

IHI Integrated Report 2019



Contribute to the development of society through technology

Refine manufacturing (“Monozukuri”) skills to satisfy demands.

Find solutions to key global problems for the sake of the planet and humankind.

Change the future through the power of technology. In the past and onward into the future.



Innovation

Corporate Philosophy

Human resources are our single most valuable asset

The will to make peoples' dreams come true
and the passion to exceed high hurdles.

Combining the wisdom of individuals to
accomplish grand projects.

IHI's driving force is its human
resources who continue growing.



IHI Group Vision

The IHI Group seeks to solve the various environmental, industrial, social, and energy related problems of the 21st century, through using engineering expertise to focus on “Monozukuri” technology.



Identity

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Value-creation Strategy

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Editorial Policy

This report is issued as a communication tool to convey particularly important information regarding fundamental initiatives that support the policies, strategies, and businesses of IHI. Please visit the following websites for more detailed information.



For more detailed information, please refer to the following websites

Financial: <https://www.ihico.jp/en/ir/>

Non-Financial: <https://www.ihico.jp/csr/english/index.html>



Late Edo period



Meiji period



Taisho period – post-WW2 reconstruction

Source: Railway Museum

Key issue Threats from Western powers

In 1853, Commodore Perry's "black ship" sailed into Uraga. Feeling threatened by large Western military ships, the Edo Shogunate began building Western warships to strengthen Japan's coastal defense.

Key issue Increased demand for electrical power

In the Age of Civilization and Enlightenment, electric lights began appearing in cities. Electric lights spread rapidly, through Tokyo and beyond. Electricity began being used as a form of power for various infrastructure, including elevators and trains, leading to the construction of power plants one after the next.

Key issue Increased demand for land transportation and traffic

Construction of railways in urban districts began, starting with the opening of a line between Shinbashi and Yokohama in 1872. In Tokyo, the construction of Central Station (present-day Tokyo Station) connecting diverse stations led to a rapid increase in railway users.

Solution

Construction of large ships to compete with the U.S. "black ships"

■ 1856

Completion of the Western-style frigate Asahi Maru

First Western-style frigate built in Japan. Toward the end of the Edo period, feeling threatened by the appearance of foreign ships in Japanese territorial waters, the Shogunate government established Ishikawajima Shipyard in 1853 to build large ships that could oppose the foreign ships. The first ship built here was the Asahi Maru. The Shogunate expressed extreme satisfaction with the ship, which offered rigidity and ample rigging.



Solution

Establishment of large-scale power plant facilities

■ 1896

Manufacture of 200 kW generator, Japan's first domestically made large-capacity generator

Japan's first domestically made thermal power generation facility was installed in the Asakusa Power Plant of Tokyo Dento Company (present-day TEPCO). The 200 kW single-phase AC generator, built by IHI and designed by Professor Hatsune Nakano of the Imperial University as Japan's first large-capacity generator, boasted one of the world's largest capacities for its time.



Source: Electricity Museum

Solution

Establishment of railway infrastructure

■ 1914

Construction of steel-frame structures using cranes began

In those days, the conventional way to construct high structures was to attach scaffolding. The project attracted much attention due to its adoption of a creative new technique for rapidly assembling steel frames by using two mobile cranes.





Rapid growth period



Stable growth period



Low-growth period

Key issue Urban overcrowding

Due to rapid industrialization, the Japanese economy averaged more than 10% annual growth in the 18 years from 1955. Increased populations in urban areas led to greater overcrowding.

Solution

Development of space-saving parking lots

1962 Completion of Japan's first full-scale mechanical parking system, "Ulpa Lift" (tower parking)

In 1961, when many Japanese people began wanting to own their own cars, IHI completed a prototype of Ulpa Lift, Japan's first, domestically made full-scale, vertical mechanical parking system. In 1962, we delivered a working model to Takashimaya department store in Nihonbashi (product name at the time was Sky Parking). This same product was later installed in the Matsuya department store in Ginza, the Tokyo Metropolitan Police building, and other locations, fueling the popularization of tower parking.



Key issue Saving energy

Following two economically disastrous oil shocks in the 1970s, people became aware of the importance of energy conservation, which triggered new energy-saving policies.

Solution

Improved fuel efficiency of car engines

1982 Release of City Turbo equipped with the world's smallest vehicular turbocharger

As an example of increasing efforts to save energy, IHI developed the RHB5 turbocharger for automotive turbo engines, which attracted attention as the world's smallest turbocharger. Boasting outstanding energy-savings and economical performance, the RHB5 was adopted for Honda Motor's City Turbo in 1982, the engine's first use in a Japanese-made passenger vehicle.



Key issue Combating global warming

Adoption of the Kyoto Protocol at the COP3 international meeting in Kyoto in 1997 obligating member countries to reduce greenhouse gas emissions to at least 5% below 1990 levels by 2008 to 2012.

Solution

Reduced CO2 emissions from aero engines

2011 Boeing 747-8 equipped with GENx aero engine began operating

IHI participated in the GENx aero engine development program led by GE, assuming a 13% work share, including the design and manufacture of major components for a low-voltage turbine module and high-voltage compressor. GENx offered 15% better fuel efficiency than conventional engines and reduced emissions of CO2, nitrogen oxide, etc. It was adopted for Boeing's 787 and 747-8 aircraft.



IHI's Value-creation Process

» IHI Group's Important Assets

P17
Technology | Contribute to the development of society through technology

Our strength

Problem-solving capability supported by concentration of diverse technologies

	2008	2018
R&D expenses	¥15.6 billion	▶ ¥36.5 billion
Investment in plant and equipment	¥45.2 billion	▶ ¥67.3 billion
No. of national project consignments	17	▶ 44

Lean and flexible

Flexible response to environmental changes

P61
Human Resources | Human resources are our single most valuable asset

Our strength

Globally-connected teamwork

	2008	2018
Employees (consolidated)	24,348	▶ 29,286
No. of overseas affiliate companies	183	▶ 217
Percentage of female managers	1.1%	▶ 2.8%

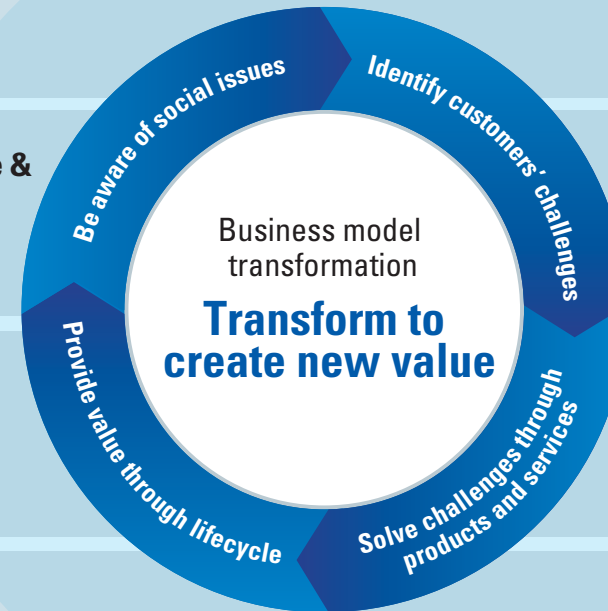
» Solutions IHI offers customers

Resources, Energy & Environment
P29

Social Infrastructure & Offshore Facilities
P33

Industrial Systems & General-Purpose Machinery
P37

Aero Engine, Space & Defense
P41



» Value offered to society

10-year vision

Net sales of a
 → **2 trillion yen** scale

→ **Realization of 10%**
 or higher stable operating margin

Create new value needed for social sustainability

Targets (FY2021)

(Invested capital profitability) ROIC ¹	10% or more
(Profitability) Operating margin	8%
(Cash flow generating capability) CCC ²	80 days

1. ROIC = (Operating profit + Interest and dividend income) after tax / (Shareholders' equity + Interest-bearing debt)

2. CCC (Cash Conversion Cycle)
 = Operating capital ÷ Net sales × 365 days

IHI's perspective on sustainability

IHI contributes to realization of a sustainable society through our corporate activities. We contribute to achievement of SDGs (Sustainable Development Goals) through our initiatives relating to businesses and initiatives relating to business foundation.

Initiatives through businesses

Resources, Energy & Environment

Contribute to carbon-free and recycling societies by providing optimal integrated solutions for each region and customer



Social Infrastructure & Offshore Facilities

Contribute globally and across life cycles to materialize safe and secure social infrastructures, centered on bridges and tunnels



Industrial Systems & General-Purpose Machinery

Contribute to industrial infrastructure progress by thoroughly optimizing operational lifecycles with customers

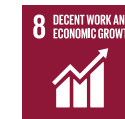


Aero Engine, Space & Defense

Leverage advanced technology to open new vistas for air transportation, defense systems, and space utilization, and help materialize social affluence and safety



Shared business goals



Business foundation P47

Environment

Reduce environmental impact

- Climate change
- Circular economy
- Environmental protection

Society

Materialize an affluent society

- Human rights
- Customer relationship management
- Diverse human resources
- Labor practices
- Supply chain management
- Corporate citizenship

Governance

Principled corporate management

- Compliance
- Corporate governance
- Risk management
- Information security
- Timely and proper disclosure

IHI Group Medium-term Management Plan

Group Management Policies 2019

In April 2019, IHI launched a new medium-term management plan, "Group Management Policies 2019."

Review of Group Management Policies 2016

Group Management Policies 2016, which IHI rolled out in FY2016, targeted three main initiatives for strengthening the Group's earnings foundations: concentration and selection through new portfolio management, boosting profitability by reinforcing project-implementation structure, and employing common Group functions to transform business model.

Due to factors such as continued downturns in specific projects, worsening market conditions for new projects, primarily in Resources, Energy & Environment Business, and fluctuating exchange rates, we were unable to reach certain key targets, including 7% operating margin, 10% ROIC, and max. 0.7 debt-to-equity ratio.

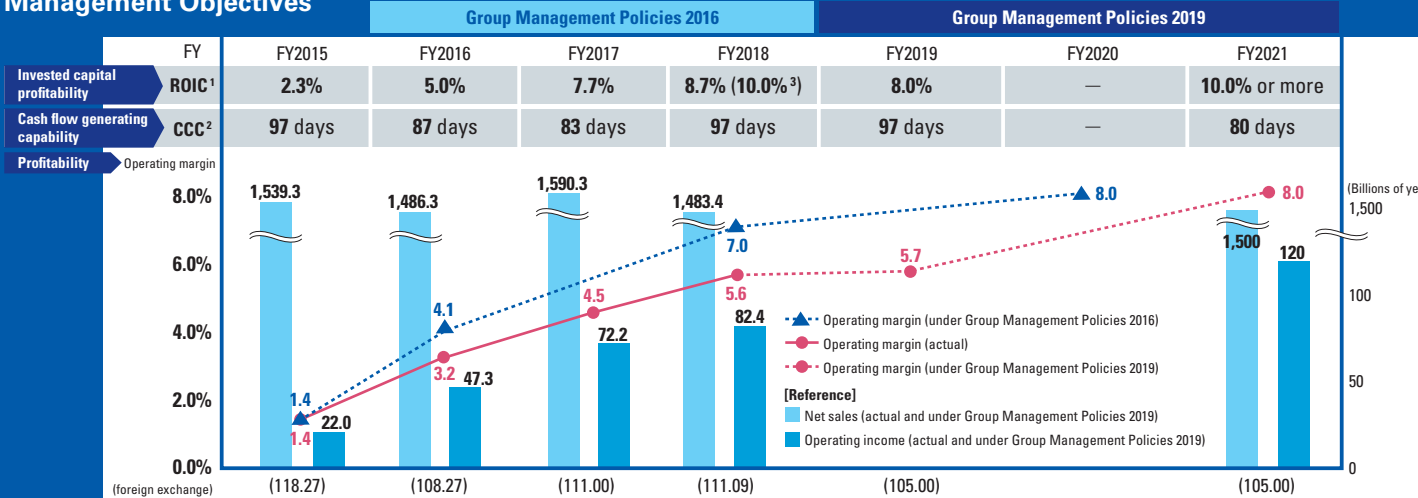
However, by strengthening risk managements and strategically allocating resources under our new system for business areas and business units, operating margin and ROIC have shown signs of improvement and our earnings base has improved somewhat.

Group Management Policies 2019

(FY2019 – 2021)

The environment surrounding us is rapidly changing. While dramatic technological innovations such as IoT, ICT, AI and digitalization are driving global evolution, a number of key issues are intensifying, including climate change, over-population, and resource depletion. From a long-term perspective, IHI believes in the importance of forming an "ideal vision" for contributing to the realization of a sustainable society. Group Management Policies 2019 aims to shift IHI businesses and products away from the conventional focus on supplying hardware and toward a new focus on "tackle social and customer issues with customers and create new value."

Management Objectives



IHI's ideal vision for the coming 10 years is net sales of about two trillion JPY and stable operating margin of at least 10%, based on which appropriate interim targets have been formulated for FY2021.

1. ROIC = (Operating profit + Interest income and dividend income) after tax / (Equity + Interest-bearing liabilities)
2. CCC (Cash Conversion Cycle) = Working capital ÷ Net sales × 365 days
3. Targets under Group Management Policies 2016

Long-Term Approach

Tackle social and customer issues with customers and create new value

Contribute to social sustainability

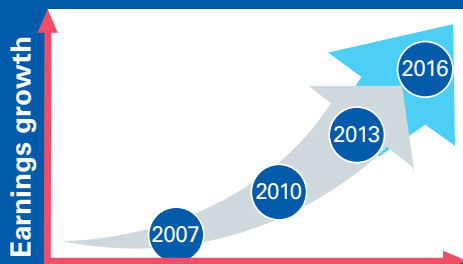


Enhance customer value



Further evolve initiatives of Group Management Policies 2016 to address increasing social issues

Contribute to society, primarily by supplying hardware



**“Group Management Policies 2016”
“Strengthen earnings foundations”**

Three transformative initiatives

- Concentration and selection through new portfolio management
- Boost profitability by reinforcing project implementation structure
- Employ common Group functions to transform business model

Three initiatives

To realize IHI’s ideal vision from a long-term perspective, the three years beginning in FY2019 are positioned as the period for fully launching IHI’s business transformation. During this period, IHI businesses will be reorganized flexibly and appropriately in accordance with changes in the environment and the expectations of society. The objectives are to create new value for society and customers and to fully launch IHI’s transformation to become a company that enhances its value through its own initiatives. As the foundation for this transformation, and to ensure that “safety and quality” remain our top priorities, initiatives will be implemented with a risk-management approach that focuses on profitability and business stability. Additionally, IHI’s human resources will be further cultivated to help drive the transformation and respond to environmental changes with flexibility and speed.

Three initiatives for transformation

1 Strengthen business foundations
Accelerate aftermarket business development with customers from lifecycle perspectives

Focusing on overall lifecycles, we will align closely with customers’ operations, accelerate our deployment of after-market business, and help customers find solutions for their key issues.

2 Build a robust operational structure
Create a lean and flexible operational structure

We will optimally allocate resources, such as employees and funds, to growth areas and other strategic areas, and build a corporate structure that is resilient to change.

3 Accelerate preparations for tomorrow
Transform our business model to create value

To help realize a sustainable society, we will accelerate our transformation to a business model that generates forward-looking new value.

Cultivate human resources as change drivers

Safety and quality

Risk management

IHI is undergoing a full-scale transformation to contribute to society's long-term sustainability.

IHI Corporation
President and Chief Executive Officer

Tsugio Mitsuoka



The medium-term business plan that began in FY2016 has ended and a new plan, Group Management Policies 2019, was launched this year. Our mission is to contribute to social sustainability. Responding to major changes taking place in our external environment, we are transforming our business and products to resolve issues faced by society and customers more effectively and to create new value.

Review of Group Management Policies 2016

Steady progress towards a stronger earnings foundation

The future that IHI is aiming for

The main thrust of Group Management Policies 2016 was to strengthen IHI's earnings foundation by avoiding project downturns, allocating corporate resources more strategically and introducing new business models. By analyzing and monitoring projects more thoroughly, we began to reduce downturns in certain projects. Furthermore, by introducing our strategic business unit (SBU) system and by executing strategies that transcended the boundaries of these SBUs, we were able to allocate resources in more profitable businesses in a timely manner. As a result, we made steady progress towards strengthening our earnings foundation.

Despite these accomplishments, we did not meet expectations in withdrawing from businesses focused

on hardware supply. Moreover, we fell short of key numerical targets and various issues remained unresolved.

Meanwhile, major global changes have affected the very core of corporate management over the past three years. The list includes increased risks pertaining to climate change and other environmental issues, innovation in digital technologies such as IoT, ICT and AI, changes in industrial structure and workstyles, and increasing diversity in various regions, countries and time zones. All of these changes have far exceeded expectations.

Accordingly, we reviewed plans for positioning IHI over the next three years.



To realize Group Management Policies 2019 goals Creating new value for society while enhancing IHI's value

IHI's mission, as in our Group Vision established ten years ago, is to solve social issues and create affluence, safety and peace of mind for people and the planet. This mission will not change moving forward, but in view of the changes occurring in our external environment, we reconsidered our long-term goals when drafting our new medium-term plan.

In light of dramatic global changes, we have developed a new long-term vision that will serve as the basis for value perception throughout our entire Group. Out in the field where we interact with customers, we must swiftly determine what is most important, including what customers truly want and which issues must be addressed first, and then take action accordingly. Under Group Management Policies 2019, our long-term vision is to resolve social and customer issues and create new value.

We have positioned the three years from 2019 as the period in which to push ahead with our business transformation in response to external-environment changes and social demands, to create new value for society and customers and to become a company that can enhance its value independently. To pursue initiatives under our new plan, we will advance our strategic allocation of corporate resources and transition

out of businesses that focus on hardware supply.

Satisfying the total-lifecycle needs of customers

This involves three basic strategies: 1. accelerate aftermarket business expansion from an overall lifecycle perspective by working with customers to strengthen our business foundation; 2. create a more robust operational structure to become leaner and more flexible; and 3. transform our business model to create future-oriented value.

Our Resources, Energy & Environment Business Area, for example, involves making thermal power plant boilers and supporting stable supplies of energy. On the other hand, thermal power generation entails relatively high CO₂ emissions, which is a problem. Therefore, we will support the shift away from fossil-fuel power generation by modifying existing plants and increasing power-generation efficiency, which will help to dramatically reduce CO₂ emissions. As we work to meet needs in specific countries and regions, our course of action is being shaped by our very careful consideration of solutions and services that we might offer, including examining the core essence of each potential offering. This also involves evaluation of the best services to offer customers from a total lifecycle perspective.

Up until now, our mainstream business has been large-

Message from the CEO

scale construction, but as we strive to more finely pinpoint our responses to diversifying needs, we are evolving our design concepts and creating internal structures to respond with greater flexibility. We are transforming our business initiatives not merely for isolated products but rather based on a grand design covering everything from funds procurement to total cost, in other words, from the perspective of comprehensive value.

Of course, the notion that we “must change” certainly is not a rejection of everything that IHI has accomplished to date. Rather, we aim to leverage our internal/external resources and well-honed technologies to become a company that responds flexibly to the needs of customers and society.



Visiting IHI Aioi Works

Evolving without relying solely on past successes

In order to survive this age of turbulent change, we aim to create an all-new dimension of value. Even in fields where we have been successful, we will fall behind if we continue to follow our traditional model of focusing on hardware provision. Unless we transform swiftly, our effort could be meaningless. Even if we were to achieve 80% of our goal, continuing changes in society would compel us to strive even harder than first imagined to fully accomplish our goal.

We will move ahead as quickly as possible based on trial & error, and adhering constantly to the PDCA cycle. Also, we will form dynamic cross-organizational teams to develop innovative solutions. Moreover, we will delegate more authority to worksites to accelerate PDCA cycles.

ESG initiatives as a foundation for business

Ensuring the level of awareness employees need to respond to society's expectations

Governance

Safety and compliance awareness are key pillars that can never be compromised

We announced that inadequate inspections had been carried out in our civil aero engine maintenance business, and we received administrative sanctions from

the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism. I myself was once an aero-engine engineer, so I took this extremely unfortunate matter very much to heart. Although we brandish the motto of “sangen-shugi,” which emphasizes focusing on worksites, equipment/products and conditions as they actually are, I believe that our senior and middle-level executives did not accurately grasp what was happening in the field. Although quality was never a problem, safety and compliance awareness are extremely important pillars of our business that can never be compromised. In response, we established the IHI Code of Action and Quality Declaration for companywide deployment. Also, new compliance training and e-learning activities were implemented, and now we are creating a framework for repetitive learning in light of this matter. Moreover, we are reemphasizing the importance of



Visiting IHI Mizuho Works

close communication between top executives and workers in the field. We are building a stronger culture to ensure that all managers know what is going on in the field, address problems as they arise and promptly form excellent teams to devise needed solutions.

| Environment

Developing new businesses to support sustainability

IHI positions environmental action as being extremely important due to the company's direct involvement in the sustainability movement.

In May 2019, for example, IHI became a signatory to the Task Force on Climate-related Financial Disclosures (TCFD). As well as disclosing information in line with the TCFD, IHI is pursuing new businesses by balancing environmental and business needs for greater sustainability.

The global shift away from CO₂ is creating needs to stabilize energy supply while reducing CO₂ emissions. For example, IHI is helping to lower the carbon output of coal-fired power generation by upgrading existing plants for higher efficiency and by introducing wood-biomass high-ratio co-combustion systems. Future activities will target the use of renewable energy and optimal energy management. Furthermore, we are developing technologies to use CO₂ as a resource in the carbon dioxide capture, utilization and storage (CCUS) process. Resource allocation for this purpose will be optimized during the current year.

| Human resource development

Business reform will not succeed unless every IHI employee also transforms

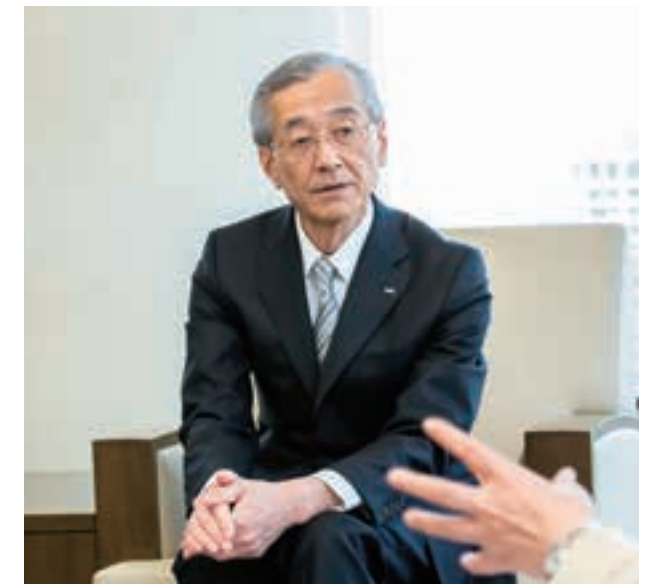
Under Group Management Policies 2019, we have set a goal to cultivate human resources as change drivers. Accordingly, we plan to invest in our people more than ever before.

Our business transformation cannot succeed unless people also transform. As part of this effort, we are encouraging employees to communicate with customers on an unprecedented level, which will enable them to become more aware and to learn many new things. We also are providing new educational opportunities to help employees transform through their own initiatives. In addition, we are transforming IHI's allocation of human resources. In this age of transformation, I believe that it is more important to find the right place for the person, rather than the right person for the place. In other words, rather than assigning people to places suited to their capabilities, first we must clarify the qualities required in each workplace and then assign the right people. In particular, we are developing greater flexibility for the prompt assignment of the best people to each workplace. IHI is becoming a more dynamic organization that welcomes people regardless of nationality, gender, disability, age, etc., and assigns people appropriately to enable them to maximize their specific capabilities.

This has become the perfect time to return to our core philosophy — *human resources are our single most valuable asset* — by nurturing the capabilities and motivation of every employee so that everyone can help IHI contribute to sustainability. Under Group Management Policies 2019, IHI will continue striving for growth.

| To our stakeholders

This Integrated Report is a communication tool explaining IHI's businesses and the initiatives that support them. We look forward to your feedback to help us further improve our business.



IHI will strengthen its financial foundation for the long term under Group Management Policies 2019 and new dividend policy.



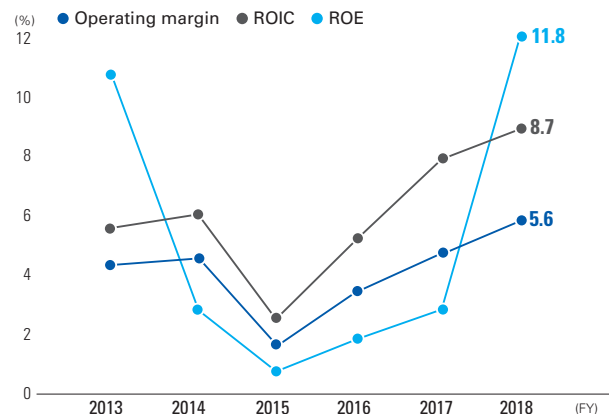
Associate Director
General Manager of Finance & Accounting Division
Seiji Maruyama

We will pursue long-term growth through improved profitability and stronger cash generation.

IHI is engaged in four diverse business areas, requiring careful financial management suited to the nature and status of each business. Our main financial goal will continue to be focusing on achieving efficient and sustainable growth.

The medium-term plan that ended in March 2019, Group Management Policies 2016, in addition to taking the conventional approach of emphasizing earnings, additionally emphasized capital efficiency in terms of ROIC and ROE, and also generating cash. For this reason, our FY2018 targets included an operating margin of 7.0%, ROIC of 10% and D/E ratio of 0.7 or less. However, due to factors such as an unexpectedly sharp deterioration of the market, persistent downturns in certain projects and exchange rate fluctuations, we fell short of our targets across the board, recording an

Operating margin, ROIC and ROE trends

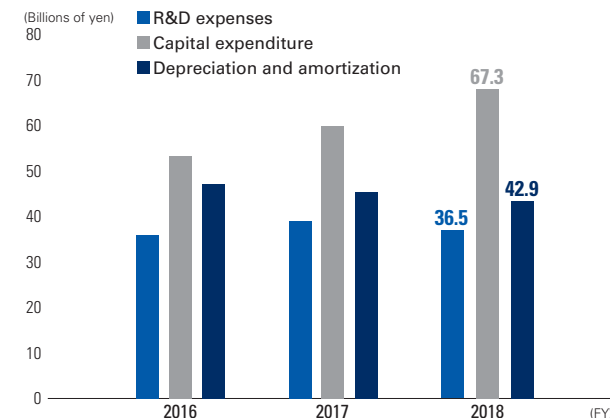


operating margin of 5.6%, ROIC of 8.7%, and D/E ratio of 0.93. Furthermore, although the equity ratio was higher than last year at 21.0%, it still could not be considered sufficient. In addition, reducing interest-bearing debt by improving cash flow through CCC management remains a pressing issue.

More recently, however, operating margin and ROIC have shown signs of improvement due to strengthened risk management and the strategic reallocation of corporate resources. Also, uneven business performance due to the deteriorating profitability of certain large projects has gradually subsided, and both financial soundness and foundational strengthening have progressed somewhat.

Under Group Management Policies 2019, IHI aims to continue improving its financial soundness through enhanced profitability and stronger cash generation. Also, investments will be pursued proactively under a long-term approach. Specifically, as demonstrated with the opening of IHI Group Yokohama Labs in May

R&D expenses / Capital expenditure / Depreciation and amortization



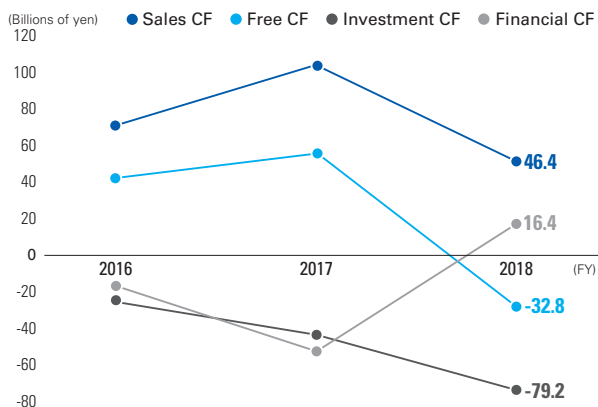
Capital expenditure and depreciation are amounts pertaining to property, plant and equipment.

