateness and efficiency of business operations from an independent standpoint based on the Internal Audit Regulations. For subsidiaries, the office exchanges information and conducts other activities on an as needed basis. The Internal Audit Office reports the results of audits to the President and Representative Director, COO and also checks the measures to be taken based on the results and the implementation of improvement. It also evaluates the operational status of internal control concerning the financial reporting of our company and important consolidated subsidiaries. While working closely with audit & supervisory board members and accounting auditors, the office works to conduct effective internal audits.

Accounting auditors

The accounting auditing for us is performed by two certified public accountants from KPMG AZSA LLC. Employees responsible for auditing are rotated appropriately, engaging in the job up to 7 consecutive fiscal years.
They are supported by 5 certified public accountants and 9 others.

● Activities of outside officers

Category	Name	Attendance at the Board of Directors' meetings, etc.	Main activities
Director	Kazuo Matsunaga	Board of Directors: 13 out of 13 meetings	With a wealth of experience and insight mainly in the field of public administration, Mr. Matsunaga gives advice and opinions useful for our business management from an independent position. He also served as a member of the Nomination and Remuneration Committee.
Director	Mitoji Yabunaka	Board of Directors: 13 out of 13 meetings	With a wealth of experience and insight mainly in the field of public administration, Mr. Matsunaga gives advice and opinions useful for our business management from an independent position. He also served as a member of the Nomination and Remuneration Committee.
Director	Kiyoshi Fujimura	Board of Directors: 13 out of 13 meetings	With a wealth of experience and insight as a director and CIO of Mitsubishi Corporation, Mr. Fujimura gives advice and opinions useful for our business management from an independent position. He also served as a member of the Nomination and Remuneration Committee.
Director	Yoko Seki	Board of Directors: 13 out of 13 meetings	With expertise mainly as an attorney, Ms. Seki gives advice and opinions useful for our business management. She also served as a member of the Nomination and Remuneration Committee.
Audit & supervisory board member	Tetsuo Ito	Board of Directors: 12 out of 13 meetings Audit & Supervisory Board: 13 out of 13 meetings	With expertise mainly as an attorney, Mr. Ito gives advice and opinions useful for our business management.
Audit & supervisory board member	Masahiro Seyama	Board of Directors: 13 out of 13 meetings Audit & Supervisory Board: 13 out of 13 meetings	With a wealth of experience and insight as president and corporate auditor of overseas affiliates of Matsushita Electric Industrial Co., Ltd. (currently Panasonic Corporation), Mr. Seyama gives advice and opinions useful for our business management from an independent position.
Audit & supervisory board member	Makio Fujiwara	Board of Directors: 13 out of 13 meetings Audit & Supervisory Board: 13 out of 13 meetings	With a wealth of experience and insight as director and corporate auditor, etc. of Tokyo Electric Power Co., Inc. (currently Tokyo Electric Power Company Holdings, Incorporated), Mr. Fujiwara gives advice and opinions useful for our business management from an independent position.

Analysis and evaluation of the effectiveness of the Board of Directors as a whole

We evaluate the effectiveness of the Board of Directors annually based on the self-evaluation of each director and audit & supervisory board member to secure the efficacy and effectiveness of the Board.
Each of the directors and audit & supervisory board members performs a self-evaluation based on the "Self-Evaluation Sheet," and the results are analyzed and evaluated by the Board of Directors after being discussed by Representative Directors and outside officers.
The summary results of this analysis and evaluation are shown below, and we believe that the efficacy and effectiveness of the entire Board of Directors is secured. Given the results, we will work to further improve the supervisory and decision-making functions of the Board.

- As a result of promoting more in-depth discussions at the meetings of the Management Council and the Internal Control Committee, which are organized under the Board of Directors, as well as enhanced internal control, it was confirmed that the appropriate development of highly effective oversight and risk management systems, which is one of the responsibilities of the Board of Directors, has been conducted on a continuous basis.
- It was confirmed that active discussions and full and multifaceted reviews were conducted at the Board of Directors meetings, showing that the Board was vitalized. In addition, there was an opinion that we should deepen more multilateral discussions to further enhance debates about the direction of medium and long-term management.
- When it comes to the COVID-19 pandemic, which is a new risk, it was noted that it is crucial to discuss in depth effects on business, the situation we are in, and countermeasures, among others.

Actions and improvement measures to be taken based on the self-evaluation results
(evaluation implemented in January 2021)

1. Composition of the Board

- While we have promoted the appointment of younger inside directors and female outside directors to diversify the composition of board members, we will ensure diversity and strengthen management supervisory functions by raising the ratio of outside directors, among other methods.

2. Responsibilities of the Board of Directors

- We will enhance debates about the direction of our management based on the medium-term business plan. To this end, we will add provisions of "Items for consideration" to the Rules for the Board of Directors to increase opportunities to discuss the important direction.

3. Training of directors and audit & supervisory board members

- We will continue to organize group training on subjects that help increase corporate value.

4. Operation of the Board of Directors

- We will run a disciplined meeting by clarifying discussion points as ever.
- To clarify points for the discussion, we will work again to ensure the preparation and explanation of materials and recommend the attachment of an executive summary, etc. depending on the subject of the discussion.

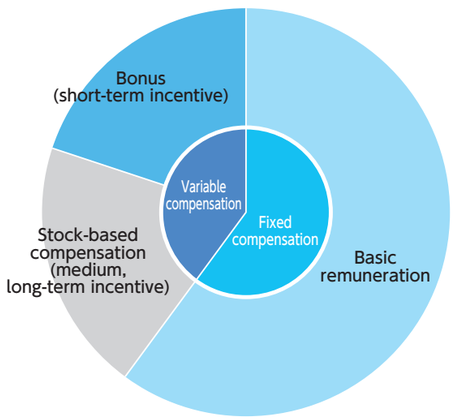
Policy for the training of directors and audit & supervisory board members

We believe that matters required of directors and audit & supervisory board members mainly consist of matters unique to Takasago Thermal Engineering such as necessary knowledge of our businesses, finance and organization and general matters such as the roles required of directors and audit & supervisory board members and their legal and other responsibilities.
Executive directors work to gain a better understanding of general matters, such as our businesses, finance and organization, through discussions at the Management Issue Review Committee every year. Executive directors and audit & supervisory board members that are not outside audit & supervisory board members strive to understand the roles and responsibilities required of directors and audit & supervisory board members by participating in training by external experts.
We provide an explanation of matters such as our businesses, finance and organization to outside directors and outside audit & supervisory board members when they assume their posts and as required, to facilitate the acquisition of knowledge required of our outside directors and outside audit & supervisory board members. As such, we develop an environment for them to fulfill their roles.
In addition, we provide opportunities and services and pay the necessary expenses to acquire and properly update the knowledge required of each director and audit & supervisory board member. The Board of Directors regularly checks progress in the training of executive directors.

Remuneration of executives

As to the remuneration of directors and audit & supervisory board members, we set the upper limit for the total amount of the remuneration, etc. of all the directors and audit & supervisory board members by resolution at a shareholders' meeting.
To enhance the independence, objectivity and transparency of the remuneration of executives, we established the Nomination and Remuneration Committee as an optional advisory body consisting of Representative Directors, the Chairman and Director, the President and Director, and outside directors.
After discussions at the Committee, we determine the remuneration of directors, etc. based on a resolution of the Board of Directors.
For the medium- to long-term growth of our business and continuous and sustainable increases in our corporate value and common interests of shareholders, we have resolved on adopting a policy to ensure that the remuneration system for our directors gives a healthy incentive to them in consideration of various issues including trends on corporate governance, survey data provided by external specialized agencies and the remuneration level in other companies. The specific levels are decided by resolution of the Board of Directors after deliberations in the Nomination and Remuneration Committee.
The remuneration of directors consists of basic remuneration, a bonus as a short-term (annual) incentive and a trust-type stock-based compensation system as a medium- to long-term incentive. The composition is set in consideration of the relevant policy.
Outside directors receive only basic remuneration while no bonus or trust-type stock-based compensation system is provided.
The basic remuneration is determined as a fixed amount according to the position of each of the directors.
For the amount of the bonus, we introduced a new mechanism with an aim to increase the motivation of directors to achieve their single-year performance targets and other goals. In this mechanism, the bonus amount changes from the basic amount for each position based on the performance in the previous fiscal year and qualitative assessment of the individual executives (degree of achievement of the goal for each person, training of successors, improvement of corporate value, commitment to SDGs, vitalization of the Board of Directors and compliance).
The trust-type stock-based compensation system aims to further enhance motivation to contribute to the improvement of medium- to long-term performance and corporate value. Points are granted according to the position of the director every year and the shares of our company that are equivalent to the total points are issued at the time of resignation. The compensation rate varies, depending on to what extent the targets of the achievement indexes were met. The achievement indexes include consolidated net sales, consolidated ordinary income, consolidated ROE for financial indexes and CO_2 emissions, among others, for non-financial indexes. The remuneration of executive officers also consists of basic remuneration, a bonus as a short-term (annual) incentive and a trust-type stock-based compensation system as a medium- to long-term incentive as in the case of directors. The levels are decided by resolution of the Board of Directors after deliberations in the Nomination and Remuneration Committee.
The directors (excluding outside directors) and executive officers make efforts to acquire our shares by voluntary contribution through the Official Shareholding Association.
Remuneration, etc. of audit & supervisory board members is basic remuneration only and the amount of the basic remuneration of each audit & supervisory board member is decided through consultation with audit & supervisory board members based on the comprehensive examination of the content, volume and difficulty of his/her duties, the degree of responsibility, etc. In view of their duties, etc., audit & supervisory board members receive no bonus or trust-type stock-based compensation system or other stock-based remuneration.

● Image of the composition of the remuneration of directors



● Total remuneration, etc. by officer category, the total amount of each type of remuneration and the number of eligible officers

Category	Total amount of remuneration, etc. (million yen)	Number of eligible officers (persons)
Director (except for outside director)	366	7
Outside director	48	4
Audit & supervisory board member (except for outside audit & supervisory board member)	54	2
Outside audit & supervisory board member	47	3
Total	516	16

Policy for constructive dialogue with shareholders

We believe that listening to shareholders and taking proper measures lead to sustainable growth and medium- and long-term improvement in corporate value. Therefore, we are committed to building a constructive relationship with shareholders through dialogue with them and the disclosure of materials.
Our policy on constructive dialogue with shareholders is as mentioned below.

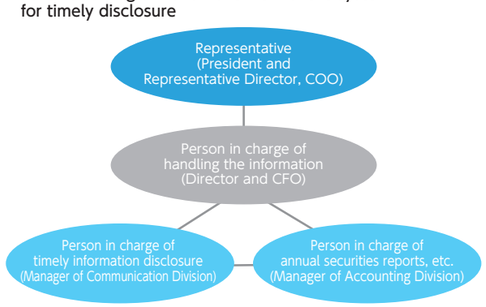
(1) We appoint the President and Representative Director COO as the person who controls the dialogue, the Director and CFO as the person in charge of handling the information, the Manager of the Communication Division as the person in charge of timely disclosure and the Manager of the Accounting Division as the person in charge of annual securities reports, etc. (the structure is shown in the schematic diagram of an overview of the system for timely disclosure later in this page).
(2) The members mentioned above share information and issues on a daily basis through regular meetings and other opportunities for the promotion of coordination while making efforts to take appropriate actions.
(3) In addition to biannual financial results briefing sessions, we plan and organize opportunities for dialogue such as briefing sessions for investors on an as-needed basis. We also participate in external events for investors but did not for FY2020 due to the COVID-19 pandemic.
(4) Directors and senior executives will obtain information directly through attendance at briefing sessions for investors, development of analyst reports and other channels and receive reports from responsible sections regularly and when necessary.
(5) In order to prevent insider trading, we strictly adhere to the Insider Trading Management Rules, which stipulate regulations concerning matters such as compliance with the Financial Instruments and Exchange Act and other related laws as well as the management of internal information. When we have dialogue, we try to manage the information in a way to avoid being suspected of giving any insider information while disclosing information not selectively but fairly. We set the period from the following day of the end of the settlement term (quarterly and full-year) to the date of the announcement of financial statements as a "period of silence." In the meantime, we obtain knowledge on the prevention of insider trading and give education to update the knowledge.

Outline of the timely disclosure system

Our internal system for the timely disclosure of corporate information is described below.

(1) The representative and the person in charge of handling the information endeavor to ensure the timeliness, legitimacy, accuracy and fairness of the information to be disclosed. The information is discussed and reported at the Management Council and Board of Directors meetings as necessary.
(2) The person in charge of timely information disclosure complies with the Timely Disclosure Rules and relevant laws on a daily basis and also collects information from related sections in a prompt and comprehensive manner for the execution of his/her duties. He/she also makes efforts to prepare proper disclosure materials and enhance the disclosure such as investigation of cases of information disclosure in other companies.
(3) Audit & supervisory board members and accounting auditors provide advice and instructions on information disclosure to us in addition to periodical audits. We also seek opinions from third-party experts, etc. when necessary.
(4) We have established the Insider Trading Management Rules and the Disclosure Policy (Information Disclosure Rules) as internal rules, as well as the Group Corporate Code of Ethics, which mentions that they must be strictly followed. Through these and other initiatives, we strive for the prevention of insider trading in our Group including affiliates as well as compliance with the fair disclosure rules.

