

## Financial Strategies as Explained by the Finance Executive

**We aim for sustainable growth and the long-term enhancement of corporate value through appropriate capital allocation.**



**Shugo Hosoda**  
Executive Officer  
Division Executive, Finance & Accounting Division

### Role as Finance Executive

In March 2021, I was appointed Executive of the Finance & Accounting Division, but I was originally an engineer. When I joined EBARA, I was in charge of new process development at the Environmental Plants Business. Later, when I worked in the Corporate Strategy Planning Division at the Head Office, I was involved in the transition to the Company with Three Committees structure, our current corporate governance system. For the last five years, I have led global operations at Elliott Company in the United States. The Finance & Accounting Division has many specialists who are deeply knowledgeable in their respective fields, but I myself have come from a comparatively diverse background. Utilizing this expertise, I would like to contribute to the Company from a more multifaceted perspective.

### Investment in Growth

As part of our financial strategy to achieve sustainable growth, we plan to undertake capital investment of ¥100 billion and R&D investment of ¥40 billion during the three years of our medium-term management plan, E-Plan 2022. In 2020, the first year of the plan, we invested in growth based on this strategy in both existing and new businesses. As we aim to achieve our 10-year vision as laid out in E-Vision 2030, we

have been steadily planting seeds for the creation of new businesses, and we believe that we are making solid progress.

First, let's look at existing businesses. To handle the growing demand for semiconductors, the Precision Machinery Business is making progress in establishing a system for the full-scale operation of the automated plant for dry vacuum pumps. In the field of liquefied natural gas (LNG), where demand for clean energy is expected to increase, we are actively investing in growth areas, including the construction of a new test stand for cryogenic pumps in the United States. In addition, the acquisition of Turkish pump manufacturer Vansan was finally completed in April 2021, and investments for growth that will strengthen and expand existing businesses are steadily under way.

To develop our new businesses, we are working enthusiastically with specialized organizations on several projects, including the development of new generation biomaterials through investment in Spiber, and inland recirculating aquaculture through a capital and business alliance with Regional Fish.

In addition to these growth investments, we are also continuing to make digital transformation investments, such as business process innovation using digital technology and companywide implementation of enterprise resource planning (ERP).

We will continue to upgrade our investment management and evaluation processes so that we can boldly break into promising new fields without missing opportunities, while ensuring adequate risk assessment.

### Capital Structure

We have set a debt-to-equity ratio of 0.4 to 0.6 times (IFRS basis) as the indicator of capital structure for this medium-term plan period. This indicator is based on the existing business structure, scale, and risks, and takes the required level of financial soundness into consideration. This is one of the cornerstones of our capital policy for this medium-term management plan.

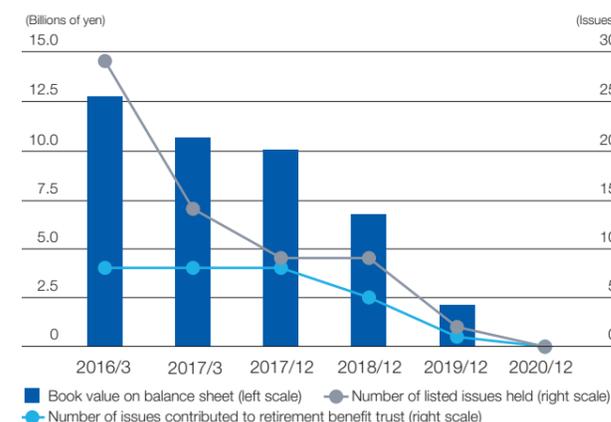
To sustainably generate returns in excess of the cost of capital from a medium- to long-term perspective, we believe it is important not only to strengthen investments for growth, but also to improve capital efficiency through management of our business portfolio and appropriate control of invested capital.

### Capital Efficiency Improvement

We have established working capital and other management indicators to better understand the status of capital in each business, and we are working toward improvement in capital efficiency to maximize return on invested capital. In addition, we have been continuously working to reduce assets outside of our main businesses. Although we used to hold more than ¥10 billion in cross-shareholdings, we completed the sale of all cross-shareholdings at the end of the fiscal year ended December 31, 2020.

We also decided to repurchase and cancel up to ¥20 billion (or 5.2 million shares) in treasury shares in May 2021 to further optimize shareholders' equity.