2019, we will invest in capital expenditure and R&D for technological development matched closely to customer needs, and we will acquire companies to strategically strengthen our competitive edge.

Based on IHI's 10-year vision, net sales and operating margin targets are expected to be achieved by providing new value under a transformed business model.

Our FY2021 targets include an operating margin of 8.0%, ROIC of 10.0% or more, and CCC of 80 days or less. These three indicators will be closely tied to our efforts to improve operating margin to help shorten CCC and, consequently, improve ROIC. To achieve the operating margin target, we plan to strengthen earnings in each business area through measures such as the incorporation of aftermarket businesses. Also, to shorten CCC, we aim to collect notes and accounts receivable faster and to shrink inventory to reduce working capital. Each business area and SBU will carry

Cash flow



out concrete initiatives along these lines, and the Finance & Accounting Division will regularly monitor the level of achievement through performance evaluation. We also have set 10-year targets for net sales on a scale of two trillion JPY and a stable operating margin of 10% or greater.

For the time being, rather than pursue a specific scale of sales, we will focus on improving profitability to achieve a stable operating margin of 10% or more, and thereafter focus on offering new value by transforming our business model to grow in accordance with global economic development.

In regards to cross-shareholdings, determinations to hold or not hold shares will be based on economic rationality.

As a general rule, the Group strives to reduce cross-shareholdings after engaging in a suitable dialogue with each issuing company. The board of directors assesses the propriety of holding shares of individual companies by confirming mid- and long-term suitability in terms of IHI's holding policy and whether the benefits and risks are commensurate with the cost of capital.

Under our new dividend policy, we will distribute stable dividends with a consolidated dividend payout ratio of about 30%.

In the past, IHI's dividend policy placed importance on stability and dividends were determined with consideration for retained earnings. Group Management Policies 2019, however, has established a new dividend policy that more clearly indicates consideration for shareholder returns.

In principle, dividends will be distributed stably at a rate

of around 30% of the consolidated dividend payout ratio. Distributions also will reflect needs to grow/strengthen IHI's financial foundation and invest in business development, including by growing/strengthening the equity ratio to enhance corporate value. We look forward to the ongoing support and encouragement of stakeholders for our efforts.

Performance (consolidated)

	FY2016	FY2017	FY2018
Operating income	¥47.3 billion	¥72.2 billion	¥82.4 billion
Operating margin	3.2%	4.5%	5.6%
ROIC ¹	5.0%	7.7%	8.7%
Debt-to-equity ratio ²	1.10	0.92	0.93
ROE ³	1.6%	2.6%	11.8%
Owners' equity ratio	18.8%	19.9%	21.0%
CCC ⁴	87 days	83 days	97 days
Dividends	—	Interim: ¥3 per share Year-end: ¥30 per share (after a consolidation of common stock)	¥70 per share (¥30 interim and ¥40 at year-end)

- (Operating profit + Interest and dividend income) after tax / (Owners' equity + Interest-bearing debt)
- Interest-bearing debt / Net assets
- Profit attributable to owners of parent / (average of previous fiscal year-end and current fiscal year owners' equity)
- Working capital / Net sales × 365 days

Accelerating business transformation through technology & intelligence focused on collaboration customers and society



Director Managing Executive Officer
General Manager of Technology & Intelligence Integration
Kouichi Murakami

Groupwide technological development

Group Technology Strategy 2019 defines technological-development program under IHI's new medium-term plan, which focuses on solving issues affecting specific customers or society overall. A major emphasis of the strategy is to do away with the conventional approach of offering technologies because we believed they were good and instead develop technologies sought by customers or society.

IHI's Technology & Intelligence Integration has fundamental technologies broadly divided into 15 areas and a system comprising a team of some 500 engineers for producing all kinds of items.

In April 2019, we reorganized our system into one with two centers: the Technology Platform Center and the Co-Creation Project Center. The Technology Platform Center refines advanced technologies while the Co-Creation Project Center intensively engages in developing technologies necessary for IHI's transformation. Cross-organizational teams comprising people from business areas and the Technology & Intelligence Integration handle everything from technological development to commercialization.

New bases for open innovation

IHI Launch Pad was established in the USA's Silicon Valley in December 2018 as a base from which to engage startups for collaboration. As the name suggests, Launch Pad is aimed at launching new businesses suited to the needs and goals of IHI and its partners. IHI also is strengthening liaisons via its technical bases in Boston, London, Singapore and Shanghai to accelerate technological development.

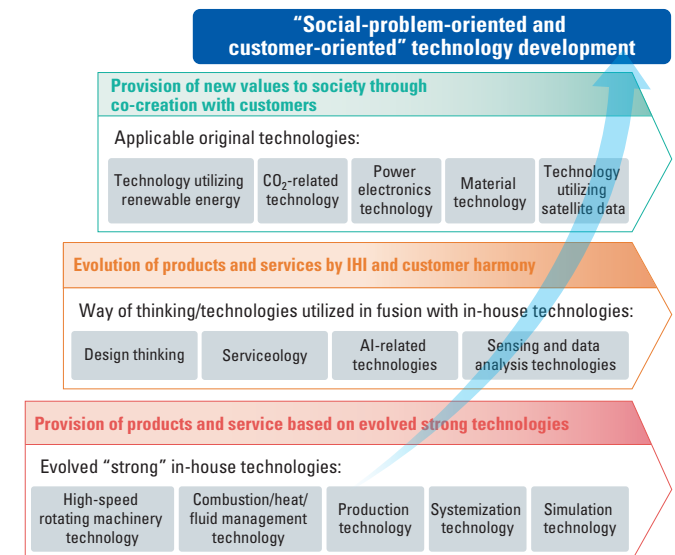
IHI Group Yokohama Labs opened in May 2019. Also, the Ignition Base (i-Base) was formed to update experimentation facilities and accelerate the conception and realization of new ideas. IHI uses Ignition Base to deeply explore customer issues and then work with

the customer to create new value. Newly conceived solutions can take shape on the spot using a 3D printer or various experimental equipment, making it possible to thoroughly discuss an idea with the customer while looking at and touching tangible items envisioned with the idea. Ignition Base is an exciting creative time & space capable of drastically shortening the initial development process to merely half a day, compared to one year or so conventionally.

Development themes for transformation

- Carbon-free recycling-orientated society (energy)
- Carbon-free recycling-orientated society (materials development & usage)
- Disaster prevention and resilience (infrastructure)
- Labor-shortage compensation, automation, labor savings & sophistication
- High-productivity systems & advanced manufacturing

Outline of IHI Technology Strategy 2019



Topics

“Design thinking” to realize customer needs —The evolving shape of open innovation—

Yamagata City

IHI Tsunagu Lab (IHI innovation hub) was established in 2014 as a hub for collaborating with diverse customers and partners to create new value.

Design thinking, which is basic to all initiatives for open innovation, is the development of products and services from the customer’s perspective.

IHI and Tohoku University of Art & Design (TUAD: Yamagata, Yamagata Prefecture), which nurtures design thinkers, formed a tie-up to conduct joint workshops, etc. in December 2018.

IHI and TUAD operate the I-To Lab. in Yamagata to solve issues. The lab, which is also helping to vitalize its surrounding community, facilitates innovation by

combining the technological and design capabilities of both partners. The name joins the first syllables of each partner’s name, “I” and “To,” and the resulting word “ito” means “thread” in Japanese, signifying that I-To Lab is a research facility that connects products and value, companies and universities, Tohoku and the world, customers and IHI, and engineering and design.



Achieve SDGs by providing products and services.

IHI Tsunagu Lab (IHI innovation hub)



Yokohama, Kanagawa Prefecture
(IHI Yokohama Engineering Center)

- Introduction of products/technical opportunities
- Holding technical matching seminars
- Holding workshops

IHI Group Yokohama Labs



Yokohama, Kanagawa Prefecture
(IHI Yokohama Engineering Center)

- Information-sharing & idea creation
- Idea prototyping & project realization
- Integration of experimental functions

Customers

IHI Launch Pad



Silicon Valley, U.S.

- Collaboration with startups
- Surveying overseas technology and business

Regional vitalization Innovation



As a contact base for sales offices across Japan, IHI launches new businesses that solve problems and thereby support regional vitalization.

Voice



Tohoku University of Art & Design
Product Design Department

Satoshi Sakai
Associate Professor

My specialty is interface design. To research this area, we need to think about relevant products and customers, as well as the experience-type value people can obtain through information, services, the environment, and so on. Design thinking is essential to do this. Design thinking is about identifying issues that are affecting customers, our end-users, and then creating excellent solutions.

Our curriculum at Tohoku University of Art & Design is tailored to ensure that students learn about design thinking and then find employment in the design divisions or business planning divisions of companies after graduating. IHI possesses a diverse range of fundamental technologies as a company that deals broadly with infrastructure products. We envision our collaboration, which combines IHI’s technical resources and TUAD’s curriculum, will lead to the creation of new businesses and services. To test this model, we formed a workshop run by

IHI employees and TUAD students.

The theme of the workshop was to “Find true customers!” by considering new products and services targeted at end-users who actually use IHI’s technologies. Because the members varied in age and experience as well as physical location, initially we were concerned about how well the trial would work. Nevertheless, IHI team members realized the students’ ideas were novel and joint activities such as video conferences became much livelier than expected.

TUAD is located in Yamagata Prefecture, which is on the forefront of dealing with Japan’s low birth rate, aging population and population decline. What is the innovation required to keep towns vibrant? In Yamagata’s own unique way, we are collaborating with IHI to devise ways to enrich peoples’ lives, turn the ideas into reality and then finally disseminate them to the world.

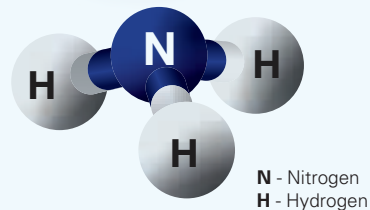
Topics

Ammonia for the carbon-free society

As the countermeasure of the global warming due to CO₂ emissions, the use of carbon-free hydrogen is highly expected in the energy fields. IHI develops various technologies for the use of the ammonia as the carbon-free hydrogen energy carrier.

The potential of ammonia

The utilization of hydrogen is anticipated to help reduce CO₂ emissions and promote decarbonization. However, there are issues such as the cost of storage and transportation due to the fact that hydrogen must be at a low temperature in order to liquefy, and hydrogen embrittlement of metal. As such, ammonia is attracting attention due to its ability to efficiently store and transport hydrogen. Ammonia has a high hydrogen content per volume unit, therefore does not create CO₂ even when burnt. Also, unlike hydrogen, ammonia liquefies easily, therefore can be transported at low cost. Because ammonia is already distributed as fertilizer and chemical raw material, there is an advantage in terms of commercialization due to the established infrastructure.



Case 1

Co-firing technology in a boiler



Reduction of the carbon emissions from the customer equipment

Technology Platform Center,
Technology & Intelligence Integration
Manager of Heat & Fluid Group

Takamasa Ito

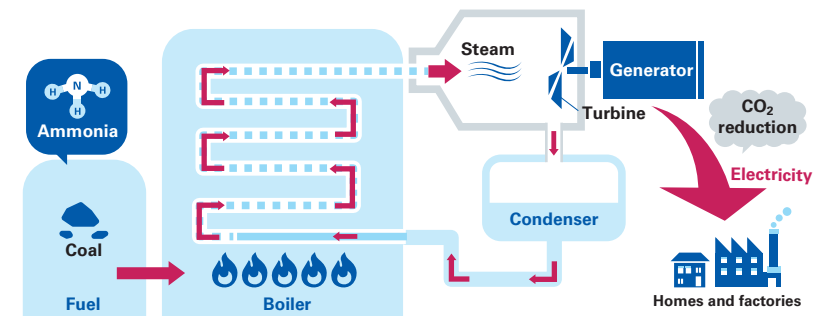
Details of the activity

Reduction of the CO₂ emissions from the coal-fired boilers by the co-firing with ammonia as the fuel

Note: SIP* commissioned research

*SIP: Strategic Innovation Creation Program by the Council for Science, Technology and Innovation of the Cabinet Office

Coal fired power plant has served as one of the main energy sources in Japan. Hereafter, coal fired power plant is expected to be an adjuster of the renewable energy whose output is influenced by the climate condition. IHI applies our knowledge and experience for the development of a low-carbon technology concerning the ammonia utilization for the coal-fired power generation. There was concern that nitrogen contained in the ammonia would be oxidized and formed to be a nitrogen oxide (NO_x). However, IHI could solve this problem by an innovative burner configuration. So far, IHI has achieved co-firing experiment with ammonia with 20% in calorific-value base. We will continue to make our effort to commercialization this technology for our customers.



Case 2

Co-firing in a gas turbine



Developing combustion technologies for the future

Technology Platform Center,
Technology & Intelligence Integration
Combustion Group

Shintaro Ito

Details of the activity

Reduction of CO₂ emissions by firing ammonia as fuel in existing gas turbine

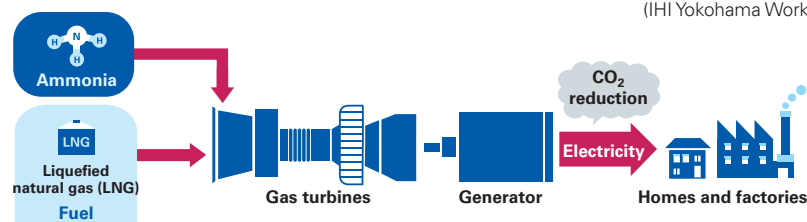
Note: SIP commissioned research

Although IHI has delivered natural-gas-fired power-generation equipment such as gas turbines and gas engines, the use of ammonia as a fuel is a new challenge and its combustibility is the starting point of development.

Two key problems, namely, the stable co-firing of natural gas and ammonia, which have quite different combustion speeds, and the suppression of NO_x emissions, were both researched intensively. The result was a 2,000 kW-class gas turbine successfully operated at a 20% ammonia co-firing ratio, worldwide for the first time. Moving forward, we will focus on increasing the ammonia co-firing ratio, reducing NO_x emissions and enlarging gas turbines.



Test facility for ammonia/natural-gas co-fired gas turbine (IHI Yokohama Works)



Case 3

Supply to fuel cell



Leveraging accumulated experience to create new technologies

Technology Platform Center, Technology & Intelligence Integration
Associate Senior Researcher,
Material & Energy Conversion Technology Group

Satoshi Ueguchi

Details of the activity

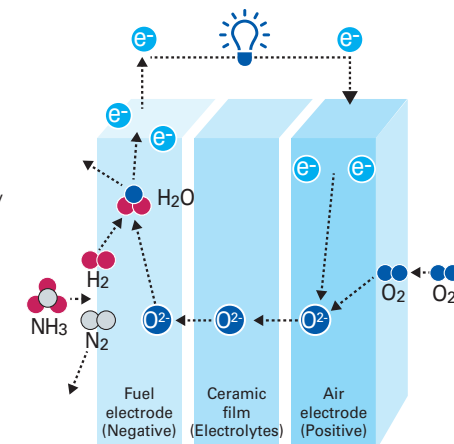
Using ammonia as SOFCs (solid oxide fuel cells) fuel for high-efficiency, carbon-free power generation

Note: SIP commissioned research

Fuel cells are promising energy conversion systems because they are capable of directly converting chemical energy of fuels into electrical energy and are expected to be distributed power sources. IHI developed a 1kW-class SOFC system to directly supply ammonia as fuel in March 2018. Many fuel cell systems currently in use require reformers to convert the fuel to hydrogen. IHI's SOFC, however, which has a simple configuration that does not require a reformer, fully utilizes heat loss to decompose ammonia into hydrogen and nitrogen ($\text{NH}_3 \rightarrow 1/2 \text{N}_2 + 3/2 \text{H}_2$) inside the hot section.

Such innovations are leading to cost reductions and space savings.

In the past, IHI had engaged in the development of MCFCs (molten carbonate fuel cells), but commercialization efforts eventually had to be abandoned. Today, however, IHI is fully leveraging its technologies and experience to develop and commercialize large-scale NH₃-SOFC systems for use in industry and general business.



The Project Risk Management Division is working to ensure the successful implementation of contracted projects and thereby support IHI's ongoing business diversification



Executive Officer
General Manager of Project Risk Management Division
Mitsutoyo Yoshida

Mission of Project Risk Management Division

IHI inaugurated the Project Risk Management Division in April 2017 to strengthen IHI's risk-management structure in view of extensive losses on large-scale overseas projects in FY2014 through FY2016.

The division's main task is to analyze these projects and investment risks and support implementation.

Project risk management for large-scale projects

It performs pre-order and pre-investment reviews, and also monitors large-scale projects and investments under way. Projects generally span a period of two years to four or five years, so interim reviews are conducted periodically, timed to significant milestones. Also, standardized systems for interim reviews have been introduced companywide to confirm the status of projects and to assess whether or not initial targets for each project are being met. The division helps business areas and SBUs to establish and

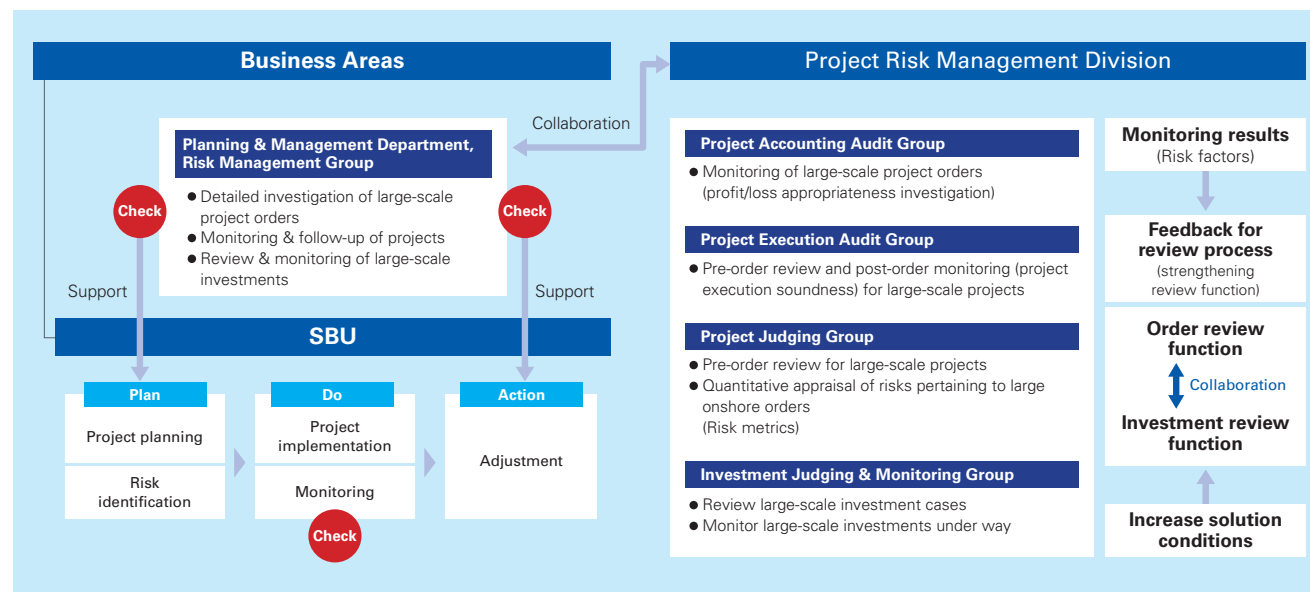
manage these systems. It also provides assistance for the early discovery of risks and swift implementation of countermeasures.

Employees, IHI retirees and external experts who are well versed in IHI businesses are retained as certified reviewers to perform monitoring. These people overview projects from overall and frontline worker perspectives to ensure proper execution.

Through the steady execution of such initiatives, the number of downside events occurring in large-scale projects has been decreasing yearly. The companywide operating margin, which had fallen to 1.4% in FY2015, improved to 5.6% in FY2018, due in part to these initiatives.

Organizational strengthening and intensive reviews

To strengthen project risk management even further, the division was reorganized by increasing its members and establishing a new group to monitor project operations in



April 2019. Through close liaison with business areas and SBUs, the division firmly supports project management to ensure sound implementation and transparent evaluation from a profit-and-loss perspective.

Under another new initiative, certified reviewers from many fields have been brought together at the forefront of projects for intensive reviews of potential risks in each major stage, namely, design, procurement and construction. Moving forward, the scope of these intensive reviews will be broadened to ensure early detection of potential risks and swift introduction of required solutions.

Status of large-scale projects

The division monitors some 80 projects globally and reports project-status appraisals and countermeasure implementation for larger projects than certain criteria regularly to the board of directors for their review. Regarding a process plant project in North America, the operating company of IHI E&C is limiting acceptance of new large-scale orders to allow it to focus on fully completing current projects. However, more engineers, workers, etc. needed to handle additional work resulted in increased costs. The division's monitoring and support

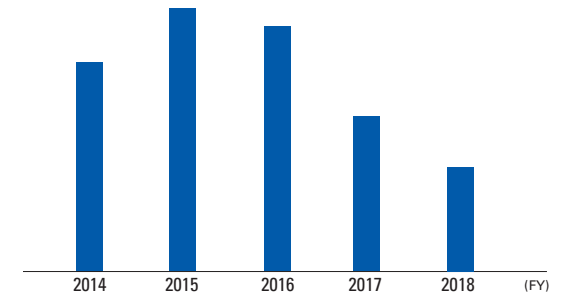
operations help to ensure that projects run smoothly and are handed over to customers on a timely basis.

Addressing new risks to support transformation

IHI is pushing ahead with its transformation in accordance with the company's new Group Management Policy. As such, new risk-management methods must suit the widening scope of IHI projects, including diversification into fields such as plant operation and maintenance, beyond conventional contracts covering the construction of large-scale plant. This development involves advanced evaluations, such as statistics-based risk management deployed in the aero engine area, being introduced in other business areas, and also even involves the deployment of external resources where required. In addition, the division is working to further reduce risk by actively monitoring projects from the stage of business-roadmap development.

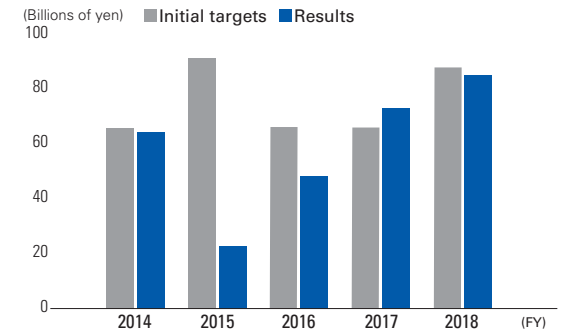
Expansion into new businesses always involves the challenge of unknown risks. By providing solid support from a risk-management perspective, the Project Risk Management Division is contributing to the safe, swift realization of IHI's transformation.

Numbers of downside events on major projects



Note: The chart shows the number of downside events that resulted in significant gaps between estimated and actual costs on large projects subject to monitoring.

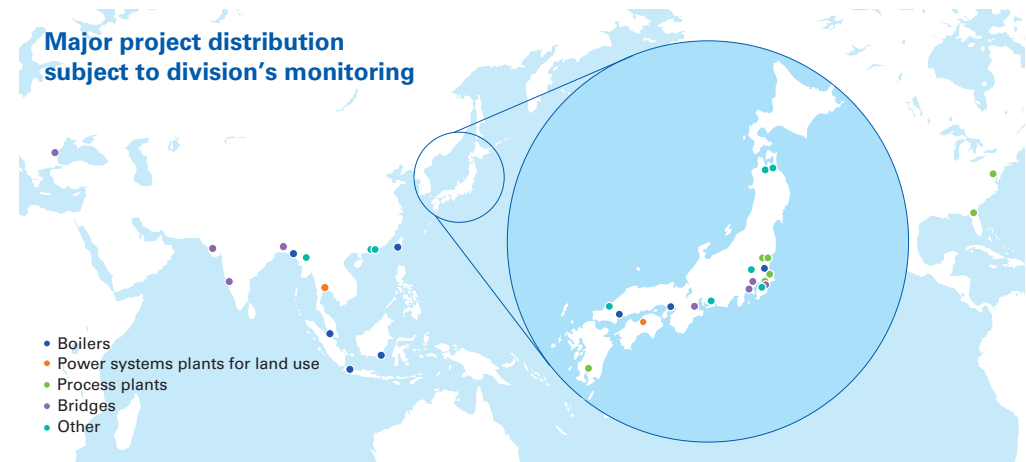
Operating income targets and results



System for supporting large-scale projects



Major project distribution subject to division's monitoring

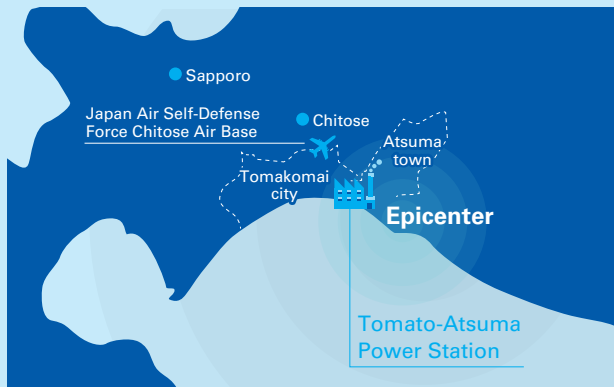


IHI Technologies and Employees Supporting Society ①

Restoring Electricity for Normal Life**—Restoration of Hokkaido Electric Power Company's Tomato-Atsuma Power Station—****Large-scale power outages across Hokkaido**

At 3:07 am on September 6th, 2018, the Hokkaido Eastern Iburi Earthquake struck. With an epicenter in the central east part of the Iburi region, the earthquake measured 6.7 in magnitude and a maximum intensity of 7 on Japan's seismic scale was recorded in Atsuma town. The Tomato-Atsuma Power Station operated by Hokkaido Electric Power Company (HEPCO), which uses IHI boilers, was damaged in the earthquake. With the Tomari Nuclear Power Station non-operational, the Tomato-Atsuma Power Station assumed an extremely important role as Hokkaido's largest-output thermal power plant. In the wake of the earthquake, damage to power lines and various unforeseen factors led to large-scale power outages throughout most of Hokkaido, greatly inconveniencing local residents.

Given that Hokkaido is located in northern Japan, power demand reaches its peak during the island's harsh winters. As such, there was an urgent need to restore power supply to the region before the onset of winter.



Tomakomai city during the power outage (4:37 am, September 6th, 2018)

Rushing to site to begin boiler repairs

Both of the power station's major power sources, the No. 2 Unit (600,000 kW output) and No. 4 Unit (700,000 kW output), were non-operational. IHI boilers are installed in both units, so IHI immediately took action to help restore power. New Chitose Airport was closed at the time, so it was feared that Hokkaido was cut off from the outside world. However, IHI engineers were allowed to be transported into the region on a Japanese Self-Defense Force cargo aircraft. Four engineers arrived on the day of the earthquake and six more flew in the following day. Thankfully, the hydropower plant in the region resumed operation, so power was available for restoration work at the Tomato-Atsuma Power Station. Despite fears of aftershocks and other uncertainties, the IHI engineers began their critical mission of restoring the power at the station as rapidly as possible.

Working together to overcome a difficult situation

While there was no major damage to the boiler on No. 4 Unit, the No. 2 Unit boiler had broken pipes in its bottom and center portions. Meanwhile, transporting materials needed for the repair work encountered difficulties. The delivery of emergency relief supplies to Hokkaido was the main priority, so the transportation of other cargo was limited. It was decided to have engineers travel to the site carrying required materials themselves. Welding materials, etc. were brought in on a Self-Defense Force aircraft.

Initially, work was performed by a limited number of personnel, but gradually we received support from personnel at subsidiaries and other sites within Hokkaido, which allowed us to unite together and accelerate the restoration work.



