



The Hitachi Group Value Creation Story

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Energy solutions

We manage **25%** of the world's substations and supply stable energy to **1.8 billion** people





Becoming a Global Leader in the Social Innovation Business

Hitachi will transform rapidly to achieve the innovations required by the times.

Reaching a record high for the second consecutive year, fiscal 2018 adjusted operating income* at Hitachi came in at ¥754.9 billion, with the adjusted operating income ratio for the year meeting the Mid-term Management Plan target of 8%. Total Hitachi, Ltd. stockholders' equity on the balance sheet during the period covered by the plan was up approximately ¥500 billion, backed by the Company improving its ability to generate cash. Having achieved a V-shaped recovery after recording losses of ¥787.3 billion in fiscal 2008, Hitachi is now moving into a new stage of development.

* Adjusted operating income is defined as total revenues less cost of sales and selling, general, and administrative (SG&A) expenses.

Toshiaki Higashihara
President & CEO

T. Higashihara

Returning to Our Roots

Reaffirming Our Strengths Based on the Lessons of the Past

In 2020, Hitachi will celebrate the 110th anniversary of its founding as a manufacturer of electrical machinery.

In all that time, one of the biggest turning points was the management crisis. The Company at the time posted the largest

loss ever for a Japanese manufacturer, with stockholders' equity of about ¥2-¥3 trillion being adversely impacted to fall at about ¥1 trillion. Hitachi had been called an "unsinkable giant" in the past, so how did things become so bad that it found itself being ridiculed as

“a sinking giant”? I believe this situation came about due to there being no real sense of crisis at the Company. That said, after posting this huge loss, management did move to rebuild itself and spur an earnings recovery through a major reshuffling of the Company’s businesses and reforms to Hitachi’s corporate governance structure.

Having witnessed the Company’s struggles, I learned the importance of simultaneously implementing “peacetime structural reforms” and a “sustainable growth strategy.” Crafting bold and decisive strategies when an emergency arises is one thing, but if, in periods of relative calm, a company is not looking likely to become a world-class competitor, its leadership needs to take steps, including shrinking or withdrawing from struggling businesses. I have taken to heart the lesson that if a business fails to act boldly and with speed, there is a very real risk of it not being able to survive, especially in these uncertain times.

Completing the V-Shaped Recovery

Initiatives to Improve Profitability and Achieve Our Mid-term Management Plan Targets

I became Hitachi’s president and COO in 2014 and president and CEO in fiscal 2016, when we launched the 2018 Mid-term Management Plan. Hitachi was unable to achieve the income ratio targets in its 2015 Mid-term Management Plan, and we were determined not to let that happen again during the period covered by the new plan. So what was the best way to achieve our minimum adjusted operating income ratio target of 8% and the creation of a structure supporting margins in the double digits?

Our first move, launched in April 2016, was to overhaul our organizational structure. This involved dividing up our large in-house company system into small business units, allowing us to clearly identify the challenges and issues in each business. While enacting measures aimed at spurring improvements in low-profit businesses, we also shrunk or withdrew from businesses where these measures appeared unlikely to work. Our efforts to tighten project management and review fixed costs on a companywide basis contributed to a reduction in unnecessary costs, and we lifted on-site awareness of cash flow by making the cash conversion cycle (CCC) a key management indicator. I believe the organizational overhaul allowed us

So the question is how best to create a growth strategy. Faced with truly dire conditions, we decided to “return to our roots.” Since its founding, Hitachi has focused on contributing to the improvement of people’s lives by following a corporate philosophy based on the desire to “contribute to society through the development of superior, original technology and products.” Established as a manufacturer of five-horsepower induction motors, Hitachi has not only developed its ability to create products, but has honed its abilities in control and operational technologies (OT) in the more than 100 years it has operated as a manufacturer, as well as its knowledge in information technologies (IT) over the past 50 years. Hitachi’s strengths lie in its ability to combine OT, IT, and its products to create new value and provide solutions that meet the needs of its customers and society. I believe the creation of an organization that makes full use of this strength allows us to contribute to the resolution of various social issues, which in turn contributes to sustainable growth at Hitachi.

to see issues that were previously difficult to see, and with the ability to make quick management decisions, I soon began to see results.

In terms of our growth strategy, we launched Lumada, which incorporates the sum of our technological knowhow, in May 2016, and established a system providing digital solutions throughout the group. Lumada is Hitachi’s advanced digital solutions, services, and technologies for turning customers’ data into insights to drive digital innovation. Lumada-based revenues have already expanded to exceed ¥1 trillion.

While promoting the reshuffling of our businesses, including the sale of listed subsidiaries, we are also actively working to incorporate businesses within the group that could be expected to generate synergies with Lumada. As examples of this, in 2017 we acquired air-compressor firm Sullair, which has a global footprint especially in North America, and we aim to complete the acquisition of ABB’s power grid business in the first half of 2020. The intent of the ABB power grid business acquisition is the greater provision of innovative energy solutions through an expansion in global sales channels. And to take it one step further, we also aim to incorporate the philosophy

and know-how of this globally successful company into Hitachi in order to spur further positive changes. I believe acquisitions of this type can provide Hitachi with a stepping-stone toward its goal of

creating greater value on a global scale as it moves into its next growth stage.

The View after Rebirth

Exploring the Purpose of Our Business

If I were to summarize the 2018 Mid-term Management Plan, I would say its biggest achievements included instilling a shared sense of crisis in employees throughout the Company and fostering a growing focus on income and cash. These changes resulted in Hitachi achieving its Mid-term Management Plan target for an adjusted operating income ratio of 8%, as well as a growing perception that Hitachi as a global company should naturally produce income margins in the double digits, and that the Company should be a global leader in the Social Innovation Business.

After having achieved a V-shaped recovery, is it really necessary for the Company to push income ratios to 10% or higher? I have for some time been saying, “Show me the cash!” to our employees, in part as I feel it is necessary to focus on what comes before profit.

In this sense, I will never forget the first factory manager at Omika Works with whom I worked after joining the Company quoting from Yuzo Yamamoto’s novel, *A Stone by the Roadside*. A line in the novel essentially says, “There is only one you and you have only one life, so if you don’t really use it, are you really human? Have you really lived?” To apply that to today, if you spend more than half your life at work, then it is through that work that you have the opportunity to feel the happiness of people and society. It is through the job in front of you that you can help people and society. In other words, I think contributing to building social and environmental value is a major driver behind our personal growth and our job satisfaction.

A look around the world shows an unending series of changes impacting people’s lives. These include resource shortages and climate change, demographic changes brought on by the aging of society, and the issues accompanying urbanization. Amid such an environment, there are growing efforts around the world, including the Society 5.0^{*1} initiative in Japan, to resolve through innovation the social issues outlined in the United Nations Sustainable Development Goals (SDGs). Hitachi’s corporate philosophy for the past 109 years has been to “contribute to society through the development of superior, original technology and products” and if each of its 300,000 employees around the world can find satisfaction in resolving social and environmental issues through advancing the Social Innovation Business and broadening the field of related activities, I believe it would surely contribute to continued growth for Hitachi. Of course, it is important to improve economic value, but I also believe it is important at the same time to improve social and environmental value. We aim to pursue this goal based not only on leadership from the top, but also through bottom-up participation from employees who find real purpose in their work. If we can accomplish this, I believe Hitachi will be all the stronger for it.

*1 Society 5.0 expresses a new idea of society and related efforts to achieve this, as advocated by the Japanese government. The aim is to develop the economy while addressing societal issues by deploying AI, IoT, robots and other forms of advanced science and technology to make use of various data creating an affluent, human-centered society. The name refers to the evolution of a fifth form of society, continuing from the hunter-gatherer, agrarian, industrial, and information societies.

A Vision for a New Leap Forward

Aiming to be a Global Leader in the Social Innovation Business

The modern age has been called the era of VUCA (Volatility, Uncertainty, Complexity, Ambiguity), where it is increasingly difficult to predict the future. This is why it is important to maintain focus on what

we value, and on the standards we use when making decisions. With Hitachi, these are grounded in our corporate mission and our values, which are based on the concepts of “harmony, sincerity, and a

pioneering spirit.” For historical perspective, Namihei Odaira, who founded Hitachi at age 36, noted that the motors and generators he repaired at the copper mines in what is now Hitachi City, Ibaraki Prefecture were all imported from abroad, and that Japanese industry could never develop if people in the country didn’t learn to make these devices on their own. With that idea, he founded Hitachi alongside a number of fellow engineers. I believe the founding of the Company was largely the result of Mr. Odaira’s desire to change Japan and contribute to the development of society and the country as a whole.