### Changes in Cross-Shareholdings (as of the end of each fiscal year)

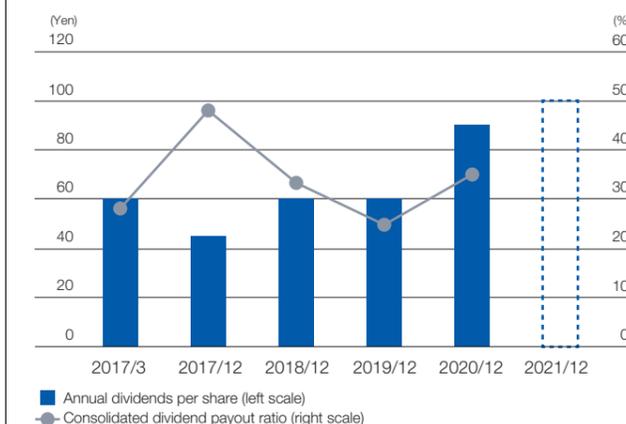


### Enhancement of Shareholder Returns

The shareholder return policy laid out in E-Plan 2022 calls for a consolidated dividend payout ratio of at least 35.0%, while maintaining a flexible policy on share buybacks.

In line with our medium-term management plan, we have raised the annual dividend per share for the fiscal year ended December 31, 2020 from the initial forecast of 60 yen to 90 yen, resulting in an increase of 30 yen compared to the previous fiscal year. For the fiscal year ending December 31, 2021, the initial annual dividend forecast is 100 yen per share. Together with the aforementioned share repurchase and cancellation, we will enhance shareholder returns in accordance with our medium-term capital policy.

### Changes in Annual Dividends per Share



### Repurchase of Shares

- Upper limit: Total repurchase price of ¥20 billion or of 5.2 million shares
- Repurchase period: May 17, 2021 to December 23, 2021

### Enhancement of Information Disclosure

Enhanced information disclosure helps shareholders and investors to correctly understand risk factors when making investment decisions. We see this as an important factor that can reduce the cost of capital for companies. Although the outlook is still unclear due to the COVID-19 pandemic, we are making every effort to meet the needs of our shareholders and investors by disclosing more detailed financial information, such as the predicted impact on the performance of each business, the status of efforts to supplement liquidity

on-hand, and the structure of long-term interest-bearing debt.

We have also shifted to IFRS starting in the fiscal year ending December 31, 2021 in response to the global standardization of information disclosure. We made this decision based on the fact that nearly half of the Company's shareholders are international investors, and that our overseas sales ratio is over 50%. We will continue to strive for proactive and appropriate information disclosure to further enhance communication with our shareholders and investors.

### E-Plan 2022 Financial Policy\*

|                     | E-Plan 2022 Target   | 2020/12 Results | 2021/12 Plan                       |
|---------------------|--|-----------------|------------------------------------|
| Growth investments  | Capital investment ¥100 billion (cumulative total for 3 years) | ¥32.2 billion   | ¥26.0 billion                      |
|                     | R&D investment ¥40 billion (cumulative total for 3 years)      | ¥12.5 billion   | ¥14.0 billion                      |
|                     | Proactive M&A stance   | —               | ¥11.3 billion (Vansan acquisition) |
| Shareholder returns | Consolidated dividend payout ratio: 35% or more                | 35.4%           | —                                  |
|                     | Flexible share buyback stance                                  | —               | ¥20.0 billion                      |
| Capital structure   | Debt-to-equity ratio 0.4–0.6 times                             | 0.34 times      | —                                  |

\* Based on IFRS

**We will proactively evaluate the challenges our employees face both within the Group and globally, and aim to be a company where employees feel fulfilled and comfortable in their work.**



**Shu Nagata**  
Executive Officer  
Division Executive, Corporate Strategic Planning and Human Resource Division

Promoting work environments that encourage challenge is one of the material issues in our long-term vision, E-Vision 2030, which illustrates our 10-year vision for the Group and the path to achieve it. In order to develop our business on a global scale and continue to grow as a company, we need to further strengthen our human resource management globally across the Group. To establish a foundation for this growth, the “One EBARA HR” project is being implemented Groupwide. The COVID-19 pandemic has transformed the way people work around the world. While looking ahead to a changed post-pandemic society, we will promote a corporate culture of competition and challenge. We will proactively evaluate the challenges our employees face both within the Group and globally, and aim to be a company where employees feel fulfilled and comfortable in their work.

**REFERENCE** Personnel Affairs and Human Resource Development Policy  
<https://www.ebara.co.jp/en/sustainability/social/information/talent-management.html>

**Human Resource Vision (E-Vision 2030)**

Create a corporate culture of competition and challenge by providing safe and stimulating working environments where diverse employees can engage in meaningful work and utilize their full potential.