Members of the restoration project team

Leveraging past experiences to accelerate restoration work

We also drew on our experience in dealing with the Great East Japan Earthquake of March 2011. By making educated guesses about what might have been damaged, we were able to prepare useful documents and drawings to help shorten preparation time and begin working sooner. At the same time, we knew that during disaster recovery, there is a tendency for people to overly focus on the damage that has just occurred and lose sight of the need for continuous safety measures. Applying this knowledge, we adopted firm safety controls to ensure that our work team would not encounter any dangerous incidents during the project. Meanwhile, restoration work also was being carried out at other power stations, factories, etc. in other parts of Hokkaido. A crisis taskforce was set up at the IHI Head Office in Toyosu to maintain close communication with each worksite, dispatch personnel as needed, and coordinate the fastest possible transportation of materials. With the cooperation of this taskforce, we implemented earthquake-proofing designs and promptly reported them to our customers. Communicating closely with our customers helped to ensure that the work proceeded smoothly and without delay, which enabled us to complete the restorations in the shortest possible time.

Eager to match the enthusiasm of our customers

No. 4 Unit recommenced operation on September 25th, followed by the No.2 Unit on October 10th. Significantly, we were able to successfully restore power to Hokkaido before the onset of winter. Some of the restoration project members shared their experiences. HEPCO employees, despite suffering from the impact of the earthquake and living in evacuation shelters with their families, were highly motivated to work as hard as they could "to get the power stations back on their feet, which was the number-one priority." We heard that one HEPCO employee said, "When we'd return from work in the middle of the night, the baths operated by the Self-Defense Force would already be closed." Seeing customers in that state of course "made us want to get the stations up and running again as quickly as possible", so we used every ounce of strength to help restore power.



Tomato-Atsuma Power Station, Hokkaido Electric Power Company

Project Members

Boiler Design Dept.
Boilers Business Unit

Manager of Service
Engineering Group
Nobukatsu Tomiyama



Boiler Construction Dept.
Boilers Business Unit

Manager of Planning &
Construction Group
Kenro Fukuda
(On-site representative)



Maintenance Engineering Center
Boilers Business Unit

Manager of Project Group
Sumio Sakamoto
(Project manager)



Showing the World Japan's Ability to Restore Infrastructure —Restoration of Sky Gate Bridge R at Kansai Airport—

The typhoon rendered a key route to the international airport unusable

In September 2018, the extremely powerful Typhoon Jebi brought strong winds, heavy rains and high waves to the Kinki region. At Kansai Airport, where a maximum wind speed of 58.1 m/s was recorded, a tanker lost power and collided with the Sky Gate connecting the island airport with the mainland. As a result, the airport was disconnected from the mainland.

The A1-P1 girder that connected the onshore A1 pier and offshore P1 pier, and the P1-P2 girder that connected the offshore P1 and P2 piers were damaged by the accident. IHI Infrastructure Systems employees who had been involved in the Sky Gate's original construction saw the accident on the news and immediately thought, "That's the bridge we built!" IHI Infrastructure Systems' Sakai Works also sustained major damage. Two large gantry cranes alongside a seawall collapsed into a building. Nevertheless, when IHI

Infrastructure Systems received a request from West Nippon Expressway Company Limited (NEXCO West Japan), they immediately established a team to respond to the request the following day. In order to secure enough space to repair the damaged girders, all employees focused on removing the collapsed cranes and repairing equipment.

Liaising with the customer to swiftly secure traffic route

On the six-lane bridge, the three lanes heading into the airport were impassable due to the damage, so a route was secured for two-way traffic by utilizing the undamaged three remaining lanes. NEXCO West Japan promptly decided to remove the median strip after confirming the safety of the makeshift roads, so IHI Infrastructure Systems was able to commence work immediately.

Moreover, all departments worked in unison and

simultaneously planned all work, including removal of all damaged sections, multi-party workflow, hauling out damaged piers, and selection of fabricators. In less than 10 days after the tanker's collision, the removal of the 188-meter section of the damaged bridge was completed, a major step in the process to reopen the train line.

Combining know-how to successfully shorten construction period

Before starting fabrication, the extent of girder damage was confirmed. When fabrication began on the new bridge girders, the handwritten design statement, blueprints, etc. used to build the original bridge in 1994 were used as key reference materials, including for determining the status of damage to girders that were brought to the factory. Fabrication and repair of the 98-meter P1-P2 girder was performed at Sakai Works, while the 90-meter A1-P1 was worked on at Takadakiko. Damage to the A1-P1 girder was relatively minor, so it was possible to reuse 60% of the original structure.

At Sakai Works, project members coordinated with related departments and planned the work processes in the shortest possible time after repeated discussions.

Workers exerted every effort to shorten the lead-time for materials, install a new manufacturing line and streamline work. Consequently, processes were significantly shortened and the new bridge girders were completed promptly. The dimensions of each part were designed larger than those of normal bridges, so creativity was needed to plan and design a special-purpose lifting beam as well as perform the work safely and efficiently. People involved in the project commented that the customer, as well as top executives

Restoration work program	2018				2019				
	September	October	November	December	January	February	March	April	May
On-site confirmation	■								
Examination of design drawings	■	■						Full restoration	
Preparation of steel material	■	■	■					Golden Week	
Fabrication at factory			■	■					
Painting				■	■				
Base assembly					■	■			
Erection						■			
Restoration of pavement and two-way route							■	■	



Removal status of damaged bridge girders



from companies related to the bridge, came to Sakai Works to cheer on the workers, which was truly encouraging. In February 2019, the two completed bridge girders, each weighing around 800 tons, were installed on the bridge pier with a massive floating crane. The work was completed on April 8th, nearly one month earlier than the original target, fully restoring the access to the airport.



Cranes that collapsed at Sakai Works (left) and states of restoration (right)

Proudly receiving words of appreciation from the customer

The restoration work became a hot topic in the media. This was the first time in Japan that a major bridge had been damaged so badly that it had to be rebuilt. Moreover, a smooth-functioning airport was crucial for Osaka's scheduled hosting of the G20 summit in June. On April 12th, NEXCO West Japan President Kazuhiro Sakai presented IHI Infrastructure Systems and Takadakiko with a Certificate of Appreciation for their efforts to restore the Sky Gate Bridge R at Kansai Airport with impressive speed. Said President Sakai: "You promptly responded to our request. In view of Osaka's official selection to host Expo 2025 as well as the G20 summit, getting the bridge operational again was an urgent mission. Full restoration in seven months after the damage occurred was accomplished thanks to your dedicated efforts and ingenuity."

Going forward, IHI will continue to leverage its technological prowess, outstanding human resources and diverse experience to respond to customer needs by constructing, maintaining and managing essential infrastructure.



Fabrication status

Project Members

IHI Infrastructure Systems Co., Ltd.
Sakai Works Production Control Dept.

Project Manager
(Fabrication)
Keiichi Takeda

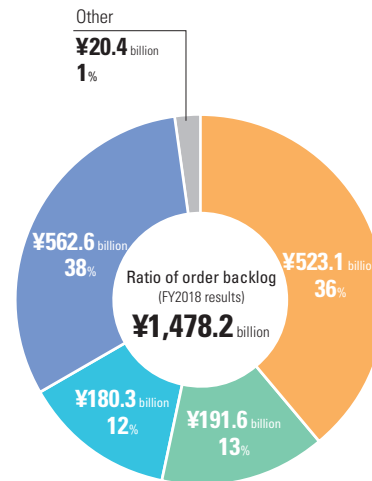
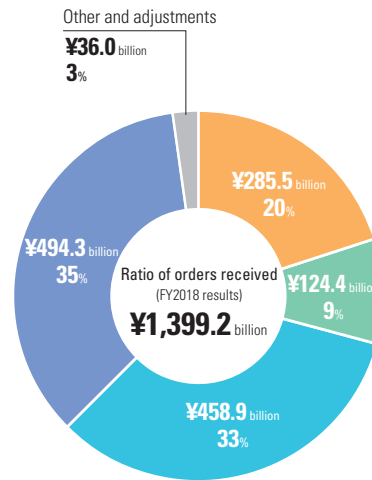
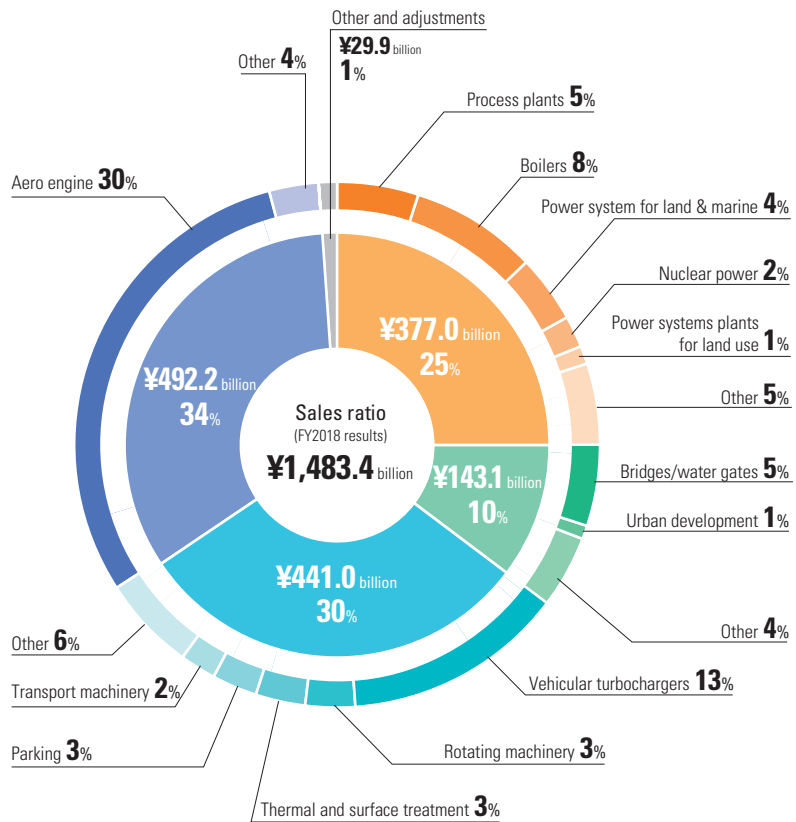


IHI Infrastructure Systems Co., Ltd.
Sakai Works Production Dept.

Planning Manager
(Fabrication)
Yasutoshi Nagase



Business Overview

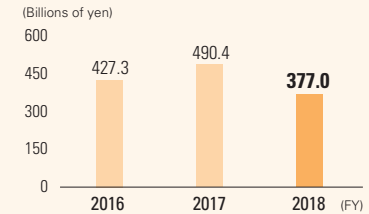


- Resources, Energy & Environment
- Social Infrastructure & Offshore Facilities
- Industrial Systems & General-Purpose Machinery
- Aero Engine, Space & Defense
- Other and adjustments

The total of percentages for all segments may not reach 100%, as amounts less than 100 million yen are rounded off.

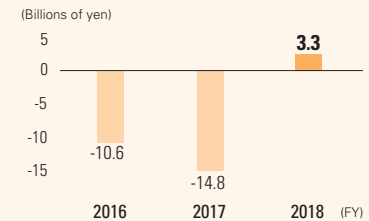
Resources, Energy & Environment

Net sales



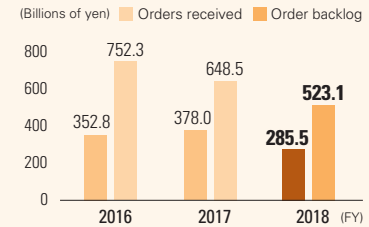
In addition to the impact from the previous fiscal year's financial reporting periods unification, net sales fell due to difficult comparisons caused by progress made in large-scale projects during the previous fiscal year in the process plants business.

Operating income



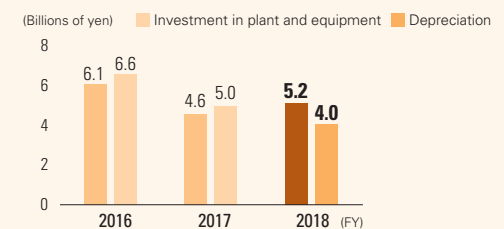
Profit increased due to overall alleviation of profit deterioration of process plants from previous fiscal year and decrease in sales, general, and administrative expenses.

Orders received / Order backlog



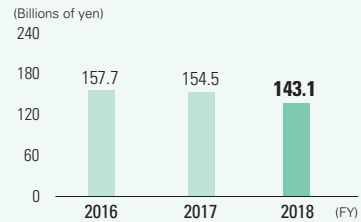
Orders received declined due to difficult comparisons caused by large-scale orders for the boilers and power systems plants for land use businesses received the previous fiscal year.

Investment in plant and equipment / Depreciation



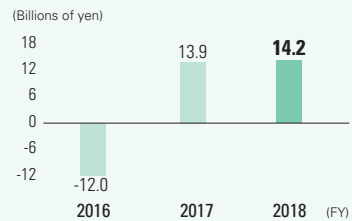
Social Infrastructure & Offshore Facilities

Net sales



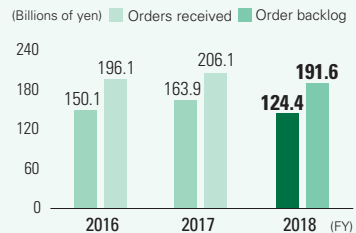
The bridges/water gates business posted higher net sales, but the F-LNG/offshore structures and shield systems businesses resulted in lower revenues overall.

Operating income



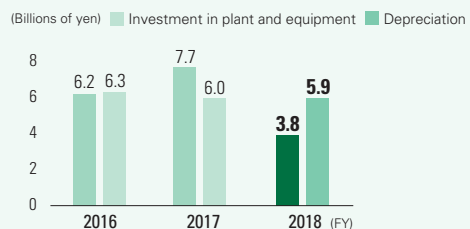
Operating profit fell at the F-LNG/offshore structures and shield systems businesses, but rose in the bridges/water gates business.

Orders received / Order backlog



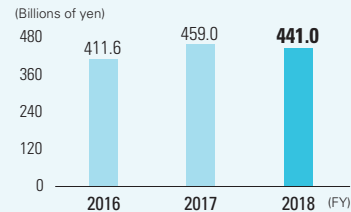
Orders received declined due to difficult comparisons caused by large-scale orders for the bridges/water gates business received the previous fiscal year.

Investment in plant and equipment / Depreciation



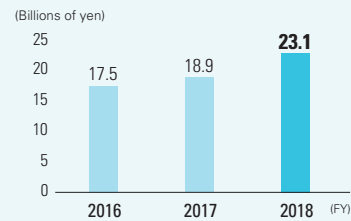
Industrial Systems & General-Purpose Machinery

Net sales



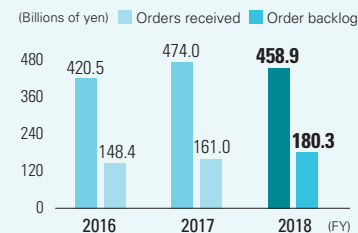
Net sales declined as a result of the previous fiscal year's financial reporting periods unification, but excluding the effects of that change, the parking and rotating machineries businesses both in effect recorded higher net sales.

Operating income



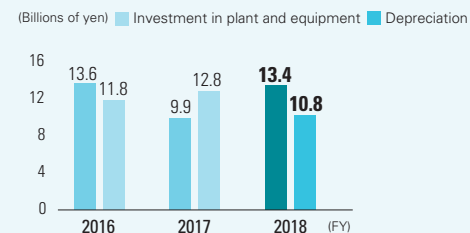
Despite the impact from the previous fiscal year's financial reporting periods unification, operating profit increased due to factors such as improvements in profitability in thermal and surface business as well as the impact of the higher net sales above.

Orders received / Order backlog



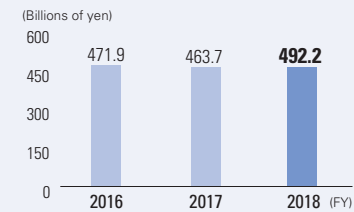
Orders received declined as a result of the previous fiscal year's financial reporting periods unification, but excluding the effects of that change, transport machineries and others in effect recorded increases.

Investment in plant and equipment / Depreciation



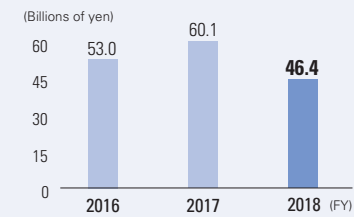
Aero Engine, Space & Defense

Net sales



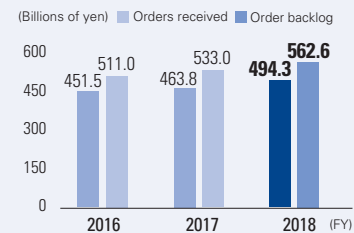
Net sales increased in the civil aero engines business.

Operating income



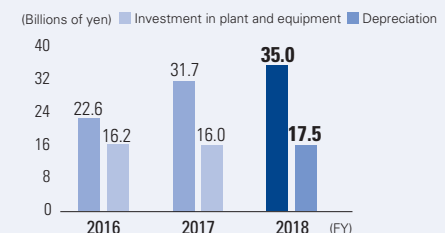
In the civil aero engines business, despite reduced share of expenses responding to problems relating to PW1100G engines, operating profit fell in the due to an increase in units of the new PW1100G engine handed over to customers, as well as other factors.

Orders received / Order backlog



Orders received rose as a result of increases in the civil aero engines and rocket systems/space development businesses.

Investment in plant and equipment / Depreciation



Products and Services

Boilers, Power systems plants for land use, Power systems for land & marine use, Large power systems, Process plants (storage facilities and chemical plants), Nuclear power plants equipment, Environmental response systems* and Pharmaceutical plants

* On January 1, 2019, IHI decided to transfer its Environmental Response Systems Business to Kobelco Eco-Solutions Co., Ltd., thereby disengaging from this business area.

IHI is supporting customer businesses throughout their entire lifecycles to help realize a carbon-free recycling society.

Managing Executive Officer
President of Resources, Energy & Environment Business Area

Hiroshi Ide



FY2018 Review

The Resources, Energy & Environment Business Area leverages technologies for diverse energy sources, including coal, natural gas, nuclear energy and renewable energy—all of which are IHI strengths—and offers finished goods and services that support the stable supply of energy essential for daily life.

In response to the Paris Agreement adopted in 2015, efforts to achieve a carbon-free world have accelerated, bringing major changes to energy-related businesses, such as reduced use of large coal-fired boilers.

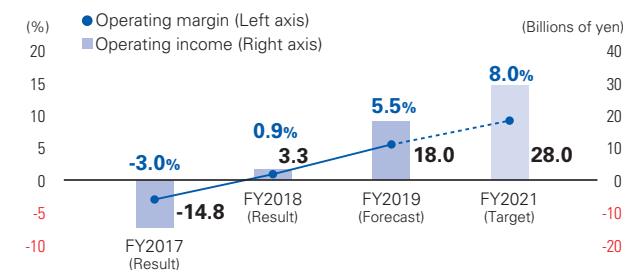
The Resources, Energy & Environment Business Area did not reach its operating-income target in FY2018 due to a weak market and the deteriorated profitability of additional projects at North American process plants. Nevertheless, by upgrading the level of our boiler maintenance work, we were able to lift sales out of the red from the previous year.

Strengthening Lifecycle Businesses Inside and Outside Japan for Increased Earnings

Among large-scale projects in FY2018, we constructed a plant in sub-Saharan Africa, a first for IHI, and finished by the agreed deadline. IHI supplied major items such as gas turbines and generators and oversaw the entire project to deliver a 100 MW-class gas-fired combined cycle power plant to Electricidade de Moçambique. IHI will also provide maintenance for the next six years and support the power plant's stable operation.

Within Japan, we constructed and commenced operation of a 49 MW woody biomass power plant in Kagoshima, working with Nanatsujima Biomass Power LLC. The

Operating income and operating margin



Exchange rate assumptions

	¥111 = US\$1.00	¥111 = US\$1.00	¥105 = US\$1.00	¥105 = US\$1.00
Net sales	¥490.4 billion	¥377.0 billion	¥330.0 billion	¥350.0 billion

renewable-energy electricity generated at the plant is being sold to Kyushu Electric Power to help power the surrounding region for the next 20 years. IHI is using fuel from palm coconut shells, wood pellets and timber from domestic forest thinning to reduce CO₂ emissions by around 200,000 tons per annum.

In business structure reforms, the nine SBUs were reorganized into five, helping to strategically concentrate corporate resources. In this connection, the waste processing facility business of IHI Environmental Engineering was transferred to Kobelco Eco-Solutions Co., Ltd. in January 2019. In April of the same year, IHI's plant business was integrated and IHI Plant Services Corporation was established. In July, the power systems business was integrated to form IHI Power Systems Co., Ltd. As illustrated by these examples, IHI is flexibly responding to market diversification to strengthen its earnings capacity.

Implementing Group Management Policies 2019

CO₂ reduction, believed to be a prime factor in climate change, is the key issue in this business centered on energy plants for power generation. The need to shift to renewable energy over the long term is paralleled by a need to respond to increased energy demands, particularly in emerging nations, in the short term.

Total Solutions for Diversified Needs

In the short and medium terms, we will focus on reducing CO₂ emissions by leveraging IHI strengths in combustion technologies, striving to improve combustion efficiency by modifying existing boilers, using biomass and other measures.

Wood pellets are primarily utilized for carbon-neutral biomass, which is expected to be used increasingly in the future. Japan, however, relies heavily on imports of this material, so stable supply is a challenge. IHI, which has focused on palm empty fruit bunches (EFB) discarded at Malaysian palm farms, has begun a business to turn EFB into pellets for fuel.

It is not possible to control the output of renewable energies, such as solar power and wind power, so power generation levels vary depending on weather conditions. As such, a key issue is supply and demand adjustment. Using energy-management technology centered on energy storage systems to balance power supply and demand, IHI is helping to further the potential of renewable energy. Meanwhile, to respond to energy supply in regions where power infrastructure is lacking, IHI believes that rather than constructing large-scale power plants and power grids from the ground up, it is more advantageous in terms of construction cost and delivery to build local power supply systems based on small-scale distributed energy. IHI is now pushing ahead with the development of small-scale distributed energy, such as high-efficiency gas engines, and focusing on providing total lifecycle support, including by using IoT and ICT for remote-control plant monitoring and maintenance.

Building a Recycling Society by Using CO₂ Effectively

The company's long-term goal is to halve current CO₂ emissions of domestic and international customers combined. Ultimately, we aim to help realize a society in which all generated CO₂ is circulated. This will require using energy that does not generate CO₂ as well as not discharging any generated CO₂ into the environment. In 2008, IHI launched a joint project between Japan and Australia to develop oxyfuel for carbon capture and storage (CCS), focusing on establishing the required CCS technology. Current efforts are targeting the conversion of captured CO₂ into a valuable resource.

Using a catalyst developed with the Institute of Chemical and Engineering Sciences, which is under the auspices of the Agency for Science, Technology and Research, IHI succeeded manufacturing methane by reacting CO₂ with hydrogen, a process known as methanation. IHI also is investigating technologies for manufacturing ethylene and propylene by utilizing plastic and resin as raw materials, etc.

By applying IHI's extensive plant engineering technologies and global network, we will introduce lifecycle services rooted in each region and thereby contribute to realization of a carbon-free recycling society.

Future direction

Contribute to carbon-free and recycling society by providing optimal integrated solutions for each region and customer

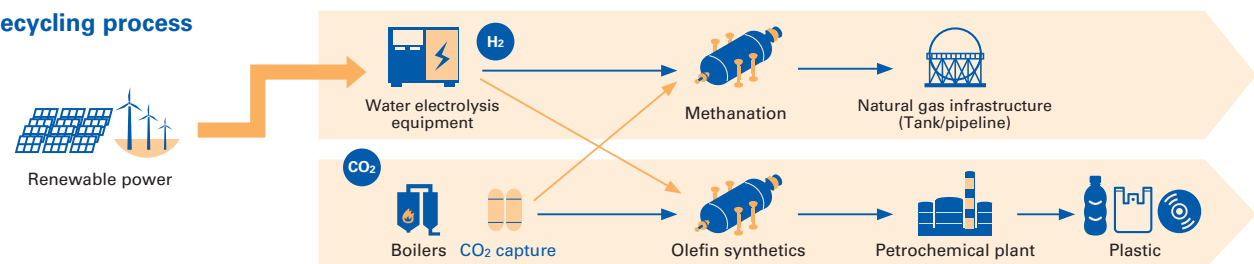
Long-term strategies

- Launch new businesses aimed at halving current CO₂ emissions of domestic and international customers combined

Short/medium-term strategies

- Reduce CO₂ emissions through improved boiler combustion efficiency, fuel conversion, biomass usage, etc.
- Energy-management technology for renewable energy

CO₂ recycling process



Major products and services/characteristics

Boilers



Domestic share of ultra-super-critical pressure boilers

35%

Efficiently combust diverse fuels to supply steam for power generation and production processes. Remove chemical substances in flue gas and reduce CO₂.

Strength

- Combustion technology efficiently utilizing diverse fuels
- 35% domestic share of ultra-super-critical pressure boilers

Opportunity

- Increasing energy demand in emerging countries
- Increasing demand for clean energy due to tightening regulations

Risk

- Decrease in large coal-fired power-generation projects

Countermeasure

- Modify existing equipment for high-efficiency/capacity
- Reduce CO₂ emissions by using biomass and ammonia fuels

Power systems



Diverse lineup

2 MW to 50 MW

For land use, supply gas turbines, gas engines and diesel engines. For marine use, supply small to large engines for large vessels and high-speed boats.

Strength

- Wide-ranging power system lineup supporting 2 MW to 50 MW
- Responding to needs and providing after-services in the land and marine fields

Opportunity

- Increasing demand for distributed energy
- Increasing demand for power-source adjustment due to adoption of renewable energy

Risk

- Shrinking market for fossil-fuel power-generation equipment

Countermeasure

- Differentiate through high-performance engines
- Participate in projects from early stage through closer customer relationships
- Use corporate resources effectively by integrating group businesses and establishing new companies

Global Plant Engineering



Service network

13 countries

Jurong Engineering provides design, procurement, construction and maintenance for overseas projects in fields including power generation, petroleum/chemicals and steel-making.

Strength

- Half-century track record of constructing plants
- Supporting customer deployments in Asia, Middle East, Africa, etc.

Opportunity

- Increasing expansions into Asian region
- Increasing demand for distributed energy

Risk

- Differences in regional characteristics and entering new countries

Countermeasure

- Use IHI bases to appraise regional characteristics
- Collaborate with partners on a grass-root basis

Topics

Kuala Lumpur
Malaysia

Full-scale deployment of solutions for Malaysian palm farms



IHI Solid Biomass Malaysia Sdn Bhd (ISBM) was established in Malaysia to fully expand the manufacture, export and sale of solid biomass fuel, or EFB pellets, derived from palm empty fruit bunches.

Biomass fuel made from palm trees

Large quantities of EFB generated during the extraction of palm oil tends to be discarded and unused, resulting in soil contamination and methane gas release due to the high content of moisture, ash and salt making EFB vulnerable to rot. IHI has established a method to convert and mass-produce EFB into high-quality low-

ash pellets, which can be used effectively as solid biomass fuel.

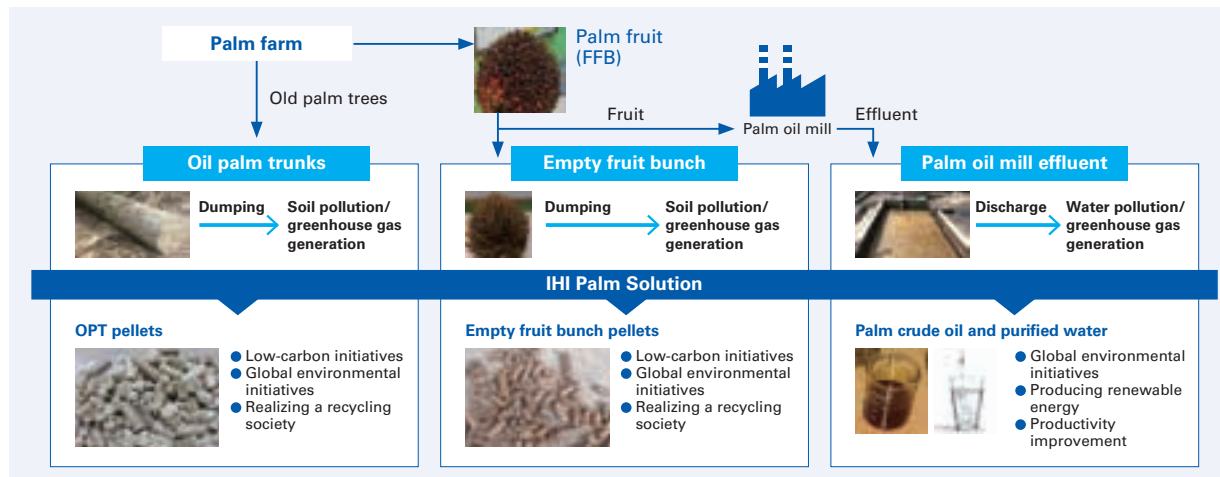
IHI also developed and is piloting a system to treat palm oil mill effluent and a facility to manufacture pellets from discarded oil palm trunks in Malaysia. Both initiatives will help to utilize palm oil production waste and reduce the environmental impact of the palm industry.