● Schematic diagram of an overview of the system for timely disclosure



Financial results briefing session

Management team

Directors

Chairman and Representative Director, CEO

Atsushi Ouchi

Date of birth: July 29, 1949

April 1975	Joined Takasago Thermal Engineering
April 2006	Executive Officer
April 2008	Managing Executive Officer; Branch General Manager, Osaka Branch
June 2008	Director and Managing Executive Officer
April 2010	President and Representative Director, COO
January 2015	President and Representative Director, COO; Director in Charge of Engineering Headquarters
April 2015	President and Representative Director, COO
April 2016	Chairman, President and Representative Director, CEO
April 2020	Chairman and Representative Director, CEO (to the present)

Reason for selection as an officer

Having served as President and Representative Director since April 2010 and Director, Chairman and President since April 2016, Atsushi Ouchi engages in management by exercising his leadership as the Group CEO. We believe that, as Chairman and CEO, he can be expected to achieve the Group's sustainable growth as well as medium and long-term improvement in corporate value and to revitalize and strengthen the functions of the Board of Directors.

President and Representative Director, COO; Director in Charge of Global Business Planning Headquarters and Research and Development Headquarters

Kazuhito Kojima

Date of birth: September 6, 1961

April 1984	Joined Takasago Thermal Engineering
April 2015	Deputy Executive Officer; Branch General Manager, Yokohama Branch, East Japan Headquarters
April 2017	Executive Officer
April 2018	Branch General Manager, Osaka Branch
April 2019	Chief Executive Officer, Management Strategy Headquarters
June 2019	Director and Executive Officer
April 2020	President and Representative Director, COO (to the present); Director in Charge of Work Style Reforms and Global Business Planning Headquarters
April 2021	Director in Charge of Global Business Planning Headquarters and Research and Development Headquarters (to the present)

Reason for selection as an officer

Through the execution of the air conditioning equipment business, Kazuhito Kojima has gained abundant experience and deep insight in the design/construction of building equipment relating to the Group's businesses. He has also fulfilled his executive responsibilities through the development of the Group's medium-term/annual business plans and through structural reforms and ESG/SDG-conscious corporate planning operations. We believe that, as President and COO, he can be expected to achieve the Group's sustainable growth as well as medium and long-term improvement in corporate value and to revitalize and strengthen the functions of the Board of Directors.

Director and Senior Managing Executive Officer, CFO; Director in Charge of Risk Supervisory Office and Property Development Management Department

Yoshiyuki Hara

Date of birth: August 12, 1957

April 1981	Joined Nippon Life Insurance Company
April 2012	Joined Takasago Thermal Engineering
April 2013	Deputy Executive Officer; Deputy Chief Executive Officer, Corporate Planning Group
April 2014	Executive Officer
April 2015	Executive Officer; Deputy Chief Executive Officer, Corporate Administration Group
June 2015	Director and Executive Officer; Deputy Chief Executive Officer, Corporate Administration Group
April 2016	Director and Managing Executive Officer; Chief Executive Officer, Corporate Administration Group
April 2017	Chief Executive Officer, Corporate Operations Headquarters; General Manager, Corporate Planning Division; Director in Charge of Management Strategy and Compliance
April 2019	Director in Charge of Management Strategy Headquarters, Corporate Operations Headquarters and Japanese Group Companies
July 2019	Director in Charge of Financial Strategy
April 2020	Director and Senior Managing Executive Officer, CFO (to the present); Director in Charge of Property Development Management Department (to the present)
April 2021	Director in Charge of Risk Supervisory Office (to the present)

Reason for selection as an officer

Yoshiyuki Hara has gained deep insight in finance and banking fields through his years of service with financial institutions. He has also fulfilled his executive responsibilities associated with accounting, finance and planning-related operations toward the enhancement of the Group's corporate governance and management foundation. We believe that, as CFO, he can be expected to achieve the Group's sustainable growth as well as medium and long-term improvement in corporate value and to revitalize and strengthen the functions of the Board of Directors.

Director and
Managing Executive Officer, CDXO; Director in Charge of Compliance, Corporate Operations Headquarters and DX Promotion Headquarters

Toshikazu Yokote

Date of birth: March 29, 1961

April 1985	Joined Takasago Thermal Engineering
April 2017	Deputy Executive Officer; Branch General Manager, Hiroshima Branch
April 2018	Executive Officer
April 2019	Chief Executive Officer, Corporate Operations Headquarters; Officer in Charge of Compliance
June 2019	Director and Executive Officer
April 2020	Director and Managing Executive Officer; Director in Charge of Compliance, Corporate Operations Headquarters and Business Innovation Headquarters
December 2020	Director and Managing Executive Officer, CDXO (to the present)
April 2021	Director in Charge of Compliance, Corporate Operations Headquarters, and DX Promotion Headquarters (to the present)

Reason for selection as an officer

Through the execution of the air conditioning equipment business, Toshikazu Yokote has gained abundant experience and deep insight in the design/construction of building equipment relating to the Group's businesses. He has also fulfilled his executive responsibilities through the enhancement of the management foundation, as an officer in charge of human resources, general affairs, accounting & finance, legal-related operations and DX promotion. We believe that, as Director in Charge of Compliance including overall corporate management, he can be expected to achieve the Group's sustainable growth as well as medium and long-term improvement in corporate value and to revitalize and strengthen the functions of the Board of Directors.

Director and Managing Executive Officer; Chief Executive Officer, Business Management Headquarters and Director in Charge of Quality, Environment and Safety Control, Total Engineering, Group Companies, and Sales & Marketing Headquarters

Tadashi Kamiya

Date of birth: October 19, 1963

April 1986	Joined Takasago Thermal Engineering
April 2016	Deputy Executive Officer; General Manager, Engineering Division, Engineering Headquarters
April 2018	Executive Officer
April 2019	Deputy Chief Executive Officer, Business Management Headquarters; Officer in Charge of Work Style Reforms
June 2019	Director and Executive Officer
April 2020	Director and Managing Executive Officer (to the present); Director in Charge of Quality, Environment & Safety Control, Japanese Group Companies and Business Management Headquarters
April 2021	Chief Executive Officer, Business Management Headquarters; Director in Charge of Quality, Environment and Safety Control, Total Engineering, Group Companies, and Sales & Marketing Headquarters (to the present)

Reason for selection as an officer

Through the execution of the air conditioning equipment business, Tadashi Kamiya has gained abundant experience and deep insight in the design/construction of building equipment relating to the Group's businesses. He has also fulfilled his executive responsibilities through business management and productivity improvement in the air conditioning equipment business. We believe that, as Director in Charge of Quality, Environment & Safety Control including core business management, he can be expected to achieve the Group's sustainable growth as well as medium and long-term improvement in corporate value and to revitalize and strengthen the functions of the Board of Directors.

Director

Kazuo Matsunaga

Date of birth: February 28, 1952

April 1974	Joined Ministry of International Trade and Industry (currently Ministry of Economy, Trade and Industry)
June 2004	Director, Nuclear and Industrial Safety Agency
September 2005	Director-General for Policy Planning and Coordination, Minister's Secretariat
July 2006	Deputy Vice-Minister of Economy, Trade and Industry, Minister's Secretariat
July 2008	Director-General, Economic and Industrial Policy Bureau
July 2010	Vice-Minister of Economy, Trade and Industry
August 2011	Advisor to Ministry of Economy, Trade and Industry
June 2013	Director, Takasago Thermal Engineering (to the present)

[Significant concurrent positions]
Outside Director, Sony Corporation
Outside Director, HASHIMOTO SOGYO HOLDINGS CO., LTD.
Representative Chairman of the Board, Mitsubishi Fuso Truck and Bus Corporation

Reason for selection as an officer

Kazuo Matsunaga has abundant experience and knowledge of public administration and the economy, and we believe that he can supervise and check business management from an independent perspective on business execution based on such experience and knowledge. While he was not involved in corporate management by any other method than serving as outside officer, we believe that he can adequately perform his duty as outside director given the reason mentioned above such as offering advice and opinions useful to our business management. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Management team

Director

Kiyoshi Fujimura

Date of birth: November 3, 1949

April 1972	Joined Mitsubishi Corporation
February 2002	Director and President, Mitsubishi Corporation Financial & Management Services (Japan) Ltd.
June 2003	Corporate Auditor (full-time), Mitsubishi Corporation
June 2007	Executive Officer, Corporate Functional Officer (CIO)
April 2008	Executive Vice President, Corporate Functional Officer (CIO)
April 2009	Director and Executive Vice President, Corporate Functional Officer (CIO)
April 2010	Director and Executive Vice President, officer in charge of auditing and internal controls
June 2012	Resigned from Mitsubishi Corporation
June 2018	Director, Takasago Thermal Engineering (to the present)

Reason for selection as an officer

Kiyoshi Fujimura has abundant experience and knowledge as a former director and CIO in a trading company and we believe that apart from supervising and checking business management from an independent perspective on business execution based on such experience and knowledge, he can adequately perform his duty as outside director appropriately such as offering advice and opinions useful to our business management. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Director

Yoko Seki

Date of birth: August 30, 1970

October 2002	Registered as an attorney
December 2006	Joined Ginza Prime Law Office (to the present)
April 2014	Professor at Kokushikan University (to the present)
June 2019	Director, Takasago Thermal Engineering (to the present)

[Significant concurrent positions]
Outside Corporate Auditor, TAIJU LIFE INSURANCE COMPANY LIMITED
Supervisory Director, AEON REIT Investment Corporation

Reason for selection as an officer

Yoko Seki has abundant experience and knowledge as a lawyer and we believe that she can supervise and check business management from an independent perspective on business execution based on such experience and knowledge. While she was not involved in corporate management by any other method than serving as outside officer, we believe that she can adequately perform her duty as outside director given the reason mentioned above such as offering advice and opinions useful to our business management. In addition, as she is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Director

Makio Fujiwara

Date of birth: August 14, 1950

April 1974	Joined Tokyo Electric Power Company Co., Ltd. (currently Tokyo Electric Power Company Holdings, Incorporated)
June 2007	Senior Director, Group General Manager of New Business Promotion Group
June 2009	Senior Director, Deputy Group General Manager of Sales Group
June 2010	Director and Vice President, Group General Manager of Sales Group
June 2011	Director and Vice President, Group General Manager of Customer Group
June 2011	Senior Corporate Auditor, Chairman of Board of Corporate Auditors
June 2014	Audit & Supervisory Board Member, Takasago Thermal Engineering
June 2021	Director, Takasago Thermal Engineering (to the present)

Reason for selection as an officer

Makio Fujiwara has abundant experience and knowledge as a former director and corporate auditor of Tokyo Electric Power Co., Inc. (currently Tokyo Electric Power Company Holdings, Incorporated) and has offered us advice and opinions useful to our business management as outside director of Takasago Thermal Engineering since June 2014. We believe that he can supervise and check business management from an independent perspective on business execution based on such experience and knowledge. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Director

Hideka Morimoto

Date of birth: January 4, 1957

April 1981	Joined Environmental Agency (currently Ministry of Environment)
August 2011	Councillor, Cabinet Secretariat, Director, Cabinet Secretariat Nuclear Power Safety Regulation Organization Reform Preparatory Office
September 2012	Deputy Secretary-General, the Secretariat of the Nuclear Regulation Authority
July 2014	Minister' s Chief Secretariat of the Environment
July 2017	Administrative Vice-Minister of the Environment
July 2019	Advisor to Ministry of the Environment
April 2020	Professor, Waseda University School of Law (to the present), Advisor to Takasago Thermal Engineering
June 2021	Director, Takasago Thermal Engineering (to the present)

[Significant concurrent positions]
Professor, Waseda University School of Law

Reason for selection as an officer

Hideka Morimoto has abundant experience and knowledge of public administration and the environment, and we believe that he can supervise and check business management from an independent perspective on business execution based on such experience and knowledge. While he was not involved in corporate management by any other method than serving as outside officer,, we believe that he can adequately perform his duty as outside director given the reason mentioned above such as offering advice and opinions useful to our business management. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Audit & Supervisory Board Members

Full-time Audit & Supervisory Board Member

Yukitoshi Yamamoto

Date of birth: November 23, 1951

April 1974	Joined Takasago Thermal Engineering
April 2012	Executive Officer
April 2013	Managing Executive Officer; Deputy General Manager, Management Headquarters
April 2014	Deputy Chief Executive Officer, Corporate Administration Group
April 2015	Advisor
June 2015	Full-time Audit & Supervisory Board Member (to the present)

Reason for selection as an officer

We believe that Yukitoshi Yamamoto can supervise and check business management by using his knowledge of construction, overall technology such as technological administration and general administration such as general affairs and human resources.

Full-time Audit & Supervisory Board Member

Kunihiro Kondo

Date of birth: January 28, 1957

April 1980	Joined Fuji Bank, Limited (currently Mizuho Bank, Ltd.)
April 2004	Branch Manager of Kudan Branch, Mizuho Bank, Ltd.
April 2007	Executive Officer; Branch Manager of Osaka Branch
April 2010	Corporate Auditor of Mizuho Private Wealth Management Co., Ltd.
April 2011	Joined Takasago Thermal Engineering; Executive Officer; Deputy General Manager of the Tokyo Main Office, East Japan Headquarters
April 2012	Executive Officer; Officer in Charge of Sales and Marketing, East Japan Headquarters
April 2014	Executive Officer; Deputy Chief Executive Officer, Sales and Marketing Headquarters
April 2017	Advisor, Takasago Thermal Engineering
June 2017	Full-time Audit & Supervisory Board Member (to the present)

Reason for selection as an officer

Kunihiro Kondo has abundant experience and knowledge of finance and accounting from his work at financial institutions. As he has served as Deputy General Manager of the Tokyo Main Office and Deputy Chief Executive Officer of the Sales & Marketing Headquarters since joining Takasago Thermal Engineering, we believe that he can supervise and check business management.