**E-Plan 2022 Progress and KPIs**

| Related Materiality   | Measures and KPIs  | 2022/12 Targets | 2020/12 Results   | Scope   | 2020/12 Achievements  | Future Initiatives   |
|---|--|-----------------|-------------------|---|---|--|
| 4   | <b>Establishing a foundation to achieve sustainable global growth</b>                  |                 |                   |   |   |  |
|   | Global expansion of the role grading system  | 100%            | 10%               | Global  | Although there was a slight delay from the initial plan, we made progress in explaining and preparing for the introduction of each system and program in Group companies, and completed implementation of the role grading system at Group companies in Italy and Vietnam | In 2021, 12 Group companies are in the process of introducing the system, aiming for a 50% adoption rate in role grading and succession systems; the goal is to implement the systems in the remaining 50% in 2022 to reach 100% |
|   | Global expansion of the performance evaluation system                                  | 50%             | 0%                |   |   |  |
|   | Global expansion of the succession program system                                      | 100%            | 1%                |   |   |  |
|   | Reduction of total recordable incident rate (TRIR) (by 2023)                           | 2023: 0.80      | 3.13              | Consolidated, in Japan  | Occupational safety consultants conducted risk surveys, safety culture diagnoses, and occupational accident analyses at each business site  | Implement measures to foster a culture of safety, including a follow-up system to prevent recurrence of industrial accidents, risk management, and human resource development for work safety leadership                         |
|   | <b>Transform into a Group with a corporate culture of competition and challenge</b>    |                 |                   |   |   |  |
|   | Reduce total average work hours  | 1,920 hours     | 1,977 hours       | EBARA CORPORATION   | Increased from 2019 due to factors such as reduced use of paid leave as a result of the COVID-19 pandemic   | Plan, implement, and expand a telework system that increases productivity; promote health and stress management; and encourage the use of paid leave   |
|   | Promote diversity by increasing the percentage of female candidates for key positions* | 6.8%            | 6.5%              |   | Career introduction by senior employees, dispatch to external training programs, and roundtable discussions held for employees on childcare leave   | Conduct training for young female employees to improve their skills at an early stage and increase the number of female candidates for key positions   |
|   | Promote diversity by increasing the percentage of female new hires                     | 30%             | 21.2%             |   | Steadily increased the number of female and non-Japanese new hires through various recruitment methods such as alumni and referral systems  | Secure a diverse workforce by hiring by job category and creating an environment where people can utilize their majors and take on their preferred challenges  |
|   | Promote diversity by increasing the percentage of non-Japanese new hires               | 25%             | 12.2%             |   |   |  |
| Improve global engagement survey score  | 83   | 78              | Global            | Efforts were made to improve communication, including increasing the frequency of messages from management; a number of items improved over time due to COVID-19 measures | Each department will formulate an action plan based on survey results and work toward improvement   |  |
| Continue investing in human resource development (training costs per person)                        | ¥29,897  | ¥23,639         | EBARA CORPORATION | To prevent the spread of COVID-19, scheduled in-person training sessions were postponed and most training sessions were moved online                                      | Provide both face-to-face and online hybrid training opportunities  |  |
| Increase the ratio of local employees in global key positions at overseas operating sites (by 2030) | 2030: 50%  | 20%             | Global            | Explained KPIs to the human resource departments of overseas Group companies at global HR meetings  | Implement Groupwide early selection and training of talent globally, and undertake systematic personnel measures for 2030   |  |

\* Key position: employee positions equivalent to managers

**Human Capital Strategies and Measures**

**Strengthen Groupwide Human Resource Management**

To realize our international business development goals in E-Vision 2030, we believe that we must accelerate the localization of the human resources that hold global key positions in the Group’s business. In order to continuously nurture human resources capable of succeeding in these positions, we must promptly select and train excellent human resources throughout the Group.

To achieve these objectives, we have been working on the One EBARA HR project since the fiscal year ended December

31, 2019 to strengthen human resource management across the entire Group. The project sets a timeline for the implementation of nine HR measures to be completed by the next mid-term management plan at all Group companies. In the fiscal year ended December 31, 2020, the introduction of the role grading system was completed at two Group companies (Ebara Pumps Europe in Italy and Ebara Vietnam Pump Company in Vietnam).

**Message from an Employee in a Global Key Position**



**Matteo Zenari**  
Product Management & Communication General Manager  
Ebara Pumps Europe

One EBARA is a great HR strategy because it makes us feel like we are one united company, as the name suggests. I’m a big supporter. I have had the opportunity to work for the EBARA Group as an export area manager in Italy and as a branch manager in Russia and the United Kingdom. I was able to use this time to develop my skills as a manager and understand cultural differences. I also learned that having people working in different parts of the world really benefits the Company.

I believe that there are many people who have expertise in various aspects of the business at EBARA. I believe that the EBARA Group will be able to become a strong global player if we give those people the opportunity to enhance their vision and mindset.

**Efforts to Change Corporate Culture**

In order to realize a corporate culture of competition and challenge, we reformed our personnel system, first with key positions in the fiscal year ended December 31, 2017, and then with unionized positions in the fiscal year ended December 31, 2018. Organizations were expanded and flattened, and a shift was made from the previous seniority-based system to a role grading system.