That kind of drive still exists in Hitachi today. Our focus is not only on economic value, revenues and income, but also on using innovation to resolve the many challenges facing society. We believe that Hitachi should be synonymous with Social Innovation Business, and with that kind of presence, we hope to widely contribute to society as a global leader. Even though times have changed, I believe the founder’s spirit continues to guide our management as part of Hitachi’s unchanging values.

I believe global leaders must have a clear vision of what they should be and that they should take the lead in creating history.

I also believe employees should do more than just fulfill the goals of leadership and that they should also focus on how their work can contribute to improving social and environmental value. Whenever I engage in direct communication, I am continually pushing for this kind of shift in the mind-set of our employees. The approach is not based on instilling a sense of crisis, but rather on raising awareness of the importance of social and environmental contribution.

Expressing sentiments such as “today we were able to supply safe water to people in the area” and “we contributed to the treatment of cancer patients,” our 300,000 employees worldwide are well aware of their contributions to the environment and society, as well as their connection to society in their daily work. I believe that this builds motivation in our employees, and through the combined efforts of all, it contributes to the creation of higher social and environmental value, and ultimately economic value for the Company.

Charting a Path to Growth: Launching the 2021 Mid-term Management Plan

Realizing Our Three Values and Establishing Goals for the Future

Our 2021 Mid-term Management Plan, launched in April 2019, focuses on simultaneously improving social value, environmental value, and economic value, and establishes five business sectors (IT, energy, industry, mobility and smart life) for the creation of social innovation. To put it differently, these are areas in which Hitachi can make use of the technological know-how it has built up through its many years of developing social infrastructure. Moreover, in each of these business sectors, Lumada can be used as a common platform to achieve the goals of improving people’s quality of life (QoL) as well as corporate value at our client companies.

Strengthening Lumada, which can accelerate innovation, is key to growth moving forward. Indeed, the creation of multiple reusable solutions in each of the key business fields can lead to the resolution of issues that cross industry and geographic boundaries.

The image of toy blocks provides a good analogy for better understanding. As with the variety of colors and shapes of a child’s

blocks coming together to form a unique structure, we can provide a variety of solutions, such as energy management, human flow simulations, and autonomous driving solutions, in a unique customized package to meet the specific needs each customer.

An example of this is the Copenhagen Metro project, for which Hitachi is supplying 24-hour driverless trains and related systems.

The Dynamic Headway solution used in testing these systems focuses on train station congestion, using data from mounted sensors to measure fluctuations in the number of passengers arriving. Based on this information, the system then optimizes the number of trains in operation. Hitachi’s efforts are focused on solving customer issues by combining solutions such as human flow simulations, automated timetable generation, and operational management optimization as customizable blocks. Amid the trend toward growing urbanization, better public transportation is increasingly required to prevent traffic congestion and create

comfortable public spaces, and given that the Copenhagen Metro project also optimizes operational efficiency and conserves energy,

it is contributing to improvements in social, environmental and economic value.

Accelerating Innovation to Spur Growth

Building an Innovation Ecosystem with Lumada at Its Core

So the question now is how to strengthen and evolve Lumada. I believe this requires the building of an “innovation ecosystem” that accelerates collaboration with business partners, universities, research institutes, and customers around the world.

The Company is already working with research institutions and domestic universities such as the University of Tokyo to create solutions to social issues. As example is the “Hitachi The University of Tokyo Laboratory.” We are also focused on expanding these kinds of collaborative relationships to include overseas universities, research institutions, and customers. In April 2019, Hitachi launched the collaborative creation project Kyoso-no-Mori at its Central Research Laboratory, inviting customers and partners from

all over the world to create new ideas alongside Hitachi researchers and designers.

We are also actively working on initiatives designed to contribute to the acceleration of innovation around the world. These efforts include acting as a supporting partner to start-ups as they create new innovations, and establishing a corporate venture capital fund.

We will continue to work toward improving the social, environmental, and economic value of our customers by creating an ecosystem for co-creation and establishing Lumada as the driving force behind the accelerated development of the Social Innovation Business.

Building a Global “Delivery” System

Front-Line Personnel with the Hitachi DNA Hold the Key to Success

After focusing on solutions to customer issues and assessing feasibility and profitability, the framework for building on Lumada’s foundation is now complete. There are already about 650 Lumada customer cases, and we believe this shared base will assist us in providing solutions that truly satisfy our customers. However, for the sake of our customers, I believe it is vital to develop front-line personnel who can provide even higher-added-value solutions. Hitachi’s collaborative efforts with its customers are not based on a vertical relationship, with one party acting above the other, but instead are based on side-by-side cooperation with the aim of improving social value. It’s important for those involved to always think with a sense of ownership and be at the forefront of discussions. If the direction of the organization or team is different, our employees will work together in line with the final decision in the spirit of “harmony”, leaving aside their previous opinions. Moreover, they will put forth their most

“sincere” efforts for our customers and partners, and even should they fail, they will never give up on their “pioneering spirit.” I believe securing and fostering frontline personnel exhibiting these qualities is a key to our success.

By combining the common solutions accumulated through Lumada, we can customize solutions for customers in different parts of the world. Moreover, to strengthen our front-line human resources so that we can realize this kind of “innovation ecosystem,” we are not only training in-house employees, but also actively recruiting personnel from outside the Company. Given that cultures and business practices vary according to region and country, we are working to cultivate human resources in each of those areas. As an example, we have been able to secure human resources in areas such as California’s Silicon Valley who are not only talented and experienced, but share a deep commitment to harmony,

sincerity, and the pioneering spirit that make up the Hitachi founding spirit.

I worked at the Omika Works in Ibaraki Prefecture for about 29 years after joining the Company in 1977. The plant was created in 1969 to house the combined control departments that were split off from the Hitachi and Kokubu plants, and for some time after I was assigned to the facility, there was still a lot of talk about from which of the original plants you came. That said, my time there allowed me to experience the creation of a shared culture, as gradual integration brought with it the spirit of building a “Greater Omika” plant. In my opinion, the

more background diversity there is, the better. I believe human resources recruited from around the world will be instrumental in sharing Hitachi’s values and resolving the social issues impacting our customers. I have high expectations as well as great confidence in this effort.

Total Growth Investment of ¥2.5 Trillion

Aggressively Pursuing Growth Opportunities While Maintaining an Eye on Capital Costs

Hitachi will invest more aggressively in growth, including M&A, over the next three years from fiscal 2019 to fiscal 2021 as part of its effort to become a true global leader. More specifically, we target a total investment of ¥2.5 trillion during the period, including about ¥1 trillion for the already announced acquisition of ABB’s power grid business. Growth investment will be focused on the IT and industry sectors, where we will enact unprecedented investment in both human resources and R&D. To carry out large-scale investment, we will use financial leverage to reduce capital costs (WACC) and improve ROE, while at the same time fostering management awareness of capital efficiency by establishing return on invested capital (ROIC) as a new KPI.

Hitachi will also strengthen its business foundation to accelerate development of the Social Innovation Business. In addition to operational reforms based on data accumulated thanks to advancements in production systems and business processes, as well as the promotion of digital transformation by expanding the scope of Lumada’s in-house use, we are working to reduce fixed costs and improve efficiency in sales and indirect operations. Maintaining an awareness of what is appropriate for a global company, we will continue to work toward improving profitability, with a gross profit margin^{*2} target of 30% or higher and an SG&A ratio^{*3} target of under 20%.

I believe an acceleration in the Social Innovation Business requires Hitachi to further improve the level of trust it enjoys from society. With this in mind, we will promote compliance, quality assurance, and safety by utilizing digitalization and Lumada to reduce manual tasks.