Audit & Supervisory Board Member

Tetsuo Ito

Date of birth: March 15, 1948

September 1972	Passed the National Bar Examination
April 1975	Became a public prosecutor
June 2001	Chief of Special Investigation Department, Tokyo District Public Prosecutors Office
July 2007	Chief Prosecutor, Tokyo District Public Prosecutors Office
July 2008	Chief Prosecutor, Takamatsu High Public Prosecutors Office
January 2009	Deputy Chief Prosecutor, Supreme Public Prosecutors Office
December 2010	Retired from public service
April 2011	Registered as an attorney
June 2014	Audit & Supervisory Board Member, Takasago Thermal Engineering (to the present)

[Significant concurrent positions]
Of Counsel, Nishimura & Asashi Outside Corporate Auditor,
Asahi Kasei Corporation Outside Director, Japan Petroleum Exploration Co., Ltd.

Reason for selection as an officer

We believe that Tetsuo Ito is capable of conducting a proper audit from a professional perspective nurtured through his long years of experience as a prosecutor and a lawyer. As a result, we believe that he can adequately perform his duty as an outside audit & supervisory board member. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Audit & Supervisory Board Member

Masahiro Seyama

Date of birth: July 18, 1949

April 1972	Joined Matsushita Electric Industry Co., Ltd. (currently Panasonic Corporation)
September 1995	Seconded to Panasonic Latin America Co., Ltd.; responsible for sales
September 1999	General Manager of Planning Division and General Manager of Sales Division, Central and South America Group, Matsushita Electric Industry Co., Ltd. (currently Panasonic Corporation)
February 2001	President of Matsushita Electric Brazil, LLC
June 2005	Group General Manager, Central and South America Group, Matsushita Electric Industry Co., Ltd. (currently Panasonic Corporation)
June 2008	Senior Corporate Auditor (full-time)
June 2014	Audit & Supervisory Board Member, Takasago Thermal Engineering (to the present)

Reason for selection as an officer

We believe that Masahiro Seyama has abundant experience and knowledge as president and corporate auditor of overseas affiliates of Matsushita Electric Industrial Co., Ltd. (currently Panasonic Corporation) and is capable of conducting a proper audit based on such experience and knowledge. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

Audit & Supervisory Board Member

Shigeharu Kawahara

Date of birth: November 19, 1949

April 1973	Joined Sony (currently Sony Group Corporation)
January 1983	Moved to Sony Corporation of America
April 1996	Joined KPMG Peat Marwick
October 1996	KPMG partner
February 2003	Representative partner, KPMG AZSA LLC
July 2012	Representative, Public Certified Accountant Shigeharu Kawahara Office (to the present)
June 2016	Independent outside director, compensation committee member, audit committee member, Hitachi Capital Corporation (currently Mitsubishi HC Capital Inc.)
September 2016	Special assistant, Hitotsubashi University CFO Educational Research Center
June 2021	Auditor, Takasago Thermal Engineering (to the present)

[Significant concurrent positions]
Representative, Public Certified Accountant Shigeharu Kawahara Office

Reason for selection as an officer

Shigeharu Kawahara has abundant experience and knowledge as a certified public accountant, and we believe that he can perform a proper audit based on such experience and knowledge. In addition, as he is not from a parent company, a fellow subsidiary, a major shareholder or a major client or supplier of Takasago Thermal Engineering, we believe that there is no particular problem in terms of independence.

I will spare no effort to provide full support so that the company will realize the potential as an environmental creator® in the face of the global environmental preservation era.

Hideka Morimoto
Outside director, former Administrative Vice-Minister of the Environment

Served as Deputy Secretary-General of the Secretariat of the Nuclear Regulation Authority, Minister's Chief Secretariat of the Environment, Administrative Vice-Minister of the Environment.
Having abundant knowledge on and deep insight into the environment.
Concurrently serving as professor, Waseda University School of Law.

What is your aspiration as outside director?

I had been working in the Ministry of the Environment for some 40 years and approaching a big theme, environmental preservation, from different angles. From my environmental experiences, I saw massive potential in a would-be environmental creator® Takasago Thermal Engineering.
Public administration tries to view public intentions complicatedly intertwined in society from a wider perspective and strike a balance among them. Companies, on the other hand, develop their business by establishing their strengths in their business fields. Such a corporate pattern of thinking and behavior drives knowledge accumulation and growth motivation, while making them short-sighted. I thought that by connecting the Takasago Thermal Engineering Group's knowledge and human resources with other companies' or organizations' resources I could help produce enormous synergy effects. One advantage of engaging in public administration is, I strongly believe, to have chances to meet different people without interests and I thought that the time had come to put my experiences to use.
Very thankful for the opportunity to contribute to the Takasago Thermal Engineering Group's commitment to the best of my ability as outside director, I accepted the job, excited.

How should we view the business environment facing the Takasago Thermal Engineering Group in terms of the global environmental preservation?

Climate change is attracting global attention as a matter of urgency. Climate change has both "Risk" and "Opportunity." To such businesses that consume a lot of resources and emit a lot of CO_2, climate change is a serious risk when conducting business operations.
Companies such as the Takasago Thermal Engineering Group, which engages in air conditioning and environmental and energy management, however, are in a position to be able to adapt technologies and know-how developed thus far to new rules to create new fields. It seems to me that for the company climate change is more of an opportunity than a risk.
Climate change impact is far-reaching enough to influence urban forms and lifestyles, not limited to buildings and equipment, which also means that new markets and business opportunities can be created.

How do you rate the Takasago Thermal Engineering Group's efforts thus far?

I think that the attitude of going forward grasping situations appropriately is shared in-house and is being promoted. In one internal hydrogen technology working group that I am part of, I feel the young engineers' strong passion. Meanwhile, when it comes to the practical aspects such as whether we are engaged in each of the important issues, how much the commercialization of new technologies is in progress, and their originality, I am looking forward to future progress.
I am also interested in the Takasago Thermal Engineering Group advancing R&D from both short-term and medium- to long-term standpoints.
In addition to the core business centered on air conditioning, the company is focusing on the development of new technologies like the world's first electrolysis of water on the moon as well as biomass cogeneration as a research theme with an aim to have it practically used in society. In such a multifaceted approach do I see the potential for technological expansion.

What is needed to be universally recognized as an environmental creator®?

I think that the concept of environmental creator® consists of 3 aspects or phases.
First, prevention of environmental pollution, the basis of environmental policy. In the air environment or indoor environment, environmental risks by pollutants or viruses have to be averted. This is the field in which the Takasago Thermal Engineering Group is going ahead.
Second, creation of high-quality space. The company has the potential for becoming more comfort-oriented and environmentally friendly. To create high-quality workplaces and living places, a broader perspective is required as illustrated in paying attention to the supply chain involving materials used.
Third, creation of a new environment as the name environmental creator® literally shows. It is hoped that the company will live up to customers' and users' expectations by mobilizing its equipment and energy technologies.
Approaching environmental issues is, in other words, taking actions for future generations, an important perspective for an environmental creator®. I hope that the company, which sees young employees actively participating in working activities, will continue to foster and develop such spirit.

What stances are required of the Takasago Thermal Engineering Group in the future?

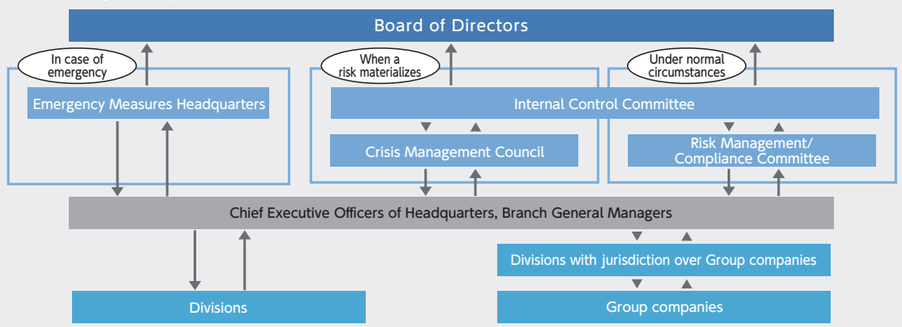
As social needs change and become diversified, the company's approach to the job has to evolve. It is essential to come face-to-face with customers and uses, grasp them properly and live up to their needs.
In my view without fear of misunderstanding, it is natural for the company to become more trading company-like. To create new needs certainly, the process of discovering what is required by paying attention to the entire supply chain, not limited to conventional areas, and finding how to address those issues is important. In this respect, the company's technologies and know-how amassed thus far are sure to flourish.
This trading company-like approach becomes more important as overseas operations are expected to grow. To run a project with local overseas companies, passions for engagement overseas and the flexibility to overcome cultural differences as well with an open-minded attitude needed to dig up local technologies are indispensable.
In the process of this evolution, I believe that I can contribute to the company with my background. I will spare no effort to provide full support so that the Takasago Thermal Engineering Group will be able to realize its potential in more areas to have the company's technologies and solutions socially implemented.

We are committed to measures to prevent management risks from materializing and adequate initial measures and subsequent actions to minimize the impact of crisis.

Risk Management

The Takasago Thermal Engineering Group carries out risk management to prevent all risks from materializing and minimize damage in case a risk actually materializes. To prevent risks from materializing, we established the Risk Management Committee chaired by Director and CFO (Chief Financial Officer), in which President and Representative Director, COO (Chief Operating Officer) serves as the chief officer, in accordance with the Risk Management Regulations. The committee is responsible for the development of the operating policy and plan for the risk management system, the identification of any risks that may have a significant impact on our Group and the evaluation of the adequacy of measures to address risks. We have developed a system to minimize damage and loss in case a risk materializes to cause a crisis in accordance with the Crisis Management Regulations.

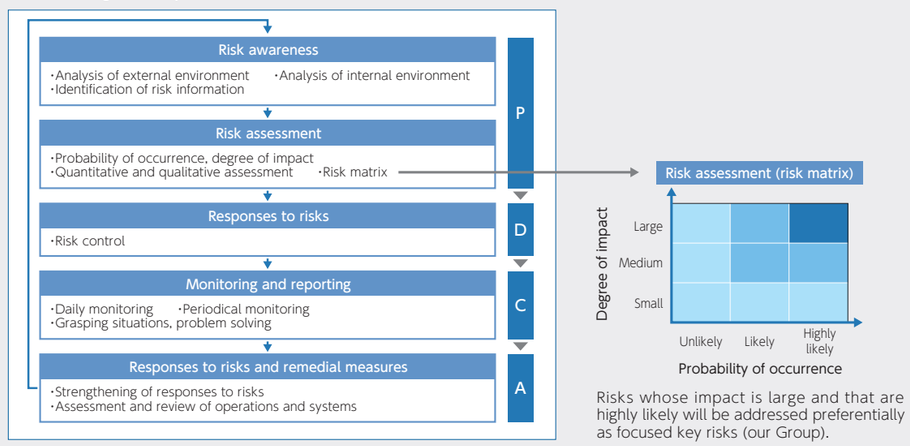
● Risk management system



Risk management cycle

In our Group, the Risk Management / Compliance Committee is responsible for identifying and assessing risks to determine what risks to prioritize and to make sure that risk awareness is shared on a group-wide basis. In risk management, we give first priority to the risks that especially have a large impact on business management and can occur with a high probability as focused key risks. By having the Group-wide Risk Management / Compliance Committee, whose sessions take place 5 times a year, and review progress and problems every quarter, we enhance the PDCA cycle that contributes to risk reduction activities.

● Risk management cycle



Risks whose impact is large and that are highly likely will be addressed preferentially as focused key risks (our Group).

Business and other risks

We have identified the risks that may have significant impacts on the financial conditions, corporate performance, cash flow, etc. of our Group as listed below. We will take various measures to address them to reduce the risks.