In the past, the earliest an employee in a unionized position could be promoted to a key position was after their

mid-thirties. However, under the new system, key positions have been created for employees in their twenties. We are selecting employees for promotion earlier based on merit and we have eliminated the seniority system.

We will continue to foster a corporate culture of competition and challenge by providing comfortable, motivating environments where diverse employees, regardless of gender, nationality, or age can conduct meaningful work globally.

**Initiatives for Human Resource Development**

In the fiscal year ended December 31, 2020, some training sessions were postponed and most were held online in order to prevent the spread of COVID-19. Online training has the advantage of being location-independent, and we will continue to use a combination of face-to-face and online training.

For the first time, in the fiscal year ending December 31, 2021, research project training will be conducted in collaboration with the Graduate School of Project Design, with the aim

of cultivating human resources for the future of EBARA who are capable of discovering new business opportunities that support society, industry, and everyday life. From the perspective of fostering a corporate culture of competition, challenge, and diversity, the participants were selected through an open recruitment process. In the future, the participants will work on conceptualizing new businesses to solve social issues.

## Human Resource Strategy

### Conducting Global Engagement Surveys

We have been conducting global engagement surveys of all domestic and overseas EBARA Group employees since 2019 to ascertain what employees think about the companies and their work. Each department takes the survey results and creates and implements an action plan to improve engagement throughout the Group. As a result of these efforts, the number of positive survey responses from employees increased in 2020. In particular, due to enhanced communication and messaging from the management team, numbers improved in the comprehensive indicator categories of “sustainable engagement” and “management team.” In addition, our prompt and appropriate COVID-19 preventive measures

resulted in an increase in positive responses in the “safety” category.

### Selected 2020 Survey Results

| Category                | Percentage of positive responses (overall EBARA Group) |
|-------------------------|--|
| Sustainable engagement* | 78% (+3 points)  |
| Management team         | 64% (+5 points)  |
| Safety                  | 79% (+4 points)  |

\* Refers to a high sense of belonging to an organization, which is maintained by a productive work environment, physical and mental health, etc. Parentheses indicate comparison to 2019 figures.

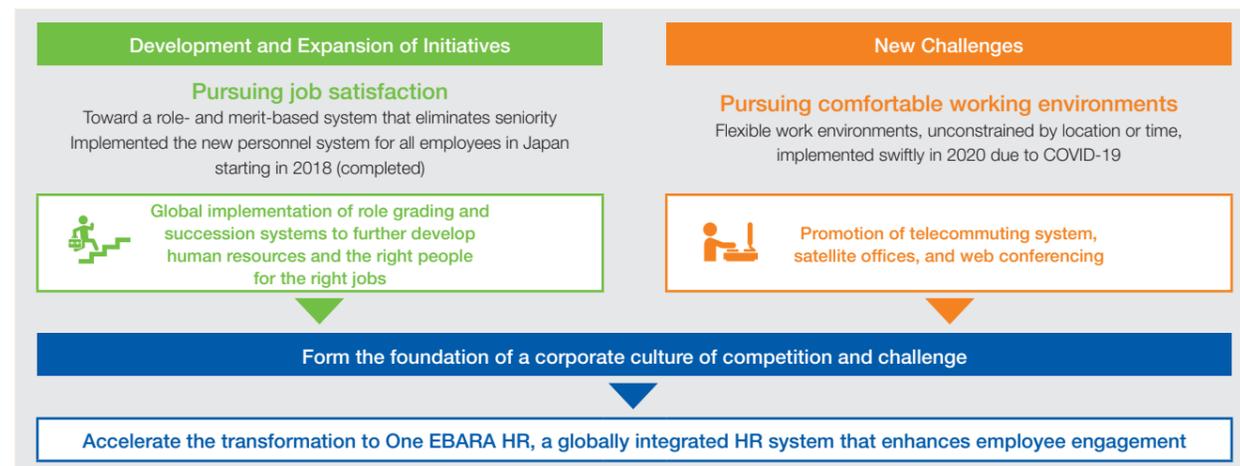
### Initiatives to Improve Job Satisfaction and Comfort

The EBARA Group aims to be a corporation in which diverse employees around the world feel fulfilled and comfortable in their work. The COVID-19 pandemic has led to widespread adoption of telecommuting and decreased opportunities for face-to-face communication. As work styles change drastically, the Group is examining new ways of working within a post-pandemic society.

To realize job satisfaction, we will implement the role grading and succession management systems globally, to promote human resource development and ensure that the right people have the right jobs.

To realize comfortable working environments, we are implementing concrete measures to create a flexible and comfortable work environment not restricted by location or time, including expanding telecommuting systems, setting up satellite offices, and promoting web conferencing.