Based on these efforts, our fiscal 2021 earnings targets include average annual revenues rising organically by more than 3%, an adjusted operating income ratio above 10%, and cumulative operating cash flow for the three years greater than ¥2.5 trillion. Moreover, we target ROIC of above 10%, with the overseas revenue ratio climbing from 51% at present to better than 60%.

^{*2} Gross profit margin: The percentage of gross profit to revenues.

$$\frac{[\text{revenue} - \text{cost of sales}]}{\text{revenues}} \times 100$$

^{*3} The SG&A ratio: The ratio of the sum of all direct and indirect selling expenses and all general and administrative expenses to revenues. $\text{SG\&A expenses/revenues}$

Keywords for Survival in the Age of Data Capitalism:

Speed, Trust, Transparency and Customer Perspective

There is a paradigm shift taking place as we move from the age of products to the age of digitalization and the importance of speedy management continues to grow. Conversation at both the World Economic Forum in Davos at the beginning of the year and the G20 Summit in June centered on Data Free Flow with Trust (DFFT), with the expectation of improvements in private information banks and national databases. While the free trade of cross-border data requires trust, I believe there can be no trust without transparency. In this age of data, Hitachi, with its sensors and analysis technologies essential for data collection, will likely find more opportunities to promptly provide customers with solutions, and should encounter more opportunities to both improve economic

value and resolve social issues.

Of course, an opportunity is only an opportunity if we are properly prepared to take advantage of it. With a venturing spirit backed by the Company's "contribute to society" mission and its corporate philosophy grounded in "Harmony, Sincerity, and a Pioneering Spirit," each of our employees is committed to building a relationship of trust with our customers and the wider society. Moreover, with the higher goal of contributing to a better world, Hitachi and its employees will continue to work tirelessly to quickly provide solutions tailored to the customer's needs. I believe these efforts will lead to more opportunities for Hitachi to become a global leader in the Social Innovation Business.

Pursuing Dialogue with Stakeholders to Further Their Understanding of Hitachi's True Value

Communication is essential in building relationships of trust with external parties. It has been said by some that Hitachi's share price and market capitalization are rather low, and when looking back, it certainly appears that shareholder returns have for a long time not been at a level of which we could be proud. Given these circumstances, I strongly believe it necessary to bolster communication with those in the capital markets to deepen trust. There are likely a substantial number of stakeholders who still have the impression of Hitachi as a manufacturer of heavy electrical machinery, something carried over from many years ago. However, the Company is undergoing rapid change, and that change is likely to accelerate moving forward. With the goal of improving stakeholder understanding of Hitachi as it stands now, as well as its future course, we will continue to work to increase opportunities for communication while simultaneously improving transparency, including in the disclosure of ROIC, adjusted operating income, and revenues by sector.

In regard to shareholder returns, Hitachi targeted a low consolidated payout ratio of 20%–30% during the period covered by the 2018 Mid-term Management Plan, and it paid dividends at this level except in fiscal 2018, when after-tax net income was particularly low due to transitory factors. Our goal moving forward is to increase dividends paid to our shareholders to a higher level.

Based on the "Hitachi Social Innovation is Powering Good" campaign tagline that launched this year, we will strive to provide social, environmental, and economic value in line with our efforts to contribute to enhanced value for our corporate customers and an improved quality of life for people in general. We thank you and look forward to your continued support as we move forward.

September 2019

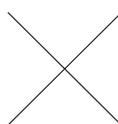
Toshiaki Higashihara
President & CEO
Hitachi, Ltd.



Independent Director* Dialogue

Harufumi Mochizuki

Chairman of the Board
Chair of the Nominating Committee
Chair of the Compensation Committee



Hiroaki Yoshihara

Chair of the Audit Committee

Board of Directors' Activities that Make Us a Global Leader

Board of Directors

In what ways is the Board of Directors at Hitachi, a company with nominating committee, etc., conducting managerial oversight?

Director Mochizuki: Hitachi's directors may have richly diverse backgrounds, but they all are united in their focus on world-class governance. Based on my personal perception, if the executive officers were swords, the directors would function like a whetstone. We hold extensive discussions as if we were grinding swords against this whetstone until it wore down, thereby creating shimmering swords. I think it is an important vision for us as directors.

The Board of Directors narrows topics of discussions down to matters of key importance, including budgets, financial results, the Mid-term Management Plan, M&A and high-risk investments. Our discussions are focused, but almost every member of the Board has something to say about each matter on the agenda, which frequently results in discussion regarding a single topic lasting more than an hour. This may be unique to Hitachi, but we sometimes hear explanations regarding important matters in advance at Audit Committee meetings, where we proactively make inquiries concerning matters we hold in question. Depending on the situation, we sometimes also ask for executive officers to make preparations at Board of Director meetings.

We also considered proposals from executive officers when forming the three-year 2021 Mid-term Management Plan that we announced in this May. We discussed these proposals on five occasions spanning an entire year, first focusing on their aims and then moving on to their main points before working on formulating drafts. This process gave depth to discussions regarding the

key elements of the mid-term management plan, which include global leadership; social, environmental and economic value; capital allocation; and capital cost. All related parties, including the Executive Vice Presidents, attended the meeting of the Board of Directors held on the day we announced the mid-term management plan, during which we discussed how we should inform individuals both inside and outside of the Company regarding the plan.

Director Yoshihara: Additionally, in fiscal 2018, we made business judgements on important matters impacting the entire Company after holding active discussions within the Board of Directors and Audit Committee and hearing additional explanations from individual executive officers on an as-needed basis. These important matters included decisions regarding the acquisition of ABB's Power Grids business and the suspension of the Horizon Project, a nuclear power plant construction project in the U.K. Every time it faces decisions like these, the Board of Directors conducts analyses and discussions concerning issues such as market trends, business strategies, acquisition prices, post-merger integration (PMI) processes and potential risk from a variety of perspectives. In the past, we have encouraged reconsideration of the projects that are inconsistent with our overall strategy or lack accountability in terms of economic rationality.

* The "Independent Directors" are the directors who fulfill the qualification requirements to be outside directors as provided for the Companies Act of Japan and also meet the independence criteria defined by the Company and those provided by Japanese stock exchanges where the Company is listed.

■ How was the Board of Directors involved in profitability improvement and business portfolio revision, two major themes of the 2018 Mid-term Management Plan?

Director Yoshihara: In fiscal 2018, the final year of the 2018 Mid-term Management Plan, we achieved both an adjusted operating income ratio of 8% and record-high profit. When excluding impact from the suspension of the Horizon Project, we also exceeded the plan's targets for net income attributable to Hitachi, Ltd. stockholders and ROA. Looking back on the three years covered by the plan, I realize that we achieved the targets we set for each year of the plan ("Prepare for growth" in fiscal 2016, "Change gears toward growth" in fiscal 2017 and "Achieve mid-term management plan to be a globally integrated enterprise" in fiscal 2018) and sense a very strong momentum.

However, these are just results. The Board of Directors holds discussions concerning topics such as whether the direction the Company is taking is in line with its vision of becoming a global leader or what is necessary to achieve this vision. When investment, including R&D expenditure, decreases, we conduct intense reviews to make sure that appropriate mid- to long-term growth strategies, including R&D strategies, are not being neglected, even for departments that are meeting their short-term targets. We also demand that even departments with particularly high results, such as adjusted operating income ratios of 8% or 10%, raise and meet their goals when they are being outperformed by global competitors. As for less profitable businesses, we routinely confirm their progress in terms of improving profitability. When businesses are continued despite not meeting targets for improved profitability, we conduct ongoing follow-ups concerning the reasons for their continuation, as well as future countermeasures.

Director Mochizuki: Even if we establish plans and implement them perfectly, external environments never conform to our expectations exactly. When faced with changes in business environment, how quickly we can react and how hard we work to meet our initial targets are important factors. Evaluations concerning this speed, time frames and results are primarily conducted by our independent directors, who have experience in managing global companies. Our Board of Directors is characterized by strictness that is unprecedented when it comes to Japanese companies, and I believe that this toughness had a significant impact on the improvement of our results.

Hitachi manages multiple large-scale businesses, so it can be extremely difficult from the outside to figure out what kind of company it is. This

Three Committees

■ Next, please tell us about the activities of each committee. First, how does the Nominating Committee select director candidates?