Developing an eco-friendly industrial estate

Also, together with Nextgreen Global Berhad (NGGB),

a major Malaysian printing company, and Nomura Holdings, Inc., IHI is evaluating the feasibility of producing pulp for paper-making and using EFB for biomass fuel production. The three parties also are considering a collaboration to support the use of palm waste at NGGB's eco-friendly industrial estate, Green Technology Park.

IHI aims to improve the sustainability of the palm industry, one of the major industries in Malaysia, and contribute to the stable supply of solid biomass fuel, for which demand is expected to rise greatly in Japan.



ISBM pellet manufacturing site (Malaysia)

Social Infrastructure & Offshore Facilities

Products and Services

Bridges and Watergates, Shield systems, Transport systems, Concrete construction materials, Urban development (real estate sales and rental), F-LNG (floating LNG storage facilities, offshore structures)*

* IHI has abolished its F-LNG business.

Ensuring infrastructure safety on a global scale from a long-term perspective

Executive Officer
President of Social Infrastructure & Offshore Facilities Business Area

Takeshi Kawakami



FY2018 Review

In Social Infrastructure and Offshore Facility business areas, IHI engages in infrastructure construction, urban development, etc. for the establishment of safe and secure social infrastructures.

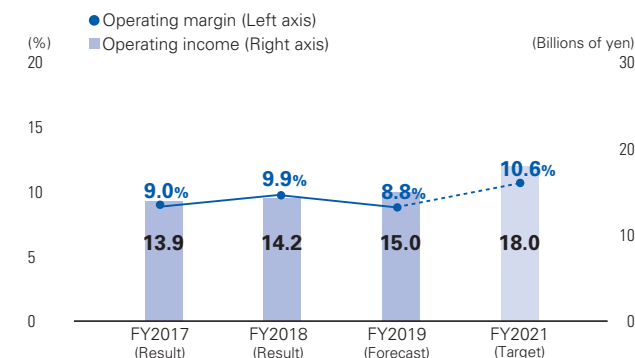
FY2018 was plagued by numerous natural disasters in Japan. Damage to Kansai International Airport’s Sky Gate Bridge R due to Typhoon Jebi affected a large number of people in transit. In response, IHI, particularly the Sakai Works of IHI Infrastructure Systems, which is located close to the bridge, made a concentrated effort to repair the damaged infrastructure. Repair jobs that normally take over one year were completed in just seven months thanks to our frontline team’s strong desire to restore the bridge to operation as soon as possible.

Also, eight railcars powered by diesel engines were delivered by Niigata Transys and began operating on Iwate Prefecture’s Sanriku Railway in March 2019. The accomplishment resulted in the full reopening of the Riasu Line, which had been damaged in the Great East Japan Earthquake of 2011.

Global Business Expansion

Overseas, the Nam Ngiep 1 Hydroelectric Power Project launched in Laos in 2014 was completed without any issues. The large-scale dam construction project, also known as the 2nd No. 4 Kurobe Dam, was backed by an all-Japan team spearheaded by Kansai Electric Power Company, with IHI supplying watergates and steel pipe equipment. The power generated at Nam Ngiep 1 is being sold to Thailand. As renewable energy, it is contributing to the reduction of CO₂

Operating income and operating margin



Exchange rate assumptions

	¥111 = US\$1.00	¥111 = US\$1.00	¥105 = US\$1.00	¥105 = US\$1.00
Net sales	¥154.5 billion	¥143.1 billion	¥170.0 billion	¥170.0 billion

emissions at a time when power demands are rising. In shield systems business, JIMT purchased a 51% share of Terratec Limited, a Hong Kong company engaged in shield system business worldwide. IHI is targeting a dramatic transformation to become a global leader in this field, including by supplying total systems, such as the backup systems, made by Terratec and by adding operation services to the portfolio.

Meanwhile, following the completion of an SPB tank order, IHI terminated its F-LNG business and lowered the curtain on 45 years of history at its Aichi Works manufacturing base. Full maintenance services for F-LNG products delivered to date, however, continue to be provided.

Implementing Group Management Policies 2019

In view of the differences in the operating environments for infrastructure in Japan and overseas, IHI has rolled out strategies matched to each market.

In Japan, where preparations are under way for Olympic and Paralympic Games Tokyo 2020, there is strong demand for new infrastructure, such as roads within the Tokyo metropolitan area and the Linear Chuo Shinkansen maglev train. Over the long term, however, demand will inevitably fall. Overseas, the demand for new infrastructure is high in emerging nations, particularly in Asia, while in advanced nations the demand is rising for total lifecycle business related to infrastructure, from design and construction to operation and maintenance, in line with the spread of outsourcing.

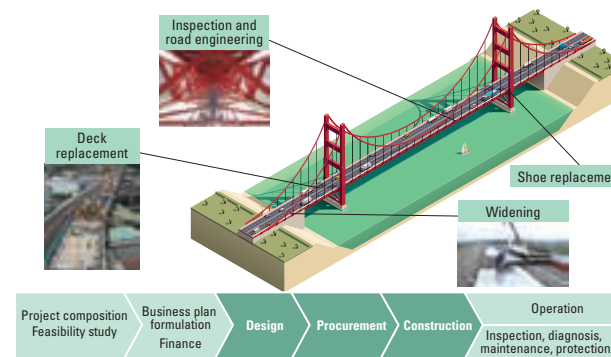
Within this environment, IHI's goal is to contribute globally and across lifecycles to help realize safe and secure social infrastructures centered on bridges and tunnels. Current efforts are focused on strengthening IHI's lifecycle businesses for servicing, maintenance, etc. on an accelerated global basis. By moving beyond the conventional scope of infrastructure engineering, procurement and construction (EPC), we are shifting to value spanning total lifecycles, from feasibility studies and initial fundraising to post-completion operation and maintenance.

Moreover, we are strengthening our product and service lineups in this business area and research problem-solving business models that enable us to offer comprehensive infrastructure systems for cities under our Smart City concept.

Longer-Life Global Infrastructure Built with Faster Construction Methods

Over 20% of the bridges and tunnels in use in Japan were built 50 years ago, and this will increase to 50% in 20 years. As in North America, Europe and other advanced regions, Japan is faced with the problem of managing its aging infrastructure. IHI's mission is to ensure the infrastructure it

constructs can be used safely over the long term, and also to complete repair work rapidly to avoid disrupting people's lives. The company takes a creative approach to conducting projects that cause minimal disruption to transportation, including by developing techniques for extra-fast completion and by utilizing ICT (BIM/CIM models) to perform highly useful simulations. We have also begun to mount special sensors on structures to monitor structural soundness remotely. Also, to help conserve the earth's limited resources, we are devising new initiatives to extend the longevity and robustness of existing infrastructure.



Bridge lifecycle business

More Robust Infrastructure for Sustainable Cities and Communities

Moving forward, as urbanization continues to spread in emerging nations while infrastructure continues to age in advanced nations, there will be two critical issues: balancing preservation vs. convenience and protecting the global environment. To help realize sustainable cities and communities, one of the United Nations' sustainable development goals (SDGs), IHI will help to construct new infrastructure and also extend the life of existing infrastructure, ultimately to conserve limited resources and protect the environment.

IHI will strive to ensure infrastructure safety on a global scale from a long-term perspective, aiming to create a society where people can live with peace of mind.

Future Directions

Contribute globally and across life cycles to materialize safe and secure social infrastructures, centered on bridges and tunnels

Long-term strategies

- Expansion of business areas through collaboration with overseas partners, etc.
- Development of concession businesses in Japan and abroad
- Creation of infrastructure for optimal urban environments

Short/medium-term strategies

Bridge business

- Focus on comprehensive post-construction maintenance and preventive business
- Participation in concession type business

Shield business

- Development of overseas businesses, including tunnel excavation

Watergate business

- Establishment of remote maintenance systems

Major products & services/characteristics

Bridges



Construction achievements

Over **12,000** bridges

IHI, the first private company to build an urban bridge in Japan (Yokohama, 1883), engages in engineering, fabrication and construction of bridges and expressways in Japan and abroad.

Strength

- Track record involving over 12,000 bridges in Japan and abroad
- Production system in five countries focused on Asia, where infrastructure demand is high
- Efficient engineering and installation utilizing ICT (BIM/CIM models)

Opportunity

- Increasing demand for new infrastructure in Asia regions due to ongoing urbanization
- Increasing demand for extended-life infrastructure due to aging and for disaster prevention
- Larger projects to increase efficiency of infrastructure investment

Risk

- Reduced domestic demand for new infrastructure
- Worsening of profitability of large projects overseas due to legal reforms, political instability and economic downturns

Countermeasure

- Consolidate and centralize comprehensive maintenance, from determining state of aging to engineering and installation
- Establish and deploy a preventive-maintenance business model
- Strengthen collaboration with overseas partners and supply chains

Watergates



Construction achievements

Over **4,000** cases

Gate for controlling water flow in dams and rivers, supporting hydropower generation and flood control

Strength

- Construction work on 4,000 dams and rivers in Japan and abroad
- Lineup meets diverse installation and application needs
- Efficient remote maintenance utilizing ICT

Opportunity

- Increasing demand for new infrastructure in Asia due to ongoing urbanization and growing needs for electricity
- Increasing demand for extended life infrastructure due to aging and for disaster prevention
- Operation and maintenance work outsourced to private sector due to labor shortages

Risk

- Reduced domestic demand for new infrastructure

Countermeasure

- Differentiate through maintenance tool functions strengthened with ICT
- Establish and deploy a preventive-maintenance business model

Tunnel Boring Machines



Japanese market share

44%

Machine with rotating cutter to excavate tunnels for subways, roads, etc. Also boasts Japan's top record for automatic assembly systems of the segments that form tunnel interiors.

Strength

- Japanese market share: 44%
- Over 4,000 units delivered in Japan and abroad
- Total systems, including backup equipment, for excavation operations

Opportunity

- Planning large projects in Japan, such as Linear Chuo Shinkansen
- Increasing excavations to construct subways in urbanizing ASEAN, the Middle East, Turkey, etc.
- Increasing demand for tunnels for flood prevention

Risk

- Reduced profitability of large projects due to intense competition
- Expansion into global market by Chinese manufacturers

Countermeasure

- Strengthen cost competitiveness by building a global supply chain
- Supply total systems, and strengthen operations and aftermarket services

Topics

Hong Kong

JIM Technology acquired HK Terratec to strengthen global competitiveness of shield machine

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

Achieve SDGs by providing products and services.

JIM Technology Corporation (JIMT), an IHI subsidiary in the shield system field, acquired 51% of Hong Kong-based Terratec Limited. Terratec offers a total system based on its tunnel boring machine (TBM) main units¹ and backup systems², which it is marketing globally. The two companies, have already been cooperating in overseas projects, are now leveraging their mutual strengths to become a world-class comprehensive tunnel builder.

Growing by overseas market development

The overseas market for TBMs is worth about US\$ 3.5 billion, 10 times the size of the market in Japan, is expected to achieve further growth in the future and is expected to continue growing. The demand for TBMs has great promise due to needs for infrastructure maintenance and subway route expansion, particularly in the developing interior regions of China and India and also in urbanizing areas of ASEAN, Middle East, Turkey and more.

Global strategy based on synergy of strengths

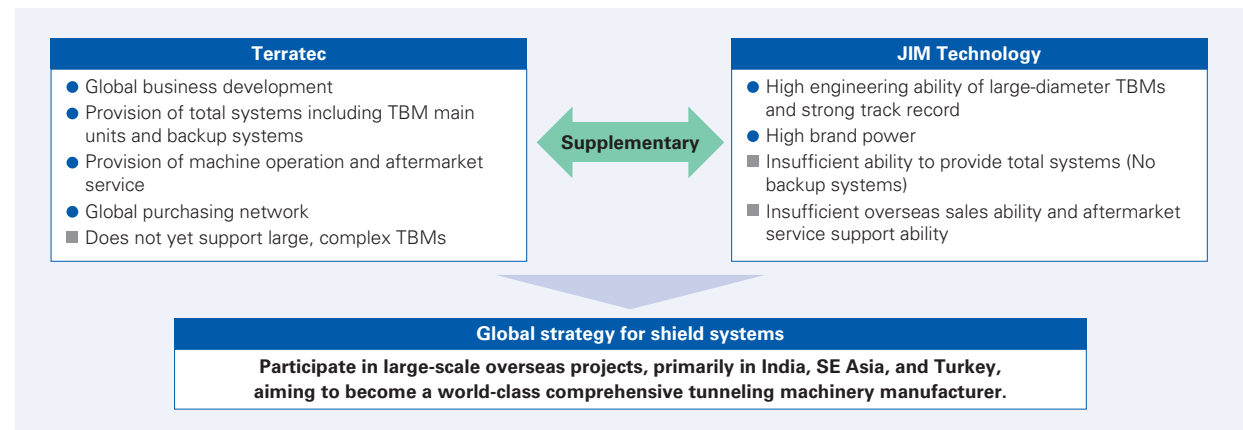
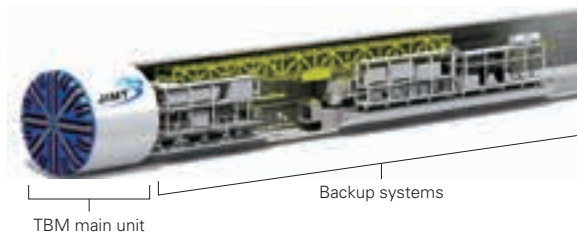
JIMT, having a track record of delivering more than 4,000 shield machines in Japan and overseas with strengths in large-diameter shield machines, now has become capable to offer a total system including the backup systems brought by Terratec through a capital tie-up with Terratec.

Terratec also has a proven track record in the global market, including large market shares in India, South East Asia and Turkey. The strategic alliance between JIMT and Terratec in TBM business will realize significant synergies in technology and thereby enhance mutual competitive strengths.

1. Tunnel boring machines (TBMs) are used for excavating subway and road tunnels.
2. Backup systems are installed behind the TBM main unit to move tunnel boring machines.



Excavation for the Thomson line of the Singapore subway



Industrial Systems & General-Purpose Machinery

Products and Services

Logistics and machinery (logistics systems and industrial machinery), Transport machinery, Parking systems, Heat Treatment and Surface Engineering, Vehicular turbochargers, Rotating machinery (compressors, separation systems, turbochargers for vessels), Agricultural machinery and small power systems, Steelmaking equipment, Papermaking machinery

We create new industrial systems that maximize the efficiency of human resources, energy and assets for customers and society.

Director
 Managing Executive Officer
 President of Industrial Systems &
 General-Purpose Machinery Business Area

Masafumi Nagano



FY2018 Review

A key strength and asset of the Industrial Systems and General-Purpose Machinery Business Area are the wide and deep connections it forms with manufacturing and logistics customers by providing various products and services that support industrial sites.

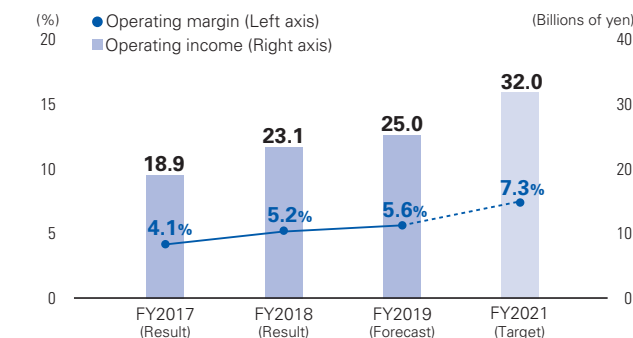
Manufacturing and logistics industries are undergoing major changes that are triggering a diversification of customer needs due to factors such as decreasing working populations, shifts toward decarbonization and energy-saving, and the expansion of sharing services. Accordingly, we are transitioning to a business model that generates customer value throughout product lifecycles.

Leveraging Robot Technology to Accelerate Manpower-saving and Process Automation

The keys to resolving labor shortages are manpower-saving and process automation. Currently, systems that automatically perform picking and sorting are being installed in warehouses to meet increasing logistics needs for e-commerce, etc. However, processes such as packing still depend on human labors, so there is still great potential for manpower-saving and process automation.

In regards to robot technology, we are focusing on depalletizing work, having developed a depalletizing system with Kinema Systems, an American startup. The system uses AI-based image recognition to improve work efficiency by 30%. We aim to realize further manpower-saving and process automation in logistics industries through continuing technological development.

Operating income and operating margin



Exchange rate assumptions

	¥111 = US\$1.00	¥111 = US\$1.00	¥105 = US\$1.00	¥105 = US\$1.00
Net sales	¥459.0 billion	¥441.0 billion	¥450.0 billion	¥440.0 billion

Strategic Reallocation of Corporate Resources for Improved Profitability

We will continue to strategically reallocate corporate resources through enhanced business portfolio management which was an initiative under “Group Management Policies 2016.” In FY2018, we transferred our small engine business to Caterpillar Inc. in the United States. Moreover, in fast-urbanizing China we established Qingdao IHI-HT Mechanical Parking System Co., Ltd., in partnership with two Chinese state-owned enterprises, to engage in the manufacture, sales and maintenance of mechanical parking systems. The company will provide high-quality products and meticulous maintenance services to grow our share of the expanding Chinese market. From now on, we will reorganize our operational structure to expand our lifecycle business and allocate resources in high-profit businesses for improved profitability.

Towards implementing "Group Management Policies 2019"

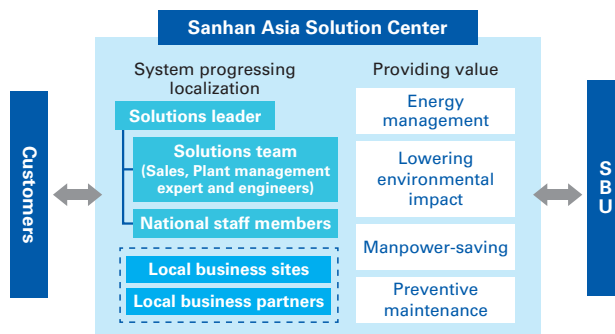
The priority fields within this Business Area are manufacturing, logistics and mobility. In each of these fields, we are maximizing the efficiency of human resources, energy and assets at customer businesses by thoroughly optimizing their operations throughout product lifecycles.

Functions Connecting the Business Area

Providing various products has been one of our Business Area's strengths. However, since many internal operations core were organized according to each product, there were problems such as duplication of functions and equipment, and loss of opportunities due to inefficient sharing of information.

In FY2019, we revised our organizational structure to strengthen cross-functional capabilities that connect each product across the Business Area. Specifically, we established the Strategy Development Department to build and reinforce lifecycle business earnings platforms, strengthen internal and external collaboration, improve global business expansion primarily in lifecycle business, pursue digital transformation to advance industrial systems, reform value chain processes, and more.

In addition, to accelerate global development centered on Southeast Asia, we established the Sanhan Asia Solution Center in Bangkok, Thailand. By localizing each business through collaboration between solution leaders dispatched



Sanhan Asia Solution Center functional diagram

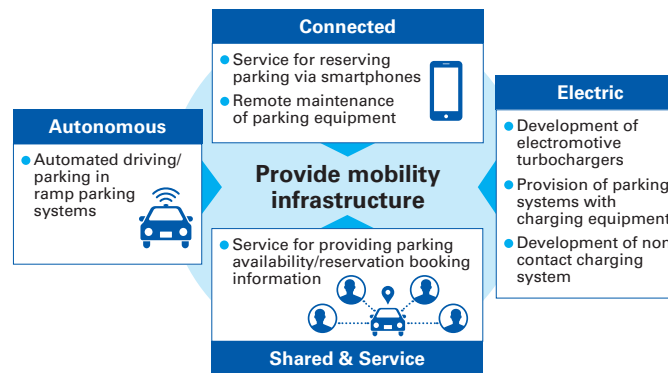
from Japan and local staffs, we are rolling out services as solutions to meet wide-ranging customer needs throughout Southeast Asia.

Technological Development Responding to the New Wave in Mobility (CASE)

In the mobility field, a huge change is taking place, called CASE (Connected, Autonomous, Shared & Service, and Electric). To respond to this change, we are pushing ahead with technological development utilizing our unique strengths.

Due to heightened emphasis on decarbonization, demands for hybrid vehicles, electric vehicles, etc. are increasing. We are leveraging our vehicular turbocharger technology to develop electromotive compressors and electric-assist turbochargers for hybrid vehicles. We are also pushing ahead with the development of oil-free electromotive turbochargers to supply air in fuel-cell vehicles that are expected to become widespread from 2030.

Meanwhile, we continue to develop new parking equipment as mobility infrastructure. One example is a joint research initiative with Keio University in Japan to enable self-driving and self-parking cars in ramp parking systems. The technology is aimed not only at achieving zero parking accidents, but also an all-new form of parking system for future urban infrastructure that will support optimal solutions. We are creating new industrial systems that maximize the efficiency of people, energy and assets for customers and society.



Response to CASE through provision of mobility infrastructure

Future Directions

Contribute to industrial infrastructure progress by thoroughly optimizing operational lifecycles with customers

Long-term strategies

Industrial systems

- Create new industrial systems that maximize the efficiency of people, energy and assets for customers and society

Vehicular turbochargers

- Develop products for electrified vehicles

Short/medium-term strategies

- Improve throughput and reduce costs through labor reduction as well as optimization of manufacturing and logistics processes
- Lower environmental impact and reduce power costs through greater efficiency of energy including electricity, heat and air
- Provide mobility infrastructure that not only is safe, reliable and convenient but also helps to lower environmental impact, assist people who have difficulty in moving, work toward achieving zero traffic accidents, and satisfy future CASE needs

Major products & services/characteristics

Vehicular turbochargers



World share

20%

Utilize exhaust gas energy to send more air and increase engine output. Reduce engine displacement of vehicles, etc. to improve fuel efficiency and environmental performance.

Strength

- Approx. 20% share of world market, approx. 50% share of domestic market
- Global development/production systems spanning seven countries
- Outstanding environmental performance (fuel economy, emissions)

Opportunity

- Increasing demand for vehicular turbochargers to downsize engines and lower environmental impact

Risk

- Shrinking market for turbocharged vehicles due to vehicle electrification
- Commoditization of turbocharger market

Countermeasure

- Develop electric turbochargers for hybrid vehicles (electromotive compressors/electric-assist turbochargers, etc.)
- Develop next-generation oil-free electromotive turbochargers for supplying air in fuel cell vehicles
- Expand the aftermarket service business

Parking Systems



Domestic share of elevator parking

42%

Since installing Japan's first tower parking in 1962, we have provided various parking systems to suit urban needs, such as tower parking, underground parking, and ramp parking.

Strength

- Approx. 42% share in domestic elevator parking market
- 24-hour/365-day support through a service network spanning 175 domestic locations

Opportunity

- Increasing demand due to ongoing urbanization in SE Asia and China

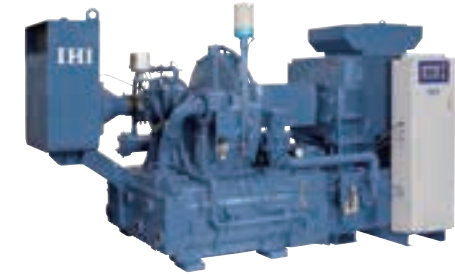
Risk

- Decreasing number of cars owned in Japan
- Shrinking market due to relaxation of obligation to install parking, etc.

Countermeasure

- Develop automatic parking technology responding to automated-driving vehicles
- Expand/enrich maintenance services by taking over maintenance businesses of competitors, etc.

Compressors



Domestic cumulative unit deliveries of general-purpose turbo compressors

9,500 units

This is an essential utility for factories that supply equipment with air or gas after compressing it and then storing it in tanks. Our lineup responds to a variety of needs, including energy-saving, maintenance-saving, and ecology.

Strength

- Domestic cumulative unit deliveries of 9,500 general-purpose compressors boasting the world's highest efficiency level
- 60% share in world market for ultra-low-temperature LNG boil-off gas compressors
- 3-country production system spanning Japan, China, and Turkey

Opportunity

- Desire for machines with high energy efficiency due to heightened environmental awareness
- Increasing demand for oil-free, clean compressed air

Risk

- Intensification of competition with foreign compressor manufacturers, particularly those from emerging nations

Countermeasure

- Strengthen aftermarket services and provide new services such as long-term maintenance
- Prevent technology leaks by producing key hardware domestically
- Improve cost competitiveness through procurement/production at overseas bases, etc.

Topics



Accelerate global expansion of heat and surface treatment business



Achieve SDGs by providing products and services.

Our business unit provides both equipment and job services for heat and surface treatments to customers worldwide, through our group companies IHI Machinery and Furnace, IHI Ionbond, IHI Hauzer Techno Coating and IHI VTN.

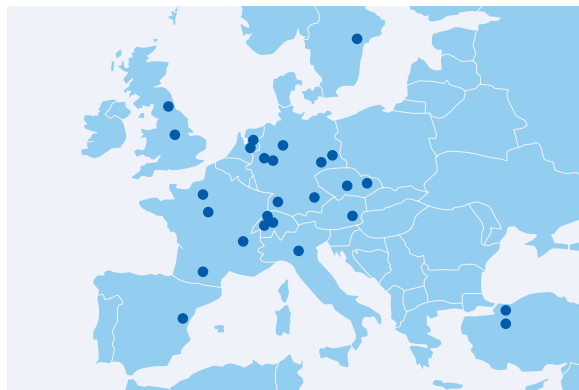
This allows our customers to choose between purchasing equipment for in-house production or outsourcing the service, depending on their production system. The capability to provide the same IHI technologies in both cases is the strength of our business. The demand in machinery-related industries is growing particularly in Europe at present.

Heat treatment of metal parts and surface treatment to form thin layers on surfaces are technologies aimed at improving properties such as wear resistance, impact resistance and surface smoothness. They are widely used for general manufacturing tools, automotive parts and more.

Reduction of parts weight and production costs are both possible by replacing metal with lightweight materials, such as plastic, and by adding a metal thin layer to the surface only. We are also contributing to environmental-impact reduction with a coating technology that does

not use hexavalent chromium, which is harmful to the human body.

We will expand applications in existing fields such as in medical (medical tools, artificial joints, etc.), interiors (door knobs, water faucets, etc.), luxury goods (watches, accessories, etc.) and accelerate globalization by increasing our production capacity in North America, China and India, where market growth is anticipated.



IHI Heat Treatment and Surface Engineering Business Unit Network in Europe

Automotive

Engine piston rings, piston pins, transmission gears, etc.

Decorative parts on meters and control panel

Manufacturing industry

Cutting/forming tools, etc.

Expand applications in new fields

Medical

Medical tools/artificial joints, etc.

Interiors

Door knobs, water faucets, etc.

Luxury goods

Watches, accessories, etc.

Examples of fields and products where heat and surface treatments are applied

Aero Engine, Space & Defense

Products and Services

Aircraft engines, Rocket systems and space exploration, Defense equipment and systems

IHI leverages diverse cutting-edge technologies, backed by quality and safety as top priorities, to lead the aero engine and space industry.