Business environmental risks

Risk item	Assumed impact	Measures to address the risk
Fluctuations in private capital investment	As a result of the suspension, postponement, change,etc. of investment plans of customers, the demand for construction and HVAC systems may fall more than previously estimated.	We will implement comprehensive company-wide measures including the reduction of fixed costs.
Fluctuations in procurement costs	When material and equipment prices for duct, piping, heat insulation, refrigerant and other utility works have sharply risen but it is difficult to reflect the cost increase on the contract amount, the costs of the construction work may increase more than previously estimated.	We will strengthen the procurement function based on the advantage of scale by enhancing the system to control purchases and accelerating the integration of purchases by all offices.
Shortage of technical staff and skilled workers	We may fail to establish a sufficient construction structure to complete the construction work by the specified deadline and lose the trust of customers as a result.	We will try to improve productivity through the establishment and use of an outsourcing system, the utilization of IT tools such as Apple Watch and SPIDERPLUS and standardization of operations and secure technical staff through commitment to the recruitment of new workers in contract construction firms and the introduction of the construction career development system promoted by the MLIT.
Overseas business development	We may face various risks in the target countries such as the regulations and supervision by authorities including voluntary regulatory bodies, economic and political instability and differences in business practices, as well as intensified competition with competitors that have a competitive edge in a specific country/region or the global market.	We will promote the review of the strategic bases in our international businesses as a whole and implement proper monitoring through the constant exchange of information with overseas Group companies.
Expansion of the business fields	In a target market, the technologies we own may not be suitable or we may not be able to achieve the initially anticipated results depending on the speed of the market expansion, the scale of the growth or difficulty in entering the market.	We will judge whether we need to withdraw from the market or not according to the predetermined criteria.
M&A/ Investment	Contingent liabilities may occur or unrecognized liabilities may be found after an acquisition. The possibility to recover the invested capital may decline to losing the whole or part of the investment if the revenue cannot be produced as expected due to changes in the business environment, sluggish performance of the invested company, etc.	Before an M&A or investment, we will perform due diligence on details including the financial statements and contractual relationships of the target company.
Trend of the financial Market/ Decrease in the credit strength of our Group	We may fail to raise funds in a timely manner under favorable conditions for our Group, which may constrain the execution of our business.	We will successively communicate and exchange information with financial institutions.
Occurrence of liability for damage or liability for non-conformity	We may be required to pay compensation for damage that is too large to be covered by the umbrella liability insurance carried for unforeseeable circumstances.	To prevent such a situation, we will thoroughly control health and safety through measures such as the provision of instructions on health and safety to sites and the establishment of a proper working environment.
Aging of employees	Decreases in the number of employees are anticipated due to increases in the employees who retire at mandatory retirement age, possibly leading to problems for our future business activities.	We will promote long-term employment by reinforcing the retirement age extension and re-employment systems and increase productivity with labor saving and efficiency improvement through the visualization of techniques by using IoT, etc. We will enhance the use of diverse human resources including international personnel.
Appointment of young workers and professional human resources	If we cannot appoint sufficient young workers and professional human resources, it may create problems for the continuity of our business activities.	We will visit universities, etc. in Japan actively, organize recruitment workshops and conduct an internship program while also increasing professional human resources by employing mid-career workers.
Absence or infringement of patents	The technologies, etc. used in our Group are not protected if we fail to acquire their patent rights and other intellectual property rights. In the meantime, in case we unintentionally infringe any patent rights and other intellectual property rights of others, we may be required to pay compensation for damage.	We will establish a system to thoroughly investigate infringed patents and constantly share information among all departments.
Asset holding	Marketable stocks, etc. involve the risk of price fluctuations. We may suffer an impairment loss due to a significant decline in market prices and post it as an extraordinary loss.	While paying attention to the economic trends, we will consider options, including the sale of the assets we own, to reduce the risk of a decrease in the value of the assets.
Fluctuations in the exchange rate	The financial results, assets and liabilities of overseas affiliates can be affected by fluctuations in the exchange rate because those figures are converted from the local currency to yen for the preparation of consolidated financial statements.	When conducting a transaction in a foreign currency, we will try to reduce the risk of fluctuations in the exchange rate with foreign exchange reserves and other actions while paying attention to the economic trends.

Business environmental risks (continued from the previous page)

Risk item	Assumed impact	Measures to address the risk
Possession of personal information and secret information of customers	In case of external leakage, abuse, etc. of information with illegal access, etc., we may be involved in a legal dispute and subject to punishment from supervisory authorities in Japan and overseas.	We will take measures to address cyber-attacks and strengthen IT governance. To enhance our approaches to incidents, we aim to construct a Computer Security Incident Report Team (CSIRT) system while giving relevant training to employees and taking other initiatives to improve their information technology literacy.
Application of legal regulations, etc	The operation of our Group may be subject to new constraints due to the establishment or revision of legal regulations, withdrawal of an approval/license or punishment by supervisory authorities, the establishment or revision of new guidelines or voluntary rules, etc.	We will promote cross-sectoral initiatives for compliance in the Group and report the status of the initiatives to the Risk Management Committee and the Board of Directors to ensure proper execution of duties while also conducting internal audits to reinforce the compliance system.
Lawsuits, etc.	Our Group may face lawsuits and other claims concerning various issues including the environment, labor and intellectual property rights.	We will try to prevent them through the establishment of a crisis management system to prepare for emergencies, as well as the activities of the Crisis Management Council, while also purchasing various insurance policies.
Natural disasters	The occurrence of large-scale natural disasters, such as earthquakes, typhoons and tsunamis, and the pandemic of infectious diseases might result in a suspension or significant delay of construction works as well as a decline in the demand for construction due to the slowdown of economic activities in society as a whole.	We will work to improve the accuracy of the business continuity planning (BCP) manual and develop measures to address emergencies.
Expansion and prolongation of infectious diseases	The growing number of in-house infections could disturb operations. Or a decline in the demand for construction due to the economic downturn, as well as sharp rises in the prices of materials and equipment, is likely.	We will set up task forces internally and take various measures to prevent infection and develop measures to address emergencies.

Strengthening of our capabilities to respond to disasters, etc. based on business continuity plans (BCPs)

In preparation for large-scale earthquakes, we established business continuity plans (BCPs) in April 2014. The BCPs specify the initial response and recovery procedures in case of the occurrence of a large-scale earthquake to establish a system for business continuity within a target time while also setting up a system to fulfill social responsibilities to be assumed by the construction industry at the time of a disaster, including support for the restoration of hospitals and other facilities of a highly public nature and the supply chains of customers.

In FY2020, we compiled the activities we had implemented to cope with the ongoing COVID-19 pandemic as a business continuity plan (BCP manual on infectious diseases) to prepare for the pandemic of such diseases that can occur in the future.

In the face of the COVID-19 pandemic, we conducted: a support simulation in the case where on-site employees have been certified as someone in close contact with those infected; a business transfer drill in the case where all staff in a particular department in the Head Office are prohibited from showing up because they have been certified as someone in close contact with those infected; and a BCP drill including a safety confirmation drill in the case where an earthquake with seismic intensity of 6 upper has broken out in the midst of the COVID-19 pandemic and a Head Office-wide initial action drill in the event of an earthquake occurring directly beneath the Tokyo Metropolitan Area. The findings from these drills are already reflected in the manual above.


Scene of COVID-19 meeting

Promotion of information security measures

We view information security as an important business issue and to prevent information security accidents such as information leakage surrounding personal information, customers' and partners' information as well as all types of information handled in the process of work, we have the Basic Policy for Information Security in place to strengthen information security on a Group-wide basis.

Information security management and promotion structure

In addition to appointing the officer responsible for risk management as the information security supervisor for the company and the entire Group, we have the Information Security Committee operating under the Company-wide Risk and Compliance Committee to strengthen information security measures and manage the state of their implementation, to provide security education to employees, and to respond to and control information security incidents.

Information security measures

In view of the expansion of teleworking accompanied by the COVID-19 pandemic, the use of digital technology promoted by Digital Transformation (DX), highly developed and diversified cyberattacks, among others, we reviewed information risks and are working on information security measures.

- Revision of information rules and regulations to respond to new risks
- Strengthening of authentication methods and networks to counter illegal accesses
- Implementation of coding to reduce damage by accidents including information leakage
- Strengthening of the operational mechanism of the Security Operation Center (SOC) and monitoring
- Strengthening of the operational mechanism of the Computer Security Incident Response Team (CSIRT)

Education on information security

In addition to offering e-learning to all employees, we distributed a brochure that contains essentials on information security (general version and construction-site version) to raise employees' awareness of information management.

Compliance

We comply with legislation concerning information security at home and abroad, personal information protection, data transfer, among others, and check relevant legislation when needed for appropriate responses and measures.

To ensure that our sites can constantly achieve the aggressive target of "the creation of the best product quality," we are committed to initiatives from multidimensional viewpoints.

What is the best product quality?

To provide value to customers and get them to realize the value, it is important to consider that customers can realize the value only when they make full use of the goods. Therefore, quality assurance cannot be completed without taking how customers use the goods into consideration. Our organization also has to establish a quality assurance system that does not only meet the performance and service specifications required by customers but also includes the process until customers can realize the value through the provided performance and services. We aim for an ideal quality assurance system where quality is based on the perspective of ensuring that customers can realize the value at the highest level, in addition to the performance of the goods.

Basic policies on quality and the environment * Those related to quality are extracted.

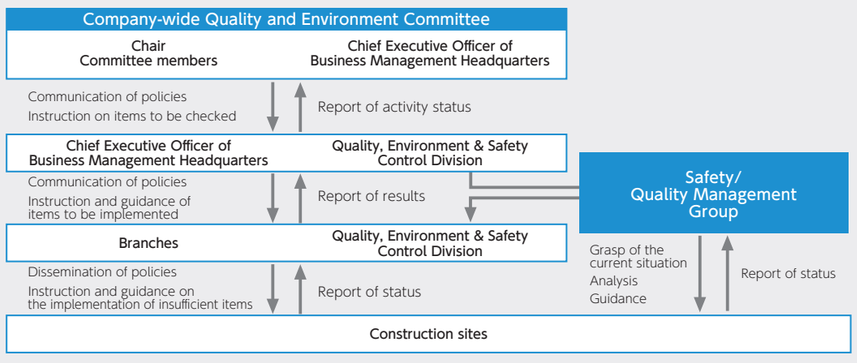
1. We will work to understand customer needs and provide the best quality that contributes to the corporate activities of customers.
2. We will comply with relevant laws as required.
3. We will promote research and development and provide advanced quality.
4. We will provide services continuously through the life cycle of construction facilities.
5. To promote them, we will develop a quality control system and work to maintain and improve it continuously.

Quality control system

Based on the quality management system certification (ISO 9001:2015) obtained, we will improve ourselves continuously so that we can offer quality goods and services to customers as soon as possible. We will also proactively offer proposals concerning a CO_2- or energy-saving system and its operation to create new added value in customers' facilities.
As an initiative to enhance quality control, we set up the Safety/Quality Management Group in the Business Management Headquarters to integrate the quality control system. We have a remote joint inspection or a cross-patrol control using DX technology in action starting FY2021 to work on improvement in the control level and quality equalization.
We carried out a remote safety and quality patrol with three locations, our overseas local subsidiary (China) office, its construction site, and the Head Office connected.

Remote safety and quality patrol

● Organizational chart



Basic concept for occupational health and safety

Under our safety and health philosophy "Safety is the top priority in carrying out all business tasks," we strive for health and safety activities on construction sites based on the basic approach "The employees working for Takasago Thermal Engineering and their families must never suffer from accidents at construction sites."

Cooperation with partner companies

To enhance cooperation with the partner companies working together on the construction sites, we organized Kowakai in 2003 with our partner companies included as the members. While being subject to our guidance and instructions concerning cost, quality, delivery time, safety and health and environmental conservation, the organization continues autonomous activities to improve each member's management level.
In FY2020, amid the COVID-19 pandemic, we implemented such countermeasures as free distribution of antivirus masks to the members and compensation for loss of wages for workers who were suspended from work due to site shutdown.
Kowakai consists of the headquarters and branches. The health and safety cooperation committee established in each of them is committed to the communication of information on safety and health technologies, PR activities and thorough dissemination of relevant laws. The branches implement activities to improve health and safety including the Branch Office Health and Safety Convention. Kowakai also operates an online system for safety improvement, TKCS-s (Takasago Kowakai Communication Systems-safety), to share safety information.

Analysis and identification of risks and measures to address them

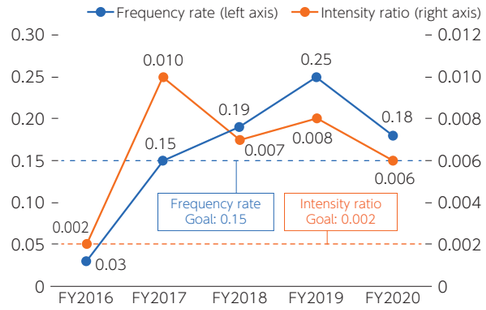
We see the elimination of 3 accidents leading to serious accidents in recent years as a priority, coming up with actions to do to prevent them. To put the target into action, we compile concrete actions to do in the Safety and Health Activities Policy, which we issue early in each term, to disseminate them to all technical staff and partner companies. In addition, we include risk assessment in the safety and health management, urging each construction site to focus on prevention of risks and measures against them.
What with the pandemic and DX, we have developed the Company-wide Safety and Health Conference and the safety and health patrol into remote versions, trying to raise all employees' and partner companies' awareness of safety and health activities and risk management level.

Remote version of the Company-wide Safety and Health Conference

Safety records by year and pursuit of the elimination of accidents

In fiscal 2020, 47 accidents (6 lost-time injuries and 41 non-lost-time injuries) occurred, which resulted in failure to meet the safety targets.
When it comes to the accidents leading to lost-time injuries in particular, we will incorporate recurrence prevention measures in the Safety and Health Activities Policy after a thorough analysis of cause to promote zero accidents.

●Safety records by year: Frequency rate and intensity ratio in the past 5 years (%)

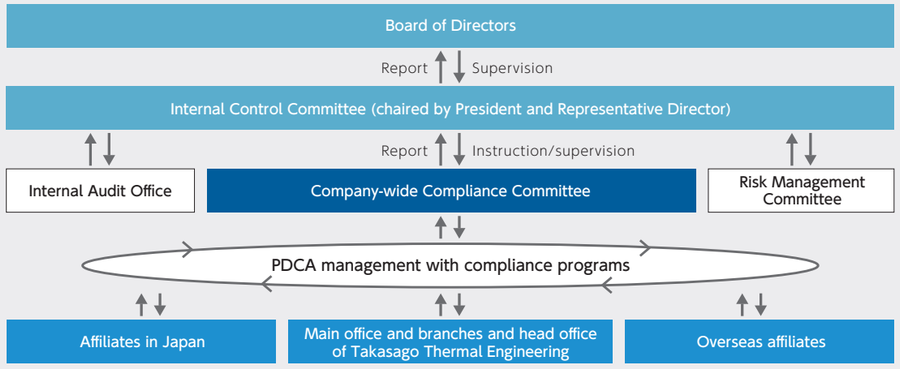


Based on the recognition that the establishment of compliance is the foundation for strengthening corporate governance, we are continuously working to enhance the awareness of compliance and ensure it in daily activities

Compliance promotion system

We have set up the Compliance Committee chaired by the officer in charge of the supervision of risk management in the Takasago Thermal Engineering Group as a whole. This committee takes various measures based on the basic policy on compliance. The Compliance Office, which is a dedicated section, is committed to establishing the compliance system and promoting measures for it including the transmission of information to executives and employees and the dissemination of the consultation and reporting counters.
While incorporating major subjects on compliance, such as the prevention of harassment and compliance with competition laws, into the compliance programs, we work to promote compliance through shared recognition of problems as well as the confirmation of progress in measures and the examination of cooperation and coordination between departments by the Company-wide Risk Management/ Compliance Committee.
An officer in charge of corporate ethics and staff in charge of the promotion are appointed in each of our affiliates in Japan and overseas to enhance coordination with us and continuously develop the Group-wide system.