Director Mochizuki: After thoroughly discussing the ideal composition for the Board of Directors based on considerations of management issues, we try to compose images of the individual candidates we believe to be necessary.

We then request that external consulting companies compile a list of potential candidates based on these images and then hold discussions

means that analyzing Hitachi takes time, which reduces the amount of opportunity for people to become interested. It would be a waste for us to reduce our own level of opportunity to be positively evaluated by capital markets and would also be undesirable from a governance point of view. We have repeatedly discussed and asked executive officers what kind of company we would like to become and why we engage in the businesses we do. As a result, revisions to our portfolio have picked up speed over the past few years.

■ What is the background or the system that allows for frank and effective discussions?

Director Yoshihara: One reason cited for our ability to conduct frank and effective discussions is the management team's wonderful Tone at the Top approach. In particular, I feel that Executive Chairman Nakanishi and CEO Higashihara's Tone at the Top approaches are providing us with an environment that encourages frank and sincere discussions and enable quick access to information and people within Hitachi. Our top management's attitude of sincerely working together to create a bright future based on our fundamental principles regularly appears in their words and conduct. This attitude is what forms the cornerstone of good governance at Hitachi and encourages our independent directors to adopt attitudes that will spare no opportunity to support Hitachi's proper success.

Director Mochizuki: Hitachi's system of holding annual Board of Director meetings overseas in line with its goal of becoming a global leader may also be unique. The goals of these overseas meetings are for all directors to visit locations important to our global businesses together, provide local residents with a deeper understanding concerning our businesses and raise the awareness of local employees. During the previous fiscal year, we held this meeting in San Francisco, where we met with senior management from Hitachi Vantara and other Group companies to discuss overseas business strategies related to IT. We also invited experts on local circumstances and lecturers from organizations such as the World Economic Forum Center for the Fourth Industrial Revolution Japan (C4IR), who provided us with the opportunity to understand front-line trends.

Furthermore, we ensure that annual evaluations of the effectiveness of the Board's activities are done to completion by holding meetings in which independent directors discuss their results with the goal of improving them. Although the opinions of individual directors may vary, we feel a strong sense of unity in that we all share the desire to contribute to the success of Hitachi. I believe that this sense of unity is an essential component of the Board of Directors.

regarding this list. After narrowing down the number of potential candidates, 4 members of the Nominating Committee then hold interviews individually with each of them. The committee then discusses these results before finally drafting a list of final candidates, which is submitted at the General Meeting of Shareholders. Each member of the committee takes pride in Hitachi's Board of Directors and participates in the establishment of its ideal vision. For these reasons, committee members sometimes have different opinions, regarding which they hold active and frank discussions.

Independent Director Dialogue

What about the selection and training of CEO candidates?

Director Mochizuki: The selection of the next CEO is the Board of Directors' largest mission. The Nominating Committee deliberates concerning the succession plan after hearing reports from executive officers. First, while maintaining a common awareness regarding the qualifications that Hitachi requires from a CEO, the Nominating Committee first discusses what kind of human resources will be needed and at what time. Through discussions and individual coaching, the committee narrows down candidates for leadership positions, including CEO, from an unfixed pool of human resources that it attempts to revise at the conclusion of each fiscal year for a period of several years. This process enables members of the Nominating Committee to understand the candidates while providing candidates with the opportunity to learn a lot from the Nominating Committee. We do not limit our consideration to the next CEO but also consider subsequent CEOs in the near and more distant future. Accordingly, we work to train management from a mid- to long-term perspective as well, which we do through a variety of efforts, including awareness-raising activities. These activities include lectures conducted by independent directors targeting young employees referred to as the "Future 50."

Director Yoshihara: For sure, members of the Nominating Committee are deeply involved in Hitachi's leader development program. Committee members hold discussions with candidates for leadership positions regarding actual management issues and contribute to concrete training plans that involve the creation of opportunities for candidates to acquire actual work experience through overseas assignments and involvement with various business units. Hitachi promotes diversity as a driver of growth, and the diversification of all levels of its management, in terms of nationality, gender and age, has picked up speed, particularly since Director Cynthia Carroll joined the Nominating Committee, bringing proactive initiatives along with her.

How does the Compensation Committee make decisions regarding remuneration?

Director Mochizuki: Our executive compensation comprises basic remuneration, short-term incentive compensation and medium- and long-term incentive compensation. We decide payment levels based on considerations of economic environment, market trends and levels at other companies.

When deciding upon executive compensation that will objectively satisfy the corporate officers who receive it, we make every possible effort to avoid being arbitrary, as we believe that it is important for this compensation to lead to the desire to work toward maximizing Hitachi's corporate value. Based on this point of view, we have been promoting reforms for several years. In fiscal 2019, we increased the ratio of variable compensation to overall compensation. A distinguishing feature of this change is the reflection of personal target evaluations in short-term incentive compensation. Additionally, we adopted a restricted stock compensation system for executive officers with the goal of providing an incentive for our management team to work toward continuous growth in corporate value from a medium- to long-term point of view while sharing a common perspective with our shareholders. Eligibility for mid-term stock-based compensation incentives may be partially reduced depending on how total shareholder return measures up compared to the TOPIX growth rate.

We are continuously conducting reviews aimed at optimizing our systems as our management team becomes more diverse, with a growing number of foreign members, and faces changing management issues.

Please tell us about Hitachi's tripartite audit approach, which involves close collaboration among the Audit Committee, the internal audit section and external third-party auditing firm.

Director Yoshihara: The establishment and maintenance of appropriate audit systems are extremely important matters for companies like Hitachi that are expanding businesses globally. The Audit Committee primarily identifies, assesses and deals with the various risks that face the entire Hitachi Group, which includes about 800 consolidated subsidiaries worldwide. To perform these activities, the Audit Committee, the internal audit section and external third-party auditing firm cooperate closely to perform their tripartite audit function. This cooperation is based on mutual trust, transparency and a shared sense of vigilance.

Moving forward, Hitachi will aim for further growth overseas. An increase in global growth opportunities also means a simultaneous related increase in potential risk. For this reason, we must be more prepared than ever to verify and cautiously consider this varied range of risks. Accordingly, it will become important for us to further intensify our tripartite audit approach on a global scale. To enable all members of the Audit Committee to more accurately understand global risks, we will provide instructions concerning matters of priority to the internal audit section while gathering information from related business departments and proactively visiting important sites both in Japan and overseas, including those of acquired companies, to conduct inspections.

Other than through on-site inspections, how do you identify risks?

Director Yoshihara: Members of the committee also request that executive officers provide explanations regarding other projects that are deemed to carry a high degree of risk. In fiscal 2018, the committee requested explanations concerning scandals and information security, confirming the validity of response measures as well as progress on improvement efforts. When considering projects that have resulted in comparatively large-scale monetary losses, the committee receives explanations regarding the cause of these losses and recurrence prevention measures.

As original measures, Audit Committee members hold audit reporting sessions targeting all corporate divisions and verify the status of initiatives aimed at raising the corporate value of back-office sections. At least once per year, responsible parties from about 20 divisions, including human resources, procurement, IT and brands, provide explanations concerning the execution of these initiatives to the committee, which, having gained an understanding of the issues these divisions face, provides operational advice as well as other support.

How does Hitachi's tripartite audit approach differ from similar approaches employed at other companies with nominating committees, etc.?

Director Yoshihara: I cannot speak for what other companies are doing but, generally, I can say that no matter how magnificent the organizations and structures you build happen to be, when it comes to practical implementation, their

abilities to perform tasks and the amount of enthusiasm they put into them often determine their actual efficacy. The three parties that help Hitachi implement its tripartite audit approach continuously work earnestly to achieve ideal auditing that is more effective and efficient. All members of the tripartite audit team work to plan and implement audits in a manner that is respectful and disciplined while remaining keenly aware of each other's roles. Before, we mentioned our top management's Tone at the Top approach; our management team, our finance department and other organizations that receive audits have high levels of understanding and awareness regarding governance, which creates a very cooperative environment. Each year, the Audit Committee receives feedback from the internal audit section, the finance department and external auditing firm. It then holds discussions regarding this feedback and earnestly engages in initiatives aimed at further strengthening and improving Hitachi's tripartite audit system and framework.