Director
 Managing Executive Officer
 President of Aero Engine, Space &
 Defense Business Area

Tomoharu Shikina



FY2018 Review

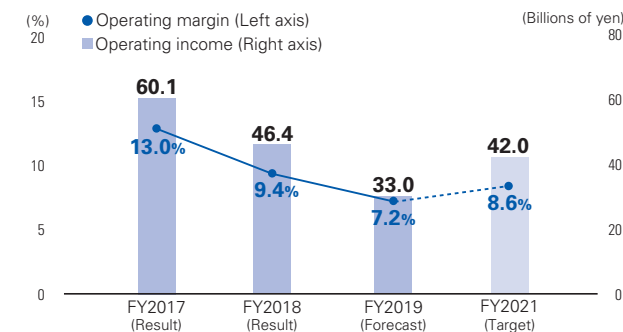
The Aero Engine, Space and Defense Business Area contributes to prosperity and safety through products and services for aero engines used in the private sector and by Japan’s Ministry of Defense, as well as rocket systems, space utilization, defense equipment and systems. We sincerely apologize for our inappropriate conduct in the civil aero engine maintenance business recently, understanding that we greatly inconvenienced customers and partners.

IHI’s civil aero engines represent a mainstay product line that is expected to continue growing. The company will steadily invest in the further expansion of this business, including by launching new maintenance bases. Reflecting with sincere regret on the recent incident, IHI is committed to establishing a robust quality-assurance system to move the business forward.

Aircraft Equipped with New Engine Model Commences Operation, an Example of IHI’s Expanding Engine Business

In FY2018, the Global 7500 business jet obtained type approval in September and made its inaugural flight in December. IHI’s civil aero engine unit has been part of the development program for the Passport 20 engine, which is installed in the Global 7500. The GE9X engine, which is scheduled to be delivered for the Boeing 777X, was installed in a jet owned by GE and is now undergoing tests to obtain type approval.

Operating income and operating margin



Exchange rate assumptions

	¥111 = US\$1.00	¥111 = US\$1.00	¥105 = US\$1.00	¥105 = US\$1.00
Net sales	¥463.7 billion	¥492.2 billion	¥460.0 billion	¥490.0 billion

The prototype XF9-1 aero engine was delivered to Japan’s Ministry of Defense for potential use in future fighter jets. The ministry subsequently confirmed that the engine satisfied its target performance requirements. For the F110 engine that powers F-2 fighters, we signed a six-year contract to provide comprehensive high-quality maintenance over the long term.

Successful Launch of Epsilon-4

In our rocket systems and space exploration business, the Epsilon Rocket 4 was launched in January 2019. Capable of accommodating multiple satellites, this is the fourth version of a small rocket that IHI is developing to respond to evolving needs for satellites.

Implementing Group Management Policies 2019

Achieving Progress Based on Safety and Quality as Top Priorities

Group Management Policies 2019 calls for leveraging advanced technologies to open new vistas for air transportation, defense systems and space utilization, ultimately for greater prosperity and safety in society. To strengthen IHI's presence in the global market, a robust quality-assurance system backed by safety and quality as top priorities is being established. A new base for engine maintenance has been constructed in Tsurugashima, Saitama Prefecture and is currently being prepared to commence operations. By connecting people, objects and facilities through advanced IoT and ICT, we are working to minimize human error and streamline work through services that customers choose.



Conceptual image of new factory in Tsurugashima, Saitama Prefecture

Refining our Strengths Through Material and Technology Development

Our civil aero engine unit has joined an international joint-development program involving many companies. To actively participate in this program, it is important to offer technologies differentiated from those of other companies. IHI is developing new materials and processing technologies to help reduce the weights of engine components. Carbon fiber reinforced plastics (CFRP) are already being used in major engine components, but we intend to harness this new material even further by adapting it for fan blades. Furthermore, we are collaborating with materials manufacturers and domestic research institutions to commercialize ceramic matrix composites (CMC) as a lightweight and highly heat-resistant new material. Also, we are combining additive-manufacturing (3D printer) and metal-processing technologies to produce complex-shaped parts

inexpensively and swiftly.

Materials used in aero engine components not only have become much more costly, they also are becoming more difficult to obtain, putting further pressure on prices and lengthening product lead times. In response, IHI is strengthening its competitiveness by developing and manufacturing selected materials in-house.

Aero engines offering enhanced fuel efficiency and electrification are attracting greater demand to help reduce CO₂ emissions as both air passenger and air cargo volume increase year after year. In regard to electrification, IHI is expanding its technological development through outside collaborations both in Japan and abroad.

Responding to Growing Needs for Small Satellite Launches

The global space industry continues to grow as needs for satellites increase, creating demand for small rockets capable of launching satellites inexpensively and swiftly. IHI is overseeing the development and manufacture of the Epsilon rocket's main body system and has been serving as a primary manufacturer since the Epsilon-4. In May 2019, IHI submitted a technical proposal to the Japan Aerospace Exploration Agency (JAXA) for the development and launch of a transportation-service business that will strengthen the Epsilon rocket's international competitiveness. IHI was subsequently selected as the operator. Also, to commercialize the development and launch of small rockets, IHI, Canon Electronics Inc., Shimizu Corporation and the Development Bank of Japan jointly established Space One Co., Ltd. This company is pursuing development aimed at a first launch in FY2021. Moving forward, we will continue to stably nurture our space-transportation business by developing rocket-system technologies to help advance space development in Japan.

We will also explore advanced technologies to solve pressing issues and thereby contribute to greater prosperity and safety in society.

Future Directions

Leverage advanced technology to open new vistas for air transportation, defense systems, and space utilization, and help materialize social prosperity and safety

Long-term strategies

Civil engine business

- Develop technologies and manufacturing capabilities for air transportation that is safe, comfortable and economical as well as eco-friendly

Defense systems business

- Develop advanced system technologies for frontline combat equipment and logistics assistance to strengthen national safety and security

Rocket systems and space exploration business

- Establish a rocket lineup matched to current demands and develop a launching service
- Offer space-utilization solutions that leverage satellite data to meet needs in diverse industries and sectors

Short/medium-term strategies

Strengthen business foundations

- Apply advanced technologies for improved customer value over total lifecycles

Build a robust operational structure

- Establish a lean and flexible structure for greater competitiveness

Accelerate preparations for future initiatives

- Create a business model to deliver outstanding value across the entire value chain

Major products & services/characteristics

Civil aero engines



World share of long shaft market

1st place

Leveraging IHI's unique technologies, we participate in global joint development projects of various types of civil aero engines (small to extra-large), as well as develop and supply engine modules and parts for these projects. We also perform maintenance and repair on engines and support aero engines throughout their entire lifecycle.

Strength

- Broad engine lineup covering everything from small to extra-large models
- Engineering capability for new materials such as carbon fiber reinforced plastics (CFRP) and design technology
- Top share of world market for aero engine long shafts

Opportunity

- Worldwide increase in demand for aircraft and engines
- Expansion of maintenance business through a network of engine manufacturers

Risk

- Supply chain constraints and high material prices in line with rapid expansion of engine demand
- Intensification of technical competition in cutting-edge areas

Countermeasure

- Strengthen supply chain management and promote cost-cutting efforts
- Promote development of unique/differentiating technologies and challenge expansion into material business

Aero engines for Japan's Ministry of Defense



Domestic share

1st place

IHI is the general contractor overseeing the development and production of many aero engines used by Japan's Ministry of Defense. Particularly in regards to engines used in fighter jets operated in Japan, IHI is involved with all models. Moreover, we facilitate the efficient operation of aircraft through engine maintenance and technical support.

Strength

- Technological ability to oversee everything from design to manufacture of entire engine systems
- Production infrastructure and know-how cultivated through manufacturing and operational support of all engine models for many years

Opportunity

- Launch of full-scale efforts for development of future fighter planes and engine
- Proceed with transfer of logistics assistance to the private sector
- Proceed with overseas transfer of defense equipment

Risk

- Pressure of cost to purchase domestically-made equipment due to inter-government overseas purchasing

Countermeasure

- Promote R&D for future fighter jet engines
- Sophisticate products and logistical support through application of cutting-edge technologies
- Further strengthen production and technology infrastructure through deployment to overseas market

Rocket systems and space exploration



Courtesy of JAXA

Epsilon rocket launch success rate

100%

IHI develops and manufactures the solid rocket booster and turbo pump which are core components of the engine for the H3, Japan's mainstay rocket, as well as oversees the development and manufacturing of the Epsilon rocket. In addition, we engage in development in the space utilization sector through satellite data utilization.

Strength

- Design and manufacturing technology for solid fuel/liquid fuel rocket systems and elements
- Results in stable rocket launch (successful launches of Epsilon versions 1 to 4)

Opportunity

- Increase in rocket demand due to higher demand for small satellite launch
- Expansion in satellite data usage market

Risk

- Emergence of operators engaging in small civil rocket launch
- Intensified competition of satellite data business

Countermeasure

- Establish a rocket lineup responding to the demand for small satellite launches
- Enter into launch service business
- Collaborate with partners to develop a solution business utilizing satellite data

Topics

Delivery of XF9-1 aero engine prototype for future fighter jets

Mizuho-machi
Tokyo

In June 2018, XF9-1 jet engine prototype for future fighter jets was delivered to the Aerial Systems Development Division of the Acquisition, Technology & Logistics Agency (ATLA). ATLA began developing the engine based on the Hyper Slim Engine concept in FY2010. Incorporating world-leading technology, the compact, lightweight engine achieves high output and has already been confirmed as satisfying required functional and performance requirements.

Leading-edge technologies incorporated in the engine include an aerodynamic design based on highly advanced simulation technology, a proprietary single-crystal alloy and turbine components made with ceramic matrix composites (CMC). In achieving 15 tons of thrust, on par with the world's top-class engines and a first for a domestically made engine, ATLA and IHI have demonstrated to the world the advanced state of Japanese engine technology. Going forward, IHI will continue to push the envelope for manufacturing fighter jet engines by advancing and integrating the company's world-class technologies.

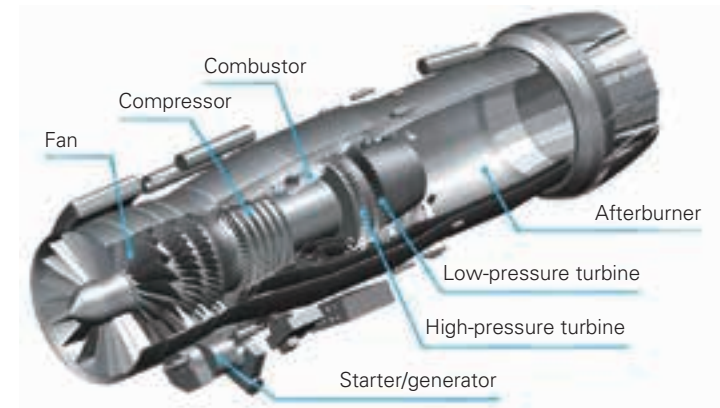
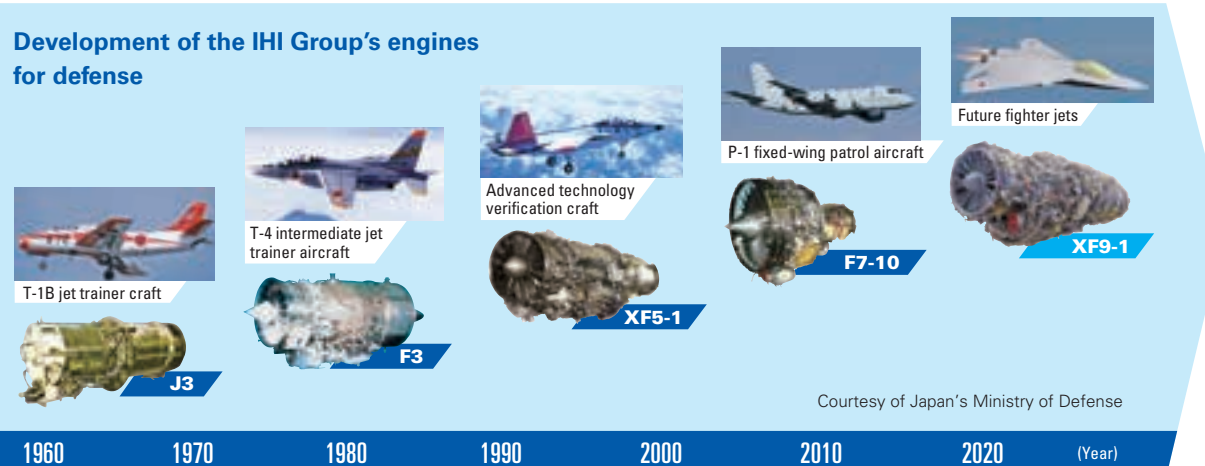


Achieve SDGs by providing products and services.



Scene of work at Mizuho Factory

Development of the IHI Group's engines for defense

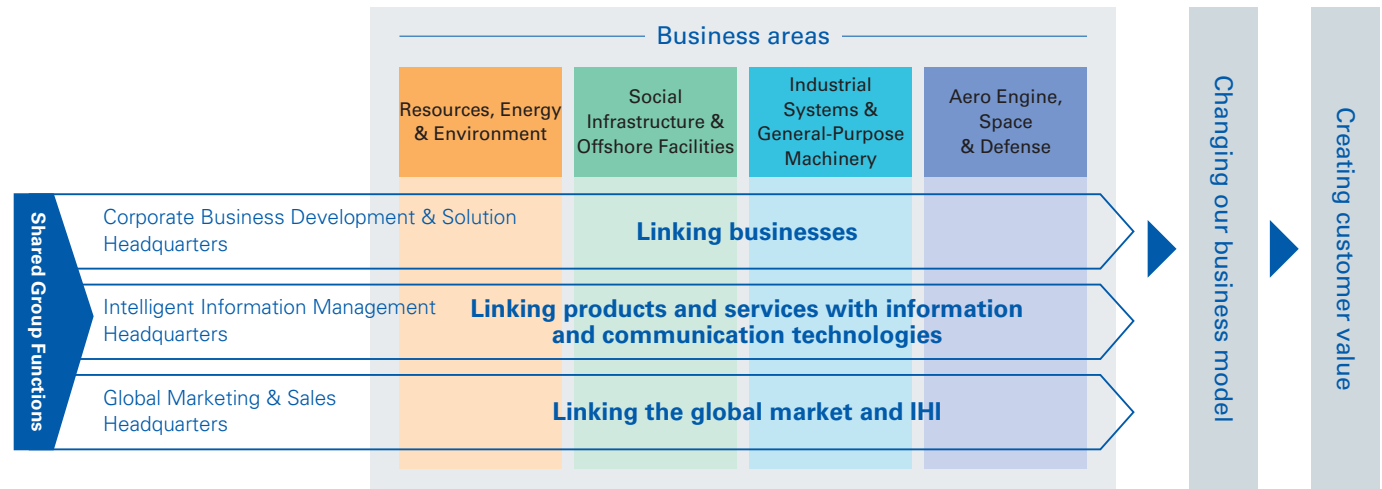


Shared Group Functions

Driving business model reforms through Three Tsunagu (Links)

The IHI Group identifies diversifying customer needs through the Corporate Business Development & Solution Headquarters, the Intelligent Information Management Headquarters, and the Global Marketing & Sales Headquarters, which it set up in April 2013 to handle shared Group functions and accelerate business model reforms.

We will link technologies accumulated in our business areas. We will innovate by combining technologies and business models amassed in our operations and combining shared Group functions to provide new value to customers.



Corporate Business Development & Solution



Corporate Business Development & Solution resolve companywide operational issues and create businesses that address diversifying customer value and social changes.

We accordingly develop businesses by combining products, services, and technologies of within and outside the IHI Group in light of market needs.

Intelligent Information Management



Intelligent information management draws on IoT, AI and machine learning, and other advanced information and communication technologies to drive IHI's digital transformation with its business areas and strategic business units.

This management setup deploys a common IoT platform within the Group to provide predictive diagnostics and proposals on optimal operations and product designs and supply information related to customer product usage and operations.

Global Marketing & Sales



Global Marketing & Sales accelerates the IHI Group's globalization and business model transformations by integrating domestic and overseas business units. Global Marketing & Sales brings together marketing and comprehensive sales capabilities, forms private-public projects, and localizes operations to create value with customers.

Topics

Smart Communities through local production of renewable energy for local consumption

—Newly opened Soma IHI Green Energy Center—

Soma City
Fukushima



Launch of Smart Community businesses for sustainable local production for local consumption

Photovoltaic power and other renewable energies are being introduced at an accelerated pace worldwide to help counter global warming and realize a carbon-free society.

But since the amount of photovoltaic power generation fluctuates greatly depending on the weather, time of day and season, power transmission sometimes exceeds the capacity to the ready-made power grid system. Such situations present the risk of large-scale power failures. Accordingly, resolving such disruptions in stable power supply is a key issue.

With the cooperation of Soma, Fukushima Prefecture, the Soma IHI Green Energy Center have been launched in April 2018. With the aim of realizing “local production of renewable energy for local consumption” — that is, consuming as much generated renewable electric power as possible within the local community — as well as contributing to the development of the local area community.

The center supplies photovoltaic power to nearby sewage disposal plants, etc. and converts surplus electricity into steam and hydrogen to maximize usage of the power it produces.



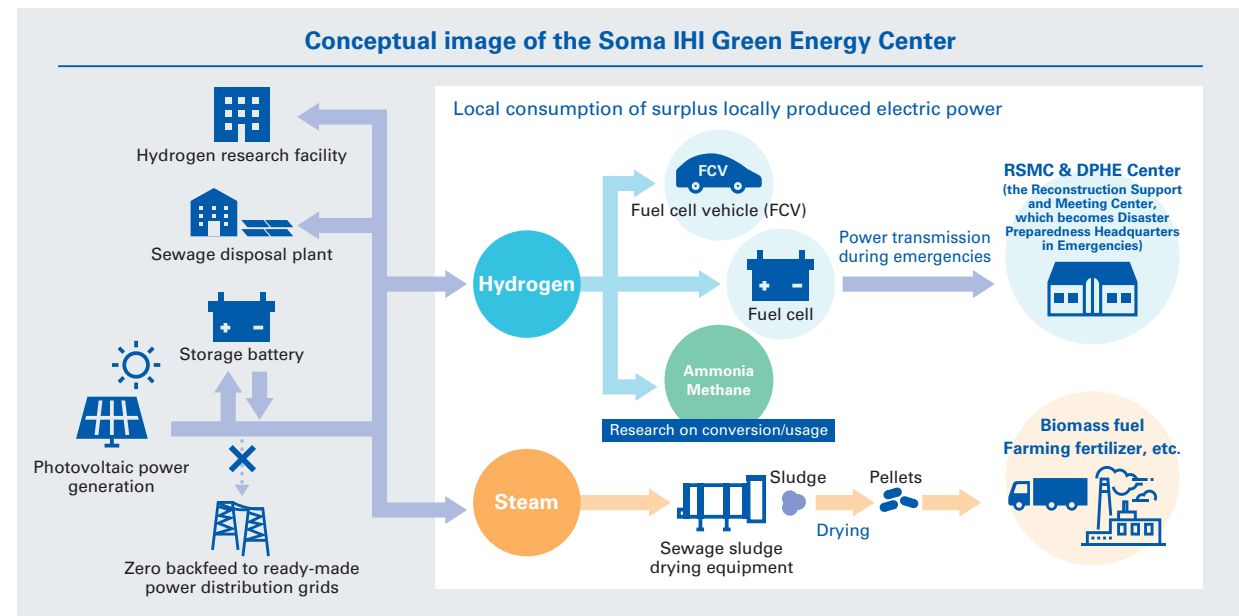
Monitoring of the energy management system control room

Manufacture of biomass fuel from an unused resource

Sludge generated in sewage disposal plants is an industrial waste, so its disposal cost presents a problem. However, steam produced with the center’s surplus electricity can be used in a drying process to remove moisture in the sludge and reduce its mass, lowering the disposal cost significantly. Moreover, dried sludge formed into pellets can be sold as biomass fuel, which promises to reduce the disposal cost further and create a new business in the local region.

Hydrogen production for strengthening of disaster prevention

The center is home to Japan’s largest fuel-cell power-generation facility, which supplies electricity to the Reconstruction Support and Meeting Center, which becomes Disaster Preparedness Headquarters in Emergencies. In addition, the center has a hydrogen research facility for open innovation aimed at furthering the use of hydrogen as a valuable resource. Activities also include plans to hold hands-on learning events for elementary and middle school students. Through this initiative, IHI is contributing not only to the stable supply of clean electricity, but also disaster preparedness and regional development, working in harmony with its host community.



Management Team

Directors

Name Position at the Company	Reasons for nomination	Attendance at Board of Directors meetings in FY2018	Period in office
 <p>Tamotsu Saito Chairman of the Board</p>	After leading IHI Group's management as President and Chief Executive Officer since April 2012 until April 2016, he has worked to achieve further improvements in corporate governance as Chairman of the Board. His abundant experience and insight as corporate manager have been utilized in the management of the IHI Group.	18 of 18	11 years and 2 months
 <p>Tsugio Mitsuoka President</p> <p>Remuneration Nomination ★</p>	He was appointed as President of Aero-Engine & Space Operations in April 2013, driving the growth of its globally-expanding business before becoming President and Chief Operating Officer in April 2016 and President and Chief Executive Officer in April 2017, in which capacity he has led IHI Group's management. His abundant experience and insight as corporate manager have been utilized in the management of the IHI Group.	18 of 18	5 years
 <p>Hiroyuki Otani Executive Vice President</p>	He has accumulated a great deal of knowledge mainly in the aero-engine production and technology division. In addition, he has been responsible for business divisions including power systems, machinery and logistics, and the Resources, Energy & Environment Business Area, and has been serving as Executive Vice President since this April. This wide range of business management experience and insight has been utilized in the management of the IHI Group.	18 of 18	5 years
 <p>Takeshi Yamada Executive Vice President</p> <p>Remuneration</p>	He accumulated a great deal of knowledge mainly in the finance and accounting field and corporate planning division. Appointed as Deputy General Manager of Finance & Accounting Division in April 2014 and General Manager of Finance & Accounting Division in April 2017, he contributes to IHI Group's management by leveraging his rich insight on financial strategies, improvements in financial condition, and overall group management.	18 of 18	2 years
 <p>Tomoharu Shikina Director</p>	After accumulating a great deal of knowledge mainly in the aero-engine technology development field, he was appointed as President of Aero-Engine & Space Operations in April 2016. His abundant results and experience have been utilized for the growth of the IHI Group particularly in Aero Engine, Space & Defense Business Area.	18 of 18	3 years
 <p>Nobuko Mizumoto Director</p>	After accumulating achievements as a researcher at IHI's technology research institute, she has served in important posts in the headquarter divisions, beginning with a project regarding the relocation of the headquarter building. The wide range of experience and achievements she has accumulated in her career have been utilized for the growth of the IHI Group.	14 of 14*	1 year
 <p>Masafumi Nagano Director</p>	He has accumulated a great deal of knowledge mainly in the Human Resources Division. In addition, he has been responsible for the domestic sales headquarters, the Human Resources Division, and subsequently, the Corporate Planning Division. His abundant experience and results have been utilized for the growth of the IHI Group particularly in Industrial Systems & General-Purpose Machinery Business Area.	14 of 14*	1 year
 <p>Kouichi Murakami Director</p>	After gaining experience in the research and development of materials and technological management overall in the Corporate Research & Development Division, he became in charge of the Rotating Machinery Operations Division, subsequently appointed as General Manager of Corporate Research & Development in April 2017. This experience and high level of insight into the Group's overall technologies have been utilized for the growth of the IHI Group.	14 of 14*	1 year
 <p>Taketsugu Fujiwara Outside Director</p> <p>Remuneration ★ Nomination Independent</p>	He gained extensive experience and broad insight at the Asahi Kasei Corporation, where he implemented diversified management. These qualities have been reflected in the management of the Company, acknowledging his proven ability in performing management oversight and monitoring functions from an independent perspective.	18 of 18	4 years
 <p>Hiroshi Kimura Outside Director</p> <p>Remuneration Nomination Independent</p>	His extensive experience and broad insight as a business manager has led aggressive globalization in response to changes in business environment at the Japan Tobacco Inc. These qualities have been reflected in the management of the Company, acknowledging his proven ability in performing management oversight and monitoring functions from an independent perspective.	17 of 18	3 years
 <p>Kazuhiko Ishimura Outside Director</p> <p>Remuneration Nomination Independent</p>	He gained extensive experience and broad insight at the AGC Inc. These qualities have been reflected in the management of the Company, acknowledging his proven ability in performing management oversight and monitoring functions from an independent perspective.	18 of 18	2 years

* Shows attendance status to the Board of Directors' meetings held after appointment as director.

Remuneration Remuneration Advisory Committee Member

Nomination Nomination Advisory Committee Member

Independent Independent directors as stipulated by the Tokyo Stock Exchange, and directors satisfying IHI's "Independence Standards for Outside Directors and Outside Audit & Supervisory Board Members"

★ Chairperson

Audit & Supervisory Board Members

Name Position at the Company	Reasons for nomination	Attendance numbers at Audit & Supervisory Board of meetings in FY2018	Period in office
 <p>Shigeru Uesugi Standing Audit & Supervisory Board Member</p>	He has accumulated a great deal of knowledge mainly in the accounting and finance field of the aero-engine and space business. After having been in charge of formulating policy for the management of the Company's affiliates, he has extensive knowledge in internal control and compliance. These qualities have been reflected to the management auditing operations of the Company.	18 of 18 16 of 16	3 years
 <p>Taizo Suga Standing Audit & Supervisory Board Member</p>	After accumulating a great deal of knowledge mainly in the finance & accounting field, he was appointed as President and Chief Executive Officer of IHI ASIA PACIFIC PTE. LTD. His high degree of specialist knowledge in financial management and wide range of business experience in overall business management have been reflected to the management auditing operations of the Company.	18 of 18 16 of 16	2 years
 <p>Yoko Hatta Outside Audit & Supervisory Board Member Independent</p>	Her extensive experience and insight in global business operations, notably international taxation from an independent perspective have been reflected to the management auditing operations of the Company.	18 of 18 16 of 16	3 years
 <p>Tomomi Yatsu Outside Audit & Supervisory Board Member Independent</p>	She has accumulated extensive experience and insight by responding to various corporate issues as an attorney at law and a certified public accountant. These qualities and independent perspective have been reflected in the management auditing operations of the Company.	18 of 18 16 of 16	2 years
 <p>Toshio Iwamoto Outside Audit & Supervisory Board Member Remuneration Independent</p>	His abundant experience and broad insight gained while serving as a top management executive and director in charge of finance at NTT Data have been reflected in IHI's management auditing tasks from an independent perspective.	— —	Since June 2019

Executive Officers

Tsugio Mitsuoka

Chief Executive Officer

Hiroyuki Otani

Senior Executive Officer
In charge of Business Relating to Procurement
In charge of Group Safety, Labor, Monozukuri System Strategy, and Group Quality Assurance

Takeshi Yamada

Senior Executive Officer
In charge of Business Relating to Corporate Planning
In charge of Group Finance & Accounting

Tomoharu Shikina

Managing Executive Officer
President of Aero Engine, Space & Defense Business Area
In charge of Business Relating to Public Relations and Investor Relations

Nobuko Mizumoto

Managing Executive Officer
General Manager of Intelligent Information Management Headquarters
In charge of Business Relating to Information Management

Masafumi Nagano

Managing Executive Officer
President of Industrial Systems & General-Purpose Machinery Business Area

Kouichi Murakami

Managing Executive Officer
General Manager of Technology & Intelligence Integration
In charge of Group Engineering and Business Relating to New Corporate Businesses

Kazuki Awai

Managing Executive Officer
General Manager of Administration Division
In charge of Business Relating to Legal and CSR
In charge of Group Compliance

Yoshinori Kawasaki

Managing Executive Officer
Vice President of Industrial Systems & General-Purpose Machinery Business Area

Yutaka Kunisada

Managing Executive Officer
General Manager of Solution & Engineering and New Corporate Businesses Headquarters

Hiroshi Ide

Managing Executive Officer
President of Resources, Energy & Environment Business Area

Takashi Niimura

Executive Officer
General Manager of Global Marketing & Sales Headquarters
In charge of Group Operations

Yoshio Yonezawa

Executive Officer
President of IHI INC. (Regional Headquarters in the Americas)

Syunichi Takayanagi

Executive Officer
Vice President of Social Infrastructure & Offshore Facilities Business Area

Naoshi Matsumoto

Executive Officer
Vice President of Aero Engine, Space & Defense Business Area

Mitsutoyo Yoshida

Executive Officer
General Manager of Project Risk Management Division

Masato Shida

Executive Officer
General Manager of Human Resources Division

Hideo Morita

Executive Officer
Vice President of Aero Engine, Space & Defense Business Area

Takeshi Kawakami

Executive Officer
President of Social Infrastructure & Offshore Facilities Business Area

Yoshinori Komiya

Executive Officer
Vice President of Resources, Energy & Environment Business Area

Kouji Takeda

Executive Officer
Vice President of Resources, Energy & Environment Business Area
President of IHI Plant Services Corporation

Yasuhiro Shigegaki

Executive Officer
Vice President of Industrial Systems & General-Purpose Machinery Business Area

Tetsuji Fujimura

Executive Officer
Vice President of Aero Engine, Space & Defense Business Area

Roundtable Discussion of Outside Directors

Expectations of IHI regarding board of directors reforms

Upon the launch of IHI's new medium-term management plan, the company's outside directors shared their opinions on the nature of governance and achievement of IHI's management targets.