● Organizational chart of compliance in the Group



Continuous activities to promote compliance

Awareness-raising activities with Group Corporate Code of Ethics and various tools

We have established the Group Action Guidelines as the basic action guide for executives and employees and distributed a portable booklet "Group Corporate Code of Ethics" to executives and employees to use for daily duties, in-house training and other purposes.
In addition, we organize various training programs on compliance for not only employees but also partner companies and periodically prepare and distribute tools for small study sessions in workplaces.

Compliance awareness survey

We conduct a compliance awareness survey once a year to grasp yearly changes and any new trends in the awareness of compliance among employees.
This survey asks questions about the awareness of various types of harassment and the awareness among employees about placing orders, as well as circumstances in the company, to identify any problems and solve them quickly.
The results of the survey in fiscal 2020 brought some labor problems to the surface while there was a sign of improvement in awareness of compliance as a whole. The answers to harassment-related questions presented gaps between different positions and other attributes. Accordingly, we will continue to develop activities to prevent harassment and raise awareness of it.
The survey results are disclosed to all employees and used for compliance training and other purposes in each department. The analysis of the answers is reported to various committees to share the problems and help develop action policies and measures for improvement.

Maintenance of proper relationships with customers (commitment to the prevention of bribery)

To maintain proper relationships with customers, we have prohibited excessive business entertainment, in addition to the offering of bribes to government workers, etc. and commercial bribery to private customers, in the Group Corporate Code of Ethics.
In consideration of the current international situation and other factors, we have also established the rules concerning the prevention of bribery that explicitly prevent bribery in each of our subsidiaries in Japan and overseas. The effectiveness of the rules is enhanced through the adaptation of them to the local culture and business practices as well as regular monitoring.

Measures to comply with the Anti-Monopoly Act

For thorough compliance with the Anti-Monopoly Act and other competition-related laws, we have specified and practiced measures for each of the stages from "prevention" to "detection and early discovery," "response to the occurrence or suspicion of a violation" and "measures to prevent any violations from being forgotten or the rules from losing substance."
Our executives and employees will strive for thorough compliance and we will continue to create an environment for the continuous execution of sound operations.

Prevention	•Clarification of rules with the Basic Rules on Compliance with Competition Law and the Guidelines on Compliance with Competition Law and periodical review of them •Enhancement and improvement of training for compliance with competition laws
Detection and early discovery	•Check and storage of records on contact with competitors •Voluntary inspection by sales sections and management sections •Internal audits or monitoring by legal sections
Response to the occurrence or suspicion of a violation	•Establishment of procedures to prevent violations •Development of an in-house investigation system
Measures to prevent any violations from being forgotten or the rules from losing substance	•Periodical review and implementation of training in the "Compliance Month" •Report of the status of management and operation of the Competition Law Compliance Program to the Internal Control Committee and the Board of Directors

Whistle-blower system

We have established wide-ranging consulting counters including lawyers and external services, in addition to an internal section in charge of the system. To ensure that the counters can be used with a sense of security, the Rules on the Protection of Whistle-blowers in the Group have been stipulated and operated.
In fiscal 2020, we received a total of 6 reports through this system, including reports on harassment and opinions to the company.
The reports are passed to the Company-wide Compliance Committee and the Whistle-blowing Committee, while the protection of the whistle-blowers is ensured, to identify and remedy problems early. The content of the reports is also reflected in the subjects selected for compliance training. We thus use this system for our efforts to prevent problems.
In overseas bases, we work to make the whistle-blower system known and promote the establishment of the counters in multiple languages.

● The number of reports made in the whistle-blower system by category

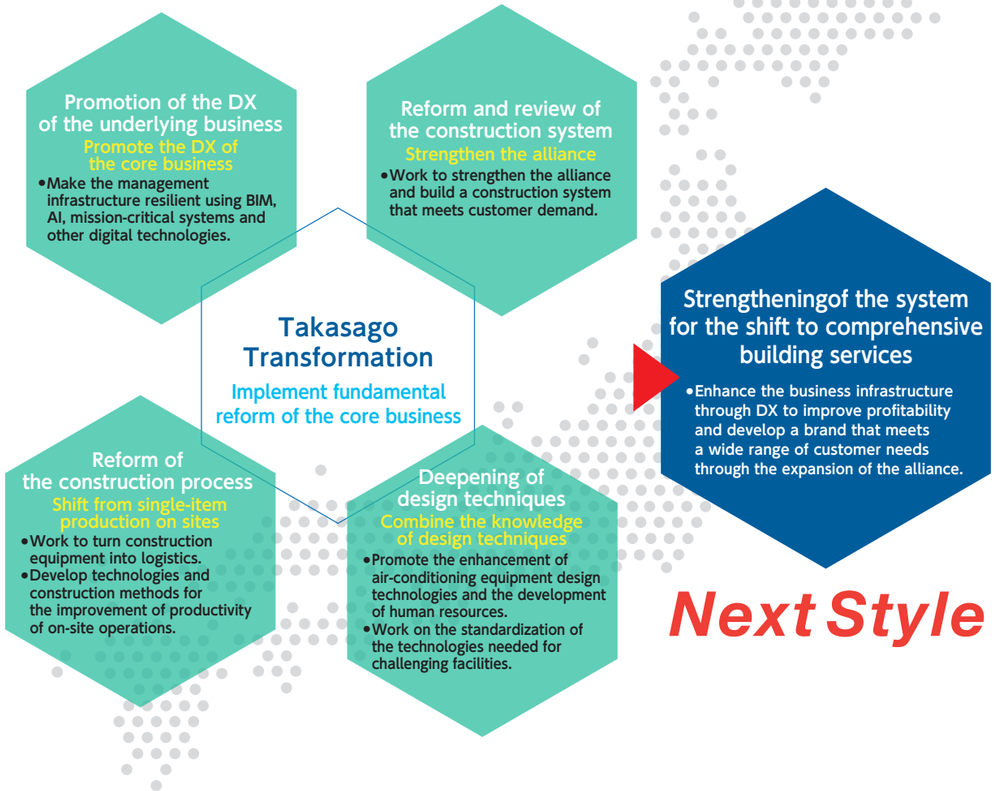
Figures in parentheses are the number of cases not corrected

Category	FY2018	FY2019	FY2020
Harassment	2 (0)	5 (1)	4 (1)
Complaints about superiors	—	1 (0)	0 (0)
Opinions to the company	1 (1)	1 (0)	1 (0)
Other including labor management	2 (1)	3 (0)	1 (1)
Total number of reports	5 (2)	10 (1)	6 (2)

Growth strategy

Making business in Japan resilient

On the basis of the worsening of business conditions anticipated in the future including decreases in construction investment and labor population and changes in the business structure as a result of technical innovations, we will work for the fundamental reform of the core business and strengthening of management infrastructure for the future.



Recognition of the current situation and challenges

Construction demand is likely to be steady for a while as it is stimulated by growing demand for semiconductors in industrial fields and large cities redevelopment. Meanwhile, to address skyrocketing labor costs and the labor shortage, we need to be committed to bold reforms such as productivity improvement and a shift to a new work style.
We will shift from the old-fashioned ways of doing jobs in the construction industry to a new work style and reform work processes hugely by establishing a platform that integrates the technological and sales capabilities we have cultivated over many years with digital techniques and developing supply chain management (SCM) with production bases that function as the hubs for affiliated companies and construction sites.
We will also systemize know-how developed as design and construction skills by using digital techniques to further sophisticate the skills and continuously hand them down.
While there has been a gap in planning capabilities, abilities to prepare resources and construction quality between construction sites, as well as a gap in the level of specific skills between workers, we will level them at high levels through the initiatives mentioned above and promote business operation for the achievement of the highest quality and high productivity.

Details of initiatives

Deepening of design techniques

In an effort to centralize and advance design techniques, and develop human resources, we founded the Design Supervisory Department in the Head Office in FY2020. In FY2021, we installed the Design Supervisory Office to enhance design capabilities and expand our activities.
We will take on facilities at home and abroad that need advanced techniques on a company-wide basis. We will also make proposals in various ways such as CO_2- or energy-saving systems, the energy solution business, and operational support for customers' satisfaction and added value creation.
In a bid to respond to more challenging facilities and special technologies, and to hand down design techniques, we will develop the technological specialist program, which we have been running since 1986, into a high technology team, which we will actively promote internally and externally.

Review of the construction system and reform of the construction process

Under the leadership of the Productivity Improvement Planning Office in the Business Management Headquarters, T-Base®, a platform that amassed craftsmanship and digital technologies developed thus far, was created.
Breaking away from the conventional single-item production on sites, we provide quality products unitized and standardized through off-site platform-based manufacturing to each site in a "JUST IN TIME" manner. Off-site management makes it easy to promote diversity and a circular economy that are difficult to promote in sites.
By significantly reforming a series of construction processes from planning, ordering, and the delivery of material and equipment to construction, we will accelerate efforts to address the problems of long working hours and the labor shortage.
Not limiting these approaches to us alone, we will strengthen partnerships with our partner companies and aim to reform the construction process involving the entire sector.

Strengthen of sales personnel — globalization of sales personnel —

We have carried out sales staff globalization trainings for young employees such as sending them to overseas subsidiaries, but in FY2020, given the effects of the COVID-19 pandemic, we hosted a web training for local staff from China, Thailand, and Malaysia.
This training enabled sharing of business philosophies and business styles based on each country's business environment through lively discussions.

Strengthening of sales infrastructure

We have the customer relationship management (CRM) system, which we have been examining and developing, operating in each headquarters since FY2020.
Centralizing information on customers and sales activities using the system have enabled sharing of information between superiors and subordinates, branches and headquarters, and staff currently in charge and staff in charge in the future.
The system serves as the foundation based on which we, as Takasago Thermal Engineering as a whole, deliver seamless services to customers and live up to their expectations. We will make the best use of the system to store information.

TOPIC | Toward the reform of the construction process — T-Base® project

As a project to improve productivity in the construction process as a whole to help reform the core business drastically, we have inaugurated T-Base®, and are preparing to open a center equipped with headquarters functions in FY2022.

Platform underlying reform

T-Base® enables a shift from the single-item production on sites to off-site production to reform the conventional construction process as we know it in view of a fully BIM-controlled construction industry.

● Roles of T-Base® as a platform

Construction technologies development foothold	Creation of technologies capable of reforming the construction process
Processing and assembling plant	Off-site production of technological products developed
Logistics hub	Hub capable of realizing a nationwide supply chain
Employee and worker education and training center	Source of nationwide dissemination of new technologies
Place of diversity	Pursuit of new work styles and diverse human resources

With T-Base®, we aim to establish a central production system capable of facilitating cooperation among the hubs across the country and, based on standardized construction and digital technologies, reform the Takasago Thermal Engineering as a whole. In that process, we aim to become a business activity hub widely open to society that creates new work styles and offers a variety of human resources opportunities to prove themselves.

Provision of new value generated by off-site production×standardization

Off-site production and standardization via the T-Base® platform provide new value to customers.

①Shortening of construction period in sites

Improved productivity by off-site production and standardization contribute to shortening construction period in sites.

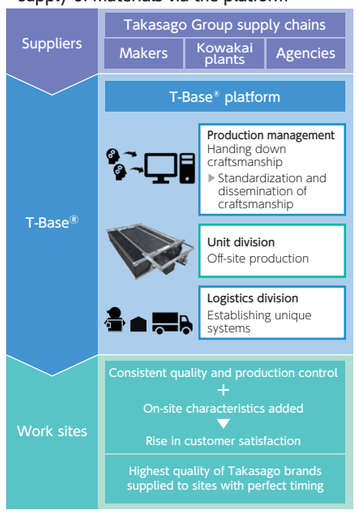
②Consideration for sites

Constructing a logistics system in supply chains across the country optimizes material supply to sites, reducing CO_2 from transport. Besides, a circular economy is promoted in which packing materials disposed of on site are reduced in cooperation with suppliers.

③Promotion of diversity

Off-site production, which is safer than on-site production, and simplification of the manufacturing process by standardization promote the employment of diverse human resources.

● Flow of planning and supply of materials via the platform



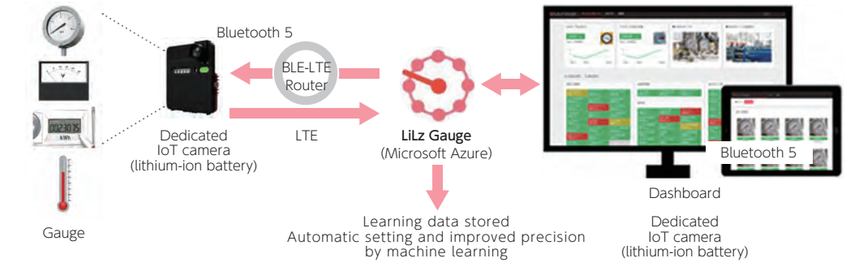
Group companies' efforts

The Takasago Thermal Engineering Group provides one-stop services in a wide range of fields in addition to construction work while making maximum use of respective features of the Group companies. In recent years, we are working to expand the fields and also promoting initiatives for total optimization including restructuring with a focus on synergies in the Group and for ESG and SDGs.