Looking Ahead

Finally, could you explain the key points of Hitachi's governance? Also, please tell us about the challenges you will tackle and the points on which you will focus to meet targets in the 2021 Mid-term Management Plan.

Director Mochizuki: The executive officers and directors that make up our management share common targets and work together to refine their abilities and maximize their performance as managers. I believe that this sharing of goals and teamwork define governance at Hitachi.

To become a global leader, we must always think about what is necessary and continue to develop our governance sustainably. In terms of meeting targets in the 2021 Mid-term Management Plan, the most important task facing the Board of Directors is to reliably follow-up on and support the implementation and progress of the plan.

The Nominating Committee will aim to continuously adjust the composition of the Board of Directors in accordance with our management issues. As for our CEO succession plan, all members of the committee are focusing their full efforts toward selecting our next CEO. However, starting from this year, we have decided to strengthen the involvement of the entire Board of Directors by including directors who are not Nominating Committee members in the process. As the Compensation Committee has just implemented new compensations structures, we will continue to verify whether they have truly increased effectiveness and whether they contribute to our goal of becoming a global leader.

Director Yoshihara: Generally, when people talk about governance, we tend to pay attention to the compliance aspect (e.g., legal compliance). However, the essential purpose of compliance is to fulfill the expectations of the shareholders who have placed their trust in us and to raise our corporate value by practicing good management. Therefore, it goes without saying that Hitachi's governance strategy must involve compliance countermeasures aimed at preventing issues such as anomalous transactions and legal violations. However, from the perspective of true governance, our directors must hold timely discussions with our management team when they make important decisions aimed at raising corporate value and participate in the process of implementing these decisions. The support and supervision our

Could you explain your thoughts regarding future improvements to the Audit Committee?

Director Yoshihara: We are conducting a variety of ongoing initiatives aimed at enhancing the effectiveness and efficiency of the committee's oversight function. For example, starting from the current fiscal year, we are appointing sector auditors who provide support by constructing tripartite audit frameworks for their individual sectors of responsibility. This support contributes to the further enhancement of our governance. We are also discussing the use of digital technology to raise the efficiency of our auditing operations, which require a great deal of time. Furthermore, we are continuously aiming to enhance our auditing function by working to uncover human resources with audit capabilities within the Hitachi Group. At the same time, we hold training and brainstorming sessions targeting personnel throughout the Group who are involved with audits.

directors provide is essential toward making sure Hitachi is on track toward success.

In our 2021 Mid-term Management Plan, we have identified three key challenges we must face to achieve our goal of becoming a true global leader. First, we must further strengthen our hiring and development processes to secure diverse human resources capable of performing globally. Second, we must build a global ecosystem that will support our digital solutions business, which is primarily based in Lumada. Third, the Hitachi Group must continuously revise and accelerate the development of its business portfolio so that it will enable the Group to maximize its synergies on a global scale and function as One Hitachi.

We are currently experiencing an era of volatility, uncertainty, complexity and ambiguity (VUCA) in which changes occur daily and quickly and many opportunities and risks exist alongside each other. The Audit Committee is prioritizing further enhancement of our global risk management. For example, it is extremely important for us to work to reduce risk by strengthening our monitoring of overseas acquisitions. As an independent director, I will continue to support and supervise the management team in the execution of its duties in accordance with Hitachi's founding corporate philosophy of contributing to society. These efforts will serve to assist Hitachi as it aims to raise the three values (social, environmental, economic) targeted in its 2021 Mid-term Management Plan and become a global leader of social innovation.

Director Mochizuki: Both the management environment and the issues facing our management are continuously changing at a dizzying pace. Under these conditions, ideal governance for Hitachi is continuously changing, presenting a perpetual challenge for its management. Moving forward, I will continue to support Hitachi in its goal of becoming a global leader by continuously working to improve the management of its Board of Directors and all of its committees, as well as the systems they decide upon, while maintaining a trial-and-error approach.

Value Creation Process

Comprehension of Issues and Trends

Social issues

- Climate change
- Issues concerning energy, water and other natural resources
- Population growth and urbanization
- Aging infrastructure
- Cybersecurity

Global trends

- Accelerating digitalization
- Appearance of geopolitical risks due to the globalization of politics and the economy
- Paradigm shifts (shifting from possession to sharing, from objects to things and from closed to open strategies)

Customer issues

- Safety and security
- Reduction of energy consumption
- Response to diversifying consumer needs
- Improvement of productivity

Input ▶ P.24



Human capital

- Strengthen front-line and digital talents
- Promote diversity
- Establish a globally unified evaluation standard and training system for the development of human resources
- Consolidated number of employees (number of overseas employees): **295,000 (133,000)**



Intellectual capital

- An IoT platform (Lumada) with more than 100 years' worth of operational technology (OT) and more than 50 years' worth of information technology (IT), and accumulated know-how
- Open innovation industry-academia-government cooperation
- R&D investment: **¥323.1 billion**



Manufacturing capital

- Lead time reduction by enhancement of supply chain management



Social capital

- Establishment of NEXPERIENCE, a collaborative creation process
- Enhance disclosure of information to investors
- CSR audits of suppliers
- Improve dialogue between management and employees



Natural capital

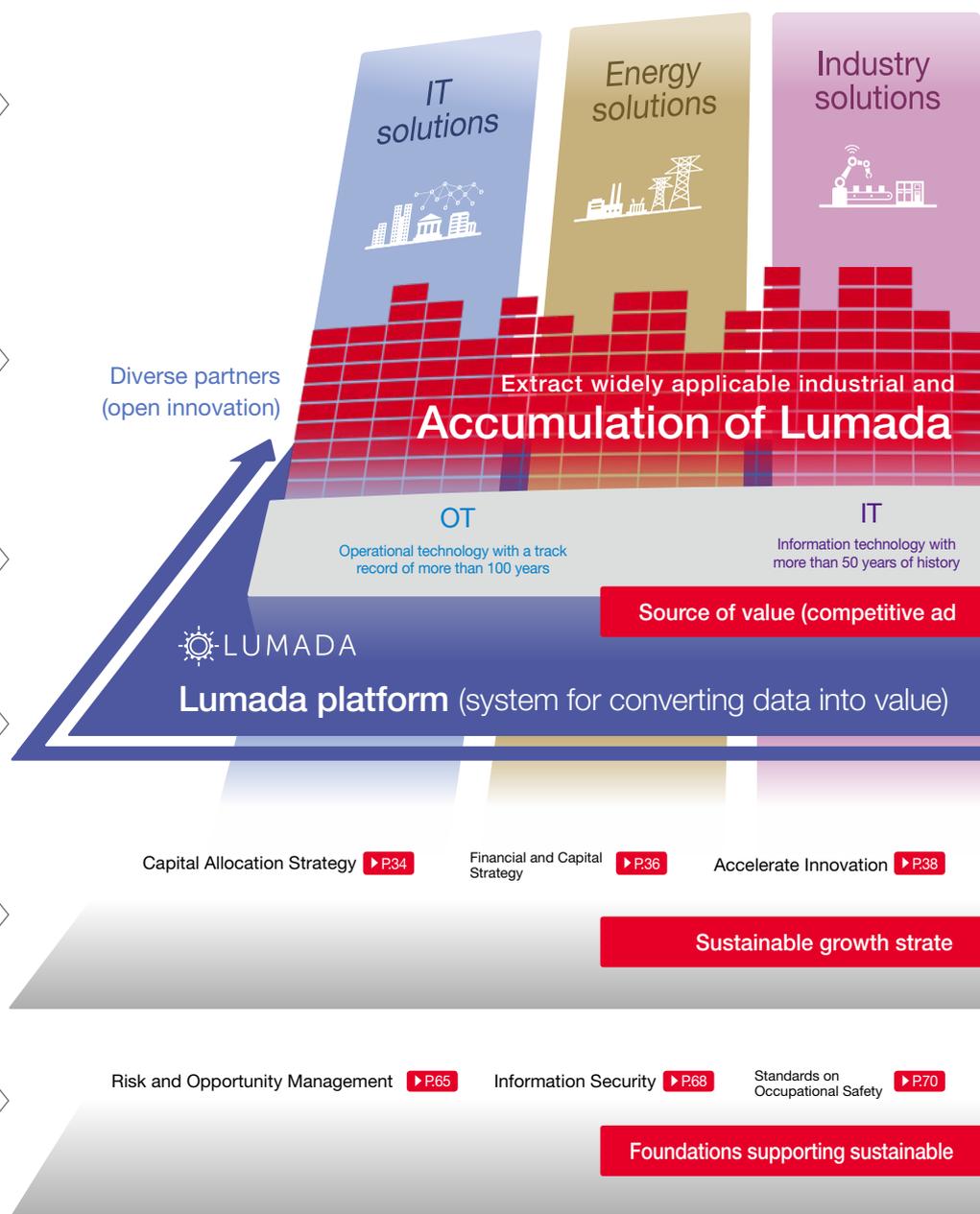
- Total energy input (crude oil equivalent): **2.27 GL**
- Raw material input: **4,403 kt**
- Total water input: **37.02 million m³**