Outside Director

Hiroshi Kimura

Executive Alumnus Japan Tobacco Inc.
Outside Director, Nomura Holdings, Inc.
Outside Director, Mitsui Sumitomo Insurance Co., Ltd.

Outside Director

Kazuhiko Ishimura

Director and Chairman, AGC Inc.
Outside Director, TDK Corporation
Outside Director, Nomura Holdings, Inc.

Outside Director

Taketsugu Fujiwara

Adviser, Asahi Kasei Corporation
Outside Director, Shimadzu Corporation
Outside Director, Kokuyo Co., Ltd.
Outside Director, Konica Minolta, Inc.

IHI Governance and Board of Directors

Fujiwara In 2017, President Mitsuoka introduced the keyword "transformation" and has been accelerating profound change in IHI's organizational system and business structure ever since. Even after five years as an IHI outside director, I feel the directors' awareness in incorporating external opinions continues to grow in their management of the board of directors system. In addition, providing outside directors with thorough explanations regarding resolutions by the board of directors and its internal discussions support us in providing more relevant advice.

Kimura In terms of the configuration of IHI's board of directors, Financial Services Agency requirements, such as the ratio of outside directors, have been satisfied, making IHI's system a progressive one domestically. As the format is already in place, I'd

like to see further enrichment of the matters we discuss.

For example, the person responding to questions from outside directors tends to be the company president, but I believe that other inside directors also should voice their opinions beyond their individual areas of responsibility to take discussions to a deeper level.

Ishimura I believe the role expected of outside directors is figuring out how to strengthen the business of the company as a whole. People within the company are inclined to prioritize the protection of the company's business, so I would like to promote the strategic allocation of corporate assets even further through the participation of outside members.

Fujiwara Board of directors meetings are not merely aimed at reaching conclusions, but must also generate

opportunities to hold discussions and identify risks and points of issue.

I'd also like to see the board of directors meetings as a place utilized for OJT [on the job training] to nurture management executives. This is the perfect position to get a bird's eye view of the entire company and to learn about the company's decision-making process and value perception.

Ishimura Indeed, there is a need for people who can view the overall company to be involved in management. Management should not merely maximize the value of individual businesses, but also maximize the value of IHI's overall business. To maximize the advantages of transitioning from a system with one business division and eight sectors to one with four business areas, I'd like to see IHI implement personnel assignments on a cross-company scale to enable employees to cultivate diverse experiences.

Realization of Group Management Policies 2019

Ishimura Upon forming Group Management Policies 2019, discussions were held repeatedly by the board of directors. First, based on the policy “product-selling to value-selling,” we considered how we could realize this in each business area before finalizing Group Management Policies 2019.

Kimura I think the conventional focus was on how to increase profit as much as possible, but this time we also incorporated SDGs [sustainable development goals]. I believe that it was a breakthrough for IHI to show how to resolve issues and to contribute to the world in each business area.



Ishimura The shift from products to value is occurring worldwide so the key point is how to achieve differentiation. In order to differentiate our value from that of other companies, I think we first need to differentiate our products. IHI’s Civil Aero-Engine business is differentiated on a deep level through its development of material and machining



technology, which is one of our strengths. Having visited IHI’s factories, I have seen equipment that looks like it is capable of making absolutely anything out of metal. With such technologies, I feel that IHI is capable of manufacturing practically any product. This is based on the company’s background of expanding in an age when material goods were lacking, thus IHI developed all possible products that it could produce. However, what a company *can* do and what it *must* do to be competitive today are two different things. Moving forward, I believe it is desirable for IHI to allocate resources in businesses where it has highly competitive strengths, ultimately to advance these businesses further.

Kimura The portfolio must be transformed and the company needs to specialize in businesses where it has strengths. We have experienced major deficits, so in some cases has been difficult even to reach the point where it became possible to discuss portfolio management, however, now that risk-management initiatives for project have borne

fruit and the downturns have been alleviated, the opportunity is ripe.

Fujiwara In order to transform existing businesses into new businesses by leveraging our strengths, it is important to have a new perspective, particularly in terms of intangible aspects. I think there may be a need to further increase diversity so that, for example, people with diverse values, such as non-Japanese and female employees, can work at IHI with enthusiasm.

IHI’s strengths lie in building infrastructure such as large bridges and structures. Ever since its founding, IHI has been passionate about building a new society, and this is not something that just any company can do.

Even if we try to forecast how the world will change, there is no one right answer, thus we need to thoroughly consider our strengths and then proceed in the most appropriate way. For this reason, we, the outside directors, also wish to engage in in-depth discussions to support transformation.



Corporate Governance Initiatives

Basic Policies

IHI defines corporate governance as a system that assures sustainable growth and maximization of corporate value by enhancing management efficiency so that the Company can leverage its innate capabilities to the fullest extent possible. To achieve this, the Company targets efficient and appropriate internal decision-making by clearly separating management monitoring and supervisory functions from functions related to their execution of business. Furthermore, by establishing the relevant internal rules and building a system to administer them, the Company ensures appropriate operations across the entire Group.

The Company promotes constant improvement of its corporate governance, aiming to earn the trust and support of its shareholders and other stakeholders over the long term.

The Company will work to enhance its corporate governance in line with the following basic policies.

- 1 Respect shareholders' rights and ensure equal treatment
- 2 Strive to cooperate appropriately with shareholders and other stakeholders
- 3 Fulfill our responsibility to be accountable to stakeholders and ensure transparency by appropriately and proactively disclosing information relating to the company
- 4 Clarify the roles and responsibilities of the board of directors, the audit & supervisory board members and the Audit & Supervisory Board to enable them to adequately fulfill their management-monitoring and supervisory functions
- 5 Conduct constructive dialogues with shareholders whose investment policies accord with the medium- to long-term interests of shareholders

Overview of Corporate Governance Structure

The Company has an Audit & Supervisory Board, which comprises audit & supervisory board members who audit the duties executed by directors. The Board of Directors, which consists of directors, makes decisions related to all important matters concerning the management of the Company and the Group, in addition to supervising directors in their business execution. The outside directors, who are

elected from among individuals with extensive experience and broad insight gained at the helms of management, or with a high degree of specialist knowledge and diverse experience, participate in the Board of Directors' decision-making process, offer advice and make recommendations independently of managers who have been delegated the authority to handle day-to-day operations.

Business Execution Framework

The Company has an executive officer system to strengthen the decision-making and supervisory functions of the Board of Directors, as well as to improve the efficiency of business operations. The executive officers are appointed by resolution of the Board of Directors.

Compensation Advisory Committee and Nomination Advisory Committee

To ensure that directors and audit & supervisory board members are remunerated appropriately, the Company has the Compensation Advisory Committee, a voluntarily established body consisting of six members: three outside directors, one outside audit & supervisory board member, one director in charge of human resources, and one director in charge of finance and accounting. The chair is an outside director. The Company established a Nomination Advisory Committee to supervise the Board of Directors' nomination of candidates for directors and audit & supervisory board members, checking that such appointments are conducted appropriately and offering related advice. The committee

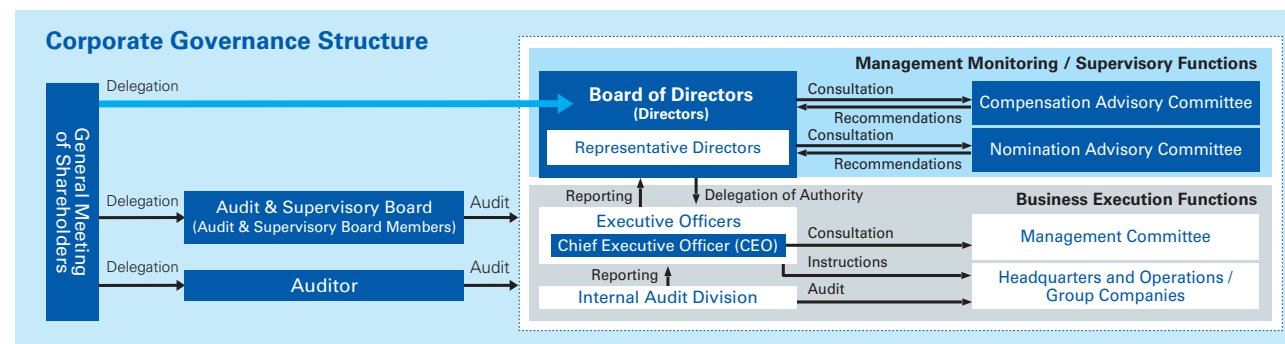
has four members: President and Representative Director, and three outside directors, with the President and Representative Director serving as chair.

Policies Relating to Appointment of Officers

The Board of Directors decides on ideal attributes for officers and draws up standards of independence for outside directors and outside audit & supervisory board members. These standards are based on the requirements for independent directors/ audit & supervisory board members stipulated by the Tokyo Stock Exchange. The emphasis is to assure that outside directors and outside audit & supervisory board members are genuinely independent. The Board of Directors sets the basic policy of appointing the most appropriate officers according to these standards. The aim is to ensure sustainable growth and increased corporate value for the Group over the medium to long term.

Evaluation of Board of Directors' Effectiveness

The Company has been evaluating the Board of Directors basically every year since FY2015 to enhance its effectiveness. A FY2018 evaluation confirmed that the effectiveness of the Board of Directors was insufficient. We also became aware of issues such as the need to enhance risk management-related discussion, therefore, moving forward, we will establish measures to solve such issues, and further improve effectiveness of the Board of Directors.



Policies and Procedures in Determining Officer Remuneration

Basic Policies

Regarding officer remuneration, we will ensure the sustainable growth of IHI and the IHI Group and enhance corporate value over the medium and long terms by encouraging directors and executive officers to do their best in line with our management philosophy, Group vision, and Group management policies and motivate them to reach specific business targets. We will accordingly augment fixed remuneration with performance-based stock compensation and bonuses.

Procedures for Determining Remuneration

To ensure appropriateness and objectivity in determining

the director and executive officer remuneration, the Compensation Advisory Committee where outside directors have a majority shall examine and report on remuneration related to these individuals. The Board of Directors shall make final decisions.

Remuneration of Outside Directors and Audit & Supervisory Board Members

Remuneration for outside directors shall consist only of base amounts reflecting duties. Remuneration for audit & supervisory board members shall consist only of base amounts as compensation for auditing the Group operations. Amount shall be determined through discussions among the audit & supervisory board members.

Calculation method for incentive remuneration

Consolidated ROIC and consolidated operating profit margin, which are important management indicators of profitability under Group Management Policies 2019, are used as the performance evaluation indicators.

Remuneration types	Performance-linked stock remuneration	Payment amount calculation method
Performance-linked stock remuneration (medium- and long-term incentives)	Stock	$\text{No. of issued shares} = \left(\text{Basic points corresponding to job title ranking} \times \text{Performance evaluation payout rate corresponding with consolidated ROIC} \times \text{Percentage obtainable by dividing the months of enrollment by 12} \right) \times 1/2$ <p>Fluctuation from 0 to around 150 Evaluation of level of accomplishment after completing performance evaluation period (upcoming 3 business years)</p>
	Cash	$\text{Amount of money to be issued} = \left(\text{No. of confirmed points}^1 - \text{No. of issued shares} \right) \times \text{Current value of IHI shares on the day rights are finalized}$ <p>1. 1 finalized point is equivalent to 1 IHI share.</p>
Performance-linked bonus (annual incentives)	Cash	<p>In the case of representative director</p> $\text{Performance-linked bonuses} = \text{Standard payment amount corresponding to job title ranking} \times \left(\text{Performance evaluation payout rate corresponding to the current net income attributable to owners of parent}^2 \times 50/100 + \text{Performance evaluation payout rate corresponding with consolidated operating profit margin}^2 \times 50/100 \right)$
		<p>In the case of directors</p> $\text{Performance-linked bonuses} = \text{Standard payment amount corresponding to job title ranking} \times \left(\text{Performance evaluation payout rate corresponding to the current net income attributable to owners of parent}^2 \times 30/100 + \text{Performance evaluation payout rate corresponding to consolidated operating profit margin}^{2,3} \times 50/100 + \text{Payout rate based on individual performance evaluation}^2 \times 20/100 \right)$ <p>2. Fluctuation from 0 to around 200 3. In the case of a director overseeing a business area, the performance evaluation payout rate corresponding to the consolidated operating profit margin of the said business area is used.</p>

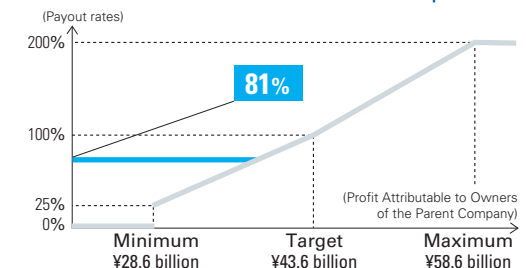
FY2018 Remuneration Results

Details of director and audit & supervisory board members remuneration (Millions of yen)

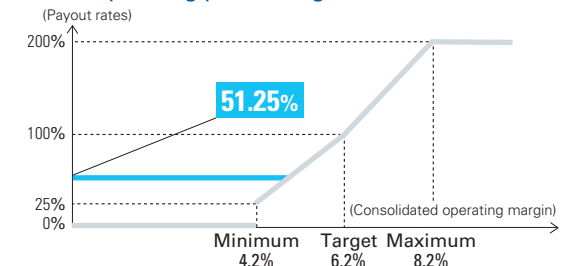
Category	Number of people remunerated	Total remuneration by type			Total remuneration
		Basic remuneration	Performance-linked stock remuneration	Performance-linked bonus	
Directors	17	450	134	83	668
Audit & Supervisory Board Members	5	108	-	-	108
Total (outside officers)	22 (7)	558 (84)	134 (-)	83 (-)	776 (84)

Note: Annual remuneration for directors is capped at 1,090 million yen, while the maximum corporate auditors is 120 million yen.

Performance evaluation payout rate corresponding to the current net income attributable to owners of parent



Performance evaluation payout rate corresponding to consolidated operating profit margin



A minimum value of 0% and maximum value of 120% are the performance evaluation payout rate results corresponding to the consolidated operating profit margin of the said business area.

Inadequate Inspections in the Civil Aero Engine Maintenance Business

During the months March to April, IHI announced that inadequate inspections had been carried out in IHI's civil aero engine maintenance business, and we received administrative sanctions from the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism pursuant to the respective laws under their jurisdiction.

Regarding the inadequate practices, we offer our most sincere apologies for the immense trouble and concern caused to all parties concerned, including the airline companies and related organizations involved, and all of our stakeholders.

Background

As the result of an on-site investigation by competent authorities conducted at IHI's Mizuho Aero-Engine Works in January 2019, and our own internal investigation that followed, two practices came to light: inspections had been carried out by unqualified persons and the recorded dates were not the actual inspection dates.

We reported these practices to the relevant agencies, including the competent authorities. Furthermore, we reported the issue to the engine manufacturer and requested them to conduct an investigation regarding airworthiness in the case of using the delivered items that had been inadequately inspected. As a result of the verifications, although it was confirmed that airworthiness had not been compromised, we issued a voluntary recall on some engines and parts from the perspective of long-term continual use. Moreover, from February 2019 onward, we voluntarily suspended all of our inspection operations in the civil aero engine maintenance business to focus on implementing countermeasures to prevent any recurrence, and then finally recommenced operations on May 24th.

Measures to Prevent Recurrence

We are now making doubly sure that everyone in the Aero Engine, Space and Defense Business Area, particularly the site of the civil aero engine maintenance business, has sufficient safety awareness, and we are carrying out compliance education. In addition, we have conducted significant revisions to the safety management system through such measures as appointing the new Safety Manager to oversee all safety management operations and establishing the "Safety Management System Department" in the business area. Moreover, we have conducted revisions to the work implementation system, making changes to operation procedures to prevent the occurrence of incorrect actions and formulating work introduction plans that suitably correspond to operation process capabilities, among other actions.

IHI is fully conscious of the need to thoroughly implement these recurrence prevention measures and recover trust.

Declaration on Returning to Company's Core Ethics to Promote Safety and Quality as Top Priorities

Having neglected the most fundamental point—understanding and abiding by the rules—the occurrence of inadequate quality practices motivated us to return to our core ethics and deploy groupwide measures, as explained below.

- 1 Establish and deploy IHI Group Code of Action and Quality Declaration
- 2 Strengthen Compliance System **P55**
- 3 Strengthen Quality Assurance System and Quality Management System
- 4 Create workplaces where people speak up
- 5 Strengthen risk management **P56**

Establishment and deployment of IHI Group Code of Action and Quality Declaration

The IHI Group Code of Action was established to define the standards that all IHI employees must follow in their daily tasks. The Code of Action, which is based on the Basic Code of Conduct for IHI Group, defines required actions and judgment criteria in understandable terms. Moreover, the IHI Quality Declaration confirms that safety and quality are top priorities. The declaration clarifies the basic “monozukuri” concept as well as action and awareness regarding quality. The Code of Action and Quality Declaration were established and deployed immediately across the entire IHI Group. Awareness of these two policies is being spread through training so that they become daily practices.

Strengthening of Quality Assurance System and Quality Management System

The system was strengthened to promote quality improvement. The Chairperson of the IHI Quality Committee serves as the Officer in Charge of Group Quality Assurance. At the Monozukuri System Strategy Planning, a Quality Integration Department was newly established to strengthen the functions of quality assurance divisions in business areas, Business Units and affiliated companies. Moreover, training is carried out to nurture quality leaders.

Creation of Workplaces where People Speak Up

Our President and other executives visit worksites and exchange opinions with employees regarding matters including the concept of quality as our first priority. Moreover, a team-based program has been launched to establish a more robust quality assurance system. Companywide improvement activities are implemented to stimulate dialogue in workplaces.

IHI Group Code of Action

- 1 We truly understand and will comply with any and all applicable rules.
- 2 We do not engage in any wrongdoing.
- 3 We respect human rights.
- 4 We make safety and quality for our customers a top priority.
- 5 We enter into fair and legitimate transactions.
- 6 We never impair the safety of ourselves or our colleagues.
- 7 We strictly manage and control information.
- 8 If we discover an issue, we report it immediately.

Quality Improvement Promotion System

(July 1, 2019)



IHI Group Quality Declaration

We, the IHI Group shall:

- 1 always put Quality First.
- 2 continue improving Quality via Sangen-Shugi and Communication.
- 3 listen sincerely to Issues, swiftly take Action and share accurate Information.
- 4 provide Quality Assurance through Compliance with rules and working appropriately.
- 5 all strive for the Satisfaction of our Customers.

Compliance Initiatives

Basic Policies

Compliance helps form the foundation for corporate activities. The following conduct is specified in the Basic Code of Conduct for the IHI Group.

- Observing strictly all laws, company rules, and other regulations
- Acting in a fair and responsible manner as business people

System for Implementing Compliance Activities

We established the Compliance Committee as a companywide entity that meets quarterly. The chief compliance officer chairs the committee, which discusses and establishes important compliance policies and undertakes activities.

Figure of compliance activity system



Compliance Education

IHI conducts multifaceted training and education to improve compliance awareness. Creative approaches are taken to achieve highly effective activities, such as ensuring that training is carefully tailored to the participants.

Officer Training

IHI officers participate in collective compliance training. In FY2018, an external lecturer held training on the topic “Officers’ Duty of Care Regarding Good Management” and covered content such as trends and characteristics of company scandals in recent times, as well as officers’ duty of care regarding good management, and the judgment system thereof.

Training for Line Management

IHI holds training for line managers who instruct their subordinates on a daily basis. In FY2018, we considered keys to preventing compliance violations, the importance of fostering a corporate culture that heightens occupational self-esteem, and future management guidelines.

e-Learning

Compliance education is provided to employees in the form of e-learning based on set themes. For FY2018, we set the topic as “Lessons Learnt from Quality Issues” and rolled out e-learning in our group companies both in Japan and overseas.

Compliance training results (FY2018)

Level	No. of participants
Executives	47
Line managers	75
e-learning participants in Japan	18,234
e-learning participants overseas	1,126

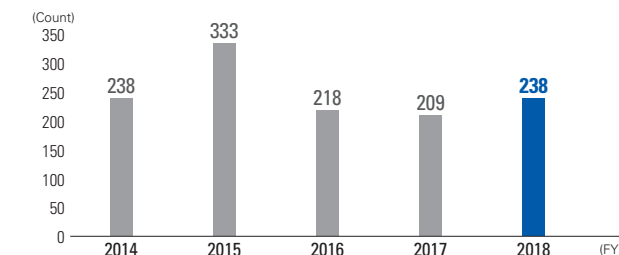
Compliance Hotline

IHI’s Compliance Hotline facilitates reporting of possible illegal, unethical or improper conduct to take appropriate corrective actions. In FY2017, we expanded this service to include U.S. bases as well as the current domestic ones. In FY2018, we made preparations in our Asia Pacific, China, Taiwan, and Korea locations, and commenced operations in some countries.

Compliance Hotline



Compliance Hotline reports



Approach to Risk Management

Basic Policies for Risk Management

IHI recognizes that risk management is one of the top business priorities for the Group, and strive to reinforce its overall capabilities in that regard.

The basic objectives of risk management are ensuring business continuity, ensuring the safety of executives, employees and their families, protecting managerial resources, and maintaining public trust in IHI Group companies. Also, IHI performs risk management in accordance with the "Basic Code of Conduct for the IHI Group", as well as the following action guidelines.

- ① Ensure the continuity of the IHI Group's business operations
- ② Improve the public reputation of the IHI Group
- ③ Protect the IHI Group's managerial resources
- ④ Avoid jeopardizing stakeholders' interests
- ⑤ Achieve recovery from damage as soon as possible
- ⑥ Take responsible action when an issue arises
- ⑦ Meet public requirements regarding risks

Risk Management System

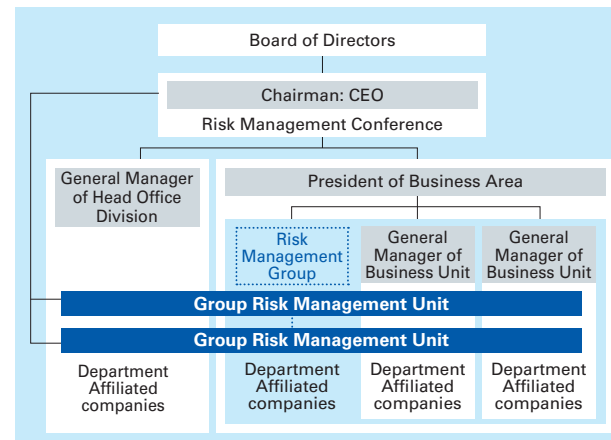
IHI established the Risk Management Conference under the leadership of the CEO. The Conference assesses key general risk management matters, and considers policies, annual plans, corrective measures, and other important matters.

IHI formulated the IHI Group Key Risk Management Policies. All parent units and Group companies in Japan and abroad independently pursue risk management in keeping with those policies.

Regarding commonly existing risks in the IHI Group, the

Group Risk Management Units, which comprise parent divisions, take responsibility for supporting each group units, as well as monitoring the implementation of the rules and developing effective risk management measures. The Internal Audit Division assesses Group risk management structure deployments and progress to ensure their suitability.

Risk Management System As of April 1, 2019



Key Policies for Risk Management in FY2019

In response to the inadequate quality assurance practices occurring in civil aero engine maintenance business, IHI strengthens its compliance/QA systems and risk management of business operations, and promotes initiatives for recurrence prevention. After clarifying roles and responsibilities of corporate, business areas, and business divisions including affiliated companies in risk management, IHI promotes the below major themes of risk management.

Risk management planning and implementation responding to the themes defined by the top-down approach

- ① Reinforce compliance structure
- ② Strengthen quality assurance structure
- ③ Address key business risks

Risk management planning and implementation through checking business activities by the bottom-up approach

- ① Thoroughly implementing and strengthening safety management
- ② Strengthening of compliance
- ③ Reform of quality systems and operational systems
- ④ Response to changing management environment and competitive environment
- ⑤ Appropriate responses to risks associated with the execution of global strategy
- ⑥ Transforming to robust project implementation and risk management structures
- ⑦ Ensuring appropriateness of large-scale investments
- ⑧ Compliance with environmental law and environmental management
- ⑨ Elimination of long working hours and improvement of work efficiencies through the promotion of work style reforms
- ⑩ Prevention of the outflow of business proprietary, personal, and vital technical information
- ⑪ Ensuring information security
- ⑫ Appropriate development of the Business Continuity Plan in case of disasters/accidents
- ⑬ Maintaining and improving relationships of trust with stakeholders
- ⑭ Further promotion of improvement of diversity
- ⑮ Thorough implementation of measures against harassment
- ⑯ Promotion of human rights education and awareness activities

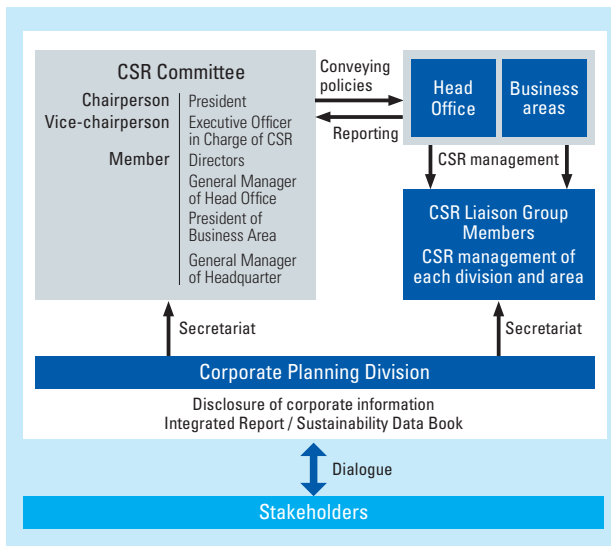
Initiatives for Sustainability

Basic Policies

IHI believes that “meeting society’s expectations” is a corporate social responsibility and a key to sustainability. In accordance with this belief, Basic Code of Conduct for the IHI Group compiles the necessary practices we are obliged to carry out. A guide to the Basic Code of Conduct has been translated into 18 languages other than Japanese to ensure that all IHI employees understand and follow these practices in their work.

Sustainability Promotion System

We established a CSR committee comprising of our president as the chairperson, executive officer in charge of CSR as the vice-chairperson, and head office/business area general managers as members. We are maintaining a sustainability promotion system centered around this committee.