TMES Corporation | Aims to provide new added value to facility management

A walk-around visual check of meters for facility maintenance imposes a heavy burden on a facility inspector.
TMES Corporation's automatic meter reading technology LiLzGauge is a cloud-based service capable of significantly reducing the burden on a facility inspector derived from a walk-around visual check of analog meters using low power consumption IoT cameras and machine learning.
LiLzGauge was selected in Takasago Thermal Engineering's first accelerator program. A verification outcome shows that with the process implemented automatically in which measurements of meters installed in a building are taken by a dedicated IoT camera and their images uploaded to the cloud platform are analyzed to be displayed and recorded as digital values, the time it has taken an inspector to carry out a daily walk-around check can be reduced to more than half.
Using IoT tools, TMES Corporation aims to realize a work style reform that improves enormously an inspector's work efficiency and work on the digitalization of analog information to provide new added value to customers' facility management.

● Full view of LiLz Gauge system



NIPPON PMAC Co., Ltd. | Product development countering the COVID-19 pandemic

Air® is a portable air cleaner for a place attracting a lot of people. Equipped with the HEPA filter designed to trap 99.7% of the 0.3 μm particles, it can capture microparticles with viruses suspended in the atmosphere with high efficiency.
Characterized by reduced outside air treatment air conditioning energy with filtration using filters, 100V power source running, installation not necessary, improved portability performance using large casters, and high airflow with low acoustic noise, the product has realized increased ventilation volume as measures to counter the COVID-19 pandemic.
The Ministry of Health, Labour and Welfare, and the Society of Heating, Air-Conditioning and Sanitary Engineers of Japan also support the efficacy of concurrent use of air cleaners equipped with HEPA filters and outdoor air inlet ventilation, and the product has been adopted by Nagaoka University of Technology and many other facilities including schools, hospitals, offices, department stores and nursing homes. We have also donated Air® to Minato City, Tokyo, and Atsugi City, Kanagawa Prefecture.

Scene of Air® installation

Interview with CDXO

Special Feature

Toward the creation of new added value and the reform of corporate culture through digital utilization

Toshikazu Yokote
Director CDXO

Takasago Thermal Engineering marks its 100th anniversary in 2023.
Since its founding, the company, setting HVSC systems at the core, has been committed to value creation according to needs of the times and lived up to customers' expectations.
Now, the world is changing even more significantly.
Business environmental changes surrounding companies are speeding up at an unprecedented pace transnationally, accompanied by the keyword Digital. Social issues must be considered on a global basis, impossible for one single company alone to tackle. The time has come when business entities that have shared value join forces to create new values for solving problems.

From "tangible" to "intangible". Capturing new needs through the core business

I believe that our DX strategy mission is to grasp issues and events from a global perspective and find what we can do as a space environment designer to tackle them and give it a try.
To carry out the strategy, we will work to realize our core concept improvement in environmental value of spaces making up a building. As recent times see a shift from tangible goods consumption to intangible goods consumption, an extension of our attention from the installation of equipment to resulting intangible consumption, I believe, is one of our directions to take.
To drive our directions, we have been developing a new key system that controls the operational process of construction equipment work, our core business, for the past few years. The key system would function as the heart of our core business. The new system will be designed to realize the operational process efficiency and become an agile model capable of responding to hugely changing external environment.
In parallel with the system development, we will work on efficient collection, analysis, and processing of data obtained from business activities and initiatives to create new added values. We aim to grasp appropriately what is required in each scene of the life cycle of a building and provide high-value services to customers engaged in the value chain on a real-time basis. For customers engaged in the design and construction, we will promote efforts to make safer and more efficient work progress possible. By utilizing fresh data on the operation of a building after it is completed with the user, a data-based new value creation is possible. What with troubles and complaints after equipment goes into operation, stable operation of equipment, and its safety and operational efficiency, we will mobilize our living know-how amassed thus far to contribute to realizing the optimization over a building life cycle.
The key to this is the centralized management of data through BIM restructuring, prediction and analysis of designed operations based on the operational data of equipment, and the presentation of appropriate operation of equipment according to the operational state. We will provide user-oriented value through DX.

Growing as an environmental creator® and providing new added values

We, as an environmental creator®, see providing new added values to customers as the next mission in addition to creating new businesses.
Based on a track record of engaging in energy and the conservation of nature, we aim to develop energy saving into the visualization of data-based energy use and thereby believe that we can make proposals for the operation of equipment leading to quantitative and appropriate assessment of carbon neutrality.
For the preservation of nature, a global challenge, we are engaging in a variety of projects. For example, to treat volatile organic compounds (VOC) toxic gas, we have our own circular system operating, which we are trying to equip with digitalization technology. By digitalizing characteristics of input gas that vary depending on the customer, a baseline of output gas, and presenting our own optimal system, we will guarantee safety. Based on the concept of a circular economy, we will commit to sustainable environmental preservation.

New reform for the solution of industry-specific challenges

We are working on the correction of long working hours and work style reform, the construction industry's issues, through DX. When it comes to improvement of employee engagement, the core element of our Group's business, we, in addition to supporting them during working hours, have how to effectively spend off-duty hours visualized so that they can check it through DX to create an environment where they can enjoy health, lively.
We are also fostering a culture in which employees think autonomously to improve things and creating a system that disseminates it. When it comes to personnel affairs, we are trying to have employees' skills and motivations visualized using HR Tech and by placing the right people in the right place we encourage them to improve their skills and feel more motivated.

Transformation of corporate culture through the promotion of DX

We are working on corporate resilience against all types of risks and strengthening our cybersecurity in a timely manner. As we handle customers' important information, we have formulated the information security basic policy to enhance information security measures against highly developed and diversified cyberattacks in parallel with strengthening of operational management of SOC and CSIRT.
When it comes to TCFD, potential new added values have been found following scenario analyses and identification of risks and we hope to provide them as literal new added values.
Although our DX might still be in its infancy, we will build up a corporate culture that can detect changes in the world flexibly through DX and create new added values out of new approaches derived from new ideas any time as the ultimate goal and will promote our efforts actively.

Growth strategy

Reform of international business

To lead the stabilization of our international business management to steady growth, we will work to introduce a new business model, establishing robust business foundations in overseas markets as illustrated in the localization of the management of overseas subsidiaries

Establishment of the "ALL Takasago" system

Further enhancement of the MEP construction (mechanical, electrical and plumbing) business for the stabilization of management infrastructure

We will expand the building/plant construction business, in addition to the facility construction business, to promote the strengthening of the revenue structure.

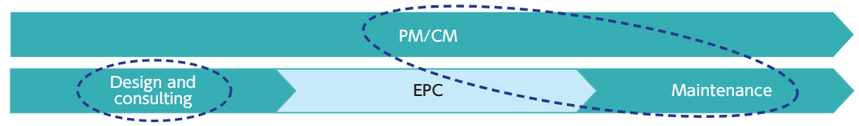
Establishment of a local network across the region (enhancement of the presence in the market)

We will strengthen the sales organization to increase the appeal to important Japanese customers and raise the ratio of non-Japanese customers.

Handing down for integration with local staff - Human resource development and improvement of management abilities –

We will develop executives among local employees (for succession) and be committed to helping improve the skills of individual employees (for handing down).

Business model reform



Dealing with the activities from the receipt of an order to maintenance and operation in an integrated manner

- Construction management (CM) function
- Project management (PM) function
- Facility operation and management function with DX

Investment for the next generation

- Consulting business (new)
- EPC business (strengthening of the function)
- Maintenance business (new)

Initiatives taken in fiscal 2020 and their details

Initiatives	Details
Strengthening of communication with other countries	Strengthened domestic cooperation making the best use of communication tools as visits to other countries were called off by the COVID-19 pandemic
Strengthening of sales infrastructure	Shared information with and provided support to sales and marketing staff from overseas subsidiaries. Provided a Head Office-hosted local sales staff training
Strengthening of technological capabilities	Provided monthly online seminars on our excellent technologies to staff from overseas subsidiaries so that local technology leaders could meet online and share information about quality and costs for technological improvement
Strengthening of compliance	Improved the compliance system in cooperation with the Legal Division and the Information Systems Division and provided information security enhancement education

Recognition of the current situation and challenges

In FY2020, while the COVID-19 pandemic cast a huge shadow over economic activities, our international Group companies' presence kept rising in respective countries where we are operating thanks to growing demand derived from aggressive investment in the electronic parts industry for semiconductors in particular, and the pharmaceutical business. In addition, by paying attention to various countries' rising awareness of investment in or interest in the environment, we are sure of making more environmental contributions as an environmental creator® that creates a future earth through energy-saving or decarbonization technologies.

Mentioning the reform of international business in the medium-term business plan, we are developing international business into a solid core business of our Group. With the stabilization of management infrastructure for increased profitability and the expansion of the business fields in pursuit of markets taking on new changes at the core, we are doing so.

To further contribute to the countries where we are operating, we are promoting the localization of the management of overseas subsidiaries reflecting local trends. We have someone locally recruited at the top of Takasago Constructors and Engineers (China) Co., Ltd. and Takasago Thermal Engineering (Hong Kong) Co., Ltd. for more constructive and characteristic business development. Overseas subsidiaries across the world are reinforcing relationships with non-Japanese customers while seeing Japanese customers as important ones.

Integrated Cleanroom Technologies Pvt. Ltd. (India), which manufactures medical clean panels, is expanding their business scope to a general contract business handling the product and their business area as well.

International Business Headquarters Technology Conference

The FY2020 session unfortunately took place online. Nevertheless, each overseas subsidiary presented advanced technologies put into practice. The session was very lively as an opportunity to have each subsidiary's technological information shared by other ones and to present accomplishments in international "un-Japanese" settings. Partly because the group selected as the best presenter at this conference is qualified to participate in the Takasago Thermal Engineering Group Technology Conference, a lot of very high-quality technologies were presented.

In FY2020, the Vietnamese office's "COGENERATION SYSTEM PLANT PROJECT" received the best award and the office presented at the company-wide technology conference the system installation that was unprecedented in Japan in scale, which was highly appreciated.

Toward business model reform

As emerging countries, the stage of our international business, are growing economically in recent times, the market environment is significantly changing. With ensuring of diverse revenue sources beyond existing economic models becoming the center of focus, by making Integrated Cleanroom Technologies Pvt. Ltd. in India a consolidated subsidiary, we are targeting growing markets in India and the surrounding countries and expanding and strengthening our business fields beyond the existing EPC business. We aim to realize Takasago Thermal Engineering Group's sustainable growth through international business reform by actively promoting alliances with local companies for entering high-value-added growth fields for us and by acquiring the total engineering capabilities including the project management function and the construction management function.

TOPIC | For management taking advantage of the local features of the countries where we are operating

For stable growth of international business, we are promoting cooperation with local overseas subsidiaries and the transfer of authority to them. By taking orders from non-Japanese customers as well as Japanese ones, our important customers, actively and enhancing relationships with them, we aim to strengthen our commitment to the countries where we are operating to raise our Group's corporate value.
Chinese and Hong Kong offices witnessed locally recruited staff members promoted to the top, which reinforces their management foundation.

Sun Tiebin, Managing Director
2004: Joined Takasago Constructors and Engineers (Beijing) Co., Ltd.
2017: Became DMD of Takasago Constructors and Engineers (China) Co., Ltd

就任首届中国现地总经理，不胜荣幸。

自2003年高砂中国成立以来，我一直在本公司工作。高砂中国不仅承接设备工程，还作为包括成套设备、建筑在内的综合承包商来开展业务。中国现在的市场和环境都在发生着飞速变化，我们必须要跟上中国经济的发展。为此，我认为必须进行本地化管理、拓展非日系的客户，以及与其他公司展开广泛的合作。

高砂热学有近100年的技术积累。我们要将这种被培养出来的"魂"好好地传承给中国的现地雇员，全体员工团结一致，回归原点，提供满足顾客要求的高品质服务，努力经营成为收益良好的公司。作为中长期目标，在日本总部的监管下，以营收200亿日元为目标，努力成为稳定经营、稳定分红的企业。

同时，高砂中国作为国际化企业，致力于提高企业的满意度，作为环境创造者，努力创造最佳的空间和环境，为实现脱碳社会，为中国社会的发展做出贡献，发展成为优秀的企业。今后也请多指教。

I am very honored to be appointed Managing Director of Takasago China.

I have been working for Takasago China since it was founded. Not limited to equipment work, Takasago China is operating as a general contractor covering plants and construction. China is experiencing a dramatic change in markets and environment, and we must keep up with the growth of the Chinese economy. I strongly believe that we must promote localization, establish relationships with non-Japanese customers, and enhance cooperation with other companies.
Takasago Thermal Engineering has a 100-year technological accumulation. I will hand down the developed "soul" to local staff certainly and work with them to develop our office into an entity capable of providing high-quality services living up to customers' requests. Our office aims for stably growing business management over the medium-to-long-term. We will make our company an excellent one that contributes to the development of a low-carbon Chinese society as a global company in China. Your advice and opinions would be appreciated as ever.

Siu Hei Cheung, Jimmy, Managing Director
1986: Joined Takasago Thermal Engineering (Hong Kong) Co., Ltd.
2017: Became DMD of the company

Great Honour to be the first local MD in H.K.

I have joined Takasago Hong Kong Subsidiary for more than 35 years and I am proud of leading Takasago Hong Kong operation to be successfully localized.
The most valuable assets of the Company should be our staff. Our existing excellent reputation in both commercial construction industry and pharmaceutical cleanroom / laboratory construction was gained by the talent and abilities of our staff with the great performance in various projects which have also acquired the trust and confidence of our major clients too.
Although the current Hong Kong economic environment is still being affected by COVID-19 condition, I am confident that Takasago Hong Kong subsidiary can continue to maintain the status in Hong Kong market together with steady growth.