We will continue to enhance employee engagement by realizing both job satisfaction and comfortable working environments, and accelerate the transformation to the globally integrated HR system, One EBARA HR.



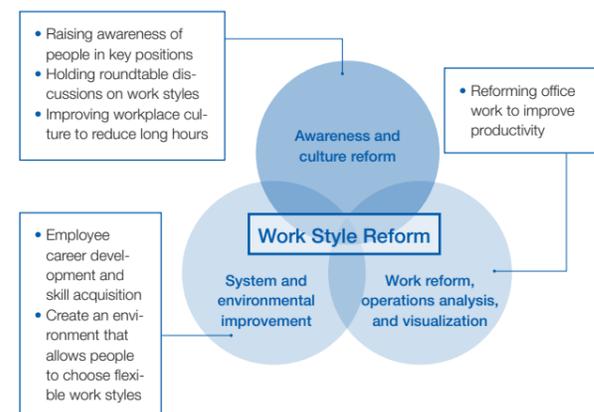
### Distribution of Tablets to Employees at Manufacturing Sites

To improve the motivation and engagement of manufacturing site employees, and to close the information infrastructure gap in the workplace, we provided a tablet device to each person. Previously, a single computer was shared amongst each group of manufacturing site employees. Onsite communications were mainly done on paper, which made for an inefficient work environment. Tablets enable employees to have timely access to information on the Company intranet,

e-learning courses, expanded telecommuting options, and electronic manuals. This shift will both improve employee IT literacy and increase productivity, as well as facilitate the switch to paperless documents and promote human resource development. We will continue to formulate and implement measures that will help everyone move forward together, regardless of their workplace.

### Diversity Promotion

The EBARA Group’s long-term vision as laid out in E-Vision 2030 is to create comfortable and stimulating working environments where diverse employees can engage in meaningful work to their full potential. To realize this vision, we are implementing initiatives in three areas: awareness and culture reform; system and environmental improvement; and work reform, operations analysis, and visualization.



### Advancement for Women

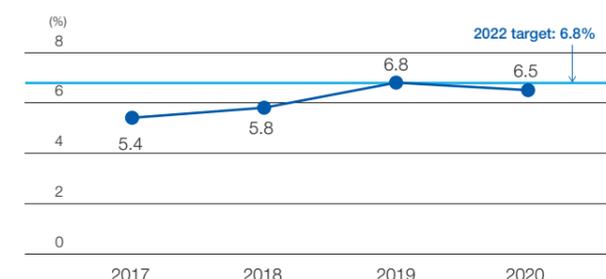
We aim to be a company where women can evolve and exercise their full ability through their work.

Aiming to resolve the current issues of the percentage of women in key positions and the small number of female candidates for key positions, we have set a goal of increasing the percentage of women in key positions to 7% or more by April 2023, and 8% or more by April 2025.

As part of our efforts to realize these goals, we will actively provide educational opportunities to foster career advancement, including options for employees to participate in external training programs.

We also held a roundtable discussion for employees on childcare leave in 2020, as there are many women who are concerned about their career path relative to marriage, childbirth, and other major life events. We will provide information about continuing careers, balancing work with raising children, and other possible opportunities.

### Ratio of Women in Key Positions (EBARA CORPORATION, full-time employees)



### Support for Non-Japanese Employees

One of the issues we faced was establishing a support system to help retain excellent non-Japanese talent who contribute to our global competitiveness. To ensure that non-Japanese employees in Japan and overseas can work safely and securely even during the ongoing COVID-19 pandemic, we are taking measures to prevent COVID-19 and providing useful information to ensure smooth operations. In addition, we hold periodic interviews to solve problems with communication or internal networks. During the first two years of a non-Japanese employee’s tenure at EBARA in Japan, we also provide periodic interviews in their native language to better understand and assist with the settling-in process, challenges they’re facing, and their growth. These interviews are conducted by specialists (outsource basis) with the requisite language skills.

### Recruitment and Training of Non-Japanese Employees in Japan



### Hiring by Job Category

Until 2020, new graduates were assigned to positions based on aptitude after joining the Company, but for 2022, we have changed the system to allow new graduates to choose a path (both job category and product sector) when they apply. By choosing their own jobs, they can choose to utilize what they learned as a student or choose a job that provides new challenges, making it easier for them to realize their desired careers.

### Start of the Alumni System

We have started building a network of former employees, known as Ebalumni (Ebara-Alumni), with the aim of expanding personal connections and visualizing the talent of people who have left EBARA.

In general, alumni systems expand the range of human resources that an organization can access. By connecting people when they are recruited to the time they leave, we hope to attract diverse human resources, promote collaboration, and facilitate open innovation to achieve sustainable growth in the global market.