Financial capital

- At the start of the 2018 Mid-term Management Plan (April 1, 2016)
- Total Hitachi, Ltd., stockholders' equity: **¥2,735.0 billion**
- Total Hitachi, Ltd. stockholders' equity ratio: **21.8%**
- Free cash flows: **¥81.4 billion**

Comprehend social issues and global trends while identifying customer issues through collaboration with those same customers



Vision: Improving the Quality of People's Lives, Raising Customers' Corporate Value and Achieving a Sustainable Society

Social value



Healthy lives and a safe, secure, comfortable and efficient society

Environmental value



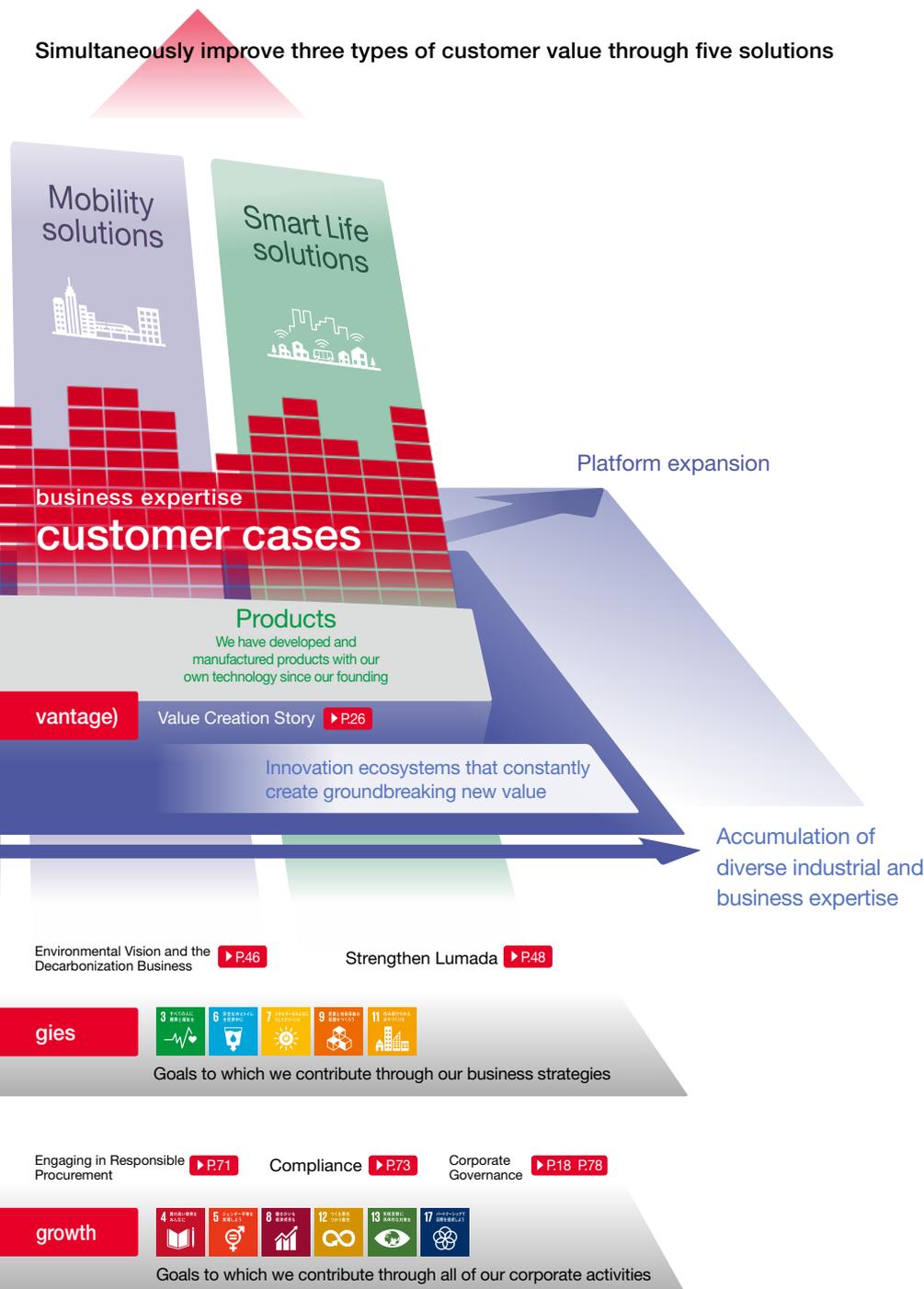
High-quality and environmentally conscious manufacturing
Reduction of environmental burden through the value chain

Economic value



Redistribution of added economic value to stakeholders

Simultaneously improve three types of customer value through five solutions



Output/ Outcomes ▶ P.24

(as of end-FY2018)



Human capital

- Ratio of female executive and corporate officers: **5%**
- Ratio of non-Japanese executive and corporate officers: **8.8%**
- Number of female managers: **635** (Hitachi, Ltd.)



Intellectual capital

- Number of Lumada customer cases: over **650**



Manufacturing capital

- Lead time reduction 20% from order receiving to shipment for large industrial products. (Compared with FY2016)



Social capital

- Number of meetings with institutional investors and analysts: **550**
- Number of town hall meetings: **20**
- Number of suppliers who received CSR audits: **24**



Natural capital

- Reduction in CO₂ emissions through improved environmental performance of products and services: **34%** compared with FY2010
- Reduction in energy use per unit: **14%** compared with FY2005
- Reduction in water use per unit: **34%** compared with FY2005
- Reduction in waste and valuables generation per unit: **16%** compared with FY2005



Financial capital

- Total Hitachi, Ltd. stockholders' equity: **¥3,262.6 billion**
- Total Hitachi, Ltd. stockholders' equity ratio: **33.9%**
- Free cash flows: **¥447.1 billion**
- TSR* over past 10 years: **209.6%**

* Total Shareholder Return: Return obtained from stock investments over a certain period of time; calculated as dividends+capital gains+share price