Integrated Cleanroom Technologies Pvt. Ltd. (India)
Commitment to the research and development to combat COVID-19

An immediate research and clarification of COVID-19 is a material issue of utmost urgency in India as well. The virus research requires high safety facilities meeting the WHO's or governmental requirements. But lacking such laboratories, the country had been required to prepare them urgently.
To address the situation, ICLEAN, at the request of a governmental research and development institution that a laboratory be constructed, came up with a mobile laboratory and delivered (donated) one to a governmental ESIC hospital in two weeks while it usually takes 6 months to construct a laboratory.
Named Mobile Virology Research and Diagnostic Laboratory (MVRDL), the laboratory was commended by the Defense Minister as it was delivered in an unprecedentedly short time even under a lockdown that made material procurement and manufacturing activities remarkably difficult, contributing to speedier research and investigation.

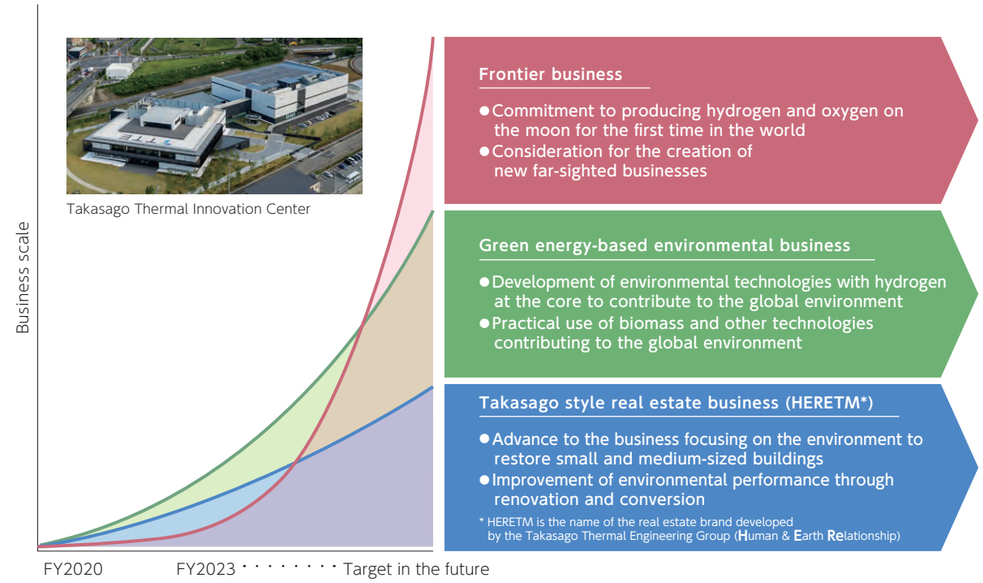
Not only making a social contribution to curbing the COVID-19 pandemic by delivering MVRDL across India, we will promote our business activities so that we can raise the visibility of ICLEAN and business performance.

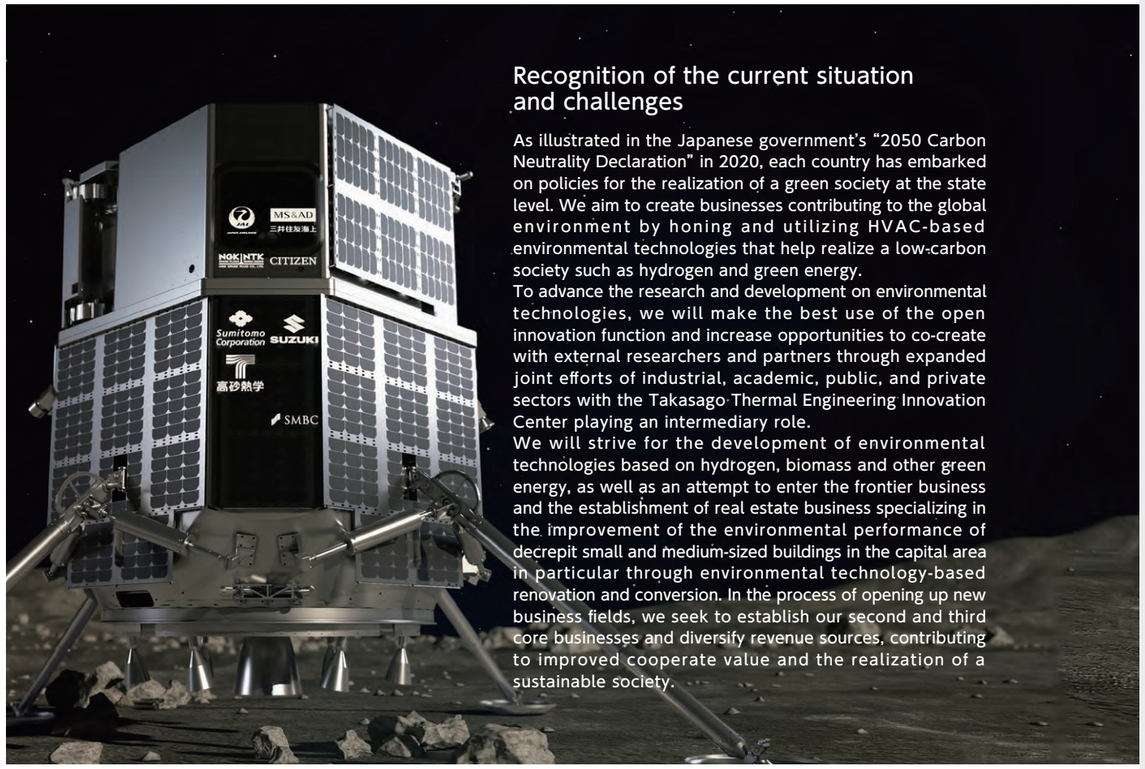
Mobile laboratory

Growth strategy

Entry into environmental business

By utilizing environmental technologies cultivated thus far, we aim to create businesses leading to an improved global environment, establish our second and third core businesses and diversify revenue sources.





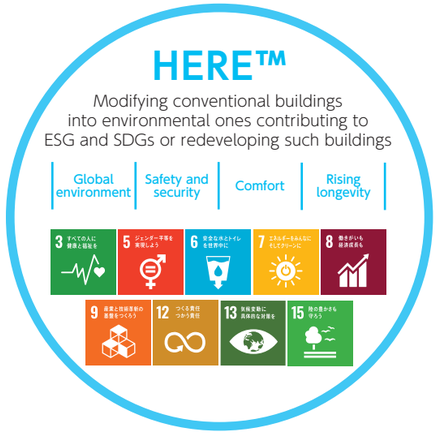
Recognition of the current situation and challenges

As illustrated in the Japanese government's "2050 Carbon Neutrality Declaration" in 2020, each country has embarked on policies for the realization of a green society at the state level. We aim to create businesses contributing to the global environment by honing and utilizing HVAC-based environmental technologies that help realize a low-carbon society such as hydrogen and green energy.
To advance the research and development on environmental technologies, we will make the best use of the open innovation function and increase opportunities to co-create with external researchers and partners through expanded joint efforts of industrial, academic, public, and private sectors with the Takasago Thermal Engineering Innovation Center playing an intermediary role.
We will strive for the development of environmental technologies based on hydrogen, biomass and other green energy, as well as an attempt to enter the frontier business and the establishment of real estate business specializing in the improvement of the environmental performance of decrepit small and medium-sized buildings in the capital area in particular through environmental technology-based renovation and conversion. In the process of opening up new business fields, we seek to establish our second and third core businesses and diversify revenue sources, contributing to improved cooperate value and the realization of a sustainable society.

Takasago style real-estate business HERE™

Takasago style real-estate business HERE™ adopts a variety of technologies and opinions scattered across society as well as our Group's knowledge and technologies and embodies our corporate mission "Contribution to society through personal harmony and creativity" through the real-estate business. This business, a brand named HERE™ (Human & Earth Relationship) aims to create a comfortable workplace environment, promote earth-conscious buildings and their sustainable use, and realize safe and secure lives.
In FY2020, we carried out a variety of ESG-related measures including energy saving, diversification of work styles, and infection spread prevention in our real estate and improved usage environment on feedback from users.
HERE™ evolves and takes deeper root in society with the times.

●Commitment to ESG and SDGs through HERE™



Year-round screening-based co-creation program

As an initiative to create new businesses and services jointly with startup companies, we have implemented an accelerator program since 2017.
This program aims to use the platform of open innovation as means to respond to a variety of business environmental changes such as automation and digitalization progressing rapidly in construction and facility management sites, strengthening of environmental, recycling, and energy businesses development capabilities, and shortage of technical staff and skilled workers.
We have advanced the program as means to create new value beyond the conventional framework of HVAC construction work by combining startups' knowledge and assets with ours.
With the number of applicant companies growing in each session over the past three years, there is growing demand for technological demonstration opportunities we can provide.
We have developed the program into a year-round screening-based co-creation program starting FY2021 so that we can receive a broader range of themes and promote a flexible and timely adoption of submitted ideas for co-creation.
We will advance the program in cooperation with business divisions of the Head Office, main office and branches, and domestic Group companies including TMES Corporation.

Corporate Overview

Corporate Overview

(as of March 31, 2021)

Company name	Takasago Thermal Engineering Co.,Ltd.
Established	November 16, 1923
Number of employees	2,116 (consolidated: 5,890)
Capital	13,134 million yen
Financial closing	March
Listed	On the First Section of the Tokyo Stock Exchange
Address	6-27-30, Shinjuku, Shinjuku-Ku, Tokyo 160-0022
TEL	+81-3-6369-8212
FAX	+81-3-6369-9103

Business description

- Air conditioning systems
- Clean rooms and associated equipment and devices
- District heating and cooling facilities
- Plumbing and sanitary systems
- Co-generation systems
- Electrical, instrumentation and communication systems
- Equipment diagnosis
- Failure diagnosis systems
- Dehumidifying/drying systems
- HVAC systems for nuclear energy facilities
- High-precision HVAC systems
- Waste vacuum transfer systems
- Construction work
- Exhaust heat recovery systems
- Heating/cooling systems
- Refrigerating/freezing systems
- Design, construction, production, installation and maintenance of other environmental control and thermal engineering systems
- Design, manufacture, import, export, sale and mediation of machinery, equipment and materials
- Consulting services concerning energy saving and environmental measures
- Business related to greenhouse gas emissions trading
- Purchase, sale, brokerage, lease and management of real estate
- Worker dispatch business
- Security business
- Cleaning business
- Energy supply business
- Power generation business
- Water treatment business

License under the provisions of Article 3, paragraph (1) of the Construction Business Act

[Special construction business]

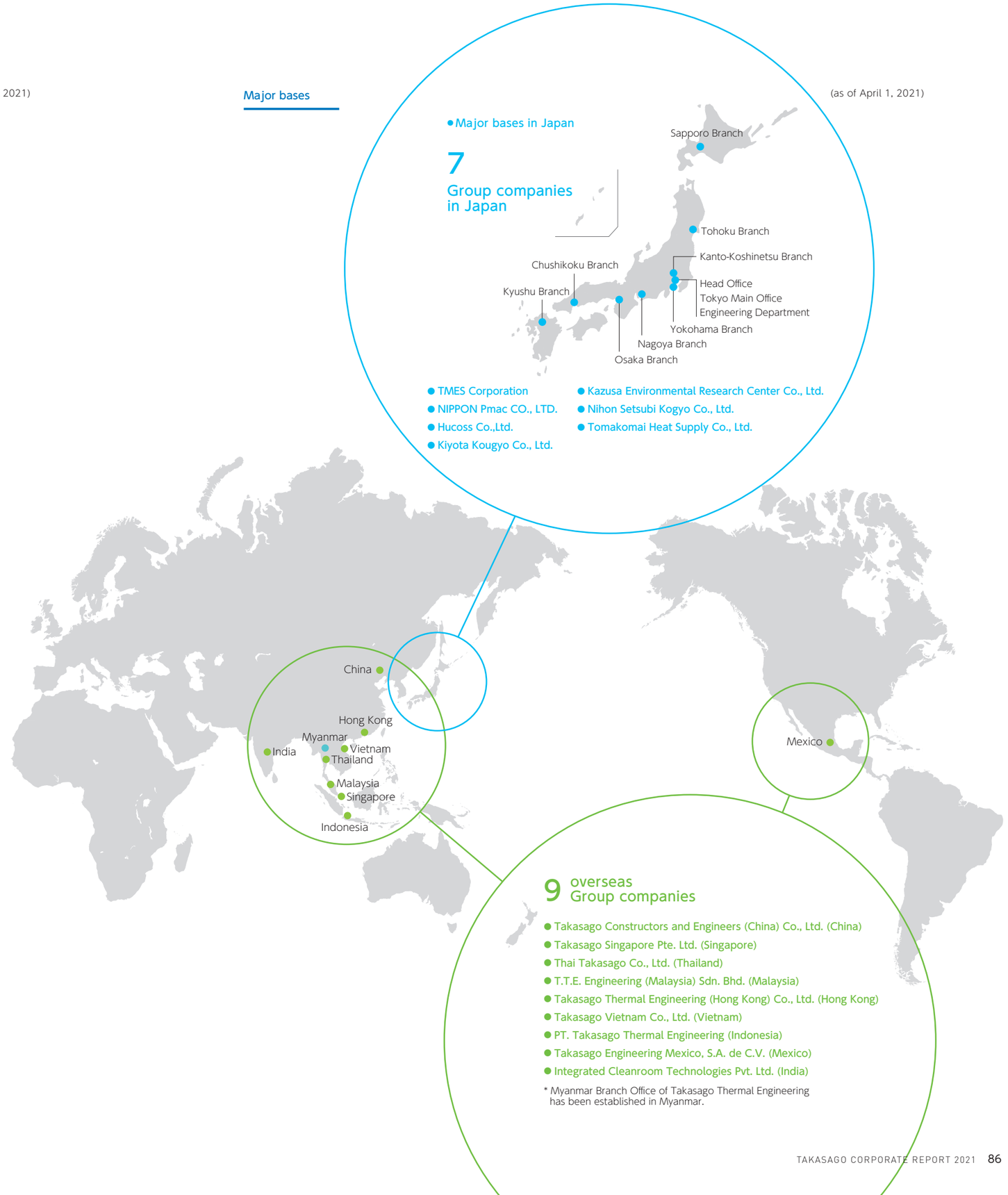
License No.: (TOKU-2) No. 5708 issued by the Minister of Land, Infrastructure, Transport and Tourism
License date: December 4, 2020
Duration of license validity: From December 4, 2020 to December 3, 2025
Licensed fields of construction:
Plumbing, machine and equipment installation, electrical work, telecommunications work and general construction work