**We will contribute to the resolution of social and environmental issues through our business by evolving and expanding our long-term initiatives.**



**Hiroshi Sobukawa**

Executive Officer  
Responsible for Technologies, R&D & Intellectual Property  
Division Executive, Advanced Technology Division,  
Precision Machinery Company

In the decade since the closure of EBARA Research Co., Ltd. in 2009, we have been strengthening our R&D activities and intellectual property based on a unique approach guided by BRDIP,\*1 which promotes coordination among businesses, research and development, and intellectual property, and ABA,\*2 which encourages collaboration among academia, businesses, and associations. In 2020, the first year of E-Vision 2030 and E-Plan 2022, we strengthened ties between BRDIP and ABA, formulated long-term strategic operation plans for the next decade, and implemented initiatives to create new businesses. By further evolving and developing these initiatives, we will continue to contribute to the resolution of social and environmental issues through our business.

\*1. BRDIP: An original EBARA Group acronym created from "businesses," "R&D," and "intellectual property"

\*2. ABA: An original EBARA Group acronym created from "academia," "businesses," and "associations"

REFERENCE Technologies <https://www.ebara.co.jp/en/technology/technology-top.html>

**R&D and Intellectual Property Vision (E-Vision 2030)**

We will further evolve and expand long-term strategic activities and contribute to solving social and environmental issues through our business.

**E-Plan 2022 Progress and KPIs**

| Related Materiality | Measures and KPIs  | 2022/12 Targets                          | 2020/12 Results   | 2020/12 Achievements  | Future Initiatives   |
|---------------------|--|--|---|---|--|
| 1                   | <b>Strengthening development capabilities</b>  |  |   |   |  |
|                     | Formulation of a research roadmap (RM) in key technology areas and implementation of medium- to long-term research themes in line with RMs | E-Plan 2022 target progress: 100%        | E-Plan 2022 target progress: 58%  | Formed RMs and action plans (APs) in the areas of fluids, materials, machine elements/vibration/acoustics, micro-interfaces, and numerical analysis   | Revise RMs and initiate measures in line with APs, as well as formulate RMs/APs for electrical, control, and thermal sectors   |
| 2                   | <b>Pursue new needs and research opportunities</b>   |  |   |   |  |
|                     | Propose and implement research themes that lead to new technologies and new businesses   | Ongoing proposals of new business fields | Planned research themes in new fields and started new technology projects | Strengthened research activities, conducted research on materials informatics (MI) and energy-related technologies, and supported the launch of new research themes and new technology projects in new fields | Promote R&D of MI, xR (virtual and augmented reality technologies), and energy-related technologies, and conduct research activities and plan research themes that broaden the scope of research |
|                     | Conduct patent application and rights acquisition activities based on market and technology trends for every product                       | Secure 100% of key products              | Achieved target for the fiscal year ended December 31, 2020               | Target products selected and IP strategies formulated; also started expanding strategic activities with business divisions  | Work to improve competitive advantage of our key products by reviewing targets based on annual results   |

**Intellectual Property Initiatives**

- To enhance the competitive advantage of our key products, we are conducting patent application and rights acquisition activities based on the market and technological trends of each product.
- We are formulating contract policies for each type of contract and disseminating them internally, and also promoting the establishment and application of contract models that adhere to the policies.
- We are investigating other companies' patent strategies, technology trends, and trademark activities, and are providing information and proposals that contribute to management decisions, business decisions, and investor relations.
- We have registered our intellectual property in the *Chizaizukan* intellectual property database to generate demand for our intellectual property and to co-create new value with external companies. We will continue collaborating with external parties through our technology and intellectual property to create solutions that contribute to society.



One example from the *Chizaizukan*  
Technology for fixing metal particles to synthetic fibers serves as a catalyst for improving chemical manufacturing efficiency

REFERENCE Chizaizukan <https://chizaizukan.com/>

**R&D Initiatives That Lead to Increased Corporate Value**

The corporate R&D division stays informed of the latest technologies and contributes to the introduction of technologies that meet the needs of the business divisions.

**Development of Technology to Diagnose Abnormalities in Rotating Machinery**



**Takahito Kagoshima**  
EBARA CORPORATION  
Marketing Division

In the operation of rotating machinery like pumps, scheduled, periodic inspection and maintenance is conducted to avoid performance degradation and losses due to sudden abnormalities or stoppages.

In recent years, various companies and research institutes have been developing condition-based maintenance technologies using AI and IoT. However, the mainstream approach of most of these technologies is to generate a so-called "rough diagnosis," in which the presence or absence of an abnormality is determined based on data obtained during normal operation. To get a "precision diagnosis" that identifies the cause of the abnormality, it is essential to have a detailed understanding of the structure and other aspects of the rotating machinery in question. To add to this, abnormalities occur infrequently in rotating machinery, making it difficult to collect a large amount of error data.