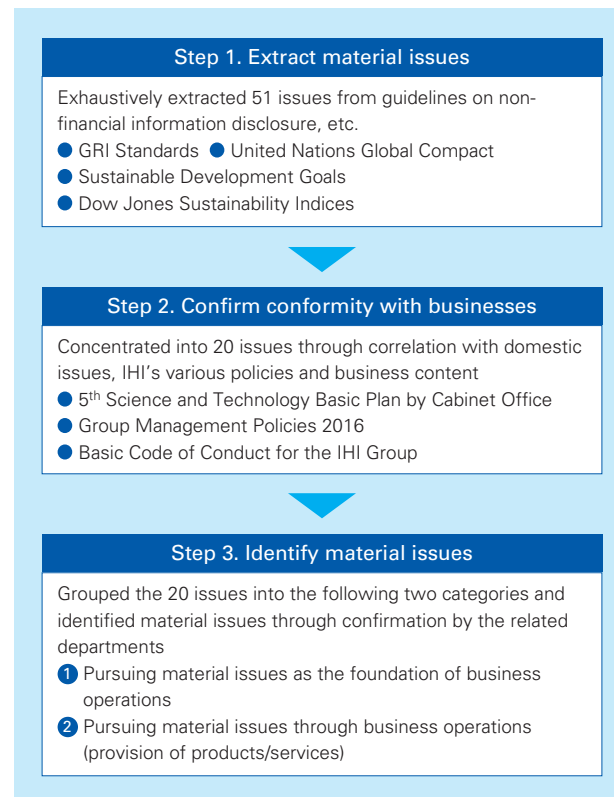


Materiality

With the diversification of social issues and information disclosure requirements, we have identified the material issues we must prioritize in order to realize a sustainable society and our growth.

We will take a united stance in engaging in these material issues, and disclose the status of initiatives through various channels.

Material issues identification process



Pursuing material issues as the foundation of business operations

Environment – Reduce environmental impact –	
● Climate change	● Circular economy
● Environmental protection	
Society – Materialize an affluent society –	
● Customer relationship management	● Supply chain management
● Corporate citizenship	● Diverse human resources
● Labor practices	● Human rights
Governance – Principled corporate management –	
● Corporate governance	● Compliance
● Information security	● Timely and proper disclosure
● Risk management	

Pursuing material issues through business operations (provision of products/services)

- Climate change
- Circular economy
- Environmental protection
- Stable supply of energy and resources
- Building and maintaining social infrastructure
- Advancement of mobility society
- Strengthening and sophistication of monozukuri
- Utilization of aerospace
- Securing safe and secure living

Business areas	SDGs we engage in
Resources, Energy & Environment	7 AFFORDABLE CLEAN ENERGY, 13 CLIMATE ACTION
Social Infrastructure & Offshore Facilities	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE, 11 SUSTAINABLE CITIES AND COMMUNITIES
Industrial Systems & General-Purpose Machinery	7 AFFORDABLE CLEAN ENERGY, 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Aero Engine, Space & Defense	7 AFFORDABLE CLEAN ENERGY, 13 CLIMATE ACTION, 16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Common to all businesses	8 DECENT WORK AND ECONOMIC GROWTH, 12 RESPONSIBLE CONSUMPTION AND PRODUCTION, 14 LIFE BELOW WATER, 15 LIFE ON LAND, 17 PARTNERSHIPS FOR GOALS

Dialogue with Stakeholders

IHI believes that communication with stakeholders is essential for gaining an understanding of society's expectations toward us.

We adopt various approaches to facilitating dialogue with our stakeholders; namely, customers, business partners, government, shareholders/investors, local communities, and employees. Through such dialogue, we learn of the expectations society places in us and reflect these in our corporate activities.

Major dialogue activities

Customers	<ul style="list-style-type: none"> ● Sales activities ● Customer satisfaction surveys ● Product/service information on website ● CSR questionnaires
Suppliers	<ul style="list-style-type: none"> ● Procurement activities ● Supplier award system ● Explanation of IHI Group Procurement Policy ● Reviews of quality management systems
Government organizations	<ul style="list-style-type: none"> ● Relevant laws & regulations ● Notifications, permission and authorization
Shareholders & investors	<ul style="list-style-type: none"> ● General meeting of shareholders ● Financial results briefing ● Factory tours ● Institutional investor visits
Local communities	<ul style="list-style-type: none"> ● Activities contributing to local communities (sponsorship of traditional events, atrium concerts, etc.) ● IHI Forum
Employees	<ul style="list-style-type: none"> ● e-learning (questionnaires) ● Employee-awareness surveys

Selected questions and answers

(during FY2018 earnings presentation on May 8, 2019)

Q. 1	Should we assume that risks associated with the North American process plant project will continue?
A. 1	<ul style="list-style-type: none"> ● There were significant equipment-delivery delays attributable to the customer, so we determined that this matter needs to be deemed a risk and accordingly included it to some extent in our extraordinary loss forecast for FY2019. ● We believe that delivery of the No. 1 train and auxiliary equipment will be completed soon. Since work on the No. 2 train and subsequent units will be of a repetitive nature, we expect fluctuations in costs to decline.
Q. 2	In Civil Aircraft Engine Maintenance business, IHI voluntarily stopped plant operations. How do you think this will affect results?
A. 2	<ul style="list-style-type: none"> ● Due to the discovery of improper inspections, we voluntarily halted maintenance work from mid-February through March 2019, resulting in some operational losses. We have allocated an amount for FY2018 in non-operating expenses to cover compensation and penalty expenses for the inconvenience caused to customers. ● We have included a 6 billion yen operational loss risk buffer in our operating income forecast for FY2019.

Social contributions

We establish material issues for social activities suited to regions in which we operate business bases, carry out construction projects, etc. Through our social contribution activities, we urge each and every employee to gain an awareness of themselves as a member of the community, and proactively meet society's expectations.

Three key themes

- 1 Harmonizing with communities
- 2 Cultivating future generations
- 3 Environmental protection

Results of FY2018 initiatives

- 1 Total spending on social contributions: 640 million yen
- 2 Major initiatives
 - Sponsorship of activities by the United Nations World Food Program (WFP)
 - Development of training programs to nurture future generations
 - Sponsorship of events in business localities

Supporting wheelchair basketball

We have been an official sponsor of the Japan Wheelchair Basketball Federation since 2015. In addition to making our facilities available for practice and overnight training camps, we also hold interactive events introducing wheelchair basketball and players at our business bases throughout Japan.



Wheelchair basketball experience gathering at Soma Works

Environmental Initiatives

Basic Policies

In Group Management Policies 2019, IHI spells out its commitment to creating new value for sustainable societies. Accordingly, IHI again confirmed our direction of reducing is combating by working continuously to reduce the environmental impact of various aspects throughout society, seizing business opportunities and developing new business models in order to solve climate change and other environmental issues.

We obey environmental laws/regulations and reduce the environmental impact of our plants and offices in regional areas as a priority. In addition, we propose solutions to reduce CO₂ emissions based on life cycle CO₂ indices of our products and services.

Previously, the Environment Committee oversaw our environmental activities. From this year, the Environment Committee has been strengthened separating environmental impact-reducing initiatives into two categories: products/services (proactive environmental activities) and plants/offices (reactive environmental activities), with the former category under the Corporate Planning Division and the latter under the Administration Division Environment Group.

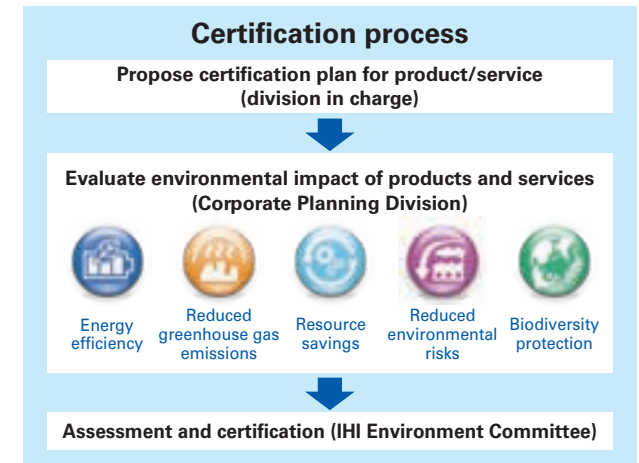
Environmental Action Plan

IHI Group formulates an Environmental Action Plan every three years and promotes environmental activities accordingly. For the new 3-year plan covering FY2019 – 2021, Environmental Action Plan 2019, the following three major themes have been established; Reduce environmental impact through products/services, reduce environmental impact in factories, offices, etc., and cultivate human resources to promote environmental management.



Environmentally Friendly Products Certification Scheme

Since FY2014, we have implemented the Environmentally Friendly Products Designation Scheme to encourage further reductions of the environmental impact of products and services. Under the scheme, the environmental performance of products and services is evaluated against self-established criteria and those exhibiting particularly outstanding performance are designated “environmentally friendly products.”



By FY2018, we certified 18 environmentally friendly products. IHI Scube’s community cycle business, which is certified, is deployed to six areas throughout Japan, and utilized by a total of 1.35 million people annually.



Community cycle system of Kurume city, Fukuoka prefecture – “Kurukuru”

Factoring Biodiversity into Business Site Administration

About 71% of the Aioi Works is covered by vegetation that is home to a lot of flora and fauna, including rare species. We therefore ensure that the facility is sustainable plant by enabling people and nature to co-exist. In FY 2018, we adopted a construction method that uses materials derived from nature to prevent damage from landslides. Employees helped plant native species at the site. The green infrastructure helps safeguard from disasters and contribute to greenery.

In recognition of these efforts, we received the sixth certification from the Association for Business innovation in harmony with Nature and Community*.

* Association for Business Innovation in Harmony with Nature and Community (ABINC) performs third-party evaluations/certifications of corporate initiatives such as establishing, managing and using greenbelts to preserve biodiversity.



Planting activities at Aioi Works

Environmental Communication

At IHI Forum 2018 held in November 2018, IHI Group introduced weather sensing technology, social infrastructure maintenance business, etc. as adaptation measures for extreme weather and climate change. We heard from many visitors, including customers, shareholders, and local residents, regarding their expectations of IHI.

June is Environment Month for the IHI Group. It is during this time that we conduct environmental quizzes and disseminate in-house news to increase employee awareness of environmental issues. In FY2018, 5,422 employees took part in quizzes. We engage extensively with stakeholders and reflect such efforts in environmental management.



Footage shown in the product/technology presentation space

Topics

Agreed with policy recommendation of Task Force on Climate-related Financial Disclosures (TCFD)

In May 2019, following a resolution passed by the Board of Directors, IHI became a signatory to the policy recommendation of the Task Force on Climate-related Financial Disclosures (TCFD). In light of the Paris Agreement, the TCFD was established by the Financial Stability Board at the request of the G20 to help reduce the risks of financial instability caused by climate change. The TCFD's final report, released in June 2017, stated that signatories should disclose information to enable financial markets to accurately evaluate risks and opportunities pertaining to each company's future activities regarding climate change.

The framework for information disclosure recommended by the TCFD comprises of four themes—Governance, Strategy, Risk Management, and Metrics and Targets—which are the core elements of organizational management. By using this framework as a tool for formulating strategy, we aim to strengthen our risk management and develop related business opportunities.



Human Resource Management Initiatives

Basic Policies

We manage our people in keeping with our corporate philosophy of “human resources are our single most valuable asset.” We endeavor to maximize the potential of our employees and enhance their skills by providing training programs, positive work environments, and reforming the corporate culture.

Our Group Human Resource Management Policy emphasizes such key concepts as group, global, and diversity in hiring, assigning, training, and evaluating employees.

Group

Optimally assigning people and providing collective Group education and training system in keeping with our management and business strategies

Global

Fostering global human resources, providing language and intercultural communication education and cultivating local managers at overseas sites

Diversity

Promoting active participation of women, foreign nationals, disabled persons, and senior workers, and supporting the balance between work and child rearing/nursing care

Group Human Resource Management Policy

In line with IHI’s management principles and Group vision, IHI Group aims to create customer value through using engineering expertise to focus on Monozukuri technology by the following:

1. In order to become an enterprise with distinguished global professionals who strive to excel in Monozukuri Technology and engineering technologies with world-renowned high quality products, ideal human resources shall be enhanced and shall serve as a shared value for employees within the group.
2. Ideal human resources shall serve as the foundation for the establishment of HR management policies in order to provide employees with opportunities for development.
3. Foster inclusive workplaces based on our Corporate Philosophy and IHI Group Vision. Provide greater opportunities for employees to develop and grow.

Ideal Human Resources	Keywords
Integrity and Trust	Group
For Customers and Society	Global
Innovation and Creation	Diversity
Team Work	
World-class Professional	

IHI Group education and training system

	Managerial training	Professional training	Training by position and job category	Global human resources education	Diversity	Open lectures
Executives	Executive managerial training					
Management	Executive education Special training for affiliates at management	Engineering professional training Quality professional training Production management training Product development project training Procurement professional training IoT/ICT professional development training	Education by job category and department (at affiliates) Training by position and job category	Global program dispatch Training before overseas assignment (language/cultural understanding, global management, etc.) Global Player training (India/Malaysia)	Female managerial and assistant manager training Personnel exchanges across industries	Management skills Business and other skills Language and cross-cultural skills
Workplace leaders	Overseas study (MBAs)		Instructor training			
Mid-ranked personnel						
Junior employees						

Selected courses Position and job category education Elective courses

Diversity Promotion

Received PRIDE Index Gold Award

Diversity is integral to our corporate strategies. We aim to create workplaces in which individuals with diverse values can reach their potential. The goal is to foster a corporate culture that brings together wide-ranging ideas and generates opportunities for creativity and innovation.

IHI received the Gold Award, the highest level of commendation in PRIDE Index 2018, an evaluation of workplace initiatives for sexual minorities, such as LGBT, established by Work with Pride, a volunteer organization. The award was received for IHI's efforts to be an LGBT Ally by understanding and supporting sexual minorities, as well as by establishing workplace environments in which everyone feels welcome. Specific actions have included opening a consultation service, adopting various work/welfare schemes for relevant persons and LGBT-related training courses for employees.



PRIDE Index 2018 mark



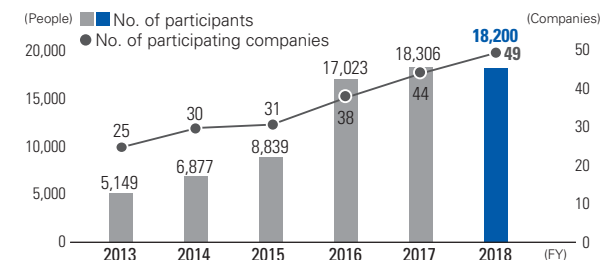
LGBT Ally sticker

Health Management Initiatives

Certified as Health & Productivity Company

IHI is taking action to secure the health of all employees and create welcoming workplaces. In recent years, in accordance with the IHI Group Health Management Declaration, IHI has liaised with the Society-Managed Health Insurance and Labor Union to take the initiative in supporting the health of employees and their families. During the FY2018 Health Challenge Campaign, 18,200 employees from 49 group companies participated in health improvement initiatives to achieve various goals. In recognition of such efforts, seven IHI companies were certified as Health & Productivity Companies 2019 by the Ministry of Economy, Trade and Industry and Nippon Kenko Kaigi.

Employees/companies engaged in Health Challenge Campaign



Health & Productivity Companies 2019 mark awarded to IHI companies

Workstyle Reforms

Certified as 4-star Company in Smart Work Management Survey

In FY2013, IHI launched the I-Project to improve work processes as part of the company's overall transformation. I-Project, which has been rolled out at all group companies, includes concrete action such as streamlining work processes, reforming workstyles and setting other themes and targets in individual workplaces. In the pilot workplaces, IHI is visualizing work processes and adopting ICT tools based on results from employee surveys and data analysis.

Elsewhere, the automation of routine work via computers utilizing robotic process automation (RPA) and the reduction/streamlining of work time also progressed.

IHI received a 4-star rating in the 2nd Nikkei Smart Work Management Survey by Nikkei Inc., which certifies companies working to revolutionize productivity through work-style reform. The comprehensive survey aggregates scores in four key areas: human resources utilization, innovation, market development and financial stability.

NIKKEI
Smart Work

★★★★★ 2019

Nikkei Smart Work Management Survey – 4 stars

Supply chain management initiatives

Basic Policies

IHI's Group Procurement Policy is based on three core principles — fair and impartial procurement, mutually beneficial partnerships with business partners and satisfying compliance and societal needs. The procurement of materials or equipment involves not only compliance with legal requirements but also consideration of human rights, the environment and conflict minerals¹. In addition to education for employees, IHI also satisfies societal demands by educating suppliers for beneficial coexistence and co-prosperity.

¹: Minerals from conflict regions that, if purchased, sometimes result inadvertently in funding armed insurgents or fueling regional disputes.

Procurement cost reduction initiatives

IHI holds once-annual Procurement Cost-reduction Case Study Presentations for the promotion of Group efforts to reduce procurement costs and share best practices. The presentations introduce outstanding internal examples of improving and standardizing procurement specifications, improving competitiveness by shifting to global multisourcing and concentrated purchasing. At a presentation held in March 2019, 7 of the 81 case studies were deemed outstanding and were therefore specially commended and then shared within



Giving Procurement Cost-reduction Case Study Presentations

the Group. IHI has established Common Product-Specific Expert Councils to strengthen groupwide procurement capabilities. Council members endeavor to build optimal procurement networks for the Group by reviewing product specifications and suppliers in collaboration with business areas. These efforts cover key items common to the entire Group, including steel, cast and forged products, bearings and electrical products. Furthermore, in terms of procurement from China and Taiwan, until now each business area and group company had procured materials independently, but now the Group has combined its purchasing know-how and supplier information, and strengthened liaison with the Chinese headquarters to increase efficiency in developing new suppliers and aggregating them, as well as sharing best practice.

IHI Group Procurement Policy

1. Fair and impartial procurement

IHI provides business opportunities in an open manner to business partners around the world, aiming to work with creative and competitive partners. Partners are evaluated and selected in a fair and comprehensive manner based on factors such as quality, price, delivery schedule, technology and financial conditions.

2. Mutually beneficial partnerships

IHI regards partners as value creators. To secure optimal quality, prices and deliveries as well as reliable procurements, the company aims to establish relationships of trust with partners for mutual competitiveness and prosperity.

3. Satisfying compliance and societal needs

IHI complies with all laws that govern its local and global businesses. IHI procurements give priority to consideration for the environment, human rights, labor conditions, occupational safety and health, and information management.

<Request to Business Partners>

IHI emphasizes the following values in its businesses and asks for the cooperation and understanding of partners in promoting these values.

- Compliance
- Paying attention to human rights, labor conditions and occupational safety and health
- Ensuring optimal quality, cost and delivery conditions
- Enhancement of competitiveness
- Respect for the environment
- Information disclosure

Overseas Procurement Network



Tokyo, Japan
 London, UK
 New York, USA
 Shanghai and Dalian, China
 Seoul, South Korea

New Delhi, India
 Bangkok, Thailand
 Singapore
 Kuala Lumpur, Malaysia
 Ho Chi Minh City and Hanoi, Vietnam

Topics

New service using satellite-based tracking for up-to-date container ship schedules

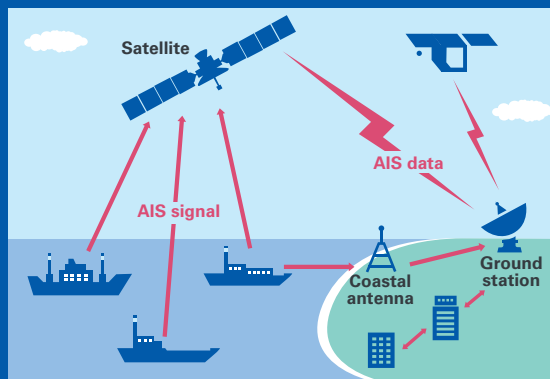
IHI Jet Service provides AIS Liner Viewer Service which serving the position and navigation information of Container ships.

Container-ship operating schedules can fluctuate greatly due to weather, so the delayed arrival of raw materials or products carried by such ships can impact production schedules. To address this issue, We developed a system to utilize information from the Automatic Identification System (AIS) transmitted by vessels over 500 gross tons in Domestic waters and over 300 gross tons in International waters. By analyzing satellite data on a vessel's position, speed

and name, the Estimated Time of Arrival (ETA) can be refreshed as a precise data for the customers. Also, by connecting with customer stock-management systems, We can accurately ascertain items status in-transit.

Initiatives to use satellite information are enabling IHI to help customers for enhancement of supply-chain management.

Automatic Identification System (AIS)



AIS LinerViewer

Service

- Current-position information
- Shipping schedules
- Estimated Time of Arrival (incl. delay warnings)
- Information on port arrivals/departures



Topics

Partnerships deepened with three outstanding suppliers awarded by IHI

IHI awarded suppliers for their high achievements and thereafter strengthened its partnerships with these companies. In FY2018, the following three companies were presented with Appreciation Awards.

- **Dalian Xindong Machinery Co., Ltd. (China)**

Possesses outstanding welding technology and has delivered high-quality steel structural parts primarily for compressors.

- **Daliانشي Jinzhou Dongfang Zhugangchang (China)**

Possesses excellent technological capabilities for using a broad range of materials to manufacture forged products, mainly for boilers and compressors.

- **DEE Development Engineers Ltd. (India)**

Using highly efficient precision-manufacturing, the company supports IHI's stable supply of pipes and joints for boilers and plants.



Award ceremony at Daliانشي Jinzhou Dongfang Zhugangchang

Financial Summary

FY	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Key financial highlights											(billions of yen)
Orders received	1,176.7	970.4	1,200.9	1,269.6	1,225.6	1,458.9	1,664.3	1,605.3	1,389.8	1,505.0	1,399.2
Sales	1,388.0	1,242.7	1,187.2	1,221.8	1,256.0	1,304.0	1,455.8	1,539.3	1,486.3	1,590.3	1,483.4
Operating income	25.6	47.1	61.3	43.3	42.1	53.2	63.2	22.0	47.3	72.2	82.4
Share of profit of entities accounted for using equity method	0.7	0.4	0.3	0.6	4.3	5.3	(1.7)	1.1	(3.5)	(33.0)	4.1
Net non-operating income	(12.1)	(14.1)	(9.9)	(1.6)	(5.9)	0	(6.7)	(12.3)	(25.3)	(50.8)	(16.7)
Ordinary income	13.5	33.0	51.4	41.7	36.2	53.2	56.5	9.7	22.0	21.4	65.7
Profit attributable to owners of parent	(7.4)	17.3	29.7	23.8	33.3	33.1	9.0	1.5	5.2	8.2	39.8
R&D expenses	24.7	25.5	29.2	30.0	30.2	33.5	37.0	41.6	35.5	38.6	36.5
Investment in plant and equipment	45.2	37.5	86.3	53.5	55.0	54.5	63.9	50.8	52.7	59.2	67.3
Depreciation	36.1	38.2	38.2	41.1	41.7	40.4	43.2	46.7	46.6	44.8	42.9
Total assets	1,489.3	1,412.4	1,361.4	1,338.1	1,364.2	1,496.3	1,690.8	1,715.0	1,692.8	1,633.4	1,664.5
Interest-bearing debt	427.1	432.0	373.3	345.2	353.8	357.8	410.6	374.5	371.9	322.2	355.0
Net assets	205.9	227.0	253.6	258.4	299.2	362.5	359.5	333.3	337.6	350.2	381.6
Employees	24,348	24,890	26,035	26,915	26,618	27,562	28,533	29,494	29,659	29,706	29,286
Per share data											(yen)
Profit attributable to owners of parent per share ¹	(50.51)	118.51	202.94	162.58	228.14	225.13	58.84	9.90	33.98	53.71	258.53
Book value per share ²	1,309.64	1,446.63	1,623.33	1,708.36	1,970.77	2,236.81	2,240.31	2,061.63	2,060.33	2,103.22	2,263.12
Annual dividends per share	0.00	20.00	30.00	40.00	50.00	60.00	60.00	30.00	0.00	60.00	70.00
Sales by region											(billions of yen)
United States	157.6	139.2	126.1	125.7	147.1	212.7	270.8	336.1	319.8	350.7	326.4
Europe	90.4	70.3	90.8	99.4	93.0	152.2	171.0	139.9	116.1	132.6	102.2
Asia and other	358.6	315.1	295.1	295.9	246.2	253.7	316.2	320.9	321.5	324.7	284.9
Japan	781.4	718.1	675.2	700.8	769.7	685.4	697.8	742.4	728.9	782.3	769.9
Sales by business segment											(billions of yen)
Resources, Energy & Environment	–	–	306.4	312.3	321.5	344.0	415.3	452.4	427.3	490.4	377.0
Social Infrastructure & Offshore Facilities	–	–	122.4	114.7	117.8	150.3	188.6	168.1	157.7	154.5	143.1
Industrial Systems & General-Purpose Machinery	–	–	282.2	318.7	382.5	397.8	411.7	404.7	411.6	459.0	441.0
Aero Engine, Space & Defense	–	–	273.7	299.4	338.4	406.0	434.8	500.2	471.9	463.7	492.2
Financial index											(%)
Percentage of overseas sales	43.7	42.2	43.1	42.6	38.7	47.4	52.1	51.8	51.0	51.0	48.0
Operating margin	1.9	3.8	5.2	3.5	3.4	4.1	4.3	1.4	3.2	4.5	5.6
ROIC (return on invested capital) ³	3.0	4.8	6.2	4.6	4.5	5.3	5.8	2.3	5.0	7.7	8.7
ROA (return on assets) ⁴	(0.5)	1.2	2.1	1.8	2.5	2.3	0.6	0.1	0.3	0.5	2.4
ROE (return on equity) ⁵	(3.6)	8.6	13.2	9.8	12.4	10.5	2.6	0.5	1.6	2.6	11.8
Debt-to-equity ratio (times) ⁶	2.07	1.90	1.47	1.34	1.18	0.99	1.14	1.12	1.10	0.92	0.93
Equity to total assets	12.9	15.0	17.5	18.7	21.1	23.1	20.5	18.6	18.8	19.9	21.0

FY	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Balance sheet-related information											(billions of yen)
Current assets	1,036.4	941.7	853.4	844.3	814.7	901.2	1,053.7	1,100.5	1,073.8	993.4	987.8
Non-current assets	452.9	470.6	508.0	493.7	549.4	595.1	637.1	614.5	618.9	640.0	676.6
Total assets	1,489.3	1,412.4	1,361.4	1,338.1	1,364.2	1,496.3	1,690.8	1,715.0	1,692.8	1,633.4	1,664.5
Current liabilities	898.1	758.1	691.1	689.6	665.4	726.2	795.9	882.7	876.2	811.6	823.1
Provision for construction warranties	49.9	35.7	47.2	44.7	40.4	43.8	65.3	97.5	85.2	80.9	69.1
Provision for loss on construction contracts											
Non-current liabilities	385.2	427.1	416.6	389.9	399.5	407.5	535.3	498.9	478.9	471.6	459.7
Total liabilities	1,283.3	1,185.3	1,107.8	1,079.6	1,064.9	1,133.8	1,331.2	1,381.6	1,355.2	1,283.2	1,282.8
Shareholders' equity	187.0	204.6	234.6	254.3	282.7	332.2	313.5	305.8	309.9	313.2	343.4
Total net assets	205.9	227.0	253.6	258.4	299.2	362.5	359.5	333.3	337.6	350.2	381.6
Total liabilities and net assets	1,489.3	1,412.4	1,361.4	1,338.1	1,364.2	1,496.3	1,690.8	1,715.0	1,692.8	1,633.4	1,664.5
Cash flow statement-related information											(billions of yen)
Cash flow from operating activities	(17.6)	76.7	95.5	24.7	74.3	39.2	63.5	95.3	65.3	99.0	46.4
Cash flow from investing activities	(41.7)	(62.7)	(77.7)	(37.7)	(61.0)	(62.2)	(74.6)	(35.5)	(28.9)	(47.9)	(79.2)
Cash flow from financing activities	42.8	(1.8)	(25.9)	(38.5)	(3.1)	11.3	33.4	(47.5)	(21.9)	(57.3)	16.4
Change in interest-bearing debt	59.2	4.9	(58.7)	(28.1)	8.6	4.0	52.8	(36.1)	(2.6)	(49.7)	32.8
Free cash flow ⁷	(59.3)	13.9	17.7	(12.9)	13.3	(23.0)	(11.0)	59.8	36.4	51.0	(32.8)

1. Profit attributable to owners of parent / total number of shares outstanding
2. Net assets / total number of shares outstanding
3. (Operating income + Interest and dividend income) after tax / (Owners' equity + Interest-bearing debt)
4. Profit attributable to owners of parent / (Average of total assets at end of previous term and end of current term)
5. Profit attributable to owners of parent / (Average of previous fiscal year-end and current fiscal year owners' equity)
6. Net interest-bearing debt / Net assets
7. Cash flow from operating activities / Cash flow from investing activities

For more detailed information,
please refer to the website.