[Ordinary construction business]

License No.:
(HAN-2) No. 5708 issued by the Minister of Land, Infrastructure, Transport and Tourism
License date: December 4, 2020
Duration of license validity: From December 4, 2020 to December 3, 2025
Licensed fields of construction: Fire protection facility construction work

Major bases

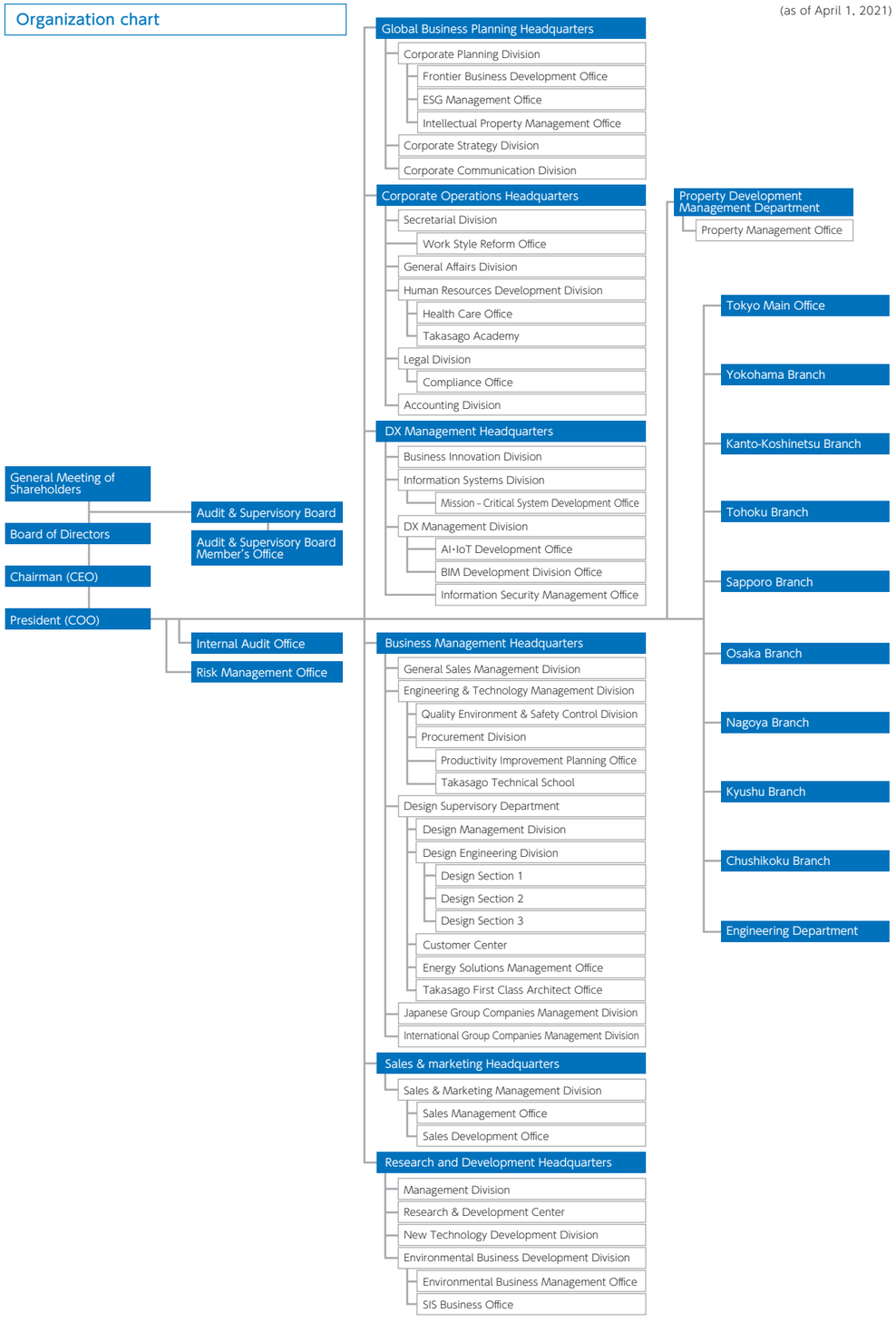
(as of April 1, 2021)



Corporate Overview

Organization chart

(as of April 1, 2021)



Stock information

Major shareholders (Top 10)

(as of March 31, 2021)

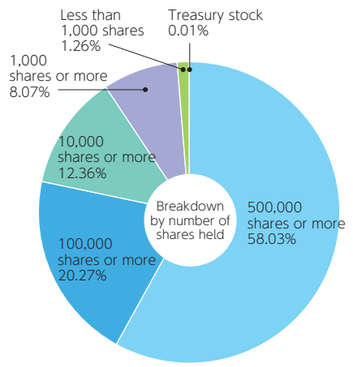
Shareholder's name	Number of shares owned (thousands shares)	Percentage (%)
The Master Trust Bank of Japan, Ltd. (Trust Account)	4,683	6.66
Nippon Life Insurance Company	4,560	6.49
Dai-ichi Life Insurance Co., Ltd.	4,231	6.02
Takasago Thermal Engineering Employee Shareholders' Association	3,406	4.85
Takasago Mutual Benefit Society	2,742	3.90
Custody Bank of Japan, Ltd. (Trust Account)	2,610	3.71
MUFG Bank, Ltd.	1,439	2.04
STATE STREET BANK AND TRUST COMPANY 505001	1,265	1.80
Mizuho Bank, Ltd.	1,210	1.72
Keiokaku, Ltd.	1,016	1.44

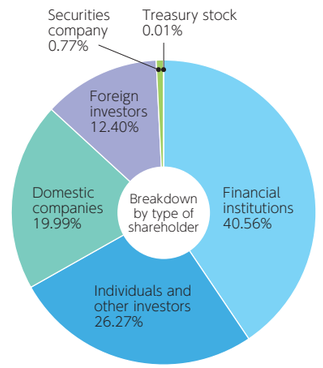
(Note) 1. Numbers of shares are rounded down to the nearest thousand.
2. The treasury stock (9,123 shares) is excluded from the calculation of the shareholding ratio.
3. The shareholding ratio is rounded down to two decimal places.
4. The treasury stock excludes our shares owned by the executive remuneration BIP trust (413,858 shares).
5. The treasury stock excludes our shares owned by Employee Stock Ownership Plan (J-ESOP) (285,300 shares)

Status of shares

(as of March 31, 2021)

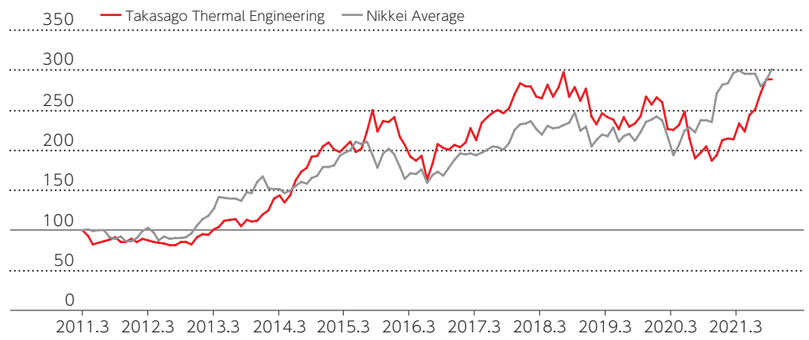
- **Total number of issuable shares**
  200,000,000 shares
- **Total number of issued shares**
  70,230,297 shares
  (excluding 9,123 treasury stock shares)
- **Number of shareholders**
  7,019
  (increased by 1,170 from the end of the previous fiscal year)





Stock price trends

The stock prices of Takasago Thermal Engineering and Nikkei Average are relative values with the prices at the end of March 2011 set to 100



Basic Information

Financial and Non-Financial Data

* Rounded down to the nearest million yen

Financial data (consolidated)

Business results

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 (FY)
Orders received	(million yen)	221,431	253,918	264,280	255,648	265,301	273,464	288,646	333,887	297,883	287,501
Net sales	(million yen)	215,464	248,430	237,389	243,582	251,291	260,204	289,933	319,834	320,893	275,181
Gross profit	(million yen)	22,572	22,249	27,308	27,800	29,526	34,082	39,550	41,877	43,376	36,845
Selling, general and administrative expenses	(million yen)	17,357	18,678	19,527	20,073	20,237	21,699	23,187	24,657	25,476	24,545
Operating Income	(million yen)	5,214	3,570	7,780	7,727	9,289	12,383	16,362	17,219	17,900	12,300
Ordinary Income	(million yen)	6,695	4,760	9,109	8,582	10,602	13,427	17,461	18,359	19,286	13,902
Net income attributable to owners of parent	(million yen)	4,269	2,186	4,011	5,196	6,650	8,665	11,804	12,609	13,231	10,116
Net income per share	(yen)	55.23	28.74	53.24	69.28	89.40	117.83	160.41	173.29	186.49	145.56
Rate of return on equity	(%)	5.2	2.5	4.4	5.2	6.4	8.2	10.3	10.4	10.8	8.0
Ratio of ordinary income to total assets	(%)	3.6	2.4	4.3	3.9	4.7	5.9	7.0	6.8	7.1	5.2
Gross profit margin	(%)	10.5	9.0	11.5	11.4	11.8	13.1	13.6	13.1	13.5	13.4
Selling, general and administrative expenses	(%)	8.1	7.5	8.2	8.2	8.1	8.3	8.0	7.7	7.9	8.9
Ratio of operating income to net sales	(%)	2.4	1.4	3.3	3.2	3.7	4.8	5.6	5.4	5.6	4.5
Dead equity ratio	(times)	0.06	0.05	0.05	0.07	0.09	0.05	0.14	0.14	0.18	0.23
R&D expenses	(million yen)	996	843	768	791	918	903	1,064	945	1,357	899
Capital investment	(million yen)	481	1,209	962	2,019	2,325	862	3,303	3,962	12,669	4,422
Depreciation and amortization	(million yen)	709	734	770	758	840	776	730	824	1,299	1,537

Financial positions

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 (FY)
Total assets	(million yen)	197,434	207,465	217,132	225,810	223,267	233,426	264,062	279,743	265,649	271,146
Net assets	(million yen)	85,771	93,932	97,416	108,362	104,613	111,574	124,484	126,208	125,861	135,849
Interest-bearing debt	(million yen)	5,058	4,443	4,447	7,700	9,435	5,527	16,277	17,402	21,733	29,933
Net assets per share	(yen)	1,105.66	1,186.44	1,248.38	1,413.59	1,392.30	1,487.29	1,637.63	1,704.31	1,757.68	1,907.64
Shareholders' equity	(million yen)	84,075	90,371	93,415	105,725	102,325	109,382	120,546	122,060	122,091	132,135
Equity ratio	(%)	42.6	43.6	43.0	46.8	45.8	46.9	45.7	43.6	46.0	48.7

Cash flows

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 (FY)
Cash flows from operating activities	(million yen)	569	13,054	13,575	△3,423	△1,272	23,528	6,170	14,892	△6,369	22,568
Cash flows from investing activities	(million yen)	△556	△870	1,455	△4,921	△5,398	2,329	△5,685	△6,069	△8,187	△324
Cash flows from financing activities	(million yen)	△1,157	△2,801	△3,285	△837	△2,215	△6,079	7,107	△7,928	△4,199	3,642

Dividends

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 (FY)
Dividends per share	(yen)	25	25	25	25	28	36	50	52	56	56
Payout ratio	(%)	45.3	87.0	47.0	36.1	31.3	30.6	31.2	30.0	30.0	38.5
Ratio of dividends to net assets	(%)	2.3	2.2	2.1	1.9	2.0	2.5	3.2	3.1	3.2	3.1

Non-financial data

		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 (FY)
Number of employees	(persons)	4,085	4,312	4,405	4,471	4,576	4,831	5,714	5,912	5,899	5,890
Non-consolidated	(persons)	1,845	1,859	1,850	1,858	1,885	1,950	2,025	2,051	2,064	2,116
Consolidated subsidiaries in Japan	(persons)	1,909	1,908	1,938	1,940	1,999	2,040	2,120	2,218	2,201	2,182
Overseas consolidated subsidiaries	(persons)	331	545	617	673	692	841	1,569	1,643	1,634	1,592
Number of persons who took childcare leave	(persons)	8	13	6	10	11	12	10	20	41	44
Employment rate of persons with disabilities	(%)	—	—	—	—	—	—	1.77	2.20	2.26	2.48
Turnover rate (within the first three years of employment)	(%)	10	11	11	9	27	14	12	13	23	12
Final disposal rate of construction waste (excluding sludge)	(%)	19	10	14	9	9	13	14	12	14	14