We are conducting R&D with the aim of realizing precision diagnosis technology by utilizing data science. We are developing a new learning method model (transfer learning) that enables diagnosis of abnormalities with a smaller amount of error data, and working on the construction of a system for actively and efficiently collecting necessary data in an experimental environment. We have also created physical models based on the structure and characteristics of rotating machinery, and combined them with simulation technology to study the mechanisms of abnormalities.

By developing technology to diagnose abnormalities in rotating machinery and providing condition-based maintenance services, we will build and strengthen new customer contact points through data, and this technology will also enable us to identify and provide solutions for potential unseen issues.



Illustration of transfer learning

**Utilizing xR Technology**



**Kazuya Hirata**  
EBARA CORPORATION  
Technologies, R&D Division  
xR Application Development  
Section

We are promoting the use of xR (extended reality) technologies such as VR (virtual reality) and AR (augmented reality) to improve our internal operations and product value. We are considering ways to utilize xR technology in various situations, such as during training when understanding the structure or disassembly of a product is difficult with two-dimensional drawings, as well as offering remote support or instructions. We are currently trialing this technology in the Precision Machinery Business and in the infrastructure systems division of the Fluid Machinery & Systems Business. We will continue to promote the use of xR technology in various fields, such as safety education and practical hazard experience applications, to improve operations, increase efficiency, and strengthen the competitiveness of the Group.



xR technology in use

**xR Technology in Business Divisions and Employee Message**



**Seiji Miura**  
EBARA CORPORATION  
Precision Machinery  
Company  
Equipment Division, Service &  
Support Department, Training  
Section and xR Application  
Development Section

Previously, customers would come to Japan to train on chemical mechanical polishing (CMP) equipment, but that was not possible in 2020 due to travel restrictions related to the COVID-19 pandemic, so we switched to online training using videos and e-learning. However, we could not conduct training using actual onsite equipment, so our customers asked us to conduct online training that would be close to real, in-person practical training. To tackle this challenge, we are developing a training program that incorporates VR and AR. Ideally, customers around the world should be able to receive training regardless of language or time differences, so we are also using this program to cultivate local trainers for overseas Group bases.

This new training program is expected to improve work efficiency, shorten the time required to acquire skills, and reduce costs. It has been well-received in the internal evaluation stage, but there are still some issues that need to be resolved, so we plan to release it in 2021. In the future, while giving due consideration to safety, we will create programs as part of a new type of training that can be easily utilized by the next generation.

**External Collaboration for Human Resource Development**

We hold EOI\* symposiums and invite experts in academic fields related to our business projects to help further our understanding of the latest technologies and develop human resources, as well as to promote the use of such advancements through external collaboration.

\* EOI (Ebara Open Innovation): An original open innovation framework that fosters young researchers at outside research institutions by conducting joint research to resolve advanced technological issues

Digital transformation driving corporate innovation.



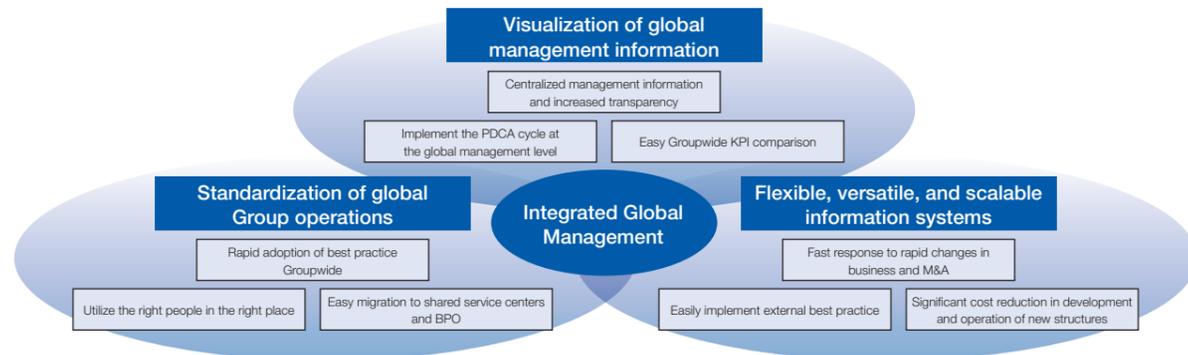
**Hiroyuki Kowase**  
Executive Officer  
Division Executive, Information & Communication System Division

The EBARA Group is making extensive use of digital transformation (DX) in order to develop as a global company. Digital transformation is driving corporate culture reform, improving business efficiency, and reshaping structures and business models. We have received a DX Certification from the Ministry of Economy, Trade and Industry (METI), and are proceeding with the standardization of our information infrastructure and core systems. The EBARA standard template for our core systems has been completed, and the system is being rolled out both within EBARA Corporation and at Group companies.