Financial <https://www.ihj.co.jp/en/ir/>

Non-financial summary

Material issues	Theme and index		Results		
			FY2016	FY2017	FY2018
Governance – Principled corporate management –					
Strengthening of corporate governance	Corporate governance	Average attendance rate (%) of outside directors at Board of Directors' meetings	94.0	95.3	96.6
		Average attendance rates of outside Audit & Supervisory Board members on the Board of Directors and Audit & Supervisory Board (%)	93.0	98.1	96.1
Strengthening of compliance	Legal compliance	No. of law violations / No. of guidance cases: Competition law	0	0	0
		No. of law violations / No. of guidance cases: Anticorruption law	0	0	0
	Whistleblowing	Compliance Hotline reports	218	209	238
	Compliance training	No. of participants: Executives	55	50	47
		No. of participants: Line managers	73	83	75
No. of participants: Employees (domestic)		18,859	18,020	18,234	
No. of participants: Employees (overseas)	1,392	1,261	1,126		
Strengthening of information security	Information security training	Participatory rate (%)	98.5	98.0	96.8
Enforcement of risk management	Protection of intellectual property	No. of owned patents by region: Domestic	4,157	3,915	4,120
		No. of owned patents by region: Overseas	2,744	2,598	3,047
Environment – Reduce environmental impact –					
Climate change	CO ₂ emissions	CO ₂ emissions (t-CO ₂)	316,914	330,162	329,602
		CO ₂ emission intensity (t-CO ₂ /100 mill yen)	21.3	20.8	22.2
	Energy consumption	Energy consumption (TJ)	6,015	6,087	5,828
		Energy intensity (TJ/10 bill yen)	40.5	38.3	39.3
	Evaluation of CDP climate change		A- (Leadership)	B (Management)	B (Management)
Circular economy	Waste generated	Waste generated (ton)	30,531	28,691	29,010
		Waste generated intensity (ton/100 mill yen)	2.05	1.80	1.96
	Water consumption	Water consumption (1,000 m ²)	4,169	3,776	4,182
		Water consumption intensity (1,000 m ² /10 bill yen)	28.0	23.7	28.2
Environmental protection	Compliance with environmental laws and regulations	Major environmental law/regulation violations/environmental incidents (cases)	0	0	0
	Environmental management	Nikkei Environmental Management Survey	429	431	437
Participatory rate for environmental e-Learning (%)		84.3	85.3	85.6	

Material issues	Theme and index		Results		
			FY2016	FY2017	FY2018
Society – Materialize an affluent society –					
Corporate citizenship	Social contributions	Social contribution expense (100 mill yen)	2.06	3.31	6.35
Diverse human resources	Employment	New graduate employment	288	245	155
		Breakdown – Engineers: Men	208	174	110
		Engineers: Women	21	19	7
		Administrative: Men	40	36	25
		Administrative: Women	19	16	13
		Mid-career employment (people)	153	29	78
	Gender diversity	Disabled people employment percentage (%)	2.14	2.03	2.21
		People selecting a retirement age of 61 or above (%)	84	87	84
		Number of female managers	66	68	74
		Ratio of female managers (%)	2.5	2.6	2.8
		Female officers	2	4	4
Professional development	No. of participants in position-specific training (people)	Approx. 3,300	Approx. 2,900	Approx. 3,300	
	No. of hours for position-specific training (hours)	Approx. 112,000	Approx. 101,000	Approx. 112,000	
	No. of participants in open lectures (people)	Approx. 5,800	Approx. 5,800	Approx. 6,200	
	No. of hours for open lectures (hours)	Approx. 46,000	Approx. 44,000	Approx. 47,000	
Labor practices	Safety and hygiene	Health checkup prevalence rate (%)	70	69	70
		Stress check participation rate (%)	90	91	96
		Smokers (%)	29	28	28
		Lost time injuries frequency rate (%)			
		No. of fatalities or injuries through work-related accidents per million working hours (excluding non-loss-time accidents)	0.33	0.57	0.26
	Work-life balance	Employees with reduced work hours	149	159	158
		No. of people who have taken childcare leave (people)	674	677	689
		No. of people who have taken parental leave (people)	89	111	113
		Percentage returning to work after taking parental leave (%)	100	100	100
		No. of people who have taken nursing care leave (people)	11	18	6
		Average of annual paid vacation days acquired [regular employees] (days)	16.50	17.63	18.36
	Labor-management partnership	Average monthly overtime work (hours)	23.90	22.90	22.50
		No. of labor union members	7,884	7,851	7,564

External evaluation



IHI was included in the S&P/JPX Carbon Efficient, an index determining the weight of index companies by focusing on the disclosure of environmental information and level of carbon efficiency (carbon discharge per sales unit).



Of the top 500 companies with market capitalization of Japanese stocks, IHI was chosen by the MSCI Japan Empowering Women (WIN) Select Index, which selects companies with particularly outstanding gender diversity.



IHI was certified as a Level 2 “Eruboshi” company. “Eruboshi” is a recognition system established in line with the Act on Promotion of Women’s Participation and Advancement in the Workplace recognizing companies with outstanding performance in terms of women’s participation in the workplace. The recognition is granted by Japan’s Minister of Health, Labour and Welfare.



IHI received the Gold Award, the highest level of commendation for the PRIDE Index 2018, an index evaluating workplace initiatives for sexual minorities, such as LGBT, established by the voluntary organization, Work with Pride.



IHI Group companies were certified as Health & Productivity Companies 2019, a certification recognizing companies with particularly outstanding health management efforts addressing regional health issues and health improvement initiatives led by Nippon Kenko Kaigi.



IHI was chosen as a Competitive IT Strategy Company, which is a joint scheme by the Ministry of Economy, Trade and Industry and Tokyo Stock Exchange evaluating companies proactively utilizing IT to strengthen their management innovation and competitive strength.

Consolidated Financial Statements

Consolidated Balance Sheets

(Millions of yen)

	March 31, 2018	March 31, 2019
ASSETS		
Current assets		
Cash and deposits	109,028	94,951
Notes and accounts receivable – trade	400,330	377,695
Finished goods	25,647	23,084
Work in process	282,245	276,238
Raw materials and supplies	120,630	142,588
Other	59,758	77,351
Allowance for doubtful accounts	(4,164)	(4,043)
Total current assets	993,474	987,864
Non-current assets		
Property, plant and equipment		
Buildings and structures, net	131,035	137,156
Machinery, equipment and vehicles, net	75,249	76,697
Land	92,506	99,217
Leased assets, net	14,736	15,962
Construction in progress	11,828	10,100
Other, net	23,692	28,262
Total property, plant and equipment	349,046	367,394
Intangible assets		
Goodwill	12,231	10,032
Software	15,483	18,060
Other	8,306	5,992
Total intangible assets	36,020	34,084
Investments and other assets		
Investment securities	99,284	117,967
Deferred tax assets	118,113	116,802
Net defined benefit asset	24	31
Other	39,251	41,763
Allowance for doubtful accounts	(1,724)	(1,376)
Total investments and other assets	254,948	275,187
Total non-current assets	640,014	676,665
Total assets	1,633,488	1,664,529

(Millions of yen)

	March 31, 2018	March 31, 2019
LIABILITIES		
Current liabilities		
Notes and accounts payable – trade	304,928	290,043
Short-term loans payable	81,515	111,785
Current portion of bonds	–	20,000
Accrued expenses	88,252	88,520
Income taxes payable	8,075	7,384
Advances received	177,819	157,546
Provision for bonuses	26,119	28,089
Provision for construction warranties	53,727	47,968
Provision for loss on construction contracts	27,266	21,212
Other provision	808	1,079
Other	43,146	49,483
Total current liabilities	811,655	823,109
Non-current liabilities		
Bonds payable	50,000	30,000
Long-term loans payable	172,533	175,813
Lease obligations	13,214	14,307
Deferred tax liabilities for land revaluation	4,941	4,953
Net defined benefit liability	154,125	160,244
Provision for loss on business of subsidiaries and affiliates	1,188	1,212
Other provision	1,150	1,132
Other	74,465	72,067
Total non-current liabilities	471,616	459,728
Total liabilities	1,283,271	1,282,837
NET ASSETS		
Shareholders' equity		
Capital stock	107,165	107,165
Capital surplus	53,406	53,410
Retained earnings	153,564	184,092
Treasury shares	(879)	(1,170)
Total shareholders' equity	313,256	343,497
Accumulated other comprehensive income		
Valuation difference on available-for-sale securities	2,034	1,063
Deferred gains or losses on hedges	(286)	(190)
Revaluation reserve for land	5,359	5,321
Foreign currency translation adjustment	3,679	2,808
Recalculation of defined benefit plans	559	(3,319)
Total accumulated other comprehensive income	11,345	5,683
Subscription rights to shares	792	659
Non-controlling interests	24,824	31,853
Total net assets	350,217	381,692
Total liabilities and net assets	1,633,488	1,664,529

Consolidated Statements of Income

(Millions of yen)

	April 1, 2017 to March 31, 2018	April 1, 2018 to March 31, 2019
Sales	1,590,333	1,483,442
Cost of sales	1,316,915	1,205,713
Gross profit	273,418	277,729
Selling, general and administrative expenses	201,151	195,241
Operating income	72,267	82,488
Non-operating income		
Interest income	1,433	913
Dividend income	1,071	1,133
Share of profit of entities accounted for using equity method	–	4,108
Foreign exchange gain	–	5
Reversal of accrued expenses for environment conservation measures	1,072	–
Other income	3,600	5,199
Total non-operating income	7,176	11,358
Non-operating expenses		
Interest expenses	3,007	3,227
Share of loss of entities accounted for using equity method	33,088	–
Foreign exchange losses	3,813	–
Share of compensation in line with delayed construction of SPB tank	–	6,679
Expenses for delayed delivery	4,489	838
Share of cost to adjust civil aero engine contract	6,488	–
Other expenses	7,133	17,353
Total non-operating expenses	58,018	28,097
Ordinary income	21,425	65,749
Extraordinary income		
Profit from sale of subsidiary and affiliate shares	–	4,199
Business transfer gain	1,586	1,108
Total extraordinary income	1,586	5,307
Extraordinary losses		
Impairment loss	1,095	1,610
Settlement-related expenses related to boiler facilities in commercial operation	2,932	–
Total extraordinary losses	4,027	1,610
Profit before income taxes	18,984	69,446
Income taxes – current	12,924	16,925
Prior corporate income tax, etc.	–	4,304
Income taxes – deferred	(7,357)	2,977
Total income taxes	5,567	24,206
Profit	13,417	45,240
Profit attributable to non-controlling interests	5,126	5,351
Profit attributable to owners of parent	8,291	39,889

Consolidated Statements of Comprehensive Income

(Millions of yen)

	April 1, 2017 to March 31, 2018	April 1, 2018 to March 31, 2019
Profit	13,417	45,240
Other comprehensive income		
Valuation difference on available-for-sale securities	(786)	(808)
Deferred gains or losses on hedges	(106)	(163)
Revaluation reserve for land	12	(12)
Foreign currency translation adjustment	2,353	(605)
Recalculation of defined benefit plans, net of tax	1,406	(3,612)
Share of other comprehensive income of entities accounted for using equity method	478	(443)
Total other comprehensive income	3,357	(5,643)
Comprehensive income	16,774	39,597
Comprehensive income attributable to		
Comprehensive income attributable to owners of parent	11,541	34,405
Comprehensive income attributable to non-controlling interests	5,233	5,192

Consolidated Statements of Changes in Equity

April 1, 2017 to March 31, 2018

(Millions of yen)

	Shareholders' equity				
	Capital stock	Capital surplus	Retained earnings	Treasury shares	Total shareholders' equity
Balance at beginning of current period	107,165	53,510	149,832	(513)	309,994
Changes of items during period					
Dividends of surplus			(4,633)		(4,633)
Profit attributable to owners of parent			8,291		8,291
Purchase of treasury shares				(419)	(419)
Disposal of treasury shares		(1)		53	52
Change in ownership interest of parent due to transactions with non-controlling interests		(103)			(103)
Net decrease from newly consolidated subsidiaries					–
Withdrawal of land revaluation reserve			74		74
Net changes of items other than shareholders' equity					
Total changes of items during period	–	(104)	3,732	(366)	3,262
Balance at end of current period	107,165	53,406	153,564	(879)	313,256

	Accumulated other comprehensive income						Subscription rights to shares	Non-controlling interests	Total net assets
	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Recalculation of defined benefit plans	Total accumulated other comprehensive income			
Balance at beginning of current period	2,892	(277)	5,427	1,298	(1,171)	8,169	843	18,624	337,630
Changes of items during period									
Dividends of surplus									(4,633)
Profit attributable to owners of parent									8,291
Purchase of treasury shares									(419)
Disposal of treasury shares									52
Change in ownership interest of parent due to transactions with non-controlling interests									(103)
Net decrease from newly consolidated subsidiaries									–
Withdrawal of land revaluation reserve									74
Net changes of items other than shareholders' equity	(858)	(9)	(68)	2,381	1,730	3,176	(51)	6,200	9,325
Total changes of items during period	(858)	(9)	(68)	2,381	1,730	3,176	(51)	6,200	12,587
Balance at end of current period	2,034	(286)	5,359	3,679	559	11,345	792	24,824	350,217

April 1, 2018 to March 31, 2019

(Millions of yen)

	Shareholders' equity				
	Capital stock	Capital surplus	Retained earnings	Treasury shares	Total shareholders' equity
Balance at beginning of current period	107,165	53,406	153,564	(879)	313,256
Changes of items during period					
Dividends of surplus			(9,267)		(9,267)
Profit attributable to owners of parent			39,889		39,889
Purchase of treasury shares				(424)	(424)
Disposal of treasury shares				133	133
Change in ownership interest of parent due to transactions with non-controlling interests		4			4
Net decrease from newly consolidated subsidiaries			(126)		(126)
Withdrawal of land revaluation reserve			32		32
Net changes of items other than shareholders' equity					
Total changes of items during period	–	4	30,528	(291)	30,241
Balance at end of current period	107,165	53,410	184,092	(1,170)	343,497

	Accumulated other comprehensive income						Subscription rights to shares	Non-controlling interests	Total net assets
	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Revaluation reserve for land	Foreign currency translation adjustment	Recalculation of defined benefit plans	Total accumulated other comprehensive income			
Balance at beginning of current period	2,034	(286)	5,359	3,679	559	11,345	792	24,824	350,217
Changes of items during period									
Dividends of surplus									(9,267)
Profit attributable to owners of parent									39,889
Purchase of treasury shares									(424)
Disposal of treasury shares									133
Change in ownership interest of parent due to transactions with non-controlling interests									4
Net decrease from newly consolidated subsidiaries									(126)
Withdrawal of land revaluation reserve									32
Net changes of items other than shareholders' equity	(971)	96	(38)	(871)	(3,878)	(5,662)	(133)	7,029	1,234
Total changes of items during period	(971)	96	(38)	(871)	(3,878)	(5,662)	(133)	7,029	31,475
Balance at end of current period	1,063	(286)	5,321	2,808	(3,319)	5,683	659	31,853	381,692

Consolidated Statements of Cash Flows

(Millions of yen)

	April 1, 2017 to March 31, 2018	April 1, 2018 to March 31, 2019
Cash flows from operating activities		
Profit before income taxes	18,984	69,446
Depreciation	56,522	53,200
Depreciation and amortization on other	6,722	8,413
Impairment loss	1,095	1,610
Increase (decrease) in allowance for doubtful account	(1,119)	(587)
Increase (decrease) in provision for bonuses	2,414	2,161
Increase (decrease) in provision for construction warranties	5,645	(5,505)
Increase (decrease) in provision for loss on construction contracts	(9,364)	(6,517)
Increase (decrease) in net defined benefit liability	5,568	909
Interest and dividend income	(2,504)	(2,046)
Interest expenses	3,007	3,227
Foreign exchange losses (gains)	698	21
Loss (gain) on sales of short-term and long-term investment securities	(646)	(37)
Loss (gain) on valuation of short-term and long-term investment securities	687	540
Share of (profit) loss of entities accounted for using equity method	33,088	(4,108)
Loss (gain) on disposal of property, plant and equipment	2,487	3,728
Business transfer loss (gain)	(1,586)	(664)
Loss (profit) from sale of subsidiary and affiliate shares	–	(4,199)
Settlement-related expenses related to boiler facilities in commercial operation	2,932	–
Decrease (increase) in notes and accounts receivable – trade	2,608	25,842
Increase (decrease) in advances received	(29,278)	(19,507)
Decrease (increase) in advance payments	14,296	(7,611)
Decrease (increase) in inventories	(15,779)	(14,794)
Increase (decrease) in notes and accounts payable – trade	18,549	(15,813)
Increase (decrease) in accrued expenses	(7,342)	178
Decrease (increase) in other current assets	4,992	(8,715)
Increase (decrease) in other current liabilities	(13,607)	(5,374)
Decrease (increase) in consumption taxes refund receivable	4,590	(3,309)
Other	(1,520)	(1,243)
Subtotal	102,139	69,246
Interest and dividend income received	3,336	2,520
Interest expenses paid	(3,125)	(3,179)
Income taxes paid	(3,332)	(22,185)
Cash flows from operating activities	99,018	46,402

(Millions of yen)

	April 1, 2017 to March 31, 2018	April 1, 2018 to March 31, 2019
Cash flow from investing activities		
Decrease (increase) in time deposits	1,377	(652)
Purchase of short-term and long-term investment securities	(20,328)	(18,272)
Proceeds from sales and redemption of short-term and long-term investment securities	21,212	7,081
Purchase of property, plant and equipment and intangible assets	(59,406)	(64,195)
Gain (loss) on sales or disposal of property, plant and equipment and intangible assets	1,800	(393)
Income through business transfer	2,347	2,834
Payments from changes in ownership interests in subsidiaries that results in change in scope of consolidation	–	(1,003)
Decrease (increase) in short-term loans receivable	1,581	188
Payments of long-term loans receivable	(13)	(1,147)
Collection of long-term loans receivable	22	37
Decrease (increase) in other investments	(3,080)	(9,739)
(Decrease) increase in other fixed liabilities	6,527	5,968
Other	(16)	13
Cash flow from investing activities	(47,977)	(79,280)
Cash flow from financing activities		
Net increase (decrease) in short-term loans payable	(26,734)	36,733
Net increase (decrease) in commercial papers	(5,000)	–
Proceeds from long-term loans payable	64,709	52,614
Repayments of long-term loans payable	(70,510)	(58,186)
Redemption of bonds	(10,000)	–
Proceeds from sales and leasebacks	93	1,459
Repayments of lease obligations	(5,719)	(6,709)
Decrease (increase) in treasury shares	(13)	(5)
Income and expenditures due to setting of money trusts aimed at acquiring own shares	(406)	(419)
Purchase of treasury shares of subsidiaries	–	(1)
Cash dividends paid	(4,620)	(9,241)
Proceeds from share issuance to non-controlling shareholders	3,180	3,855
Dividends paid to non-controlling interests	(2,306)	(3,623)
Payments from changes in ownership interests in subsidiaries that do not result in change in scope of consolidation	–	(14)
Cash flow from financing activities	(57,326)	16,463
Effect of exchange rate change on cash and cash equivalents	(2,275)	1,743
Net increase (decrease) in cash and cash equivalents	(8,560)	(14,672)
Cash and cash equivalents at beginning of period	115,911	107,323
Increase in cash and cash equivalents from consolidation of non-consolidated subsidiaries	–	523
Decrease in cash and cash equivalents resulting from exclusion of subsidiaries from consolidation	(28)	(566)
Cash and cash equivalents at end of period	107,323	92,608

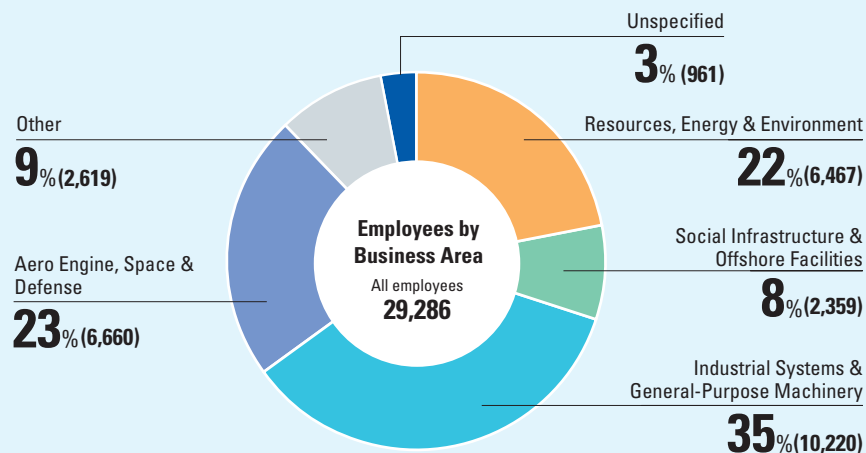
Corporate Data (As of March 31, 2019)

Name	IHI Corporation
Head office	Toyosu IHI Building, 3-1-1 Toyosu, Koto-ku, Tokyo 135-8710, Japan Tel: +81-3-6204-7800
President and CEO	Tsugio Mitsuoka
Founded	December 5, 1853
Incorporated	January 17, 1889
Capital	107.1 billion yen
Employees (consolidated)	29,286
Works	6
Branches in Japan	8
Overseas offices	14
Group companies	In Japan: 69 (50 subsidiaries, 19 affiliates) Overseas: 148 (123 subsidiaries, 25 affiliates)
Securities code	7013
Stock exchange listings	Tokyo, Nagoya, Sapporo, Fukuoka
Share unit	100
Total number of authorized shares	300,000,000
Outstanding shares	154,510,508 (not including 169,446 treasury shares)
Shareholders	73,168
Fiscal year	April 1 to March 31 of following year
General shareholders' meeting	June of each year
Record date for year-end dividend	March 31 of each year
Record date for interim dividend	September 30 of each year
Shareholder registry administrator / Special account managing institution	1-4-1 Marunouchi, Chiyoda-ku, Tokyo 100-8233, Japan Sumitomo Mitsui Trust Bank, Limited Stock transfer Agency Business Planning Department 2-8-4 Izumi, Suginami-ku, Tokyo 168-0063, Japan 0120-782-031 (toll-free in Japan)

Our Offices Around the World



Employees by Business Area



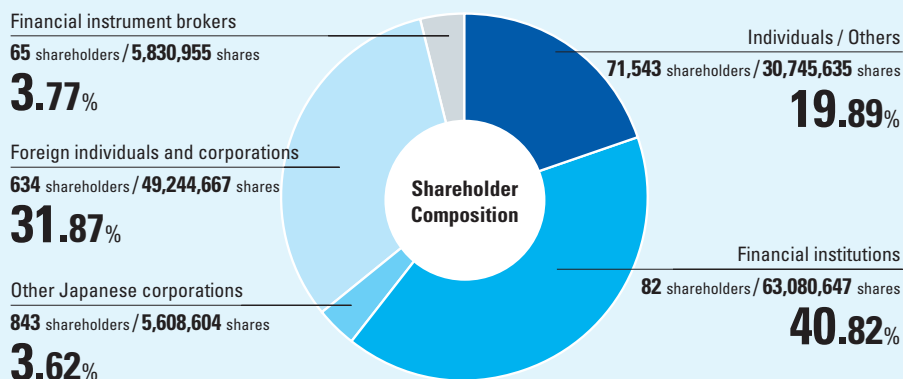
Note: The number of employees is the number of officially employed individuals, including those seconded to IHI Group and excluding Group employees seconded to other companies. Temporary workers represent less than 10% percent of employees and are not included.

Major Shareholders

Name	Number of shares held (thousand shares)	Shareholding ratio (%)
The Master Trust Bank of Japan, Ltd. (holder in Trust)	10,503	6.79
Japan Trustee Services Bank, Ltd. (holder in Trust)	7,879	5.09
Japan Trustee Services Bank, Ltd. (TOSHIBA CORPORATION Retirement Benefit Trust Account re-entrusted by Sumitomo Mitsui Trust Bank, Limited)	5,542	3.58
The Dai-ichi Life Insurance Company, Limited	5,406	3.49
State Street Bank And Trust Company 505001	4,634	2.99
Trust & Custody Services Bank, Ltd. as trustee for Mizuho Bank Retirement Benefit Trust Account re-entrusted by Mizuho Trust and Banking Co., Ltd.	4,597	2.97
Japan Trustee Services Bank, Ltd. (holder in Trust 9)	3,813	2.46
Japan Trustee Services Bank, Ltd. (holder in Trust 5)	3,015	1.95
State Street Bank And Trust Company 505223	2,844	1.84
IHI Kyoeikai	2,545	1.64

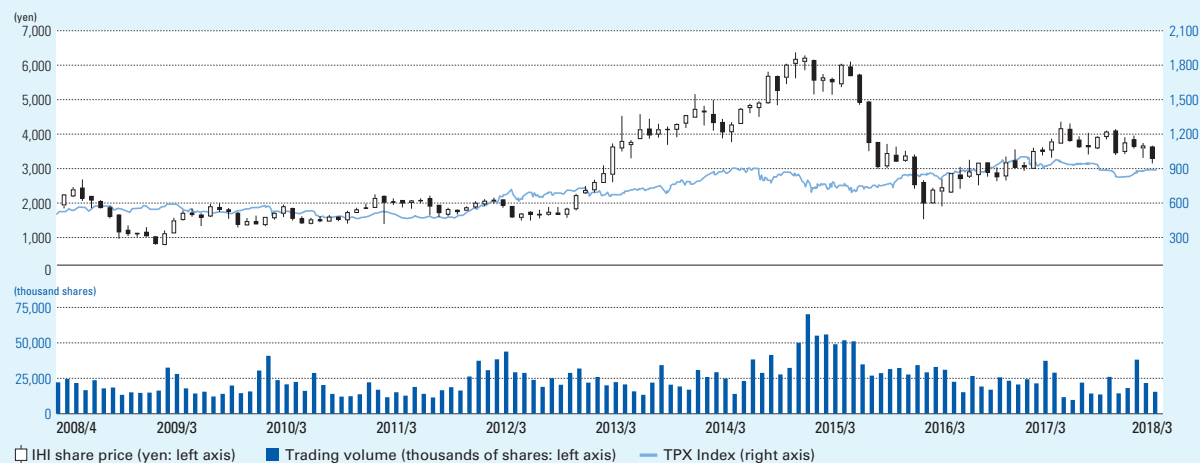
Notes: 1. The number of shares and shareholder ratios less than a single unit are rounded down.
2. Shareholding ratios are calculated without including the total number of treasury shares.

Shareholder Composition



Notes: Due to rounding, the total percentage may not add up to 100.

IHI Stock Performance and Average Trading Volume Per Day



The Company conducted a consolidation of common stock on a 10 for 1 basis on October 1, 2017. Data regarding Stock Performance and Average Trading Volume Per Day prior to the said consolidation of common stock is calculated on the premise that the consolidation of common stock would be carried out.

About IHI Integrated Report 2019

Scope

IHI Corporation and its major group companies

Period

This report covers FY2018, which began on April 1, 2018 and ended on March 31, 2019.

However, information prior to and after this period may also be included.

Guidelines

- International Integrated Reporting Framework, International Integrated Reporting Council
- Sustainability Reporting Guidelines (GRI Standards), Global Reporting Initiative

Inquiries

Please contact us via the inquiry form on IHI website.
<Inquiries about CSR activities>

https://contact.ihico.jp/index.php/ihico_eng/IHI/form_10707

Disclaimer

This report contains facts, both past and present, about the IHI Group, as well as forward-looking projections based on our current management plans and policies. These forward-looking projections are made with the information available at the time and are based on numerous assumptions, and are subject to changes in the business environment and operations. Actual results may differ materially from the forecasts.

IHI

Realize your dreams

IHI Corporation

Corporate Planning Division

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URL : <https://www.ihi.co.jp/en/index.html>



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