Capital Utilization and Value Creation

Contribution to Value Creation	 Human capital	 Intellectual capital	 Manufacturing capital
Targets (For fiscal 2021, in principle)	<p>Working as a team, a diverse and global workforce contributes to global growth of the Social Innovation Business.</p> <p>Creating a Workplace That Supports the Active Participation of a Diverse Workforce</p> <p>(1) Attract, retain, and develop diverse talent to lead business growth</p> <ul style="list-style-type: none"> Strengthening the front-line and digital talents Developing mindset and skills to become global leaders Promoting diversity: Targeting 10% for both female and non-Japanese in executive and corporate officer positions, and 800 female managers by fiscal 2020 (Hitachi, Ltd.) <p>(2) Transforming organizational culture and employee mindset to encourage proactivity and individual growth</p> <ul style="list-style-type: none"> Building Hitachi culture globally Fostering a culture of career ownership <p>(3) Reform organization and transform employment policies to adapt to environmental changes; take action on organizational reshuffling</p> <ul style="list-style-type: none"> Ensuring safety, health, and compliance Shifting to job and role-based human resources management 	<p>Creating new innovations by fusing ecosystems that stimulate open innovation with cutting-edge technologies.</p> <p>Building New Technologies and Business Models through Collaborative Creation</p> <p>(1) Accelerating innovation</p> <ul style="list-style-type: none"> Strengthening collaborative creation on a global basis Creating new values through open initiatives such as "Kyōsō-no-Mori" and corporate venturing Creating innovations by strengthening solution inventions <p>(2) Creating the world's No. 1 technologies</p> <ul style="list-style-type: none"> Focusing investment in the five key sectors and Lumada Creating intellectual properties that support the world's No. 1 technologies <p>(3) Promoting R&D and intellectual property activities to resolve social issues</p> <ul style="list-style-type: none"> Explore new business opportunities and disruptive technologies through open innovation Drive activities to achieve "IP for Society," an IP strategy for the new era <p>P.38 Accelerate Innovation</p>	<p>In addition to the manufacturing capabilities gained so far, manufacturing capital contributes to improved customer productivity and operational efficiency by making full use of advanced technologies such as IoT, big data, and AI.</p> <p>A Global Leader in Production Efficiency and Quality</p> <p><Manufacturing></p> <p>Improving the efficiency of global manufacturing operations 30% through enhancement of the ECM¹ and SCM² systems.</p> <p>¹ Engineering chain management ² Supply chain management</p> <p><Quality Assurance></p> <ul style="list-style-type: none"> Further strengthening the framework for quality assurance Strengthening global quality assurance operations Promoting digitization of product certificates Strengthening quality assurance in services, software, and security Training quality assurance personnel
Major Initiatives in Fiscal 2018	<ul style="list-style-type: none"> Improved visibility of human resources-related information by introducing "HR Management Integrated Platform" https://www.hitachi.com/New/cnews/month/2017/11/171128.html Started Hitachi Academy in April 2019 to foster human resources that drives digital transformation Promoted diversity among executives (diversifying the decision-making level) Held events such as the Global Women's Summit to motivate female workers http://www.hitachi.com/New/cnews/month/2018/10/181003.html Globalizing our management training programs Established Safety Management Division in April 2019 	<ul style="list-style-type: none"> Investment in R&D: ¥323.1 billion Promoted collaborative creation activities with customers and open co-evolution activities (open forums, Ideathons, Hackathons, etc.) Expanded the field for open innovation globally Build our global patent portfolio Implement appropriate IP strategies according to business domains - competitive strategy (product business) and collaborative strategy (digital solution businesses) Promoted industry and academia collaboration (Hitachi Cambridge Lab., Hitachi Kobe Lab., Hitachi The University of Tokyo Lab., Hitachi Kyoto University Lab., Hitachi Hokkaido University Lab.) Participating in the setting on international standards and rules. 	<p><Manufacturing></p> <p>Lead time reduction for Large Industrial products by enhancing SCM</p> <ul style="list-style-type: none"> Trained IE³ engineers Trained Skilled workers <p>Placed three participants in the 45th WorldSkills Competition, with one silver medal, one bronze medal, and one medalion for excellence.</p> <p>³ Industrial Engineering</p> <p><Quality Assurance></p> <ul style="list-style-type: none"> Revised the framework for quality assurance Strengthened quality assurance in embedded software Strengthened global quality assurance Training quality assurance personnel
Fiscal 2018 Results	<ul style="list-style-type: none"> Number of female managers (Hitachi, Ltd.): 635 Ratio for female executive and corporate officers (Hitachi, Ltd.): 5.0% Ratio for non-Japanese executive and corporate officers (Hitachi, Ltd.): 8.8% Number of participants in global management training programs: 3,844 Average educational investment per employee: ¥127,800 <p>Number of fatal accidents: 0¹</p> <p>Global occurrence rate: 4.20%^{1, 2}</p> <p>¹ Calendar year 2018 ² Occurrence rate is the rate of workplace accidents per 1,000 directly contracted employees resulting in fatality or work-time loss of one day or more.</p>	<ul style="list-style-type: none"> Lumada customer cases: more than 650 Patent application ratio outside Japan: 58% Recognized as the Clarivate Analytics Top 100 Global Innovators Award for eight consecutive years Awarded the National Commendation for Invention "Japan Patent Attorneys Association President's Prize" by the Japan Institute of Invention and Innovation for the Hitachi X-ray fluoroscopy system. <p>[*] Hitachi in fiscal 2019 was awarded the National Commendation for Invention "Imperial Invention Prize" for the design of the Class 800 high-speed train for the UK.</p>	<p><Manufacturing></p> <ul style="list-style-type: none"> Lead Time Reduction 20% for Large Industrial products at Japan sites (vs. FY2016) Lead Time Reduction 20% for Large Industrial products at China sites (vs. FY2016) Started the qualification program of IE engineers <p><Quality Assurance></p> <ul style="list-style-type: none"> Strengthened governance by revising framework for quality assurance Enhanced system development methods within the Hitachi Group by strengthening the software quality assurance system Developed Quality Assurance Standards within the Hitachi Group Implemented quality and reliability training



Social capital

Building strong relationships with stakeholders, including tie-ups between industry, academia and government, as well as collaborative creation with customers, maximizes business opportunities on a global scale and reduces risk.

Earning the Trust of Stakeholders

- (1) Enhance feedback to management based on dialog with stakeholders (government, investors, shareholders, customers, employees, local communities)
- (2) Strengthen human rights due diligence (HRDD) and CSR, green procurement
 - Promote HRDD
 - Strengthen supplier compliance
- (3) Promote social contribution activities
 - Training, including STEM (see p. 9) training for those in the younger global generation likely to be the future leaders
- (4) Proactive engagement and disclosure of information

<Customer Competition Events>

- Held the Hitachi Social Innovation Forum, an event creating opportunities for collaborative creation with customers that includes lectures and exhibitions on the results of social innovation businesses around the world as well as future prospects
- Held the Hitachi IR Day, which included business briefings for shareholders, investors, and analysts
- Held town hall meetings for executives and employees to interact and exchange views
- Promoted HRDD
- Conducted audits during visits to suppliers
- Hosted 6 participants in the Hitachi-DST Scholarship Program for South African Engineers

- Hitachi Social Innovation Forum 2018 TOKYO, etc.
<https://hsiftokyo.hitachi/en/>
- Institutional investor and analyst meetings: 550
- Executive town hall meetings: 20
- Human rights for employees at each BU and group company division were assessed and prioritized, with consideration given to the formulation of medium-term action plans
- Conducted CSR audits at 24 suppliers (130 suppliers in the fiscal 2012–2018 period)
- Spending on social contribution activities: ¥1,888 million



Natural capital

Guided by our Environmental Vision, we strive to create value while also contributing to the resolution of environmental issues to realize a low-carbon society, a resource efficient society and a harmonized society with nature.

Achieve the targets set forth in the Environmental Action Plan for 2021 looking toward the Hitachi Environmental Innovation 2050 long-term environmental targets.

- (1) Reduce CO₂ emissions from the use of our products and services, expand Hitachi's decarbonization business
 - Reduction rate of CO₂ emissions compared to FY 2010: more than 20%
- (2) Reduce CO₂ emissions of factories and offices by introducing renewable energy and high-efficiency equipment
 - Reduction rate of CO₂ emissions per unit compared to FY2010: 9%
- (3) Enhance efficiency in the use of water
 - Reduction rate in water use per unit compared to FY 2010: 9%
- (4) Enhance efficiency in the use of resources, reduce and recycle waste materials
 - Reduction rate in waste and valuables generation per unit compared to FY 2010: 12%

Implemented environmental activities aimed at achieving a low-carbon society, a resource efficient society, and a harmonized society with nature outlined in our Environmental Vision and the Hitachi Environmental Innovation 2050

- Reduced CO₂ emissions from the use of our products and services, expanded Hitachi's decarbonization business
- Reduced CO₂ emissions of factories and offices by introducing renewable energy and high-efficiency equipment
- Clarified climate-related risks and opportunities based on the TCFD recommendations
- Enhanced efficiency in the use of water in factories and offices
- Enhanced efficiency in the use of resources, reduced and recycled waste materials in factories and offices

- Improve environmental performance of products and services
Reduction rate in CO₂ emissions compared to FY 2010: 34%
- Reduce energy use of factories and offices
Reduction rate in energy use per unit compared to FY 2005: 14%
- Reduced waste generation
Reduction rate in waste and valuables generation per unit compared to FY 2005: 16%
- Enhance efficiency of water usage
Reduction rate in water use per unit compared to FY 2005: 34 %



Financial capital

Hitachi can realize growth, centered on the Social Innovation Business, through flexibility in its operations thanks to a solid financial base and appropriate financial strategies.