In response to the drastically changing business environment, our management, business, and IT departments will work in unison to implement ongoing corporate innovation through digital transformation.

Digital Transformation Initiatives

The EBARA Group will achieve the transformation from international management to integrated global management.



Digital Transformation Vision (E-Vision 2030)

Transform products, services, and business models and strengthen S&S by driving digital transformation.

E-Plan 2022 Progress and KPIs

| Related Materiality | Measures and KPIs                                      | 2022/12 Target   | 2020/12 Results               | 2020/12 Achievements   | Future Initiatives  |
|---------------------|--|--|-------------------------------|--|---|
| 1<br>               | <b>Realization of integrated global management</b>     |  |                               |  |   |
|                     | Global deployment of systems centered on ERP (by 2024) | Determine optimal pilot facilities and deploy systems in advance | Implemented according to plan | Although the pilot company was changed due to COVID-19, measures were taken to ensure the overall plan would not be affected | Expand pilot facilities, complete full implementation in FY2024   |
|                     | Integration of global IT infrastructure                | 100%   | 16%                           | Defined integration policy, established global centralized model, then implemented at overseas companies                     | Implement EBARA Group infrastructure integration, including security and other important measures, at more than 50 bases by the end of FY2021 |
|                     | Expansion of centralized global systems                | 100%   | 54%                           | Started with usage trials and gradually expanded to overseas affiliates  | Plans under way to roll out to 41 overseas Group companies by the end of FY2021, with continued expansion thereafter                          |
| 4<br>               | Increase of internal IT tools                          | 100%   | 37%                           | Increased the number of internal IT tools in operation such as robots (exceeded 2020 plan)                                   | Continue to revise workflows and optimize operations through automation   |

Utilizing Digital Transformation in Business

Shortening Design Lead Time and Improving Design Quality through Automation

The delivery times that customers require are getting shorter. In the Compressors and Turbines Business, where each order is custom designed and manufactured to the customer's specifications, the value of a product is decided by the speed and quality of the design phase. Automated design is an initiative to resolve the conflict between short design lead time and high design quality.

In conventional design work, the standard method is to reuse relevant parts of similar previously designed products and modify them for the new specifications. However, this method requires the designer to sift through a huge amount of past designs and decide which components to reuse based on their individual expertise, so design quality is inconsistent. This inconsistency leads to delivery delays and unnecessary costs.

With that in mind, we endeavored to develop an optimal design system that would produce the same results as an expert, regardless of individual proficiency.

In the automated design method, the designer inputs basic design specifications using a program that makes calculations based on the customer's requirements and applicable technologies. Based on the input data, modeling, drawings, and BOM\*1 are generated automatically by utilizing the functions of the mechanical and 3D-CAD system.

The basic design program instantly performs technical calculations based on the customer's requirements, such as performance and rotor stability calculations, as well as selecting the optimal impeller. This system delivers the final product in the form of basic design specifications, and can also automatically generate proposal reports to send to customers.

The 3D-CAD system is a high-end system that supports the parametric design of mechanical systems. In recent years, 3D-CAD systems have become more sophisticated, and can automatically create high-quality 3D modeling data and

drawings. The input data used for the 3D-CAD system is the basic design specification data generated by our basic design program. We have also started developing xR\*2 technology using the 3D modeling data obtained from this system. Recently, we have been receiving increased customer requests for 3D modeling data, and we believe that 3D modeling data will be even more important going forward.

The BOM creation system automatically creates BOM data using the same basic design specifications input as the 3D-CAD system.

All technical information (including project design, development design, production preparation, production technology, production, procurement, logistics, sales, and maintenance data) collected throughout the product lifecycle is managed by the Product Lifecycle Management (PLM)\*3 system and aggregated in an engineering chain. This information is the foundation for our product development capabilities and our business competitiveness.

\*1. BOM: Bill of Materials, a list of components, basic information, and hierarchical structure required to manufacture a product.  
\*2. xR: Extended Reality, a generic term for technology that integrates a virtual world with the real world.  
\*3. PLM: Product Lifecycle Management, a system that aims to improve efficiency and overall optimization by monitoring the entire lifecycle of a product, from the planning stage to disposal and recycling.



Centrifugal compressor (left) and steam turbine (right) made with the automated design system

Message from a Lead Developer of the Automated Design System

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The automated design system has successfully reduced the design lead time by 80% compared to ten years ago, and design quality has dramatically improved.

We developed the automated design system entirely in-house, and didn't use any external resources. We did this so that every member involved would get the same understanding of design work throughout the system development process, since explicit knowledge would be replacing tacit knowledge. I felt that the members gained a deeper understanding of each other, and that we have produced great results as a team.