Building the Financial Base Necessary to Achieve Value Creation

- (1) Enhanced profitability and generation of cash
 - Promotion of business restructuring
- (2) Improving capital efficiency
 - Restructuring or selling off unprofitable assets
 - Acquiring highly profitable assets
 - Promoting financial strategies with an eye toward capital costs

Fiscal 2018 Targets

- ROA: above 5%
- D/E ratio: under 0.5 times
- Operating cash flow margin: above 9%
- CCC (Cash Conversion Cycle): 70.0 days

Total Hitachi, Ltd. stockholders' equity: ¥3,262.6 billion
Total Hitachi, Ltd. stockholders' equity ratio: 33.9% (35.9%)

- ROA: 3.3% (6.2%)
- D/E ratio: 0.23x (0.21x)
Free cash flow: ¥447.1 billion
- Operating cash flow margin: 6.4%
- CCC: 69.3 days
- ROIC: 8.5% (10.1%)

* Figures in parentheses exclude the effects from the Horizon Project consolidation

Value Creation Story

Hitachi offers a host of solutions to the problems society faces. To develop these solutions, we maximize our strengths, OT, IT, products we have accumulated over the years, along with the technological capabilities, knowledge and know-how we have amassed through projects. Here, we introduce a global co-creation project in which Hitachi reduces CO₂ emissions and helps resolve the issues customers face.

“AI Captain” to Curtail Fuel Costs and Optimize Travel Routes

Co-Creation with Stena Line, One of Europe's Leading Shipping Lines, to Optimize Fuel Efficiency and Voyage Planning

Here, we introduce a flagship project that demonstrates how Hitachi is cultivating social innovation. For this project, Hitachi has partnered with ferry operator Stena Line to reduce ships' fuel consumption costs and minimize environmental impact by introducing artificial intelligence (AI) technology.

Integrating Digital Technologies and Hitachi's Products

Hitachi has created value by capitalizing on its three core competencies: operating technologies (OT), which the Company has built up over more than a century of manufacturing; cutting-edge information technologies (IT), which have a solid track record dating back more than half a century; and products, which the Company has developed and manufactured since the time of establishment based on its own technologies.

On top of these value sources, Hitachi has developed the Lumada IoT platform as a system for deriving value from data. Making use of its cutting-edge AI technology, the Company is providing various solutions even in new fields and industries where it does not play a direct role.

In June 2018, Hitachi partnered with Stena Line, one of Europe's largest ferry operators, to introduce AI and machine-learning in shipping.

In this project, although Hitachi does not manufacture the vessels themselves, it is developing an effective solution for Stena Line based on its solid understanding of IT requirements (such as edge-processing capabilities), its AI and machine-learning capabilities, and operating technologies developed and accumulated through the manufacture of other Hitachi products.

Delivering Global Solutions through Collaboration with Customers

Stena Line, which transports 7.6 million passengers, 1.7 million cars and 2 million cargo units each year, has taken on the huge challenge of becoming the world's leading cognitive shipping company by 2021. To this end, optimizing fuel and voyage

planning are two of the highest priorities. While shepherding ships from a voyage's start to finish, crews are tasked with minimizing fuel consumption and respecting the expected time of arrival (ETA).

Fuel represents a major cost for shipping companies, so controlling consumption is a vital concern. Also, less fuel used means lower emissions. Stena Line is at the forefront of the shipping industry's efforts to reduce its environmental footprint. Accordingly, pursuing fuel efficiency and optimized shipping serves the dual purpose of improving financial performance and environmental impact. This is well in line with Stena Line's vision of “Connecting Europe for a Sustainable Future”.

In 2017, Hitachi and Stena Line started discussing ways to improve operational performance through advances in artificial intelligence and machine learning. This collaborative project involved three Hitachi entities. The Social Innovation Business Unit, which has data scientists experienced in marine analytics, initiated discussion with the customer. Hitachi Consulting acted as a project management partner, providing data scientists with experience in data analytics and visualization. The Center for Social Innovation Europe's Automotive and Industry Lab developed the core AI model for the project based on its vast experience in AI, deep/machine learning and general data analytics.

To develop a practical, feasible solution, Hitachi's team has conducted multiple rounds of workshops to better understand the customer, potential problem areas and the operating environment. The team accessed historical shipping data, applying machine learning algorithms to generate insights on how to reduce fuel consumption. In these ways, the team



sought to identify common characteristics of fuel-efficient operations and extrapolate these findings across the fleet.

The team discovered that weather conditions and the action of captains were major contributors to fuel consumption. Collaborating closely with Stena Line, Hitachi inspired Stena Line to create an AI-based technology that learns captains' practices, such as operating parameters corresponding to low fuel consumption, and then recommends fuel-efficient operating parameters for upcoming trips.

With the help of AI, Stena Line's captains can simultaneously consider several variables, such as currents, weather conditions, shallow water, and speed through water, all of which would be impossible to do manually. Once installed in a vessel, the crew monitors the ship and AI system, intervening only when necessary—such as reducing vessel speed due to traffic. The technology, dubbed AI Captain recommends fuel-efficient voyage plans in terms of propulsion power and speed for given weather and environmental conditions (such as winds, sea current, waves and sea depth), as well as vessel characteristics (such as loading conditions and hull roughness). Initial trials of the AI-based model have been very successful and Stena Line's current goal is to roll out AI across the entire fleet by 2021.

Values Hitachi Delivers

Modern-day society faces major changes and a host of challenges, from energy and environmental issues to water scarcity, rapid urbanization, an aging society, insufficient infrastructure and security needs. Amid these circumstances, Hitachi is committed to providing value to stakeholders by improving quality of life (QoL) and realizing a sustainable environment.

With the Stena Line Project, Hitachi has inspired Stena Line to create a cross-functional team that combines seamanship, mathematics and technology and to deliver social, environmental and economic value through AI and machine-learning.

Optimizing shipping reduces fuel consumption, lowering emissions of CO₂, NO_x, and SO_x. Rather than replacing the captain and crew, the AI technologies aimed at extending their expertise to allow for better decision-making and execution.

In addition to social and environmental value, considering the success of AI Captain, Hitachi is developing a core solution that can be scaled across the industry, which could drive revenues and profit for Hitachi. The solution could also help Hitachi gain market recognition in a new business segment and to develop cutting-edge AI technology.

Going forward, Hitachi will keep providing innovative solutions and creating social, environmental and economic value.

Value Creation Story

Ride a Train or a Bus, Using Only Your Smartphone

Hitachi Rail STA Starts Proof of Concept of a Digital Ticketing Solution for a Public Transportation Operator in Italy



In May 2019, Hitachi Rail STA S.p.A, a Hitachi subsidiary operating in the railway systems business, entered an agreement with Trentino Trasporti S.p.A to carry out proof of concept (PoC) of a new digital ticketing solution for the public transportation operated by Trentino Trasporti, including Trento-Malé-Mezzana Railway and buses in the vicinity of Trento, Italy. The digital ticketing, which uses smartphones as tickets, leverages the Hitachi Group's experience in ticketing and digital technology.

With this solution, passengers install an app on their smartphones that allows position information to be read by vehicles (such as train cars and buses) and at waypoints (train stations and buses). The ticketing solution then determines when a person is using public transportation, automatically calculates the fare, and charges that fare to the passenger in a cashless transaction.

The solution allows passengers to ride multiple types of public transportation without the need for paper tickets or IC cards, making movement seamless and more convenient. For operators of public transportation systems, the system reduces the need for ticket machines, ticket wickets and other equipment, lowering equipment investment and maintenance costs. With this proof of concept, we are making travel more convenient for passengers by allowing them to seamlessly take multiple modes of public transportation in comfort.

Once the digital ticketing solution is approved by Trentino Trasporti and the service launches officially, Hitachi Rail STA will start selling tickets for the public transportation system, receiving a share of the revenues from ticket sales.